



Ruizia

**ORCHIDACEAE  
OF IVORY COAST**

**Dariusz L. Szlachetko**

MONOGRAFÍAS DEL REAL JARDÍN BOTÁNICO, MADRID

CSIC



ORCHIDACEAE  
OF IVORY COAST

RUIZIA  
Monografías del Real Jardín Botánico, CSIC, 20

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# ORCHIDACEAE OF IVORY COAST

Dariusz L. Szlachetko

Polystachyeae prepared in cooperation with  
Joanna Mytnik-Ejsmont

CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS  
Madrid, 2008

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Foto de cubierta: *Epiphorella victoriae*

(T. Stévant, *Botánica y botánicos en Guinea Ecuatorial*, pág. 245)

*Catálogo general de publicaciones oficiales:*

<http://www.060.es>



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NIPO: 472-08-030-2

ISBN: 978-84-00-08725-8

Depósito Legal: 52.061-2008

Maquetación: Departamento de Publicaciones  
del Real Jardín Botánico, CSIC

Imprime: Fareso, S. A.

Paseo de la Dirección, 5. 28039 Madrid

Impreso en España - *Printed in Spain*

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## INTRODUCTION

Ivory Coast lies on the West African coast on the Gulf of Guinea. It is located between 2°30' and 8°37'W and between 4°22' and 10°55'N (Fig. 1). It comprises 322,460 km<sup>2</sup>. It extends ca. 690 kilometers longitudinally and latitudinally at its longest span. Ivory Coast's terrain can generally be described as a large plateau, rising gradually towards the north up to 1218 m above sea level (Mt. Tonkoui), the highest elevation is Mt. Nimba, at 1752 m above sea level in the far west of



Fig. 1.–Localization of the study area.

the country along the border with Guinea. The lowest elevation is at sea level on the coasts.

There are three main types of climate in the Ivory Coast taking a parallel course:

- humid equatorial in the southern coasts with almost constant rainfalls through the year with an average of 1400-2000 milimeters annually;
- humid tropical in the middle of the country with dry season from December to January;
- semiarid in the far north with dry season from November till March.

Climate influence the flora naturally. The flora's distribution in Ivory Coast runs evenly with a parallel of latitude. There are evergreen rain forest in the south, with the richest floristically ecosystems that are abounded with many orchid species. The central part of the country is covered with masophilous forests, which are gradually transformed into savanna of the Guinea type. The driest part of the country, the north, is covered with savanna of the Sudan type. Different types of vegetation are azonal formation of gallery forests occurring along rivers and montane forests.

Flora of the Orchidaceae of Ivory Coast is relatively well known mainly thanks to recent works of two botanists: Laurent Aké Assi (2002) and Francisco Pérez-Vera (2003). However the first elaboration of the orchid flora of Ivory Coast was prepared by Summerhayes (1968) within Flora of Tropical West Africa. In the present work 234 species representing 66 genera are distinguished. Pérez-Vera (2003) classified 229 species in 48 genera. Differences between these works are results of different taxonomic conceptions, especially on the generic level. Species richness in Ivory Coast is striking against a background of West Africa, i.e. in neighboring Guinea 153 species and 54 genera are reported (Szlachetko & Kowalkowska 2007). Several species, or even genera, have their geographical boundary just in the Ivory Coast area.

The comparison between species of Guinea and Ivory Coast is presented in the table 1.

**Tab. 1. Comparison between orchidflora of Ivory Coast and Guinea**

Species	Ivory Coast	Guinea	Species	Ivory Coast	Guinea
1 <i>Aerangis biloba</i> .....	1	1	16 <i>Angraecopsis parviflora</i> .....	1	0
2 <i>Aerangis calantha</i> .....	1	0	17 <i>Angraecopsis tridens</i> .....	0	1
3 <i>Aerangis kotschyana</i> .....	0	1	18 <i>Angraecum birrimense</i> .....	1	0
4 <i>Afrorchis sceptrum</i> .....	1	1	19 <i>Angraecum claessensii</i> .....	1	0
5 <i>Ancistrochilus rotschildianus</i> .....	1	1	20 <i>Angraecum distichum</i> .....	0	1
6 <i>Ancistrochilus akeassiae</i> .....	1	0	21 <i>Angraecum moandense</i> .....	1	1
7 <i>Ancistrochilus capitatus</i> Summerh. ....	1	0	22 <i>Angraecum multinominatum</i> ....	1	1
8 <i>Ancistrochilus cephalotes</i> ....	1	1	23 <i>Angraecum podochiloides</i> .....	0	0
9 <i>Ancistrochilus clandestinus</i> ....	1	1	24 <i>Angraecum pyriforme</i> .....	1	0
10 <i>Ancistrochilus metteniae</i> .....	1	0	25 <i>Angraecum subulatum</i> .....	1	1
11 <i>Ancistrochilus recurvus</i> .....	1	1	26 <i>Ansellia africana</i> .....	1	0
12 <i>Ancistrochilus strausii</i> .....	1	0	27 <i>Auxopus kamerunensis</i> .....	1	1
13 <i>Angraecopsis elliptica</i> .....	1	0	28 <i>Auxopus macranthus</i> .....	1	0
14 <i>Angraecopsis ischnopus</i> .....	1	1	29 <i>Brachycorythis buchananii</i> .....	0	1
15 <i>Angraecopsis macrophylla</i> .....	1	0	30 <i>Brachycorythis kalbreyeri</i> .....	0	1
			31 <i>Brachycorythis ovata</i> .....	1	0

Species	Ivory Coast	Guinea	Species	Ivory Coast	Guinea
32 <i>Brachycorythis ovata</i> Lindl. var. <i>ovata</i> . . . . .	1	0	78 <i>Bulbophyllum josephii</i> (Kuntze) Summerh. var. <i>josephii</i> . . . . .	1	1
33 <i>Brachycorythis ovata</i> Lindl. var. <i>schweinfurthii</i> . . . . .	1	0	79 <i>Bulbophyllum josephii</i> (Kuntze) Summerh. var. <i>mahonii</i> . . . . .	1	1
34 <i>Brachycorythis ovata</i> Lindl. var. <i>welwitschii</i> . . . . .	1	0	80 <i>Bulbophyllum lupulinum</i> . . . . .	1	1
35 <i>Brachycorythis paucifolia</i> . . . . .	1	1	81 <i>Bulbophyllum magnibracteatum</i> . . . . .	1	0
36 <i>Brachycorythis pubescens</i> . . . . .	1	0	82 <i>Bulbophyllum maximum</i> . . . . .	1	1
37 <i>Bilabrella angustissima</i> . . . . .	0	1	83 <i>Bulbophyllum melinostachyum</i> . . . . .	1	0
38 <i>Bilabrella genuflexa</i> . . . . .	1	1	84 <i>Bulbophyllum nigericum</i> . . . . .	1	0
39 <i>Bilabrella ichneumonea</i> . . . . .	1	1	85 <i>Bulbophyllum nigritianum</i> . . . . .	1	0
40 <i>Bilabrella pauper</i> . . . . .	0	1	86 <i>Bulbophyllum oreonastes</i> . . . . .	1	1
41 <i>Bilabrella schimperiana</i> . . . . .	1	0	87 <i>Bulbophyllum oxychilum</i> . . . . .	1	1
42 <i>Bilabrella tisserantii</i> . . . . .	0	1	88 <i>Bulbophyllum phaeopogon</i> . . . . .	1	0
43 <i>Bolusiella batesii</i> . . . . .	1	0	89 <i>Bulbophyllum pipio</i> . . . . .	1	0
44 <i>Bolusiella iridifolia</i> ssp. <i>iridifolia</i> . . . . .	1	0	90 <i>Bulbophyllum pumilum</i> . . . . .	1	1
45 <i>Bolusiella iridifolia</i> ssp. <i>picea</i> . . . . .	1	0	91 <i>Bulbophyllum purpureorhachis</i> . . . . .	1	0
46 <i>Bolusiella maudae</i> . . . . .	1	1	92 <i>Bulbophyllum resupinatum</i> . . . . .	1	0
47 <i>Bolusiella talbotii</i> . . . . .	1	1	93 <i>Bulbophyllum resupinatum</i> Ridl. var. <i>resupinatum</i> . . . . .	1	0
48 <i>Brachycorythis buchananii</i> . . . . .	0	1	94 <i>Bulbophyllum resupinatum</i> Ridl. var. <i>filiforme</i> . . . . .	1	0
49 <i>Brachycorythis kalbreyeri</i> . . . . .	0	1	95 <i>Bulbophyllum saltatorium</i> Lindl. var. <i>saltatorium</i> . . . . .	1	0
50 <i>Brachycorythis ovata</i> . . . . .	1	1	96 <i>Bulbophyllum saltatorium</i> Lindl. var. <i>calamarium</i> . . . . .	1	0
51 <i>Brachycorythis ovata</i> Lindl. var. <i>schweinfurthii</i> . . . . .	1	1	97 <i>Bulbophyllum scaberulum</i> . . . . .	1	1
52 <i>Brachycorythis ovata</i> Lindl. var. <i>welwitschii</i> . . . . .	1	1	98 <i>Bulbophyllum scariosum</i> . . . . .	1	1
53 <i>Brachycorythis paucifolia</i> . . . . .	1	1	99 <i>Bulbophyllum schimperianum</i> . . . . .	0	1
54 <i>Brachycorythis pubescens</i> . . . . .	1	1	100 <i>Bulbophyllum schinzianum</i> . . . . .	1	0
55 <i>Bulbophyllum barbigerum</i> . . . . .	1	1	101 <i>Bulbophyllum schinzianum</i> Krenzl. var. <i>schinzianum</i> . . . . .	1	0
56 <i>Bulbophyllum bidenticulatum</i> . . . . .	1	1	102 <i>Bulbophyllum schinzianum</i> Krenzl. var. <i>irigaleae</i> . . . . .	1	0
57 <i>Bulbophyllum bufo</i> (Lindl.) . . . . .	1	1	103 <i>Bulbophyllum stenopetalum</i> . . . . .	1	0
58 <i>Bulbophyllum calyptratum</i> . . . . .	1	1	104 <i>Bulbophyllum tenuicaule</i> . . . . .	0	1
59 <i>Bulbophyllum calyptratum</i> Krenzl. var. <i>calyptratum</i> . . . . .	1	1	105 <i>Bulbophyllum tetragonum</i> . . . . .	1	0
60 <i>Bulbophyllum calyptratum</i> Krenzl. var. <i>graminifolium</i> . . . . .	1	1	106 <i>Bulbophyllum velutinum</i> . . . . .	0	1
61 <i>Bulbophyllum calyptratum</i> Krenzl. var. <i>lucifugum</i> . . . . .	1	0	107 <i>Calanthe sylvatica</i> . . . . .	0	1
62 <i>Bulbophyllum carnosisepalum</i> . . . . .	1	0	108 <i>Calyptrochilum christyanum</i> . . . . .	1	1
63 <i>Bulbophyllum cochleatum</i> . . . . .	1	1	109 <i>Calyptrochilum emarginatum</i> . . . . .	1	1
64 <i>Bulbophyllum cochleatum</i> Lindl. var. <i>cochleatum</i> . . . . .	1	1	110 <i>Ceratopetalorchis cirrhata</i> . . . . .	1	1
65 <i>Bulbophyllum cocoinum</i> . . . . .	1	0	111 <i>Ceratopetalorchis comuta</i> . . . . .	1	1
66 <i>Bulbophyllum colubrinum</i> . . . . .	1	0	112 <i>Ceratopetalorchis holubii</i> . . . . .	1	0
67 <i>Bulbophyllum comatum</i> . . . . .	1	0	113 <i>Ceratopetalorchis laurentii</i> . . . . .	1	1
68 <i>Bulbophyllum comatum</i> Lindl. var. <i>inflatum</i> . . . . .	1	0	114 <i>Ceratopetalorchis sanfordiana</i> . . . . .	1	0
69 <i>Bulbophyllum denticulatum</i> . . . . .	1	0	115 <i>Chamaeangis ichneumonea</i> . . . . .	1	1
70 <i>Bulbophyllum falcatum</i> . . . . .	1	1	116 <i>Chamaeangis lanceolata</i> . . . . .	1	0
71 <i>Bulbophyllum falcipetalum</i> . . . . .	1	0	117 <i>Chamaeangis letouzeyi</i> . . . . .	1	0
72 <i>Bulbophyllum finetii</i> . . . . .	1	0	118 <i>Chamaeangis odoratissima</i> . . . . .	1	1
73 <i>Bulbophyllum fuscum</i> . . . . .	1	1	119 <i>Chamaeangis pauciflora</i> . . . . .	1	0
74 <i>Bulbophyllum imbricatum</i> . . . . .	1	1	120 <i>Chamaeangis vesicata</i> . . . . .	1	1
75 <i>Bulbophyllum inflatum</i> . . . . .	0	1	121 <i>Chauliodon deflexicalcaratum</i> . . . . .	1	0
76 <i>Bulbophyllum intertextum</i> . . . . .	1	1	122 <i>Corymborkis corymbis</i> . . . . .	1	1
77 <i>Bulbophyllum ivorense</i> . . . . .	1	1	123 <i>Cribbia brachyceras</i> . . . . .	1	1
			124 <i>Cribbia confusa</i> . . . . .	1	0
			125 <i>Cyrtorchis arcuata</i> (Lindl.) Schltr. var. <i>variabilis</i> . . . . .	1	1

Species	Ivory Coast	Guinea	Species	Ivory Coast	Guinea
126 <i>Cyrtorchis arcuata</i> (Lindl.) Schltr. var. <i>whytei</i> . . . . .	1	0	177 <i>Eulophia schweinfurthii</i> . . . . .	1	0
127 <i>Cyrtorchis aschersonii</i> (Kraenzl.) . . . . .	1	0	178 <i>Eulophia sordida</i> . . . . .	1	0
128 <i>Cyrtorchis chailluana</i> (Hook. f.) . . . . .	1	1	179 <i>Eurychone galeandrae</i> . . . . .	1	0
129 <i>Cyrtorchis hamata</i> (Rolfe) . . . . .	1	0	180 <i>Eurychone rotschildiana</i> . . . . .	1	1
130 <i>Diceratostele gabonensis</i> . . . . .	1	0	181 <i>Genyorchis apetala</i> . . . . .	1	0
131 <i>Diaphananthe bidens</i> . . . . .	1	1	182 <i>Graphorkis lurida</i> . . . . .	1	1
132 <i>Diaphananthe bueae</i> . . . . .	1	0	183 <i>Gyaladenia conica</i> . . . . .	0	1
133 <i>Diaphananthe pellucida</i> . . . . .	1	1	184 <i>Gyaladenia tenuior</i> . . . . .	1	1
134 <i>Diaphananthe plehniana</i> . . . . .	1	0	185 <i>Habenaria barrina</i> . . . . .	1	1
135 <i>Diaphananthe quintasii</i> . . . . .	1	0	186 <i>Habenaria buettnerana</i> . . . . .	1	1
136 <i>Diaphananthe sarcophrynchoides</i> . . . . .	1	0	187 <i>Habenaria chlorotica</i> . . . . .	1	0
137 <i>Didymoplexis africana</i> . . . . .	1	0	188 <i>Habenaria filicornis</i> . . . . .	1	1
138 <i>Dinklagella liberica</i> . . . . .	1	0	189 <i>Habenaria lelyi</i> . . . . .	0	1
139 <i>Disa welwitschii</i> . . . . .	1	1	190 <i>Habenaria physuiformis</i> . . . . .	1	0
140 <i>Disa welwitschii</i> Rchb.f. subsp. <i>welwitschii</i> . . . . .	1	1	191 <i>Habenaria procera</i> . . . . .	1	1
141 <i>Disa welwitschii</i> Rchb.f. subsp. <i>occultans</i> . . . . .	1	1	192 <i>Habenella leonensis</i> . . . . .	1	1
142 <i>Disperis thomensis</i> Summerh. . . . .	1	1	193 <i>Habenella stenochila</i> . . . . .	0	1
143 <i>Dolabrifolia bancoense</i> . . . . .	1	0	194 <i>Habenella zambesina</i> . . . . .	1	1
144 <i>Dolabrifolia disticha</i> . . . . .	1	0	195 <i>Hetaeria heterosepala</i> . . . . .	1	0
145 <i>Dolabrifolia podochiloides</i> . . . . .	1	0	196 <i>Hetaeria occidentalis</i> . . . . .	1	1
146 <i>Eggelingia clavata</i> . . . . .	1	0	197 <i>Homocolleticon brownii</i> . . . . .	1	0
147 <i>Epiphorella dalzielii</i> . . . . .	1	1	198 <i>Homocolleticon crassifolia</i> . . . . .	0	1
148 <i>Epiphorella pobeguinii</i> . . . . .	1	0	199 <i>Homocolleticon monteiroae</i> . . . . .	1	0
149 <i>Epiphorella pseudodisa</i> . . . . .	1	0	200 <i>Homocolleticon ringens</i> . . . . .	1	1
150 <i>Epiphorella reflexa</i> . . . . .	1	0	201 <i>Kornasia che1alieri</i> . . . . .	1	0
151 <i>Epiphorella victoriae</i> . . . . .	1	1	202 <i>Kornasia maclaudii</i> . . . . .	1	1
152 <i>Epipogium roseum</i> . . . . .	0	1	203 <i>Lacroxia minor</i> . . . . .	1	1
153 <i>Eulophia adenoglossa</i> . . . . .	1	1	204 <i>Liparis callei</i> . . . . .	1	1
154 <i>Eulophia alta</i> . . . . .	1	1	205 <i>Liparis epiphytica</i> . . . . .	1	0
155 <i>Eulophia angolensis</i> . . . . .	1	1	206 <i>Liparis nervosa</i> . . . . .	1	1
156 <i>Eulophia barteri</i> . . . . .	1	1	207 <i>Liparis platyglossa</i> . . . . .	1	0
157 <i>Eulophia brevipetala</i> . . . . .	1	1	208 <i>Liparis sp.1</i> . . . . .	1	0
158 <i>Eulophia buettneri</i> . . . . .	1	1	209 <i>Liparis tridens</i> . . . . .	1	0
159 <i>Eulophia calantha</i> . . . . .	0	1	210 <i>Lisowskia katangensis</i> . . . . .	1	0
160 <i>Eulophia caricifolia</i> . . . . .	1	1	211 <i>Lisowskia prorpens</i> . . . . .	0	1
161 <i>Eulophia cristata</i> . . . . .	1	1	212 <i>Listrostachys pertusa</i> . . . . .	1	0
162 <i>Eulophia cucullata</i> . . . . .	1	1	213 <i>Macrura walleri</i> . . . . .	0	1
163 <i>Eulophia euglossa</i> . . . . .	1	0	214 <i>Manniella gustavi</i> . . . . .	1	1
164 <i>Eulophia flavopurpurea</i> . . . . .	1	1	215 <i>Microcoelia caespitosa</i> . . . . .	1	0
165 <i>Eulophia gracilis</i> . . . . .	1	1	216 <i>Microcoelia macrorrhynchia</i> . . . . .	1	0
166 <i>Eulophia guineensis</i> Lindl. var. <i>guineensis</i> . . . . .	1	1	217 <i>Microcoelia kondensis</i> . . . . .	1	0
167 <i>Eulophia guineensis</i> Lindl. var. <i>purpurata</i> . . . . .	0	1	218 <i>Nephrangis filiformis</i> . . . . .	1	0
168 <i>Eulophia guineensis</i> Lindl. var. <i>tisserantii</i> . . . . .	1	1	219 <i>Nervilia adolphi</i> . . . . .	1	1
169 <i>Eulophia horsfallii</i> . . . . .	1	1	220 <i>Nervilia adolphi</i> Schltr. var. <i>adolphi</i> . . . . .	1	1
170 <i>Eulophia juncifolia</i> . . . . .	1	0	221 <i>Nervilia adolphi</i> Schltr. var. <i>seposita</i> . . . . .	1	1
171 <i>Eulophia leonensis</i> . . . . .	1	1	222 <i>Nervilia bicarinata</i> . . . . .	1	1
172 <i>Eulophia lindiana</i> . . . . .	0	1	223 <i>Nervilia crocififormis</i> . . . . .	1	1
173 <i>Eulophia milnei</i> . . . . .	1	1	224 <i>Nervilia fuerstenbergiana</i> . . . . .	1	0
174 <i>Eulophia monile</i> . . . . .	1	0	225 <i>Nervilia kotschy</i> . . . . .	1	1
175 <i>Eulophia odontoglossa</i> . . . . .	1	1	226 <i>Nervilia kotschy</i> (Rchb.f.) Schltr. var. <i>kotschy</i> . . . . .	1	1
176 <i>Eulophia orthoplectra</i> . . . . .	1	0	227 <i>Nervilia kotschy</i> (Rchb.f.) Schltr. var. <i>purpurata</i> . . . . .	1	1
			228 <i>Nervilia petraea</i> . . . . .	1	1
			229 <i>Nervilia subintegra</i> . . . . .	1	1
			230 <i>Ochyrorchis jaegeri</i> . . . . .	0	1

Species	Ivory Coast	Guinea	Species	Ivory Coast	Guinea
231 <i>Oeceoclades maculata</i> . . . . .	1	1	269 <i>Polystachya saccata</i> . . . . .	0	1
232 <i>Oeceoclades saundersiana</i> . . . . .	1	1	270 <i>Polystachya seticaulis</i> . . . . .	1	0
233 <i>Oeceoclades ugandae</i> . . . . .	1	0	271 <i>Polystachya</i> sp. 1. . . . .	1	0
234 <i>Phyllomphax macrantha</i> . . . . .	1	1	272 <i>Polystachya subulata</i> . . . . .	1	1
235 <i>Plantaginorchis englerana</i> . . . . .	1	1	273 <i>Polystachya tenuissima</i> . . . . .	1	0
236 <i>Plantaginorchis jacobii</i> . . . . .	0	1	274 <i>Polystachya tessellata</i> . . . . .	1	1
237 <i>Plantaginorchis parva</i> . . . . .	0	1	275 <i>Rangaeris longicaudata</i> . . . . .	1	0
238 <i>Platycoryne buchananiana</i> . . . . .	0	1	276 <i>Rangaeris muscicola</i> . . . . .	1	1
239 <i>Platycoryne paludosa</i> . . . . .	1	1	277 <i>Rangaeris rhipsalisocia</i> . . . . .	1	1
240 <i>Platylepis glandulosa</i> . . . . .	1	1	278 <i>Rhipidoglossum curvatum</i> . . . . .	1	0
241 <i>Plectrelminthus caudatus</i> . . . . .	1	1	279 <i>Rhipidoglossum laxiflorum</i> . . . . .	1	0
242 <i>Podandriella macrandra</i> . . . . .	1	1	280 <i>Rhipidoglossum rutilum</i> . . . . .	1	1
243 <i>Podangis dactyloceras</i> . . . . .	1	1	281 <i>Satyrrium trinerve</i> . . . . .	0	1
244 <i>Polystachya adansoniae</i> . . . . .	1	1	282 <i>Schlechterorchis occidentalis</i> . . . . .	1	0
245 <i>Polystachya affinis</i> . . . . .	1	1	283 <i>Schwartzkopffia pumilio</i> . . . . .	1	1
246 <i>Polystachya bancoensis</i> . . . . .	1	0	284 <i>Solenangis clavata</i> . . . . .	1	0
247 <i>Polystachya bequaertii</i> . . . . .	0	1	285 <i>Solenangis scandens</i> . . . . .	1	0
248 <i>Polystachya coriscensis</i> . . . . .	1	0	286 <i>Summerhayesia laurentii</i> . . . . .	1	0
249 <i>Polystachya crassifolia</i> . . . . .	1	0	287 <i>Szlachetkoella mystacioides</i> . . . . .	1	0
250 <i>Polystachya dendrobiiflora</i> . . . . .	0	1	288 <i>Tridactyle anthomaniaca</i> . . . . .	1	1
251 <i>Polystachya dolichophylla</i> . . . . .	1	1	289 <i>Tridactyle armeniaca</i> . . . . .	1	1
252 <i>Polystachya fractiflexa</i> . . . . .	1	0	290 <i>Tridactyle bicaudata</i> . . . . .	1	0
253 <i>Polystachya galeata</i> . . . . .	1	1	291 <i>Tridactyle crassifolia</i> . . . . .	1	0
254 <i>Polystachya golungensis</i> . . . . .	1	0	292 <i>Tridactyle fusifera</i> . . . . .	1	0
255 <i>Polystachya laxiflora</i> . . . . .	1	1	293 <i>Tridactyle oblongifolia</i> . . . . .	1	0
256 <i>Polystachya leonensis</i> . . . . .	1	1	294 <i>Tridactyle tridactylites</i> . . . . .	1	1
257 <i>Polystachya microbambusa</i> . . . . .	1	1	295 <i>Tridactyle tridentata</i> . . . . .	1	0
258 <i>Polystachya modesta</i> . . . . .	1	1	296 <i>Unguiculabia parva</i> . . . . .	1	0
259 <i>Polystachya monolenis</i> . . . . .	0	1	297 <i>Vanilla africana</i> . . . . .	1	1
260 <i>Polystachya mukandaensis</i> . . . . .	1	1	298 <i>Vanilla africana</i> Lindl. subsp. <i>africana</i> . . . . .	1	1
261 <i>Polystachya obanensis</i> . . . . .	1	0	299 <i>Vanilla africana</i> Lindl. subsp. <i>cucullata</i> . . . . .	1	1
262 <i>Polystachya oblanceolata</i> . . . . .	0	1	300 <i>Vanilla africana</i> Lindl. subsp. <i>ramosa</i> . . . . .	1	1
263 <i>Polystachya odorata</i> . . . . .	1	0	301 <i>Vanilla imperialis</i> . . . . .	1	0
264 <i>Polystachya paniculata</i> . . . . .	1	1	302 <i>Zeuxine elongata</i> . . . . .	1	1
265 <i>Polystachya polychaete</i> . . . . .	1	1	303 <i>Zeuxine stammleri</i> . . . . .	1	0
266 <i>Polystachya puberula</i> . . . . .	1	1			
267 <i>Polystachya ramulosa</i> . . . . .	1	0			
268 <i>Polystachya rhodoptera</i> . . . . .	1	0			





## MATERIALS AND METHODS

*Orchidaceae of Ivory Coast* was based entirely on the herbarium material and literature. The total number of revised specimens during preparation of the book was 2212. They were either loaned from or examined in B, BM, BR, C, HBG, HEID, K, P, W and WAG.

Both artificial and natural keys for determination of taxa are dichotomical. Subfamilies, tribes and subtribes are arranged in the taxonomical order according to my former work (Szlachetko 1995, with later changes Szlachetko & Rutkowski 2000, Szlachetko & Margońska 2002, Szlachetko 2003). The genera within subtribes and species within genera are arranged alphabetically. Specimens with uncertain determination (cf.) are added to the suitable proper species. Specimens, which are not identified, are listed after described species. The characteristic of every species includes Latin name, abbreviation of the authors' surnames, citation, broadly accepted synonymy, description, habitat information, distribution data and list of representative specimens. Citation and synonymy are written accordingly to the international rules, both taxonomic and nomenclatural. In case of more than one synonym, they are listed chronologically. The abbreviations of the authors' names are followed by Brummitt & Powell (1992, updated version available at [www.ipni.org](http://www.ipni.org)).

The herbarium sheets are listed alphabetically according to the names of localities. In case when the locality's name is lacking on the sheet - at the end of the list of representative specimens. The sheet's description contains: the collector's name with number, locality, eventual information about habitat, the date of collecting, the phenological state of plant, the acronym of herbarium. Some sheets have more than one species, in this instance additionally there were used letters after dash, one for each taxon.

The herbarium acronyms' are adopted from *Index Herbariorum* (Holmgren & al. 1990). The information from the herbarium sheets is left in original reading. Information on the labels was used to describe ecological requirements: habitat, flowering time, altitude, two latter ones are given only for Ivory Coast, if available.

All illustrations included in this volume were prepared under my supervision by Dr. Hanna B. Margońska and Agnieszka Kowalkowska, M.Sc. The illustrations were based mostly on my sketches made from dehydrated flowers taken from the herbarium sheets.

## ACKNOWLEDGEMENTS

I wish to express my sincere thanks to the Curators of B, BM, BR, C, HBG, HEID, K, P, W and WAG for their hospitality during my personal visits. I am

grateful to Dr. Joanna Mytnik-Ejsmont, Agnieszka Kowalkowska M.Sc., Dr. Hanna B. Margońska and Dr. Tomasz S. Olszewski for kind permission to using their drawings in this work. I am obliged to Marta Kras M.Sc., for her invaluable technical assistance.

## ORCHIDACEAE

Plants variable in habit; herb, vine or shrub-like, sympodials or monopodials. Autotrophic or occasionally saprophytes. Roots clustered or scattered along the stem or rhizome, with or without velamen. Storage organs of different form. Leaves plicate, convolute, conduplicate or terete, occasionally scale-like, cauline or basal, sessile or petiolate, articulated or not. Inflorescence terminal or axillary, forming a spike, raceme or panicle, single- to many-flowered. Flowers of various size and form, usually resupinate, occasionally not; the median tepal of the inner whorl transformed into a lip, usually different from the other tepals. Ovary usually single-, but occasionally tri-chambered. Fruit capsular, sometimes fleshy. Seeds tiny, adopted to anemochory, exceptionally to zoo- or hydrochory. Gynostemium often with the basal columnfoot free or agglutinate to the ovary apex. Column part formed by the complete or partial fusion of the staminodes, filament and style, usually well-developed, but none in some groups. Stigma triple-, bi- or single-lobed, often greatly modified, concave to convex, entire or split into two parts, wet. The median stigma lobe transformed into the rostellum, a structure of various shape and size, producing a cellular or sometimes semi-fluid viscidium, single but double in some genera. The viscidium sometimes produces a hook-like structure, the so-called hamulus. The tegula originates on the abaxial surface of the rostellum. The single fertile anther, representing the median of the outer whorl, is erect, reflexed or deflexed, fixed or motile, or detachable. Connective thick, fleshy or wide, separating or covering both locules. Pollinia usually compact or sectile, rarely granular, of monads or tetrads, often partially sterile forming caudicles of different shape and structure. Staminodes, representing the lateral anthers of the inner whorl, rarely becoming free, finger- or wing-like, usually incorporated into the column part. Their apices often free, forming structures of various form, size and function.

The family Orchidaceae is the largest taxon of this rank in the order Orchidales, which apart Orchidaceae consists of Apostasiaceae and Cyripediaceae. The three families mentioned are, in most published systems, united into one, Orchidaceae *sensu lato* (cf. Garay 1960, Dressler 1981, 1993, Burns-Balohg & Funk 1986, Pridgeon & al. 2000). Sometimes only Cyripediaceae are included among Orchidaceae, the status of an independent family being reserved for Apostasiaceae (Lindley 1840, Schlechter 1915). Apart from Dahlgren & Rasmussen (1983), the three families were also distinguished by Vermeulen (1966), Rasmussen (1985) and Szlachetko (1995).

From the three families included in the order Orchidales, Apostasiaceae occur in Australasia, and Cyripediaceae are known from Europe, Asia, Australasia, North and South America. They are lacking in Australia and Africa. The third family, Orchidaceae, are worldwide in distribution. They comprise eight subfamilies, seven of which are represented in Africa, and in Ivory Coast.

AN ARTIFICIAL KEY TO THE ORCHID GENERA IN IVORY COAST

1. Leaves convolute ..... 2
- Leaves duplicate ..... 30
2. Leaves plicate ..... 3
- Leaves non-plicate ..... 9
3. Plants with no storage organs ..... 4
- Plants with storage organs, i.e. corms, pseudobulbs or bulbs ..... 5
4. Lip with prominent oblong callus. Gynostemium with digitate staminodes ..... 21. *Diceratostele*
- Lip ecallose. Gynostemium with no digitate staminodes ..... 16. *Corymborkis*
5. Storage organs underground, bulbous. Leaf single ..... 23. *Nervilia*
- Storage organs on the ground, pseudobulbous. Leaves few to many ..... 6
6. Flowers medium-sized or relatively large, showy ..... 26. *Ancistrochilus*
- Flowers inconspicuous, small ..... 7
7. Lip with no basal auricles ..... 27. *Kornasia*
- Lip auriculated ..... 8
8. Lip with single, central callus ..... 29. *Lisowskia*
- Lip ecallose ..... 28. *Liparis*
9. Plants achlorophyllous ..... 10
- Plants with chlorophyll ..... 12
10. Flowers medium-sized. Sepals free ..... 7. *Schwartzkopfia*
- Flowers small, inconspicuous. Sepals partially fused together ..... 11
11. Lip ecallose, with long, narrow claw, about half of its length. Flowers very slender, narrowly tubular ..... 24. *Auxopus*
- Lip with thickenings or callus, claw very short. Flowers campanulate ..... 25. *Didymoplexis*
12. Flowers spurless ..... 13
- Flowers with spur ..... 18
13. Plants monopodial ..... 22. *Vanilla*
- Plants sympodial ..... 14
14. Plants with underground storage organs (tuberoids) ..... 4. *Brachycorythis*
- Plants with no underground tuberoids ..... 15
15. Roots fleshy, clustered ..... 20. *Manniella*
- Roots spaced on elongate creeping rhizome ..... 16
16. Both stigmatic lobes confluent, stigma entire ..... 17. *Platylepis*
- Stigmatic lobes well separated ..... 17
17. Gynostemium with two terminal or ventral appendages ..... 18. *Hetaeria*
- Gynostemium without any appendages ..... 19. *Zeuxine*
18. Lip spurless ..... 19
- Lip with spur ..... 20
19. Lip simple, linear. Spur on dorsal sepal ..... 1. *Disa*
- Lip with various appendages. Spur on sepals ..... 2. *Disperis*
20. Stigma confluent ..... 21
- Stigma bilobed, both lobes on elongate stalks ..... 23
21. Lateral sepals much larger than the dorsal one. Spur ovoid-conical, short . 3. *Afrorchis*
- Sepals subsimilar in size. Spur conical-cylindrical, elongate ..... 22

22. Lip lateral lobes large, obliquely triangular or rhomboid, acute, the middle lobe much reduced or absent ..... **6. Phyllomphax**
  - Lip lateral lobes distinctly larger than the middle one, occasionally lip unlobed ..... **5. Gyaladenia**
23. Petals and lip entire, occasionally with tiny basal teeth. Rostellophores inconspicuous. Caudiculae shorter or equal in length to pollen mass ..... **8. Habenella**
  - Lip always 3-lobed, petals bilobed or entire. Rostellophores usually longer than anther fertile part. Caudiculae usually longer than pollen mass ..... 24
24. Flowers nonresupinate ..... **15. Schlechterorchis**
  - Flowers resupinate ..... 25
25. Antherophores, rostellophores and stigmaphores short, usually shorter than the anther thecae ..... 26
  - Antherophores, rostellophores and/or stigmaphores much longer than anther thecae ..... 29
26. Thecae clavate to oblong, greatly elongate, much longer than very short rostellophores, antherophores and stigmaphores ..... **14. Podandriella**
  - Not above combination of features ..... 27
27. Lip lateral lobes usually obscure, much smaller than the middle one. Auriculae prominent, placed below stigmatophore ..... **13. Platycoryne**
  - Lip lateral lobes subequal to or longer than the middle lobe ..... 28
28. Lip 3-lobed in the apical half or third, the lateral lobes much larger than the middle one, usually obliquely obovate to rhombic, irregularly dentate to fringed on margins, the middle lobe linear-ligulate ..... **12. Plantaginorchis**
  - Lip 3-lobed above the middle, all lobes of similar width, lateral lobes linear, entire ..... **10. Habenaria**
29. All sepals deflexed. Lateral sepals strongly asymmetric with laterally placed apiculus .. **8. Bilabrella**
  - Dorsal sepal usually erect. Lateral sepals spreading, oblique, not strongly asymmetric, with no laterally placed apiculus ..... **9. Ceratopetalorchis**
30. Inflorescence terminal ..... 31
  - Inflorescence lateral ..... 34
31. Lip furnished with prominent cushion-like crest in the middle ..... **35. Epiphorella**
  - Lip with a single basal (or rarely apical) callus, if any, not pulvinate ..... 32
32. Lip with a long claw, at least third of lip length ..... **34. Unguiculabia**
  - Lip shortly clawed or sessile ..... 33
33. Pendent or creeping plant, leaves laterally compressed ..... **33. Szlachetkoella**
  - Plant habit and leaves not as above ..... **32. Polystachya**
34. Leaves laterally compressed ..... **66. Dolabrifolia**
  - Leaves not as above ..... 35
35. Plants sympodial ..... 36
  - Plants monopodial ..... 41
36. Pseudobulbs uninodial ..... 37
  - Pseudobulbs multinodial ..... 39
37. Lip firmly joined with the column foot, quadrilobe, with prominent spur ..... **39. Oeceoclades**
  - Lip sensitive, ligulate, fleshy, spurless ..... 38
38. Flowers resupinate ..... **30. Bulbophyllum**
  - Flowers nonresupinate ..... **31. Genyorchis**
39. Inflorescence unbranched. Rostellum short and wide ..... **37. Eulophia**
  - Inflorescence paniculate ..... 40

40. Leaves many. Rostellum short and wide ..... **36. Ansellia**
  - Leaves 1-2. Rostellum beak-like ..... **38. Graphorkis**
41. Plants leafless ..... 42
  - Plants leafy ..... 43
42. Lip reduced to a small point in front of the spur, mouth of spur with erect tooth-like callus ..... **54. Chauliodon**
  - Lip usually well-developed with no callus in the spur mouth ..... **46. Microcoelia**
43. Leaves terete or semiterete ..... 44
  - Leaves not as above ..... 46
44. Lip bilobed at the apex, lobes large, elliptic ..... **47. Nephrangis**
  - Lip unlobed or 3-lobed at the apex ..... 45
45. Inflorescence 1-2-flowered. Lip entire ..... **64. Angraecum**
  - Inflorescence 4-5-flowered. Lip 3-dentate ..... **51. Tridactyle**
46. Leaves laterally compressed ..... 47
  - Leaves dorsiventrally flattened ..... 50
47. Inflorescence single-flowered ..... **64. Angraecum**
  - Inflorescence at least few-flowered ..... 48
48. Pedicel and ovary glandular ..... **49. Rangaeris**
  - Pedicel and ovary glabrous ..... 49
49. Inflorescence elongate, longer than leaves. Flowers tiny ..... **41. Bolusiella**
  - Inflorescence shorter than leaves. Flowers medium-sized ..... **48. Podangis**
50. Spur geniculate ..... 51
  - Spur pendent or straight, but not geniculate ..... 53
51. Stem very short. Inflorescence capitate or subcapitate ..... **40. Ancistrohynchus**
  - Stem elongate. Inflorescence elongate ..... 52
52. Stem densely leaved. Inflorescence dense, many-flowered ..... **53. Calypstrochilum**
  - Leaves well-spaced on stem. Inflorescence loosely few-flowered ..... **56. Lacroixia**
53. Lip more or less 3-lobed ..... 54
  - Lip unlobed, elliptic, lanceolate to ovate ..... 59
54. Lip deeply 3-lobed ..... 55
  - Lip 3-lobed at the apex ..... 57
55. Lateral sepals distinctly asymmetric, fused with petals ..... **63. Angraecopsis**
  - Lateral sepals subsymmetric, free from petals ..... 56
56. Inflorescence much longer than leaves. Lip lobes widest at their apices .....
  - ..... **55. Dinklageella**
  - Inflorescence shorter than leaves. Lip lobes widest at their bases ..... **51. Tridactyle**
57. Flowers large, showy. Lip middle lobe caudate ..... **60. Plectrelminthus**
  - Flowers small, inconspicuous ..... 58
58. Lip middle lobe rounded. Spur cylindrical ..... **62. Rhipidoglossum**
  - Lip middle lobe acute. Spur with ampullaceous apex ..... **58. Chamaeangis**
59. Inflorescence dense, capitate to subcapitate ..... **40. Ancistrohynchus**
  - Inflorescence elongate ..... 60
60. Lip infundibuliform, orbicular to almost ovate in general outline, cochleate in the centre ..... **44. Eurychone**
  - Lip not as above ..... 61
61. Lip with denticulate or fringed margins ..... 62
  - Lip with entire margins ..... 63

- 62. Lip with basal callus. Spur constricted just above the base ..... **59. Diaphananche**
  - Lip ecallose. Spur with no constriction ..... **65. Cribbia**
- 63. Lip with callus in the centre ..... 63
  - Lip ecallose ..... 65
- 64. Lip callus elongate, below the spur orifice ..... **64. Angraecum**
  - Lip callus surrounding spur orifice ..... **61. Summerhayesia**
- 65. Flowers tiny. Tepals up to 8 mm long ..... 66
  - Flowers medium-sized or large, at least 10(6.5) mm long ..... 69
- 66. Flowers nonresupinate ..... **58 Chamaeangis**
  - Flowers resupinate ..... 67
- 67. Spur narrowly cylindrical, attenuate gradually towards the apex ..... **51. Tridactyle**
  - Spur clavate or ampullaceous at the apex, blunt ..... 68
- 68. Rostellum 3-dentate after removal of pollinarium, the middle tooth reduced, both lateral lobes considerably larger ..... **43. Eggelingia**
  - Rostellum remnant furcate ..... **50. Solenangis**
- 69. Floral bracts obscure, much shorter than pedicel and ovary ..... 70
  - Floral bracts prominent, membranous, as long as or longer than pedicel and ovary .. 71
- 70. Stem very short. Floral segments thin ..... **57. Aerangis**
  - Stem elongate. Floral segments thick ..... **49. Rangaeris**
- 71. Viscidium consisting of two parts; thin, lamellate lower part and very thick, saddle-shaped upper one ..... **42. Cyrtorchis**
  - Viscidium very thin, delicate, hyaline ..... **45. Homocolleticon**

#### A NATURAL KEY TO THE ORCHID SUBFAMILIES IN IVORY COAST

- 1. Pollinia granular or sectile, easily disintegrating to release pollen grains or massulae ... 2
  - Pollinia compact, pollen grains more or less united into the well-defined pollinia ..... 6
- 2. Anther base near the rostellum apex, anther projecting above stigma ..... 3
  - Anther base near the stigma base or below, rostellum concealing the anther ..... 5
- 3. Plants with root-stem tuberosities. Anther stiffly fused with the gynostemium. No staminodes; auricles present on both sides of the anther. Pollinia exclusively sectile. Caudicles prominent, filiform. Viscidia double ..... **Orchidoideae** (p. 20)
  - Not above combination of features ..... 4
- 4. Anther erect. Rostellum, if present, erect. Viscidium, when present, semi-fluid. Staminodes finger- to wing-like or vestigial ..... **Neottioideae** (p. 90)
  - Anther usually incumbent. Rostellum usually incumbent. Viscidium, when present, cellular. Staminodes fused with the column forming an apical clinandrium, secondarily reduced to a collar-like structure ..... **Vanilloideae** (p. 93)
- 5. Leaves plicate. Hamulus with sclerenchymatous layer ..... **Tropidioideae** (p. 74)
  - Leaves non-plicate. Hamulus, when present, fleshy ..... **Spiranthoideae** (p. 77)
- 6. Pollinia laterally compressed. Caudicles long, slender or sticky. Viscidium soft. Anther movable, anther partitions well-developed ..... **Epidendroideae** (p. 112)
  - Pollinia superposed. Caudicles sticky. Tegula lamellar. Viscidium lamellar to multi-layered, persistent. Anther operculate, anther partitions reduced ..... **Vandoideae** (p. 169)

#### Subfamily **Orchidoideae**

Plants with one, two or more subterranean tubers of various shape and size present, sometimes reduced. Leaves convolute, non-plicate, occasionally reduced

to a scale-like structures. Inflorescence terminal. Flowers predominantly resupinate. Lip trilobed or simple. Spur of various origins, i.e., formed from the lip base or sepals, occasionally reduced. Seeds of the *Orchis* or *Disa* types. No column foot. Column part below stigma absent, except Satyriaceae. Stamines none or vestigial and combined with the auricles. Stigma concave or convex, entire, single- or trilobed, or bilobed with each lobe separated or stalked. Rostellum predominantly trilobed, sometimes with both lateral lobes elongate, with a more or less prominent pleat on the abaxial surface of the midlobe, suberect to horizontal. Both lateral rostellum lobes produce a cellular viscidium, which may be secondarily fused together. Sometimes the viscidium is hooked on the inner surface. Anther fused stiffly with the gynostemium apex, immovable, erect to reflexed, 2-chambered, locules diverging basally. Connective usually wide, distinctly separating the locules. Dorsal side of the anther with two fleshy appendages, so-called auricles, composed of very large inflated cells, including raphides. Anther base near the rostellum base. Pollinia exclusively sectile.

## KEY TO THE TRIBES AND SUBTRIBES

1. Dorsal and/or lateral sepals spurred ..... 2
  - Dorsal and lateral sepals cochleate or concave but never spurred ..... (**Orchideae**) 3
2. Lip simple, linear, single-nerved, free from gynostemium. Anther base joined with rostellum base into “internodium” ..... **Diseae** (p. 21)
  - Lip combined with the gynostemium, never linear, adorned by thickenings of various form. Anther covered partially by rostellum arms ..... **Corycieae** (p. 24)
3. Anther, stigma and rostellum with no projections ..... **Orchidinae** (p. 27)
  - Anther, stigma and/or rostellum with projections ..... **Habenariinae** (p. 39)

Tribe **Diseae** Dressler in Selbyana 5(2): 204. 1979

Tribe includes a sole subtribe.

Subtribe **Disinae** Benth. in J. Linn. Soc., Bot. 18: 288. 1881

Plants with underground, ovoid to ellipsoid tuber or tubers. Stems of one or two kinds, in the last case flowering stem with sheath-like, more or less imbricating leaves, adpressed to the stem and sterile stem with normal leaves. Inflorescence few- to many-flowered. Flowers resupinate. Lip usually simple, linear, sometimes fimbriate. Dorsal sepal spurred. Spur entrance behind or above the anther. Petals joined basally with the gynostemium through the rudimentary stamens. Stigma convex, padded, fleshy, entire, shortly stalked. Rostellum trilobed, both lateral lobes canaliculate. Basal part of the rostellum, the filament, the base of the lip and partially the petals grown together into the „internodium”. Viscidia usually large, hard. Anther erect to reflexed (to nearly 180°). Auricles present.

An exclusively African subtribe comprising 5 genera. In Ivory Coast is represented only by one species of the genus *Disa* Bergius.

### 1. *Disa* Bergius in Descr. Pl. Cap.: 348. 1767

Terrestrial plants. Tubers ellipsoid to nearly globose, sometimes forked at apex. Sterile stem with long, usually lanceolate leaves often present. Flowering stem more or less covered by erect to suberect leaves. Inflorescence terminal, few- to many-flowered. Flowers small to large, resupinate, usually bright-coloured. Dorsal sepal clawed or subsessile, blade ovate to pentagonal, cochleate to conical, spurred. Spur horizontal to pendent, clavate to cylindrical. Petals unlobed or bilobed. Lateral sepals deflexed or spread. Lip simple, linear, pendent to horizontal. Anther erect to horizontal. Pollinia sectile. Stigma fleshy, shortly stalked to sessile, pad-like, trilobed. Rostellum trilobed, sidelobes canaliculate, terminated with large, massive, naked viscidia. Caudicles usually shorter than pollen mass. Auricles present, usually fused with petals (Fig. 2).

A genus of about 170 species.

#### 1. *Disa welwitschii* Rchb. f. in Flora 48: 181. 1865

(Figs. 3, 4)

TYPE: ANGOLA. *Welwitsch* 715 (LECTOTYPE: W-R!; ISOLECTOTYPES: BM!, C!, K!, P!; DRAWING: UGDA-DLSz)

*Disa calophylla* Kraenzl. in Bot. Jahrb. Syst. 33: 58. 1901; TYPE: TANZANIA. *Busse* 834 (HOLOTYPE: B†; ISOTYPE: K!)

Tubers 1.5-7 cm long, 1-3 cm in diameter, almost globose to elongate-ovoid, sometimes forked or bilobed at apex. Sterile stem up to 7 cm long, with sheaths at

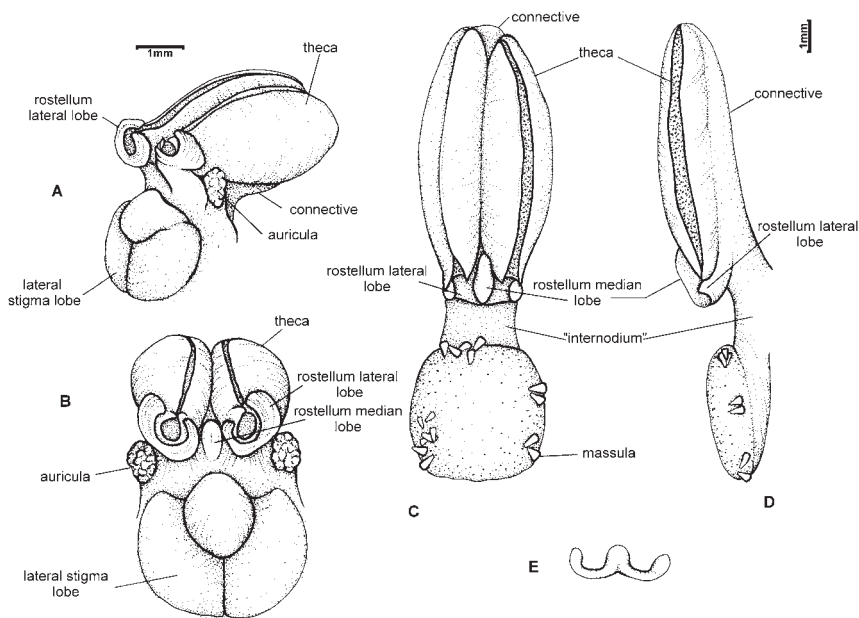


Fig. 2.—Gynostemium structure of *Disa* Bergius: A, D – gynostemium side view; B, C – gynostemium front view; E – rostellum remnant, front view (Szlachetko & Rutkowski 2000).



base and 1-4 leaves at apex; leaves 8-36 cm long, 0.5-4 cm wide, linear or narrowly lanceolate, acute. Flowering stem 20-100 cm tall, erect, delicate to rather stout, glabrous, entirely covered by leaves. Leaves 10-18, 3-11 cm long, 0.8-2 cm wide, lanceolate, acute, erect or suberect, loosely adpressed to the stem, the upper 3-4 crowded just below inflorescence; the lower 3-4 sheath-like. Inflorescence 3-21 cm long, 20-100-flowered, usually dense, occasionally subtax. Flowers small or medium-sized, pink, carmine, crimson, mauve or magenta, often with darker spots. Floral bracts 1.3-4 cm long, lanceolate, acute to acuminate, the lower longer than flower. Ovary 1-1.7 cm long, erect, slender, twisted. All tepals glabrous, nerves branched, except in the lip. Dorsal sepal 4.5-12 mm long, 3.5-8 mm wide, oblong-obovate, nearly orbicular to pentagonal in general outline, rounded at apex to subacute, cochleate, cucullate, spurred near the centre or at the base. Spur 3-10 mm long, 0.6-1.2 mm in diameter, cylindrical or subclavate, blunt, pendent. Petals distinctly bi-lobed; anterior lobe 3-9 mm long, (2.5)4-6 mm wide, obliquely elliptic, ovate to semi-orbicular, entire or with irregularly dentate apical margin; posterior lobe 6-11 mm long from the base, 1-3 mm wide, lanceo-

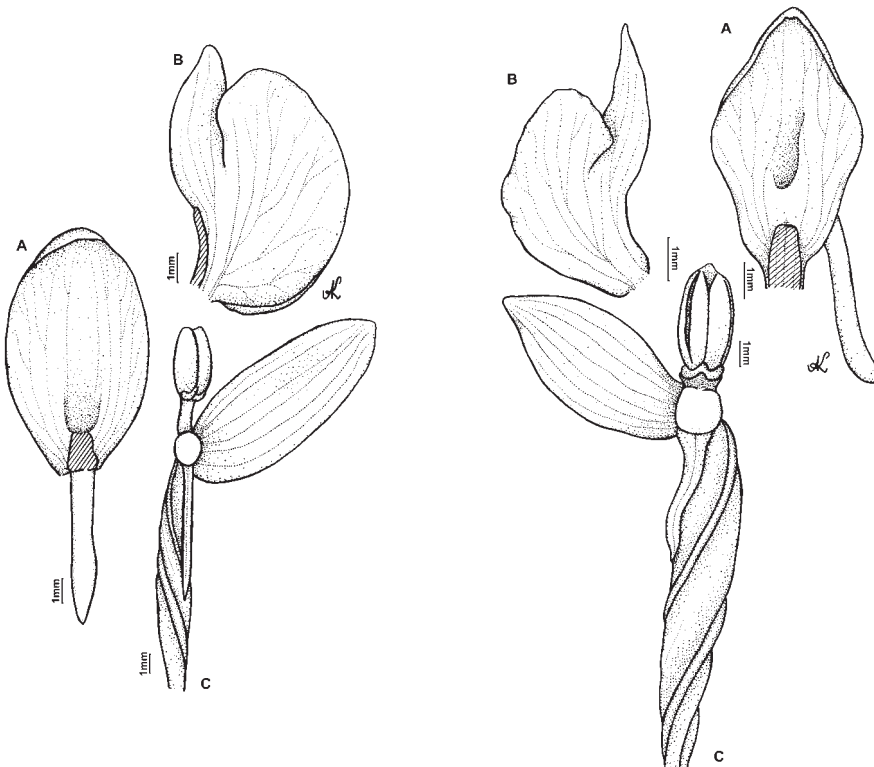


Fig. 3.—*Disa welwitschii* Rchb. f. subsp. *welwitschii*: A – dorsal sepal; B – petal; C – gynostemium, lateral sepal, lip and ovary (drawn by A. Kowalkowska, *Leeuwenberg 10142*, P). Fig. 4.—*Disa welwitschii* Rchb. f. subsp. *occultans* (Schltr.) Linder: A – dorsal sepal; B – petal; C – gynostemium, lateral sepal, lip and ovary (drawn by A. Kowalkowska, *Tisserant s.n.*, P).

late to ribbon-like, acute to rounded, longer or equalling in length the anterior lobe. Lateral sepals 5-12 mm long, 3-8 mm wide, obliquely oblong, elliptic to ovate-lanceolate, obtuse or acute. Lip 4-12 mm long, 0.7-2 mm wide, linear, acute, single-nerved, pendent. Anther 3-6 mm long, erect.

HABITAT. Damp grasslands, dambos, grasslands, humid savanna, *Erica*-bushes. All year around.

VARIABILITY. Linder (1995) distinguished two subspecies in *D. welwitschii* of which subsp. *occultans* has been collected in Ivory Coast.

subsp. ***occultans*** (Schltr.) Linder in Bull. Jard. Bot. Belg. 51: 306. 1981 (Fig. 4)

*Disa occultans* Schltr. in Notizbl. Bot. Gart. Berlin-Dahlem 8: 225. 1922; TYPE: KENYA. *Lindblom s.n.* (HOLOTYPE: S)

Flowers pink. Dorsal sepal pentagonal in general outline, more or less acute. Spur entrance near the centre of dorsal sepal. Posterior petal lobe as long as or longer than anterior one. Lateral sepals 7-12 mm long.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Nigeria, Cameroon, Congo, Central African Republic, Gabon, Democratic Republic of Congo (Zaire), Uganda, Kenya, Tanzania, Zambia, Malawi. Alt. 750-2300 m.

REPRESENTATIVE SPECIMENS. Nimba Mts., 10 Aug. 1954, *Boughey GC 18047* (BR!, K!); Nimba Mts., June 1942, *Schnell 1491* (K!); *Schnell 1558* (K!); Aug.-Oct. 1947, *Schnell 3372* (K!); *Schnell 3394* (K!); Aug. 1954, *Schnell 6239* (P!)

NOTES. *D. welwitschii* subsp. *welwitschii* has not been collected in Ivory Coast so far. It is known from Nigeria and Cameroon through Central African Republic to Tanzania eastwards, and Mozambique and South Africa in the South of the continent. This subspecies is characterized by red or carmine flowers, oblong-obovate dorsal sepal rounded at the apex, spur entrance near the base of the dorsal sepal and posterior petal lobe generally one-third longer than anterior one. Lateral sepals are 5-9 mm long.

Tribe **Corycieae** (Benth.) Szlach. in Folia Geobot. Phytotax. 26: 326. 1991

A tribe including two subtribes, Disperidinae Schltr. and Coryciinae Benth., of which the former one is a monotypic taxon represented also in Ivory Coast.

Subtribe **Disperidinae** Schltr. in Bull. Herb. Boissier 6: 800. 1898

Plants small to tiny, delicate. Stem erect, with usually two, opposite to alternate leaves. Flowers held in horizontal position or sometimes slightly reflexed. Lateral and dorsal sepals more or less saccate, the latter united with the petals. Lip simple, often thick, fused with the gynostemium and both forming a complicated structure. Auricles secondarily united. Stigma bilobed, both lobes convex, usually oblong. Rostellum trilobed, the midlobe usually reduced, both lateral ones large, canaliculate apically, more or less embracing or overlying both locules. Viscidia two, detachable, firm, sometimes covered by the rostellar apical projections. Anther reflexed. Connective wide, separating distantly both locules, or in some cases reduced, very narrow, hence both locules close to each other.

## 2. *Disperis* Sw. in Kongl. Vetensk. Acad. Handl. 21: 218. 1800

Terrestrial, epiphytic or lithophytic herbs. Tubers single or double, ovoid, ellipsoid or globose, usually hairy. Stem erect, delicate. Leaves 1-2, rarely 3, sometimes bract-like or completely reduced, amplexicaul, usually near the middle of the stem, opposite to alternate. Inflorescence usually few-flowered. Flowers horizontal to bent forward, small to tiny. Dorsal sepal and petals joined together forming a saccate to spurred hood hiding lip and the gynostemium. Lateral sepals widely spread, horizontal with sac-like projections of various size. Lip greatly modified, claw usually linear of different length, united basally with the gynostemium, usually curved apically, terminating by small, linear limb with simple or two, bi-lobed appendages. Gynostemium greatly modified. Neither column foot nor column part present. Stigma bi-lobed, both lobes well separated near the sides of the lip claw. Rostellum trilobed, the middle lobe reduced, both lateral lobes very large, canaliculate, often slightly twisted in the apical parts, each terminating by large viscidium. Anther more or less horizontal, connective very wide, well-separating parallel locules. Pollinia sectile, massulae often in a double row along the basal margins of ribbon-like, sometimes twisted or curled up caudicles. Auricles present (Fig. 5).

A genus comprises of about 90 species distributed in tropical and southern Africa, Madagascar, Mascarene Islands, India, Sri Lanka eastwards to New Guinea. A single species was recorded in Ivory Coast.

### 1. *Disperis thomensis* Summerh. in Bull. Misc. Inform. Kew. 1937: 458. 1937 (Fig. 6)

TYPE: SÃO TOMÉ. *Exell 136* (HOLOTYPE: BM!; DRAWINGS: K!, UGDA-DLSz)

Tuber ca. 10 mm long, cylindrical, woolly. Stem 8.5-17 cm tall, erect, glabrous. Leaves 2, opposite, above the middle of the stem; petiole up to 7 mm long, sheathing at the base; blade 2-5 cm long, 1.1-3.5 cm wide, ovate to ovate-lanceolate, acute to shortly acuminate, slightly cordate to truncate at the base, undulate along margins. Inflorescence 1-4-flowered. Flowers white, marked with green and purple, held horizontally. Floral bract 3-17 mm long, ovate with lanceolate apex. Ovary up to 17 mm long, erect, slender. Hood up to 6 mm deep, 4-dentate at the apex, spur cylindrical, distinctly swollen in the apical half, rounded. Dorsal sepal up to 12.5 mm long and 1.7 mm wide, linear-lanceolate, acute. Petals slightly longer, up to 3 mm wide, 3-lobed, all lobes triangular, acute, the apical one the smallest, the middle one close to the apical one, the basal lobe distinctly remote from both other. Lateral sepals 5-6 mm long, 2.5-4 mm wide, obliquely ovate, aristate at the apex, with incurved, conical, subacute spur, 2-2.5 mm long. Lip set on a long, linear claw up to 7 mm long, reflexed abruptly at the apex; limb up to 2 mm long, linear, subacute, densely papillate; appendages 4-6 mm long, 2 mm across at the apex, bi-lobed, lobes linear, obtuse, divergent, papillate.

**HABITAT.** Riverine and evergreen forests, montane forests, in leaf litter in deep shade and rock faces. July-September.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea (Bioko), São Tomé, Democratic Republic of Congo (Zaire), Angola, Kenya, Tanzania, Zambia, Malawi. Alt. 1200-2150 m.

REPRESENTATIVE SPECIMENS. Mt. Nimba, Aug. 1973, *van der Burg* 521B (K!); Mt. Tonkoui, 24 Aug. 1975, *van der Burg* 772 (WAG!); Mt. Tonkoui, Man, 17 Sep. 1975, *van der Burg* 1048 (WAG!); 20 Aug. 1969, *Cremers* 1091 (P!); 28 July 1973, *Pérez-Vera* 521 (K!, P!); 14 Aug. 1954, *Schnell* 6337 (P!).

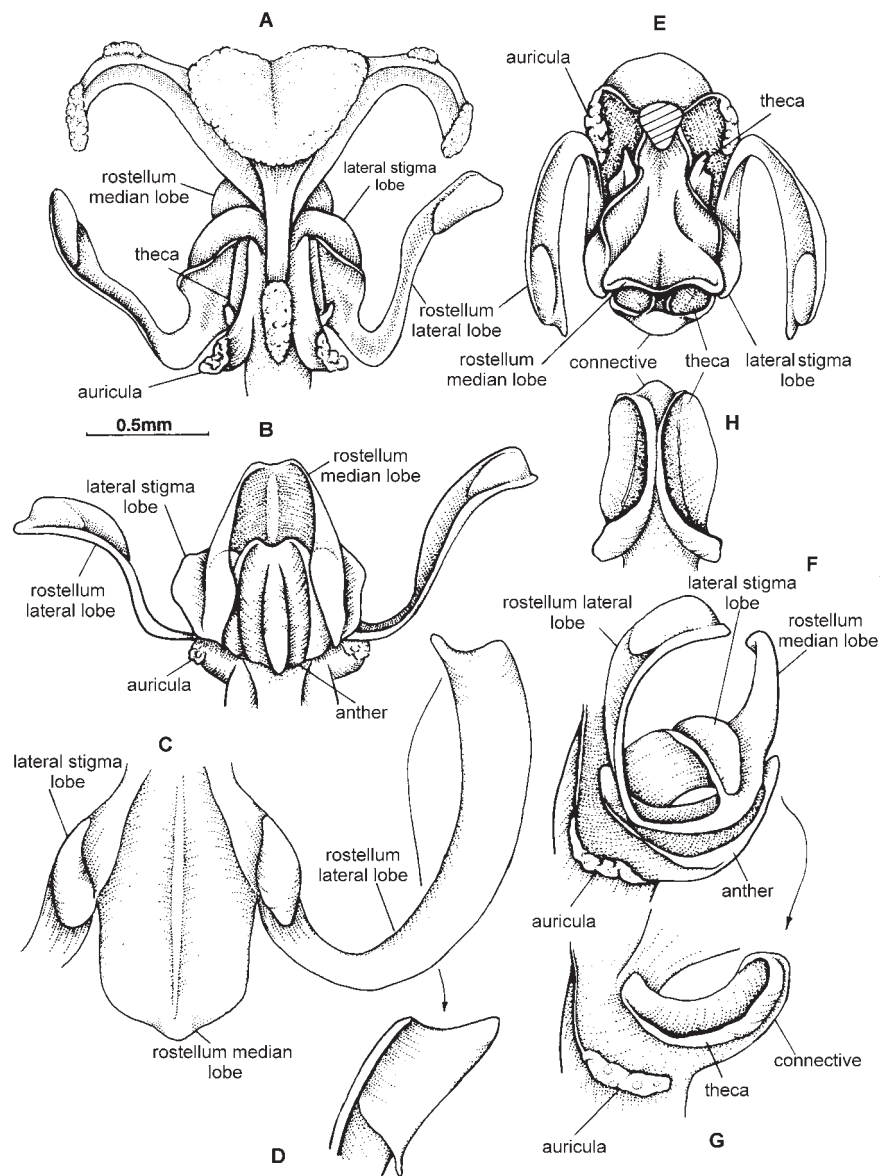


Fig. 5.—Gynostemium structure of *Disperis* Sw.: A – gynostemium front view; B – gynostemium view from above; C – rostellum, spread; D – apical part of rostellum lateral lobe; E – gynostemium, bottom view; F – gynostemium, sode view; G – anther, side view; H – anther (Szlachetko & Rutkowski 2000).

Tribe **Orchideae**

Flowers resupinate or not. Lip frequently trilobed, usually spurred, or at least, saccate basally. Spur entrance below gynostemium. Column part absent. Stigma variable in size and shape. Rostellum joined basally with the fertile part of the stigma, trilobed, primarily with the midlobe pleated, shelf-like, secondarily furculate, sometimes the midlobe greatly reduced and both lateral lobes stalked. Occasionally rostellum produces sac-like structures, bursiculae, covering viscidia. Viscidia double, secondarily joined together, detachable. Anther erect to bent back, both locules well separated by usually wide and often massive connective. Auricles well developed in most genera, but occasionally reduced.

The largest tribe in Orchidoideae, including about 100 genera placed in 6 subtribes.

Subtribe **Orchidinae**

Underground storage organs usually as ovoid, ellipsoid to palmate tubers, or, occasionally short rhizome with numerous roots. Leaves basal to cauline. Inflorescence few- to many-flowered. Flowers resupinate or not. Basal part of the

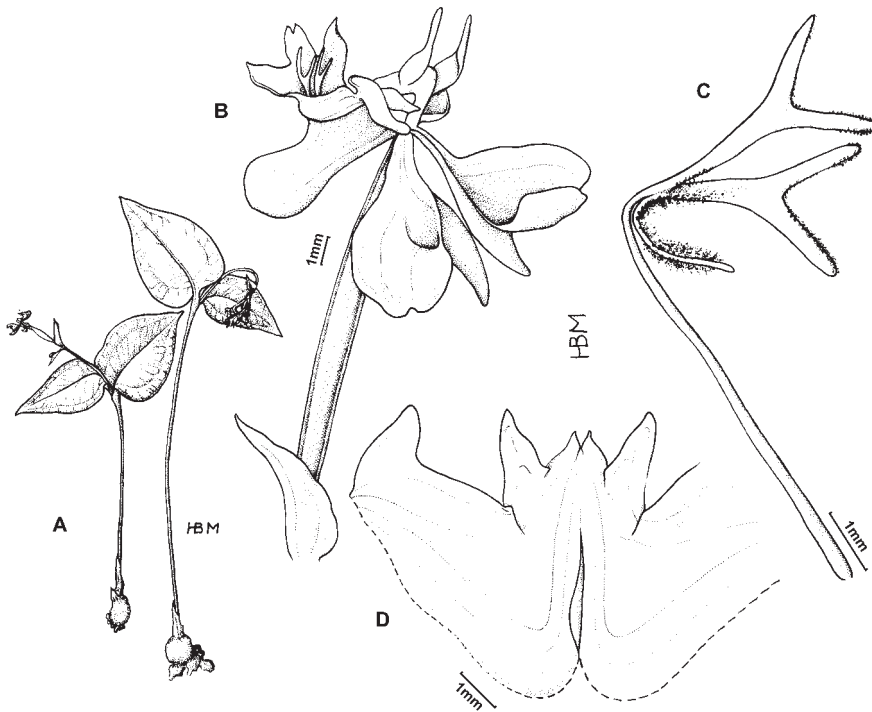


Fig. 6.—*Disperis thomensis* Summerh.: A – habit; B – flower; C – lip appendage; D – galea (drawn by H.G. Margońska, *Letouzey* 7837, P).

lip saccate to spurred, occasionally with no cavity. Stigma confluent. Rostellum shelf- to tongue-like, erect to bent towards the stigma; the middle lobe pleated, laterally flattened, squeezed between locules, hence both lateral lobes of rostellum in close contact with each other. Viscidia double. Locules parallel.

Five genera of this subtribe are represented in the flora of Ivory Coast.

#### KEY TO THE GENERA

1. Spur prominent, ovoid-conical to cylindrical ..... 2
  - Spur lacking, at most basal part of the lip slightly concave ..... 4
2. Sepals subsimilar in size. Spur conical-cylindrical, elongate ..... 3
  - Lateral sepals much larger than the dorsal one. Spur ovoid-conical, short ... **3. Afrorchis**
3. Lip lateral lobes large, obliquely triangular or rhomboid, acute, the middle lobe much reduced or absent ..... **6. Phyllomphax**
  - Lip lateral lobes distinctly larger than the middle one, occasionally lip unlobed ..... **5. Gyaladenia**
4. Leaves ovate, lanceolate, acute, sheathing at the base only. Lip constricted near the middle forming a concave hypochile and flat or convex epichile. Sepals dissimilar ..... **4. Brachycorythis**
  - Stem covered by imbricating sheath-like cauline bracts. Lip not divided into hypochile and epichile. Sepals subsimilar ..... **7. Schwartzkopffia**

#### 3. *Afrorchis* Szlach. in Szlachetko & al., Richardiana 6(2): 82. 2006

Roots thick, fleshy, clustered. Stem rather stout, leafy through its length, glabrous or velvety hairy. Leaves several to numerous, sessile, glabrous or velvety hairy. Inflorescence multi-flowered, often very dense. Flowers broadly opened. Floral bracts leaf-like. Sepals and petals dissimilar. Lip 3-lobed at the apex, lobes equal or not in length, inconspicuous. Spur short, ovoid to ovoid-saccate. Anther erect, connective narrow, blunt, locules close to each other, parallel. Pollinia massulate, caudicles shorter than pollen mass. Stigma entire, oval to elliptic, slightly concave in the centre. Rostellum tongue-like, the middle lobe pleated, both lateral lobes in close contact to each other. Viscidia naked. Auricles prominent.

*Afrorchis* includes about 4-6 African species.

#### 1. *Afrorchis sceptrum* (Schltr.) Szlach. in Szlachetko & al., Richardiana 6(2): 83. 2006 (Fig. 7)

*Brachycorythis sceptrum* Schltr. in Beih. Bot. Centralbl. 38(2): 114. 1921; TYPE (*here designated*): CAMEROON. Walker s.n. (SYNTYPE: B†) & Range 80 (SYNTYPE: B†). Letouzey 11330. CAMEROON (NEOTYPE: P!; ISONEOTYPE: K!)

*Diplacorchis ashantensis* Summerh. in Kew Bull. 1931: 378. 1931; TYPE: GHANA. Chipp 531 (HOLOTYPE: K!)

Tubers horizontal, digitiform, subterranean. Stem 50-100 cm tall, erect, stout, glabrous. Cauline leaves up to 35 or so, 4-9 cm long, up to 3 cm wide, sessile, broadly lanceolate, acute to acuminate, glabrous, mid-nerves well-seen on the lower surface, covered by large swollen cells, suberect, decreasing in size up the stem,

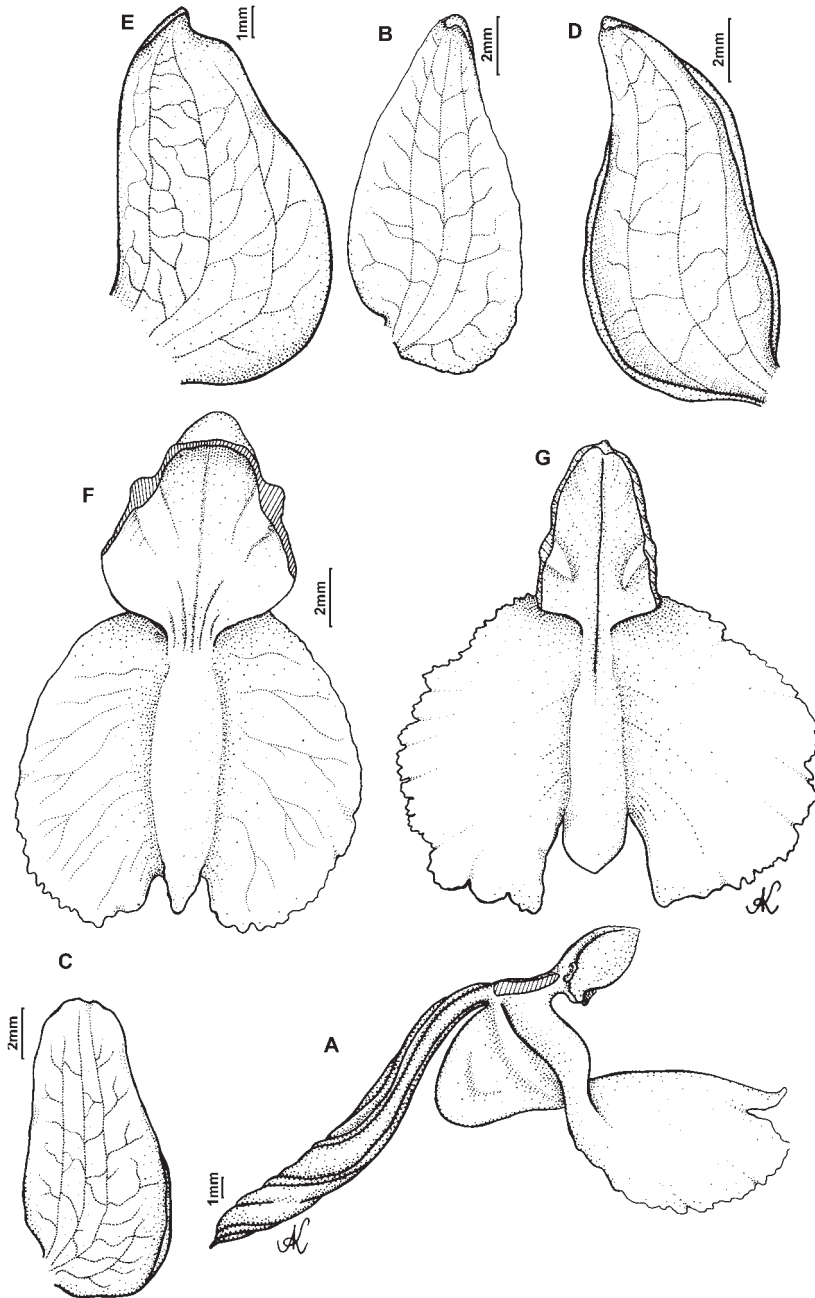


Fig. 7.—*Afrorchis sceptrum* (Schltr.) Szlach.: A – ovary, gynostemium, lip and spur; B, C – petal; D, E – lateral sepal; F, G – lip (drawn by A. Kowalkowska, A, B, D, F – *Letouzey 11330*, P; C, E, G – *Letouzey 2337*, P).



up to 4 the lowermost sheath-like. Inflorescence 13-25 cm long, up to 70-flowered, dense, cylindrical. Flowers medium-sized, sepals and petals greenish white, lip pink-purple. Floral bracts 1.7-4.5 cm long, oblong-lanceolate, acute, leaf-like, glabrous, the lower ones distinctly longer than flowers. Pedicel and ovary 12-17 mm long, slender, erect, twisted in the lower part, glabrous. Dorsal sepal 8-13 mm long, up to 6 mm wide, oblong ovate, subacute, cucullate at apex, glabrous, with 3, branched nerves. Petals up to 12 mm long, 5.5 mm wide, obliquely ovate-lanceolate, subacute to rounded, cucullate, minutely papillate on both sides, with 3 branched nerves. Lateral sepals up to 12 mm long, 6 mm wide, obliquely oblong-ovate, subacute to subobtuse, semi-cucullate at apex, revolute on margins, glabrous, with 3 branched nerves. Lip 10-11 mm long, 11-14 mm wide, transversely elliptic-reniform to rotundate-ovate, thickened along mid-vein, densely papillate, obscurely trilobed at apex; middle lobe ca. 1 mm long tongue-like, obtuse; side-lobes longer than middle one, rounded to triangular at apex, erose along margins. Spur up to 2 mm long, sac-like. Gynostemium 5.5 mm long.

HABITAT. Terrestrial. Grass savanna, grasslands. July-August.

DISTRIBUTION. Senegal, Guinea, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Equatorial Guinea. Alt. up to 1200 m.

REPRESENTATIVE SPECIMENS. S of Gansé, 3°55'W, 8°37'N, 11 Aug. 1967, *Geerling & Bokdam 239* (WAG!); S of Kotouba, 3°08'W, 8°30'N, 14 July 1967, *Geerling & Bokdam 694* (WAG!)

#### 4. *Brachycorythis* Lindl. in Gen. Sp. Orchid. Pl.: 363. 1838

Stem leafy through its length, glabrous or pubescent. Leaves usually sessile, glabrous or pubescent. Inflorescence often multi-flowered. Flower resupinate of various size, usually broadly opened. Floral bracts leaf-like. Sepals and petals very dissimilar. Lip constricted above the base, forming shallow, rounded hypochile and much larger, almost flat epichile. Epichile usually unequally 3-lobed at the apex only, the middle lobe often obscure. Spur lacking. Anther erect, connective narrow, blunt or apiculate, locules close to each other, parallel. Pollinia massulate, caudicles shorter than pollen mass. Stigma entire, oval to elliptic, slightly concave in the centre. Rostellum tongue-like, the middle lobe pleated, both lateral lobes in close contact to each other. Viscidia naked. Auricles prominent (Fig. 8).

A genus of about 20 species native to tropical and South Africa.

#### KEY TO THE SPECIES

1. Lip lateral lobes falcate, acute, much larger than usually obscure middle lobe ..... **1. *B. ovata***
- Lip lobes almost equal in length ..... 2
2. Lip epichile perpendicular to the hypochile. Leaves pubescent ..... **3. *B. pubescens***
- Lip hypochile and epichile lying on the same plane. Leaves glabrous .... **2. *B. paucifolia***

#### 1. *Brachycorythis ovata* Lindl. in Gen. Sp. Orchid. Pl.: 363. 1838

TYPE: SOUTH AFRICA. *Drege 4569* (HOLOTYPE: K!; DRAWING: UGDA-DLSz)

Roots thick, fleshy, cylindrical, woolly. Stem 20-100 cm tall, erect, slender, glabrous in the lower part, minutely glandular below and along inflorescence axis.



Leaves numerous, up to 35, up to 8 cm long and up to 2.5 cm wide, narrowly to broadly lanceolate or oblong-ovate, acute, glabrous, erect, decreasing in size up the stem, 3-4 lower sheath-like. Inflorescence 13-35 cm long, rather dense to relatively lax. Flowers medium-sized, various shades of purple or mauve, often with an admixture of white. Floral bracts up to 4 cm long, oblong lanceolate, acute, glabrous, the lower ones usually as long as or even longer than the flowers. Pedicel and ovary 1-2 cm long, slender, erect, cylindrical, twisted in the lower part, glabrous. Dorsal sepal 5-9 mm long, 3-4.5 mm wide, elliptic to rotundate-ovate, cochleate, obtuse to rounded and cucullate at apex, with 3 branched nerves. Petals 6-10 mm long, 2.8-7 mm wide, obliquely oblong-ovate, subacute to truncate, with reticulate-ly branched nerves. Lateral sepals 6.5-11 mm long, 2-5.8 mm wide, obliquely elliptic-ovate, cochleate, subacute, semi-cucullate, with densely branched nerves. Lip 8.5-12(16) mm long, 6.5-10.5 mm wide, broadly ovate-lunate in general outline, three lobed in the apical part, with a keel running along the mid-vein, into the triangular, upcurved mid-lobe, sidelobes falcate, subacute, shorter than, equalling or longer than the middle lobe, glabrous. Spur lacking. Gynostemium 4 mm long.

HABITAT. Terrestrial in grasslands, savanna, dry dambos, wet meadows. April-July.

DISTRIBUTION. Senegal, Guinea, Ivory Coast, Togo, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Democratic Republic of Congo (Zaire), Angola, Sudan, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, South Africa. Alt. 1200-2200 m.

VARIABILITY. Three varieties can be distinguished in *B. ovata*. Typical variety is known from South Africa, var. *welwitschii* from Democratic Republic of Congo

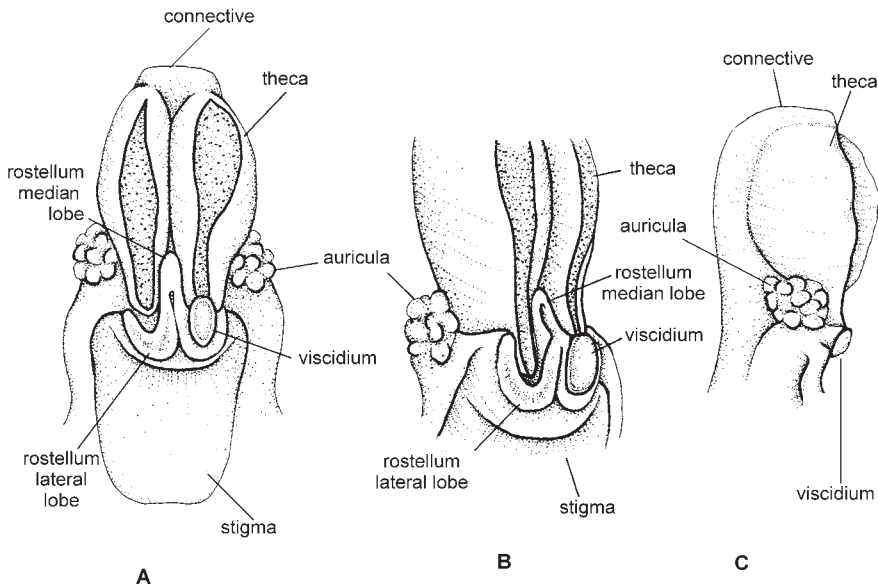


Fig. 8.—Gynostemium structure of *Brachycorythis* Lindl.: A – gynostemium front view; B – central part of gynostemium; C – gynostemium side view (Szlachetko & Rutkowski 2000).

(Zaire), Angola, Burundi, Tanzania, Zambia, Zimbabwe and Malawi, whereas var. *schweinfurthii* was found in West Africa through Democratic Republic of Congo (Zaire), Sudan to Uganda, Kenya and Tanzania eastwards. In Ivory Coast only the last variety was collected.

var. ***schweinfurthii*** (Rchb. f.) Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroun 34(1): 72. 1998 (Fig. 9)

*Brachycorythis schweinfurthii* Rchb. f. in Otia Bot. Hamburg. 1: 59. 1878; TYPE: SUDAN. *Schweinfurth* 3577 (LECTOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Brachycorythis ugandensis* Schltr. in Notizbl. Bot. Gart. Berlin-Dahlem.-Dahlem 8: 223. 1922; TYPE: KENYA. *Lindblom s.n.* (HOLOTYPE: S)

*Brachycorythis grandis* var. *ugandensis* Braid in Kew Bull. 1925: 359. 1925; TYPE: UGANDA. *Snowden* 877 (HOLOTYPE: K!)

Plants usually exceeding 40 cm. Inflorescence rather lax. Flowers relatively large. Lip 12-16 mm long, lobed in the upper part, with sidelobes distinctly longer than upcurved middle lobe.

NOTES. Summerhayes (1968b) cited *B. ovata* var. *schweinfurthii* from Kong Dist. (*Bouet* 2560 collection), but I had no opportunity to exam this or any other material of this species from Ivory Coast.

*B. ovata* var. *ovata* is rather a short plant, with dense inflorescence and small flowers; the lip is lobed at the apex only, the middle lobe equalling or is longer than both sidelobes. *B. ovata* var. *welwitschii* (Rchb. f.) Szlach. & Olszewski is characterized by lax inflorescence, with larger flowers than

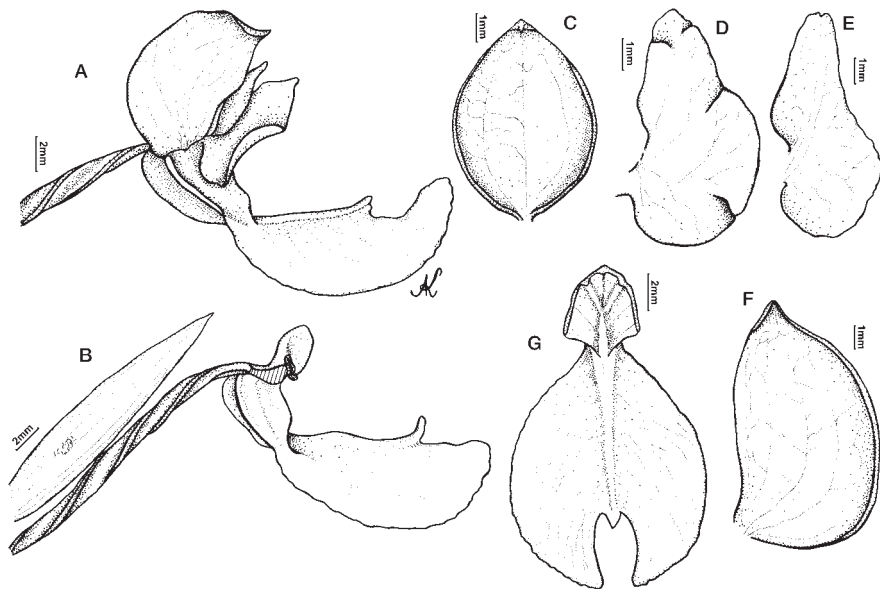


Fig. 9.—*Brachycorythis ovata* var. *schweinfurthii* (Rchb. f.) Szlach. & Olszewski : A – flower; B – floral bract, ovary, lip and gynostemium, side view; C – dorsal sepal; D, E – petal; F – lateral sepal; G – lip (drawn by A. Kowalkowska, A, D – *Schweinfurth* 3577, W-R; *Letouzey* 8646, P).

in typical variety. Lip is lobed at the apex only, the middle lobe is usually shorter than the acute or sub-acute sidelobes.

**2. *Brachycorythis paucifolia* Summerh. in Kew Bull.: 123. 1948**  
(Fig. 10)

TYPE: SIERRA LEONE. *Jaeger 1324* (HOLOTYPE: K!; DRAWING: UGDA-DLSz)

Roots tuberous, fleshy, ellipsoid to cylindrical. Stem 25-50 cm tall, erect, rather delicate, glabrous. Cauline leaves 4-6, 5-13 cm long, 0.5-2.5 cm wide, gathered in the lower third of the stem, oblong- to narrowly lanceolate, acute to acuminate, glabrous, spread, decreasing in size up the stem, 1-2 uppermost bract-like, acute. Inflorescence 6-15 cm long, 8-12-flowered, subdense. Flowers relatively large, tepals white to pink, lip purplish, white and purple dotted in the centre. Floral bracts up to 2 cm long, ovate-lanceolate, acute, glabrous. Pedicel and ovary 1-2 cm long, slender, cylindrical, erect, twisted in the lower part, glabrous. Sepals glabrous. Dorsal sepal 14-16 mm long, 6-6.5 mm wide, elliptic to broadly ovate, subacute, with 3, branched nerves. Petals 14-15 mm long, 10-11 mm wide, obliquely triangular-ovate, obtuse, with 5, branched nerves. Lateral sepals 14-18 mm long, 6-6.5 mm wide, obliquely ovate- or elliptic-lanceolate, acute, concave in the centre, with 3, branched nerves. Lip 12-14 mm long and wide, elliptic to oblong-ovate, held horizontally, widest at apex, trilobed in the apical part; the middle lobe ca. 1-2 mm long, triangular, obtuse or rounded; sidelobes 1-2 mm long, obliquely rounded to rhomboid; basal part of the lip shortly bowl-shaped, 1-3 mm long. Gynostemium 6 mm long.

HABITAT. Terrestrial in savanna, in full sun. September.

DISTRIBUTION. Guinea, Sierra Leone, Ivory Coast. Alt. 1000-1700 m.

REPRESENTATIVE SPECIMENS. Mt. Nimba, 13 Sep. 1975, *Pérez-Vera 829* (K!)

**3. *Brachycorythis pubescens* Harv. in Thes. Cap. 1: 35, tab. 54. 1859**  
(Fig. 11)

TYPE: SOUTH AFRICA. *Sanderson 482* (HOLOTYPE: K!; DRAWING: UGDA-DLSz)  
*Peristylus hispidulus* Rendle in J. Linn. Soc., Bot. 30: 398. 1895; TYPE: KENYA. *Gregory s.n.* (HOLOTYPE: BM!)

*Brachycorythis goetzeana* Kraenzl. in Bot. Jahrb. Syst. 28: 176. 1900; TYPE: TANZANIA. *Goetze 634* (HOLOTYPE: B†; ICONOTYPE: K!)  
*Brachycorythis kassneriana* Kraenzl. in Bot.

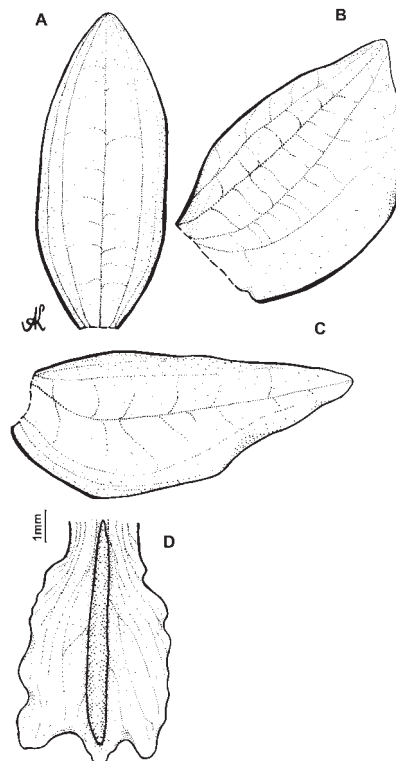


Fig. 10.—*Brachycorythis paucifolia* Summerh.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by A. Kowalkowska, *Jaeger 1324*, K).

Jahrb. Syst. 51: 378. 1914; TYPE: ZAMBIA. *Kassner 2117* (HOLOTYPE: B†; ISOTYPES: BM!, BR!, K!; DRAWING: UGDA-DLSz)

*Brachycorythis baumii* Schltr. in Beih. Bot. Centralbl. 38(2): 109. 1921; TYPE: ANGOLA. *Baum 542* (HOLOTYPE: B†; ISOTYPE: K!; DRAWING: UGDA-DLSz)

*Brachycorythis stolzii* Schltr. in Beih. Bot. Centralbl. 38(2): 110. 1921; TYPE: TANZANIA. *Stolz 506* (HOLOTYPE: B†; ISOTYPE: K!)

Roots tuberous, fleshy, ellipsoid to cylindrical, ca. 1 cm in diameter, densely woolly, clustered. Stem 15-80 cm tall, erect, rather delicate, densely, minutely pubescent. Cauline leaves up to 40 or so, 2-6 cm long, 1-2.5 cm wide, ovate to narrowly lanceolate, acute to acuminate, densely velvety hairy on both surfaces, spread to suberect, decreasing in size up the stem, 3-4 lowermost sheath-like, obtuse. Inflorescence 4-35 cm long, up to 40-50-flowered, dense. Flowers small, pink to purple often with the orange or yellow centre, the tepals often darker at the tips. Floral bracts up to 2.5 cm long, ovate-lanceolate, acute, leaf-like, densely pubescent on both sides. Pedicel and ovary 1-2.5 cm long, very slender, cylindrical, erect, twisted in the lower part, densely pubescent. Sepals densely, minutely pubescent outside. Dorsal sepal 4.5-8 mm long, 2-4.5 mm wide, elliptic to broadly obovate, obtuse to rounded at apex, with 3, densely branched nerves. Petals 4.5-7 mm long, 2-4 mm wide, obliquely ovate to elliptic, obtuse to subacute, with 3, branched nerves, sparsely pubescent outside. Lateral sepals 4.5-8 mm long, 2.5-5 mm wide, obliquely ovate or elliptic, rounded at apex, cochleate, with 3, branched nerves. Lip 5-10 mm long, 6-14 mm wide, bent downwards in the knee-like manner, densely pubescent on both sides, broadly wedge-shaped or fan-shaped in general outline, very narrow at base, widest at apex, trilobed in the apical part; the middle lobe ca. 1 mm long and wide, obscure, triangular or rounded; side-lobes broadly rounded to rhomboid, usually longer than the middle one; basal part of the lip shortly bowl-shaped, 1-3 mm long. Gynostemium 2.5-4 mm long.

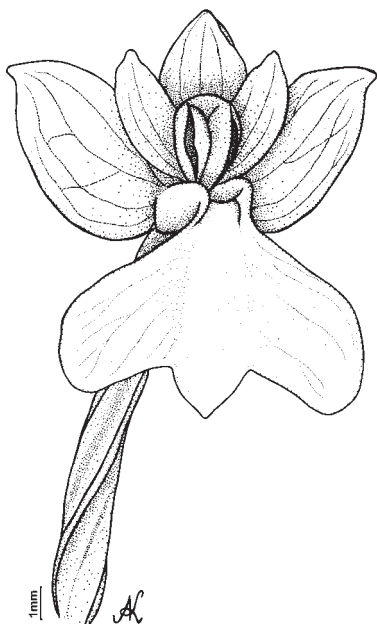


Fig. 11.—Flower of *Brachycorythis pubescens* Harv. (drawn by A. Kowalkowska, *Baum 542*, W).

HABITAT. Terrestrial in upland grasslands, edge of dambos and *Brachystegia* sp. or other open woodlands. May-July.

DISTRIBUTION. Mali, Guinea, Ivory Coast, Burkina Faso, Togo, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Ethiopia,

Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Mozambique, South Africa. Alt. 500-2400 m.

REPRESENTATIVE SPECIMENS. Between Séguéla and Touba, 20 July 1974, *Pérez-Vera* 681 (K!); Between Sémien and Kanebly, 6 July 1966, *Aké Assi* 9071 (K!); Lamto Reserve, 50 km S of Toumodi, 12 June 1968, *Bokdam* 2745 (K!, WAG!); Yuala, 16 June 1974, *Pérez-Vera* 646 (K!); 10 km N of Vavoua, 8 May 1975, *Pérez-Vera* 790 (P!)

### 5. *Gyaladenia* Schltr. in Beih. Bot. Centralbl. 38(2): 124. 1921

*Diplacorchis* Schltr. in Beih. Bot. Centralbl. 38(2): 127. 1921

Tuber few, ovoid, clustered. Stem leafy through its length, glabrous. Leaves usually sessile, glabrous. Inflorescence multi-flowered. Flower resupinate, rather small, usually broadly opened. Floral bracts leaf-like. Sepals subsimilar in size. Lip 3-lobed, lateral lobes distinctly smaller than the middle one, occasionally lip unlobed. Spur elongate, cylindrical to cylindrical-conical, spur orifice decurrent on the lip as to more or less prominent keels. Anther erect, connective narrow, blunt, locules close to each other, parallel. Pollinia massulate, caudicles shorter than pollen mass. Stigma entire, oval to elliptic, slightly concave in the centre. Rostellum tongue-like, the middle lobe pleated, both lateral lobes in close contact to each other. Viscidia naked. Auricles prominent.

The genus includes about 5-8 species known from Africa. Species belonging to this genus are characterized by a cylindrical, elongate spur, sepals subsimilar in size and unequally 3-lobed lip, with lateral lobes distinctly smaller than the middle one. Basal part of the lip is adorned by two keels.

#### 1. *Gyaladenia tenuior* (Rchb. f.) Szlach. in Szlachetko & al., *Richardiana* 6(2): 82. 2006 (Fig. 12)

*Brachycorythis tenuior* Rchb. f. in *Flora* 48: 183. 1865; TYPE: SOUTH AFRICA. *Gueinzus* s.n. (LECTOTYPE: W-R!; DRAWING: UGDA-DLSz)

Tubers 1-3.5 cm long, ellipsoid to ovoid. Stem 20-64 cm tall, erect, delicate, glabrous, leafy throughout its length. Leaves 12-28, up to 5.5 cm long, up to 1.5 cm wide, ovate-lanceolate to lanceolate, acute, glabrous, erect to suberect, decreasing its size up the stem, the lower 3-4 sheath-like. Inflorescence 4.5-16 cm long, (8)12-30-flowered, dense. Flowers resupinate, rather small, purple or violet, often with darker spots or whitish portions. Floral bracts up to 30 mm long, ovate-lanceolate, acute to acuminate, glabrous, leaf-like. Pedicel and ovary 6-13 mm long, arcuate, twisted at base, glabrous. Dorsal sepal 5-10 mm long, 2.3-5 mm wide, elliptic, convex, obtuse, cucullate at apex, with 3 branched nerves. Petals 6-9.5 mm long, 2.3-3.7 mm wide, oblong, sigmoid, obtuse, somewhat cochleate, nerves 3, branched. Lateral sepals 6.5-12 mm long, 2.3-4.5 mm wide, obliquely oblong-ovate, subobtuse, with 3 branched nerves. Lip 6.5-9.5 mm long, 3.8-7.5 mm wide, thick, fleshy, minutely papillate, trilobed near the half-way; the middle lobe 3-4.5 mm long, ca. 3 mm wide, oblong, obtuse, with two decurrent keels terminating abruptly in front; sidelobes ca. 2 mm long and wide, semi-ovate-rhomboid, obtuse to subacute. Spur 5-10.5 mm long, cylindrical, obtuse, curved down at apex. Gynostemium 4-6 mm long, erect.

**HABITAT.** Open grassy areas, dambo margins, long grass woodlands. July-September.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, South Africa. Alt. 300-1800 m.

**REPRESENTATIVE SPECIMENS.** Bouaké, 17 July 1967, *Aké Assi 9103* (K!); Nimba Mts., 13 Sep. 1975, *Pérez-Vera 830* (K!)

**6. *Phyllomphax*** Schltr. in Repert. Spec. Nov. Regni Veg. Beih. 4: 118. 1919

Tuber 1 or few, ellipsoid or ovoid, or clustered, fleshy roots. Stem leafy through its length, glabrous. Leaves sessile, glabrous, decreasing in size up the stem, convolute, non-plicate. Inflorescence multi-flowered. Flower resupinate of various

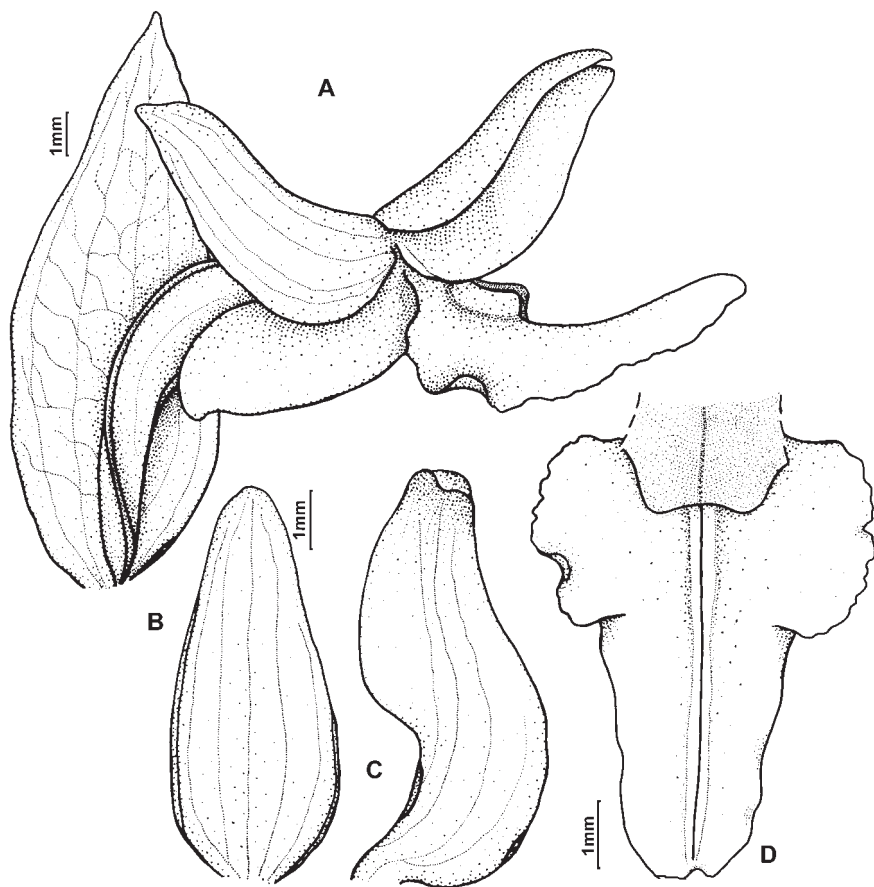


Fig. 12.—*Gyaladenia tenuior* (Rchb. f.) Szlach.: A — flower, B — dorsal sepal; C — petal; D — lip (drawn by A. Kowalkowska, *Buchanan 1046*, W-R).

size, usually broadly opened. Floral bracts leaf-like. Sepals and petals subsimilar. Lip spurred, 3-lobed at the apex, the middle lobe obscure, sometimes absent, lateral lobes large, obliquely triangular or rhomboid, acute. Spur conical-cylindrical, elongate. Gynostemium slender. Anther erect, connective narrow, blunt or apiculate, locules close to each other, parallel. Pollinia massulate, caudicles shorter than pollen mass. Stigma entire, oval to elliptic, slightly concave in the centre, confluent. Rostellum tongue-like, the middle lobe pleated, both lateral lobes in close contact to each other. Viscidia naked. Auricles prominent (Fig. 13)

A genus of about 13 species known from Africa and SE Asia.

**1. *Phyllomphax macrantha* (Lindl.) Summerh. in Kew Bull. 1938: 143. 1938 (Fig. 14)**

*Gymnadenia macrantha* Lindl. in Gen. Sp. Orchid. Pl.: 279. 1835; TYPE: SIERRA LEONE. Turner s.n. (HOLOTYPE: K!; PHOTO: UGDA-DLSz) - *Brachycorythis macrantha* (Lindl.) Summerh. in Kew Bull. 9: 236. 1955.

Tubers few to some, 1.7-3.5 cm long, 0.7-1.5 cm in diameter, globose, oblong-ovoid to ellipsoid, subterranean. Stem 20-65 cm tall, erect, rather delicate, glabrous. Cauline leaves 6-8, along the stem, sessile, 5-11 cm long, 2-4 cm wide, elliptic-lanceolate, broadly lanceolate to lanceolate, acute, spread, gradually decreasing in size up the stem. Inflorescence 6.5-16 cm long, laxly 6-15-flowered.

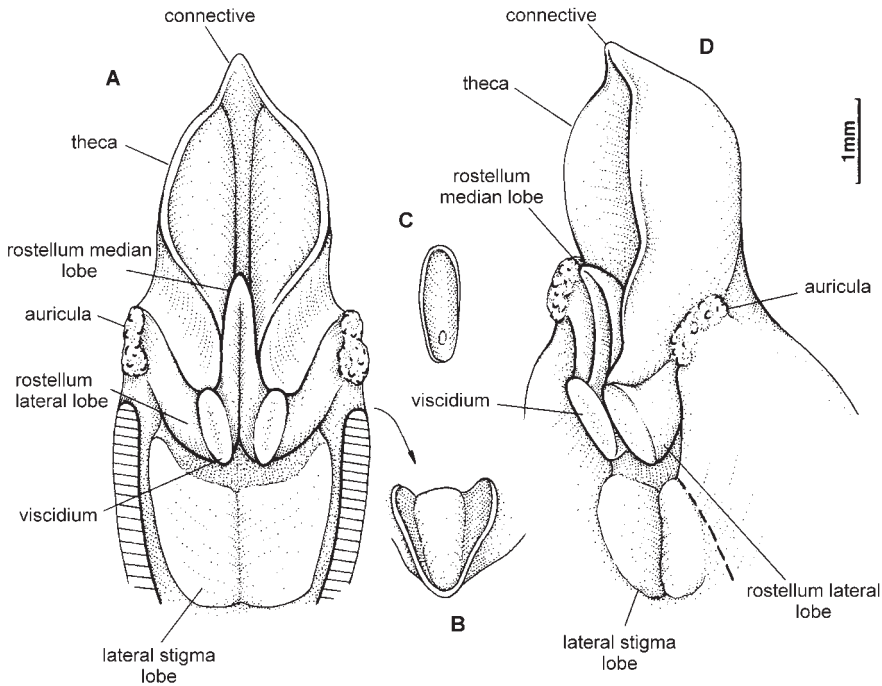


Fig. 13.—Gynostemium structure of *Phyllomphax* Schltr.: A – gynostemium front view; B – rostellum remnant; C – viscidium; D – gynostemium side view (Szlachetko & Rutkowski 2000).



Flowers relatively large, glabrous, Sepals and petals greenish-brown to purple, lip magenta or pinkish with white, purple spotted centre. Floral bract up to 38 mm long. Pedicel and ovary up to 15 mm long. Dorsal sepal 9-13 mm long, 2.5-4.5 mm wide, oblong ovate-lanceolate, cucullate at the apex. Petals 8.5-12 mm long, 2.5-4 mm wide, falcate, ovate-lanceolate, subobtusate. Lateral sepals similar in size to petals, sigmoid, oblong-lanceolate, subacute, with revolute margins. Lip 16-22 mm long, 14-27 mm wide, broadly ovate, oblong-ovate to transversely elliptic, usually deeply split (up to 4 mm) at the apex, serrate or erose along margins. Spur 7-9 mm long, 3.5-5 mm in diameter at the base, the basal half swollen, cylindrical-saccate, the apical half slender, finger-like, arcuate, with longitudinal membrane inside, hence the spur two-chambered. Gynostemium 4 mm long.

**HABITAT.** Upland grasslands, submontane forests, swampy gallery forests with *Phoenix reclinata* Jacq. Terrestrial or litophytic. July-October.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Cost, Togo, Nigeria, Cameroon, Central African Republic, Gabon. Alt. 590-1600 m.

**REPRESENTATIVE SPECIMENS.** Danané, 18 Oct. 1974, *Pérez-Vera* 702 (K!); 10 Aug. 1975, *Pérez-Vera* 824 (K!, P!); Mt. Tonkoui, 24 Aug. 1975, *van der Burg* 774 (WAG!); Sep. 1955, *Nozeran* s.n. (P!); *Sine* loc., 1937, *Scaëtta* 3055 (P!); *Sine* loc., 1937, *Scaëtta* 3285 (P!)

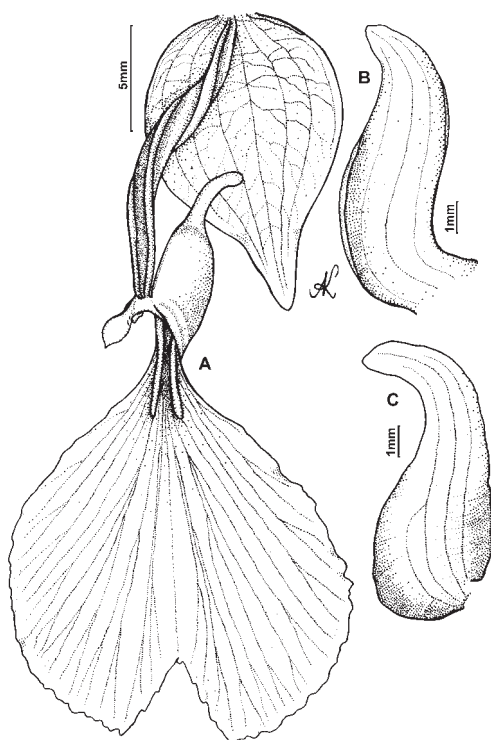


Fig. 14.—*Phyllomphax macrantha* (Lindl.) Summerh.: A — floral bract, ovary, gynostemium, lip and spur; B — lateral sepal; C — petal (drawn by A. Kowalkowska, *Le Testu* 5880, P).

## 7. *Schwartzkopffia* Kraenzl. in Bot. Jahrb. Syst. 28: 177. 1900

Plants terrestrial. Roots thick, fleshy, clustered. Stem very short, erect, leafless, achlorophyllous, covered densely by imbricate sheaths. Inflorescence subcapitate, few-flowered. Flowers resupinate, pedicellate, rather large. Sepals dissimilar, free from one another. Petals united in the basal part with the gynostemium. Lip horizontal, trilobed, shallow saccate at the base. Gynostemium massive. Stigma entire, flat, rather large. Rostellum trilobed, erect; the middle lobe pleated; sidelobes well separated from one another. Viscidia naked. Caudicles shorter than pollinia. Anther erect, connective relatively wide, locules parallel. Pollinia sectile. Auricles prominent (Fig. 15).

A genus of two species known from tropical Africa.



**1. *Schwartzkopffia pumilio* (Lindl.) Schltr. in Orchideen: 63. 1914 (Fig. 16)**

TYPE: NIGERIA. *Mann 904* (HOLOTYPE: K!; PHOTO: UGDA-DLSz)

Roots up to 2.5 cm long, 0.5 cm in diameter, thick, fleshy, clustered, spreading. Stem 3-8 cm tall, erect, glabrous. Cauline bracts few, up to 3 cm long, imbricate, acute, the apices of the upper ones recurved, whitish. Inflorescence 1-2-flowered, lax. Flowers relatively large. Floral bracts up to 3 cm long, similar to the cauline bracts. Pedicel and ovary 2-3 cm long, slender, erect, twisted in the lower part. Dorsal sepal 11-14 mm long, 3-5 mm wide, elliptic-oblong to lanceolate, acuminate to acute. Petals 10-13 mm long, 3-5 mm wide, obliquely ovate-oblong or ovate, acute. Lateral sepals 14-19 mm long, 3.5-6.5 mm wide, obliquely oblong-lanceolate to oblong-elliptic, acute to acuminate. Lip 13-17 mm long, 9-13 mm wide, cuneate in general outline, horizontal, shallow saccate at the base, trilobed in the apical third; lobes subsimilar in length, the middle one oblong, obtuse, with a very prominent rib; sidelobes semi-ovate, obtuse to subacute. Gynostemium 5-6 mm long.

HABITAT. Terrestrial in savanna, mesophilous forests. January-March (July).

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Togo, Nigeria.

REPRESENTATIVE SPECIMENS. Djizontou, Mt. Nienokoué, 17 Jan. 1976, *Pérez-Vera 868* (K!); Djizontou, 19 Jan. 1976, *Pérez-Vera 870* (K!); Moyen Cavally, between Fort Binger and Mt. Niènokoué, 17-18 July 1907, *Chevalier 19502* (P!); Nimba Mts., 11 Feb. 1950, *Schnell 4300* (P!).

Subtribe **Habenariinae** Benth. in J. Linn. Soc., Bot. 18: 288. 1881

Plants with underground storage organs of different kind, tuber or tubers, or elongate to short and fleshy rhizome. Leaves basal, almost radical, or cauline,

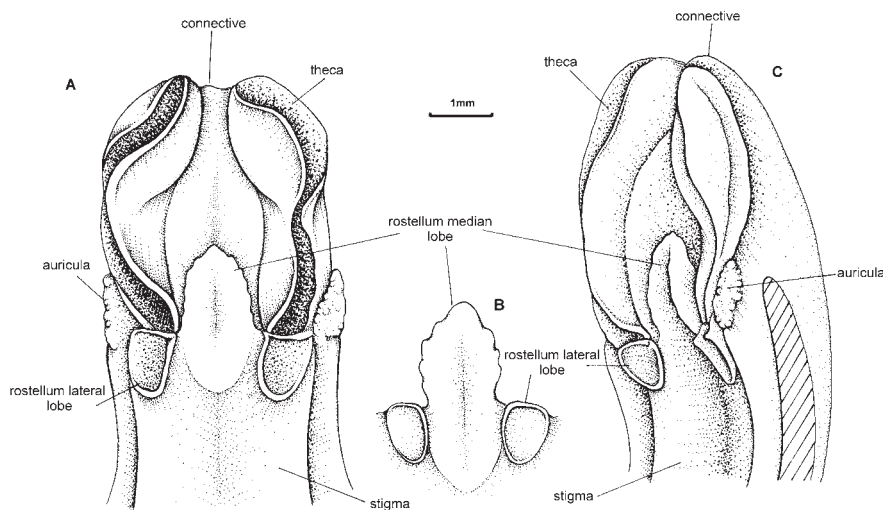


Fig. 15.—Gynostemium structure of *Schwartzkopffia* Kraenzl.: A – gynostemium front view; B – rostellum front view; C – gynostemium side view (Szlachetko & Rutkowski 2000).

spread to straight. Inflorescence few- to many-flowered. Flowers resupinate or not, large and showy to small, tiny, inconspicuous. Lip usually trilobed, with spur of various size. Stigma bilobed, convex, lobes confluent only at the base, usually stalked with the most apical parts fertile, forming so-called stigmaphores. The midlobe of stigma completely transformed into the rostellum. Rostellum trilobed, the central lobe often dome-like, wedged between locules; both lateral lobes elongated into rostellophores, protruding in front of the gynostemium. Viscidia usually massive, firm. Anther erect, bent back to arcuate, often narrow and slender, frequently only the apical part fertile, i.e. producing massulae; basal parts elongate forming antherophores, becoming connected with the rostellophores. Caudicles usually very long, ribbon-like. Auricles stalked or wing-like projections, occasionally sessile.

A group of about 30 genera occurring mostly in Old World tropics and subtropics; 8 genera have been reported from Ivory Coast so far.

#### KEY TO THE GENERA

1. Petals and lip entire, occasionally with tiny basal teeth. Rostellophores inconspicuous. Caudiculae shorter or equal in length to pollen mass ..... **11. Habenella**
- Lip always 3-lobed, petals bilobed or entire. Rostellophores usually longer than anther fertile part. Caudiculae usually longer than pollen mass ..... 2
2. Flowers nonresupinate, i.e. lip superior ..... **15. Schlechterorchis**
- Flowers resupinate, i.e. lip inferior ..... 3
3. Antherophores, rostellophores and stigmaphores short, usually shorter than the anther thecae ..... 4
- Antherophores, rostellophores and/or stigmaphores much longer than anther thecae ..... 7
4. Thecae clavate to oblong, greatly elongate, much longer than very short rostellophores, antherophores and stigmaphores ..... **14. Podandriella**
- Not above combination of features ..... 5
5. Lip lateral lobes usually obscure, much smaller than the middle one. Auriculae prominent, placed below stigmaphore ..... **13. Platycoryne**
- Lip lateral lobes subequal to or longer than the middle lobe. Auriculae small, on both sides of the anther ..... 6
6. Lip 3-lobed in the apical half or third, the lateral lobes much larger than the middle one, usually obliquely obovate to rhombic, irregularly dentate to fringed on margins, the middle lobe linear-ligulate ..... **12. Plantaginorchis**

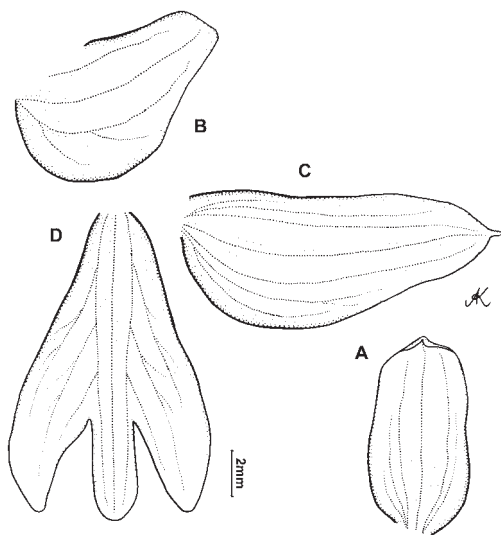


Fig. 16. – *Schwartzkopffia pumilio* (Lindl.) Schltr.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by A. Kowalkowska, A – Mann 904, K; B-E – Lisowski 65568, DLSz).

- Lip 3-lobed above the middle, all lobes of similar width, lateral lobes linear, entire ..... **10. Habenaria**
- 7. All sepals deflexed. Lateral sepals strongly asymmetric with laterally placed apiculus .... **8. Bilabrella**
- 7. Dorsal sepal usually erect, lateral sepals spreading, oblique, not strongly asymmetric, with no laterally placed apiculus ..... **9. Ceratopetalorchis**

**8. Bilabrella** Lindl. in Edwards's Bot. Reg. 20: t. 1701. 1835  
emend. Szlach. & Kras-Lap., Richardiana 3(3):136-139. 2003

*Habenaria* sect. *Replicatae* Kraenzl. in Bot. Jahrb. Syst. 16: 74, 85. 1893

Tuber solitary, ovoid to ellipsoid. Leaves cauline, linear to lanceolate, few widely spread and gathered at the stem base and the others ensheathing more or less the stem. Inflorescence densely to laxly many-flowered. Flowers usually long-pedicellate, resupinate, small, inconspicuous, with all sepals strongly deflexed and more or less touching the ovary. Petals bilobed to the base, with both lobes unequal in size and subsimilar in shape, partially, more or less ciliate or pubescent; the anterior lobe pendent, subparallel to the lip lobes; the posterior lobe erect or suberect, directed upwards or forwards. Lateral sepals much larger than the dorsal one, strongly asymmetric, cochleate, with laterally placed apiculus, deflexed. Lip deeply 3-lobed with lobes unequal in size but similar in shape. Spur cylindrical, apically swollen, twisted or not, pendent or geniculate. Gynostemium slender to relatively massive. Anther erect, ovoid to ellipsoid. Antherophores, stigmaphores and rostellophores very slender, almost filiform. Connective relatively narrow. Pollinia obovoid to ellipsoid, usually distinctly shorter than filiform caudiculae. Auriculae small, sculptured, stalked. Receptive surface vertical, confined to the apex of stigmaphores; stigmaphores usually longer than both rostello- and antherophores. Rostellum middle lobe subulate, acute, adnate to the inner surface of connective (Fig. 17).

*Bilabrella* is easily distinguishable from any other African Habenariinae by its habit, strongly asymmetric, apiculate, deflexed lateral sepals, unequally bilobed petals, with anterior lobe pendent and by the gynostemium structure. The genus is widely spread in Africa and includes over 100 species.

#### KEY TO THE SPECIES

- 1. Spur spirally twisted at least once, usually more, geniculate near the middle ..... 2
- Spur not twisted, straight, pendent ..... **2. B. ichneumonea**
- 2. Pedicel and ovary up to 25 mm long. Anterior petals lobe 8 -16 mm long, glabrous or papillose, not ciliate ..... **1. B. genuflexa**
- Pedicel and ovary 20-35 mm long. Anterior petals lobe 11-18.5 mm long, ciliate in the lower 2/3 ..... **3. B. schimperiana**

- 1. Bilabrella genuflexa** (Rendle) Szlach. & Kras-Lap. in Richardiana 3(3): 140. 2003  
(Fig. 18)

*Habenaria genuflexa* Rendle in J. Bot. 33: 279. 1895; TYPE: UGANDA. *Scott-Elliot* 7922 (HOLOTYPE: BM!; ISOTYPE: K!; DRAWING: UGDA-DLSz)

*Habenaria confusa* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 241. 1898; TYPE: ANGOLA. *Welwitsch 681* (HOLOTYPE: BM!; ISOTYPES: K!, P!, W-R!; DRAWING: UGDA-DLSz)

*Habenaria stenoloba* Schltr. in Bot. Jahrb. Syst. 38: 1. 1905; TYPE: GABON. *Schlechter 12824* (HOLOTYPE: B†; ISOTYPES: BM!, BR!, K!; DRAWING: UGDA-DLSz)

Tuber single, 1-2.5 cm long, 0.5-1 cm in diameter, ellipsoid, ovoid. Stem 20-100 cm tall, erect, rather stout, glabrous. Leaves 7-11, 7-29 cm long, 0.5-2(2.5) cm wide, linear or narrowly lanceolate, acute, suberect to spreading, the upper ones much smaller, erect, adpressed to the stem, often overlapping, the lower 1-2 sheath-like. Inflorescence 5-29 cm long, 6-40-flowered, rather loose. Flowers small, resupinate, green with white petals and column. Floral bracts 8-25 mm long, ovate-lanceolate, acuminate, herbaceous, glabrous or pubescent inside. Pedicel and ovary 15-25 mm long, glabrous; pedicel slender, twisted, erect; ovary bent forward, slightly swollen, bent back at the apex. Dorsal sepal 5-7.5 mm long, 2-3.5 mm wide, narrowly elliptic or oblong, concave, obtuse or shortly apiculate, sometimes semi-cucullate, glabrous, reflexed, with 3-5 unbranched nerves. Petals bipartite nearly to the base; anterior lobe 8-16 mm long, 1-1.5 mm wide, obliquely narrowly lanceolate, apiculate, spreading forward, rather thick, glabrous or rarely papillose; posterior lobe 4.5-7.5 mm long, 0.5-1 mm wide, linear, acute, rather thin, papillose and ciliate. Lateral sepals 7-10 mm long, 3.5-6 mm wide, obliquely oblong-obovate or obovate-elliptic, cochleate in the apical half, with short, ca. 0.6 mm long, lateral apiculus, glabrous, nerves 5, unbranched. Lip tri-partite above an undivided basal part 2-3.5 mm long, minutely papillate, thin at the base, thicker towards the apex; the middle lobe 9-13 mm long, 0.5-1 mm wide, linear, acute or obtuse; sidelobes 6-11.5 mm long, 0.5-0.8

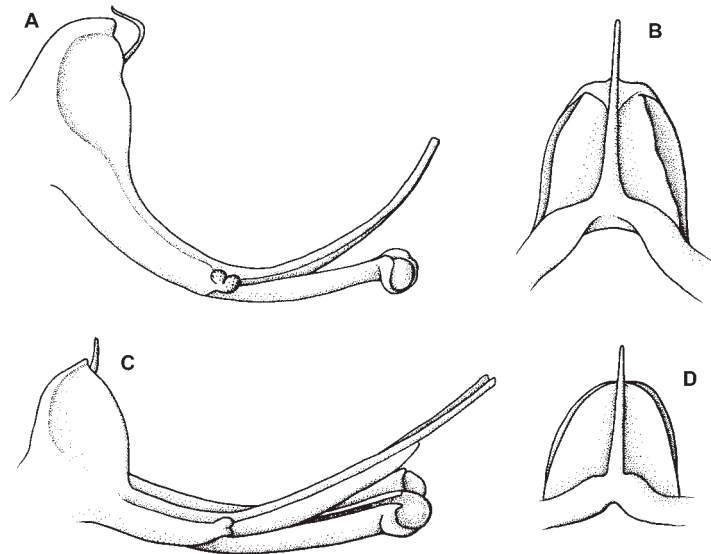


Fig. 17.—Gynostemium structure of *Bilabrella* Lindl.: A, C – gynostemium side view; B, D – gynostemium front view (Szlachetko & Kras-Lapińska 2003).

mm wide, linear, acute, curved upwards. Spur 8-13 mm long, bent in the knee-shaped manner near the middle, twisted once or twice above, distinctly swollen in the apical third or half, ca. 1.9-2.5 mm in diameter, blunt. Anther 3 mm long, connective narrow, obtuse, rostellum middle lobe linear, acute, as long as or longer than connective, antherophores 4-8 mm long, longer than stigmaphores.

HABITAT. Short grasslands, wet or swampy. August-September.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Senegal, Guinea-Bissau, Ghana, Nigeria, Cameroon, Gabon, Congo, Central African Republic, Democratic Republic of Congo (Zaire), Angola, Sudan, Uganda, Burundi, Uganda, Tanzania, Zambia. Alt. 800-2100.

REPRESENTATIVE SPECIMENS. Banfora, 20 Sep. 1958, *Adam* 15230 (K!); 1 Sep. 1976, *De Koning* 7207 (WAG!); Banfora-Solmarécageua, 20 Sep. 1958, *Jaeger* 5239 (K!); 40 km W of Bania, 3°27'W, 9°01'N, 16 Sep. 1967, *Geerling & Bokdam* 901 (WAG!), (along with *H. chlorotica*); 3°28'W, 9°01'N, 16 Sep. 1967, *Geerling & Bokdam* 915 (WAG!); Between Boundiali and Korhogo, 24 Aug. 1975, *Pérez-Vera* 826 (K!, P!); Danane, 18 Oct. 1974, *Pérez-Vera* 700 (K!, P!); Mt. Tonkoui, 24 Sep. 1969, *Cremers* 1148 (P!); Aug. 1974, *Pérez-Vera* 673 (K!); Aug. 1954, *Schnell* 6364 (P!).

## 2. *Bilabrella ichneumonea* (Sw.) Szlach. & Kras-Lap. in *Richardiana* 3(3): 140. 2003 (Fig. 19)

*Orchis ichneumonea* Sw. in Vet. Akad. Handl. Stockh. 21: 207. 1800; TYPE: SIERRA LEONE. *Afzelius* s.n. (LECTOTYPE: UPS; ISOLECTOTYPE: W-R!; DRAWING: K!, UGDA-DLSz) - *Habenaria ichneumonea* (Sw.) Lindl. in Gen. Sp. Orchid. Pl.: 313. 1835.

*Habenaria pedicellaris* Rchb. f. in Otia Bot. Hamburg.: 100. 1881; TYPE: ETHIOPIA. *Schimper* 1364 (LECTOTYPE: UPS; ISOLECTOTYPE: W-R!; DRAWING: K!, UGDA-DLSz)

Tubers 0.7-2.5 cm long, 0.4-1.2 cm in diameter, ellipsoid or ovoid. Stem 15-85 cm tall, erect, delicate, glabrous. Leaves 5-12, 7-21 cm long, 4-10 mm wide, grass-like, acute, erect, decreasing in size up the stem, the upper 1-3 bract-like, narrowly lanceolate, acute, loosely adpressed to the stem; the lower 3-6 sheath-like. Inflorescence 6-22 cm long, laxly or densely few- to many-flowered. Flowers small, resupinate, green or green with white centre. Floral

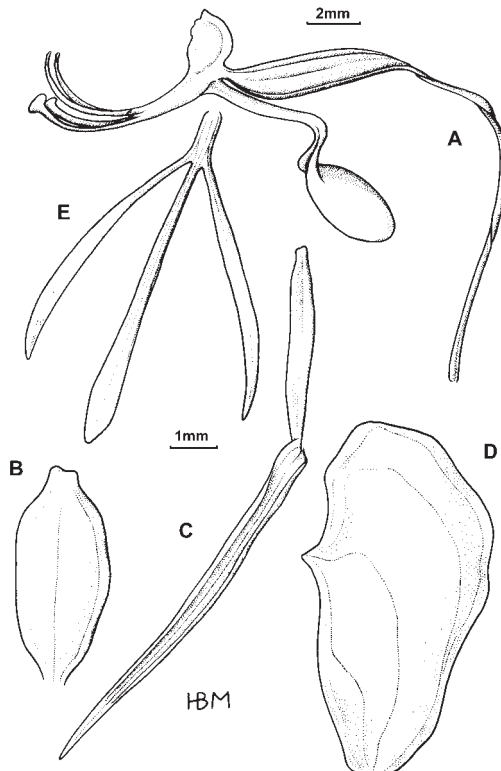


Fig. 18. - *Bilabrella genuflexa* (Rendle) Szlach. & Kras-Lap.: A - pedicel, ovary, spur and gynostemium, side view; B - dorsal sepal; C - petal; D - lateral sepal; E - lip (drawn by H.B. Margońska, *Afzelius* s.n., W-R).

bracts 5-17 mm long, ovate-lanceolate, acuminate, glandular inwards. Pedicel and ovary 15-30 mm long, glabrous; pedicel very slender, twisted; ovary ca. one-third of the pedicel length, erect, swollen. Dorsal sepal 3-5.5 mm long, 1.5-2.5 mm wide, ovate, subobtusely, cochleate, glabrous, 3-nerved. Petals bipartite to the base, ciliolate; anterior lobe 6.5-13 mm long, 1-1.5 mm wide, slightly lanceolate with filiform apex, rather thick, fleshy; posterior lobe 3-4.5 mm long, 0.2 mm wide, filiform, thin, delicate. Lateral sepals 4-8.5 mm long, 3-5 mm wide, obliquely elliptic or broadly obovate, cochleate at apex, with laterally placed apiculus ca. 0.5 mm long, glabrous, nerves 3, unbranched. Lip tri-partite above the undivided basal part ca. 1.5-4 mm long, rather thick, fleshy, glabrous; the middle lobe 7-15 mm long, 0.3-0.5 mm wide, filiform; sidelobes 6-13 mm long, 0.2 mm wide, filiform, all lobes pendent. Spur 10-25 mm long, 0.3 mm in diameter at base, 1.2 mm in diameter at apex, not twisted, pendent, slightly incurved, narrowly cylindrical, apical quarter swollen, blunt. Anther 1.2-2.5 mm tall, connective narrow, truncate, rostellum middle lobe linear-triangular, acute, shorter than connective, stigmaphores and antherophores 3.5-7 mm long, equal in length, auricles entire.

HABITAT. Damp grasslands, swamps, sometimes in shallow, standing water. June-November.

DISTRIBUTION. Guinea, Sierra Leone, Ivory Coast, Mali, Senegal, Nigeria, Cameroon, Central African Republic, Democratic Republic of Congo (Zaire), Angola, Ethiopia, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Botswana. Alt. 1000-1500 m.

NOTES. The following localities have been cited in literature (Cribb & Pérez-Vera 1975): Danané, *Nozeran s.n.* and Mt. Tonkoui, *Aké Assi 2630*. I have examined no material of this species from Ivory Coast.

**3. *Bilabrella schimperiana***  
(Hochst. ex A. Rich.) Szlach. & Kras-Lap. in *Richardiana* 3(3): 142. 2003  
(Fig. 20)

*Habenaria schimperiana* Hochst. ex A. Rich. in *Tent. Fl. Abyss.* 2: 295. 1851;  
TYPE: ETHIOPIA. *Schimper 1210*  
(LECTOTYPE: P!; ISOLECTOTYPES: BM!, K!, S, W-R!; DRAWING: UGDA-DLSz)

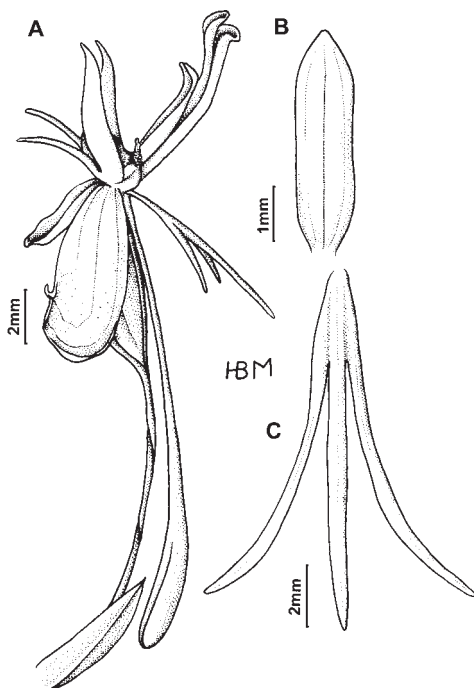


Fig. 19.—*Bilabrella ichneumonea* (Sw.) Szlach. & Kras-Lap.: A – flower; B – dorsal sepal; C – lip (drawn by H.B. Margońska, *Schimper 1364*, W-R).

Tubers 1-4 cm long, 1-2 cm in diameter, ellipsoid or ovoid. Stem

30-100 cm tall, erect, slender to rather stout, glabrous. Leaves 6-10, 7-28 cm long, 1-2 (rarely 3.7) cm wide, linear to linear-lanceolate, acute, suberect or spreading, the upper ones smaller. Inflorescence 6-35 cm long, 4-30-flowered, or more, lax or rather dense. Flowers green with white central part, with an unpleasant smell. Floral bracts 10-30 mm long, ciliolate inside, usually much shorter than pedicel. Pedicel and ovary (20)25-35 mm long, glabrous. Dorsal sepal 6-8 mm long, 3.2-4 mm wide, oblong-elliptic, obtuse, convex, glabrous, reflexed. Petals bipartite nearly to the base, rather thick; anterior lobe 11-18.5 mm long, 2 mm wide, lanceolate, apiculate, spreading downwards, ciliate in the lower two third; posterior lobe 5-8 mm long, 1 mm wide, linear, falcate, acute, thinner than anterior lobe, completely ciliate. Lateral sepals 9-11 mm long, 5-8 mm wide, obliquely obovate or broadly obovate, cochleate, glabrous, with ca. 0.8 mm long laterally placed apiculus. Lip tri-partite above an undivided basal part 2-3 mm long, fleshy, glabrous; the middle lobe 10-17 mm long, 0.5-0.9 mm wide, linear, obtuse; sidelobes 7-11 mm long, 0.5-0.7 mm wide, linear-lanceolate, acute, curved upwards. Spur 9-16 mm long, geniculate, sometimes straight, several times twisted near the middle, swollen in the apical half or third, ca. 2 mm in diameter, blunt. Anther 3-3.5 mm long, rostellum middle lobe slightly longer than connective, antherophores 5-8 mm long, slightly longer than stigma-phores.

**HABITAT.** Swamps, wet grasslands on badly drained soil, flooded grasslands, marsh. August.

**DISTRIBUTION.** Ivory Coast, Central African

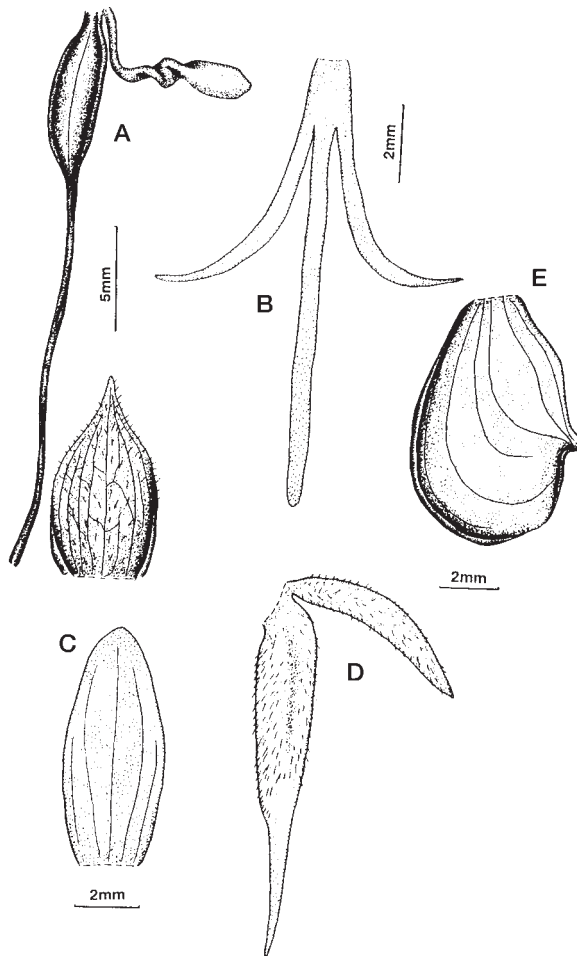


Fig. 20.—*Bilabrella schimperiana* (Hochst. ex A. Rich.) Szlach. & Kras-Lap.: A – floral bract, pedicel, ovary and spur; B – lip; C – dorsal sepal; D – petal; E – lateral sepal (Szlachetko & Olszewski 1998).



Republic, Gabon, Democratic Republic of Congo (Zaire), Sudan, Ethiopia, Kenya, Tanzania, Zambia, Malawi, Zimbabwe. Alt. 880-2550 m.

REPRESENTATIVE SPECIMENS. I'Orumbo-Boka, Aug. 1954, *Schnell 6494* (P!).

**9. *Ceratopetalorchis* Szlach., Górniak & Tukallo**  
in *Richardiana* 3(4): 158. 2003

*Habenaria* sect. *Ceratopetalae* Kraenzl. in Beitr. Monogr. Gattung *Habenaria*: 38. 1891 & Bot. Jahrb. Syst. 16: 55, 64. 1892 [non *Ceratopetalum* Sm., Spec. Bot. New Holland 1: 9, t. 3. 1793 (Cunoniaceae)].

Tuber ovoid, cylindrical to ellipsoid. Stem leafy throughout its length. Leaves sessile, lanceolate, gradually decreasing upwards. Inflorescence usually lax, few- to many-flowered. Flowers usually large, resupinate, glabrous. Sepals dissimilar. Petals bipartite almost to the base; anterior lobe usually much longer than posterior lobe. Both petal anterior lobes, lateral sepals and stigmaphores free from the lip margins. Lateral sepals often rolled up lengthwise, widest at the acute apex. Lip distinctly 3-lobed, lobes narrow, slender, pendent; the lateral ones often denticu-

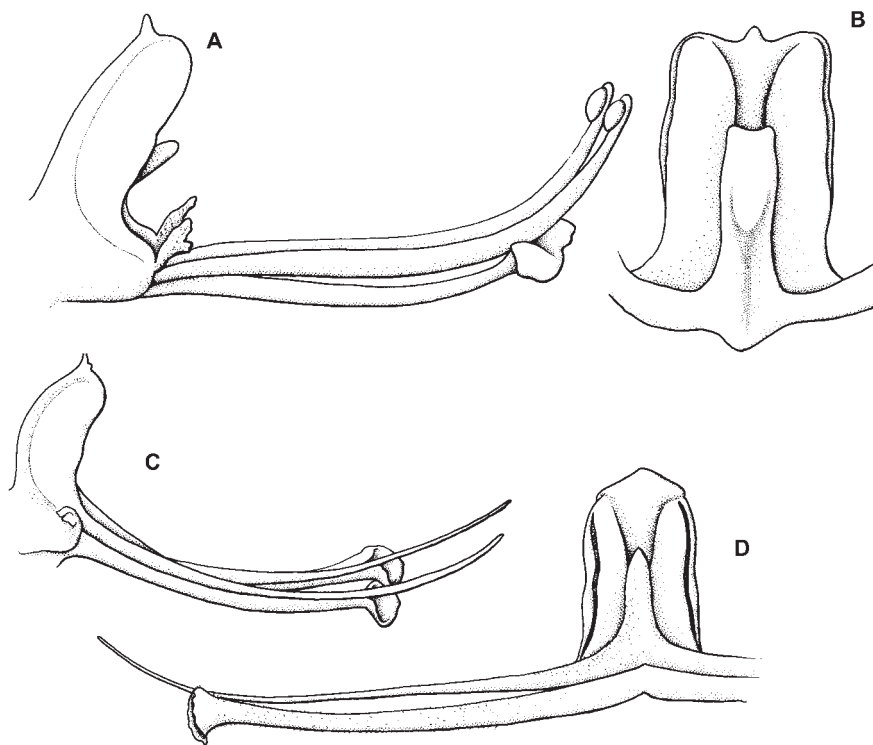


Fig. 21.—Gynostemium structure of *Ceratopetalorchis* Szlach., Górniak & Tukallo: A, C – gynostemium side view; B, D – gynostemium front view, spread (Szlachetko, Górniak & Tukallo 2003).



late or fringed on margins. Spur prominently swollen in the apical part. Gynostemium slender. Anther elongate, slender, gently curved. Antherophores long, slender, apically upcurved. Connective narrow. Pollinia ovoid to ellipsoid, much smaller than filiform caudiculae. Auriculae small, sculptured. Stigmaphores long, slender, much widened at truncate apex; receptive surface vertically positioned and confined to very small, somewhat shield-like areas at the top of stigmaphores. Stigmaphores shorter than upcurved rostellophores and antherophores. Rostellum middle lobe subulate, adnate to the ventral surface of connective. Viscidia 2, small (Fig. 21).

The genus includes over 10 species, all distributed in tropical Africa.

#### KEY TO THE SPECIES

1. Lateral lip lobes lanceolate to oblong-ovate, distinctly different than the middle one ..... 2
- Lateral lip lobes filiform or linear, similar to the middle one, but usually shorter ..... 4
2. Lip sidelobes entire ..... 3
- Lip sidelobes with 2-3 unequal tooth on margins ..... **5. *C. sanfordiana***
3. Lip middle lobe 5.5-11 mm long. Spur 15-18 mm long ..... **2. *C. cornuta***
- Lip middle lobe 16-35 mm long. Spur 55-75 mm long ..... **3. *C. holubii***
4. Spur distinctly longer than pedicel and ovary, at least 8.5 cm long ..... **1. *C. cirrhata***
- Spur as long as pedicel and ovary or shorter, up to 8 cm long ..... **4. *C. laurentii***

#### 1. *Ceratopetalorchis cirrhata* (Lindl.) Szlach., Górniak & Tukallo in Richardiana 3(4): 161. 2003 (Fig. 22)

*Bonatea cirrhata* Lindl. in Gen. Sp. Orchid. Pl.: 327. 1835; TYPE: MADAGASCAR. *Lyall s.n.* (HOLOTYPE: K!) - *Habenaria cirrhata* (Lindl.) Rehb. f. in Flora 48: 180. 1865

*Habenaria schweinfurthii* Rehb. f. in Otia. Bot. Hamb. 1: 58. 1878; TYPE: SUDAN. *Schweinfurth* 2458 (LECTOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Habenaria zenkeriana* Kraenzl. in Bot. Jahrb. Syst. 19: 247. 1894; TYPE: CAMEROON. *Zenker* 492B, (ICONOTYPE: B†; DRAWING: K!)

*Habenaria longistigma* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 248. 1898; TYPE: TANZANIA. *Hannington s.n.* (HOLOTYPE: K!)

*Habenaria dawei* Rolfe in Bull. Misc. Inform. Kew. 1912: 134. 1912; TYPE: UGANDA. *Dawe* 1026 (HOLOTYPE: K!)

*Habenaria megistosolen* Schltr. in Bot. Jahrb. Syst. 53: 512. 1915; TYPE: TANZANIA. *Stolz* 1992 (HOLOTYPE: B†; ISOTYPE: K!)

Tubers single, 3-5 cm long, 1-2.5 cm in diameter, ovoid, cylindrical to ellipsoid. Stem 50-133 cm tall, erect, robust, glabrous, leafy throughout its length. Leaves (5)7-13(16), 7-22 cm long, 3.5-9 cm wide, from almost orbicular or ovate to lanceolate, obtuse or acute, spread, decreasing in size up the stem, the upper 2-4 bract-like, up to 10 cm long, adpressed to the stem; the lower 2-3 sheath-like. Inflorescence 4-37 cm long, 2-12-flowered, lax. Flowers large, resupinate, green with white central part. Floral bracts 2-6.5 cm long, ovate, obovate or lanceolate, acute, leaf-like, herbaceous, glabrous or sparsely pubescent towards the apex. Pedicel and ovary 5.5-9 cm long; pedicel slender, erect, twisted, sparsely pubescent; ovary slender, bent forward, more or less pubescent. Dorsal sepal 19-25 mm long, 7-11.5 mm wide, elliptic-ovate to obovate, acute or apiculate, cochleate, al-

most glabrous, nerves densely branched. Petals bipartite almost to the base, glabrous; anterior lobe 50-90 mm long, 1 mm wide, filiform, acute, rather thick, upwards like a horn; posterior lobe 17-25 mm long, up to 1 mm wide, filiform, erect, rather thin. Lateral sepals 20-30 mm long, 10-15 mm wide, obliquely obovate or semi-orbicular-triangular, acute, deflexed, rolled up lengthwise, almost glabrous. Lip tripartite from an undivided basal part 2-4 mm long, rather thin, glabrous; the middle lobe 30-40(65) mm long, 1 mm wide, filiform, acute; side-lobes 20-30(45) mm long, less than 1 mm wide, filiform, acute, pendent. Spur 13-22 cm long, 1.5 mm in diameter at base, 3-4 mm in diameter at apex, filiform, swollen in the apical third or quarter, pendent, often hidden by the floral bract. Anther 7-10 mm tall, connective rather wide, truncate, antherophores 16-20 mm long, stigmaphores 15-22 mm long.

**HABITAT.** *Brachystegia* sp. woodlands, often on termite mounds, grasslands with scattered shrubs. June-August.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Democratic Republic of Congo (Zaire), Sudan, Ethiopia, Uganda, Kenya, Tanzania, Zambia, Malawi, Madagascar. Alt. 300-1500 m.

**REPRESENTATIVE SPECIMENS.** Boundiali-Kani road, June 1976, Pérez-Vera 691 (K!).

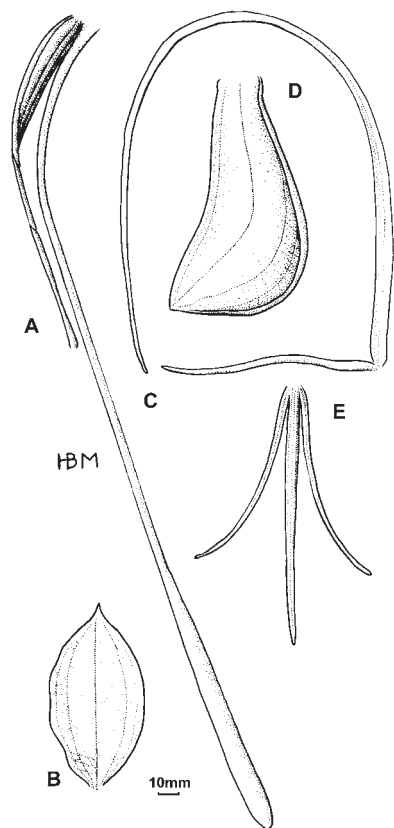


Fig. 22.—*Ceratopetalorchis cirrhata* (Lindl.) Szlach., Górnjak & Tukallo: A – pedicel, ovary and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by H.B. Margońska, Tisserant 2882, P).

## 2. *Ceratopetalorchis cornuta* (Lindl.) Szlach., Górnjak & Tukallo in Richardiana 3(4): 161. 2003 (Fig. 23)

*Habenaria cornuta* Lindl. in Compan. Bot. Mag. 2: 208. 1836; TYPE: SOUTH AFRICA. Drege 4570 (HOLOTYPE: K!; ISOTYPE: P!; DRAWING: UGDA-DLSz)

*Habenaria ceratopetala* A. Rich. in Ann. Sci. Nat. Bot., ser. 2, 14: 267. 1840; TYPE: ETHIOPIA. *Quartin-Dillon s.n.* (LECTOTYPE: P!; DRAWING: UGDA-DLSz)

*Habenaria ruwenzorensis* Rendle in J. Bot. 33: 280. 1895; TYPE: UGANDA. *Scott Elliot* 7923 (HOLOTYPE: BM; ISOTYPE: K!)

*Habenaria orthocaulis* Schltr. in Bot. Jahrb. Syst. 53: 519. 1915; TYPE: TANZANIA. *Stolz* 1186 (HOLOTYPE: B†)

Tubers 1.5-3.5 cm long, 1-2 cm wide, ellipsoid, ovoid. Stem 20-80 cm tall, erect, rather stout, glabrous or sparsely pubescent along inflorescence, leafy throughout its length. Leaves (4)8-15, 2-10 cm long, 0.7-4.5 cm wide, linear-

lanceolate to ovate, acute, spread or recurved, grading towards the apex into bracts, the lower 2-3 sheath-like. Inflorescence 5-19 cm long, loosely to densely 4-30-flowered. Flowers resupinate, pale green or yellow green. Floral bracts 10-27 mm long, broadly ovate or ovate-elliptic, acute to acuminate, herbaceous, rather densely pubescent inside, glabrous or sparsely pubescent outside, with 3 keels. Pedicel and ovary 15.5-28 mm long, erect, slender, twisted in the lower part, glabrous. Dorsal sepal 5-10 mm long, 4-7 mm wide, broadly ovate or elliptic-ovate, obtuse to acute, cochleate, sometimes semi-cucullate, glabrous, with more or less branched 3 nerves. Petals bipartite almost to the base, glabrous, rather thick and fleshy; anterior lobe (10) 25-30 mm long, 1.5-2 mm wide, obliquely lanceolate at base, filiform above, acute, curved upwards like a horn; posterior lobe (5) 8-10 mm long, 0.3-0.6 mm wide, filiform, erect or falcate. Lateral sepals 6-16 mm long, 5.5-10.5 mm wide, obliquely semi-orbicular or semi-obovate, subobtuse, deflexed, more or less rolled up lengthwise, glabrous, with sparsely branched nerves. Lip tripartite nearly to the base, thick above the base, glabrous; the middle lobe 5.5-11 mm long, 0.9-1.1 mm wide, linear or linear-lanceolate, obtuse; lateral lobes 6-12 mm long, 1.1-2 mm wide, obliquely lanceolate in the basal half, filiform above, widely divergent or pendent, entire. Spur 15-18 mm long, 0.6-0.7 mm in diameter in the lower half, 2-3.2 mm in diameter at apex, filiform in the basal half or two-third, much swollen above, blunt. Anther 4 mm long, connective rather wide, truncate, antherophores 5-6 mm long, slightly up-curved at apex, longer than stigmaphores.

**HABITAT.** *Brachystegia* woodlands, montane often badly drained grasslands, marshy ground, dambo. May-September.

**DISTRIBUTION.** Guinea, Ivory Coast, Nigeria, Cameroon, Democratic Republic of Congo (Zaire), Kenya, Ethiopia, Uganda, Tanzania, Zambia, Malawi, Zimbabwe, South Africa. Alt. 850-2400 m.

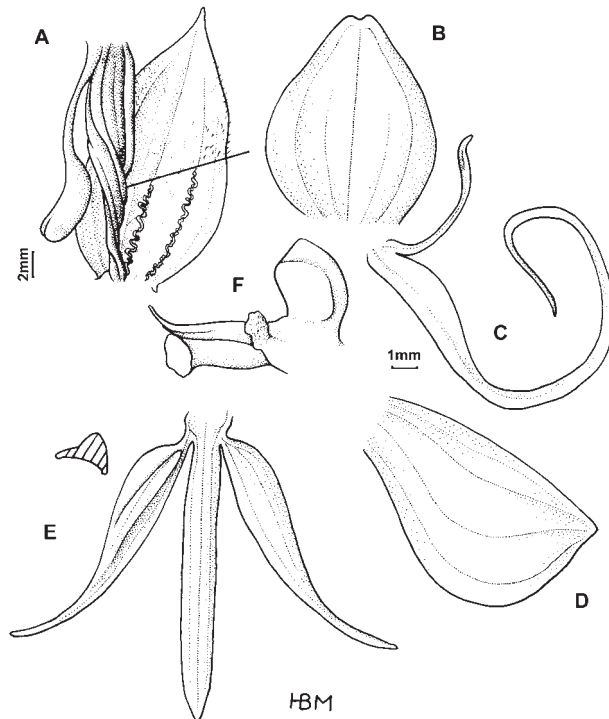


Fig. 23.—*Ceratopetalorchis cornuta* (Lindl.) Szlach., Górnjak & Tukallo: A – floral bract, pedicel, ovary and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip; F – gynostemium, side view (drawn by H.B. Margońska, *Drege* 4570, P).

REPRESENTATIVE SPECIMENS. Mt. Niangbo, 5°12'W, 8°48'N, 29 Sep. 1967, *Geerling & Bokdam 1032* (WAG!).

**3. *Ceratopetalorchis holubii* (Rolfe) Szlach., Górniak & Tukallo in Richardiana 3(4): 161. 2003**  
(Fig. 24)

*Habenaria holubii* Rolfe in Oliver & al. (eds.), *Fl. Trop. Afr.* 7: 249. 1898; TYPE: ZIMBABWE. *Holub s.n.* (HOLOTYPE: K!)

*Habenaria rhopaloceras* Schltr. in Warb., *Kunene-Sambesi-Exped.*: 207. 1903; TYPE: ANGOLA. *Baum 598* (HOLOTYPE: B†; ISOTYPES: BM!, HBG!, K!, W!; DRAWING: UGDA-DLSz)

*Habenaria valida* Schltr. in Bot. Jahrb. Syst. 38: 148. 1906; TYPE: TOGO. *Thieneman s.n.* (HOLOTYPE: B†; DRAWING: K!)

*Habenaria brevilabris* Kraenzl. in Bot. Jahrb. Syst. 51: 371. 1914; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE) *Kassner 2397a* (HOLOTYPE: B†; ISOTYPE: K!)

*Habenaria henningiana* Schltr. in Bot. Jahrb. Syst. 53: 511. 1915; TYPE: TANZANIA. *Stolz 1934* (HOLOTYPE: B†; ISOTYPE: K!)

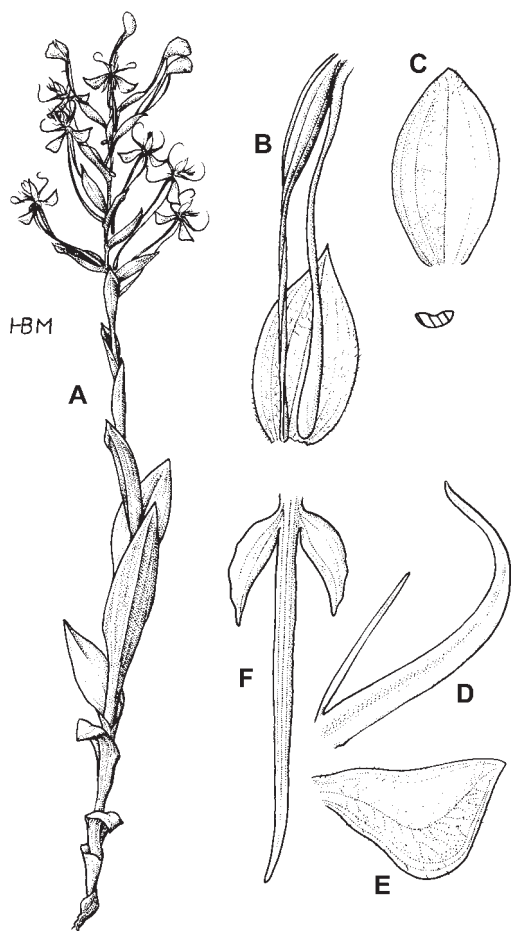


Fig. 24.—*Ceratopetalorchis holubii* (Rolfe) Szlach., Górniak & Tukallo: A – habit; B – floral bract, pedicel, ovary and spur; C – dorsal sepal; D – petal; E – lateral sepal; F – lip (drawn by H.B. Margońska, *Baum 598*, HBG).

Tuber single, 2.5-5 cm long, 1-2.5 cm in diameter, ellipsoid or ovoid. Stem 25-80 cm tall, erect, rather stout, leafy throughout its length. Leaves 7-11, 7-15 cm long, 2-4.5 cm wide, ovate-lanceolate, acute, erect, spread or slightly recurved, the upper ones smaller and loosely adpressed to the stem. Inflorescence 4-25 cm long, rather loosely 3-19-flowered. Flowers pale green or greenish-white, sometimes sweetly scented. Floral bracts 20-60 mm long, glabrous. Pedicel and ovary 45-75 mm long, glabrous. Dorsal sepal 14-20 mm long, 6-10 mm wide, elliptic-oblong to broadly ovate, acute, cochleate, glabrous or sparsely pubescent. Petals bipartite nearly to the base, glabrous; anterior lobe 20-40 mm long, 2-3.5 mm wide, narrowly linear, subulate in the upper part, thick, fleshy, curved upwards like a horn; posterior lobe 15-20 mm long, filiform,

acute, thin, erect. Lateral sepals 18-24 mm long, 10-15 mm wide, obliquely semi-ovate to semi-orbicular, acute, rolled up lengthwise, glabrous or sparsely pubescent outside. Lip distinctly three-lobed above the basal undivided 2-2.5 mm, glabrous, rather thin; the middle lobe 16-35 mm long, 1-1.5 mm wide, linear or linear-lanceolate, subobtuse; sidelobes 6-12(17) mm long, obliquely lanceolate or oblong-oblancoate, slightly falcate, acute, pendent. Spur 55-75 mm long, 1 mm in diameter near the middle, 3 mm in diameter at the apex, filiform, swollen in the apical third or quarter, blunt. Antherophores 13-19 mm long, as long as or longer than stigmaphores.

**HABITAT.** Terrestrial in grasslands, woodlands, dembo and meadows bordering gallery forests. August-January.

**DISTRIBUTION.** Ivory Coast, Togo, Nigeria, Chad, Central African Republic, Democratic Republic of Congo (Zaire), Angola, Uganda, Kenya, Tanzania, Zambia, Malawi, Zimbabwe. Alt. 810-1500 m.

**REPRESENTATIVE SPECIMENS.** 50 km W of Bania, 3°30'W, 9°00'N, 16 Sep. 1967, *Geerling & Bokdam* 890 (K!, WAG!); Reserve de Bouna, Bania, 16 Sep. 1967, *Téhé* 684 (P!); Nassian, 8 Nov. 1977, *Audru* 6424 (P!).

**4. *Ceratopetalorchis laurentii* (De Wild.) Szlach., Górniak & Tukallo in Richardiana 3(4): 162. 2003**  
(Fig. 25)

*Habenaria laurentii* De Wild. in Not. Pl. Util. Congo: 325. 1904; TYPE: D E M O C R A T I C REPUBLIC OF CONGO (ZAIRE) E. & M. Laurent s.n. (HOLOTYPE: BR)

Tuber single, 2-3.5 cm long, 1-2.5 cm in diameter, ellipsoid, ovoid or nearly globose. Stem 25-85 cm tall, erect, robust, glabrous, leafy throughout its length. Leaves 6-15, 6-22 cm long, 2.5-7 cm wide, from elliptic or ovate to oblong- or ovate-lanceolate, obtuse, to acute, spread, decreasing in size up the stem, the upper 3-5, bract-like, suberect; the lower 2-3 sheath-like. Inflorescence 6-30 cm long, 3-15-flowered, lax to rather dense.

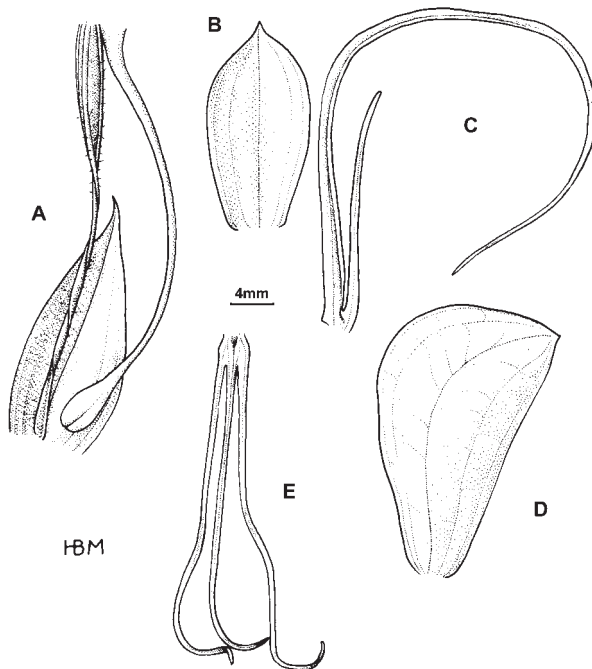


Fig. 25.—*Ceratopetalorchis laurentii* (De Wild.) Szlach., Górniak & Tukallo: A – floral bract, pedicel, ovary and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by H.B. Margońska, *Letouzey* 7541, P).

Flowers large, resupinate, white or green with white central part. Floral bracts 3-8 cm long, ovate-lanceolate, acute to acuminate, herbaceous, glabrous. Pedicel and ovary 6-8.5 cm long; pedicel slender, twisted, glabrous; ovary erect, narrowly cylindrical, rather sparsely pubescent. Dorsal sepal 20-24 mm long, 6-10 mm wide, elliptic-lanceolate or elliptic-obovate, acuminate, cochleate, thin, sparsely pubescent at the base only, nerves with numerous anastomoses. Petals bipartite almost to the base, fleshy, glabrous; anterior lobe 38-85 mm long, 1.5-3 mm wide, linear in the lower part, subulate above, acute, curved upwards like a horn; posterior lobe 19-22 mm long, 1 mm wide, subulate, acute, erect or slightly falcate. Lateral sepals 22-28 mm long, 10-13 mm wide, obliquely semi-obovate or semi-orbicular, obtuse or subacute, rolled up lengthwise, thin, sparsely pubescent at the base only, nerves with numerous anastomoses. Lip tripartite from an undivided basal 2 mm, glabrous, thin at the base, rather fleshy above; the middle lobe 24-36 mm long, 1 mm wide, filiform, slightly revolute on margins; sidelobes 20-35 mm long, 0.8 mm wide, filiform, pendent. Spur 55-80 mm long, less than 1 mm in diameter near the middle, 3.5-5 mm near the apex, curved backwards to form a bow, much swollen at the apex, blunt. Anther 5-9 mm tall, connective wide, with broadly triangular apex, antherophores 13-20 mm long, slightly curved upwards, longer than stigmaphores, stigmaphores 13-17 mm long, abruptly widened and truncate at apex.

HABITAT. *Brachystegia* sp. woodland, forests, savanna, grassland, often among rocks. August.

DISTRIBUTION. Mali, Senegal, Guinea, Sierra Leone, Ivory Coast, Nigeria, Cameroon, Central African Republic, Kenya, Zambia, Malawi, Zimbabwe. Alt. 1000-2100 m.

REPRESENTATIVE SPECIMENS. 45 km S of Boundiali, 23 Aug. 1975, *Pérez-Vera* 825 (K!, P!); Parc National de Bouna, Téhini, ca. 40 km E of Ouangofétini, 26 Aug. 1963, *de Wilde* 803 (WAG!).

**5. *Ceratopetalorchis sanfordiana* (Szlach. & Olszewski) Szlach., Górnjak & Tukallo in *Richardiana* 3(4): 162. 2003**  
(Fig. 26)

*Habenaria sanfordiana* Szlachetko & Olszewski in *Abrév. & al. (eds.), Fl. Cameroun* 34(1): 156. 1998;  
TYPE: CAMEROON. *Jacques-Felix* 4004 (HOLOTYPE: P!; ISOTYPE: K!; DRAWING: UGDA-DLSz)

Tuber single, 1.5 cm long, 1 cm in diameter, ovoid. Stem 33-63 cm tall, erect, stout, glabrous, leafy throughout its length. Leaves 11-30, up to 9 cm long and 3 cm wide, lanceolate, acute, spread, decreasing in size up the stem. Inflorescence 11.5-17 cm long, 10-40-flowered, lax to very dense. Floral bracts up to 25 mm long, densely pubescent inside, almost glabrous outside with 1 or 3 keels. Pedicel and ovary 30-33 mm long, glabrous. Dorsal sepal 8.5 mm long, 5-6 mm wide, ovate, subacute, cochleate, thin, glabrous. Petals bipartite almost to the base, rather thick, fleshy, glabrous; anterior lobe 31-40 mm long, 1.5-2.2 mm wide, obliquely lanceolate or linear-lanceolate at the base, filiform above, acute, curved upwards like a horn; posterior lobe 7-8 mm long, 0.7-1.3 mm wide, subulate to linear-lanceolate acute, erect. Lateral sepals 11-12 mm long, 5.5-6.5 mm wide, obliquely semi-orbicular, acute, slightly concave, with involute margins, rolled up lengthwise, glabrous. Lip tripartite nearly to the base, thick, fleshy, glabrous; the

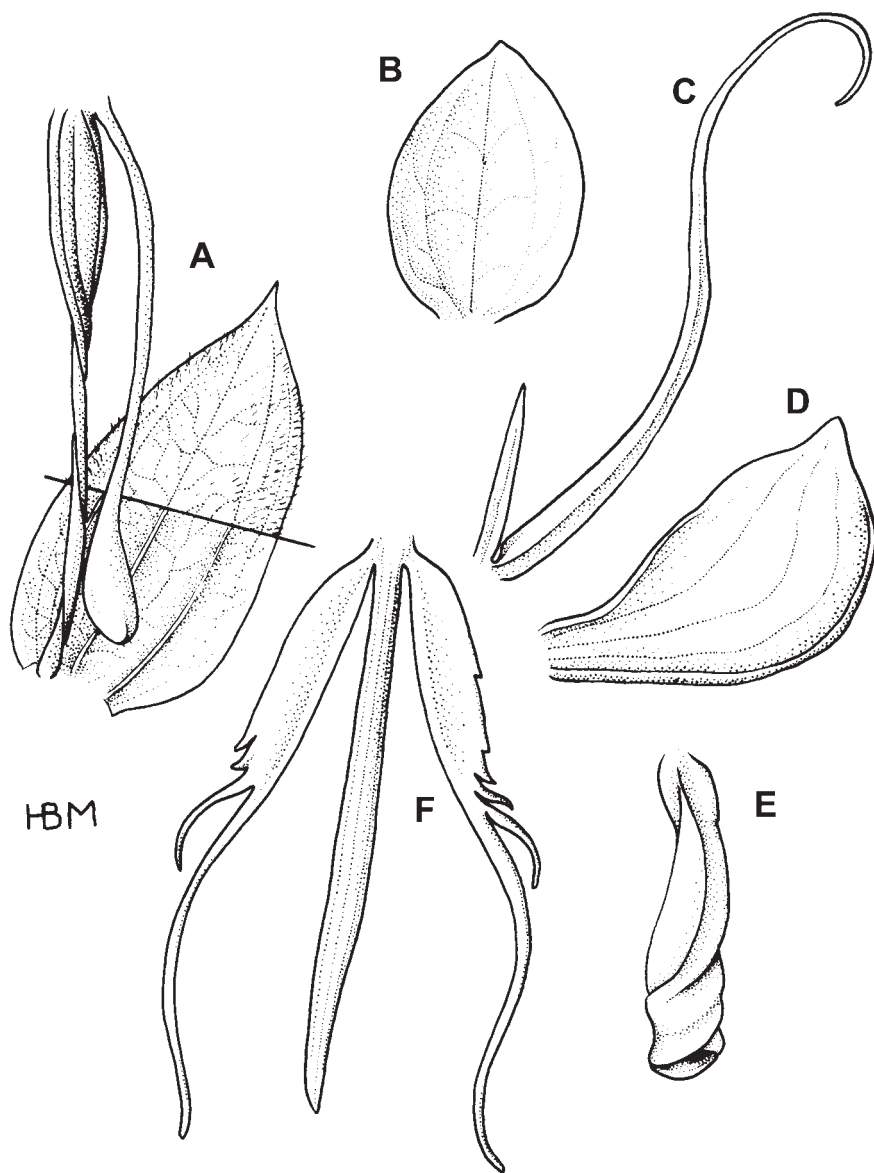


Fig. 26.—*Ceratopetalorchis sanfordiana* (Szlach. & Olszewski) Szlach., Górniak & Tukallo: A – floral bract, pedicel, ovary and spur; B – dorsal sepal; C – petal; D, E – lateral sepal, various views (Szlachetko & Olszewski 1998).



middle lobe 12-17 mm long, 1 mm wide, linear, acute or obtuse; sidelobes 18 -19 mm long, widened in the basal half or third, with 2-3 unequal teeth on outer margin, filiform above, acute, pendent. Spur 22-32 mm long, 0.7-0.8 mm in diameter near the middle, 2.5-3 mm in diameter at the apex, more or less equal in length to pedicel and ovary, filiform, swollen in the apical fifth or sixth, blunt. Antherophores 6-7 mm long, longer than stigmaphores.

HABITAT. Swamps, forests. August.

DISTRIBUTION. Ivory Coast, Cameroon, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. Parc National de la Maraoué, 11 Aug. 1975, *Pérez-Vera 801* (P!).

### 10. *Habenaria* Willd. in Sp. Pl. 4: 44. 1805

Tubers 1 or few, usually ovoid or ellipsoid. Leaves cauline, decreasing in size upwards, or basal, almost radical, ground-hugging, usually sessile or subsessile. Inflorescence usually many-flowered. Flowers of various size, but most often small to medium, resupinate. Sepals similar or dissimilar. Petals bi-partite or entire, ciliate or glabrous, partially adnate to the dorsal sepal forming a galea or completely free. Lip 3-lobed, lobes similar or dissimilar, usually linear or lanceolate, pendent or diverging. Spur filiform to cylindrical, of various length and shape. Gynostemium short and massive. Anther erect or bent back up to an angle of 90°, rounded at the apex and elongate at the base in short processes (=antherophores). Connective usually truncate, rather broad. Pollinia 2, obovoid to ellipsoid. Caudiculae elastic, usually as long as or longer than pollinia. Auriculae usually small, sometimes bi-lobed or very conspicuous, large. Stigma bi-lobed, both lobes forming a prominent but relatively short stigmaphores, often pendent, with most of the upper surface fertile. Rostellophores subequal in length to antherophores. Viscidia rather small (Fig. 27).

*Habenaria* with over 400 species, constitutes the largest genus in the subfamily Orchidoideae *sensu* Szlachetko (1995). Of this large number of species just 6 have been reported from Ivory Coast so far.

#### KEY TO THE SPECIES

1. Petals entire or with small basal tooth ..... 2
- Petals deeply bilobed, both lobes subequal or anterior one much longer than the posterior one ..... 4
2. Leaves lanceolate to ovate-lanceolate. Petals oblong to ovate, subobtuse, straight ..... **6. *H. procera***
- Leaves linear or linear-lanceolate. Petals linear-lanceolate, acute, falcate ..... 3
3. Leaves 10-20 times longer than wide. Stigmaphores glabrous ..... **3. *H. chlorotica***
- Leaves 5-6 times longer than wide. Stigmaphores papillose ..... **4. *H. filicornis***
4. Tubers lacking, rhizome fleshy, elongate ..... **5. *H. physuriformis***
- Tubers present ..... 5
5. Dorsal sepal 12-15 mm long. Petals anterior lobe 17 mm long, posterior lobe 12 mm long. Spur 11-14 mm long ..... **1. *H. barrina***
- Dorsal sepal 3.5-5 mm long. Petals anterior lobe 2.8-6.5 mm long, posterior lobe a little longer. Spur 14-25 mm long ..... **2. *H. buettnerana***



**1. *Habenaria barrina* Ridl. in Bol. Soc. Brot. 5: 202. fig. b. 1887 (Fig. 28)**

TYPE: SÃO TOMÉ. *Quintas s.n.* (HOLOTYPE: BM!; DRAWING: UGDA-DLSz).

Tubers ca. 2 cm long, 1 cm in diameter, elipsoid. Stem up to 40 cm tall, erect, rather delicate, glabrous, leafy. Leaves 4-6, 3.5-9 cm long, 1-3 cm wide, oblanceolate, oblong-ovate or oblong-elliptic, acute to acuminate, attenuate towards the base, spread, decreasing in size up the stem, gathered just below the inflorescence. Inflorescence up to 17 cm long, up to 10-flowered, lax. Flowers white or greenish-white. Dorsal sepal 12-15 mm long, 3-4 mm wide, oblong-lanceolate, obtuse, concave, glabrous. Petals bipartite nearly to the base, glabrous, thin; anterior lobe

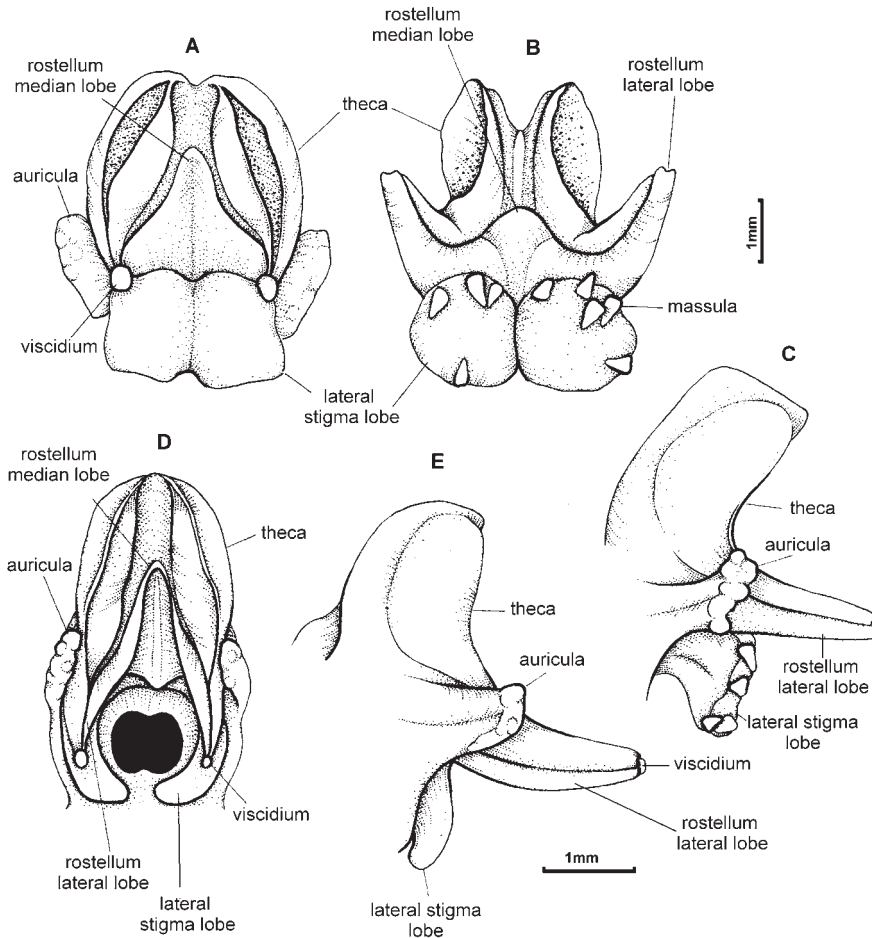


Fig. 27.—Gynostemium structure of *Habenaria* Willd.: A, B, D – gynostemium front view; C, E – gynostemium side view (Szlachetko & Rutkowski 2000).

17 mm long, 0.5 mm wide, filiform, acute, upcurved; posterior lobe 12 mm wide, 0.5 mm wide, filiform, acute, erect. Lateral sepals 10-15 mm long, 4 mm wide, obliquely oblong-lanceolate, subacute, concave, glabrous. Lip distinctly three-lobed nearly at the base, glabrous; middle lobe 15 mm long, 0.8-1 mm wide, filiform, acute; sidelobes 22 mm wide, 0.8-1 mm wide, filiform, acute, widely spread. Spur 11-14 mm long, filiform, gradually inflating towards the acute apex, falcate. Stigmaphores 6 mm long, antherophores 6 mm long.

HABITAT. Terrestrial, virgin forests. February, July.

DISTRIBUTION. Guinea, São Tomé and Príncipe, Ivory Coast, Nigeria, Congo, Democratic Republic of Congo (Zaire). Alt. 50-600 m.

REPRESENTATIVE SPECIMENS. Moyen Cavally, Oubi, Keéta, 5-9 July 1907, *Chevalier 19364* (P!).

**2. *Habenaria buettnerana* Kraenzl. in Bot. Jahrb. Syst. 16: 68. 1892**

(Fig. 29)

TYPE: TOGO. *Buettner* 288 (HOLOTYPE: B†; FRAGMENT OF HOLOTYPE: K!; DRAWING: UGDA-DLSz)

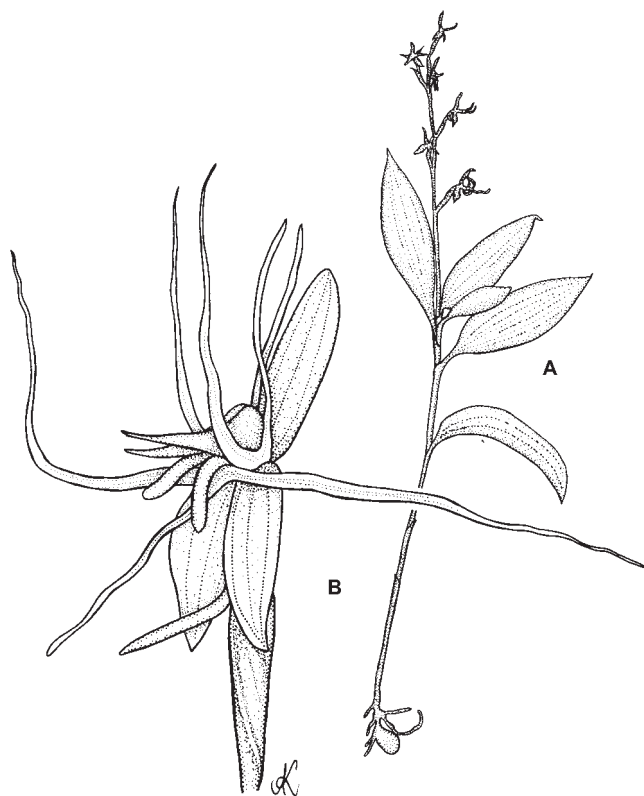


Fig. 28.—*Habenaria barrina* Ridl.: A – habit; B – flower (redrawn by A. Kowalkowska from original Summerhayes' drawing kept at K).

Tubers 1.5-3 cm long, 1-1.5 cm in diameter, ovoid or ellipsoid, plus few or some smaller at the ends of slender roots. Stem 20-100 cm tall, erect, delicate or rather stout, glabrous, leafy. Leaves 11-17, 8-15 cm long, 2.5-5 cm wide, oblanceolate to obovate, apiculate, spread, the upper 2-4 much smaller, ca. 2 cm long, bract-like, lanceolate, acute; the lower 3-4 sheath-like. Inflorescence 10-30 cm long, multi-flowered, lax at the bottom, dense at the apex. Flowers small, resupinate, green, sometimes tinged pink or brownish. Floral

bracts 8-16 mm long, lanceolate, acuminate, glabrous. Pedicel and ovary 10-22 mm long, glabrous; pedicel slender, twisted; ovary swollen, slightly arcuate. Dorsal sepal 3.5-5 mm long, 2-3.5 mm wide, broadly ovate-elliptic or ovate, obtuse, cochleate, glabrous, nerves unbranched. Petals bipartite 1 mm above the base, thickened towards the apex, glabrous; anterior lobe 2.8-6.5 mm long, 0.6 mm wide, linear, acute, curved upwards at the base; posterior lobe a little longer and wider, 4.5-6.5 mm long, 1 mm wide, linear-lanceolate, subacute, erect. Lateral sepals 5-7 mm long, 2 mm wide, semi-elliptic or obliquely lanceolate, subacute, cochleate, with involute lower margin, glabrous, nerves unbranched. Lip tripartite above the basal 1-2 mm, thick, glabrous; the middle lobe 4-6 mm long, 0.7-1 mm wide, linear, subobtusely; lateral lobes 3.3-5 mm long, 0.6 mm wide, linear, acute, widely divergent. Spur 14-25 mm long, 1 mm in diameter, filiform in the basal half, swollen in the apical half, acute, pendent. Gynostemium ca. 1-2 mm long, connective narrow, antherophores as long as or longer than stigmaphores.

HABITAT. Rain forest. September-October.

DISTRIBUTION. Guinea-Bissau, Guinea, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, São Tomé, Uganda. Alt. 1200-1350 m.

REPRESENTATIVE SPECIMENS. Danané, 18 Oct. 1974, *Pérez-Vera* 699 (K!, P!); Mt. Tonkoui, Sep. 1975, *Pérez-Vera* 812 (K!).

### 3. *Habenaria chlorotica* Rchb. f. in Flora 48: 178. 1865 (Fig. 30)

TYPE: ANGOLA.  
*Welwitsch* 725 p.p  
(LECTOTYPE: BM!;  
ISOLECTOTYPE: K!;  
DRAWING: UGDA-  
DLSz)

Tuber single, 1-1.5 cm long, 0.5-1 cm in diameter, ellipsoid to oblong ovoid. Stem 20-80 cm tall, erect, delicate to relatively stout, glabrous. Leaves 4-11, 6-19 cm long, and to 1.1 cm wide, usually narrower, narrowly

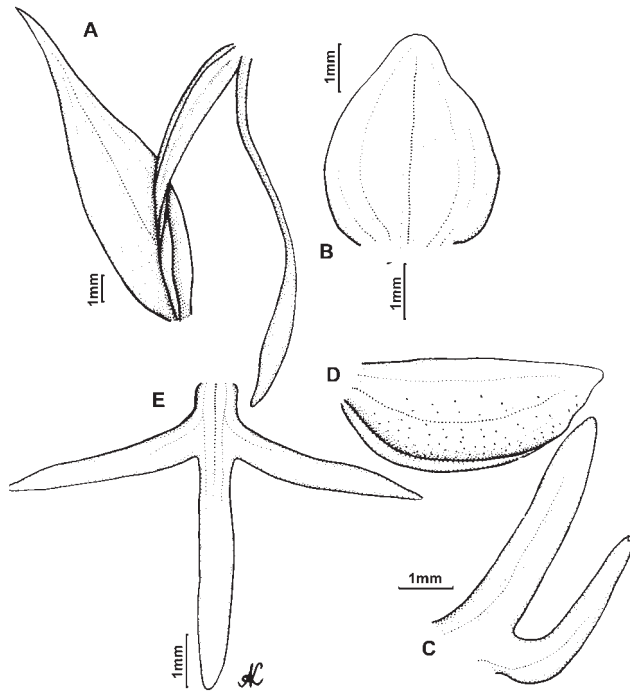


Fig. 29.—*Habenaria buettnerana* Kraenzl.: A — floral bract, pedicel, ovary and spur; B — dorsal sepal; C — petal; D — lateral sepal; E — lip (drawn by A. Kowalkowska, *Letouzey* 7705, P).

to linear-lanceolate, acute, erect to spread, the upper 2-3 bract-like; the lower 1-2 sheath-like. Inflorescence 7-25 cm long, 7- to many-flowered, rather lax, spirally arranged. Flowers small, resupinate, green or yellow-green. Floral bracts 6-10 mm long, ovate-lanceolate, acuminate, glabrous, the lower ones longer than flowers. Pedicel and ovary 8-13 mm long, glabrous; pedicel slender, twisted; ovary arcuate, swollen near the apex. Dorsal sepal 2-4.5 mm long, 1.2-1.5 mm wide, ovate-ellip-

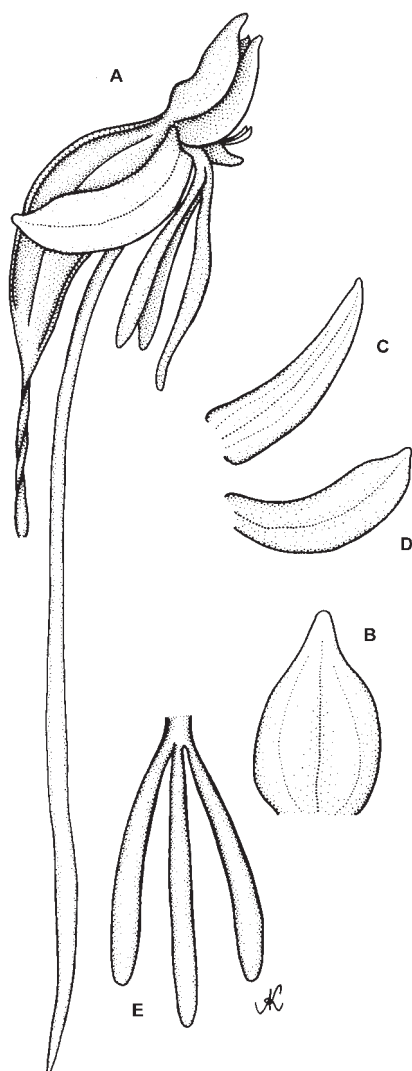


Fig. 30.—*Habenaria chlorotica* Rchb. f.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip (drawn by A. Kowalkowska, Welwitsch 725, W-R).

tic, obtuse, cucullate, slightly concave, glabrous, with 3 unbranched nerves. Petals 2.2-4.5 mm long, 0.7-1 mm wide, falcate-ovate, acute, glabrous, with 3 unbranched nerves. Lateral sepals 3-7 mm long, 1.5-2 mm wide, obliquely oblong-ovate, obtuse, cochleate, with involute lower margin, glabrous, with 3 sparsely branched nerves. Lip rather thick, glabrous, trilobed from a very short basal undivided part ornamented with small, triangular callus; the middle lobe 4.8-9 mm long, 0.8-1 mm wide, linear, obtuse; lateral lobes 4-7.5 mm long, ca. 0.5 mm wide, linear or filiform, obtuse, falcately divergent. Spur 1.3-3 cm long, ca. 0.8-1 mm in diameter, very slender, slightly swollen in the lower half, subacute, pendent or falcate. Gynostemium 2-2.5 mm long, connective narrow, shortly apiculate, stigmas rather massive, club-like, nearly as long as antherophores. Rostellum middle lobe linear, truncate at apex, with distinct keel near the base.

**HABITAT.** Damp grasslands, poorly drained areas over rock. September.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Nigeria, Cameroon, Democratic Republic of Congo (Zaire), Angola, Ethiopia, Uganda, Kenya, Tanzania, South Africa. Alt. 500-2600 m.

**REPRESENTATIVE SPECIMENS.** 40 km W of Bania, 3°27'W, 9°01'N, 16 Sep. 1967, Geerling & Bokdam 901 (K!, WAG!) (along with *B. genuflexa*).

#### 4. *Habenaria filicornis* Lindl. in Gen. Sp. Orchid. Pl.: 318. 1835 (Fig. 31)

**TYPE:** GUINEA. *Thouring s.n.* (HOLOTYPE: C?; ISOTYPE: W-R!; DRAWING: UGDA-DLSz)  
*Habenaria tridactyla* A. Rich. in Tent. Fl. Abyss. 2:

291. 1851; TYPE: ETHIOPIA. *de Franqueville* s.n. (LECTOTYPE: P!; DRAWING: UGDA-DLSz)  
*Habenaria spiranthes* Rchb. f. in Flora 48: 178. 1865; TYPE: ANGOLA. *Welwitsch* 684  
 (LECTOTYPE: K!; ISOLECTOTYPES: BM!, P!; DRAWING: UGDA-DLSz)

Plants 14-50 cm tall, erect, delicate, glabrous. Leaves 3-9, 3-11 cm long, 0.6-1.8 cm wide, lanceolate or oblong-lanceolate, acute, erect to spread. Inflorescence 5-20 cm long, up to 20-flowered, rather lax. Flowers green. Floral bracts 6-8 mm long. Pedicel and ovary 10-17 mm long. Dorsal sepal 1.8-5.5 mm long, 1.8-5 mm wide, ovate-elliptic to suborbicular, obtuse, slightly concave, glabrous. Petals 2.2-5.5 mm long, 0.7-1 mm wide, falcate-lanceolate, acute or obtuse, glabrous. Lateral sepals 3-7 mm long, 1.3-3 mm wide, obliquely oblong-obovate, subacute to obtuse, glabrous. Lip rather thick, glabrous, three-lobed from a very short basal undivided part (up to 1 mm long); the middle lobe 3-11 mm long, 0.5-1 mm wide, linear-ligulate, obtuse; lateral lobes 3.5-10 mm long, 0.2-0.5 mm wide, linear, obtuse, falcately divergent. Spur 13-30 mm long, 0.6-1 mm in diameter, cylindrical, more or less swollen in the lower half, subobtuse, pendent or subfalcate. Stigmaphores papillose, massive, club-like, nearly as long as upcurved antherophores.

HABITAT. Grasslands, secondary bushlands. August.

DISTRIBUTION. Guinea, Ivory Coast, Ghana, Nigeria, Democratic Republic of Congo (Zaire), Angola, Ethiopia, Uganda, Tanzania, Zambia, Malawi, Zimbabwe. Alt. 1350-1950 m.

REPRESENTATIVE SPECIMENS. Baoulé-Nord, Kodiokoffi, Ciégouakro, 8 Aug. 1909, *Chevalier* 22345 (P!).

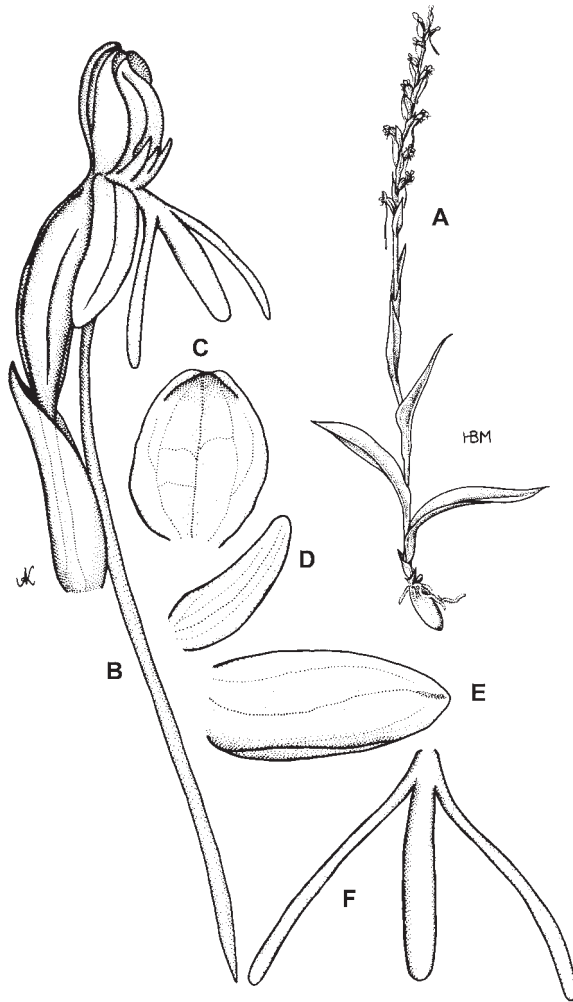


Fig. 31.—*Habenaria filicornis* Lindl.: A – habit; B – flower; C – dorsal sepal; D – petal; E – lateral sepal; F – lip (drawn by H.B. Mar-gońska, *Spanguirille* sn).

5. *Habenaria physuriformis* Kraenzl. in Bot. Jahrb. Syst. 43: 395. 1909

(Fig. 32)

TYPE: CAMEROON. *Zenker 3670* (HOLOTYPE: B†; DRAWING: K!; PHOTO: UGDA-DLSz)

*Habenaria buntingii* Rendle in Rendle & Baker, Cat. Pl. Oban.: 109, tab. 15, fig. 10-11. 1913;

TYPE: LIBERIA. *Bunting 33*. (HOLOTYPE: BM!; DRAWING: UGDA-DLSz)

Rhizome ca. 2-3 cm long, 2 mm in diameter, internodes ca. 3-4 mm long, creeping, rather fleshy, roots numerous, in the leaves axils. Stem 11-40 cm tall,



Fig. 32.—*Habenaria physuriformis* Kraenzl.: A – floral bract, pedicel, ovary and spur; B – dorsal sepal; C, D – petal; E – lateral sepal; F, G – lip (drawn by A. Kowalkowska, A-C, E, F – *Halle & Villiers 5302*, P, D, G – *Le Testu 6480*, P).

erect, delicate, glabrous. Leaves 3-9, gathered at the base of the stem or along the stem, petiolate; petiole up to 3 cm long, narrow; blade up to 7 cm long and 3 cm wide, oblanceolate, obovate, rarely lanceolate or broadly lanceolate, acute to shortly acuminate, spread; 3-4 cauline bracts above them, up to 2.5 cm long, ovate-lanceolate, acute, adpressed to the stem, glabrous. Inflorescence 3-20 cm long, 6-20-flowered, dense or lax. Flowers small, resupinate, white, greenish or pinkish. Floral bracts 7-20 mm long, oblong-lanceolate to ovate-lanceolate, acute to acuminate, glabrous. Pedicel and ovary 12-15 mm long. Dorsal sepal 4-5 mm long, 1.5-2.6 mm wide, broadly obovate, elliptic-ovate to oblong, obtuse to subacute, slightly cochleate, glabrous. Petals 4-6 mm long, 1 mm wide, linear, narrowly lanceolate or filiform, acute, erect, falcate to sigmoid, with small basal lobules, glabrous. Lateral sepals 4.5-6 mm long, 2.5-3 mm wide, obliquely elliptic-ovate or ovate-lanceolate, subobtuse or subacute, cochleate, thin, glabrous. Lip tripartite above the basal 1 mm, rather fleshy, glabrous; the middle lobe 5-7 mm long, 0.8-1 mm wide, filiform, linear-lanceolate, acute to obtuse; lateral lobes 5.8-9 mm long, 0.6-1 mm wide, filiform to linear-lanceolate, widely divergent. Spur 12-13 mm long, 0.3-0.8 mm in diameter at the base, 0.8-2 mm in diameter at the apex, filiform in basal half, swollen in apical half, subacute.

**HABITAT.** Terrestrial in forests. February, June, November.

**DISTRIBUTION.** Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Central African Republic, Gabon, Democratic Republic of Congo (Zaire).

**REPRESENTATIVE SPECIMENS.** Chute, Naoua, 2 Nov. 1975, *Pérez-Vera* 855 (K!); Moyene Sassandra, Soubré-Péhiré road, 26 June 1907, *Chevalier* 19182 (P!); Sassandra, between Péhiré and Kopréagui, ca. 7 km WNW of Soubré, 25 Nov. 1961, *de Wilde* 3309 (K!, WAG!); Tiapleu, Feb. 1964, *Aké Assi* 7386 (K!).

**6. *Habenaria procera*** (Sw.) Lindl. in Gen. Sp. Orchid. Pl.: 318. 1835 (Fig. 33)

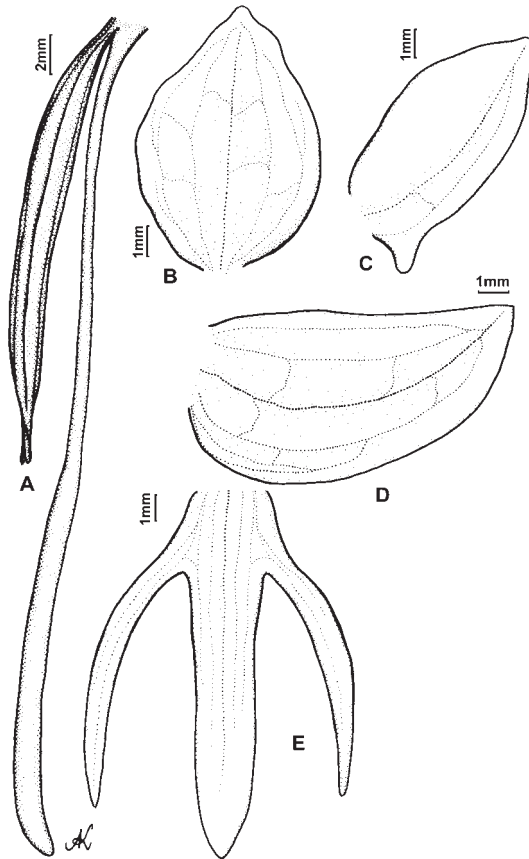


Fig. 33.—*Habenaria procera* (Sw.) Lindl.: A – pedicel, ovary and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by A. Kowalkowska, Halle & Villiers 5662, P).



*Orchis procera* Sw. in Pers. Syn. 1: 506. 1807; TYPE: SIERRA LEONE. *Afzelius s.n.* (HOLOTYPE: UPS)  
*Habenaria milnei* Rehb. f. in Otia Bot. Hamburg. 2: 96. 1881; TYPE: GABON. *Milne s.n.*  
 (HOLOTYPE: W-R!; DRAWING: UGDA-DLSz)  
*Habenaria staudtiana* Kraenzl. in Orchid. Gen. Sp.: 320. 1898; TYPE: AFRICA. *Zenker & Staudt*  
 503 (HOLOTYPE: B†)

Tubers of various shapes, pubescent. Stem up to 90 cm tall, erect, delicate to stout, glabrous. Leaves 6-8, on the lower part of the stem, petiolate; petiole up to 3 cm long, rather broad; blade up to 30 cm long and to 6.5 cm wide, elliptic to broadly lanceolate or oblanceolate, acute, tapering gradually towards the base, spread decreasing gradually in size up the stem; the lower 3-4 sheath-like. Inflorescence 9-18 cm long, multi-flowered, lax to dense. Flowers medium-sized, resupinate, white with green tips of tepals. Floral bracts up to 3.5 cm long, broadly ovate to ovate-lanceolate, acute, glabrous. Pedicel and ovary up to 6 cm long, slender, slightly arcuate, twisted at the base only, glabrous. Dorsal sepal 8-12 mm long, 5-7 mm wide, elliptic-ovate, subacute, thin, glabrous, with 5 branched nerves. Petals 9-12 mm long, 3.5-6 mm wide, obliquely oblong-ovate, with or without small basal teeth, subacute, glabrous, slightly thickened on the outer margin. Lateral sepals 10.5-12 mm long, 6-6.5 mm wide, obliquely elliptic-ovate, subacute, glabrous, with branched nerves. Lip distinctly trilobed above the basal linear 2-5 mm, rather thick, glabrous; the middle lobe 11-18 mm long, linear to narrowly lanceolate, subobtusate to subacute; lateral lobes 10-27 mm long, 0.6-1 mm wide, filiform to linear-lanceolate, acute, pendent. Spur 4.7-11 cm long, 1 mm in diameter near the middle, 2 mm in diameter at the apex, filiform, slightly swollen in the apical half, acute, pendent. Gynostemium 4 mm long, connective narrow, shortly apiculate, stigmaphores longer than antherophores, rostellum middle lobe acute, ca. 3/4 of the loculi length.

**HABITAT.** Lowland rain forest, damp shady areas by river, among ferns and mosses on tree trunk and axils of branches, of several tree species, but especially on the oil palm, *Elaeis guineensis* Jacq. July-August.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Principe, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Zambia. Alt. 750-1500 m.

**REPRESENTATIVE SPECIMENS.** Forêt de Y.A.P.O., ca. 8 km S of Bécédi-Bugnan, ca. 4 km N of Mafou River, 6 Aug. 1963, *de Wilde* 633 (K!, WAG!, P!); Ca. 3 km E of Bécédi, ca. 45 km NNE of Dabou, NW of Abidjan, 14 Aug. 1963, *de Wilde* 667 (K!, WAG!); Brafouedi, *Aké Assi* 9024 (K!); Brafouedi, 5 Aug. 1965, *Bonardi* 90 (P!); Danané, 10 Aug. 1975, *Pérez-Vera* 822 (K!, P!); The Issia Rock, 24 Aug. 1956, *de Wilde* 429 (WAG!); Mt. Mafa, 7 km SW of Bécédi-Brignan, 5°52'N, 4°04'W, 21 July 1970, *Leeuwenberg* 7952 (K!, P!, WAG!); Moyen Cavally, Mt. Niénokoué, 20 km N of Fort Binger, 18-19 July 1907, *Chevalier* 19467 (P!); Mt. Niénokoué, Aug. 1942, *Schnell* 1650 (K!, P!); Ouzeyo (Oureyo), Aug. 1974, *Pérez-Vera* 110 (K!, P!).

## 11. *Habenella* Small in Fl. S. E. U. S.: 316. 1903

*Habenaria* sect. *Odontopetalae* Kraenzl. in Bot. Jahrb. Syst. 16: 56 & 217. 1893, p.p.

*Habenaria* sect. *Quadratae* Kraenzl. in Bot. Jahrb. Syst. 16: 56 & 182. 1893, p.p.

*Habenaria* sect. *Seticaudae* Kraenzl. in Bot. Jahrb. Syst. 16: 55 & 250. 1893, p.p.

*Platantheroides* Szlach. in Richardiana 4(3): 103. 2004

Tuber solitary, ellipsoid, ovoid or cylindrical. Stem leafy throughout. Leaves predominantly lanceolate to lanceolate-ovate, spreading or erect, decreasing in



size upwards. Inflorescence laxly or densely many-flowered. Flowers usually small, inconspicuous. Sepals dissimilar. Dorsal sepal cochleate. Petals entire or with small basal tooth on the outer margin, adnate to the dorsal sepal forming a galea. Lateral sepals more or less spreading or deflexed. Lip always ligulate to oblong, obtuse to subacute at the apex and often gently upcurved, entire or with two small, basal teeth. Spur filiform to cylindrical. Gynostemium short and massive. Anther erect to slightly bent back, ellipsoid to ovoid. Antherophores short, delicate, filiform. Connective rather narrow, truncate. Pollinia ellipsoid to obovoid. Caudiculae filiform, slightly longer or shorter than pollinia. Auriculae relatively large, sculptured. Stigmaphores short, ligulate, massive, usually pendent, fertile on the entire upper surface. Rostellophores subequal in length to antherophores.

*Habenella* includes about 30 or so, predominantly terrestrial species; most of them occur in subtropical and tropical zones of America and Asia, with only a few in Africa.

#### KEY TO THE SPECIES

1. Lip 11-15 mm long, ciliate in the lower part. Dorsal sepal 9 -9.5 mm long. Antherophores longer than stigmaphores ..... **1. *H. leonensis***
1. Lip 6-13 mm long, glabrous. Dorsal sepal 4-6 mm long. Antherophores shorter than stigmaphores ..... **2. *H. zambesina***

#### 1. *Habenella leonensis* (Kraenzl.) Szlach. & Kras, *comb. nov.* (Fig. 34)

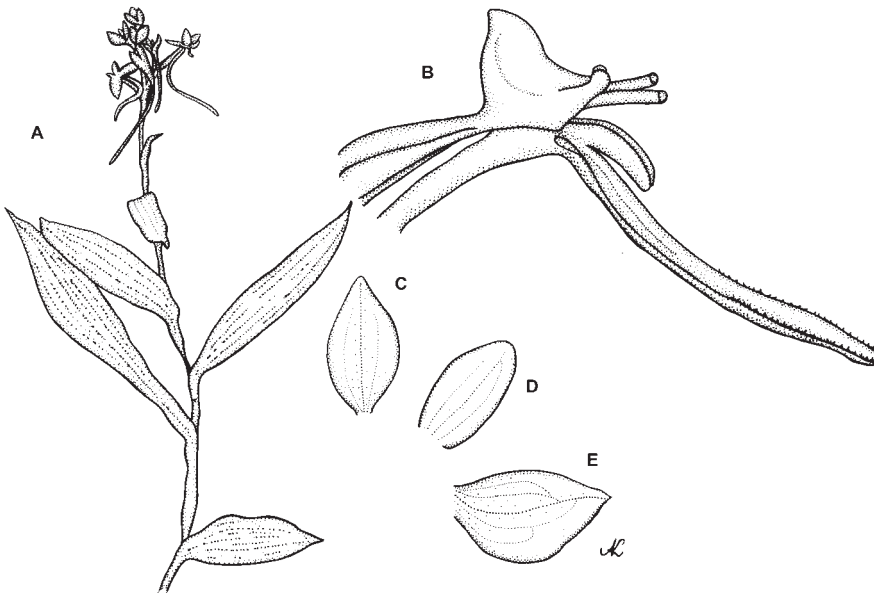


Fig. 34.—*Habenella leonensis* (Kraenzl.) Szlach. & Kras: A — habit; B — gynostemium and lip side view; C — dorsal sepal; D — petal; E — lateral sepal (redrawn by A. Kowalkowska from original Summerhayes' drawing kept at K).

Basionym: *Habenaria leonensis* Kraenzl. in Bot. Jahrb. Syst. 16: 217. 1892; TYPE: SIERRA LEONE. Preuss 1887 (HOLOTYPE: B†)

Roots clustered, fleshy, thick, cylindrical. Stem 35-55 cm tall, erect, stout, glabrous, leafy throughout its length. Leaves 8-12, 16-20 cm long, 4-5 cm wide, broadly to ovate-lanceolate, acute to acuminate, undulate on margins, spread, decreasing in size up the stem, the lower 3-4 sheath-like. Inflorescence 7-15 cm long, 10-20-flowered, dense to subdense. Flowers medium-sized, resupinate, white, sepals turning green towards the apex. Floral bracts 1-1.5 cm long, ovate-lanceolate, acute to acuminate, glabrous. Pedicel and ovary 10-15 mm long, slender, slightly arcuate, twisted at the base, glabrous. Dorsal sepal 7-9.5 mm long and wide, elliptic-ovate to broadly obovate, obtuse, cochleate, with 3 unbranched nerves. Petals 7 mm long, 3-3.5 mm wide, entire, elliptic-ovate, slightly cochleate, obtuse to subacute, broadly fused with the gynostemium. Lateral sepals 10-11 mm long, 6-7.5 mm wide, obliquely semi-orbicular-ovate, slightly cochleate, subacute. Lip 9-15 mm long, 1.5-2 mm wide, linear-ligulate, obtuse, entire, relatively thick, glabrous, ciliate in the lower part, upcurved in the apical half. Spur 4-4.5 cm long, very slender, slightly swollen towards the acute apex, falcate. Gynostemium ca. 3 mm long, connective narrow, blunt, antherophores distinctly longer than stigmaphores.

HABITAT. Terrestrial in humid areas, in humus covering granit rocks, or epiphyte at the mossy bases of large tree trunks. August-September.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast.

REPRESENTATIVE SPECIMENS. Mt. Tonkoui, Aug. 1973, *Pérez-Vera* 499 (K!, P!); 1 Sep. 1942, *Schnell* 1728 (K!, P!); *Schnell* 1747 (K!, P!); *Sine loc.*, 1937, *Scaëtta* 3287 (P!).

## 2. *Habenella zambesina* (Rchb. f.) Szlach. & Kras in Richardiana 6(1): 39. 2006 (Fig. 35)

*Habenaria zambesina* Rchb. f. in Otia Bot. Hamburg.: 96. 1881; TYPE: MOZAMBIQUE. *Kirk s.n.* (LECTOTYPE: K!; ISOLECTOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Habenaria myriantha* Kraenzl. in Notizbl. Bot. Gart. Berlin-Dahlem. 3: 237. 1903; TYPE: TANZANIA. *Kersten* 375 (HOLOTYPE: B†)

*Habenaria haullevilleana* De Wild. in Ann. Mus. Congo, Ser. 1, Bot., ser. 3: 172. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Verdick* 373 (HOLOTYPE: BR)

Roots clustered, fleshy, thick, cylindrical. Stem 40-131 cm tall, erect, stout, glabrous, leafy throughout its length. Leaves 8-15, 4-24 cm long, 2-7.5 cm wide, broadly lanceolate to ovate, acute to acuminate, sometimes undulate on margins, spread, decreasing in size up the stem, the lower 3-4 sheath-like. Inflorescence 11-40 cm long, multi-flowered, dense. Flowers medium-sized, resupinate, white, sepals turning green towards the apex. Floral bracts ca. 3 cm long, ovate-lanceolate, acute to acuminate, glabrous. Pedicel and ovary 18-21 mm long, slender, slightly arcuate, twisted at the base, glabrous. Dorsal sepal 4-6 mm long, 3-5.5 mm wide, elliptic-ovate to broadly ovate, obtuse, cochleate, with 3 branched nerves. Petals 3.5-10 mm long, 3-4.6 mm wide, entire, broadly ovate-triangular, slightly cochleate, obtuse to subacute, very broadly fused with the gynostemium. Lateral sepals 5-10 mm long, 3-4.5 mm wide, obliquely semi-orbicular, slightly cochleate, subacute, sometimes semi-cucullate. Lip 6-13 mm long, 1.5-2.5 mm wide, ligulate, subobtuse, entire or with two basal tiny lobules, rather thick,



Fig. 35.—The flower of *Habenella zambesina* (Rchb. f.) Szlach. & Kras (drawn by A. Kowalkowska, Kirk 2, K).

glabrous. Spur (1.5)3-9 cm long, very slender, slightly swollen towards the acute apex, falcate. Gynostemium ca. 5 mm long, connective narrow, apiculate, antherophores distinctly shorter than stigmaphores.

HABITAT. Wet grasslands, dambos, savannas. July-October.

DISTRIBUTION. Senegal, Guinea-Bissau, Guinea, Sierra Leone, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. up to 2000 m.

REPRESENTATIVE SPECIMENS. Cercle au Baoule-Nord, Marabadiassa-Gottoro, 4 July 1909, *Chevalier* 22034 (K!, P!); Cercle du Baoulé-Nord, Mt. Kangoroma, Fétéfro, 27 July 1909, *Chevalier* 22167 (P!); Bondoukou, Sep.-Oct. 1930, *Chevalier* 34090 (P!); Mt. Bo, Danane, Sep. 1955, *Nozeran s.n.* (P!); Daloa-Zuéuoula road, Aug. 1974, *Pérez-Vera* 235 (K!, P!); 20 km N of Kotouba, 3°11'W, 8°50'N, 9 Aug. 1967, *Geerling & Bokdam* 625 (K!, WAG!); Haut Sassandra, Loura, Soucourala-Sanrou?, 20 May 1909, *Chevalier* 21587 (P!); Tonkoui, 14 Aug. 1954, *Boughey GC* 18331 (K!); Touba, Cuirasse, 3 July 1976, *César* 349 (P!); *Sine loc.*, 1937, *Scaëtta* 3051 (P!).

## 12. *Plantaginorchis* Szlach. in *Richardiana* 4(2): 61. 2004

*Habenaria* sect. *Plantaginea* Kraenzl. in *Bot. Jahrb. Syst.* 16: 56 & 194. 1893

Tubers 2, ellipsoid. Leaves cauline or sometimes rosette-forming, usually lanceolate or ovate-lanceolate, acute, decreasing in size upwards and gradually transforming into the bracts. Inflorescence many-flowered. Petals predominantly entire, occasionally with small basal lobules. Lip 3-lobed distinctly above basal

undivided third or half, lobes dissimilar; the middle lobe lanceolate to ligulate, entire; lateral lobes obliquely rhombic or obovate, irregularly dentate to entire on margins. Gynostemium short. Anther erect, ellipsoid-ovoid to conical. Antherophores elongate, filiform, perpendicular to the anther. Connective rather narrow. Pollinia obovoid-ellipsoid. Caudiculae filiform, distinctly longer than pollinia. Auriculae conspicuous, sculptured, stalked. Stigmaphores elongate, clavate, gently upcurved, with the entire upper surface fertile. Rostellophores elongate, filiform, equal in length to antherophores. Viscidia tiny (Fig. 36)

A homogenous group embracing over 15 species known from tropical Africa and S and SE Asia. The most characteristic feature of this genus is shape of the lip, which is usually cuneate or obovate in outline and unequally 3-lobed at the apical third or so. Both lateral lobes are often dentate or divided into numerous delicate segments.

**1. *Plantaginorchis englerana* (Kraenzl.) Szlach.** in *Richardiana* 4(2): 64. 2004 (Fig. 37)

*Habenaria englerana* Kraenzl. in *Bot. Jahrb. Syst.* 17: 68, tab. 5a. 1893; TYPE: TOGO. *Buettner* 692 (HOLOTYPE: B†; ICONOTYPE: K!)

Roots up to 10 mm in diameter, clustered, thick, fleshy, tuberoid. Stem 60-71 cm tall, erect, stout, glabrous. Cauline leaves 5-9, 10-24 cm long, 4-8.5 cm

wide, obovate to oblanceolate, apiculate, spread, distributed along the stem, decreasing in size up the stem, the lower 1-2 sheath-like. Inflorescence 5-10 cm long, laxly ca. 5-flowered. Flowers rather large, resupinate, white, scented at night. Floral bract 3-5 cm long, elliptic-ovate, acuminate, leaf-like, glabrous. Pedicel and ovary up to 5.5 cm long, glabrous; pedicel very slender, twisted; ovary slightly swollen. Dorsal sepal 15-17 mm long, 12-

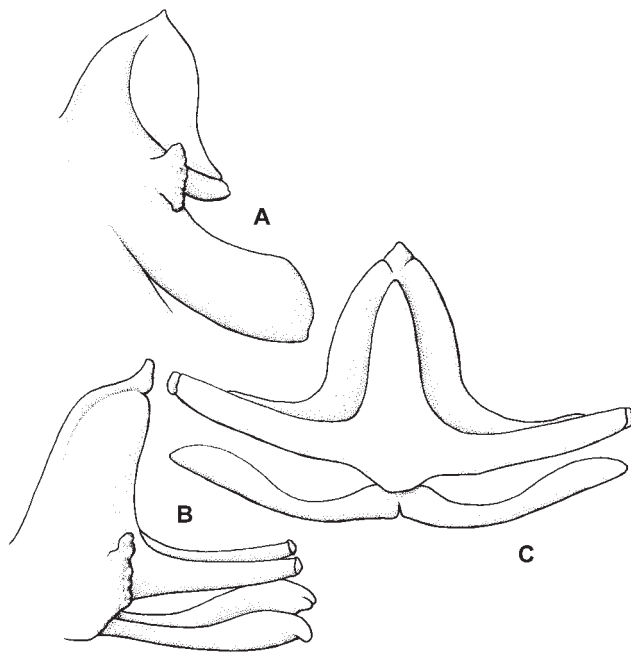


Fig. 36. –Gynostemium structure of *Plantaginorchis* Szlach.: A, B – gynostemium side view; C – gynostemium front view (Szlachetko 2004).

14 mm wide, broadly ovate, acute to apiculate, strongly cochleate, thin, glabrous, with numerous branched nerves. Petals 16-18 mm long, 4-5 mm wide, oblong-ob lanceolate, subobtuse, rather fleshy, glabrous, nerves branched. Lateral sepals 21-22 mm long, 12-15 mm wide, broadly semi-ovate, apiculate, strongly cochleate with revolute lower margin, glabrous, nerves numerous, branched. Lip trilobed

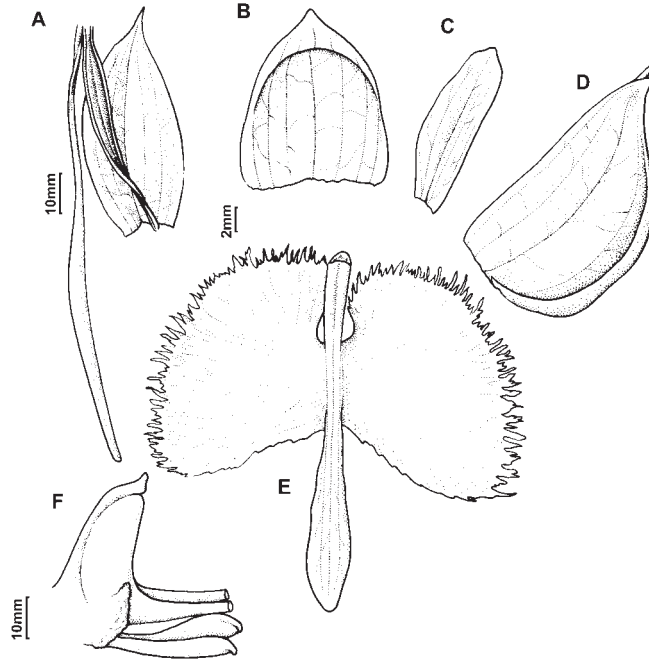


Fig. 37.—*Plantaginorchis englerana* (Kraenzl.) Szlach.: A — floral bract, pedicel, ovary and spur; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — gynostemium, side view (drawn by H.B. Margońska, *Letouzey* 3974, P).

above the basal linear, thick 7-7.5 mm; the middle lobe 11.5-15 mm long, 0.5-3.5 mm wide, linear to narrowly oblanceolate, subobtuse, thick; sidelobes 18-24 mm long, ca. 12-15 mm wide, ovate to rhomboid, with irregularly flimbriate outer margins, segments up to 4 mm long. Spur 12.5-17 cm long, 3 mm in diameter, swollen in the lower part, acute, slightly twisted near the base. Gynostemium ca. 10 mm long, connective narrow, apiculate, stigmaphores slender club-like.

**HABITAT.** Terrestrial or epiphyte up to 2 m above the ground, in forests, often along rivers. July.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Ghana, Togo, Nigeria, Cameroon. Alt. 300-1500 m.

**REPRESENTATIVE SPECIMENS.** *Sine loc.*, 29 July 1949, *Adam* 5737 (P!).

### 13. *Platycoryne* Rchb. f. in *Bonplandia* 3: 212. 1855

Tuber 1 or 2, ovoid or ellipsoid. Stem erect, delicate. Leaves scattered along stem or gathered in basal rosette, small, narrow, linear or lanceolate. Inflorescence usually short, often capitate. Flowers resupinate, bright-coloured. Dorsal sepal and petals form a kind of helm-like structure, lateral sepals deflexed. Lip ligulate, simple. Lip and/or petals sometimes with filiform basal lobules. Anther erect, con-

nective narrow, apiculate, antherophores of various length, erect or incurved, as long as rostellophores. Pollinia sectile. Caudicles as long as pollinia. Rostellum middle lobe of various size, in front of anther or close to the connective. Viscidia large, stout. Stigmaphores rather massive, short, truncate at apex. Auricles usually prominent, below antherophores and rostellophores, entire, subglobose (Fig. 38).

An exclusively African genus, found in tropical Africa and Madagascar, embracing ca. 20-25 species. A sole species has been collected in Ivory Coast.

**1. *Platycoryne paludosa* (Lindl.) Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 256. 1898 (Fig. 39)**

*Habenaria paludosa* Lindl. in J. Linn. Soc., Bot. 6: 139. 1862; TYPE: NIGERIA. Barter 1479 (HOLOTYPE: K!; DRAWING: UGDA-DLSz)

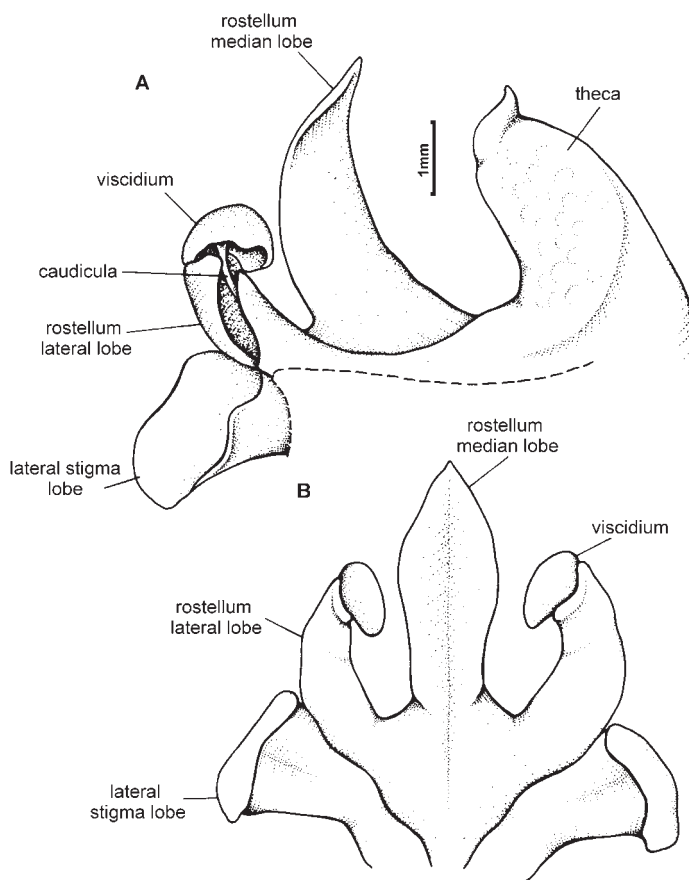


Fig. 38.—Gynostemium structure of *Platycoryne* Rchb. f.: A – gynostemium side view; B – gynostemium view from beneath (Szlachetko & Rutkowski 2003).

Tubers 1 or 2, 1-2 cm long, 0.4-0.6 cm in diameter, narrowly ellipsoid. Stem 20-31 cm tall, erect, delicate, glabrous. Leaves 5-7, scattered along stem, 3-4 cm long, up to 0.8 cm wide, narrowly lanceolate, acute, erect to suberect, decreasing in size up the stem, the upper 1-2 bract-like, ca. 2 cm long, the lower 1-2 sheath-like. Inflorescence 1-3.5 cm long, 1-6-flowered, lax. Flowers small, resupinate, yellow to oranges. Floral bracts 10 mm long, broadly ovate to semi-orbicular, apiculate, glabrous. Pedicel and ovary up to 20 mm long, erect, glabrous, ovary cylindrical. Dorsal sepal 5-9 mm long, up to 7 mm wide, semi-orbicular, subobtusate, cochleate, glabrous, nerves unbranched. Petals up to 9 mm long, 2 mm wide, linear-lanceolate to oblong, falcate, acute or subacute, glabrous, nerves sparsely branched. Lateral sepals up to 10 mm long and 2.5 mm wide, obliquely oblong-lanceolate, obtuse with thick apiculus, glabrous, nerves sparsely branched. Lip up to 8 mm long and 1.5 mm wide, ligulate, obtuse, rather fleshy with revolute margins, glabrous, pendent. Spur 9-10 mm long, 1 mm in diameter, narrowly cylindrical, blunt. Anther up to 2.5 mm tall, connective apiculate, rostellum middle lobe much shorter than connective, rostellophores much longer than the middle lobe, antherophores erect, ca. 4 mm long, stigmaphores distinctly shorter than antherophores, auricle prominent.

**HABITAT.** Terrestrial in marshes or damp grassy places, in shallow loamy sand in meadows. July.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Mali, Senegal, Ghana, Benin (Dahomey), Nigeria, Chad, Cameroon, Central African Republic, Gabon. Alt. 600-1600 m.

**REPRESENTATIVE SPECIMENS.** Between Boundiali and Korhogo, 6 July 1958, *Aké Assi 5613* (K!); Between Boundiali and Korhogo (km 62), 21 July 1974, *Pérez-Vera 688* (K!, P!); Korhogo, Mt. Korhogo, 4 July 1985, *César 2076* (P!).

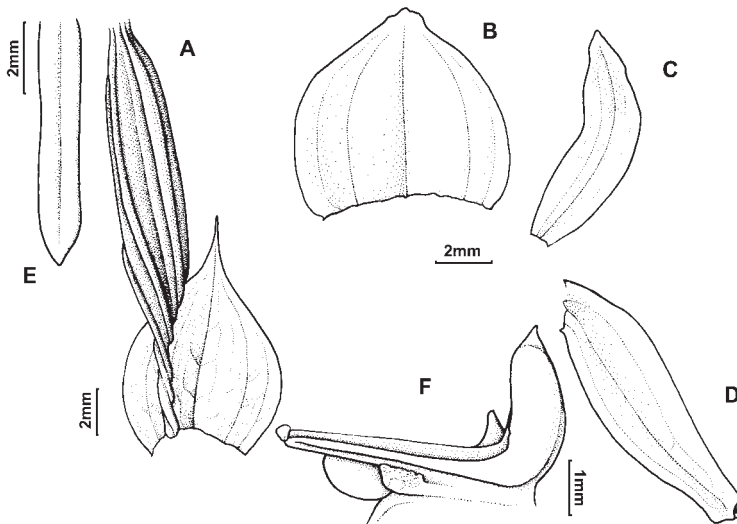


Fig. 39.—*Platycoryne paludosa* (Lindl.) Rolfe: A — floral bract, pedicel and ovary; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — gynostemium, side view (drawn by H.B. Margońska, *Jacques-Felix 4292*, P).

**14. *Podandriella*** Szlach. in Abrév. & al. (eds.), Fl. Cameroun 34(1): 192. 1998

*Habenaria* sect. *Podandria* (Rolfe) P.F. Hunt in Kew Bull. 22: 489. 1968

Terrestrial plants. Roots fleshy, clustered, woolly. Stem erect. Leaves form a basal rosette, petiolate with elliptic-lanceolate, acute blade. Inflorescence terminal, lax to dense. Flowers resupinate, widely opened. Dorsal sepal and petals form a galea, lateral sepals spread. Petals entire. Lip distinctly trilobed, lobes narrow, linear to thread-like. Spur filiform, swollen near the apex or not. Gynostemium with long, slender anther with only uppermost part producing sectile pollinia. Connective narrow, both locules parallel. Caudicles distinctly longer than pollinia. No anther basal projections. Rostellum trilobed, both sidelobes free from the anther with rather small viscidia each, the mid-lobe triangular to elongate. Auricles stalked. Stigma bi-lobed, both lobes relatively small, parallel, shortly-stalked (Fig. 40).

A genus of about 5 species of which one is widely distributed in tropical Africa, and others are restricted to the small areas in Principe, Cameroon and Congo.

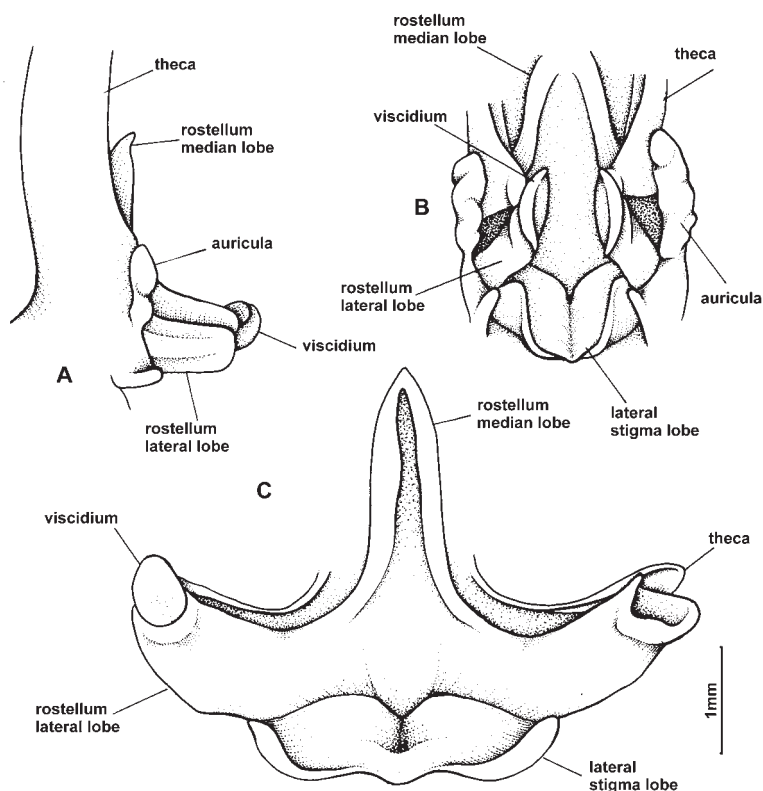


Fig. 40.—Gynostemium structure of *Podandriella* Szlach.: A – basal part of gynostemium, side view; B – basal part of gynostemium, front view; C – front view of rostellum and stigma (Szlachetko & Rutkowski 2000).



**1. *Podandriella macrandra* (Lindl.) Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroun **34**(1): 194. 1998 (Fig. 41)**

*Habenaria macrandra* Lindl. in J. Linn. Soc., Bot. 6: 139. 1862; TYPE: NIGERIA. Mann 518 (HOLOTYPE: K!; DRAWINGS: W-R!, UGDA-DLSz)

*Podandria macrandra* (Lindl.) Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 206. 1898

Roots fleshy, cylindrical, woolly, clustered. Stem 15-(55)80 cm tall, erect, glabrous, rather delicate. Leaves 3-7, clustered at the base of the stem, petiolate, erect-spreading; petiole 2.5-7 cm long, narrow, canaliculate; blade 5-24 cm long, 2.5-6 cm wide, elliptic-, ovate-lanceolate to lanceolate, acuminate. Cauline bracts 2-5, above the basal rosette, ovate-lanceolate, acute, amplexicaul, shorter than internodes. Inflorescence 4-19 cm long, 2-11-flowered, rather lax. Flowers rather large, widely opened, white with greenish apices of the tepals, spur green. Floral bract 25-37 mm long, ovate-lanceolate, acuminate, herbaceous, glabrous. Pedicel up to 4 mm long, twisted. Ovary up to 28 mm long, slender, narrow, slightly arcuate to straight. Dorsal sepal 16-29 mm long, 3-4 mm wide, narrowly oblong-lanceolate, acute, with 3-5 nerves. Lateral sepals 17-30 mm long, 3-4.5 mm wide, obliquely lanceolate, acuminate, with 3-4 nerves. Petals 17-34 mm long, up to 0.8 mm wide, linear to filiform, acuminate. Lip trilobed almost to the base, pendent; mid-lobe 26-45 mm long, 0.8 mm wide, linear to filiform, acute; sidelobes 45-60 mm long, 0.5 mm wide, filiform, acuminate. Spur 5-8 cm long, pendent, filiform in the basal part, ca. 1 mm in diameter, swollen slightly towards the apex and here ca. 2.1 mm in diameter, subacute. Gynostemium 13-26 mm long. Anther of the same size, erect, very slender. Rostellum arms 1.5 mm long, shorter than the narrowly triangular mid-lobe. Stigmaphores 1.5 mm long.

**HABITAT.** Evergreen forests, dense riverine forests, semideciduous forests with Sterculiaceae and Ulmaceae, gallery forests. September-October, February.

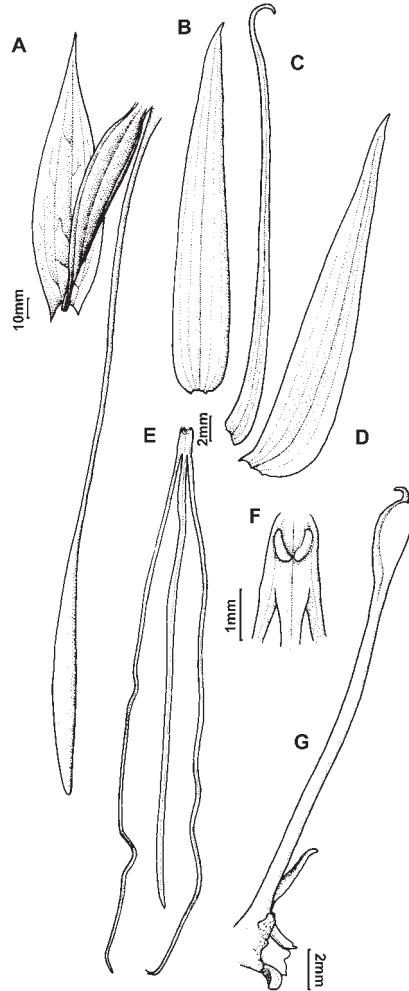


Fig. 41.—*Podandriella macrandra* (Lindl.) Szlach. & Olszewski : A – floral bract, pedicel, ovary and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip; F – basal part of the lip; G – gynostemium, side view (drawn by H.B. Margońska, *Mpom Benoit* 530, P).

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Tanzania, Malawi, Zimbabwe, Mozambique. Alt. 350-1500 m.

REPRESENTATIVE SPECIMENS. 'Oroumbo-Bocca', near Assakra, ca. 35 km SW of Dimbokro, 7 Nov. 1961, *de Wilde 3212* (WAG!); Between Daba and Zuéuoula, Oct. 1973, *Pérez-Vera 510* (K!); Mt. Mafa, 28 Oct. 1965, *Bonardi s.n.* (P!); Mt. Momi, 29 Oct. 1966, *Aké Assi 9146* (K!); Mt. Nimba, Aug. 1973, *Pérez-Vera 500/B* (P!); 24.8 km Sassandra-Lakota road to Dassieko, ca. 19 km W of Kpato-Aidou, 5°05'N, 5°50'W, 9 May 1975, *van der Burg 212* (WAG!); Mt. Tonkoui, 24 Sep. 1969, *Cremers 1149* (P!); 3 Oct. 1961, *F. Hallé 375* (P!); 26 Sep. 1955, *Nozeran s.n.* (P!); Sep. 1942, *Schnell 1731* (P!); 1 Sep. 1942, *Schnell 1745* (K!); *Sine loc.*, Feb. 1938, *Scaëtta 3317* (P!).

### 15. *Schlechterorchis* Szlach. in Orchidee (Hamburg) 54(2): 85. 2003

Tuber ovoid to ellipsoid. Leaf predominantly single, ground-hugging, sessile, cordate, ciliate or papillose along margins at least. Inflorescence, cauline and floral bracts, ovary and sepals more or less ciliate or pubescent. Flowers nonresupinate, small. Sepals dissimilar; the dorsal sepal erect; both lateral sepals deflexed. Petals obtriangular or obtriangular-obovate in outline, widest at the apex, gradually attenuate towards the base, entire, truncate and shortly apiculate at the apex, or bi-lobulate in the upper part only, free from the dorsal sepal, deflexed. Lip triangular in outline, widest at the apex, shallowly tridentate or 3-lobed in the upper half. Spur narrowly cylindrical, slightly swollen at the apex. Gynostemium short, massive. Anther erect, ovoid. Antherophores short, massive, perpendicular to the anther. Connective wide. Pollinia ovoid, equal in length to the filiform caudiculae. Auriculae sculptured, elongate. Stigmaphores very short, massive, pendent, ligulate. Rostellum median lobe digitate and squeezed between locules. Rostellophores as long as antherophores.

This genus appears to be related to *Pseudohemipilia* especially when habit is considered. Both have single, ground-hugging, sessile, cordate leaf, ciliate or papillose along margins at least. Also the inflorescence, cauline and floral bracts, ovary and sepals are more or less ciliate or pubescent. The differences between these two genera concern the flower structure. *Schlechterorchis* is easily recognisable by its nonresupinate flowers. At the best of my knowledge this is the unique phenomenon, which does not occur in any other member of the subtribe Habenariinae. Petals of all species of this genus are obtriangular or obtriangular-obovate in outline, being widest at the apex, and gradually attenuate towards the base. They are entire, truncate and shortly apiculate at the apex, or bi-lobulate in the upper part only. The lip is triangular in outline, widest at the apex. It is shallowly tridentate at the apex or 3-lobed in the upper half. In contrary to *Pseudohemipilia* rostellum median lobe of *Schlechterorchis* is digitate and squeezed between locules.

The genus includes 4 african species.

### 1. *Schlechterorchis occidentalis* (Lindl.) Szlach. in Orchidee (Hamburg) 54(2): 87. 2003 (Fig. 42)

*Habenaria occidentalis* (Lindl.) Summerh. in Bull. Misc. Inform. Kew. 1933: 246. 1933  
*Amphorchis occidentalis* Lindl. in J. Linn. Soc., Bot. 6: 139. 1862; TYPE: NIGERIA. *Barter 1487*  
(HOLOTYPE: K!; ISOTYPE: W-R?; DRAWING: UGDA-DLSz)

Tubers up to 2.5 cm long and 1.3 cm in diameter. Stem 12-25 cm tall, erect, delicate, densely hairy. Leaf 1, up to 2.7 cm long and wide, basal, radical, cordate, acute, densely hairy on margins, with white markings, 2-5 cauline bracts above. Inflorescence up to 7.5 cm long, densely or subdensely 5-15-flowered. Flowers nonresupinate, orange or yellow. Floral bracts 7 mm long, lanceolate, hairy. Pedicel and ovary 7-10 mm long, slender, arched, densely hairy. Dorsal sepal 4.5-5 mm long, 3 mm wide, elliptic-ovate, truncate or obtuse at the apex, densely hairy outside. Petals 4 mm long and wide, obliquely triangular-ovate, truncate with short apiculus, glabrous. Lateral sepals 5-5.5 mm long, 2.7-3 mm wide, obliquely elliptic with triangular apex, acute, densely hairy outside. Lip 8 mm long, 6 mm wide, triangular, shallowly 3-lobed at the apex, apical margin irregularly dentate; the middle lobe apiculate; lateral lobes obliquely triangular, acute. Spur 10-12 mm long, 1 mm in diameter, sigmoid, slightly swollen towards blunt apex.

HABITAT. On granite soils. April.

DISTRIBUTION. Ivory Coast, Benin (Dahomey), Nigeria, Chad.

REPRESENTATIVE SPECIMENS. Reserve de Bouna (Bauna), 6 Apr. 1966, *Aké Assi 8651* (K!).

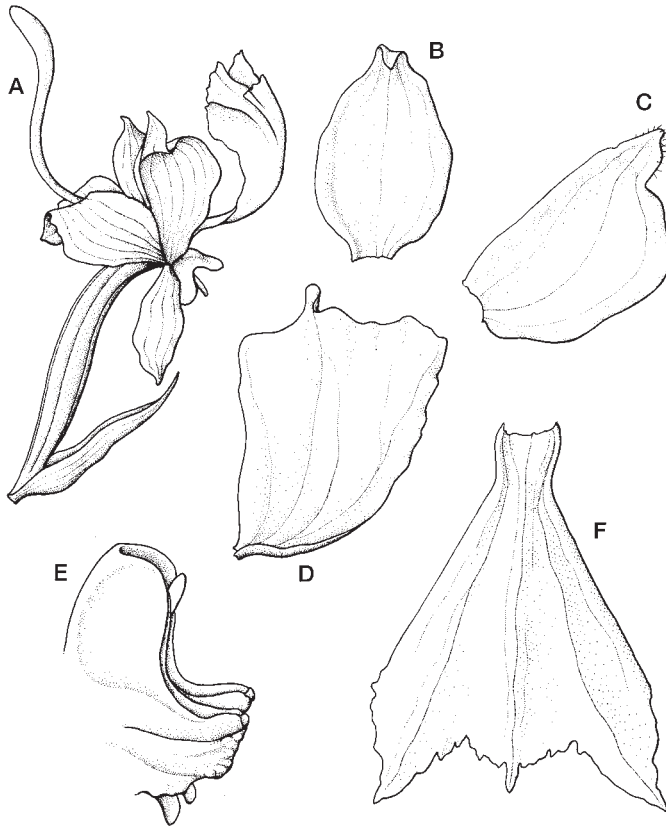


Fig. 42.—*Schlechterorchis occidentalis* (Lindl.) Szlach.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — gynostemium (drawn by H.B. Margońska).

Subfamily **Tropidioideae** (Pfitzer) Szlach. in *Fragm. Flor. Geobot.*, Suppl. 3: 35. 1995

Stem reed-like, woody, often branched. Leaves spirally arranged, convolute, plicate. Inflorescence terminal or lateral. Flowers resupinate or not, tubular or saccate at the base. Lip fixed. Gynostemium erect, slender to short. Staminodes wing-like, fused with the style below the stigma, or rudimentary or completely reduced. Stigma transversally elliptic, sometimes horizontal. Rostellum elongate, beak-like, erect, massive, acute. Viscidium single, oblong, thick. Hamulus thick and fleshy, bi-layered. Rostellum remnant bidentate. Anther narrowly cordate to oblong, movable. Connective fleshy, forming a thick pad above the locules. Pollinia sectile.

A small, relic taxon, pantropical.

Tribe **Tropidieae** (Pfitzer) Dressler in *Telopea* 2(4): 422. 1983

A tribe embracing three genera - *Cnemidia* Lindl. in *Tropidia* Lindl. and *Corymborkis* Thouars - of which only the last one is represented in Africa.

Subtribe **Tropidiinae** Pfitzer in *Entwurf Anordn. Orch.*: 99. 1887

**16. Corymborkis** Thouars in *Nouv. Bull. Sci. Soc. Philom. Paris* 1: 318. 1809

*Corymborchis* Thouars in *Hist. Orchid.*: tab. gen., figs. 37, 38. 1822

*Corymbis* Thouars in *Hist. Orchid.*: prem. tab. espec., figs. 37, 38. 1822

Terrestrial. Rhizome short, subterranean. Stem semi-woody, up to 2 m tall. Leaves spirally arranged, plicate, shortly petiolate, acute. Inflorescence terminal or lateral, sometimes branched. Sepals and petals free, usually widely opened, similar in shape and size. Lip of the similar length as tepals, constricted near the apex or apically widened, ecallose or with small callus. Gynostemium erect or slightly arcuate, slender. No column foot. Column part about twice as long as the anther. Staminodes wing-like, fleshy. Stigma almost horizontal, large, flat or slightly convex. Rostellum elongate, canaliculate, fleshy, acute. Viscidium elongate with single, ribbon-like, somewhat fleshy tegula. Rostellum deeply bifid after removal of pollinium. Anther erect, oblong, acute. Connective fleshy. Pollinia sectile (Fig. 43)

A genus of 6 species widely distributed in tropical area of New and Old World, in Africa represented by two species.

**1. Corymborkis corymbis** Thouars in *Hist. Orchid.*: prem. tab. espec., figs. 37, 38. 1822  
(Fig. 44)

TYPE: REUNION. *Du Petit Thouars s.n.* (LECTOTYPE: P)

*Corymbis welwitschii* Rehb. f. in *Flora* 48: 183. 1865; TYPE: ANGOLA. *Welwitsch* 688 (LECTOTYPE: BM!; DRAWINGS: W-R!, UGDA-DLSz). - *Corymborkis welwitschii* (Rehb. f.) Kuntze in *Revis. Gen. Pl.* 2: 658. 1891

Rhizome short, more or less vertical. Stem 30-200 cm tall, erect, more or less woody in the lower part. Leaves arranged spirally along the stem, 11-35 cm long,

3-10 cm wide, narrowly ovate to elliptic, plicate, apiculate, attenuated towards the base, margins often undulate. Inflorescence 1-4, up to 7 cm long, erect to drooping panicles with up to 5 branches, rarely with secondarily branches, up to 20-flowered. Peduncles to 9 cm. Flowers greenish-white to white, long, rather inconspicuous. Floral bract ca. 1 cm long, ovate-lanceolate, acute. Ovary longer than bract, narrow cylindric. Perianth segments widely spreading and elongated. Dorsal sepal 45-90 mm long, 2-4 mm wide, linear with lanceolate, acute apex.

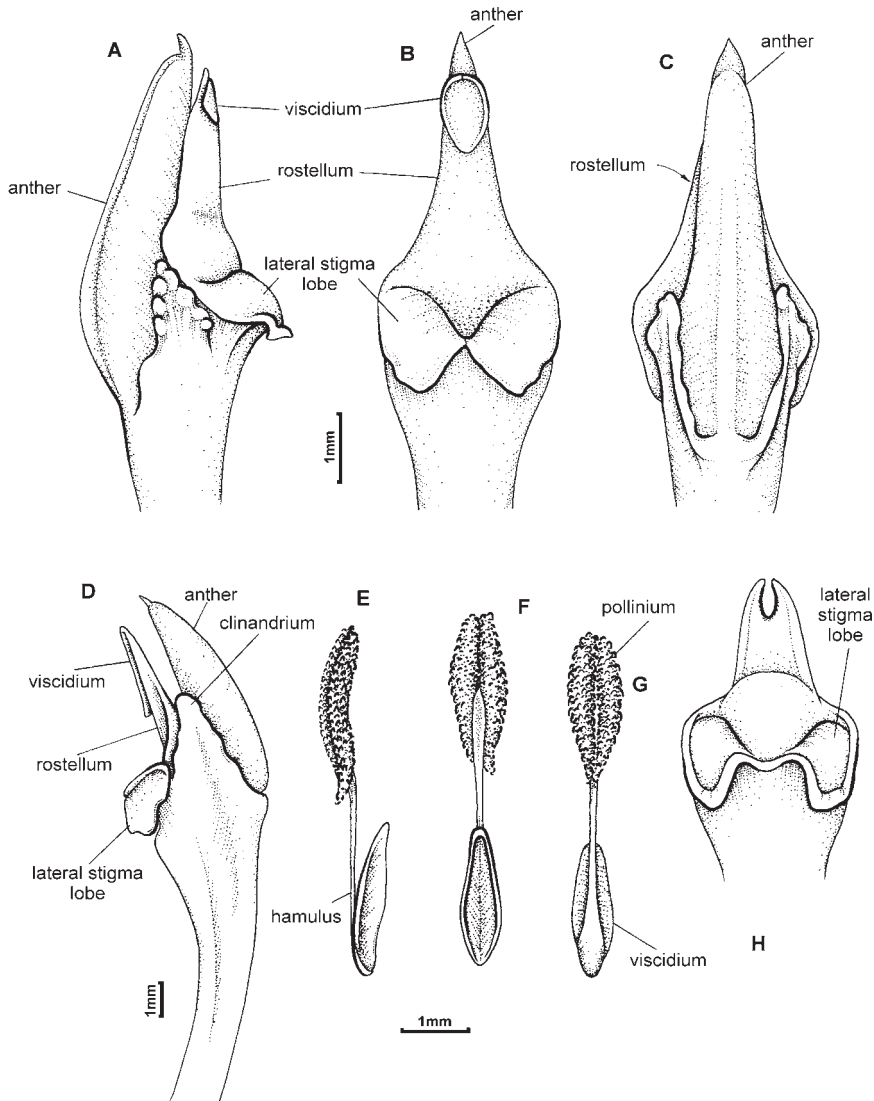


Fig. 43.—Gynostemium structure of *Corymborkis* Thouars: A, D – gynostemium side view; B, H – gynostemium bottom view; C – gynostemium back view; E–G – pollinarium (Szlachetko & Rutkowski 2003).

Lateral sepals of the same size, linear with oblique lanceolate, acute apex. Petals 45-90 mm long, 2-5 mm wide, linear with oblique lanceolate, acute apex, often with crenulate margins. Lip 45-90 mm long, claw tapering towards the blade; blade unguiculate, linear, canaliculate, with elliptic, acute apex and here 5-13 mm broad. Gynostemium slightly shorter than the lip, partially enveloped by the lip. Capsules 3 cm long, 6 mm in diameter.

**HABITAT.** Evergreen, usually lowland forests, in densely shady undergrowth. All year round, most frequently in April-July.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, São Tomé, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire), Angola, Sudan, Uganda, Tanzania, Malawi, Zimbabwe, Mozambique, South Africa (Transkei, Natal), Madagascar and Mascarene Is. Alt. up to 1400 m.

**REPRESENTATIVE SPECIMENS.** Bonon, Between Daloa and Bonaflé, 24 Apr. 75, *Pérez-Vera 509* (P!); Bouroukrou, 20 Dec. 1906-21 and 1907, *Chevalier 16861 bis* (P!); Moyen Cavally, Oubi, Keéta, 5-9 July 1907, *Chevalier 19302* (P!); 5-9 July 1907, *Chevalier 19359* (P!); Moyen Sassandra, Guidéko, 3-5 June 1907, *Chevalier 19014* (P!); Moyen Sassandra, between Guidéko and Zozro, 10-11 June 1907, *Chevalier 19026* (P!); Between Moyen Sassandra and Moyen Cavally, 27-28 June 1907, *Chevalier 19189* (P!); Haute Sassandra, Dyolas, between Droupleu and Zoanlé, 5 May 1909, *Chevalier 21458* (P!); Yapo, 16 km NW of Azaguié-Ahoua, 5°43'N, 4°06'W, 21 May 1975, *van der Burg 460* (WAG!).

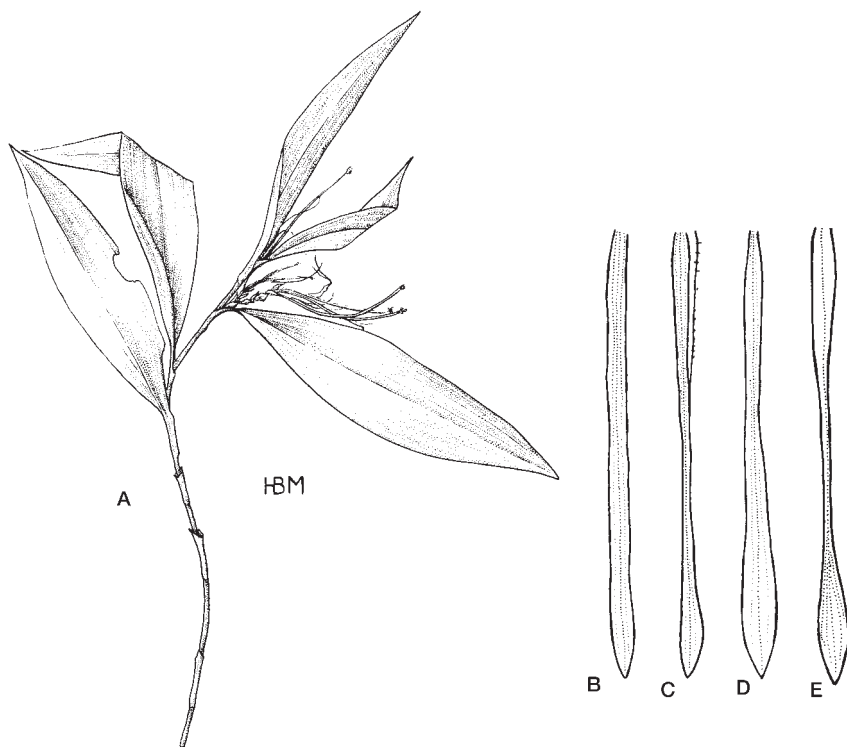


Fig. 44.—*Corymborkis corymbis* Thouars: A – habit; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (Gossweiler 5439, BR).

Subfamily **Spiranthoideae** Dressler in Selbyana 5(2): 204. 1979.

Roots fleshy, clustered or distributed along a thick rhizome. Leaves convolute, non-plicate, thin. Inflorescence terminal. Lip fixed, canaliculate at the base, saccate to spurred. Gynostemium usually short and massive. Stamines wing-like, thin or relatively thick, fused with the filament and margins of the stigma, or even the rostellum forming a distinct dorsal clinandrium. Stigma confluent to bi-lobed. Rostellum elongate, beak-like in most species. Viscidium single, membranous to multi-layered. Tegula lamellar, if present. Fleshy hamulus in some genera. Anther erect, cordate to oblong-cordate, hardly movable in some cases. Connective narrow, somewhat fleshy. Anther base situated near or below the stigma base. Pollinia attenuate towards the apex, rounded at the base, powdery, sectile or compact. Caudicles found in some groups.

Spiranthoideae can be divided into three tribes, cosmopolitan Goodyereae King & Pantl. and Spirantheae Endl. and exclusively neotropical Cranichideae Endl.

#### KEY TO THE SUBTRIBE

1. Roots densely arranged along rhizome. Spur adnate to the ovary ..... **Manniellinae**  
 – Roots well-spaced along long and fleshy rhizome. Spur, if any, free from ovary ..... 2
2. Stigma confluent, oval ..... **Goodyerinae**  
 – Both lateral stigma lobes well separated ..... **Cheirostylidinae**

Tribe **Goodyereae** King & Pantl. in Ann. Roy. Bot. Gard. (Calcutta) 8: 273. 1898.

Roots, usually few in number, distributed along a thick and fleshy creeping rhizome, sometimes reduced to ridges only. Stem usually leafy. Flowers more or less tubular. Lip usually deeply concave or spurred at the base. Gynostemium swollen at the base, attenuate towards the apex. Clinandrium usually tightly surrounding the back and sides of the anther. Rostellum usually elongate, beak-like, acute, fleshy. Viscidium elliptic to oblong. Pollinia sectile. The apical parts of pollinia are transformed into the lamellar caudicles.

A tribe of three subtribes; Ludisiinae Szlach., Goodyerinae Klotzsch and Cheirostylidinae Szlach. The former one is an exclusively Australasian, both latter are represented also in tropical Africa.

Subtribe **Goodyerinae** Klotzsch in Hayne, Getreue Darstell. Gew. 14: t. 24. 1846

Rhizome usually long, relatively fleshy, creeping, with few roots distributed along its length. Leaves, sometimes ornamented, spirally arranged and usually gathered in the lower part of the stem. Flowers medium to small, resupinate or not, pale-coloured, arranged spirally in the inflorescence. Lip saccate to spurred at the base. Stigma entire, formed from both lateral lobes, and mostly from the median lobe, ventral to horizontal.

A large subtribe consisting of some twenty genera occurring mostly in Australasia and neotropics, of which a sole is found in tropical Africa.



# 17. *Platylepis* A. Rich. in Mem. Soc. Hist. Natl., Paris 4: 34. 1828

Terrestrial herb. Rhizome creeping. Leaves arranged spirally, distributed along the stem. Inflorescence terminal. Flowers densely glandular. Lip sessile, saccate at the base, joined with the gynostemium along its longer part. Gynostemium erect, rather slender. Column part relatively long. No column foot. Stigma entire, oval, concave. Rostellum elongate, subobtusate, erect. Viscidium narrow, oblanceolate. Rostellum deeply bifid after removal of the viscidium. Clinandrium spacious. Anther narrow trullate, erect. Connective thick. Pollinia sectile with apical caudicles (Fig. 45).

A genus of about 10 species occurring in tropical and South Africa, Madagascar and the Mascarene Islands.

## 1. *Platylepis glandulosa* (Lindl.) Rchb. f. in Linnaea. 41: 62. 1877 (Fig. 46)

*Notiophrys glandulosa* Lindl. in J. Linn. Soc., Bot. 6: 138. 1862; TYPE: PRÍNCIPE. Barter 1952 (HOLOTYPE: K!)

*Diplogastra angolensis* Welw. ex Rchb. f. in Flora 48: 183. 1865; TYPE: ANGOLA. Welwitsch 672 (HOLOTYPE: BM!; ISOTYPES: K!, P!, W-R!; DRAWING: UGDA-DLSz)

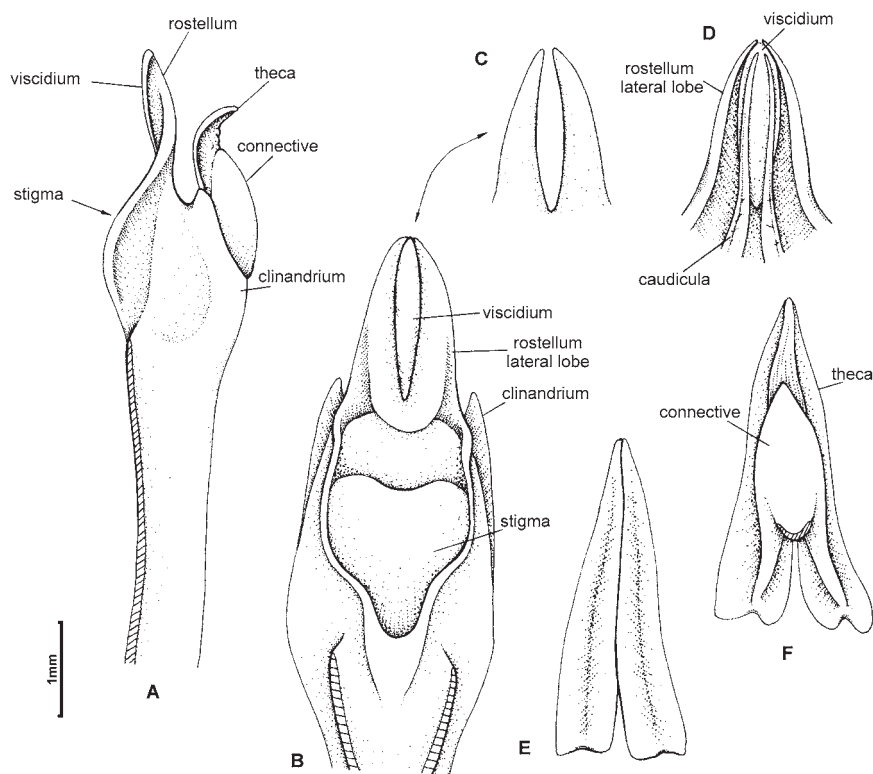


Fig. 45.—Gynostemium structure of *Platylepis* A. Rich.: A – gynostemium side view; B – gynostemium bottom view; C – rostellum remnant; D – rostellum apex; E, F – anther various views (Szlachetko & Rutkowski 2000).



*Platylepis australis* Rolfe in Bull. Misc. Inform. Kew. 1906: 378. 1906; TYPE: REPUBLIC OF SOUTH AFRICA. *Meadley 1008* (LECTOTYPE: K!); REPUBLIC OF SOUTH AFRICA. *Sanderson 1048* (PARATYPE: K!) & REPUBLIC OF SOUTH AFRICA. *Wood 4122* (PARATYPE: K!)  
*Platylepis nyassana* Schltr. in Bot. Jahrb. Syst. 53: 557. 1915; TYPE: TANZANIA. *Stolz 585* (HOLOTYPE: B†; ISOTYPES: K!, W!; DRAWING: UGDA-DLSz)  
*Platylepis talbotii* Rendle in Rendle & Baker, Cat. Pl. Oban: 109. 1913; TYPE: NIGERIA. *Talbot 1463* (HOLOTYPE: BM!)



Fig. 46.—*Platylepis glandulosa* (Lindl.) Rchb. f.: A – habit; B – flower; C – dorsal sepal; D – petal; E – lateral sepal; F – lip; G – lip and gynostemium, side view (drawn by H.B. Margońska, Tisserant 2623, P).

Rhizome up to 25 cm long, creeping, fleshy, unbranched or sparsely branched, lying on the soil or subterranean. Roots fleshy, villous. Stem 20-36 cm tall, erect, stout, glabrous. Leaves 6-8, spirally arranged along stem; sheath up to 2.5 cm long, narrowing apically to 2-2.5 cm long petiole; blade 4.8-11 cm long, 1.2-5.5 cm wide, ovate to elliptic, acuminate, slightly asymmetric, sometimes undulate along margins; 4-6 cauline bracts above leaves. Inflorescence terminal. Spike 5-6 cm long, 30-60-flowered, dense. Rhachis, bracts, ovary and sepals densely glandular. Flowers medium-sized, tubular, green, pink-brown tinged, lip white, pink-brown at base. Floral bracts 15 mm long, broadly ovate, subacute, herbaceous, stout. Ovary 8-10 mm long, erect, twisted. Dorsal sepal 6-10 mm long, 2.2-3 mm wide, oblong-ovate, thin, cochleate, subobtusate, 3-nerved. Lateral sepals of the same size, obliquely oblong, subacute, thin, cochleate, 3-nerved. Petals 5-9.5 mm long, 1 mm wide, oblanceolate to spatulate, obtuse, thin, delicate, glabrous, single-nerved. Lip 5.5-8.5 mm long, 2.2-2.5 mm wide, joined together with the gynostemium almost to its apex, sessile, indistinctly constricted in the apical part, oblong in general outline, canaliculate; basal part deeply saccate with 2 thickenings inside; apical part more or less cordate, undulate on margin, reflexed, with obscure V-shaped thickening. Gynostemium 5-8 mm long.

**HABITAT.** In deep shade in marshy forests, sometimes in plantations. June-July.

**DISTRIBUTION.** Guinea-Bissau, Guinea, Liberia, Equatorial Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, São Tomé and Príncipe, Central African Republic, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Uganda, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa. Alt. up to 1300 m.

**REPRESENTATIVE SPECIMENS.** Bassam, 7 July 1966, *Gnesio Téhé Henri 455* (P!); Basen Moyen Sassandra, route Soubré-Peturi, 26 June 1907, *Chevalier 19185* (P!); Tai, June-July 1976, *Pérez-Vera 892* (K!).

Subtribe **Cheirostylidinae** Szlach. in *Folia Geobot. Phytotax.* 26: 318. 1991

Plants with short, rather fleshy creeping rhizome. Leaves gathered near the base of the stem, spirally arranged. Inflorescence, few- to many-flowered. Flowers resupinate or not, medium-sized to tiny, pale-coloured. Lip saccate to shortly spurred. Stigma bi-lobed, both lobes separated, horizontal.

A subtribe of nine genera distributed mostly in Australasia.

#### KEY TO THE GENERA

1. Gynostemium with two terminal or ventral appendages ..... **18. Hetaeria**
- Gynostemium without any appendages ..... **19. Zeuxine**

#### **18. Hetaeria** Blume in *Bijdr.*: 409. 1825

Rhizome fleshy, creeping. Leaves gathered in the basal rosette, arranged spirally, petiolate. Inflorescence terminal. Flowers nonresupinate. Sepals and petals free. Lip usually deeply saccate to spurred basally, with two or more appendages inside. Epichile widened and distinctly bi-lobed. Gynostemium short, erect. No column foot. Column part very short united with the lip margins. Staminodes form spacious,

large clinandrium. Stigma bi-lobed, both lobes well-separated by wing-like, fleshy or lamellar ventral projections. Rostellum elongate, blunt, fleshy. Viscidium oblong. Tegula rather fleshy and short or elongate Rostellum remnant bifid. Anther erect, cordate to ovate-cordate. Pollinia sectile with short caudicles (Fig. 47).

It embraces about 20 species, of which two was found in Ivory Coast.

KEY TO THE SPECIES

1. Lip inferior ..... **1. *H. heterosepala***  
 – Lip superior ..... **2. *H. occidentalis***

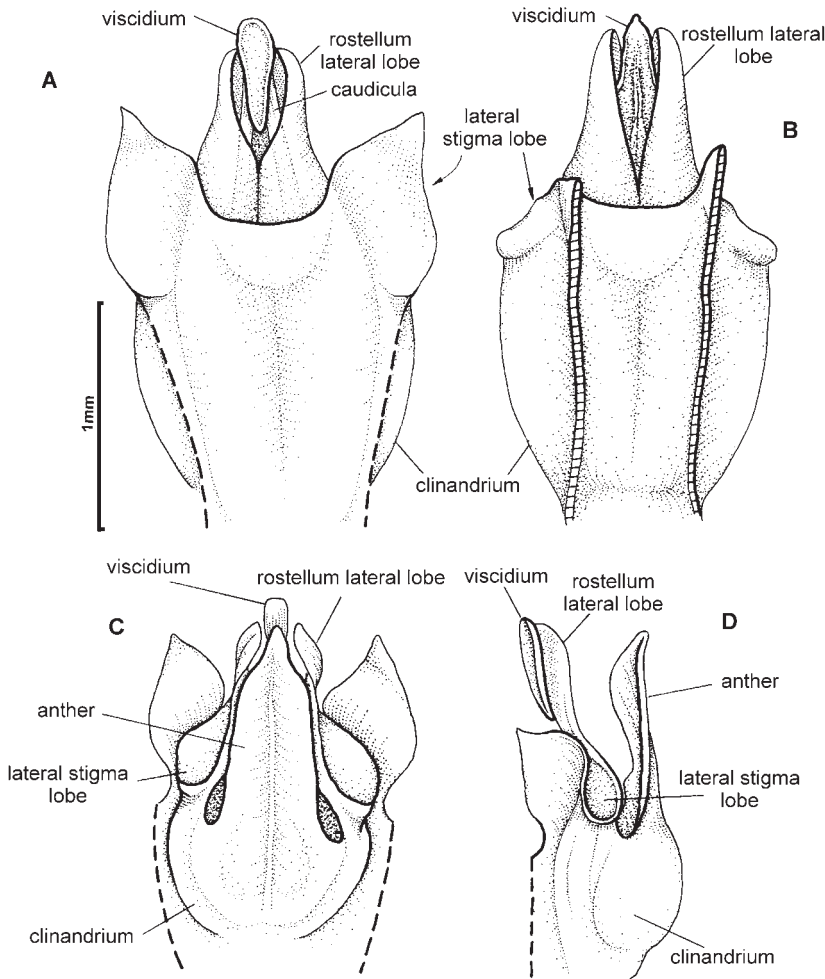


Fig. 47.—Gynostemium structure of *Hetaeria* Blume: A, B – gynostemium bottom view; C – gynostemium back view; D – gynostemium side view (Szlachetko & Rutkowski 2000).

**1. *Hetaeria heterosepala* (Rchb. f.) Summerh. in Kew Bull. 1934: 207. 1934 (Fig. 48)**

*Cheirostylis heterosepala* Rchb. f. in Otia Bot. Hamburg.: 110. 1881; TYPE: CAMEROON. *Mann 2130A* (HOLOTYPE: W-R!; ISOTYPE: K!; DRAWING: UGDA-DLSz)

Rhizome creeping. Stem 12-20 cm, erect, delicate, in the upper part glandular. Leaves along the stem, longer than inflorescence, 5-6, spirally arranged, petiolate; petiole and sheath 0.7-1 cm long; blade 3.5-5.5 cm long, 1.2-1.7 cm wide, obliquely oblong-ovate, acute with semi-cordate base. 1-3 cauline bracts above the leaves, up to 0.5 cm long, ovate-lanceolate, longer than internodes. Inflorescence 1.5-2 cm long, 7-10-flowered, very dense. Flowers small, resupinate, white-green with purplish tinged outside. Floral bract 5-8.5 mm long, ovate-lanceolate, acute, fimbriate along margins, herbaceous. Ovary 6-7.5 mm long, twisted, glandular. Perianth segments thin, delicate. Basal parts of sepals glandular outside. Dorsal sepal 5.5 mm

long, 2 mm wide, ovate, saccate at the base, obtuse. Petals 4.5 mm long, 1.5 mm wide, falcate, widest near the middle, subacute. Lateral sepals 3-5 mm long, 1.5-2 mm wide, obliquely ovate, saccate in the base, cucullate at the obtuse apex. Lip sessile, constricted above the middle; hypochile 3 mm long, 3 mm wide when spread, deeply cochleate, with two finger-like projections inside, sidelobes bifid at the apex; epichile 2 mm long, 4.3 mm wide when spread, strongly deflexed, both sidelobes very large, more or less obovate. Gynostemium 4 mm long.

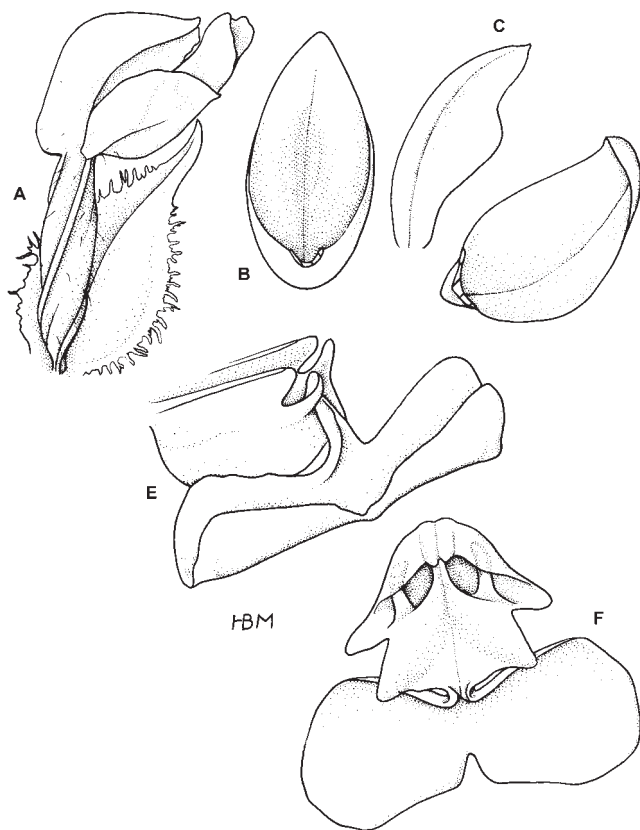


Fig. 48.—*Hetaeria heterosepala* (Rchb. f.) Summerh.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E, F – lip (drawn by H.B. Mar-gońska, Breteler 2029, P).

HABITAT. Submontane, humid forests. July.

DISTRIBUTION. Liberia, Ivory Coast, Cameroon, São Tomé and Príncipe, Democratic Republic of Congo (Zaire), Tanzania. Alt. 700-900 m.

REPRESENTATIVE SPECIMENS. Cavally, Grabo, 26-28 July 1907, *Chevalier 19614* (P!).

**2. *Hetaeria occidentalis* Summerh. in Kew Bull. 1934: 206. 1934**  
(Fig. 49)

TYPE: BENIN. *Punch s.n.* (HOLOTYPE: K!)

Rhizome horizontal, creeping in upper part. Stem 27-60 cm tall, erect, rather stout, glabrous, glandular below and along inflorescence. Leaves 4-5 or more (8), gathered in the lower part of the stem, petiolate; petiole and sheath 2-4.5 cm long; blade 6-16 cm long, 2-5 cm wide, obliquely lanceolate to elliptic, acuminate. Cauline bracts 2-4, up to 2.2 cm long, ovate-lanceolate, amplexicaul, lowermost glabrous, uppermost glandular. Inflorescence 7-17 cm long, 20-40-flowered, dense. Flowers nonresupinate, white with pinkish suffusion. Floral bracts 8-15 mm long, ovate-lanceolate, acuminate, densely glandular outside. Ovary 5-6 mm long, very densely glandular. Sepals densely glandular outside, thin. Dorsal sepal 4-7 mm long, 1.5-2.5 mm wide, oblong-ovate, obtuse, 3-nerved. Lateral sepals 5-7 mm

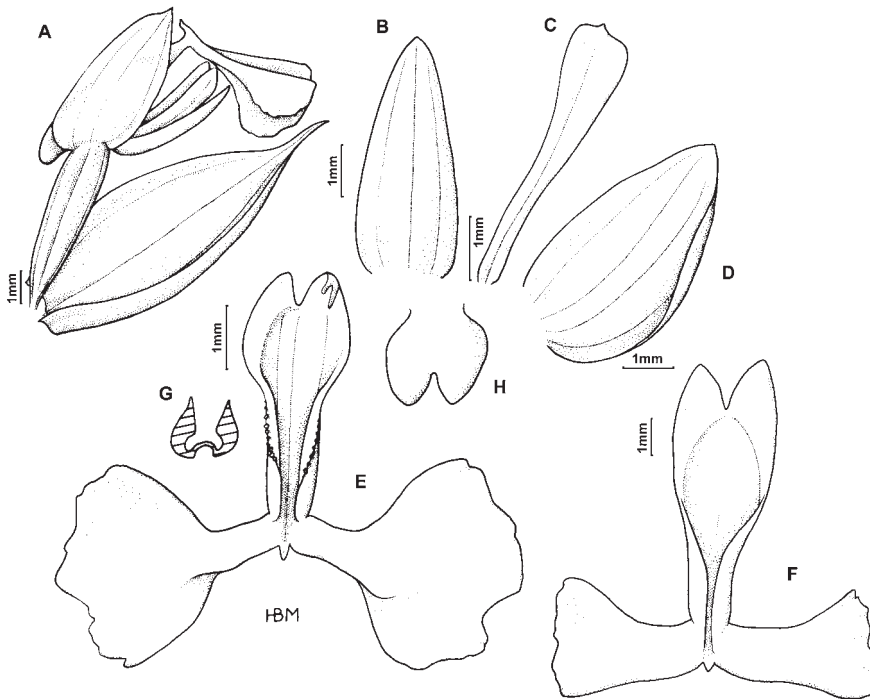


Fig. 49.—*Hetaeria occidentalis* Summerh.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E, F – lip; G, H – schematic cross-section of the lip at the base and near the middle (drawn by H.B. Margońska, A-E – *Le Testu 3571*, P; F – *Letouzey 10801*, P).

long, 3-4 mm wide, obliquely ovate, subobtuse, cochleate, 3-4-nerved. Petals 4-7 mm long, 0.9-1.3 mm wide, linear, widened towards the apex, truncate, single-nerved. Lip sessile, constricted near the apex; hypochile 5-6 mm long, 1.6-2 mm wide, oblong-ovate in general outline, basal part deeply saccate forming two distinct spurs 1-2 mm long, with two fleshy appendages inside, apical part of margins thickened, papillate; epichile bi-lobed, lobes widely spreading, up to 7.5 mm long, up to 3.5 mm wide, broadly cuneate from a narrow base, rounded at apex.

HABITAT. Lowland forests. December-February.

DISTRIBUTION. Guinea-Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Congo, Democratic Republic of Congo (Zaire). Alt. 50-500 m.

REPRESENTATIVE SPECIMENS. Agniéby Valley, Guébo, 1 Feb. 1907, *Chevalier 17038* (P!); Agniéby Valley, Attéou, 31 Jan. 1907, *Chevalier 17094* (P!); Anguédédou, 18 Dec. 1975, *Aké Assi in Herb Fredoux 576* (P!); Banco, Abidjan, 8 Jan. 1964, *Aké Assi in Herb Fredoux 7270* (K!); Banco Forest Reserve, N part, 19 Dec. 1972, *De Koning 961* (WAG!); Banco Forest Reserve, near Abobo-Gare, 23 Jan. 1974, *De Koning 3173* (WAG!); Banco Forest Reserve, 12 Dec. 1974, *De Koning 5021* (WAG!); 16 Dec. 1974, *De Koning 5035* (WAG!); near the river spring, 11 Dec. 1975, *De Koning 6254* (WAG!); Banco, NW of Abidjan, 3 Jan. 1959, *Leuvenberg 2330* (WAG!); Banco, 17 Dec. 1974, *Pérez-Vera 564* (K!); Banco, Abidjan, 12 Jan. 1961, *de Wit 9019* (WAG!); Maféré, 5 Feb. 1964, *Aké Assi in Herb Fredoux 7334* (K!); Gare-Makougnie road (km 75), 25-28 Jan. 1907, *Chevalier 16999* (P!); Mt. Nimba, 8°25'W, 7°37'N, 16 Dec. 1967, *Geerling & Bokdam 1808* (WAG!); *Sine loc.*, 1972-1975, *De Koning s.n.* (WAG!).

### 19. *Zeuxine* Lindl. in Coll. Bot. Append. 1826

Rhizome creeping, rooted occasionally. Roots rather fleshy, densely pubescent. Stem leafy in the basal part. Leaves arranged spirally, petiolate. Inflorescence terminal. Flowers resupinate or not. Sepals and petals free. Lip saccate basally with two fleshy appendages inside. Epichile elliptic to transversally elliptic, widened. Gynostemium short. No column foot. Column part short joined with the lip margins. No terminal or ventral keels are presented. Stamines form distinct clinandrium. Stigma bi-lobed, lobes separated. Rostellum elongate, fleshy, blunt. Viscidium oblong. Tegula thin, usually longer than viscidium. Anther erect, ovate-cordate. Pollinia sectile. Caudicles inconspicuous (Fig. 50).

A genus of about 50 species extending from tropical Africa to Pacific Islands.

#### KEY TO THE SPECIES

- 1. Flowers resupinate, i.e. lip inferior ..... **1. *Z. elongata***
- Flowers nonresupinate, i.e. lip superior ..... **2. *Z. stammleri***

#### 1. *Zeuxine elongata* Rolfe in Bol. Soc. Brot. 9: 142. 1892 (Fig. 51)

TYPE: PRINCIPE. *Quintas 12* (HOLOTYPE: K!; DRAWING: UGDA-DLSz)

Rhizome horizontal in the lower part, creeping in the upper part, thin, delicate. Stem 15-30 cm tall, erect, very delicate, densely glandular above the leaves. Leaves in the basal part of the stem, fading at flowering time, 4-7, petiolate; petiole and sheath 5-15 mm long, blade 2.5-5.5 cm long, 1-2 cm wide, obliquely

ovate to ovate-lanceolate, acute, delicate. Cauline bracts 2-3, up to 1 cm long, ovate-lanceolate, acute, amplexicaul, scarious, membranous, glandular along margins. Inflorescence 4-10 cm long, 13-25-flowered, lax in the lower part, dense in the upper, spiral. Flowers small, semi-campanulate, resupinate, whitish-green, pinkish outside. Flower bract 3-4 mm long, lanceolate, acuminate, membranous, sparsely glandular outside, single-nerved. Ovary 4 mm long, set on very short pedicel, twisted, densely glandular. Sepals densely glandular outside. Dorsal sepal 2-4 mm long, 1.5-2.5 mm wide, ovate, obtuse, cochleate, single-nerved. Lateral sepals 2-4 mm long, 1-2 mm wide, obliquely ovate, obtuse, cochleate, single-nerved. Petals 2-4 mm long, 1.2-2.1 mm wide, ovate-falcate, obtuse, single-nerved, adnate to the dorsal sepal. Lip sessile, constricted in the apical third; hypochile 1-2 mm long, 1-2 mm wide, relatively thick and fleshy, oblong-ovate in general outline, saccate with two fleshy, finger-like appendages inside, margins involute; epichile 0.6-1.2 mm long, 1.2-2 mm wide, transversely elliptic, papillate, deflexed.

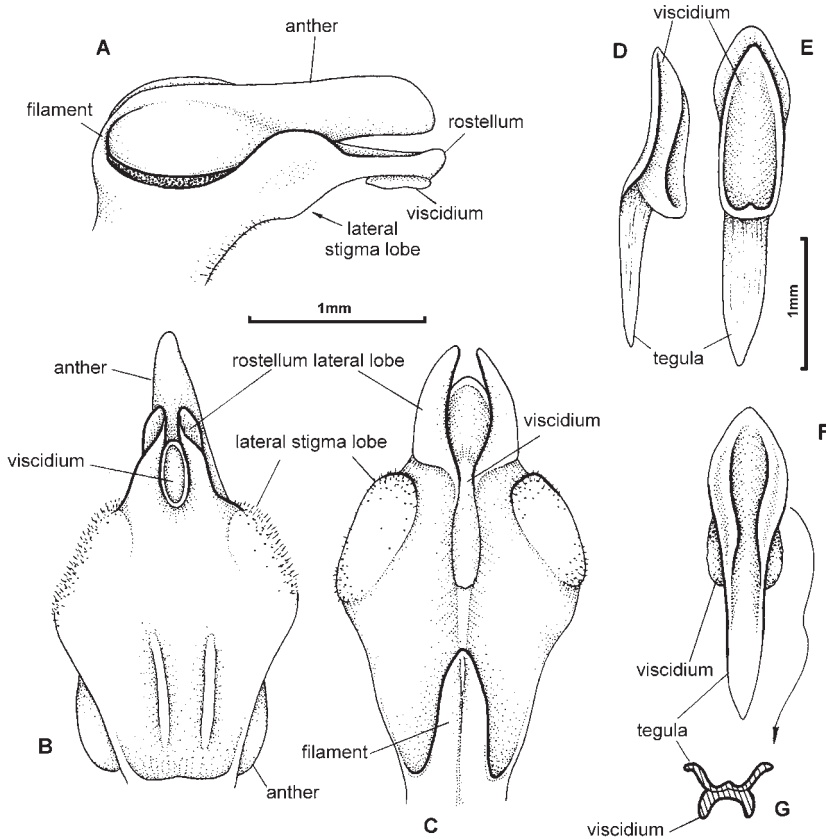


Fig. 50.—Gynostemium structure of *Zeuxine* Lindl.: A – gynostemium side view; B – gynostemium bottom view; C – gynostemium back view, anther removed; D-G – viscidium and tegula, various views (Szlachetko & Rutkowski 2000).

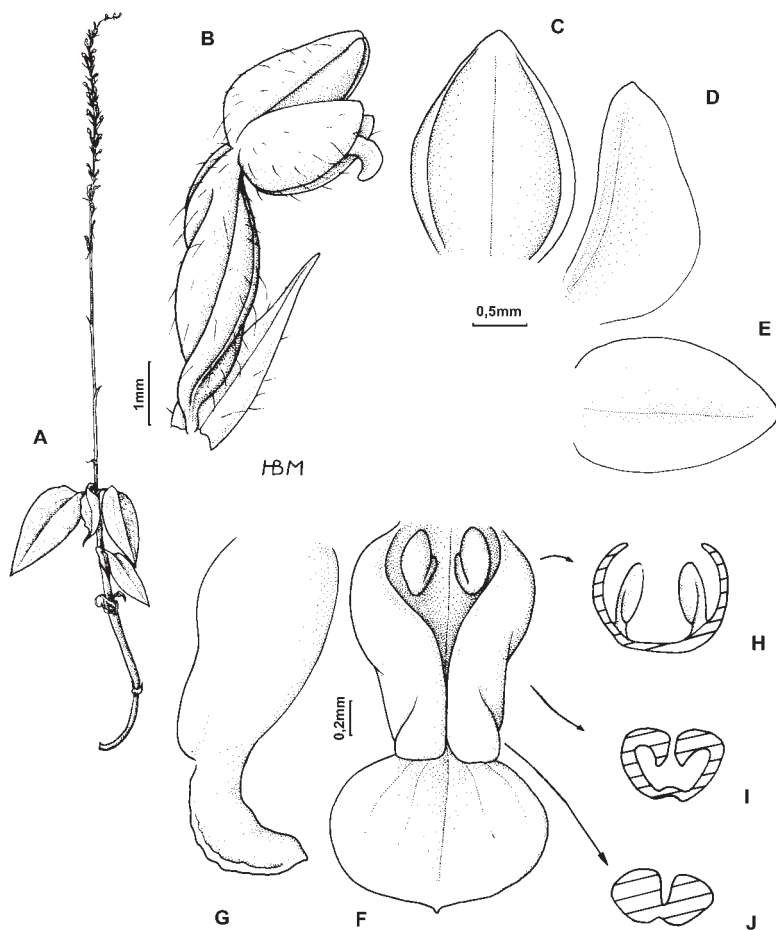


Fig. 51.—*Zeuxine elongata* Rolf: A – habit; B – flower; C – dorsal sepal; D – petal; E – lateral sepal; F & G – lip, various views; H–J – cross sections of the lip (drawn by H.B. Margońska, *Le Testu* 4529, P).

**HABITAT.** In dense shade, in humus and on rocks of rain-forest floor, by rivers and waterfalls. December-January.

**DISTRIBUTION.** Guinea, Sierra Leone, Equatorial Guinea (Annobón), Ivory Coast, Ghana, Nigeria, Cameroon, São Tomé and Príncipe, Central African Republic, Gabon, Democratic Republic of Congo (Zaire), Angola, Uganda, Kenya, Tanzania, Zambia. Alt. 400–1650 m.

**REPRESENTATIVE SPECIMENS.** Banco Forest Reserve, near the river, 13 Jan. 1976, *De Koning* 6387 (WAG!); Between Bouaflé and Sinfra, near Yaokro, 22 Jan. 1964, *Aké Assi* 7307 (K!); Danané, 3 Dec. 74, *Pérez-Vera* 671 (K!, P!); Tos, between Bouaflé and Sinfra, 29 Dec. 1963, *Aké Assi* 7222 (K!).

## 2. *Zeuxine stammleri* Schltr. in Bot. Jahrb. Syst. 38: 151. 1906 (Fig. 52)

TYPE: CAMEROON. *Stammler s.n.*, an. 1900 (HOLOTYPE: B†)



Rhizome creeping. Stem 14-40 cm tall, erect, delicate, above the leaves sparsely glandular, denser above. Leaves gathered near the base, 3-9, petiolate; petiole with sheath 1.2-2.5 cm long; blade 3-8 cm long, 1-3.5 cm wide, ovate to elliptic, asymmetric, acute. Cauline bracts 4-5, up to 1 cm long, herbaceous with hyaline margins, ovate, acute, glabrous, amplexicaul, shorter than internodes. Inflorescence 2.5-10 cm long, up to 25-flowered, dull pale pink. Flowers nonresupinate, small, perianth pinkish-green and white. Floral bract 4-12 mm long, ovate-lanceolate, acute, delicate, near the base sparsely glandular outside, reddish tinged. Ovary 6-7 mm long, glandular. Dorsal sepal 3-4.5 mm long, 2-2.5 mm wide, ovate to oblong-ovate, subobtusely, delicate, sparsely glandular outside, 3-nerved. Lateral sepals of the same size, obliquely ovate, subacute, delicate, sparsely glandular outside, 3-nerved. Petals 3-4.5 mm long, 1.2-1.5 mm wide, linear in the lower part, oblong-elliptic above, obtuse, very thin, delicate, single-nerved. Lip sessile, constricted near the apex; basal part 2.5-3 mm long, 1.3 mm wide, deeply cochleate with fleshy projections inside near the base, oblong-ovate in general outline, distinctly thickened towards the apex, margins involute in basal half, supervolute in apical half; epichile 0.3 mm long, 1 mm wide, transversely rhomboid, with shallow groove in the center, sidelobes acute.

**HABITAT.** Lowland forests with *Entandrophragma* sp., *Terminalia superba* Engl. & Diels and *Megaphrynium macrostachyum* (Benth.) Milne-Redh., in shade. December-February.

**DISTRIBUTION.** Ivory Coast, Nigeria, Cameroon, Principe, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire). Alt. 0-900 m.

**REPRESENTATIVE SPECIMENS.** Banco Forest Reserve, 31 Dec. 1974, *De Koning* 5090 (WAG!); 29 Jan. 1976, *De Koning* 6432 (WAG!); close the road to Val d'Abobo, 5 Dec. 1975, *De Koning* 6228 (WAG!); Banco, 21 Dec. 1975, *Pérez-Vera* 867 (K!); Ira, near Blapleu, 26 Jan. 1984, *Hepper & Maley* 7799 (K!); Moyen-Comoé,

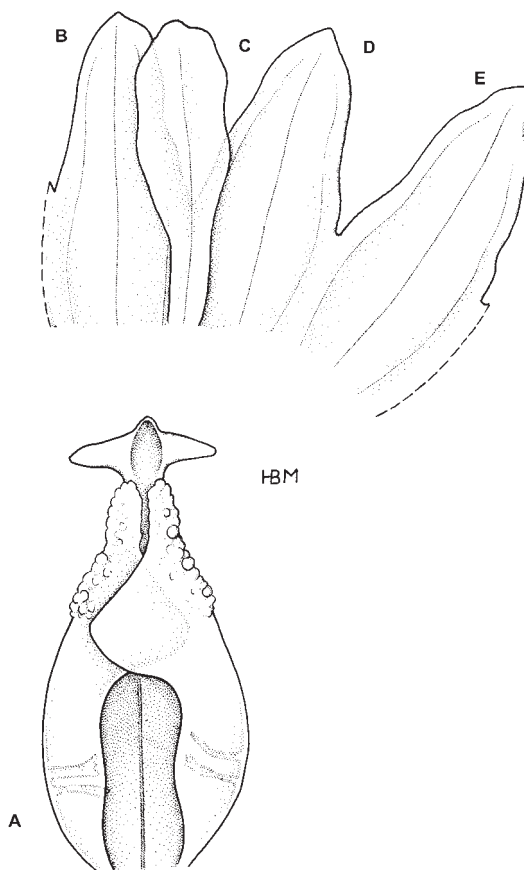


Fig. 52.—*Zeuxine stammleri* Schltr.: A — lip; B — dorsal sepal; C — petal; D, E — lateral sepal (drawn by H.B. Margońska, *Farron* 4492, P).

Assikasso, *Chevalier* 25601 (K!, P!); Tai, near R. Audréenisrou, E of Pauléoula, 8 Feb. 1984, *Hepper & Maley* 8171 (K!); Yapo, N of Abidjan, 12 Feb. 1964, *Aké Assi* 7348 (K!); Yapo, ca. 50 km N of Abidjan, 24 Dec. 1956, *de Wilde* 1017 (WAG!).

Tribe **Spirantheae** Endl. in Mant. Bot. Suppl. 2: 19. 1842.

A large group of some sixty genera. Most of them are terrestrial orchids concentrated in Mexico and South Brazil with only few representatives in northern temperate zones and Australasia. In tropical Africa only the genus *Manniella* Rchb. f. is represented.

Subtribe **Manniellinae** Schltr. in Notizbl. Bot. Gart. Mus. Berlin-Dahlem 9: 572. 1926.

Roots densely and spirally arranged along a relatively long rhizome. Leaves forming a basal rosette. Flowers resupinate. Lip adorned by two basal, fleshy lobules. Gynostemium elongate, bent forward and slightly swollen apically. Clinandrium well-developed, extended between the filament and style below the stigma, hiding the anther almost completely. Stigma entire, oval. Rostellum rudimentary, obtuse. Hamulus and tegula absent. Viscidium tiny, detachable. Rostellum foveolate apically after removal of the pollinium. Anther bent forward, ovate. Pollinia powdery.

A monotypic subtribe.

## 20. *Manniella* Rchb. f. in Otia Bot. Hamburg. 2: 109. 1881

Terrestrial herb. Rhizome short, vertical. Leaves gathered in the basal rosette, petiolated. Inflorescence terminal. Flowers long tubular, slightly arched. Lip long clawed, very thick with two basal lobules. Gynostemium sigmoid. Column foot oblique, adnate to the ovary. Stamines large, wing-like, relatively thick, fleshy, clinandrium absent. Stigma entire, flat, oval. Rostellum very small, inconspicuous. Viscidium tiny. Rostellum remnant shallowly notched. Anther immovable, incumbent, 2-chambered, obovate with very thick connective. Pollinia 2, compact (Fig. 53).

A genus of 2 species.

### 1. *Manniella gustavi* Rchb. f. in Otia Bot. Hamburg. 2: 109. 1881 (Fig. 54)

TYPE (*here designated*): CAMEROON. *Mann* 1336 (LECTOTYPE: K!; DRAWING: UGDA-DLSz); SÃO TOMÉ. *Mann* 1047 (PARATYPE: K!; DRAWING: UGDA-DLSz)

Rhizome ca 3-6 cm long, 2.5-3 mm in diameter, vertical with numerous roots. Roots 10 or more, ca. 8-12 cm long, 2.5-3 mm in diameter, fleshy, pubescent, arranged spirally. Stem up to 100 cm tall, 6 mm in diameter at base, 2-3 mm in diameter below inflorescence, erect, relatively stout, glabrous at base, glandular above, denser towards apex. Leaves 3-15, arranged spirally in the basal part of the stem forming rosette; petiole up to 12 cm long, stout, canaliculate; blade 4.5-16 cm long, 2.5-7 cm wide, elliptic- to broad-lanceolate, acuminate, silver-green spotted on the upper surface. Cauline bracts up to 10 above the leaves, herbaceous with hyaline margins, acute, more or less glandular on margins. Spike 24-38 cm long, 20-80-

flowered, lax. Flowers tubular, inconspicuous, rose to pinkish-brown. Floral bract 6-7 mm long, ovate with apiculate apex, herbaceous with hyaline margins, densely glandular along margins, sparsely on outer surface, single-nerved. Ovary 4-6 mm long, sparsely glandular, narrow cylindrical, twisted. Sepals densely glandular outside. Dorsal sepal 3-4 mm long, 2 mm wide, ovate, obtuse, cochleate, single-nerved. Lateral sepals basally connate with the column foot and dorsal sepal, apical free part 3.5-5 mm long, 1.5 mm wide, oblong to spatulate, subobtusate, more or less falcate, slightly cochleate, single-nerved. Petals 3-4 mm long, 1-1.3 mm wide, oblong, obtuse to subacute, slightly asymmetric, single-nerved, agglutinate to the sepaline tube. Lip set on a long and narrow claw, which adnates to the sepals; 2-3 mm long, 2-3 mm wide, rectangular to broadly ovate in general outline, canalliculate, non-lobed, non-constricted, very thick and pubescent in the centre, minutely ciliate outside; basal lip lobules 0.9-1.1 mm long, finger-like, thick. Gynostemium 2 mm long.

HABITAT. Humid forests, lowland and submontane forests. November-January.

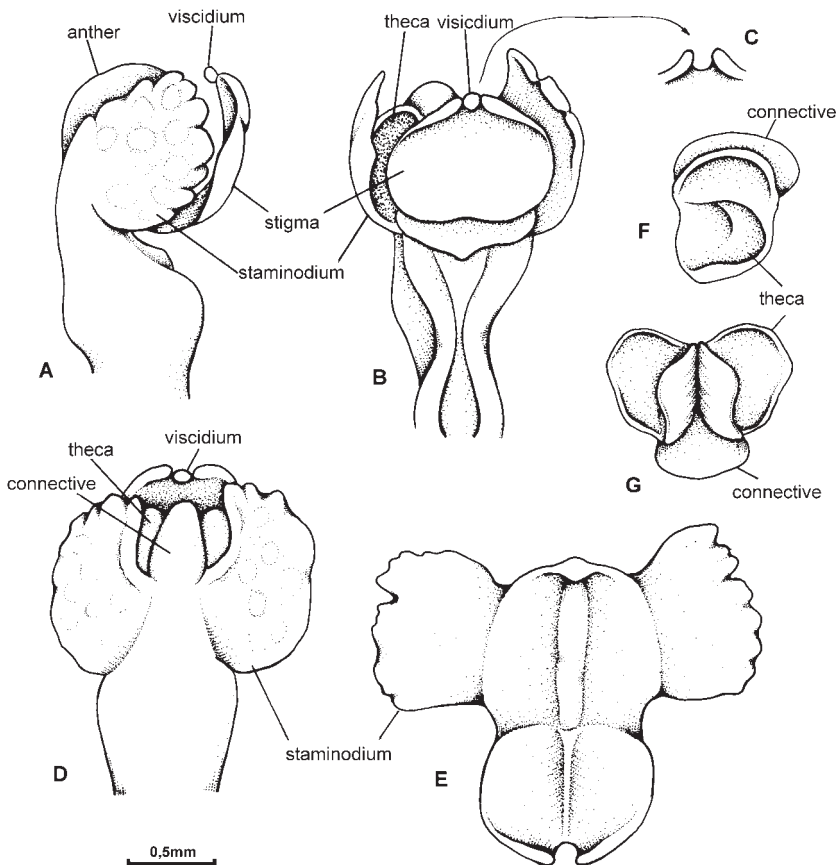


Fig. 53.—Gynostemium structure of *Manniella* Rchb. f.: A – gynostemium side view; B – gynostemium bottom view; C – rostellum remnant; D – gynostemium back view; E – gynostemium front view, anther removed; F, G – anther various views (Szlachetko & Rutkowski 2000).

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, São Tomé and Príncipe, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda, Tanzania. Alt. up to 1200 m.

REPRESENTATIVE SPECIMENS. Man, Lifani, Jan. 1950, *Schnell 4050* (P!); Mt. Tonkoui, 4 Nov. 1973, *Pérez-Vera 501* (K!).

Subfamily **Neottioideae** Lindl. in Coll. Bot. Append. 1826

Velamen absent. Stem reed-like or two-leaved. Leaves convolute, plicate to subplicate, sometimes lacking. Inflorescence terminal. Gynostemium erect. Stamines finger-like, united partially with the filament, or fused with the apex of the style and filament forming a dorsal clinandrium. Stigma cup-like, confluent, flat or concave. Rostellum similar to both lateral stigma lobes, or triangular and subacute, erect, sometimes producing a semi-liquid, sticky viscidium. Both hamulus and tegula absent. Anther erect to suberect, ovate or elliptic, movable. Connective thick, forming a fleshy pad above the chambers. Anther base below the apex of the rostellum. Pollinia powder-like, cylindrical to ovate.

A relic group with seven genera altogether which occur mostly in northern temperate zone. In tropical Africa two genera, *Diceratostele* Summerh. and *Epipactis* Zinn., both found also in Cameroon.

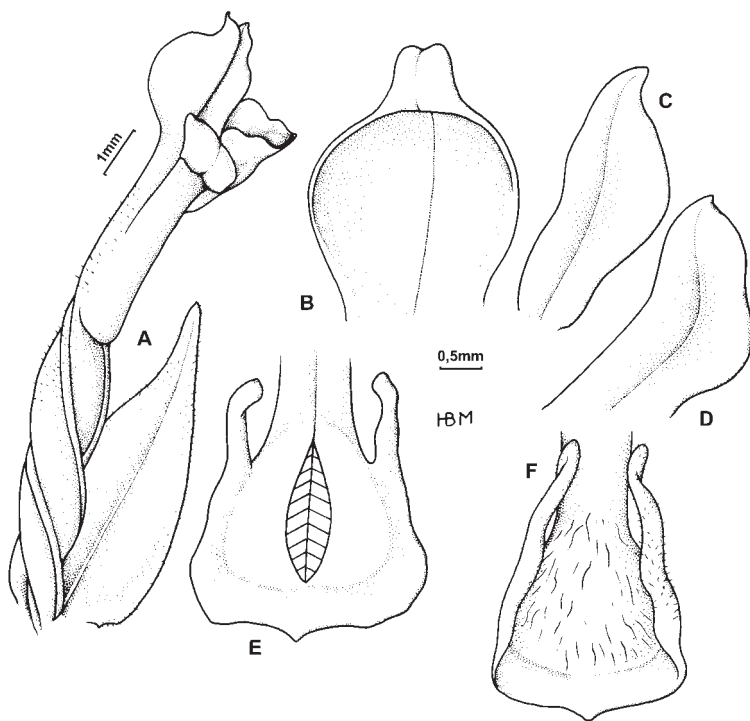


Fig. 54.—*Manniella gustavi* Rchb. f.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E, F — lip (drawn by H.B. Margońska, *Halle & Le Thomas 50*, P).

Tribe **Diceratosteleae** Dressler in Lindleyana 5(2): 114. 1990

A monotypic tribe.

Subtribe **Diceratostelinae** (Dressler) Szlach. in Fragm. Flor. Geobot., Suppl. 3: 47. 1995

Stem reed-like. Leaves plicate. Flowers resupinate. Lip with callus in the center. Gynostemium erect, slender. Stamínodes finger-like. Rostellum erect, triangular, acute, not producing any prominent viscidium. Anther set on a distinct, free filament, erect. Pollinia 4, linear in general outline, equal in size and shape.

A monotypic subtribe.

**21. Diceratostele** Summerh. in Bull. Misc. Inform. Kew. 1938: 151. 1938

Stems rooting from the lower internodes branched in the apical part. Leaves arranged spirally, petiolate, plicate. Inflorescence terminal or axillar. Flowers inconspicuous, tubular. Lip constricted near the middle. Gynostemium erect, slender. No column foot. Stamínodes finger-like, erect, relatively long. Stigmatic surface elliptic, deeply concave. Rostellum triangular, acute, erect, fleshy, with no viscidium. Anther erect, narrow oblong, apiculate, 4-chambered, set at the apex of the rostellum. Pollinia 4, linear, powdery (Fig. 55).

Monotypic genus.

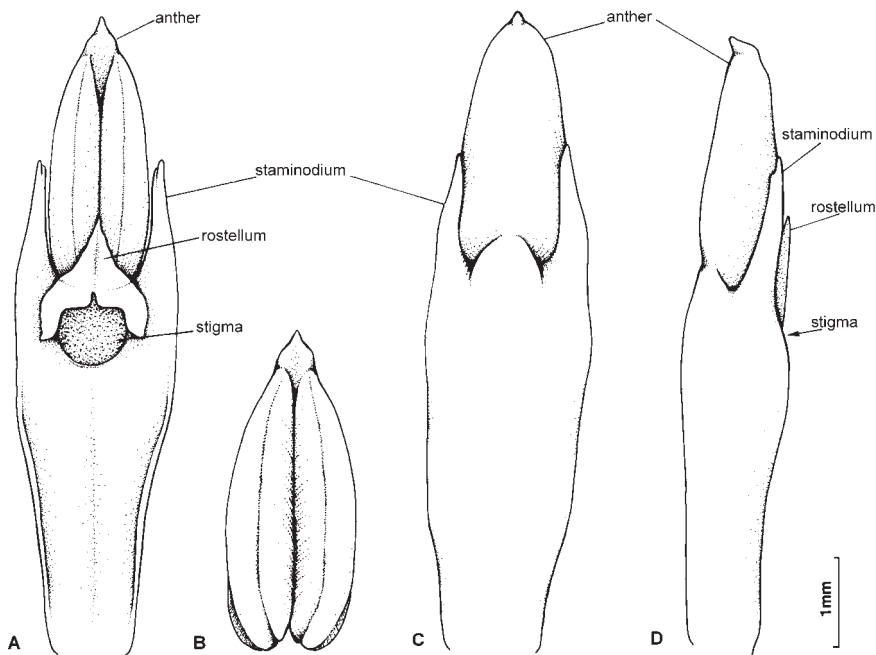


Fig. 55.—Gynostemium structure of *Diceratostele* Summerh.: A – gynostemium, bottom view; B – anther; C – gynostemium, back view; D – gynostemium, side view (Szlachetko & Rutkowski 2003).

1. **Diceratostele gabonensis** Summerh. in Bull. Misc. Inform. Kew. 1938: 151. 1938  
(Fig. 56)

TYPE: GABON. *Le Testu 5219* (HOLOTYPE: K!; ISOTYPE: BR!, P!; DRAWING: UGDA-DLSz)

Roots ca. 0.5 cm in diameter, wiry, sparsely branched. Stem 36-60 cm tall, erect, very stiffy, glabrous, with short aerial roots in the lower part, branching from axillary buds below the inflorescence, clad in strawy or medium green sheaths. Leaves 5-10; petiole 3.5-8 cm long, stout, canaliculate; blade 8-18 cm long, 2-6 cm wide, elliptic, apiculate, plicate, relatively stout to papery, glossy bright green with 3 impressed nerves above, slightly paler below with 3 promi-

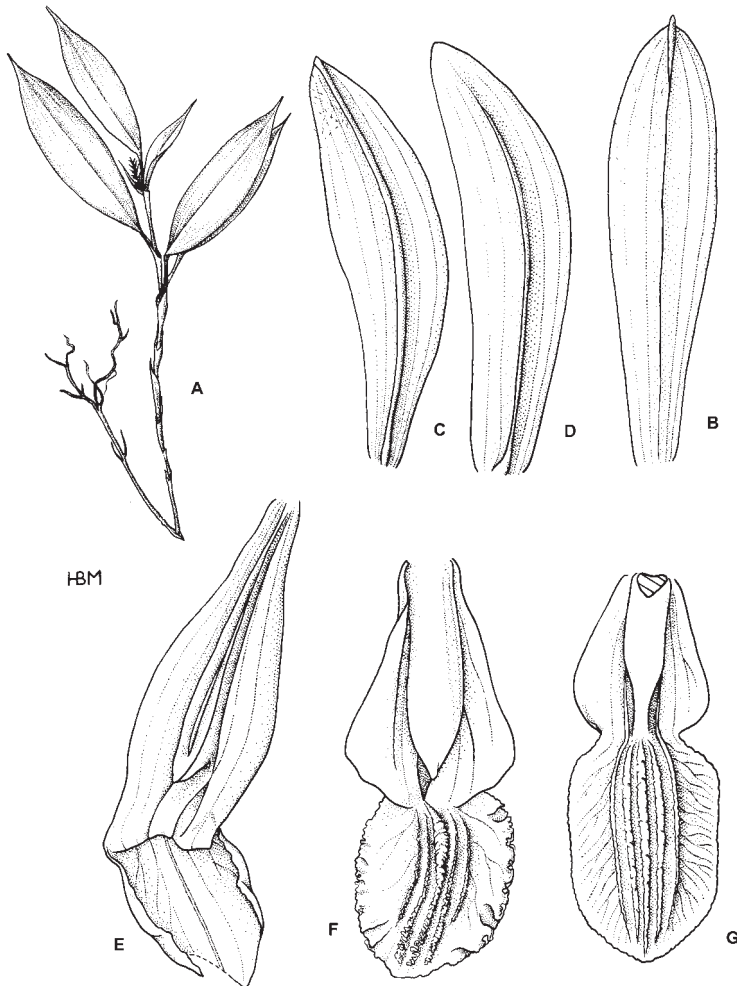


Fig. 56.—*Diceratostele gabonensis* Summerh.: A – habit; B – dorsal sepal; C – petal; D – lateral sepal; E-G – lip, various views (drawn by H.B. Margońska, *Le Testu 5219*, P).

nent nerves. Inflorescence 1-4 per plant, up to 4 cm long, 10-15-flowered, terminal or axillary, rachis pubescent. Flowers inconspicuous, tubular, resupinate, white to greenish. Floral bract up to 15 mm long, ovate-lanceolate, acute, pubescent. Ovary up to 10 mm long, twisted, erect, pubescent. Dorsal sepal 11-20 mm long, 2-3.5 mm wide, narrowly obovate to elliptic, obtuse with or without short apiculus, densely pubescent outside. Petals 10-17 mm long, 2-3.3 mm wide, similar in shape to lateral sepals, with longitudinal pubescent crest outside. Lateral sepals 11-18 mm long, 2-3.5 mm wide, obliquely obovate to elliptic, subobtuse, with longitudinal crest outside, densely pubescent outside. Lip sessile, constricted near the middle, canaliculate; hypochile 4.8-9 mm long, 3.8-6 mm wide, trullate, side-lobes obtuse, with large, fleshy, flat callus in the centre; epichile 6-7 mm long, 4.5-5 mm wide, obovate-elliptic, obtuse, flabellate and crispate along margins, with five longitudinal crests in the centre. Gynostemium 7 mm long.

HABITAT. Riverine forests, damp forests. June, September.

DISTRIBUTION. Liberia, Ivory Coast, Cameroon, Gabon, Democratic Republic of Congo (Zaire). Alt. 620 m.

REPRESENTATIVE SPECIMENS. Between Moyene Sassandra and Moyene Cavally, 27-28 June 1907, *Chevalier 19189 bis* (P!), Tiapleu, 25 Sep. 1955, *Aké Assi 3297* (K!).

Subfamily **Vanilloideae** (Lindl.) Szlach. in *Fragm. Flor. Geobot.*, Suppl. 3: 48. 1995

Saprophytic or autogamous herbs, vines or shrubs. Leaves plicate to convolute, often fleshy or rudimentary. Inflorescence terminal or lateral. An abscission layer between perianth and ovary often present, calyculus in some genera. Ovary single- or tri-celled. Lip papillate or fimbriate on the upper surface, united basally with the column or enfolding the base of the gynostemium. Gynostemium erect, slender, usually elongate, more or less swollen at the apex. Stigma often emergent, sometimes lateral stigma lobes remote from the middle one. Rostellum short and wide, truncate to obtuse at the apex, erect to bent forward, occasionally producing viscidium. Hamulus and tegula absent. Apical clinandrium usually forming an expanded „anther-bed”, hiding partly the back and sides of the anther. Anther incumbent, movable, occasionally fixed and erect. Pollinia 4, granular or sectile.

A small group of orchids with six tribes, of which four –Vanilleae Blume, Nervilieae Dressler, Gastrodieae Lindl. and Epipogieae Parlatores– are represented in Africa. Tribe Arethuseae Lindl. is known mostly from neotropics with a sole genus *Eleorchis* R. Br. in eastern Asia. Tribe Triphoreae Dressler is exclusively neotropical group.

#### KEY TO THE SUBTRIBES

1. Plants monopodial, vines ..... **Vanillininae**  
– Plants sympodial ..... 2
2. Plants autotrophic. Leaves produced after the flowers ..... **Nerviliinae**  
– Plants saprophytic, leafless ..... 3
3. Sepals joined together into a tube. No spur. No caudicles ..... **Gastrodiinae**  
– Sepals free from one another. Spur cylindrical. Caudicles two, filiform ..... **Epipogiinae**

Tribe **Vanilleae** Blume in Rumphia 1: 196. 1835

This group embraces ten genera distributed between three subtribes. Most of the genera occur in neotropics and Australasia, in Africa only one genus belonging to the subtribe Vanillinae.

Subtribe **Vanillinae** Lindl. in Gen. Sp. Orchid. Pl.: 429. 1840

Saprophytic or autotrophic shrubs or vines. Leaves, if present, convolute. Inflorescence terminal or axillary. Flowers with an abscission layer and frequently with calyculus. Lip enfolding the column, hairy, fimbriate to thickened. Fruit capsular or fleshy. Gynostemium slender, long to relatively short, united partially with the lip, or free. Clinandrium prominent or reduced, collar-like. Rostellum large, firm, truncate, erect to bent over the stigma. No viscidium. Anther suberect to incumbent. Connective large, fleshy. Pollinia soft and mealy.

A subtribe of five genera including Neo-Caledonian *Clematepistephium* Halle and *Eriaxis* Rchb. f. in neotropical *Dictyophyllaria* Garay and *Epistephium* Kunth., and pantropical *Vanilla* Miller.

**22. Vanilla** Mill. in Gard. Dict. Abr. (ed. 4): 28. 1754

Monopodial, climbing or trailing lianes. Roots adventitious arising at nodes opposite each single leaf. Leaves occasionally reduced to scale-like structures, if present, more or less petiolate, petiole twisted, canaliculate; blade of various size and shape, usually apiculate, fleshy. Inflorescence axillary, subterminal to terminal, few to many-flowered. Flowers opening successively, small to large, usually pale-coloured, occasionally with purple marks on the lip. Petals and sepals subsimilar, often quite thick and fleshy. Lip adnate to the gynostemium for part of its length forming a funnel- or sac-like structure. Central part of the lip with appendages of various kinds; hairs, scales or lamellae. Gynostemium usually erect to arcuate, long, slender, usually hairy below stigma. Stigma deeply concave, often transversely split-like, partly or almost completely hidden by large, truncate, reflexed rostellum. No viscidium. Anther incumbent, connective very large, thick. Pollinia soft and mealy. No caudicles. Clinandrium apical, usually large, spacious (Fig. 57).

Because *Vanilla* species are usually collected as sterile materials it is quite possible that in Ivory Coast additional species can be found.

KEY TO THE SPECIES

1. Flowers medium-sized, tepals up to 3 cm long. Leaves acuminate ..... **1. V. africana**  
 – Flowers large and showy, tepals at least 6 cm long. Leaves apiculate ..... **2. V. imperialis**

**1. Vanilla africana** Lindl. in J. Linn. Soc., Bot. 6: 137. 1862 (Fig. 58)

TYPE: NIGERIA. *Barter* 47 (HOLOTYPE: K!)

Epiphytic, climbing leafy liane with roots arising at nodes opposite to each single leaf. Internodes 5.5-13 cm long, 1.5-7 mm in diameter, fleshy, terete. Leaves



with a petiole 1-1.5 cm long, canaliculate, twisted; blade 8-17.5 cm long, 1.5-6.5 cm wide, oblong-elliptic, oblong-ovate to linear-lanceolate, with apiculus 1.5-2 cm long, fleshy. Inflorescence 2.5-8 cm long, densely 12-40-flowered, simple or branched at the base, usually axillary. Flowers medium-sized, white, creamy or pale buff-yellow, lip marked rosy mauve to purple. Floral bracts 2-4 mm long, scale-like, triangular, acute. Pedicel and ovary 3-3.5 cm long, narrowly cylindrical, fleshy. Dorsal sepal 18-30 mm long, 5-6 mm wide, oblong-obovate to linear-lanceolate, acute to subobtusate, cucullate or flat at apex, rather thin. Petals 15-27 mm long, 4-6 mm wide, oblong-elliptic with falcate base or obliquely broadly obovate, acute to obtuse, sometimes with revolute margin(s), with thickened ridge

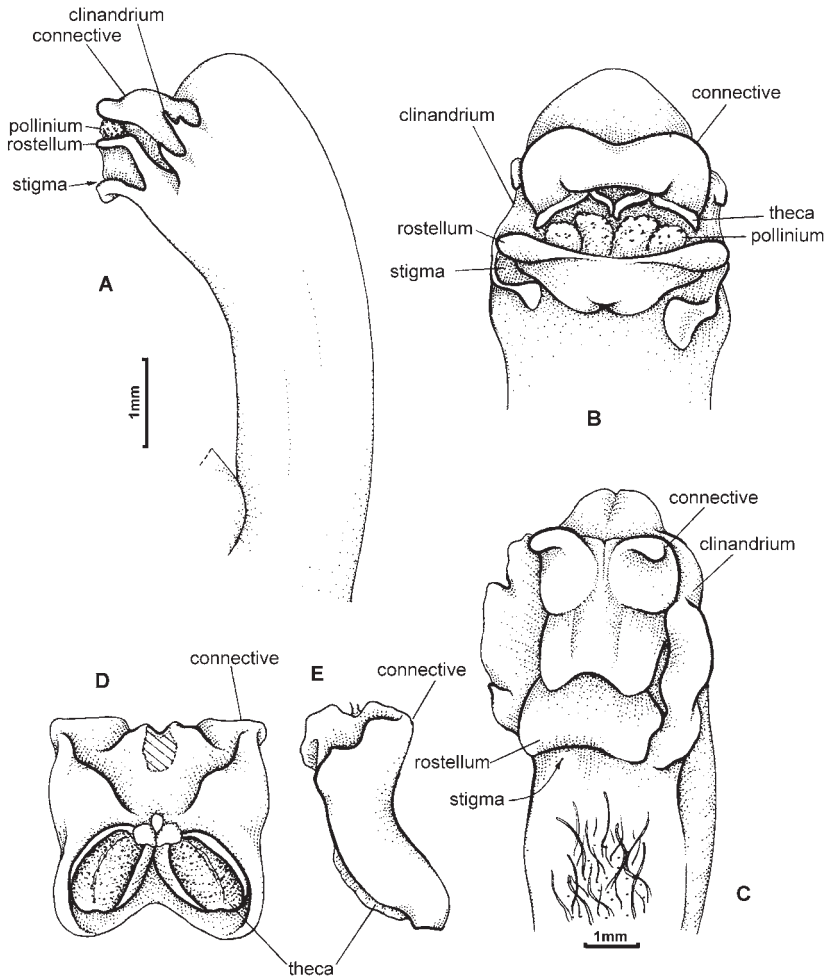


Fig. 57.—Gynostemium structure of *Vanilla* Mill.: A – gynostemium side view; B, C – gynostemium bottom view; D, E – anther various views (Szlachetko & Rutkowski 2003).

along mid-vein on outer surface. Lateral sepals 14-25 mm long, 6-8.5 mm wide, obliquely ovate or elliptic to oblong-ob lanceolate, acute to obtuse, cucullate to flat at apex, sometimes with revolute margin(s). Lip 14-25 mm long, 22-27 mm wide when flattened, broadly conical towards the base in natural position, rather thin, distinctly trilobed, thickened ridge along the whole mid-vein length or in its upper half; middle lobe 10-14 mm long, 3.5-9 mm wide, obovate- to oblong-elliptic, acute to acuminate, with the central tuft of few to some dentate, delicate lamellae; sidelobes 6-7 mm long, 3.5-6 mm wide, rather large, rhomboid, joined with the gynostemium along margins almost completely, sometimes with free apex. Gynostemium 12-17 mm long, arcuate in the basal half, erect to bent forward above, adnate to the lip margins in its lower half or two-thirds.

**HABITAT.** Forests, dense scrub on coral and in plantation. All year round, most frequently in March-May. Alt. up to 900 m.

**VARIABILITY.** Three subspecies can be distinguish in this species:

#### KEY TO THE SUBSPECIES

1. Inflorescence branched at the base .....  
..... subsp. **ramosa**  
– Inflorescence simple, unbranched ..... 2
2. Lip mid-lobe obovate-elliptic, no thickening along the mid-vein in the basal half ..  
..... subsp. **africana**  
– Lip mid-lobe oblong-elliptic, with very thick ridge along the mid-vein in its basal half ....  
subsp. **cucullata**

#### subsp. **africana** (Fig. 58)

*Vanilla crenulata* Rolfe in J. Linn. Soc., Bot. 32: 477. 1896; TYPE (*here designated*): SIERRA LEONE. *Scott Elliot 5733* (LECTOTYPE: K!) & *Cummins 4* (PARATYPE: K!)

Inflorescence never branched, simple. Lateral sepals ca. twice as long as wide. Lip mid-lobe obovate-elliptic, acute, no thickening in the basal half along the mid-vein.

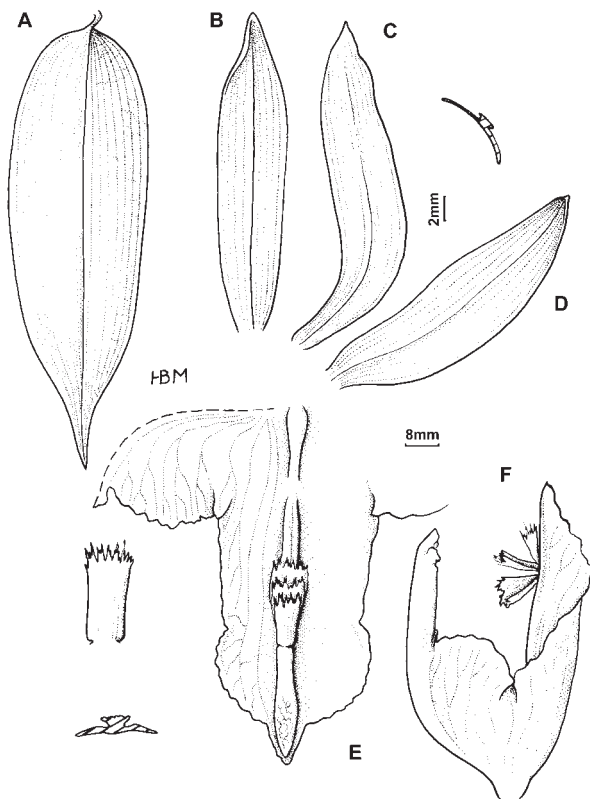


Fig. 58. – *Vanilla africana* Lindl. subsp. *africana*: A – leaf; B – dorsal sepal; C – petal; D – lateral sepal; E – lip; F – lip and gynostemium, side view (drawn by H.B. Margońska, *Le Testu* 7723, P).

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Principe, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. Adiopodoumé, 21 Feb. 1966, *Bonardi s.n.* (P!); Agboville, near Gare, 2-11 Nov. 1909, *Chevalier 22383* (K!, P!); Attié, Alépé, 3-5 Mar. 1907, *Chevalier 17504* (P!); ca. 10 km NE of Béréby, near lake, 9 Nov. 1963, *Oldeman 575* (WAG!); Bouroukrou, 20 Dec. 1906-20 and 1907, *Chevalier 16777* (P! – fragment); Cavally, 11 Aug. 1907, *Chevalier 19854* (P!); Haut-Cavally, Guerres, Sampleu, 1 Apr. 1909, *Chevalier 21110* (P! – fragment); Between Guessabo and Duékoué, 22 Nov. 1956, *de Wilde 843* (WAG!); Between Legako and Okromodou, Mar. 1976, *Pérez-Vera 642* (K!); Man, Sep.-Oct. 1930, *Chevalier 34171* (P!); Moyene Sassandra, Guidéka, 10-11 July 1907, *Chevalier 19010* (P!); San Pedro, 21 Oct. 1900, *Thoiré 159* (P!); San Pedro, 21 Oct. 1900, *Thoiré 159bis* (P!); 44 km N of Tai, along road to Guigló, 9 Mar. 1959, *Leeuwenberg 3054* (K!, WAG!).

subsp. **cucullata** (Kraenzl. ex Braun & Schum.) Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroun 34(1): 286. 1998

Inflorescence unbranched. Tepals ca. 2-3 times as long as wide. Lip mid-lobe oblong-elliptic, acute. Thick ridge from the base of the lip to its apex.

DISTRIBUTION. Ivory Coast, Cameroon.

REPRESENTATIVE SPECIMENS. Between Guenabó and Buyo, Aug. 1972, *Pérez-Vera 169* (P!); Maproyo, 15 km W of Sassandra, 8 July 1969, *Versteegh & den Outer 227* (WAG!); Yapo Forest Reserve, 50 km N of Abidjan, 18 Sep. 1956, *de Wilde 576* (K!, WAG!).

subsp. **ramosa** (Rolfe) Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroun 34(1): 286. 1998

*Vanilla ramosa* Rolfe in J. Linn. Soc., Bot. 32: 457. 1896; TYPE: NIGERIA. *Barter 20134* (LECTOTYPE: K, Geerinck 1984)

*Vanilla ovalifolia* Rolfe in J. Linn. Soc., Bot. 32: 457. 1896; TYPE: NIGERIA. *Thosmon 132* (HOLOTYPE: K!)

*Vanilla laurentiana* De Wild. in Not. Pl. Util. Congo: 327. 1904; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Van Rysselberghe 5* (HOLOTYPE: BR)

*Vanilla laurentiana* var. *gilletii* De Wild. in Not. Pl. Util. Congo: 328. 1904; TYPE (*here designated*): DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gillet 3362* (LECTOTYPE: BR) & *M. Laurent s.n.* (PARATYPE: BR)

*Vanilla zanzibarica* Rolfe in Bull. Misc. Inform. Kew. 1906: 116. 1906; TYPE: PEMBA. *Lyne 139* (HOLOTYPE: K!; ISOTYPE: K!)

Inflorescence usually branched at the base. Tepals ca. four times longer than wide, acute. Lip mid-lobe oblong-elliptic with acuminate apex, thickening obscure in the lower half of the lip along the mid-vein.

DISTRIBUTION. Ghana, Ivory Coast, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. Bingerville, 1903-4, *Manes s.n.* (P!).

2. ***Vanilla imperialis*** Kraenzl. in Notizbl. Bot. Gart. Mus. Berlin-Dahlem 4: 155. 1896  
(Fig. 59)

TYPE (*here designated*): CAMEROON. *Zenker & Staudt 626* (HOLOTYPE: B†) & CAMEROON. *Breteler 1014* (NEOTYPE: P!, ISONEOTYPE: WAG!)

*Vanilla lujae* De Wild. in Belg. Colon. 10: 28. 1904; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Luja s.n.* (HOLOTYPE: BR)

*Vanilla imperialis* var. *congolensis* De Wild. in Rev. Hist. Nat. Appl. (Paris) 2: 188. 1921; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Bequaert 4745* (HOLOTYPE: BR)

Epiphytic climbing or scrambling leafy liane. Roots of various length arising at nodes, opposite each single leaf. Internodes 8-15 cm long, 0.7-2.5 cm in diameter, fleshy, terete, glabrous, dull bluish green. Leaves with a petiole up to 1 cm long, canalliculate, twisted; blade 8-28 cm long, 3.5-12 cm wide, broadly elliptic-oblong to ovate, or obovate, apiculate to acuminate, fleshy, dull bluish green to dark green. Inflorescence 4-15 cm long, (5)15-50-flowered, rather dense, axillary, unbranched. Flowers large, yellow or cream, lip heavily blotched deep rose to purple especially on inner surface towards the apex. Floral bracts 15-25 mm long, scale-like, ovate-lanceolate. Pedicel and ovary 60-110 mm long, cylindrical, arcuate or erect, fleshy. Dorsal sepal 48-80 mm long, 13-18 mm wide, broad-, elliptic- or oblong-lanceolate, acute, semi-cucullate at the apex, with revolute margins.

Petals similar in size, oblong- to oblanceolate-obovate, subacute, with thickened mid-vein on the outer surface and revolute margins. Lateral sepals similar in size, obliquely elliptic- to obovate-oblong, semi-cucullate, with revolute margins. Lip 50-70 mm long, 30-40 mm wide when flattened, narrowly funnel-shaped towards the base, cuneiform in general outline, rather fleshy, strongly undulate in front margins, indistinctly three-lobed, basal part densely covered by branched, short, hairs, dense tuft of fine, hairs in the centre of the lip, fleshy, more or less bottle-shaped, papillae along the mid-vein of the middle lobe of lip; sidelobes

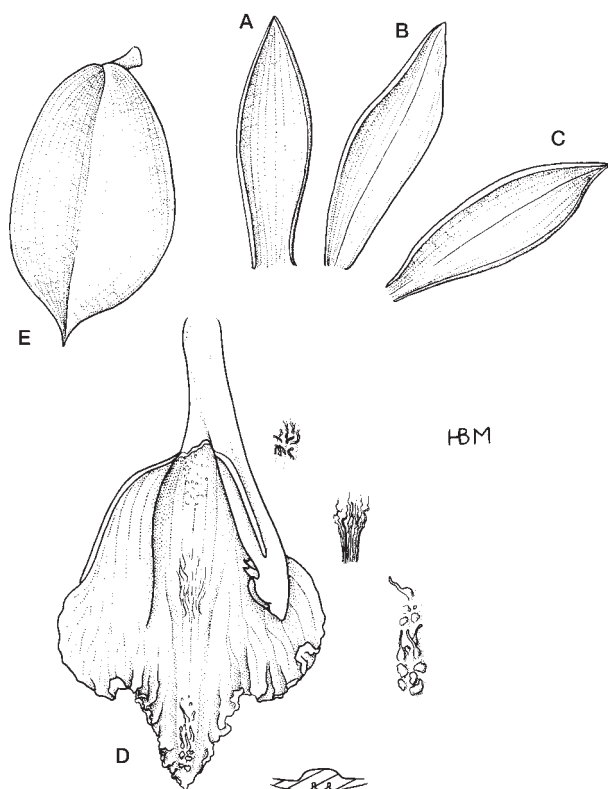


Fig. 59.—*Vanilla imperialis* Kraenzl.: A — dorsal sepal; B — petal; C — lateral sepal; D — lip with various callosities and cross section; E — leaf (drawn by H.B. Margońska, *Sita* 3397, P).

rounded; middle lobe triangular, acute. Gynostemium 30-40 mm long, erect, joined with the lip margins below stigma.

**HABITAT.** Scrambling over forests tree and up tree-trunks in shade, gallery forests, damp forests with *Raphia* sp. and *Pandanus* sp. All year round.

**DISTRIBUTION.** Sierra Leone, Ivory Coast, Ghana, Cameroon, Central African Republic, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Tanzania. Alt. 650-1200 m.

**NOTES.** I have seen no material of this species from Ivory Coast, but it is given by Summerhayes (1968b) from Bafing (*Aké Assi 9041*).

Tribe **Nervilieae** Dressler in *Lindleyana* 5(2): 124. 1990

A monotypic tribe.

Subtribe **Nerviliinae** Schltr. in *Notizbl. Bot. Gart. Mus. Berlin-Dahlem* 9: 571. 1926.

Leaf suborbicular, plicate, convolute. Inflorescence terminal. Lip partially enfolding the column, hairy or papillate. Gynostemium erect, slender, somewhat swollen at the apex. No column foot. Clinandrium apical, expanded, often glandular, enclosing a large part of the anther. Rostellum truncate, bent forward. Viscidium prominent. Anther incumbent, movable. Connective thick. Pollinia sectile.

A monotypic subtribe with the sole genus *Narvilia* Comm. ex Gaud.-Beaupre.

**23. Nervilia** Commons ex Gaudich. in Freycinet, Voy. Bonite,  
Bot.: tab. 35. 1827, & 421. 1829

Tuber single, subterranean. Leaf single, produced after the flowers, erect to prostrate, plicate, elliptic to reniform, usually with cordate base. Inflorescence single- to many-flowered, erect. Flowers resupinate, occasionally erect, tubular. Lip more or less trilobed, often with pubescence or fleshy ridges inside. Gynostemium erect, slender, slightly swollen near the apex. Apical clinandrium spacious. Anther incumbent, motile. Pollinia 4, sectile. Stigma concave, entire. Rostellum truncate, suberect, producing single, cellular viscidium. No caudicles (Fig. 60).

A genus of ca. 60 species distributed in tropical and subtropical Africa, Asia and Australia.

KEY TO THE SPECIES (FLOWERS)

1. Lip apical margin fimbriate or crenulate ..... 2
- Lip apical margin entire ..... 3
2. Lip distinctly three-lobed, both sidelobes obliquely oblong-ovate ..... **3. N. crociformis**
- Lip unlobed, obovate-cuneate in general outline ..... **6. N. petraea**
3. Basal part of the lip pandurate in general outline, widest at the apex, lip sidelobes obtuse ..... 4
- Basal part of the lip oblong-elliptic to oblong-lunate, widest near the middle, lip sidelobes acute to auriculated ..... 6
4. Lip middle lobe oblong-lanceolate, acute ..... **7. N. subintegra**
- Lip middle lobe rounded, obtuse at the apex ..... 5

5. Lip middle lobe with erect or rolled-in edges ..... **1. *N. adolphi***  
 – Lip middle lobe almost flat with convex central ridge ..... **4. *N. fuerstenbergiana***  
 6. Inflorescence 4-12-flowered. Basal part of the lip oblong-elliptic, sidelobes auriculated to triangular, small or medium, the middle lobe triangular, canaliculate at the apex, obtuse ...  
 ..... **2. *N. bicarinata***  
 – Inflorescence 2-3-flowered. Basal part of the lip oblong-lunate with acute sidelobes, the middle lobe prominent oblong-lanceolate, acute ..... **5. *N. kotschy***

## KEY TO THE SPECIES (LEAVES)

1. Leaf pubescent ..... 2  
 – Leaf glabrous ..... 3  
 2. Leaf angulate ..... **7. *N. subintegra***  
 – Leaf sinuate ..... **3. *N. crociformis***  
 3. Petiole more than 10 cm long ..... **2. *N. bicarinata***  
 – Petiole less than 9 cm long ..... 4  
 4. Leaf with ragged keels along the ridges of the pleats ..... **5. *N. kotschy***  
 – Leaf with no keels ..... 5

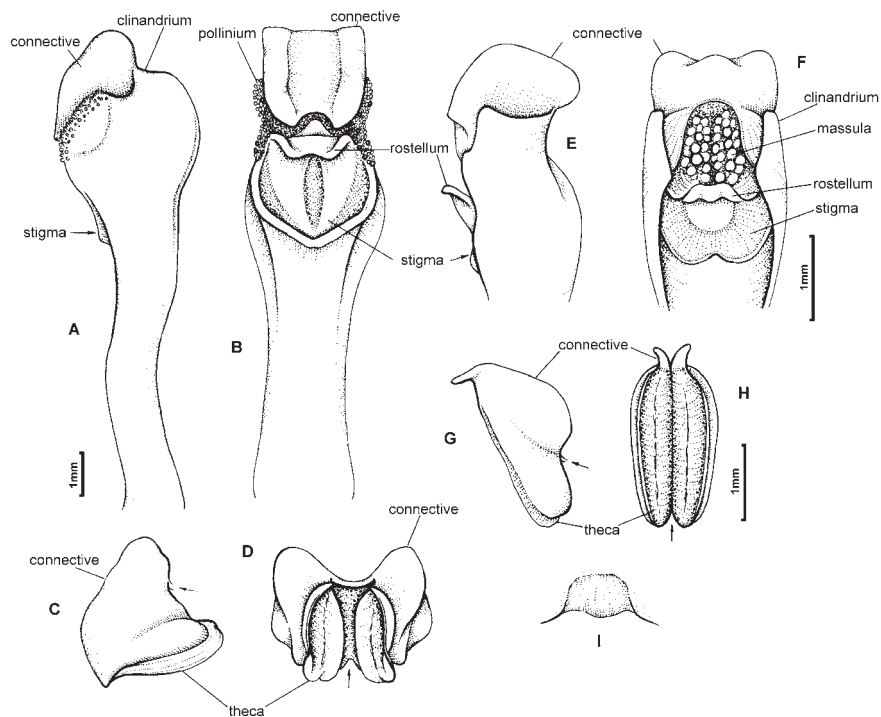


Fig. 60. – Gynostemium structure of *Nervilia* Commons *ex* Gaudich. in Freycinet: A, E – gynostemium side view; B, F – gynostemium bottom view; C, D, G, H – anther, various views; I – rostellum remnant (Szlachetko & Rutkowski 2000).

5. Leaf very small, less than 2(2.5) cm across, without a distinct apical point ... **6. N. petraea**  
 – Leaf larger, apiculate ..... 6  
 6. Leaf reniform, shortly apiculate or rounded, conspicuously tessellated silver and dark green, often dark purple below ..... **1. N. adolphi**  
 – Leaf cordate, triangular at the apex, marbled in light and dark green ..... **4. N. fuerstenbergiana**

**1. Nervilia adolphi** Schltr. in Bot. Jahrb. Syst. 53: 552. 1915

(Fig. 61)

TYPE: TANZANIA. *Stolz 1870* (LECTOTYPE: B†; ISOLECTOTYPES: BM!, K!, P!, W!; DRAWING: UGDA-DLSz)

Tuber 6-15 mm in diameter, subspherical to ovoid, 2-4-noded. Leaf solitary, with a petiole 5-7 cm long; blade 1.8-5.5 cm long, 2-8 cm wide, broadly cordate to reniform, subacute to obtuse, glabrous, dark olive-green above and purple beneath. Scape 2-13 cm tall, erect, glabrous, 1-flowered. Flowers small, horizontal, fragrant, sepals and petals brownish-green, lip white to pale pink with purple-violet shortly papillate markings. Floral bract ca. 3 mm long. Pedicel 3-4 mm long, ovary 4-5 mm long, slender. Dorsal sepal 10-20 mm long, 2.5-3.5 mm wide, oblong-ob lanceolate, apiculate, glabrous, nerves 3, unbranched. Petals slightly shorter and narrower, oblong to ligulate, slightly falcate, apiculate, glabrous, tri-nerved. Lateral sepals 10-22 mm long, 2.5-3.5 mm wide, oblong-ob lanceolate, slightly falcate, apiculate, glabrous, nerves unbranched. Lip 9.5-20 mm long, constricted near the two-third, the basal part 4-7 mm wide, pandurate in general outline, widest near the apex, the basal margins incurved, sidelobes rounded; apical part or middle lobe 3-9.5 mm long and wide, almost rounded, obtuse, with erect or rolled-in edges. Gynostemium 6-10 mm long, slender.

HABITAT. High rainfall woodlands, submontane grasslands, riverine fringe-forests, pine plantations.

VARIABILITY. Pettersson (*in* La Croix & Cribb, 1995) distinguished two varieties in this species:

**var. adolphi**

Leaf uniformly green or olive-green above and green or purple beneath.

DISTRIBUTION. Ivory Coast, Ghana, Nigeria, Equatorial Guinea, Democratic Republic of Congo (Zaire), Uganda, Rwanda, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. 900-1750 m.

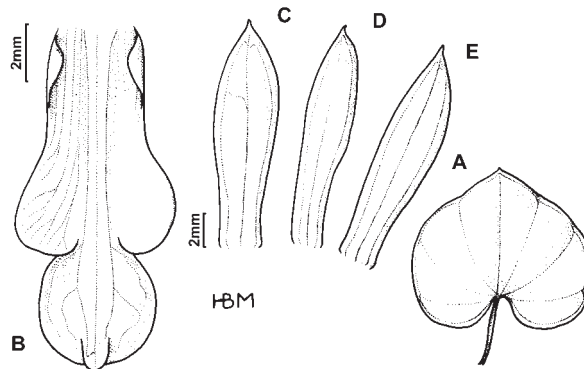


Fig. 61.—*Nervilia adolphi* var. *seposita* Hallé & Toill.-Gen.: A – leaf; B – lip; C – dorsal sepal; D – petal; E – lateral sepal (drawn by H.B. Margońska, Toilliez s.n., P).



REPRESENTATIVE SPECIMENS. Baoule Nord, Mt. Kangoroma, Fétékro, 27 July 1909; *Chevalier* 22169 (P!); Bouna, 13 Mar. 1971, *Toilliez* 453 (P!); 19 Apr. 1971, *Toilliez* 454 (P!); 29 Apr. 1970, *Toilliez* s.n. (P!); Between Boundiali and Kahogo (Korhogo), 22-27 Apr. 1975, *Pérez-Vera* 684 (K!, P!); 27 Apr. 1975, *Pérez-Vera* 687 (K!); Farakoro, 9 Aug. 1971, *Trousot* 76 & *Ybert* 252 & *Anon* 139 (P!); Kinkéné, 14 July 1971, *Anon* 95 (P!); 7 Oct. 1969, *Toilliez* 456 & *Trousot* s.n. & *Anon* s.n. (P!); 14 July 1971, *Trousot* s.n. (P!).

var. **seposita** N. Hallé & Toill.-Gen. in *Adansonia*, ser. 2, 11: 460. 1971

TYPE: IVORY COAST. *Toilliez* s.n. (HOLOTYPE: P!)

Leaf prostrate, tessellate with silver on the upper surface, purplish-grey beneath.

DISTRIBUTION. Mali, Senegal, Guinea, Ivory Coast, Central African Republic, Democratic Republic of Congo (Zaire), Uganda, Zambia. Alt. 700 m.

REPRESENTATIVE SPECIMENS. Cultivated in Adiopodoume, *Toilliez* 458 & s.n. (P!).

## 2. *Nervilia bicarinata* (Blume) Schltr. in Bot. Jahrb. Syst. 45: 405. 1911 (Fig. 62)

*Pogonia bicarinata* Blume in Coll. Orchid.: 152. 1859; TYPE: MADAGASCAR. *Perville* 383 (HOLOTYPE: L; ISOTYPE: P)

*Pogonia umbrosa* Rchb. f. in Flora 50: 102. 1867; TYPE (*here designated*): ANGOLA. *Wehwitsch* 739 (LECTOTYPE: K!; ISOLECTOTYPE: BM!, LISU; DRAWING: W-R!); SÃO TOMÉ & PRÍNCIPE. *Mann* 1149 (PARATYPE: K!; DRAWING: W-R!). - *Nervilia umbrosa* (Rchb. f.) Schltr. in Westafr. Kautschuk-Exped.: 274. 1900.

*Pogonia viridiflora* Rchb. f. in Flora 65: 532. 1882; TYPE: ANGOLA. *Mechow* 298 (LECTOTYPE: W-R!; DRAWING: UGDA-DLSz)

Tuber single, 1-3 cm in diameter, subspherical or ovoid. Leaf solitary, horizontal, with a petiole (2)10-26 cm long; blade up to 22.5 cm long, 26.5 cm wide, reniform with cordate base, apiculate, glabrous, heavily pleated. Inflorescence 17-75 cm tall, glabrous, erect, (1)4-10(12)-flowered. Flowers evenly spaced along the rhachis, sepals and petals greenish, lip greenish-white with purple or green venation.

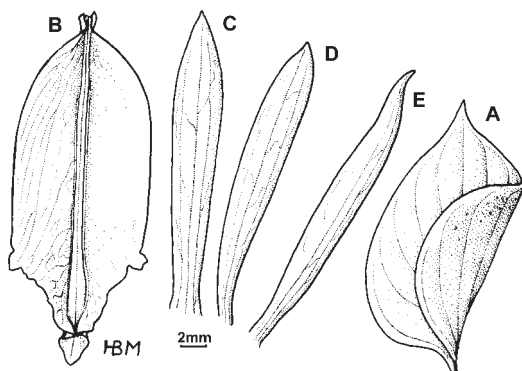


Fig. 62.—*Nervilia bicarinata* (Blume) Schltr.: A – leaf; B – lip; C – dorsal sepal; D – petal; E – lateral sepal (drawn by H.B. Margońska, *Tisserant* 406, P.).

Dorsal sepal 17-30 mm long, 0.9-4 mm wide, linear-oblongate, acute, glabrous, nerves 3, branched. Petals slightly shorter and broader than dorsal sepal, linear-oblongate or oblong-lanceolate, slightly falcate at base, acute glabrous, nerves 3, branched. Lateral sepals 17-31 mm long, slightly narrower than dorsal sepal, linear-lanceolate, acute, glabrous, nerves 3, branched. Lip 20-31 mm long, 10.5-25 mm wide, oblong-elliptic in general outline, obscurely trilobed, with



two parallel pubescent ridges running to the base of midlobe; middle lobe triangular to ovate, canaliculate at apex, obtuse; sidelobes auriculated to triangular, very small to medium. Gynostemium 10-16 mm long.

**HABITAT.** Riverine and waterfall-spray forests, xerophilous forests, *Syzygium* sp. thickets. Usually September-October.

**DISTRIBUTION.** Senegal, Guinea-Bissau, Guinea, Sierra Leone, Ivory Coast, Burkina Faso, Ghana, Togo, Benin, Nigeria, Chad, Cameroon, São Tomé and Príncipe, Equatorial Guinea, Congo, Central African Republic, Democratic Republic of Congo (Zaire), Angola, Ethiopia, Uganda, Tanzania, Zambia, Malawi, Zimbabwe, South Africa, Yemen, Oman, Madagascar, Comores, Reunion, Maurice. Alt. 600-1100 m.

**REPRESENTATIVE SPECIMENS.** Bassaoua, 17 Apr. 1971, *Anon* 84 (P!); Oct. 1969, *Anon* s.n. (P!); 8 Oct. 1969, *Toilliez* 449 (P!); July 1970, *Toilliez* 450 (P!); 12 km of Bassawa, M'Bayakro, 28 June 1969, *Cremers* 1018 (P!); Bouake, Foroforo, 28 Apr. 1971, *Gnésio Téhé* 1008 (P!); Boundiali-Kani road (km 22), 30 Mar. 1975, *Pérez-Vera* 765 (K!, P!); Mt. Kaoué (Kaone), 60 km N of Duékoué, 22 Nov. 1965, *Toilliez* 300 (P!); Kédiouni, 16 Mar. 75, *Pérez-Vera* 651 & *Pérez-Vera* 759 (K!, P!); Kiélé, 12 July 1971, *Anon* 94 (P!); Masadena, SW of Sifé, 6 July 1971, *Anon* 93 (P!); *Ybert* 245 (P!); Mt. Niangbo, 29 Apr. & 12 July 1971, *Gnésio Téhé* 1020 (P!); M. Peko, Mt. Bleni-oue-ouin, 3 Apr. 1966, *Toilliez* 366 (P!); Haut Sassandra, Loura (Toura), near Gouékouma, 24 May 1909, *Chevalier* 21687 (P!); *Sine* loc., 20 Feb. 1969, s.n. (P!); *Sine* loc., 1970, s.n. (P!)

**3. *Nervilia crociformis* (Zoll. & Moritz) Seidenf. in Dansk. Bot. Ark. 32(2): 51. 1978 (Fig. 63)**

*Bolborchis crociformis* Zoll. & Moritz in Syst. Verz.: 89. 1846; TYPE: JAVA. *Zollinger* 762 (HOLOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Nervilia humilis* Schltr. in Bot. Jahrb. Syst. 53: 551. 1915; TYPE: TANZANIA. *Stolz* 1811 (LECTOTYPE: LD; ISOLECTOTYPES: C, G, M, S, W!)

*Nervilia reniformis* Schltr. in Bot. Jahrb. Syst. 53: 551. 1915; TYPE: TANZANIA. *Stolz* 1791 (LECTOTYPE: K!)

*Nervilia erosa* P.J. Cribb in Kew Bull. 32: 155. 1977; TYPE: ZAMBIA. *Williamson & Drummond* 1679 (HOLOTYPE: K!)

Tuber 0.5-1.4 cm in diameter, ovoid to subspherical, 2-6-noded. Leaf solitary, with a petiole up to 6 cm long, sulcate; blade 1.5-9 cm long, 3.5-14 cm wide, reniform to almost orbicular, usually densely pubescent on the upper surface. Scape 1.5-10 cm tall, erect, glabrous, 1-flowered, with 2-3 sheathing bracts. Flower erect, fragrant, sepals and petals brownish-green, lip white with a yellow centre, often with a faint lilac or purple tinge or markings in the apical

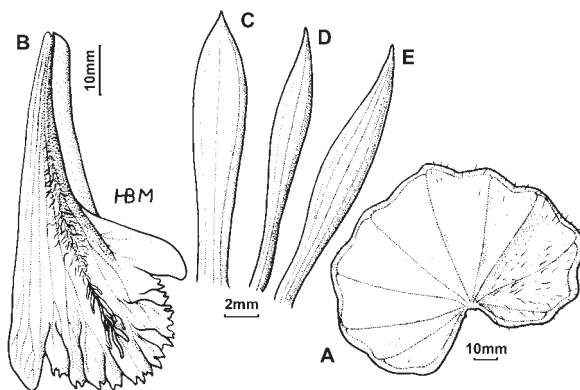


Fig. 63.—*Nervilia crociformis* (Zoll. & Moritz) Seidenf.: A – leaf; B – lip; C – dorsal sepal; D – petal; E – lateral sepal (drawn by H.B. Margońska, *Tisserant* 2506, P).

area. Floral bract 10-20 mm long. Pedicel ca. 23 mm long, ovary 5 mm long, slender. Dorsal sepal 12-17.5 mm long, 3-3.5 mm wide, oblong-oblancheolate, apiculate, glabrous, tri-nerved. Petals up to 17 mm long, 2 mm wide, narrowly oblanceolate, apiculate, slightly asymmetric, glabrous, nerves 3, unbranched. Lateral sepal 12-19 mm long, 3-3.5 mm wide, narrowly lanceolate, apiculate, slightly asymmetric, glabrous, with 3-5 nerves. Lip 12-18 mm long, 9-11 mm wide, oblong-cuneate in general outline, canaliculate, distinctly trilobed, with hairs along the midvein and thicker outgrowths in the centre of the median lobe; the middle lobe ovate-triangular to suborbicular, obtuse, with crenulate or undulate-fimbriate margins. Gynostemium 5.5-9 mm long, slender, erect.

**HABITAT.** *Brachystegia* sp. woodlands, evergreen forests, grasslands, riverine forests and pine plantations. November-June.

**DISTRIBUTION.** Cape Verde, Mali, Senegal, Guinea, Sierra Leone, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Congo, Democratic Republic of Congo (Zaire), Ethiopia, Rwanda, Burundi, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa, Swaziland, Madagascar, India, Indonesia, Philippines, New Guinea, Australia. Alt. 650-2000 m.

**REPRESENTATIVE SPECIMENS.** Man, Mt. Dent, 11 Apr. 1975, *Pérez-Vera* 609 (P!); Odienné, Aug. 1971, *Trousot* 61 & *Ybert* 255 & *Anon* 141 (P!); Mt. Peko, 19 Mar. 1974, *Pérez-Vera* 507 (K!); Sangouine, 27 Apr. 1970, *Toilliez* 455 (P!); Sangouiné, 1970, *Toilliez* s.n. (P!); 19 Mar. 1971, *Toilliez* s.n. (P!); 19 Mar. 1971, *Trousot* s.n. (P!); 19 Mar. 1971, *Trousot* & *Anon* 96 (P!); *Sine* loc., 22 Nov. 1965, *Toilliez* 302 (P!); *Sine* loc., 18 Apr. 1965, *Toilliez* 365 (P!); *Sine* loc., Mar. 1971, *Toilliez* 457 (P!); *Sine* loc., 1969-1971, s.n. (P!); *Sine* loc., 9 Mar. 1971, s.n. (P!).

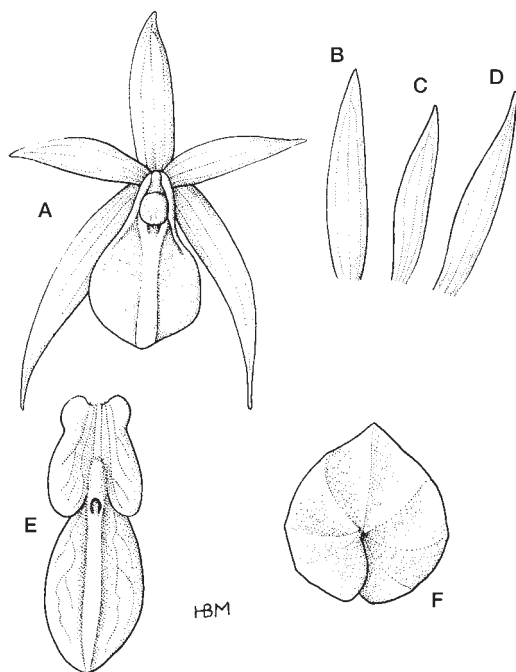


Fig. 64.—*Nervilia fuerstenbergiana* Schltr.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — leaf (redrawn by H.B. Margońska from Petterson 1990).

#### 4. *Nervilia fuerstenbergiana* Schltr. in Repert. Spec. Nov. Regni Veg. 9: 331. 1911 (Fig. 64)

**TYPE:** CAMEROON. *Schlechter* 15795 (HOLOTYPE: B†); NIGERIA. *Keay* 95 (NEOTYPE: K!)

Tuber 1-1.7 cm long, 0.7-1.2 cm in diameter, subspherical to ovoid. Leaf solitary, with a petiole 1-9 cm long; blade 3.5-7.7 cm long, 2.8-8.5 cm wide, broadly cordate, obscurely pentagonal, acute to apiculate, glabrous, clearly marbled in dark and light green above and purple blotched below. Scape 13.5-21.5 cm tall, erect, glabrous, 1-flowered. Flowers small, horizontal, fragrant, sepals and petals green, lip

white to faint pink with purple-violet shortly papillate markings. Floral bract 4.5-7 mm long. Pedicel 1-2 mm long, ovary 3.5-4 mm long, slender. Dorsal sepal 12-15 mm long, 2.5-3.5 mm wide, linear-lanceolate, acute, glabrous. Petals 12-15 mm long, slightly narrower than sepals, linear-lanceolate, slightly falcate, acute, glabrous. Lateral sepals 12-15 mm long, 2.5-3.5 mm wide, oblong-ob lanceolate, slightly falcate, acute, glabrous. Lip 11.5-16 mm long, 4.5-6 mm wide, constricted near the middle, the basal part pandurate in general outline, widest near the apex, the basal margins incurved, sidelobes rounded; apical part or middle lobe elliptic-lanceolate, subobtuse, with convex central ridge. Gynostemium 5.5-6.5 mm long, slender.

HABITAT. Humid forests. February-April.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Equatorial Guinea (Bioko), Cameroon.

REPRESENTATIVE SPECIMENS. Man, 20 Feb. 1974, *Pérez-Vera* 502 (K!); Mt. Péko, 15 Mar. 1975, *Pérez-Vera* 502/B (P!); 22 Nov. 1965, *Toilliez* 301 (P!); *Sine* loc., 7 Mar. 1965, *Toilliez* 336 (P!); *Sine* loc., 1969, s.n. (P!).

**5. *Nervilia kotschy* (Rchb. f.) Schltr. in Bot. Jahrb. Syst. 45: 404. 1911 (Fig. 65)**

*Pogonia kotschy* Rchb. f. in Oesterr. Bot. Z.: 338. 1864; TYPE: ETHIOPIA. *Kotschy* s.n. (HOLOTYPE: W-R!; DRAWING: UGDA-DLSz)

Tuber single, up to 32 mm in diameter, subspherical or ovoid. Leaf solitary, with a petiole up to 6 cm long; blade 2.3-17 cm long, 1.6-16 cm wide, broadly cordate, elliptic to lanceolate, acute to apiculate, glabrous, erect to prostrate, often dark olive-green above and purple beneath, sometimes with silvery lines along the veins, usually heavily pleated and raggedly keeled on the pleats. Inflorescence 8-42 cm tall, glabrous, (1)2-8(12)-flowered. Cauline bracts 2-4, up to 4 cm long. Flowers greenish with purple veins. Floral bract 7-25 mm long, linear, acuminate. Pedicel 5-10 mm long; ovary 4-8 mm long, slender, glabrous. Dorsal sepal up to 25 mm long and 3.5 mm wide, linear-lanceolate, acuminate, glabrous, nerves 3, unbranched. Petals up to 23 mm

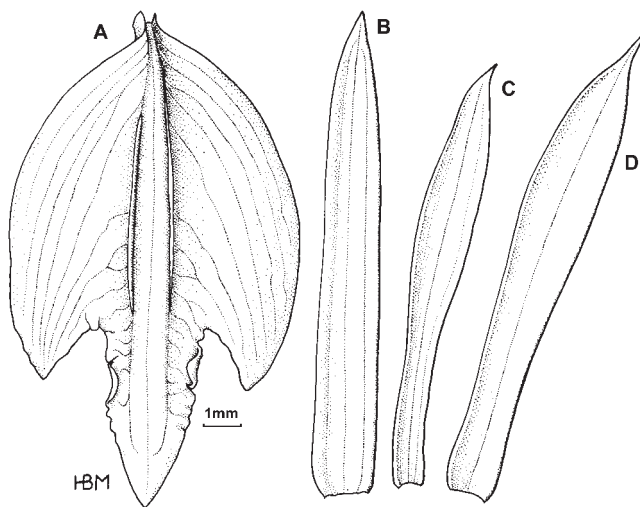


Fig. 65.—*Nervilia kotschy* (Rchb. f.) Schltr.: A – lip; B – dorsal sepal; C – petal; D – lateral sepal (drawn by H.B. Margońska, *Stolz* 1260, P).

long and 3.5 mm wide, slightly falcate, linear in the lower part, narrowly lanceolate above, apiculate, glabrous, nerves 3, unbranched. Lateral sepals (8)12-26 mm long, 2-3.5 mm wide, linear-oblongate, apiculate to acuminate, glabrous, nerves 3, unbranched. Lip 10-19 mm long, 7-12 mm wide, oblong-lunate in general outline, distinctly trilobed, with two parallel pubescent ridges along nerves running to the base of midlobe; the middle lobe the longest, ca. one-third of the lip length, oblong-lanceolate, acute; sidelobes shortly triangular or ovate-rhomboid, acute. Gynostemium 7-11.5 mm long.

VARIABILITY. Pettersson (*in* La Croix & Cribb, 1995) distinguished two varieties of this species, of which one was reported from Ivory Coast:

#### var. *kotschy*

*Nervilia sakoae* Jum. & Perrier in Ann. Fac. Sci. Marseille. 21(2): 194. 1912; TYPE: MADAGASCAR. *Perrier de la Bathie* s.n. (HOLOTYPE: P; ISOTYPE: K!)

*Nervilia diantha* Schltr. in Bot. Jahrb. Syst. 53: 553. 1915; TYPE: MALAWI. *Stolz* 1260 (LECTOTYPE: K!; ISOLECTOTYPES: BM!, K!, P!; DRAWING: UGDA-DLSz)

Leaf prostrate, up to 16 cm wide, broadly cordate, 10-14-veined. Inflorescence usually 2-flowered. Gynostemium 7-9 mm long.

HABITAT. *Brachystegia* sp. woodlands, riverine forests, thickets submontane forests and pine plantations.

DISTRIBUTION. Mali, Senegal, Guinea, Ivory Coast, Nigeria, Chad, Central African Republic, Sudan, Ethiopia, Uganda, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, Madagascar. Alt. 700-1500 m.

REPRESENTATIVE SPECIMENS. Borundiali-Kani road (km 20), 21 July 1974, *Pérez-Vera* 685 (K!); 10 km E of Gawi, 15 Mar. 1968, *Geerling & Bokdam* 2221 (WAG!); Odienné, 8 Aug. 1971, *Trousnot* 49 & *Ybert* 246, *Anon* 119 (P!); *Trousnot* 60 & *Ybert* 248 & *Anon* 130 (P!); *Trousnot* 68 & *Ybert* 249 & *Anon* 131 (P!).

NOTES. *N. kotschy* var. *purpurata* (Rchb. f. & Sonder) Pett. is easily distinguishable from the type variety by erect, up to 4 cm wide, elliptic to lanceolate, 6-10-veined leaf, mostly 3-flowered inflorescence and by 8-11 mm long gynostemium. It is known from Democratic Republic of Congo (Zaire), Angola, Sudan, Ethiopia, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa, Madagascar.

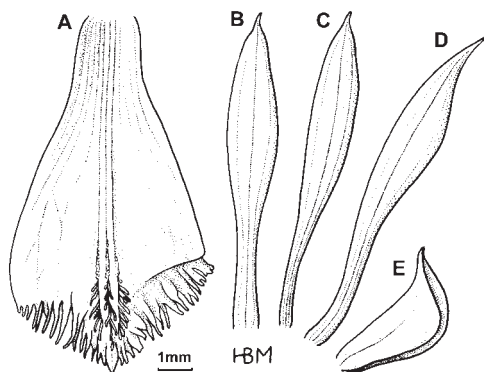


Fig. 66.—*Nervilia petraea* (Afzel. ex Sw.) Summerh.: A — lip; B — dorsal sepal; C — petal; D — lateral sepal; E — floral bract (drawn by H.B. Margońska, *Tisserant* 3089, P).

#### 6. *Nervilia petraea* (Afzel. ex Sw.) Summerh. in Bot. Mus. Leaf. 11: 249. 1945 (Fig. 66)

*Arethusa petraea* Afzel. ex Sw. in Neues J. Bot. 1(1): 62. 1805; TYPE: SIERRA LEONE. *Afzelius* s.n. (LECTOTYPE: UPS; ISOLECTOTYPE: K!; DRAWING: W-R!)

*Arethusa simplex* Thouars in Hist. Orchid.: tab. gen., fig. 24. 1822.; TYPE: *Du Petit-Thouars* s.n. MAURITIUS. (HOLOTYPE: P?) - *Nervilia simplex* (Thouars) Schltr. in Bot. Jahrb. Syst. 45: 410. 1911.

Tuber 3-8 mm in diameter, subspherical to ovoid, 2-4-noded.

Leaf solitary, with a petiole up to 1 cm long, sulcate; blade 6-15 mm long, 8-25 mm wide, cordate to almost orbicular, glabrous, dark olive-green, often with silvery rays, purple beneath. Scape 2-10.5 cm tall, erect, glabrous, 1-flowered. Flower more or less erect, sepals and petals brownish-green, lip white with a yellow centre. Floral bract ca. 6 mm long. Pedicel 10 mm long, ovary up to 3 mm long, slender. Dorsal sepal up to 14.5 mm long, 1.5-3.5 mm wide, narrowly lanceolate above the basal linear third or half, apiculate, glabrous, 3-nerved. Petals of the same size, sometimes slightly narrower, narrowly lanceolate-falcate above the basal linear third, apiculate, glabrous, with 3 unbranched nerves. Lateral sepals 8-15.5 mm long, 1.1-3.5 mm wide, narrowly oblanceolate, slightly falcate, apiculate, glabrous, with 3 unbranched nerves. Lip 9-15.5 mm long, 5.2-8 mm wide, obovate-cuneate, obtuse, unlobed or obscurely trilobed, apical margin fimbriate, numerous fleshy, erect appendages along the three central veins near the apex. Gynostemium 4-9 mm long, slender.

HABITAT. *Brachystegia* sp. woodlands, grasslands, dambos, pine plantations. All year round.

DISTRIBUTION. Sierra Leone, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Uganda, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, Madagascar, Maurice. Alt. 900-1470 m.

REPRESENTATIVE SPECIMENS. Daloa-Zuenoula road (km 5), 22 Oct. 1974, Pérez-Vera 662 (P!).

**7. *Nervilia subintegra* Summerh. in Kew Bull. 1938: 150. 1938 (Fig. 67)**

TYPE: CENTRAL AFRICAN REPUBLIC. *Le Testu* 4634 (HOLOTYPE: BM!; ISOTYPE: P!; DRAWING: K!)

*Nervilia toillieziae* N. Hallé & Toill.-Gen. in *Adansonia*, ser. 2, 11: 455. 1971; TYPE: IVORY COAST. *Toilliez* 303bis (HOLOTYPE: P!; DRAWING: UGDA-DLSz)

Tuber single, up to 1.5 cm long, 6 mm in diameter, ellipsoid. Leaf solitary, horizontal, with a petiole 2-9 cm long; blade 2-12 cm long, 2.5-13 cm wide, reniform with cordate base, 7-11-lobed, densely pubescent on the upper surface, glabrous below. Inflorescence 8-27 cm tall, single-flowered, glabrous, erect, with 3-4 sheaths, ca. 2 cm long. Flowers brownish marked with purple and yellow lines. Floral bract up to 1 cm long, ovate-lanceolate. Pedicel 2-4 mm long; ovary 3-5 mm long, slender,

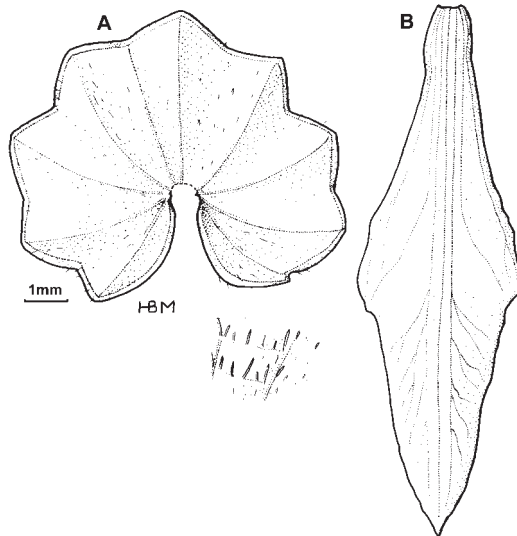


Fig. 67.—*Nervilia subintegra* Summerh.: A — leaf; B — lip (drawn by H.B. Margońska, *Toilliez* 303bis, P).

glabrous. Dorsal sepal 12-22 mm long, 2-5 mm wide, oblanceolate to oblong, acuminate, glabrous, nerves 3, unbranched. Petals of similar length but narrower, obliquely oblanceolate, acuminate, glabrous, nerves 3, unbranched. Lateral sepals 12-22 mm long, 2-5 mm wide, linear at base, oblong-elliptic above, acute, glabrous, nerves 3, unbranched. Lip 10-17 mm long, 3.5-7 mm wide, pandurate or oblong-rhomboid, unlobed or distinctly trilobed above the middle; the middle lobe about one-third of the lip length, oblong-lanceolate to lanceolate-triangular, acute, sometimes with thickenings along nerves; sidelobes short, semi-circular to obscure. Gynostemium 8 mm long.

HABITAT. Forests, savanna. March-July.

DISTRIBUTION. Guinea, Sierra Leone, Ivory Coast, Ghana, Togo, Cameroon, Central African Republic, Sudan. Alt. 300-1150 m.

REPRESENTATIVE SPECIMENS. Farakoro, 9 Aug. 1971, *Trouslet 76 & Ybert 252 & Anon 139* (P!); Kiélé, 21 Aug. 1969, *Anon 51* (P!); Man, Mt. Dent (Deut), 11 Apr. 75, *Pérez-Vera 608* (K!, P!); 4 Apr. 1968, *Anon 42* (P!); 20 Aug. 1969, *Anon 49* (P!); Oct. 1960, *F. Hallé 137* (P!); 12-18 Mar. and 1 Apr. 1974, *Pérez-Vera 490* (K!); Aug. 1954, *Schnell 6338* (P!); 22 Nov. 1965, *Toilliez 303* (P!); 1969, *Toilliez 303 bis* (P!); 25 Mar. 1970, *Toilliez 451* (P!); 4 Apr. 1968, *Trouslet s.n.* (P!); Mt. Tonkoui, NW of Man, 17 Sep. 1975, *van der Burg 1076* (WAG!).

### Tribe **Gastrodieae** Lindl. in Coll. Bot. Append. 1826

The tribe includes two subtribes of which one, *Wulschlaegellinae* (Dressler) Dressler, is exclusively neotropical, the other one, *Gastrodiinae* Lindl. in occurs in South America, Africa and Australasia.

### Subtribe **Gastrodiinae** Lindl. in Gen. Sp. Orchid. Pl.: 383. 1840

Leafless saprophytes. Inflorescence terminal. Flowers resupinate or not. Sepals and petals more or less merged. Lip of various shape, spurred or not. Column slender, erect. Clinandrium expanded, often with finger to sickle-like projections. Frequently both lateral stigma lobes are situated at the base of the gynostemium. Rostellum usually short, massive, truncate. Viscidium small, round. Anther ovate to dorsiventrally flattened, erect to incumbent. Pollinia sectile, attenuate towards the apex.

This subtribe comprises 6 genera recorded from Africa, Asia, Australia and South America.

#### KEY TO THE GENERA

1. Lip ecallose, with long, narrow claw, about half of its length; flowers very slender, narrowly tubular ..... **24. Auxopus**
- Lip with thickenings or callus, claw very short; flowers campanulate ..... **25. Didymoplexis**

### **24. Auxopus** Schltr. in Westafr. Kautschuk Exped.: 275. 1901

Leafless, achlorophyllous saprophytic orchids. Rhizome narrowly cylindrical, tuberoid, usually horizontal, subterranean. Stem erect. Inflorescence terminal. Flowers very slender, narrowly tubular. Sepals and petals joined together into

tube. Lip with long, narrow claw about half of its length, simple, ecallose, indistinctly lobed. Gynostemium erect, slender, slightly swollen at the apex. Column foot reduced, completely adnate to the ovary. Staminalodes inconspicuous. Stigma deeply concave, close to rostellum. Rostellum truncate. Viscidium small. Anther incumbent with wide connective. Pollinia sectile. No caudicles (Fig. 68).

This genus comprises 3 species, 1 in Madagascar and 2 in tropical Africa.

KEY TO THE SPECIES

1. Flowers tiny; ovary ca. 2-3 mm long; flower segments 3.5-5 mm long; lip oblong in general outline, truncate at the apex ..... **1. *A. kamerunensis***
- Flowers larger; ovary 5 mm long; flower parts more than 6 mm long; lip narrow obovate in general outline, indistinctly 3-lobed, rounded at the apex ..... **2. *A. macranthus***

**1. *Auxopus kamerunensis* Schltr. in Bot. Jahrb. Syst. 38: 4, fig. 2. 1905 (Fig. 69)**

TYPE: CAMEROON. *Schlechter 12875* (HOLOTYPE: B†; ISOTYPE: BR)

Saprophytes. Rhizome 17-30 mm long, 3-5 mm in diameter, narrowly cylindrical, horizontal or vertical. Stem 11-27 cm tall, ca. 0.5-1 mm in diameter, erect, very delicate, glabrous. Cauline bracts 2-4, short, membranous, amplexicaul, acute,

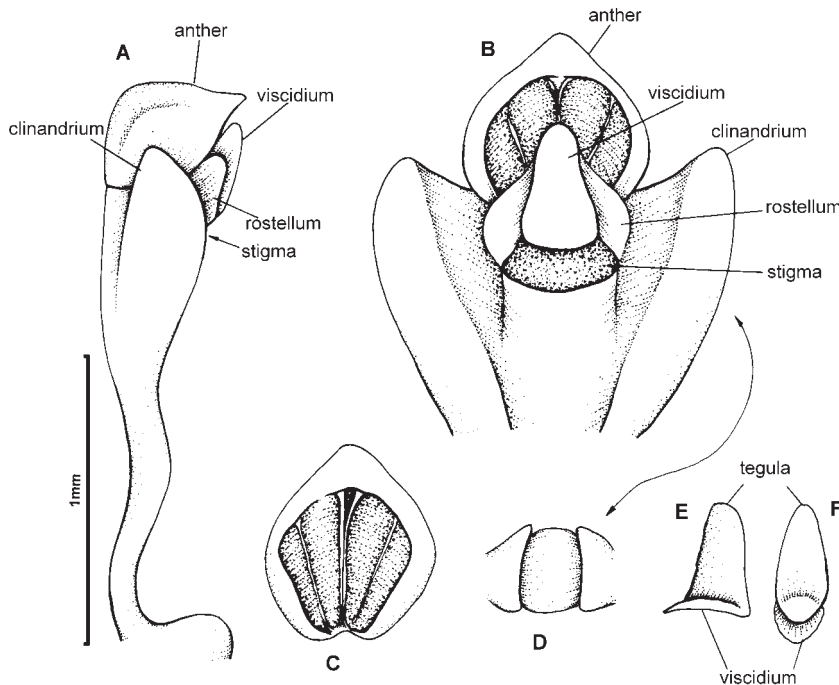


Fig. 68.—Gynostemium structure of *Auxopus* Schltr.: A – gynostemium side view; B – gynostemium apical part, bottom view; C – anther; D – rostellum remnant; E, F – viscidium and tegula, various views (Szlachetko & Rutkowski 2000).



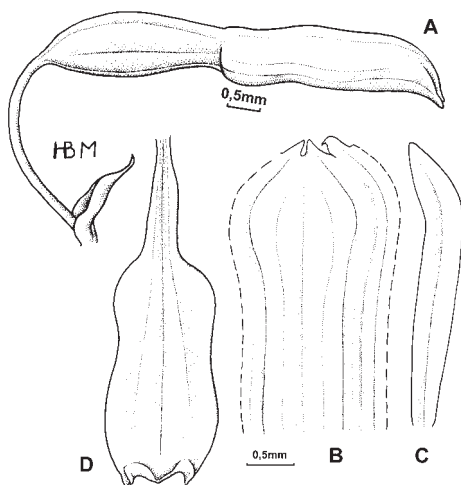


Fig. 69.—*Auxopus kamerunensis* Schltr.: A — flower; B — sepals; C — petal; D — lip (drawn by H.B. Margońska, *Letouzey* 430, P).

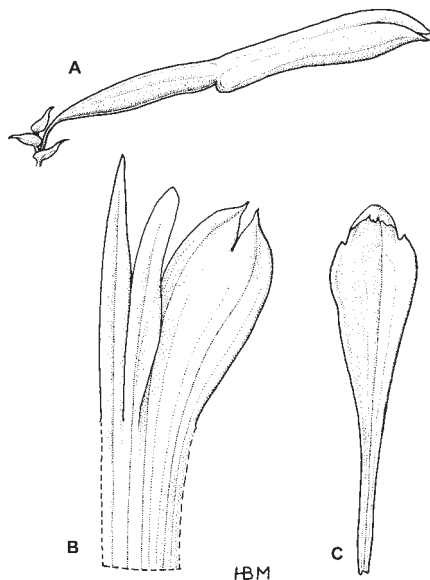


Fig. 70.—*Auxopus macranthus* Summerh.: A — flower; B — sepals and petal; C — lip (drawn by H.B. Margońska, *Chevalier* 17025, P).

separated from one another. Inflorescence 0.7-3 cm long, ca. 10-60-flowered. Flowers open successively, erect or pendulous, tubular, whitish with yellow pedicel. Floral bracts 1.5 mm long, ovate-lanceolate, acute, membranous. Pedicel 3 mm long, twisted. Ovary 2-3 mm long, swollen. Sepals joined together nearly to their apices, thin. Dorsal sepal 3.5-5 mm long, 0.4-0.6 mm wide, linear with lanceolate apex, single-nerved. Lateral sepals 3.5-5 mm long, 0.8-1 mm wide, oblique lanceolate, acute, tri-nerved. Petals 3.5-5 mm long, 0.4-0.6 mm wide, linear-falcate, acute, single-nerved, agglutinate to the sepaline tube. Lip adnate to the sepals, set on a narrow claw 0.8-1 mm long; blade 2-2.5 mm long, 1-1.4 mm wide, oblong in general outline, thin, inconspicuously trilobed, sidelobes acute, middle lobe truncate. Gynostemium 3-4.5 mm long.

**HABITAT.** Humid forests. December-January.

**DISTRIBUTION.** Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic. Alt. up to 500 m.

**REPRESENTATIVE SPECIMENS.** Attié, between Adzopé and Boudepé, 29 Dec. 1907, *Chevalier* 22681 (P!); Banco Forest Reserve, 31 Dec. 1973, *De Koning* 3029 (WAG!); 9 Jan. 1976, *De Koning* 6370 (WAG!); Guezon-Duékonné road, 12 Jan. 1974, *Pérez-Vera* 556 (K!, P!); Lobo, 28 Dec. 1974, *Pérez-Vera* 746 (K!, P!); Man, Jan. 1950, *Schnell* 4065 bis (P!); Mt. Momi, Monts des Dans, 40 km N of Danané, 30 Jan. 1984, *Hepper & Maley* 7960 (K!); Singrobo, 28 Dec. 1966, *Aké Assi* 9396 (K!).

**2. *Auxopus macranthus* Summerh.** in Kew Bull. 7: 467. 1952 (Fig. 70)



TYPE: NIGERIA. *Brenan & Jones 8777* (HOLOTYPE: K!; DRAWING: UGDA-DLSz)

*Auxopus kamerunensis* var. *grandiflora* Summerh. in Bull. Misc. Inform. Kew. 1936: 222. 1936;

TYPE: NIGERIA. *Brenan & Jones 8777* (HOLOTYPE: K!; DRAWING: UGDA-DLSz)

Plant leafless, saprophytic. Rhizome up to 5 cm long and 0.8 cm in diameter, tuberoid, narrowly cylindrical, horizontal. Stem up to 30 cm tall, 0.07-0.09 cm in diameter, slender, more or less flexuous, glabrous, delicate. Cauline bracts 1-4, small, ovate-lanceolate, subacute, amplexicaul, delicate, well-spaced from one another. Inflorescence 1.2-3 cm long, 15-25-flowered, dense. Flowers tubular, erect or spreading, yellowish brown or brown-orange. Flower bracts 1-3 mm long, ovate-lanceolate, acuminate, membranous, delicate. Pedicel 2 mm long, twisted. Ovary 5 mm long, narrow cylindrical. Tepals thin, membranous. Dorsal sepal 7.5-8.5 mm long, 0.7 mm wide, linear-lanceolate, acute, single-nerved, connate with the lateral sepals to the half of its length. Petals 8 mm long, 0.8 mm wide, linear, obtuse at the apex, agglutinate to the sepals to half of their length. Lateral sepals 7-8 mm long, 1 mm wide, lanceolate, acute, cochleate and falcate at the apices, 3-nerved, joined together almost to their apices. Lip 6.5 mm long, 1.4-1.9 mm wide, narrow obovate in general outline, gradually attenuate towards the base, thin, membranous, indistinctly 3-lobed at the apex, midlobe cucullate, 3-nerved. Gynostemium 6.5-7.5 mm long. Column foot 1 mm long.

HABITAT. Humid, lowland, degraded forests with *Monopetalanthus* sp., *Diospyros* sp., *Mapania* sp. and *Raphia regalis* Becc. January-February.

DISTRIBUTION. Ivory Coast, Ghana, Nigeria, Cameroon, Democratic Republic of Congo (Zaire), Uganda.

REPRESENTATIVE SPECIMENS. Agnieby Valley, 29 Jan. 1907, *Chevalier 17088* (P!); Makougné, S of Agboville, 22-28 Jan. 1907, *Chevalier 17025* (K!); Man, Mt. Tonkoui, near Gbepleu, 2 Feb. 1984, *Hepper & Maley 8039a* (K!); Man, 12 Jan. 1974, *Pérez-Vera 557 / 13* (K!).

## 25. *Didymoplexis* Griff. in Calcutta J. Nat. Hist. 4: 383, tab. 17. 1844

Saprophytes. Rhizome fleshy, oblong, horizontal. Stem erect. Inflorescence terminal. Sepals and petals agglutinate together up to half of their length forming a tube. Lip shortly clawed, indistinctly lobed, with very large apical callus and smaller, ligulate basal callus. Gynostemium erect, slender, slightly swollen at the apex. Column foot reduced. Staminodes inconspicuous. Stigmatic surface deeply concave, close to rostellum. Rostellum truncate, short with prominent, relatively large viscidium. Anther incumbent, 4-chambered. Connective wide. Pollinia sec-tile. No caudicles (Fig. 71).

A genus with about 20 species occurring mostly in Asia with single member in Madagascar and single in tropical and South Africa.

### 1. *Didymoplexis africana* Summerh. in Kew Bull. 6: 465. 1952 (Fig. 72)

TYPE: TANZANIA. *Moreau 269A* (HOLOTYPE: K!; DRAWING: UGDA-DLSz)

Leafless, achlorophyllous saprophytic herb. Rhizome 4-6 cm long, 0.5-0.7 cm in diameter, subterranean, thick, horizontal. Stem 8-21 cm tall, erect, delicate,

glabrous. Cauline bracts 2-3, 0.2-0.3 cm long, ovate-lanceolate, amplexicaul, in the lower part of the stem. Flowers medium-sized, tubular in the lower part, widely opened towards the apex, white. Flower bract ca. 5 mm long, ovate-lanceolate, acute, herbaceous. Pedicel and ovary 10 mm long, slender. Dorsal sepal 15 mm long, 3.5-4 mm wide, in the lower half joined together with petals and lateral sepals forming a distinct tube, apical free part elliptic, obtuse, verrucose outside. Petals 10-11 mm long, 3.5-4.5 mm wide, oblong-elliptic, obtuse. Lateral sepals 10-11 mm long, 3.2-3.5 mm wide, similar in shape to dorsal sepal, verrucose outside. Lip shortly clawed, indistinctly three-lobed, 10-11 mm long, 5.5 mm wide, orbicular-obovate in general outline, erose-denticulate and flabellate at apical margin with

very large, transverse fleshy callus just below apex, basal lip callus ligulate, reflexed. Gynostemium 10 mm long, typical for the genus.

**HABITAT.** In dense shade among rotting leaves in rain and submontane evergreen forests floor. February.

**DISTRIBUTION.** Ivory Coast, Ghana, Congo, Tanzania, Malawi, Zimbabwe, Mozambique. Alt. 800-1050 m.

**REPRESENTATIVE SPECIMENS.** Man, Mt. Tonkoui, near Gbepleu, 2 Feb. 1984, *Hepper & Maley* 8039 (K!).

Subfamily **Epidendroideae**  
Lindl. in Coll.  
Bot. Append.  
1826

Leaves plicate or duplicate. Inflorescence termi-

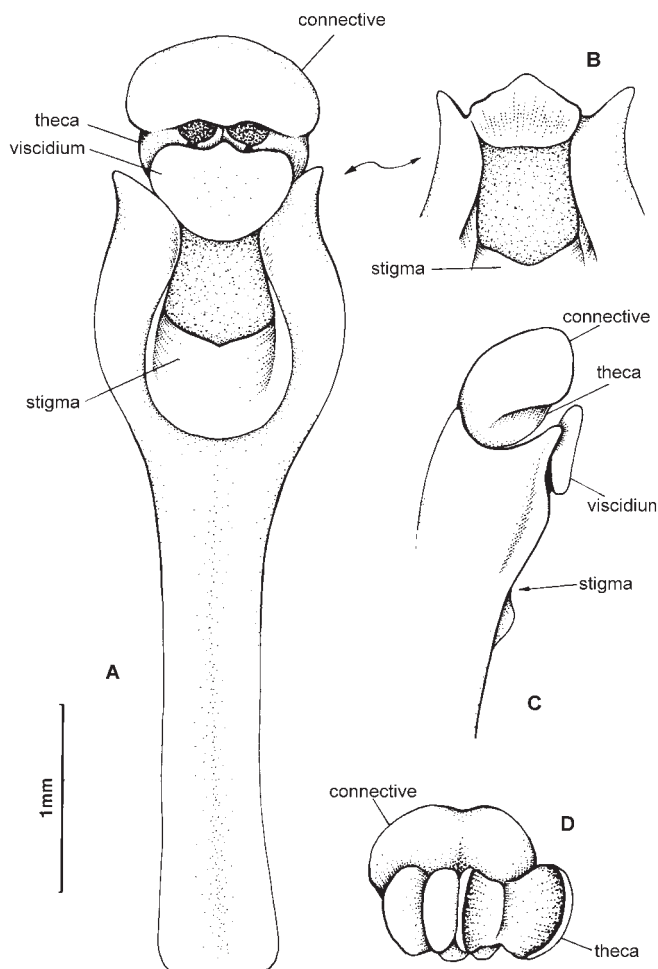


Fig. 71.—Gynostemium structure of *Didymoplexis* Griff.: A — gynostemium, bottom view; B — stigma and the rostellum remnant; C — gynostemium, side view; D — anther (Szlachetko & Rutkowski 2000).

nal or lateral. Gynostemium with well developed column part and often with prominent column foot, primarily petaloid in apical part, i.e., with very large, apical clinandrium, secondarily with collar-like clinandrium or stelidia. Stigma often emergent and deeply concave. Rostellum usually very simple, ligulate, truncate or obtuse, erect to bent towards the stigma, occasionally modified. Viscidium infrequent, composed of partly macerated cells and sticky matter. Hamulus, tegula and undifined kind of stipe found in exceptional cases. Anther bent forward late in ontogeny, motile but not operculate, partitions well-developed, dividing it usually into four or eight chambers. Pollinia four or eight, but two or six in some groups.

In the classification adopted here (Szlachetko 1995), Epidendroideae include nine tribes, of which species representing only three of them were so far collected in Ivory Coast.

Tribe **Bletieae** Benth. in Fl. Austral. 6: 270, 302. 1873

Pseudobulbs or fleshy corms of some internodes, but stem slender in some cases. Leaves plicate to conduplicate. Inflorescence terminal or lateral. Seeds of *Eulophia* or *Bletia* TYPES. Column foot usually short, rudimentary. Column part slender, arcuate, but sometimes short and massive. Clinandrium collar-like. Rostellum short, truncate to triangular, erect to bent towards the stigma. Viscidium, if present, fleshy, composed of macerated cells and sticky matter. Hamulus present in some genera. Anther usually incumbent, 4- or 8-chambered. Pollinia 4 or 8, clavate, obovate to ellipsoid. Caudicles short, sticky.

This group includes three subtribes of which Corallorhizinae Cam., Berg. & Cam. are widely distributed in the northern temperate zone, Arundinae Dressler occur mostly in Indo-Malaya and third - pantropical Bletiinae Benth. are known also from Africa.

#### KEY TO THE SUBTRIBES

1. Leaves conduplicate, relatively thick. Pseudobulbs of single internode ..... **Bulbophyllinae**
- Leaves thin, usually plicate. Pseudobulbs of some internodes ..... 2

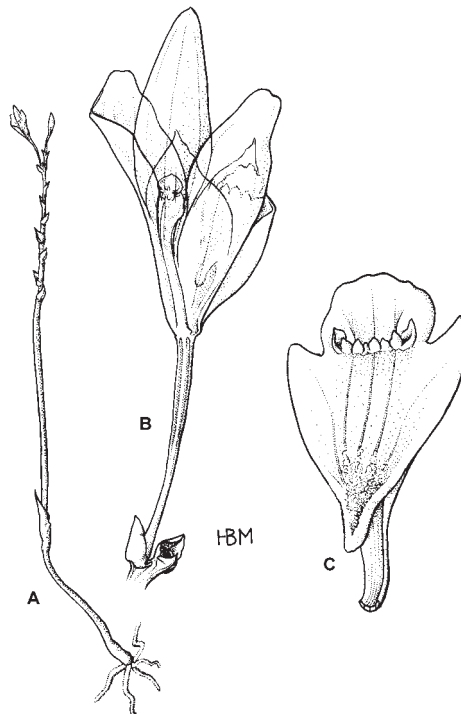


Fig. 72.—*Didymoplexis africana* Summerh.: A – habit; B – flower; C – lip (drawn by H.B. Margońska, Gillet s.n., BR).

2. Flowers rather large. Plants large or medium-sized. Corms fleshy ..... **Bletiinae**  
 – Flowers small to tiny. Plants of meddile size. Pseudobulbs of various shape .....  
 ..... **Malaxidinae**

Subtribe **Bletiinae** Benth. in J. Linn. Soc., Bot. 18: 287. 1881

Leaves plicate. Inflorescence terminal or lateral. Lip hinged or saccate to spurred. Rostellum ligulate to triangular, incumbent or erect. Fleshy hamulus present in Asian genus *Cephalantheropsis* Guill. Anther incumbent to suberect, 8-chambered. Connective fleshy. Pollinia 8, of various size and shape: clavate, obovate to ellipsoid, laterally flattened. Caudicles 2 or 8, sometimes basally joined together, sticky.

In Ivory Coast only 1 genus, *Ancistrochilus* Rolfe has been recorded so far.

**26. *Ancistrochilus*** Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 44. 1897

Small or medium-sized epiphtic herbs. Pseudobulbs clustered, conical or orbicular, dorsiventrally flattened. Leaves 1 or 2, apical, shortly petiolate, thin-textured.

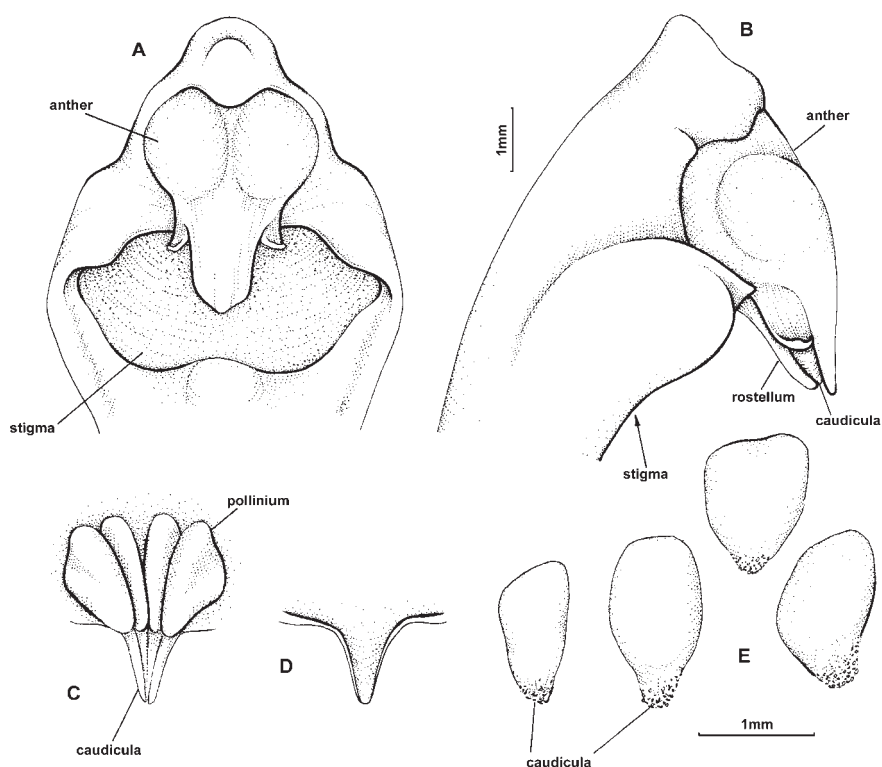


Fig. 73.—The gynostemium structure of *Ancistrochilus* Rolfe: A – apical part of gynostemium from front view; B – apical part of gynostemium side view; C – pollinia and caudiculae; D – rostellum remnant; E – pollinia (Szlachetko & Margońska 2002).

tured, plicate. Inflorescence arising from the base of pseudobulbs, arcuate, few-flowered. Flowers medium-sized, showy, Sepals subsimilar, petals narrower and smaller than sepals. Lip hinged on the top of the column foot, distinctly trilobed, the middle lobe linear or linear-lanceolate, sidelobes obliquely oblong-ovate. Column foot prominent, free from the ovary. Gynostemium slender, arcuate. Anther incumbent, connective narrow, thick. Pollinia 8, laterally flattened, ovoid, unequal in size and shape, with prominent apical caudicles each. Apical clinandrium narrow, collar-like. Rostellum incumbent, triangular, canaliculate, with no viscidium. Stigma rather large, deeply concave (Fig. 73).

A genus of 2 species widespread in tropical West Africa to Uganda, with 1 in Ivory Coast.

**1. *Ancistrochilus rothschildianus* O'Brien in Gard. Chron. ser. 3, 4: 51. 1907 (Fig. 74)**

TYPE: NIGERIA. *Rothschild* 62-08 (HOLOTYPE: K!) - *Pachystoma rothschildiana* (O'Brien) Sander in Sander's Orch. Guide: 363. 1927. *Ancistrochilus hirsutissimus* Kraenzl. in Bot. Jahrb. Syst. 51: 386. 1914; TYPE: CAMEROON. *Lederman* 6457 (HOLOTYPE: B†)

Pseudobulbs up to 5 cm in diameter and tall, conical or pyriform. Leaves 2 on the top of pseudobulbs, petiolate; petiole up to 5 cm long, canaliculate, narrow; blade 10-20 (exceptionally up to 40) cm long, 2-5(7.5) cm wide, elliptic-lanceolate, lanceolate to oblanceolate, acute to acuminate, plicate, thin. Inflorescence up to 20 cm long, laxly 1-3-flowered, axis densely pubescent with few bracts. Flowers medium-sized, resupinate, white to pink-mauve, lip dark mauve or purple with green and yellow spots; pleasantly odorant. Floral bract up to 10 mm long, ovate, obtuse to subacute, scarious, softly and densely pubescent out-

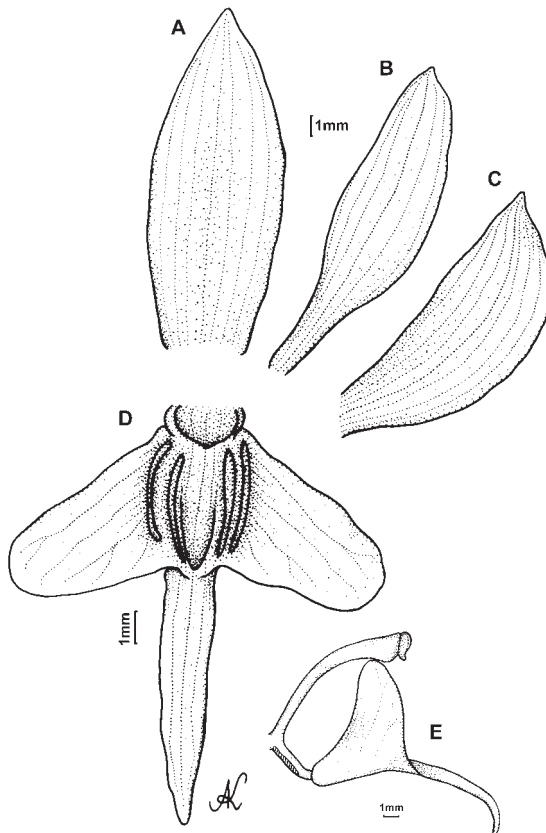


Fig. 74.—*Ancistrochilus rothschildianus* O'Brien: A — dorsal sepal; B — petal; C — lateral sepal; D — lip; E — lip and gynostemium, side view (drawn by A. Kowalkowska, *Le Testu* 5182, P).

side. Pedicel and ovary up to 30 mm long, slender, slightly arcuate or erect, densely pubescent. Tepals thin-textured. Dorsal sepal 18-30 mm long, 6.5-9 mm wide, oblong- to elliptic-lanceolate, acute, densely pubescent outside, with 7 unbranched nerves. Petals 17-27 mm long, 4.2-6.5 mm wide, obliquely oblong-lanceolate, sub-acute to acute, usually 6-nerved. Lateral sepals slightly shorter than the dorsal one, obliquely elliptic-lanceolate to semi-elliptic, acute, densely pubescent outside, with 7 unbranched nerves. Lip distinctly trilobed, densely papillate on both surfaces, slightly saccate at the base, with 3-5 longitudinal thickenings in the centre; side-lobes 5-6 mm long, 3-4 mm wide, oblong-ovate to elliptic, obtuse, upcurved in natural position; the middle lobe 8-12 mm long, up to 2 mm wide, linear-lanceolate, acute, recurved in apical half. Gynostemium 10-15 mm long, slender, slightly arcuate, column foot 3-5 mm long, densely pubescent on the ventral surface.

**HABITAT.** Epiphyte in rain forest. November-December.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda. Alt. 1050-1100 m.

**REPRESENTATIVE SPECIMENS.** Guezon-Buyo road, 1 Nov. 1973, 23 Nov. 1974, *Pérez-Vera 533 p.p.* (K!, P!); Ca. 18 km S of Guéyo, between Gagnoa and Sassandra, 6 Dec. 1961, *de Wilde 3341* (K!, WAG!); Between Touba and Man, 15 Nov. 1953, *Aké Assi 2126* (K!).

### Tribe **Malaxideae** Lindl. in Coll. Bot. Append. 1826

Pseudobulbs of 1 to few internodes, sometimes slender stem. Leaves plicate or duplicate. Inflorescence terminal, umbellate to elongate, multiflowered. Flowers resupinate or not, usually small to tiny, inconspicuous. Lip with prominent basal auricles or not. Column foot absent. Column elongate or short, massive. Anther erect to incumbent, fixed to motile. Pollinia 4, obovate to ellipsoid, naked or with sticky caudicles, sometimes with 1 or 2 viscidia. Stamines transformed into apical clinandrium. Rostellum truncate to elongate, acute, erect to incumbent. Stigma concave, entire.

A cosmopolitan group with about 1000 species. Most of them are known from Australasia.

### Subtribe **Malaxidinae** Benth. & Hook. f. in Gen. Pl. 3: 463 & 465. 1883

Leaves usually plicate, sometimes convolute, thin, gathered at the apex of pseudobulb. Column short and massive, or slender, erect or arcuate. Anther erect to incumbent.

A rather large subtribe consisting of 16 genera.

#### KEY TO THE GENERA

1. Gynostemium elongate, slender, arcuate ..... **28. Liparis**  
 – Gynostemium short, massive, erect, not thickened at the base; connective short forming no roof above locules ..... **2**
2. Lip auriculated, with single, central callus ..... **29. Lisowskia**  
 – Lip with no basal auricles, with thickened basal margins ..... **27. Kornasia**

**27. Kornasia** Szlach. in Fragm. Flor. Geobot., Suppl. 3: 120. 1995

Small terrestrial plants with fusiform several-noded pseudobulbs. Leaves plicate, thin-textured, sessile to shortly petiolate, oval to elliptic. Inflorescence corymbiform or elongate, dense, many-flowered. Flowers small, resupinate. Sepals and petals subsimilar, spreading. Lip non-auriculate, more or less cuneiform in general outline, with thickened basal margins and often with apiculate projection in the centre. No column foot. Gynostemium short, massive, erect. Anther erect to suberect, motile, 2-chambered. Connective rather narrow, short. Pollinia four, unequal in size, ellipsoid to oblong, laterally flattened. No caudicles. Stigma oblong to elliptic, deeply concave. Rostellum truncate, producing 2, well-separated viscidia (Fig. 75).

The genus embraces 3 species widely distributed in tropical Africa.

## KEY TO THE SPECIES

1. Callus single at the base of the lip, no needle-like projections in the centre ..... **1. K. chevalieri**  
 – Two parallel calli at the lip base, in the centre a needle-like projecting point ..... **2. K. maclaudii**

**1. Kornasia chevalieri** (Summerh.) Szlach. in Fragm. Flor. Geobot., Suppl. 3: 121. 1995 (Fig. 76)

*Malaxis chevalieri* Summerh. in Bull. Misc. Inform. Kew. 1934: 208. 1934; TYPE: IVORY COAST. *Chevalier* 21786 (HOLOTYPE: P!; ISOTYPE: K!; DRAWING: UGDA-DLSz)

Pseudobulbs 3-6 cm long, 0.2 cm in diameter, fusiform, slender, with 3-4 sheathing leaves in the lower part and 3-4 normal leaves at the apex. Leaves shortly petiolate to sessile; petiole up to 2 cm long; blade 3.5-9.5 cm long, 1.1-5 cm wide, broad-

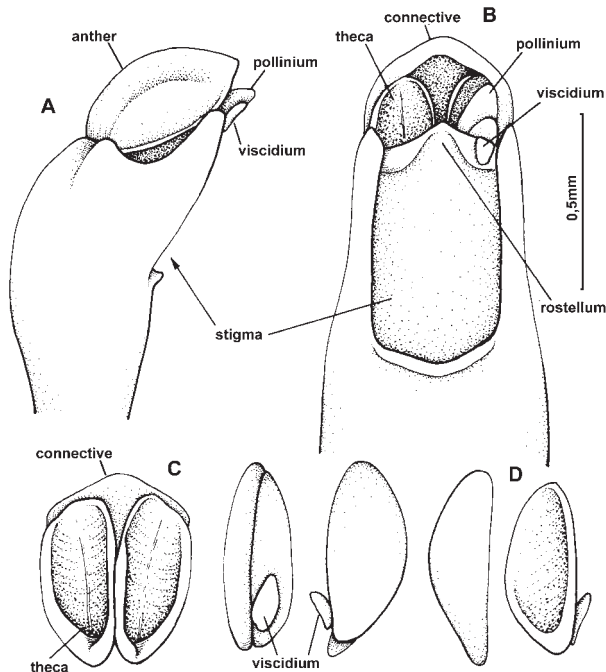


Fig. 75.—Gynostemium structure of *Kornasia* Szlach.: A - gynostemium, side view; B - gynostemium, bottom view; C - anther; D - pollinia, various views (Szlachetko & Margońska 2002).



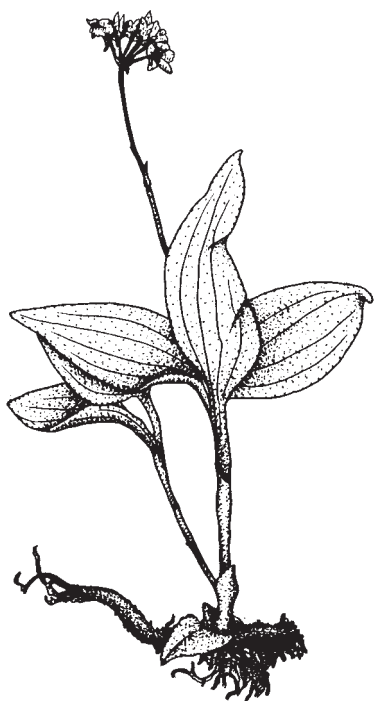


Fig. 76.—*Kornasia chevalieri* (Summerh.) Szlach.:  
A – habit (Szlachetko & Olszewski 2001).

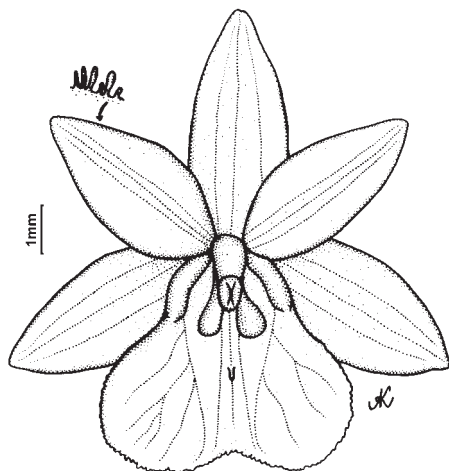


Fig. 77.—A flower of *Kornasia maclaudii* (Finet)  
Szlach. (drawn by A. Kowalkowska, *Maclaud*  
*s.n.*, P).

ly lanceolate, ovate-lanceolate to elliptic-lanceolate, acute, thin-textured, delicate, plicate, spreading. Inflorescence up to 8 cm long, 10-30-flowered, dense, subcorymbose, with few sterile bracts. Flowers rather small, resupinate, greenish-crimson, pink-wine. Floral bracts up to 3.4 mm long, triangular-lanceolate, subulate, non-auriculated, thin, delicate, glabrous. Pedicel and ovary up to 6 mm long, slender, glabrous. Dorsal sepal 2.8–4.3 mm long, 1.2–2.1 mm wide, ovate-lanceolate, acute to subacute, thin, delicate, glabrous, flat, 3-nerved. Petals 2.6–4 mm long, 1.1–1.9 mm wide, obliquely oblanceolate to oblong-oblanceolate, acute, thin, delicate, glabrous, 3-nerved. Lateral sepals 2.9–4 mm long, 1.2–2.1 mm wide, oblong-lanceolate to oblong-ovate, acute, thin, delicate, glabrous, flat, 3-nerved. Lip 2.6–4 mm long, 2.4–4.5 mm wide, broadly obovate to nearly orbiculate in general outline, rather thin, with single callus in the centre, basal margins thickened, no needle-like projection in the centre, apical margins irregularly denticulate. Gynostemium up to 1 mm long.

HABITAT. Terrestrial in gallery forests, savanna. May.

DISTRIBUTION. Senegal, Ivory Coast, Central African Republic.

REPRESENTATIVE SPECIMENS. Moyene Sassandra Valley, Touna (Gouna), 31 May 1909, *Chevalier* 21786 (K!, P!).

## 2. *Kornasia maclaudii* (Finet) Szlach. in *Fragm. Flor. Geobot.*, Suppl. 3: 121. 1995 (Fig. 77)

*Microstylis maclaudii* Finet in *Bull. Soc. Bot. France* 54: 533. 1907; TYPE: GUINEA. *Maclaud* 81 (HOLOTYPE: P!; DRAWING: UGDA-DLSz) - *Malaxis maclaudii* (Finet) Summerh. in *Bull. Misc. Inform. Kew.* 1934: 208. 1934.



*Malaxis hirschbergii* Summerh. in Bot. Mus. Leaflet. 14: 225. 1951; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE) *Hirschberg 111* (HOLOTYPE: K!)

Pseudobulbs 5-7 cm long, 0.15-0.2 cm in diameter, fusiform, erect, with 2-4 sheaths in the lower part and 3-4 leaves at the apex. Leaves sessile to petiolate; petiole up to 2 cm long, rather narrow; blade up to 8 cm long and up to 3.8 cm wide, oblong-ovate, oblong-elliptic to ovate, acute, thin-textured, delicate, plicate, spreading. Inflorescence up to 15 cm long, densely up to 40-flowered, subcorymbose, peduncle with 3-4 cauline bracts. Flowers rather small, resupinate, translucent pale yellow, violet clear, red-wine. Floral bracts up to 6.5 mm long, lanceolate, non-auriculate, subulate, thin, delicate, glabrous. Pedicel and ovary 9-17 mm long, slender, glabrous. Dorsal sepal 4.5-6.3 mm long, 1.6-2 mm wide, oblong-lanceolate to oblong-ovate, subacute to subobtuse, thin, delicate, glabrous, flat, 3-nerved. Petals 3.6-5.8 mm long, 1.3-2.8 mm wide, obliquely lanceolate to ovate-lanceolate, acute to subobtuse, thin, delicate, margins more or less ciliate, 3-nerved. Lateral sepals 4-6.2 mm long, 1.8-2.7 mm wide, obliquely ovate-lanceolate, acute to subobtuse, thin, delicate, glabrous, flat, 3-nerved. Lip 3.5-4.6 mm long, 3.8-5.6 mm wide, broadly obovate to almost obcordate, truncate at apex or shortly apiculate, thickened along the basal margins, with 2 lateral thickened areas at base, apical margins minutely, irregularly denticulate, in the centre a needle-like projecting point. Gynostemium up to 1.3 mm long.

HABITAT. Terrestrial, in humid humus of the forest with *Parinari kerstingii* Engl., in deciduous woodlands in sandy soils or grasslands among rocks. April.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ghana, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Democratic Republic of Congo (Zaire), Sudan, Tanzania, Zambia, Malawi. Alt. 900-1000 m.

REPRESENTATIVE SPECIMENS. Mt. Tonkoui, 27 Apr. 1974, Pérez-Vera 522 (K!, P!).

## 28. *Liparis* L.C. Rich. in De Orchid. Eur. 21, 30, 38. 1817

Terrestrial or epiphyte. Pseudobulbs of various size and shape, often narrowly cylindrical to ovoid, in some species lacking. Leaves basal or cauline, plicate or occasionally duplicate, thin or firm in texture. Inflorescence terminal, laxly and few-flowered to dense and many-flowered. Flowers tiny to medium-sized, more or less resupinate. Petals and sepals dissimilar. Lip auriculate, usually canalliculate, especially in the basal part, usually relatively thick and fleshy, ornamented with single callus at base. No column foot, but the base of the gynostemium thickened basally. Apical clinandrium prominent. Gynostemium elongate, slender, arcuate, broadly winged in the apical half, thickened and swollen at base. Anther incumbent, motile, 2-chambered. Connective very large forming a kind of roof above locules. Pollinia 4, laterally flattened, ellipsoid. No caudicles. Stigma oval, deeply concave. Rostellum truncate, short, narrow, usually with no viscidia (Fig. 78).

A large, mainly pantropical genus of ca. 270 species, with some representatives in temperate regions of norther and southern hemisphaere.

## KEY TO THE SPECIES

1. Lip deeply 3-dentate just above the base; the middle lobe apiculate, upcurved at apex ..... **5. *L. tridens***  
 – Lip of various shape, but never distinctly 3-lobed ..... 2  
 2. Petals ca. twice as long as dorsal sepal; flowers well-separated along rhachis; rhachis flattened ..... **1. *L. caillei***  
 – Features not as above ..... 3

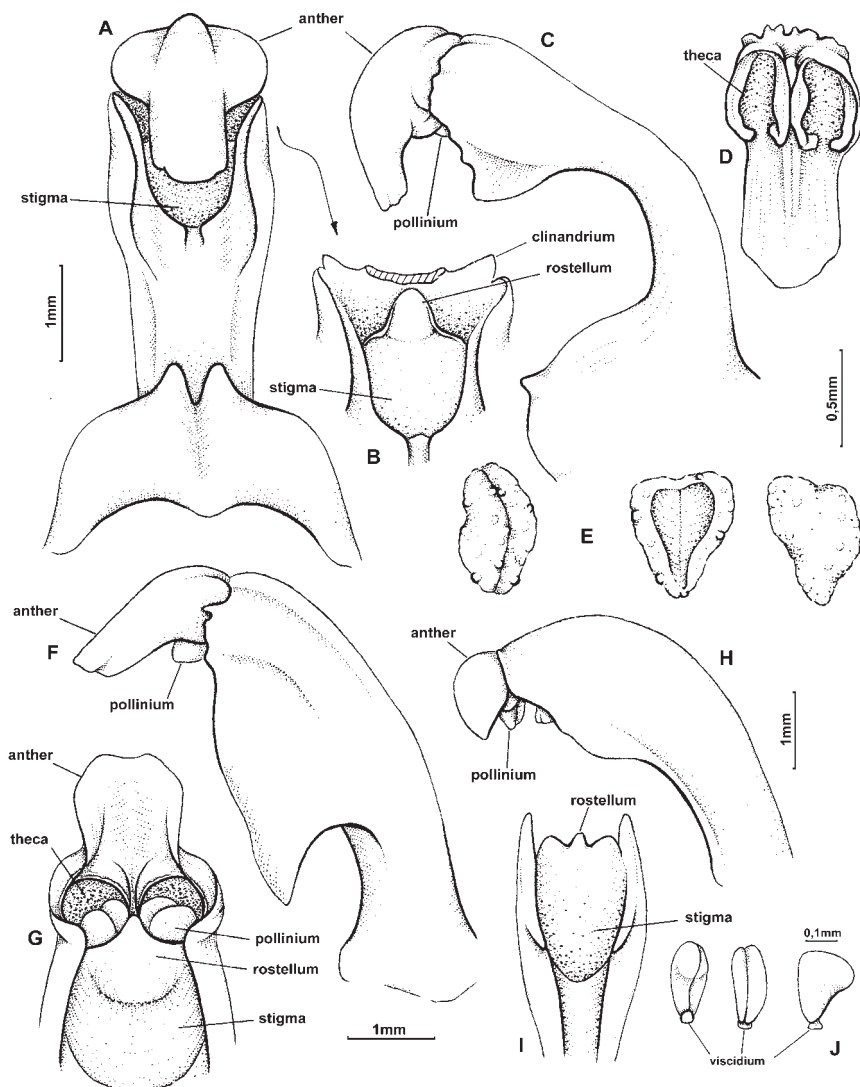


Fig. 78.—Gynostemium structure of *Liparis* L.C. Rich.: A, C, F, H — gynostemium side view; B, G, and — apical part of gynostemium, front view; D — anther; E, J — pollinia (Szlachetko & Margońska 2002).

- 3. Lip obovate in general outline, widest above the middle ..... 4
- Lip orbicular, transversely elliptic or rhomboid in general outline, widest near or below the middle ..... 5
- 4. Plants large, usually more than 25 cm tall. Leaves 2-10 cm wide. Inflorescence (10)20-40 or more –flowered ..... **3. *L. nervosa***
- Plants small, up to 15 cm tall. Leaves up to 1(1.7) cm wide. Inflorescence 3-10(20)-flowered ..... **2. *L. epiphytica***
- 5. Lateral sepals connate in the basal quarter or fifth only ..... **4. *L. platyglossa***
- Lateral sepals connate almost to the apex ..... ***L. sp. 1***

**1. *Liparis caillei* Finet in Bull. Soc. Bot. France 56: 97, tab. 1. 1909**  
(Fig. 79)

TYPE: GUINEA. *Caille s.n.* (HOLOTYPE: P!; DRAWING: UGDA-DLSz)

Pseudobulbs 1.3-2 cm long, 0.6-0.7 cm in diameter, ovoid to conical, flattened, with 2-3 sheathing leaves in the lower part and 2-4 larger leaves above, leaves distichously arranged. Leaves subsessile, 1.8-3.6 cm long, 0.9-1.3 cm wide, oblong-lanceolate to obovate, acute to shortly apiculate, margins crisped, thin-textured, delicate. Inflorescence terminal, 8-25 cm long, dependent, with 1-3 sterile flowers at the base and 6-15 flowers above, 8-15 mm apart, peduncle narrowly 4-winged at base, becoming 3-winged and wider (5-6 mm) towards apex, glabrous. Flowers small, nonresupinate, pale orange to brownish yellow, with green nerves on the lip. Floral bracts 3-4 mm long, linear, acuminate, membranous. Pedicel and ovary 0.8-3 mm long, straight, slender, glabrous. Dorsal sepal 5.5-10 mm long, 1.1-1.5 mm wide, oblong-lanceolate, acute to acuminate, margins revolute, thin, delicate, glabrous. Petals 8-14 mm long, 0.75 mm wide at base, 0.25-0.5 mm wide in the middle, linear to filiform, obtuse, thin, delicate, glabrous, margins revolute. Lateral sepals 3.5-5 mm long, 1.5-2.25 mm wide, semi-elliptic to reniform, acute to uncinat, thin, delicate, glabrous, margins flat. Lip 3.5-5 mm long, 2.6-3.6 mm wide, broadly obcordate-obovate to nearly pandurate, rather thin, delicate, glabrous, distinctly bilobed at apex, often with small apiculus between lobes, narrowing towards the basal, rudimentary auricles. Callus 3-lobed, obscure. Gynostemium 3-5 mm long, slender, slightly arcuate at apex.

HABITAT. Epiphyte in forests with

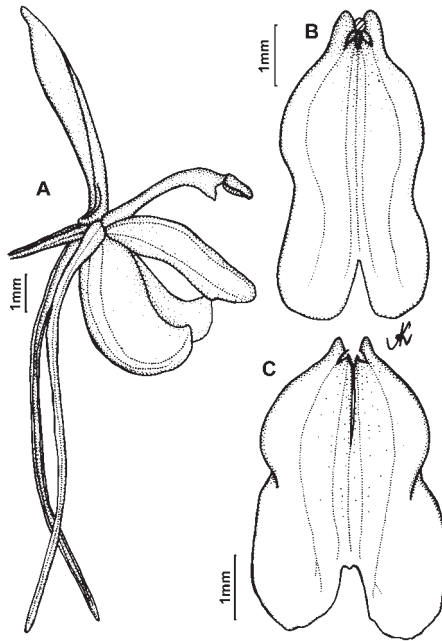


Fig. 79.—*Liparis caillei* Finet: A – flower; B, C – lip  
(drawn by A. Kowalkowska, *Caille s.n.*, P).

*Uapaca togoensis* Pax, in humid forests, swampy forests, often overhanging rivers. June.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Nigeria, Cameroon, Uganda.

REPRESENTATIVE SPECIMENS. Tiapleu (Liepleu), Moyene Cavally, June 1976, *Pérez-Vera* 889 (K!).

**2. *Liparis epiphytica* Schltr. in Bot. Jahrb. Syst. 38: 6. 1905**  
(Fig. 80)

TYPE: CAMEROON or CONGO (?) *Schlechter* 12694 (HOLOTYPE: B†; ISOTYPES: BR, K!, P!; DRAWING: UGDA-DLSz).

*Liparis lloydii* Rolfe in Bull. Misc. Inform. Kew. 1906: 31. 1906; TYPE: CALABAR. *Lloyd* 3 (HOLOTYPE: K!)

Pseudobulbs up to 1.2 cm long and 0.2-0.4 cm in diameter, ovoid, in close proximity on a short rhizome, usually 4-leaved. Leaves 5-11 cm long, 0.6-0.9 mm wide,

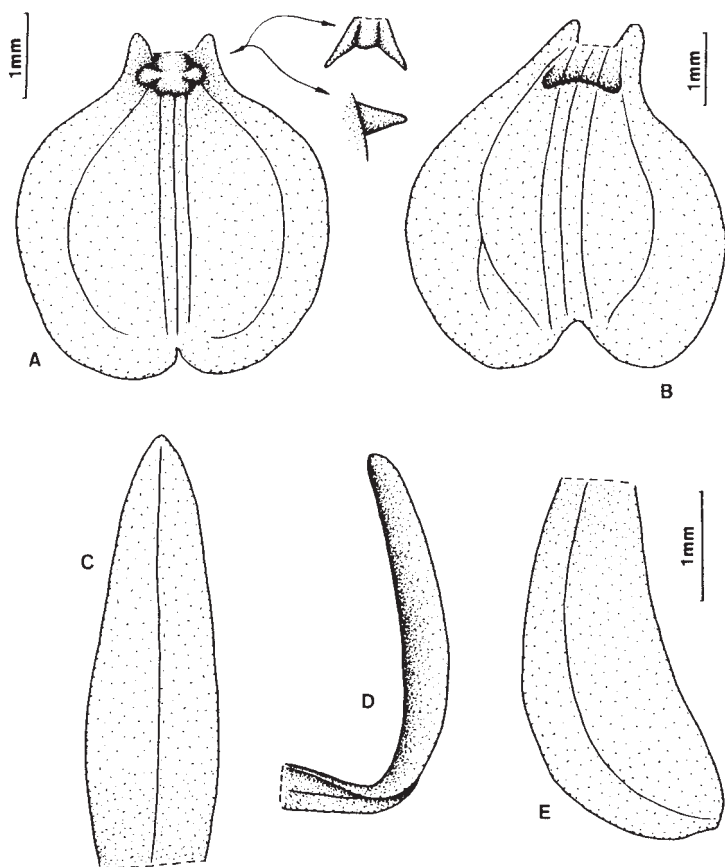


Fig. 80.—*Liparis epiphytica* Schltr.: A, B – lip; C – dorsal sepal; D – petal; E – lateral sepal (Szlachetko & Olszewski 2001a).

oblong-oblancheolate to oblong-elliptic, obtuse, with small apiculus, thin, delicate, basal 1-2 sheathing the pseudobulbs, upper 2-3 normal. Inflorescence 2.8-10 cm long, 2-20-flowered, lax, peduncle with few cauline bracts, rhachis winged. Flowers small, more or less resupinate, pale yellowish green. Floral bracts 2.8-6 mm long, ovate, acute, shortly auriculated at base, thin, glabrous, delicate. Pedicel and ovary up to 10 mm long, slender, glabrous. Dorsal sepal 4.5-6.1 mm long, 0.6-1.2 mm wide, linear to oblong-lanceolate, acute to subacute, thin, delicate, glabrous, single-nerved, margins revolute. Petals 4.5-6.4 mm long, 0.4-0.7 mm wide, filiform, subacute, thin, glabrous, single-nerved, margins revolute. Lateral sepals 3.7-4.5 mm long, 1.8-2.2 mm wide, semi-elliptic to obliquely elliptic-obovate, falcate, subobtusate, thin, delicate, glabrous, obscurely 2-nerved, margins revolute. Lip 3.8-4.9 mm long, 2.7-4.2 mm wide, broadly obovate to obcordate, fleshy, rounded or slightly notched at apex, margins entire, basal lip auricles short. Callus short, fleshy, obscurely bi-lobed. Gynostemium 3.3-4.2 mm long, arcuate, broader winged at apex.

HABITAT. Epiphytic in crowns of large forest trees. September.

DISTRIBUTION. Ivory Coast, Nigeria, Cameroon, Gabon, Democratic Republic of Congo (Zaire), Uganda, Rwanda. Alt. 600-2440 m.

REPRESENTATIVE SPECIMENS. Mt. Tonkoui, NW of Man, 17 Sep. 1975, *van der Burg 1047* (WAG!).

**3. *Liparis nervosa***  
(Thunb.) Lindl. in Gen  
Sp. Orchid. Pl.: 26.  
1830  
(Fig. 81)

*Ophrys nervosa* Thunb. in Fl.  
Jap. (Thunberg): 27. 1784;  
TYPE: JAPAN. *Thunberg s.n.*  
(LECTOTYPE: G)

*Liparis guineensis* Lindl. in  
Edwards's Bot. Reg. 20: t.  
1671. 1834; TYPE: SIERRA  
LEONE. *Whitfield s.n.*  
(HOLOTYPE: K!)

*Liparis nyassana* Schltr. in  
Bot. Jahrb. Syst. 53: 560.  
1915; TYPE: TANZANIA.  
*Stolz 1124* (HOLOTYPE: B†;  
ISOTYPES: K!, W!; DRAWING:  
UGDA-DLSz)

Pseudobulbs 2-3.2 cm long, up to 1.3 cm wide, conical-cylindrical to fusiform. Leaves 3-5, of them 1-3 small, basal, sheath-like, the upper 2-3, subsessile to petiolate; petiole up to 8 cm long, ribbon-like; blade up to 35

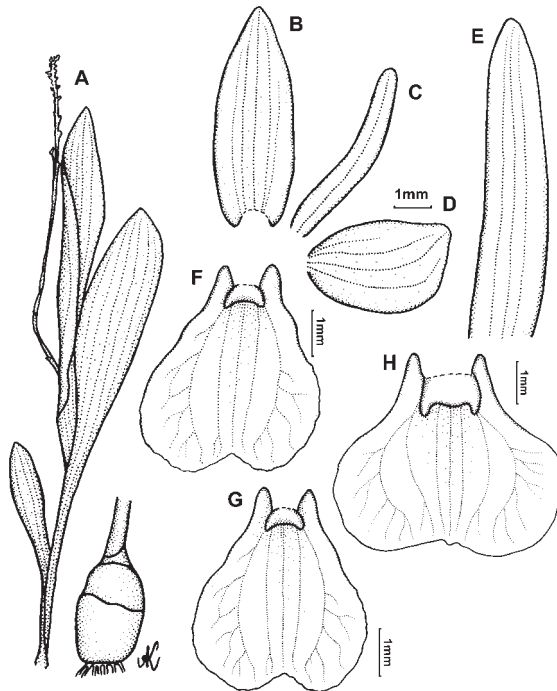


Fig. 81.—*Liparis nervosa* (Thunb.) Lindl.: A – habit; B – dorsal sepal; C, E – petal; D – lateral sepal; F–H – lip (drawn by A. Kowalkowska, A – *Schlechter 12815*, P; B–H – *Chevalier 24193*, P).

cm long, up to 7.5 cm wide, lanceolate, linear-lanceolate, oblong-oblancheolate, oblong-obovate to oblong-elliptic, acute or subobtusate, erect to suberect, plicate. Inflorescence up to 70 cm long, 10-40-flowered, dense to relatively lax, peduncle with few sheathing cauline bracts, rhachis narrowly winged. Flowers small, resupinate, green, yellowish green or yellow, tinged brown or purple, or not. Floral bracts 3.2-8 mm long, ovate-lanceolate, acute, shortly auriculated basally, thin, delicate, glabrous. Pedicel and ovary 7-12 mm long, slender, glabrous. Dorsal sepal 5.2-7 mm long, 1.5-2.4 mm wide, oblong-lanceolate, oblong-obovate to oblong, obtuse, thin, delicate, glabrous, 5-nerved, margins revolute. Petals 4.7-6 mm long, 0.6-1.2 mm wide, linear to linear-oblancheolate, obtuse, delicate, thin, glabrous, 1-3-nerved, margins revolute. Lateral sepals 3.6-5.2 mm long, 2-3 mm wide, obliquely elliptic-obovate to elliptic-oblong, obtuse, thin, delicate, glabrous, 3-5-nerved, margins revolute. Lip 2.5-5 mm long, 2.5-4.7 mm wide, broadly obovate to obcordate, fleshy, rather thick, apical margin crenulate to nearly entire, basal auricles short to prominent. Lip callus deeply bilobed, fleshy, curved down. Gynostemium 2.3-3.8 mm long, arcuate, narrowly winged.

**HABITAT.** Terrestrial in marshy grasslands, periodically inundated and fire-swept swamps, in standing water, *Setaria sphacelata* (Schum.) Stapf & C.E. Hubb. wet meadow with *Ascolepis* sp., *Hyparrhenia* sp., etc., lowland rain forest, secondary forests, savanna with *Daniellia* sp. and *Lophira* sp., savanna grazed by cattle, lithophyte on rocky river banks, epiphyte up to 2.5 m on palm trunk, in full sun and in shade. May-October.

**DISTRIBUTION.** Senegal, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Benin, Nigeria, Cameroon, São Tomé, Equatorial Guinea (Mbini, Pagalu), Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Rwanda, Burundi, Tanzania, Zambia, Malawi, Zimbabwe, India, Indochina, Malaysia, Philipines, Japan, Antilles, Costa Rica, Venezuela, Colombia, Galapagos, Peru, Brasil, Paraguay. Alt. 900-1800 m.

**REPRESENTATIVE SPECIMENS.** Near Adiopodoumé, 17 km W of Abidjan, 12 July 1965, *Leeuwenberg* 4581 (K!, WAG!); Near Adiopodoumé, 17 km W of Abidjan, 12 July 1962, *de Wilde* 458 (WAG!); Cercle du Baoulé-Nord, Kodiokoffi, between Tiéguualero (Ciéguualero) and Kodiokoffi, 8 Aug. 1909, *Chevalier* 22346 (P!); Danané, Sep. 1955, *Nozeran s.n.* (P!); Daloa-Vavoua road (km 25), 7 July 1974, *Pérez-Vera* 637 (K!); The Issia Rock (Rocher d'Issia), 24 Aug. 1956, *de Wilde* 421 (WAG!); Lamto Reserve, 50 km S of Toumodi, 12 June 1968, *Bokdam* 2748 (WAG!); Orumboka, 40 km S of Toumodi, 12 June 1968, *Bokdam* 2781 (K!, WAG!); Mt. Orumbo-Boka, 31 May 1966, *Aké Assi* 8862 (K!); 27 June 1974, *Pérez-Vera* 654 (P!); SW of Oroumba-Boka, S of Toumodi, 3 Oct. 1956, *de Wilde* 662 (WAG!); Mt. Tonkouï, 14 Aug. 1954, *Boughey GC* 18215 (K!); 24 Aug. 1975, *van der Burg* 773 (WAG!); Aug. 1954, *Schnell* 6366 (P!); *Sine loc.*, 3 Oct. 1956, *de Wilde* 647 (WAG!).

#### 4. *Liparis platyglossa* Schltr. in Bot. Jahrb. Syst. 38: 152. 1906 (Fig. 82)

TYPE: CAMEROON. *Winkler* 240 (HOLOTYPE: B†; ISOTYPE: Z; DRAWING: K!)

*Liparis winkleri* Schltr. in Bot. Jahrb. Syst. 38: 153. 1906; TYPE: CAMEROON. *Stossel* 5b (HOLOTYPE: B†; DRAWING: K!)

Pseudobulbs 1-3 cm long, 0.6-0.8 cm in diameter, ovoid to conical-fusiform, clustered, covered by sheaths in the lower part and with 3-5 leaves at apex. Leaves subsessile to petiolate; petiole up to 4 cm long, rather narrow; blade 6-12 cm long, 1.7-5 cm wide, ovate to narrowly ovate or oblong-ovate, acute to shortly

apiculate, plicate, thin, delicate, suberect to erect. Inflorescence 5-24 cm long, 4-20-flowered, dense, peduncle stout, erect, with 6-10 ovate-lanceolate cauline bracts, rhachis winged. Flowers rather large to medium-sized, resupinate, greenish white lined on lip with purple or brown-red venation. Floral bracts up to 9.5(19) mm long, lanceolate-triangular, acute, auriculated at base, thin. Pedicel and ovary up to 10 mm long, slender, glabrous. Dorsal sepal 7.5-15 mm long, 2.2-4 mm wide, lanceolate to oblong-lanceolate, acute to subobtuse, thin, delicate, glabrous, margins revolute, nerves 5. Petals 7-15 mm long, 0.6-0.9 mm wide, linear, acute to obtuse, thin, delicate, glabrous, margins revolute, 3 nerves. Lateral sepals 6.6-14 mm long, 2.9-5 mm wide, obliquely ovate to obliquely oblong-elliptic, obtuse, thin, delicate, glabrous, with 5 nerves, connate in the basal quarter or fifth. Lip 5.7-12 mm long, 6.2-15 mm wide, transversely rhomboid in general outline, margins entire, obtuse, sometimes shallowly 3-lobed at apex, rather thick and fleshy, basal auricles prominent. Callus small, obscurely bi-lobed at apex. Gynostemium 4.5-5 mm long, arcuate, narrowly winged.

HABITAT. Epiphyte in rain forest.

#### DISTRIBUTION.

Equatorial Guinea (Bioko), Ivory Coast, Nigeria, Cameroon, Democratic Republic of Congo (Zaire), Uganda. Alt. 1300-2650 m.

REPRESENTATIVE SPECIMENS. Mt. Tonkouï, Pérez Vera 520 p.p. (P!).

#### 5. *Liparis tridens* Kraenzl. in Bot. Jahrb. Syst. 28: 162. 1900 (Fig. 83)

TYPE: CAMEROON. Zenker 1387 (HOLOTYPE: B†; ISOTYPES: BM!, K! DRAWING: UGDA-DLSz)

Stem elongate, swollen at base, forming a distinct pseudobulbs up to 1.3 cm long, 0.7 cm in diameter, ovoid. Leaves 3-7, distichously arranged, increase in size from small sheaths at the

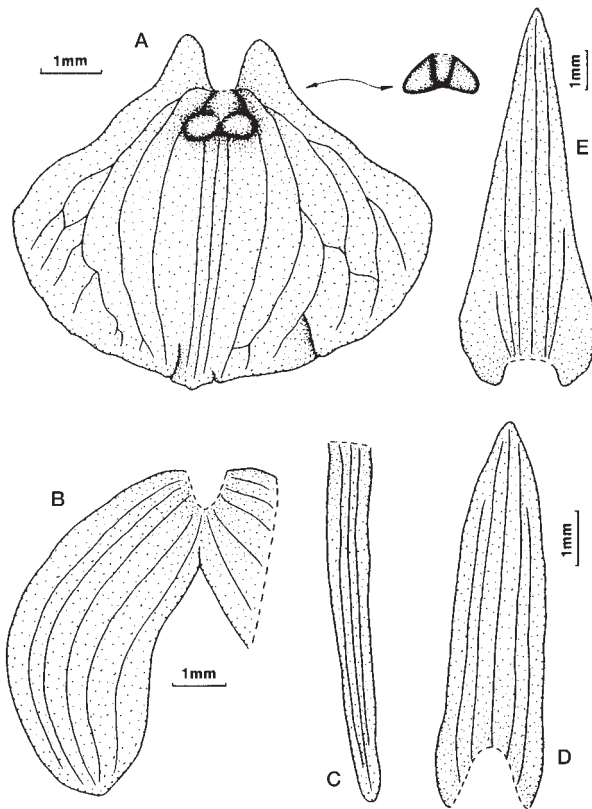


Fig. 82.—*Liparis platyglossa* Schltr.: A — lip; B — lateral sepal; C — petal; D — dorsal sepal; E — floral bract (Szlachetko & Olszewski 2001a).



base of pseudobulbs to the largest near the apex, shortly petiolate; blade 3-7.5 cm long, 0.9-1.4 cm wide, oblong-lanceolate to oblong-obovate, acute to obtuse, undulate on margins, thin, delicate. Inflorescence 5-6.5(10) cm long, terminal, 9-15(23)-flowered, lax or relatively dense, peduncle with single sheathing cauline bracts. Flowers small, resupinate, greenish-yellow. Floral bracts 3-7 mm long, ovate-lanceolate, acute to acuminate, shortly auriculated at base, thin, delicate. Pedicel and ovary 5.5-7 mm long, slender, glabrous. Dorsal sepal 2.5-3 mm long, 1-1.3 mm wide, oblong-ovate, obtuse or acute, thin, slightly convex, glabrous, 1-nerved. Petals 2.8-3 mm long, 0.3-0.5 mm wide, linear, acute or obtuse, thin, delicate, glabrous. Lateral sepals 2.8-3.5 mm long, 1.4-2 mm wide, rhomboid or obliquely oblong-ovate, acute to obtuse, thin, delicate, slightly convex, glabrous, 3-nerved. Lip 3.5-5 mm long, 2-2.3 mm wide, rather thin, delicate, glabrous, 5-nerved, distinctly 3-lobed in the basal third; the middle lobe the longest 2.5-4 mm long, 0.7-0.75 mm wide, ovate-lanceolate, apiculate, margins incurved, sharply reflexed upwards halfway along its length; sidelobes distinctly shorter than the middle one, obliquely ovate-lanceolate to rhomboid, acute to sub-

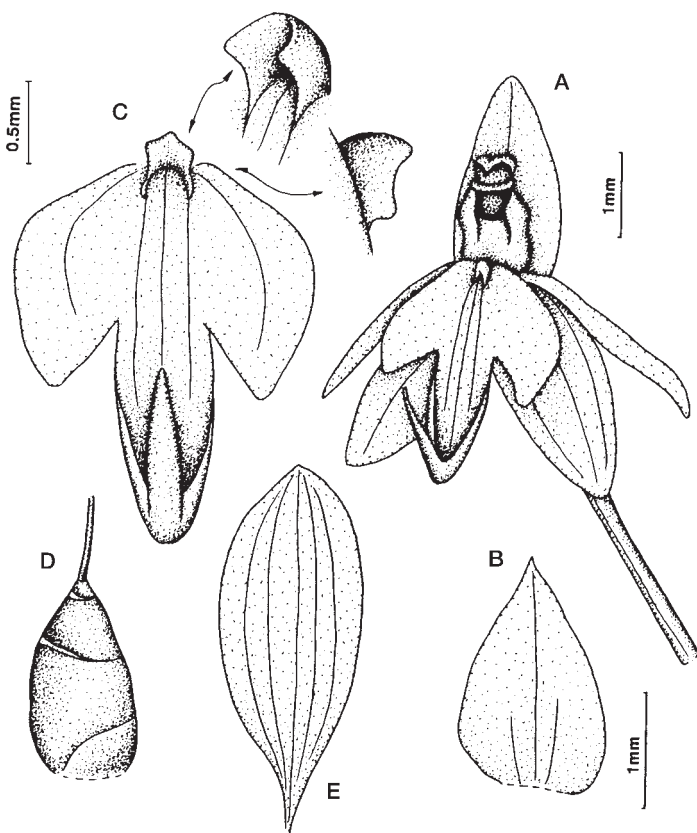


Fig. 83. - *Liparis tridens* Kraenzl.: A - flower; B - floral bract; C - lip; D - pseudobulb E - leaf (Szlachetko & Olszewski 2001a).



acute. Basal lip callus small, obscurely bi-lobed, curved down. Gynostemium 1.5-1.8 mm long.

HABITAT. Epiphyte on trees and tree ferns in wet places, woodlands with *Brachystegia* sp., *Uapaca* sp. and *Anogeissus* sp..

DISTRIBUTION. Equatorial Guinea (Bioko), Ivory Coast, Nigeria, Cameroon, Equatorial Guinea, Gabon, Uganda, Tanzania, Malawi. Alt. 300-1800 m.

NOTES. I have not examined any material of this species from Ivory Coast, but it was collected by Aké Assi (sub 6027) in Cavally, Tiapleu (Liapleu), and given by Summerhayes (1968b).

#### INCERTAE SEDIS

##### **Liparis sp. 1** (Fig. 84)

The specimens cited below differ from *L. platyglossa* in having lateral sepals connate almost to their apices and strongly purple-veined lip seen even on the dried plants.

REPRESENTATIVE SPECIMENS. Mt. Tonkouï, Aké Assi 5627 (K!); Aug. 1973 & 31 May 1974, Pérez-Vera 520 p.p. (K!).

#### **29. Lisowskia** Szlach. in *Fragm. Flor. Geobot.*, Suppl. 3: 121. 1995

Small terrestrial plants with thickened underground tubers or fusiform pseudobulbs above the ground. Leaves plicate, thin-textured, sessile to shortly petiolate, ovate or elliptic, acute. Inflorescence terminal, elongate, many-flowered. Flowers small to tiny, resupinate. Sepals and petals spreading, dissimilar, sepals wider and longer than linear petals. Lip with large, basal and rather fleshy auricles, directed towards the gynostemium, with the central or lateral thickening(s). No column foot. Gynostemium, short, erect, massive. Anther erect to suberect, motile, 2-chambered. Connective rather narrow, short. Pollinia 4, unequal in size, ovoid to ellipsoid, laterally flattened. No caudicles. Stigma oval, deeply concave. Rostellum triangular with apex up-curved, producing 2, well-separated viscidia (Fig. 85)

A genus of c. 4 species in tropical Africa and 1 in Madagascar.

##### **1. Lisowskia katangensis** (Summerh.) Szlach. in *Fragm. Flor. Geobot.*, Suppl. 3: 121. 1995 (Fig. 86)

*Malaxis katangensis* Summerh.

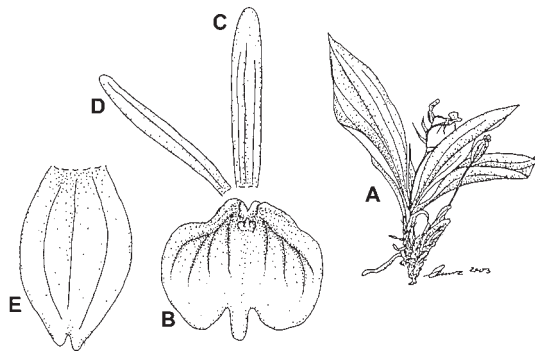


Fig. 84.—*Liparis* sp. 1: A – habit; B – lip; C – dorsal sepal; D – petal; E – lateral sepal (Olszewski, mscr., Pérez-Vera 520, P).

in Bot. Mus. Leaf. 14: 221. 1951; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *von Hirschberg 152* (HOLOTYPE: K!; ISOTYPE: BR)

Rhizome creeping, swollen, tuberous, subterranean. Pseudobulbs lacking, secondary stem up to 2 cm long, 2(3)-leaved. Leaves up to 6 cm long and 5 cm wide, sessile, prostrate or spreading, suborbicular, ovate, elliptic, obtuse, thin-textured. Inflorescence up to 14 cm long, up to 35-flowered, rather dense, peduncle with few cauline bracts. Flowers small, resupinate, adnate to the inflorescence axis, translucent, pale green or pale green-yellow, turning orange with age. Floral bracts 2-4 mm long, triangular lanceolate to ovate-lanceolate, acuminate, thin, delicate, glabrous. Pedicel and ovary up to 3 mm long, swollen in the apical half. Dorsal sepal 2-2.4 mm long, 1-1.4 mm wide, elliptic-lanceolate to elliptic-oblong, obtuse, thin, delicate, glabrous, slightly convex, 1-nerved. Petals 1.5-2.2 mm long, 0.3-0.7 mm wide, falcate linear-lanceolate, obtuse to subacute, thin, delicate, glabrous, slightly convex, 1-nerved. Lateral sepals 1.7-2.2 mm long, 1.2-1.5 mm

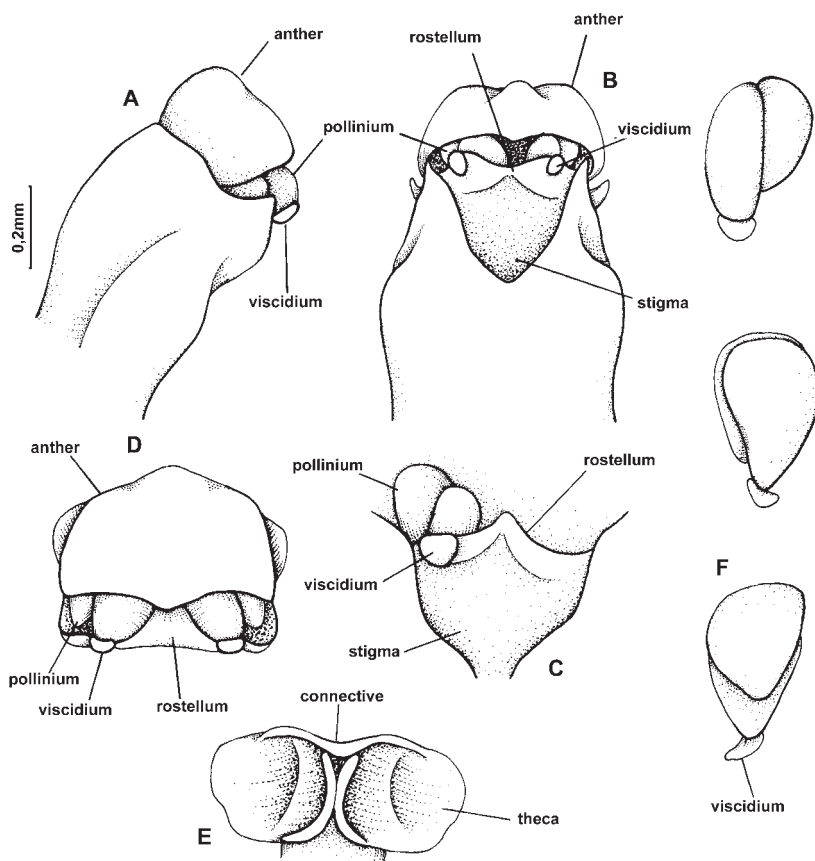


Fig. 85.—Gynostemium structure of *Lisowskia* Szlach.: A – gynostemium side view; B – gynostemium bottom view; C – rostellum and stigma; D – gynostemium front view; F – pollinia various views (Szlachetko & Margońska 2002).

wide, obliquely elliptic to elliptic-ovate, obtuse, thin, delicate, glabrous, slightly convex, 1-nerved. Lip 1.5-2 mm long, 1.3-2 mm wide, obovate to subquadrate, truncate at apex, long-auriculated, rather thin, except auricles and central papillate callus of various size. Gynostemium 0.5-0.7 mm long.

**HABITAT.** Terrestrial in deciduous woodlands. July.

**DISTRIBUTION.** Ivory Coast, Sierra Leone, Nigeria, Cameroon, Central African Republic, Democratic Republic of Congo (Zaire), Rwanda, Burundi, Tanzania, Zambia, Malawi. Alt. 1200-1850 m.

**REPRESENTATIVE SPECIMENS.** Adiopodoumé, 5 July 1974, *Pérez-Vera* 652 (K!).

Tribe **Dendrobieae** Endl. in Gen. Pl.: 190. 1837

Pseudobulbs of several or one internode. Leaves duplicate. Inflorescence lateral. Lip hinged, saccate to spurred. Column foot prominent. Column short, erect, mostly massive. Apical clinandrium usually reduced forming a kind of collar-like structure, in most species finger-like stelia. Rostellum usually short, truncate, erect. Viscidia of different types sometimes present. Hamulus occasionally and tegula-like structure exceptionally can be found. Anther bent forward, motile, 2- to 4-chambered. Pollinia 2 or 4, parallel, laterally compressed, equal or very unequal in size.

Pantropical group with most of the member known from Australasia. Dendrobieae can be divided into 4 subtribes, of which only Bulbophyllinae are known from Ivory Coast.

Subtribe **Bulbophyllinae** Schltr. in Orchideen: 319. 1915

Pseudobulbs of single internode. Single or sometimes 2 leaves present. Flowers usually small, resupinate. Usually prominent stelia

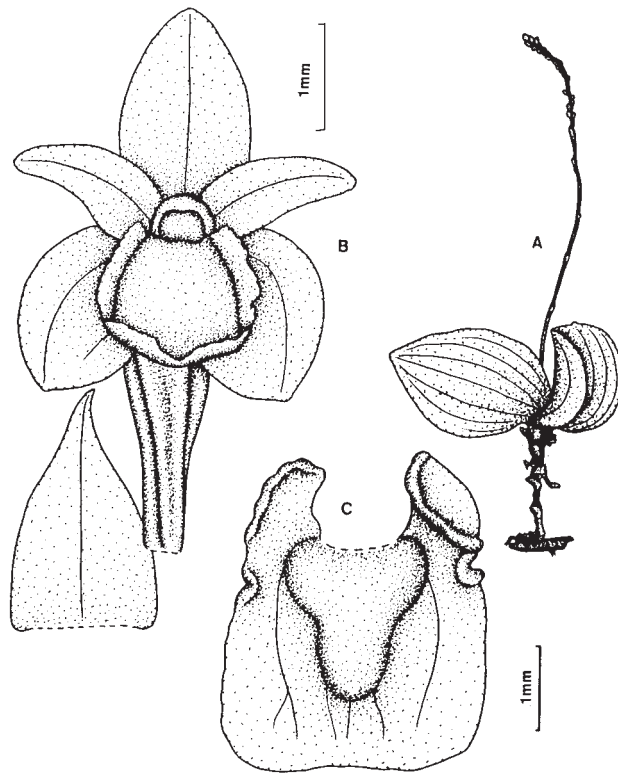


Fig. 86.—*Lisowskia katangensis* (Summerh.) Szlach.: A – habit; B – flower; C – lip (Szlachetko & Olszewski 2001a).

are present. Rostellum truncate, fleshy. Viscidium semi-liquid or cellular, single, sometimes very large. Small, finger-like hamulus present in some species of *Bulbophyllum*. Pollinia usually 4, very unequal in size in many species, though sometimes 2.

A large subtribe consisting of c. 20 genera occurring mostly in Australasia, with the only representative in Cameroon being *Bulbophyllum* Thouars. Two generic concepts presenting quite different generic delimitations have been published in the recent years by Vermeulen (1987) and Garay & al. (1994).

### 30. *Bulbophyllum* Thouars in Hist. Orchid.: tab. gen., figs. 93-97. 1822

Rhizome creeping, branched or not. Pseudobulbs single-nodal, clustered or well-spaced along the rhizome, usually apically single-, but sometimes 2-3-leaved. Leaves coriaceous or fleshy, duplicate. Inflorescence at the base of pseudobulbs, few- to many-flowered. Rhachis sometimes flattened or swollen. Flowers usually small, resupinate. Sepals and petals dissimilar, lateral sepals united with the column foot forming a prominent mentum. Lip usually smaller than sepals, hinged at the column foot apex, motile, fleshy, thick, usually tongue-like to oblong, often adorned with long hairs. Column foot prominent, usually long, massive, upcurved towards the apex. Gynostemium short, massive. Anther bent forward, motile, 2-chambered. Connective fleshy, thick, often with long hairs or papillate. Pollinia usually 4 in 2 pairs, equal or very unequal in size, sometimes only 2, laterally flattened, ellipsoid or ovoid in general outline. Stigma oval or elliptic, deeply concave. Rostellum truncate, short, erect or suberect. Viscidium single, if any, usually thick, fleshy, sticky. Neither caudicles nor tegula present (Fig. 87)

A very large genus including over 1000 species widely distributed in tropical and subtropical parts of New and Old World. About 70 species in Africa mainland. In the recent revision of continental African *Bulbophyllum*, Vermeulen (1987) did not propose any formal infrageneric classification of the genus. Cribb (1984), from another hand, accepted sectional division of *Bulbophyllum* proposed by Summerhayes (1935) stated, however, that it is still far from satisfactory.

#### KEY TO THE SPECIES

1. Lip with hairs along margins, hairs as long as width of the lip or longer ..... 1
- Lip papillate or shortly ciliate along margins, but hairs distinctly shorter than half of the lip width, or lip entirely glabrous ..... 7
2. Pseudobulbs 2-leaved ..... **6. *B. cochleatum***
- Pseudobulbs 1-leaved ..... 3
3. Lip linear in the lower part, broadly ovate or elliptic above ..... **27. *B. phaeopogon***
- Lip linear or lanceolate in general outline, gradually tapering towards the apex ..... 4
4. Lower floral bracts ca. 15 mm or longer ..... **35. *B. schinzianum***
- Lower floral bracts up to 13 mm long ..... 5
5. Petals inconspicuous, less than 1 mm long. Lip covered by apically thickened hairs ..... **1. *B. barbigerum***
- Petals longer. Lip hairs not thickened apically ..... 6

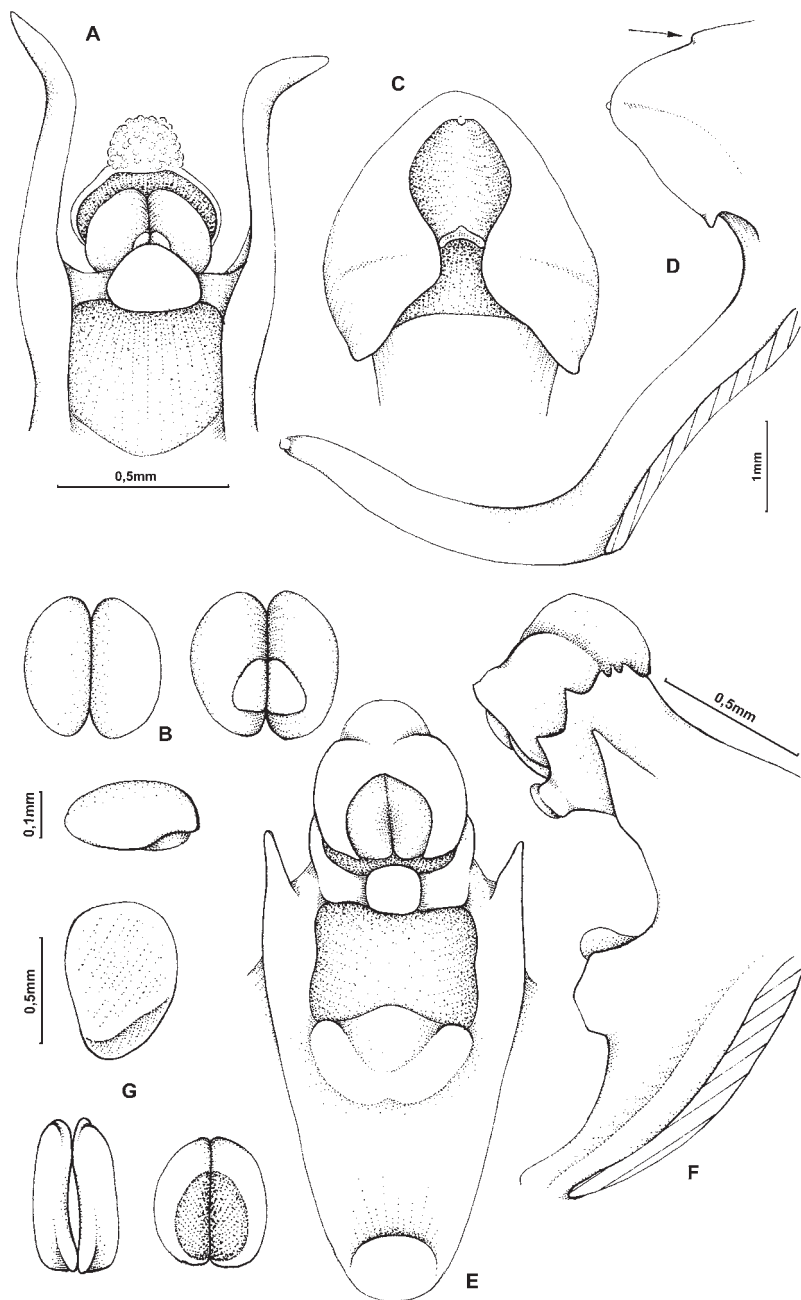


Fig. 87.—Gynostemium structure of *Bulbophyllum* Thouars: A, E — gynostemium bottom view; B, G — pollinia various views; C — rostellum remnant front view; D, F — gynostemium side view (Szlachetko & Margońska 2002).

- 6. Hairs gathered at the lip apex, directed towards the lip base ..... **13. B. finetii**  
 – Hairs along the lip margins, just above its basal third, widely divergent ..... **32. B. saltatorium**
- 7. Rhachis distinctly flattened ..... 8  
 – Rhachis not flattened ..... 20
- 8. Floral bracts as wide as rhachis ..... 9  
 – Floral bracts distinctly narrower than rhachis ..... 11
- 9. Petals as long as dorsal sepal, filiform, swollen at apex ..... **36. B. stenopetalum**  
 – Petals shorter than dorsal sepal, linear to obliquely lanceolate ..... 10
- 10. Floral bracts prominent, large, broadly ovate-triangular. Petals obliquely ovate to lanceolate. Dorsal sepal oblong-elliptic ..... **20. B. magnibracteatum**  
 – Floral bracts inconspicuous. Petals linear falcate. Dorsal sepal linear-lanceolate ..... **33. B. scaberulum**
- 11. Dorsal sepal oblong-obovate or oblanceolate in general outline, widest and distinctly thickened in the apical half, often obtuse ..... 12  
 – Dorsal sepal oblong, ovate or lanceolate, widest near the base, not thickened in the apical half, usually acute ..... 16
- 12. Petals obtuse to subobtuse ..... 13  
 – Petals acute to acuminate ..... 15
- 13. Stelidia very short, bi-lobed. Lip as long as wide in natural position .... **11. B. falcatum**  
 – Stelidia triangular, unlobed. Lip longer than wide in natural position ..... 14
- 14. Dorsal sepal obtuse. Lateral sepals very oblique in the basal half .... **4. B. calyptratum**  
 – Dorsal sepal apiculate. Lateral sepals almost symmetric ..... **5. B. carnosilabium**
- 15. Petals linear-lanceolate, falcate. Dorsal sepal 2.3-6(7) mm long, obovate to obovate-lanceolate ..... **38. B. velutinum**  
 – Petals ovate to oblong-ovate. Dorsal sepal (6)6.5-8 mm long, spatulate ..... **3. B. bufo**
- 16. Floral bracts large, prominent. Basal lip margins fimbriate ..... **15. B. imbricatum**  
 – Floral bracts inconspicuous. Basal lip margins entire or papillate or minutely indented, but not fimbriate ..... 17
- 17. Flowers densely hairy outside ..... 18  
 – Flowers glabrous ..... 19
- 18. Pseudobulbs 2-leaved ..... **30. B. purpureorhachis**  
 – Pseudobulbs 1-leaved ..... **9. B. comatum**
- 19. Pseudobulbs 1-leaved. Dorsal sepal oblong-elliptic, apiculate ..... **8 B. colubrinum**  
 – Pseudobulbs 2-leaved. Dorsal sepal lanceolate, acute or apiculate ..... **21. B. maximum**
- 20. Pseudobulbs 2-leaved ..... 21  
 – Pseudobulbs 1-leaved ..... 31
- 21. Dorsal sepal widest above the middle, margins thickened in apical part ..... **38. B. velutinum**  
 – Dorsal sepal widest below the middle, margins not thickened ..... 22
- 22. Petals obliquely obovate to rectangular ..... 23  
 – Petals linear ..... 25
- 23. Petals with rounded apex ..... **34. B. scariosum**  
 – Petals apiculate to caudate at the apex ..... 24
- 24. Petals truncate with long cauda, longer than wide ..... **23. B. nigericum**  
 – Petals truncate, shortly apiculate, wider than long ..... **2. B. bidenticulatum**

- 25. Lip curved down ..... 26
  - Lip straight ..... 28
- 26. Lip greatly thickened apically ..... **25. B. oreonastes**
  - Lip flattened towards the apex ..... 27
- 27. Sepals not reflexed. Lip obtuse ..... **31. B. resupinatum**
  - Sepals strongly reflexed. Lip acute ..... **12. B. falcipetalum**
- 28. Floral bracts shorter than flowers ..... 29
  - Floral bracts longer than flowers ..... 30
- 29. Lip with distinct sidelobes at base ..... **14. B. fuscum**
  - Lip unlobed ..... **22. B. melinostachyum**
- 30. Column foot with a prominent transverse ridge ..... **37. B. tetragonum**
  - Column foot with no transverse ridge ..... **19. B. lupulinum**
- 31. Lip apiculate ..... **26. B. oxychilum**
  - Lip obtuse at apex ..... 32
- 32. Lip 3-lobed ..... **24. B. nigritianum**
  - Lip unlobed ..... 33
- 33. Lip oblong in general outline, ca. 4 times longer than wide ..... **17. B. ivorense**
  - Lip ca. twice as long as wide ..... 34
- 34. Lip more or less ciliate on margins ..... **16. B. intertextum**
  - Lip glabrous or papillate, but not ciliate ..... 35
- 35. Lateral sepals distinctly longer than dorsal one ..... **7. B. cocoinum**
  - Lateral sepals more or less as long as the dorsal one ..... 36
- 36. Lip widest at apex or equal in width in apex and base ..... **5. B. carnosisepalum**
  - Lip oblong or widest in the basal half. Petals oblong, occasionally ovate ..... 37
- 37. Dorsal sepals oblong-elliptic to oblong-lanceolate, widest near the middle. Lateral sepals distinctly saccate at the base ..... **29. B. pumilum**
  - Dorsal sepal triangular or triangular-lanceolate, widest at base. Lateral sepals more or less flat at the base ..... 38
- 38. Petals widest at base, ovate in general outline, obtuse ..... **29. B. pumilum**
  - Petals oblong elliptic to oblong obovate, subacute ..... 39
- 39. Stelidia longer than the column part ..... **28. B. pipio**
  - Stelidia shorter than column part ..... **18. B. josephi**

**1. *Bulbophyllum barbigerum* Lindl. in Edwards's Bot. Reg. 1942: 23. 1837**

TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!)

Pseudobulbs 1.5-3.5 cm long, 1.5-3 cm in diameter, 1-2.5 cm apart, orbicular to ellipsoid or slightly ovoid, distinctly flattened, 1-leaved. Leaf shortly petiolate; petiole up to 0.4 cm long; blade 3-13 cm long, 1.7-3 cm wide, narrowly elliptic to oblong-ovate, obtuse, coriaceous, thick. Inflorescence 7-18 cm long, 12-32-flowered, lax, rhachis not thickened. Flowers medium-sized, glabrous, sepals yellowish to greenish, often red-purple spotted or suffused, petals pale greenish, lip yellowish or greenish, red-purple marked, hairs at the base of the lip white, at the apex red. Floral bracts 6-10 mm long, ovate-oblong, acute to acuminate. Pedicel and ovary up to 15 mm long, erect, glabrous. Dorsal sepal 11-14 mm long, 2-4 mm wide, ovate- to linear-lanceolate, acute glabrous. Petals up to 0.8 mm long



and to 0.35 mm wide, rudimentary, obliquely ovate, subacute, glabrous. Lateral sepals 9-13.5 mm long, 2-3 mm wide, obliquely ovate-lanceolate, acuminate, widest at base, glabrous. Lip 8-11 mm long, 1-1.5 mm wide, linear-lanceolate in general outline, acute, thick, recurved at base, long hairs on the adaxial side form a dense tuft near the lip apex, below short hairs along margins. Gynostemium 3-3.5 mm long.

**HABITAT.** Epiphyte on trunks and in the crown of trees in evergreen and semi-deciduous primary forests. April, August, November.

**DISTRIBUTION.** Sierra Leone, Liberia, Guinea, Ivory Coast, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire). Alt. 0-900 m.

**REPRESENTATIVE SPECIMENS.** Banco, 24 Apr. 1979, *van Setten 358* (WAG!); Sanguiné, 9 Nov. 1966, *Aké Assi 9223* (K!); Tai, 23 Nov. 1973, *Pérez-Vera 106/D* (K!); *Sine loc.*, 21 Aug. 1978, *van Setten KS-211* (WAG!).

## 2. *Bulbophyllum bidenticulatum* J.J. Verm. in Bull. Jard. Bot. Belg. 54: 144. 1984

**TYPE:** SIERRA LEONE. *Morton & Gledhill 3157* (HOLOTYPE: K!; ISOTYPE: WAG)

Pseudobulbs 0.8-1.8 cm long, 0.4-0.9 cm in diameter, 0.7-2 cm apart, ovoid or ellipsoid to nearly orbicular, 2-leaved. Leaves 1.6-7 cm long, 0.4-0.7 cm wide, oblong-lanceolate to linear, nearly equally bilobed, rather thick, coriaceous. Inflorescence 5-10 cm long, rather laxly 6-20-flowered, rhachis slightly swollen and zigzag, glabrous. Flowers small, sepals pale purplish to white, petals white with dark purple spots, lip yellow, sometimes flowers white. Floral bracts 4.9-8 mm long, ovate to deltoid, acuminate. Pedicel and ovary 1-2 mm long, erect, glabrous. Dorsal sepal 3.9-4.5 mm long, 2.5-3.2 mm wide, ovate-elliptic, acute, involute at apex, glabrous. Petals 1.5-2 mm long and wide, rhomboid to obtriangular, truncate, shortly apiculate, glabrous. Lateral sepals 4-6 mm long, 2-2.3 mm wide, obliquely elliptic-lanceolate, apiculate, glabrous. Lip 1.5-1.7 mm long, 1-1.2 mm wide, almost pandurate in general outline, truncate, erect, rather thick, not recurved apically, glabrous to finely papillose. Gynostemium up to 2 mm long.

**HABITAT.** Epiphyte in lower montane forests, sometimes lithophyte on boulders in open vegetation. All year round.

**DISTRIBUTION.** Guinea, Liberia, Ivory Coast, Cameroon. Alt. 900-1200 m.

**REPRESENTATIVE SPECIMENS.** Mt. Tonkoui, 13 May 1958, *Aké Assi 5669* (K!); 4 Nov. 1973, *Pérez-Vera 542* (K!); Jan. 1950, *Schnell 4155* (P!); Mt. Tonkoui, SW of Man, 4 Mar. 1959, *Leeuwenberg 2969b* (WAG!).

## 3. *Bulbophyllum bufo* (Lindl.) Rehb. f. in Ann. Bot. Syst. 6: 258. 1864

*Megaclinium bufo* Lindl. in Edwards's Bot. Reg. 27: misc. 42. 1841; **TYPE:** SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!) - *Bulbophyllum falcatum* var. *bufo* (Lindl.) J.J. Verm. in Bull. Jard. Bot. Belg. 56: 235. 1986.

*Bulbophyllum longibulbum* Schltr. in Westafr. Kautschuk-Exped.: 281. 1901; **TYPE:** CAMEROON. *Schlechter 12893* (HOLOTYPE: B†; DRAWING: K!)

*Megaclinium deistelium* Kraenzl. in Bot. Jahrb. Syst. 33: 72. 1902; **TYPE:** CAMEROON. *Deistel s.n.* (HOLOTYPE: B†; DRAWING: K!) - *Bulbophyllum deistelium* (Kraenzl.) Schltr. in Bot. Jahrb. Syst. 38: 17. 1905.

*Megaclinium gentilii* De Wild. in Belgique Coloniale. 8: 425. 1902; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE) *Gentil 1-159* - 1902 (HOLOTYPE: BR)

*Bulbophyllum sereti* De Wild. in Bull. Jard. Bot. Etat. 5: 177. 1916; TYPE (*here designated*): DEMOCRATIC REPUBLIC OF CONGO (ZAIRE) *Seret 654* (LECTOTYPE: BR!) & *Boone 116* (PARATYPE: BR)

Pseudobulbs 3.5-8 cm long, up to 2 cm in diameter, narrowly oblong-ovoid, 2-leaved. Leaves shortly petiolate; blade 8.5-21 cm long, 1.3-4.5 cm wide, oblong-lanceolate, obtuse to subacute, thick, coriaceous. Inflorescence 11-40 cm long, many-flowered, very lax, scales on peduncle cup-like, widely opened, distinctly wider than the diameter of peduncle, slightly shorter than internodes, rachis 0.2-18 mm wide. Flowers small, sepals whitish with dark red dots, petals whitish with red-purple spots, lip whitish to red-purple. Floral bracts oblong-ovate, obtuse, reflexed. Pedicel and ovary ca. 4 mm long, arcuate. Dorsal sepal 6-8 mm long, 2.5-4 mm wide, spatulate, nearly elliptic above the basal third ribbon like part, obtuse, to shortly acuminate, thickened along margins above one third. Petals 1.5-2.5 mm long, 0.5-1 mm wide, obliquely oblong-ovate, subacute to subobtuse, not thickened in apical part. Lateral sepals 5-9 mm long, 3-7 mm wide, obliquely elliptic and concave at base, triangular above, acute, finely papillose outside. Lip 1.5-4 mm long, 1.2-3 mm wide, broadly ovate in general outline, obtuse, thick, recurved, glabrous. Gynostemium ca. 2.5 mm long.

HABITAT. Epiphyte in lowland and hill forests. October-January.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Equatorial Guinea, Democratic Republic of Congo (Zaire), Uganda. Alt. 0-800 m.

REPRESENTATIVE SPECIMENS. Mt. Momi, 30 Oct. 1966, *Aké Assi 9195* (K!); Mt. Momi, 40 km N of Danane, 30 Jan. 1984, *Hepper & Maley 7921* (K!); 30 Jan. 1984, *Hepper & Maley 7931* (K!); Nimbleu, 28 Oct. 1966, *Aké Assi 9138* (K!); *Aké Assi 9139* (K!); Mt. Tonkoui, Oct. 1973, *Pérez-Vera 492* (K!).

#### 4. *Bulbophyllum calyptratum* Kraenzl. in Bot. Jahrb. Syst. 22: 24. 1895 (Fig. 88)

TYPE: CAMEROON. *Preuss 1215* (HOLOTYPE: B†; ISOTYPES: BM!, P!; DRAWING: K!)

*Megaclinium lindleyi* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 43. 1898; TYPE: SIERRA LEONE?. *Loddiges s.n.* (HOLOTYPE: K!) - *Bulbophyllum lindleyi* (Rolfe) Schltr. in Orchideen: 327. 1914

*Megaclinium buchenavianum* Kraenzl. in Bot. Jahrb. Syst. 36: 115. 1905; TYPE: CAMEROON. *Zenker 2894* (HOLOTYPE: B†; ISOTYPE: G) - *Bulbophyllum buchenavianum* (Kraenzl.) De Wild. in Pl. Bequeart. 1: 106. 1921

Pseudobulbs 1.8-6 cm long, 0.7-2 cm in diameter, 1.3-5 cm apart, ovoid to ellipsoid, more or less flattened, 2-4-angled, 2-leaved. Leaves petiolate; petiole up to 2.5 cm long; blade 7.2-20 cm long, 0.5-1.6 cm wide, linear-lanceolate to linear, obtuse, thick, coriaceous. Inflorescence 22-47 cm long, 8-50-flowered, widened to flattened or sometimes terete, usually blade-like, glabrous. Flowers small, sepals whitish or greenish, sometimes red dotted or stained, dorsal sepal with yellow or brownish thickening, petals white, lip white to red, with or without red stains or dots. Floral bracts 2.5-7 mm long, ovate to oblong-ovate, acute to acuminate. Pedicel and ovary 4-7 mm long, erect to arched. Sepals more or less finely haired abaxially. Dorsal sepal 5-8.3 mm long, 2.2-4.3 mm wide, spatulate to obovate,

rounded, glabrous, distinctly thickened along the margins above the basal third or half. Petals 1.2-1.8 mm long, 0.3-0.7 mm wide, falcate oblong-ovate, to ovate-lanceolate, obtuse to subulate. Lateral sepals 3.8-8 mm long, 2.5-5 mm wide, basal part transversely elliptic, concave, apical part obliquely triangular, acute. Lip 1-2 mm long, 0.4-0.8 mm wide, oblong-ovate, rounded at apex, thick, glabrous, recurved. Gynostemium 0.8-2.1 mm long.

**HABITAT.** Epiphyte in lowland rainforests, semideciduous and lower montane forests, mangrove, secondary forests, plantations, for example cocoa.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire). Alt. 0-1100 m.

**VARIABILITY.** Vermeulen (1987) distinguishes 3 varieties in this species. All of them have been reported in Ivory Coast:

#### var. *calyptratum*

Dorsal sepal curved towards the rhachis only just after opening, pedicel and ovary 4-7 mm long.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Ghana, Nigeria, Cameroon, Gabon, Congo.

**REPRESENTATIVE SPECIMENS.** Dakpadou-Sago road, 5°58'W, 5°16'N, 28 Mar. 1968, *Geerling & Bokdam* 2273 (K!, WAG!); Mt. Momi, Apr. 1972, *Pérez-Vera* 231 (K!); Tiapleu, 30 Apr. 1966, *Aké Assi* 8826 (K!)

var. *graminifolium* (Summerh.) J.J. Verm. in Bull. Jard. Bot. Belg. 56: 235. 1986.

*Bulbophyllum graminifolium* Summerh. in Kew Bull. 1957: 117. 1957; TYPE: *Deighton* 5744 (HOLOTYPE: K!)

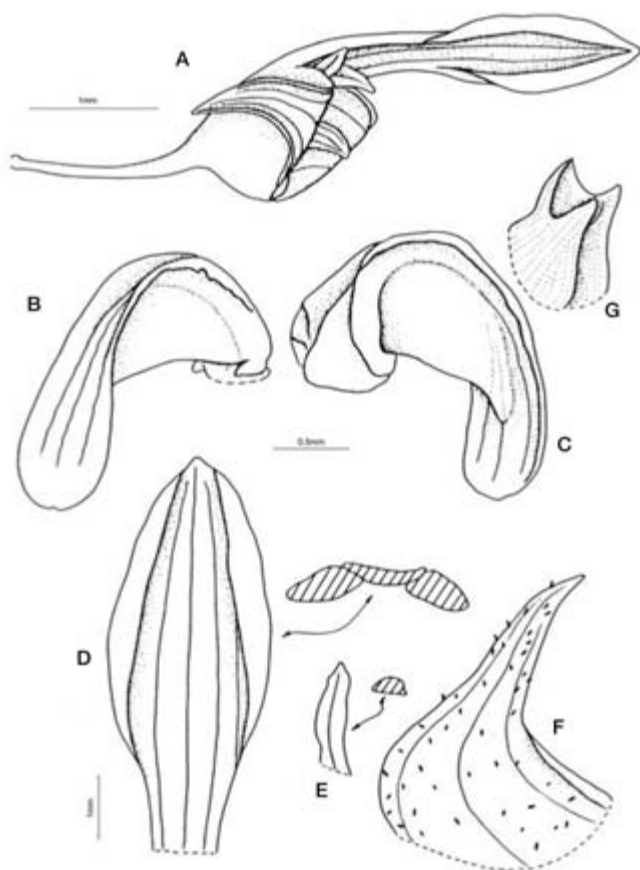


Fig. 88.—*Bulbophyllum calyptratum* Kraenzl.: A — flower; B — & C — lip various views; D — dorsal sepal; E — petal; F — lateral sepal; G — gynostemium (drawn by A. Kowalkowska, Zenker 2894, HBG).

Dorsal sepal curved towards the rhachis all the time the flower is open, pedicel and ovary up to 4 mm long, petals over 1.7 mm long.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea, Gabon, Congo.

REPRESENTATIVE SPECIMENS. Zague, Sep.-Nov. 1971, *Pérez-Vera* 240 (K!).

var. **lucifugum** (Summerh.) J.J. Verm. in Orchid. Monogr. 2: 131. 1987

*Bulbophyllum lucifugum* Summerh. in Kew Bull. 12: 119. 1957; TYPE: *Deighton* 4377 (HOLOTYPE: K!)

Pedicel and ovary up to 4 mm long, petals up to 1.5 mm long.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast.

REPRESENTATIVE SPECIMENS. Mt. Momi, 12 Feb. 1974, *Pérez-Vera* 213/B (K!); Mt. Nimba, 18 Feb. 1974, *Pérez-Vera* 567 (K!); Tiapleu, 27 Jan. 1974, *Pérez-Vera* 213 (K!)

**5. *Bulbophyllum carnosisepalum*** J.J. Verm. in Bull. Jard. Bot. Nat. Belg. 56: 236. 1986

TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Bruneel* s.n. (HOLOTYPE: BR)

Pseudobulbs 0.9-1.5 cm long, 0.4-1 cm in diameter, 0.4-0.8 cm apart, orbicular to ellipsoid, occasionally narrowly obovoid, 2-4-angled, 1-leaved. Leaf petiolate; petiole up to 9 mm long; blade 4-8.5 cm long, 0.8-1.6 cm wide, linear to linear-lanceolate, obtuse, thick, coriaceous. Inflorescence 4.8-7 cm long, 3-12-flowered, rather dense, rhachis slightly swollen and flattened, slightly zigzag, glabrous. Flowers small, greenish, often red-purple stained or entirely red-purple. Floral bracts 6.1-8 mm long, triangular, acute, glabrous. Pedicel and ovary 2-3 mm long, finely papillose or glabrous, erect. Dorsal sepal 5-5.8 mm long, 2.5-3.7 mm wide, ovate to oblong-ovate, acuminate to cuspidate, thick, finely papillose abaxially. Petals 2-2.2 mm long, 0.3-0.4 mm wide, linear to linear-lanceolate, subacute to obtuse, falcate or not, rather thin, glabrous. Lateral sepals 5-5.8 mm long, 2-2.5 mm wide, obliquely triangular, acuminate to cuspidate, finely papillose abaxially. Lip 1.6-2 mm long, 0.7-1 mm wide, broadly oblong to oblong in general outline, rounded at apex, thick, straight, glabrous, margins irregularly crenulate towards apex. Gynostemium 1.8-2.2 mm long.

HABITAT. Epiphyte in lowland to montane forests. October.

DISTRIBUTION. Ivory Coast, Cameroon, Gabon, Democratic Republic of Congo (Zaire), Uganda.

REPRESENTATIVE SPECIMENS. Yapo, 26 Oct. 1974, *Pérez-Vera* 714 (K!).

**6. *Bulbophyllum cochleatum*** Lindl. in J. Linn. Soc., Bot. 6: 125. 1862 (Fig. 89)

TYPE: EQUATORIAL GUINEA (BIOKO). *Mann* 643 (HOLOTYPE: K!)

*Bulbophyllum mannii* Hook. f. in J. Linn. Soc., Bot. 7: 219. 1864; TYPE (*here designated*): CAMEROON. *Mann* 1337 (LECTOTYPE: K!; ISOLECTOTYPE: W-R!; DRAWING: UGDA-DLSz) & *Mann* 2111 (PARATYPES: K!, W-R!)

*Bulbophyllum talboti* Rendle in Rendle & Baker, Cat. Pl. Oban: 100. 1913; TYPE: NIGERIA. *Talbot 931* (HOLOTYPE: BM!; ISOTYPE: K!)

*Bulbophyllum pholidotoides* Kraenzl. in Bot. Jahrb. Syst. 51: 383. 1914; TYPE: CAMEROON. *Ledermann 6168* (HOLOTYPE: B†)

*Bulbophyllum jungwirthianum* Schltr. in Notizbl. Bot. Gart. Berlin-Dahlem 8: 122. 1922; TYPE: CAMEROON. *Deistel s.n.* (HOLOTYPE: B†)

Pseudobulbs 0.7-1.1 cm long, 0.4-1.3 cm in diameter, 0.6-1.0 cm apart, cylindrical, slightly thickened at base, 2-leaved. Leaves petiolate; petiole up to 2.5 cm long; blade 2.8-23 cm long, 0.3-1.8 cm wide, narrowly oblong to linear, obtuse, coriaceous, rather thick. Inflorescence 7-55 cm long, 10-84-flowered, dense, with 3-12 scales, rhachis not thickened. Flowers rather small, glabrous, sepals and petals green, yellow or purple-red, lip dark purple-red. Floral bracts up to 12 mm long. Pedicel and ovary straight or slightly upcurved. Dorsal sepal 3.2-7.5 mm long, 1-4 mm wide, ovate to broadly ovate-lanceolate, acute. Petals 1-2.5 mm long, 0.2-0.8 mm wide, linear or linear-lanceolate, acute to obtuse. Lateral sepals 3-7.8 mm long,

1-3.2 mm wide, obliquely narrowly triangular, acute, reflexed. Lip 2.1-6.3 mm long, 0.3-1.6 mm wide, oblong-lanceolate or oblong-ovate above the linear basal part in general outline, widest near the middle or at base, acute, straight, margins ciliate, glabrous or papillose on the upper surface. Gynostemium 1-2.5 mm long.

**HABITAT.** Epiphyte in montane forests, riverine tropical rain forest and *Brachystegia-Uapaca* woodlands, on tree trunks, on bark and in the crown. Occasionally lithophytic.

**VARIABILITY.** Vermeulen (1987) distinguished 5 varieties in his very broad concept of *B. cochleatum*. In my opinion at least 2 of them - var. *tenuicaule* and var. *bequaertii* - deserve a species rank (cf. Szlachetko & Olszewski, 2001).

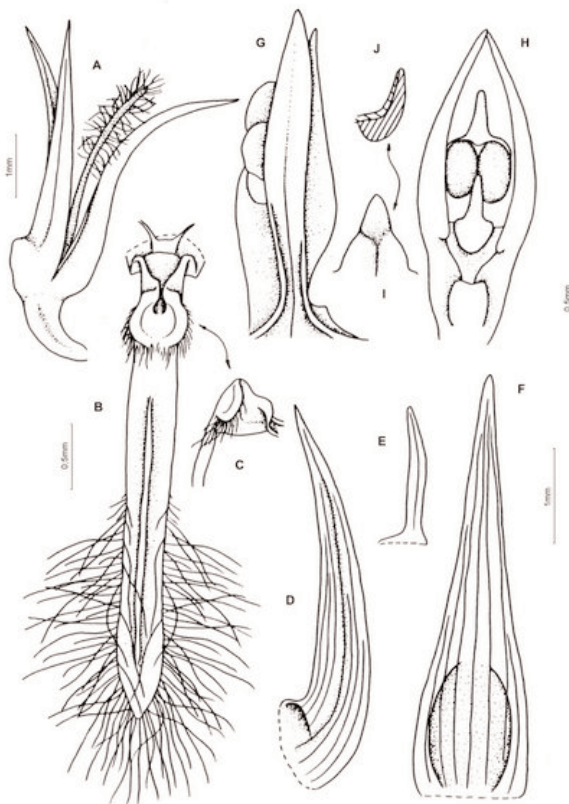


Fig. 89.—*Bulbophyllum cochleatum* Lindl.: A – flower; B – lip; C – lip base; D – lateral sepal; E – petal; F – dorsal sepal; G & H – gynostemium and petals, various views; I – rostellum; J – rostellum longitudinal section (drawn by A. Kowalkowska, Zenker 4735, HBG).

**var. cochleatum**

Mature pseudobulbs cylindrical, with smooth edges.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Nigeria, Cameroon, Equatorial Guinea, São Tomé and Príncipe, Gabon, Democratic Republic of Congo (Zaire), Sudan, Rwanda, Uganda, Kenya, Tanzania, Zambia, Malawi, South Africa. Alt. 500-2400 m.

REPRESENTATIVE SPECIMENS. Mt. Nimba, 8°25'W, 7°37'N, 14 Dec. 1967, *Geerling & Bokdam 1743* (WAG!); Mt. Tonkouï, NW of Man, *van der Burg 1075* (WAG!); *Sine loc.*, 27 Jan. 1967, *Aké Assi 9410* (K!)

**7. *Bulbophyllum cocoinum* Lindl. in Edwards's Bot. Reg. 23: pl. 1964. 1837**

TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!)

*Bulbophyllum andongense* Rchb. f. in *Flora* 48: 184. 1865; TYPE: ANGOLA. *Welwitsch 689* (HOLOTYPE: BM!; ISOTYPES: K!, W-R!)

*Bulbophyllum coriscense* Rchb. f. in *Otia Bot. Hamburg*. 2: 118. 1881; TYPE (*here designated*): WEST TROPICAL AFRICA. *Mann 1883* (LECTOTYPE: K!)

*Bulbophyllum vitiense* Rolfe in *Bull. Misc. Inform. Kew*. 1893: 5. 1893; TYPE: FIJI. *Yeoward s.n.* (HOLOTYPE: K!)

*Bulbophyllum brevidenticulatum* De Wild. in *Bull. Jard. Bot. Etat*. 5: 179. 1916; TYPE (*here designated*): DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Boone 105* (LECTOTYPE: BR!) & *Gentil s.n.* (PARATYPE: BR!)

Pseudobulbs 2-5 cm long, 1-2.7 cm in diameter, 1-3 cm apart, ovoid to narrowly ovoid, 3-4-angled, 1-leaved. Leaf petiolate; petiole 7-25 mm long; blade 9-27 cm long, 1.2-3.5 cm wide, lanceolate, occasionally broadly linear, acuminate to acute, coriaceous, thick. Inflorescence 9-38 cm long, 15-150-flowered, rather dense or lax, rhachis terete, glabrous. Flowers small, white, sepals often pink towards apex, lip white or cream-coloured. Floral bracts 3.5-5.5 mm long, narrowly elliptic to broadly lanceolate, acute, membranous, glabrous. Pedicel and ovary 1.5-3.5 mm long, slightly arcuate, glabrous. Dorsal sepal 6.7-12 mm long, 0.8-1.8 mm wide, narrowly triangular, ovate-lanceolate to broadly linear-lanceolate, acute or subacute, thin, glabrous. Petals 2-2.8 mm long, 0.4-0.8 mm wide, narrowly oblong to oblong-obovate, obtuse to acute, irregularly denticulate and finely papillose at apex. Lateral sepals 9-14 mm long, 1.5-2.5 mm wide, narrowly triangular to broadly linear-lanceolate, acute to acuminate, thin, glabrous. Lip 1.5-3 mm long, 0.8-1.2 mm wide, ovate to oblong-ovate, obtuse, rather thin, thickening towards base, recurved, glabrous, slightly papillose towards margins. Gynostemium 1.6-2.5 mm long.

HABITAT. Epiphyte on tree branches in lowland to lower montane forests. All year round.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Ghana, Cameroon, Central African Republic, Gabon, Democratic Republic of Congo (Zaire), Angola, Uganda. Alt. up to 2000 m.

REPRESENTATIVE SPECIMENS. Danané-Tiapleu road (km 3), 18 Oct. 1974, *Pérez-Vera 709* (K!); Between Guessabo and Duekoué, July 1972, *Pérez-Vera 241* (K!, P!); *Sine loc.*, 30 Jan. 1984, *Hepper & Maley 7932* (K!).



### 8. *Bulbophyllum colubrinum* (Rchb. f.) Rchb. f. in Ann. Bot. Syst. 6: 257. 1861

*Megaclinium colubrinum* Rchb. f. in Bonplandia 3: 223. 1855; TYPE (*here designated*): *Sine loc. Booth s.n.* (LECTOTYPE: K!; ISOLECTOTYPE: W!)

*Megaclinium imschootianum* Rolfe in Bull. Misc. Inform. Kew. 1895: 8. 1895; TYPE: GAND. *van Imshoort s.n.* (HOLOTYPE: K!). - *Bulbophyllum imschootianum* (Rolfe) De Wild. in Pl. Bequaert. 1: 86. 1921.

*Bulbophyllum gabunense* Schltr. in Bot. Jahrb. Syst. 38: 15. 1905; TYPE: GABON. *Schlechter 12819* (HOLOTYPE: B†)

Pseudobulbs 2.5-6.5 cm long, 1-1.9 cm in diameter, 2.7-6 cm apart, ellipsoid, 2-4-angled, 1-leaved. Leaf petiolate; petiole up to 1 cm long; blade 11-22 cm long, 1.4-3.6 cm wide, oblong to linear-lanceolate, obtuse, thick, coriaceous. Inflorescence up to 51 cm long, laxly 20-100-flowered, rhachis flattened and widened, blade-like, glabrous. Flowers small, yellowish to purple, sometimes spotted or stained with purple. Floral bracts 3.5-6 mm long, oblong to broadly-lanceolate. Pedicel and ovary 2.5-3.8 mm long, glabrous, erect. Dorsal sepal 6-10.8 mm long, 1.9-2.3 mm wide, oblong-lanceolate to linear-lanceolate, apiculate, glabrous. Petals 3-5 mm long, 1-1.9 mm wide, falcate, oblong-obovate to oblong-ob lanceolate, acute to acuminate, glabrous. Lateral sepals 5-8.5 mm long, 3.8-4.4 mm wide, obliquely semiovate to semi-elliptic, apiculate, glabrous. Lip 2.5-3 mm long, 1.4-1.7 mm wide, oblong-ovate in general outline, obtuse, thick, glabrous, margins entire to irregularly denticulate near the apex. Gynostemium 2-3.8 mm.

HABITAT. Epiphyte in lowland and lower montane forests. October-November.

DISTRIBUTION. Sierra Leone, Ivory Coast, Ghana, Nigeria, Cameroon, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola. Alt. up to 1000 m.

REPRESENTATIVE SPECIMENS. Banco, 24 Oct. 1974, *Pérez-Vera 713* (K!); *Sine loc.*, 16 Nov. 1967, *Aké Assi 9776* (K!); *Sine loc.*, 22 Oct. 1975, *van der Burg 1243* (WAG!); *Sine loc.*, 22 Oct. 1975, *van der Burg 1244* (WAG!).

### 9. *Bulbophyllum comatum* Lindl. in J. Linn. Soc., Bot. 6: 128. 1862

TYPE: CAMEROON. *Mann 642* (HOLOTYPE: K!)

Pseudobulbs 0.6-4 cm long, 0.5-2.2 cm in diameter, 1-3.5 cm apart, ovoid or ellipsoid to nearly orbicular, 1-leaved. Leaf 3-27 cm long, 1.2-5 cm wide, oblong-lanceolate to linear, acuminate, rather thick, coriaceous. Inflorescence 5-14 cm long, densely 25-65-flowered, rhachis distinctly swollen, spindle-shaped, glabrous or woolly. Flowers small, reddish. Floral bracts 7-12 mm long, ovate to broadly linear-lanceolate, acuminate. Pedicel and ovary 1.5-2 mm long, erect, with fine, ribbon-like hairs. Dorsal sepal 5.5-10 mm long, 1.8-3 mm wide, oblong-ovate to ovate-lanceolate, acuminate to caudate, glabrous or slightly papillose. Petals 2.2-4 mm long, 2-3.5 mm wide, narrowly obovate to broadly obovate-lanceolate, obtuse, papillose. Lateral sepals 6.5-10 mm long, 2-3.5 mm wide, obliquely narrowly oblong-ovate to ovate-lanceolate, acuminate to caudate, glabrous or slightly papillose. Lip 1.5-3.4 mm long, 0.6-1.4 mm wide, narrowly elliptic to oblong in general outline, rounded at the apex, erect, rather thick, slightly recurved, densely hirsute on the surface. Gynostemium up to 2 mm long.



**HABITAT.** Epiphyte in lowland forest, hill forest to montane forest up to 2300 m alt.

**DISTRIBUTION.** Sierra Leone, Liberia, Ivory Coast, Nigeria, Equatorial Guinea, Gabon.

**VARIABILITY.** According to Vermeulen (1987) the species can be divided into 2 varieties based on the presence or absence of hairs on the ovary and sepals. In Ivory Coast var. *inflatum* has been collected:

var. ***inflatum*** (Rolfe) J.J. Verm. in Bull. Jard. Bot. Nat. Belg. 56(3-4): 232. 1986

*Bulbophyllum inflatum* Rolfe in Bull. Misc. Inform. Kew. 1891: 234. 1891; TYPE: *Cult. Hort. Kew. Coll.* ? (HOLOTYPE: K!)

Ovary covered by short hairs. Sepals with long hairs along the keels, surface with much shorter hairs.

**DISTRIBUTION.** Sierra Leone, Liberia, Ivory Coast, Gabon.

**REPRESENTATIVE SPECIMENS.** Mt. Momi, *Aké Assi* 9147 (K!); Oct. 1966, *Aké Assi* 9198 (K!); *Aké Assi* 9200 (K!); 19 Dec. 1967, *Aké Assi* 9868 (K!); Mt. Nimba, 8°26'W, 7°37'N, 14 Dec. 1967, *Geerling & Bokdam* 1742 (WAG!); Mt. Nimba, 8°25'W, 7°37'N, 16 Dec. 1967, *Geerling & Bokdam* 1791 (WAG!); Oct.-Nov. 1973, *Pérez-Vera* 529 (K!, P!).

**10. *Bulbophyllum denticulatum*** Rolfe in Bull. Soc. Roy. Bot. Belg. 54: 144. 1984

TYPE: SIERRA LEONE. *Morton & Gledhill* SL3157 (HOLOTYPE: K!; ISOTYPE: WAG)

Pseudobulbs 0.8-1.8 cm long, 0.4-0.9 cm in diameter, 0.7-2 cm apart, ovoid or ellipsoid to nearly orbicular, 2-leaved. Leaves 1.6-7 cm long, 0.4-0.7 cm wide, oblong-lanceolate to linear, nearly equally bilobed, rather thick, coriaceous. Inflorescence 5-10 cm long, rather laxly 6-20-flowered, rachis slightly swollen and zigzag, glabrous. Flowers small, sepals pale purplish to white, petals white with dark purple spots, lip yellow, sometimes flowers white. Floral bracts 4.9-8 mm long, ovate to deltoid, acuminate. Pedicel and ovary 1-2 mm long, erect, glabrous. Dorsal sepal 3.9-4.5 mm long, 2.5-3.2 mm wide, ovate-elliptic, acute, involute at apex, glabrous. Petals 1.5-2 mm long and wide, rhomboid to obtriangular, truncate, shortly apiculate, glabrous. Lateral sepals 4-6 mm long, 2-2.3 mm wide, obliquely elliptic-lanceolate, apiculate, glabrous. Lip 1.5-1.7 mm long, 1-1.2 mm wide, almost pandurate in general outline, truncate, erect, rather thick, not recurved apically, glabrous to finely papillose. Gynostemium up to 2 mm long.

**HABITAT.** Epiphyte in lower montane forests, sometimes lithophyte on boulders in open vegetation.

**DISTRIBUTION.** Liberia, Ivory Coast, Cameroon. Alt. 900-1200 m.

**REPRESENTATIVE SPECIMENS.** Mt. Tonkoui, 1960, *de Wit* s.n. (WAG!).

**11. *Bulbophyllum falcatum*** (Lindl.) Rchb. f. in Ann. Bot. Syst. 6: 258. 1861

*Megaclinium falcatum* Lindl. in Edwards's Bot. Reg. 12: pl. 989. 1826; TYPE: SIERRA LEONE. *Afzelius* s.n. (HOLOTYPE: K!)

*Megaclinium endotrachys* Kraenzl. in Bot. Jahrb. Syst. 36: 115. 1905; TYPE: LIBERIA. *Dinklage* 1852 (HOLOTYPE: B†; ISOTYPE: K!)

*Megaclinium ugandae* Rolfe in Kew Bull. 1913: 338. 1913; TYPE: *Glasnevin cult.* (HOLOTYPE: K)  
*Bulbophyllum dahlemense* Schltr. in Notizbl. Bot. Gart. Berlin-Dahlem. 7: 325. 1919; TYPE:  
*Berlin cult. (Deistel s.n.).* (HOLOTYPE: B†)

Pseudobulbs 1.8-6 cm long, 0.6-1.5 cm in diameter, 0.4-6 cm apart, narrowly ovoid, more or less flattened, 2-4-angled, 2-leaved. Leaves sessile to petiolate; petiole up to 2 cm long; blade 2-14 cm long, 0.5-3 cm wide broadly lanceolate to linear, obtuse, coriaceous, thick or thin. Inflorescence up to 40 cm long, laxly multi-flowered, scales adpressed to peduncle, shorter than internodes, rhachis 4.5-13 mm wide, flattened and widened, glabrous or finely haired. Flowers small, sepals yellowish, whitish to greenish, often dark red spotted, dorsal sepal with bright yellow or red thickenings, petals yellow, lip cream with dark red spots or entirely dark red. Floral bracts ca. 5 mm long, ovate to broadly oblong-ovate, subacute. Pedicel and ovary up to 5 mm long, erect to slightly arcuate. Dorsal sepal 3.5-8 mm long, 1.5-2.5 mm wide, ribbon-like in the lower half, ovate above, obtuse, distinctly thickened along margins in the upper half, glabrous or finely papillose. Petals 1.8-3 mm long, 0.4-0.8 mm wide, linear-falcate, obtuse to subobtuse, more or less thickened in apical part, glabrous. Lateral sepals 3-5.5 mm long, 2.2-3.5 mm wide, basal part recurved and concave, obliquely triangular above, acute, thick, finely papillose in the basal part. Lip 1.5-4 mm long, 1-3 mm wide, deltoid to broadly ovate, obtuse, thick, recurved, glabrous. Gynostemium up to 1.5 mm long.

HABITAT. Epiphyte or occasionally lithophyte; primary and secondary forests, lowland forests, lower montane forests, relict forests in savanna. All year round.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Equatorial Guinea, Democratic Republic of Congo (Zaire), Uganda. Alt. 0-1400 m.

REPRESENTATIVE SPECIMENS. Adiopodoumé, 4°08'W, 5°20'N, 26 Nov. 1978, *Dekker 334* (WAG!); Anguedou, near R. Agneby, 23 Nov. 1975, *De Koning 6191* (WAG!); *De Koning 6198* (WAG!); Banco Forest Reserve, 17 Feb. 1977, *van der Burg 1267* (WAG!); 50 km N of Béréby, 14 Nov. 1963, *Oldeman 669* (WAG!); 7 km W of Gbaugnégauiné (Gbaugnégauiné), 25 km WSW of the center of Man, Danané road, 8 Mar. 1977, *van der Burg 1261* (WAG!); 7 km W of Gbaugnégauiné (Gbaugnégauiné), 25 km WSW of Man centre, Danané road, 16 Mar. 1977, *van der Burg 1262, 1263 & 1264* (WAG!); Hiré, between Kagbé and Dékadougou, 1 Dec. 1966, *Aké Assi 9335* (K!); Mt. Momi, 30 Oct. 1966, *Aké Assi 9196* (K!); Niampleu, 28 Oct. 1966, *Aké Assi 9140* (K!); 79 km NNE of Sassandra, Lagako-Tokpeko, 5°20'N, 5°50'W, 7 May 1975, *van der Burg 134* (WAG!); Tai, 22 Oct. 1961, *Aké Assi 6035* (K!); Tiapleu, 27 Oct. 1966, *Aké Assi 9123* (K!); *Sine loc.*, 8 Feb. 1978, *van Setten 92* (WAG!); *Sine loc.*, 10 Feb. 1978, *van Setten 95* (WAG!); *Sine loc.*, 6 Mar. 1978, *van Setten 112* (WAG!); *Sine loc.*, 17 Jan. 1979, *van Setten 324* (WAG!); *Sine loc.*, 7 May 1979, *van Setten 365* (WAG!); *Sine loc.*, 13 Mar. 1980, *van Setten 525* (WAG!).

DOUBTFUL RECORDS: Balé, 20 Dec. 1984, *César & Dulien 67* (P! – sterile).

## 12. *Bulbophyllum falcipetalum* Lindl. in J. Linn. Soc., Bot. 6: 128. 1862

TYPE: NIGERIA. *Mann 526* (HOLOTYPE: K!; ISOTYPE: W-R!)

Pseudobulbs 1-2.2 cm long, 0.4-0.8 cm in diameter, 0.3-1 cm apart, ovoid to ellipsoid, sometimes narrow, 3-5-angled, 2-leaved. Leaves shortly petiolate to almost sessile; blade 2.1-4.5 cm long, 0.3-0.8 cm wide, linear-lanceolate, obtuse, rather thick, coriaceous. Inflorescence 3.4-8 cm long, laxly 7-15-flowered, slightly flattened and widened or terete, zigzag. Flowers tiny, yellow or yellowish green. Floral bracts 2-5 mm long, 1.2-3 mm wide, elliptic, acute. Pedicel and rhachis 1.5-2 mm

long, slightly arcuate, with some fine, dark hairs. Dorsal sepal 4.3-5 mm long, 1.1-1.5 mm wide, ovate-lanceolate, acute to acuminate, thin, with some fine dark hairs outside. Petals 3-4 mm long, 0.6 mm wide, falcate, linear-lanceolate, apiculate, thin, glabrous. Lateral sepals 3.4-4 mm long, 1.8-2.1 mm wide, falcate, ovate-triangular, acute, thin, with some fine, dark hairs outside. Lip 1.6-1.8 mm long, 0.9-1.1 mm wide, ovate in general outline, gradually tapering towards the apex, acute, rather thick, recurved, glabrous. Gynostemium 0.8 mm long.

HABITAT. Epiphyte in lowland and mangrove forests. October-November.

DISTRIBUTION. Ivory Coast, Ghana, Nigeria, Cameroon, Gabon, Congo.

REPRESENTATIVE SPECIMENS. Yapo, 3 Nov. 1974, *Pérez-Vera* 716 (K!); Yapo, 50 km N of Abidjan, 11 Oct. 1956, *de Wilde* 688 (WAG!) (along with *Genyorchis apetala*).

**13. *Bulbophyllum finetii* Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroun 35(2): 395. 2001 (Fig. 90)**

*nom. nov. pro Bulbophyllum calamarium* var. *albociliatum* Finet in Not. Syst. 1: 383. 1911, *non B. albociliatum* (Liu & Su) Nakajima, 1973; TYPE: *Lousteau s.n.* (HOLOTYPE: P!). - *Bulbophyllum saltatorium* var. *albociliatum* (Finet) J.J.Verm. in Bull. J. Bot. Nat. Belg. 56: 230. 1986.

*Bulbophyllum distans* Lindl. in J. Linn. Soc., Bot. 6: 125. 1862; TYPE: CAMEROON? *Mann* 525 (HOLOTYPE: K; DRAWING: W-R!)

*Bulbophyllum mildbraedii* Kraenzl. in Bot. Jahrb. Syst. 43: 340. 1909; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Mildbraed* 3312 (HOLOTYPE: B†)

*Bulbophyllum nudiscapum* Rolfe in Bull. Misc. Inform. Kew. 1909: 365. 1909; TYPE (*here designated*): SIERRA LEONE. *Afzelius s.n.* (LECTOTYPE: K!) & CONGO. *Mantin s.n.* (PARATYPE: K?)

*Bulbophyllum graciliscapum* Summerh. in Kew Bull. 8: 579. 1954; TYPE: GABON. *Le Testu* 5787 (HOLOTYPE: K!; ISOTYPE: P!)

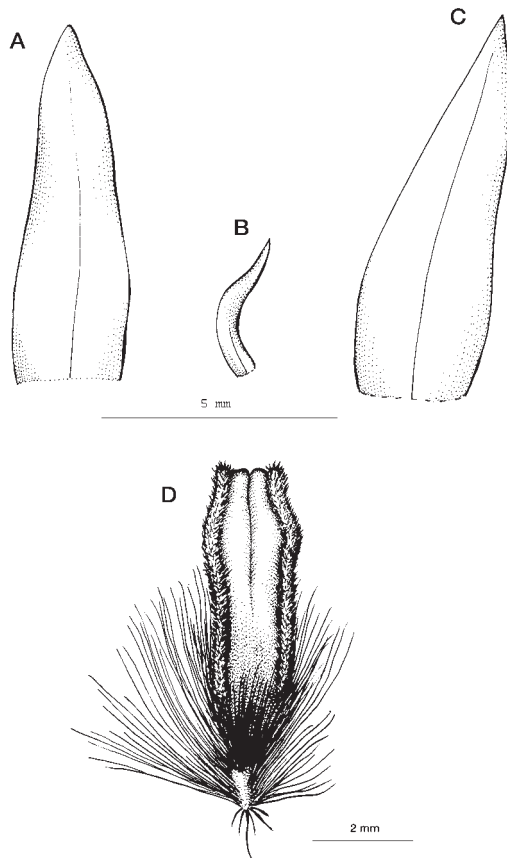


Fig. 90.—*Bulbophyllum finetii*. A – dorsal sepal; B – petal; C – lateral sepal; D – lip (redrawn by J. Mytnik-Ejsmont from Vermeulen 1987).

Pseudobulbs up to 5 cm long and 2 cm in diameter, 0.8-7 cm apart, conical-ovoid to narrowly ovoid, 1-leaved. Leaf petiolate; petiole ca. 0.7-2 cm long; blade 1.3-20.5 cm long, 0.8-4.6 cm wide, oblong lanceolate to oblong elliptic or ovate, obtuse, coriaceous, thick. Inflorescence 6.5-84 cm long, 4-105-flowered, erect, lax, rhachis not thickened. Flowers medium-sized, sepals yellowish or greenish, usually purple or brown-purple tinged, or entirely red-purple, petals red purple, lip greenish to red-purple, occasionally white towards the apex, lip hairs white, pink or purple. Pedicel and ovary to 10 mm long, erect, glabrous. Floral bracts up to 10 mm long, elliptic to oblong. Dorsal sepal 5.6-15 mm long, 1.8-3.5 mm wide, oblong-lanceolate to ovate-lanceolate, acute, glabrous. Petals 2-6 mm long, 0.2-0.35 mm wide, linear, acuminate, glabrous. Lateral sepals 5.4-15 mm long, 1.7-3 mm wide, obliquely oblong-lanceolate to oblong-ovate, acute, glabrous. Lip 4-12 mm long, 0.7-1.8 mm wide, oblong-lanceolate to lanceolate-linear in general outline, acute, thick, top of the lip adorned by long hairs directed towards the lip base, above them along margins of the adaxial side short and velvety or wooly hairs. Gynostemium up to 3 mm long.

**HABITAT.** Epiphyte on the lianas, in the crown and on bark in primary forests and low coastal forests. All year round.

**DISTRIBUTION.** Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda. Alt. up to 750 m.

**REPRESENTATIVE SPECIMENS.** Anguededou, 7 Jan. 1975, *De Koning 5120 B* (WAG!); San Pedro, Aug. 1971, *Pérez-Vera 121* (K!); Tiapleu, 9 Nov. 1966, *Aké Assi 9224* (K!).

#### 14. *Bulbophyllum fuscum* Lindl. in Edwards's Bot. Reg. 25: Misc. 3. 1839

TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!)

*Bulbophyllum ogoouense* Guillaumin in Bull. Mus. Hist. Nat. (Paris) 30: 522. 1924; TYPE: GABON. *Pobeguïn 1913* (HOLOTYPE: P!)

Pseudobulbs 1-5 cm long, 0.4-1.4 cm in diameter, (0.8)2.5-13 cm apart, slightly flattened, 4-angled, 2-leaved. Leaves usually shortly petiolate; blade 1.2-5.5(9) cm long, 0.4-2 cm wide, broadly elliptic to linear-lanceolate, obtuse, thick, coriaceous. Inflorescence 4-12 cm long, rather densely 6-20-flowered, obscurely swollen and sometimes slightly flattened, glabrous. Flowers small, sepals yellow, greenish to dark red or reddish brown, petals yellow or dark red, lip yellow, orange or dark red. Floral bracts 2-4 mm long, ovate to broadly triangular, acute to acuminate. Pedicel and ovary 1-2.5 mm long, conical, erect, glabrous. Dorsal sepal 2-3.2 mm long, 0.9-1.6 mm wide, ovate-lanceolate, acute to acuminate, rather thick, glabrous. Petals 1.3-2 mm long, ca. 0.2-0.4 mm wide, linear, slightly falcate, obtuse, glabrous. Lateral sepals 2.3-3.2 mm long, 1.3-2.5 mm wide, obliquely triangular or elliptic-triangular, acute to acuminate, rather thick, glabrous. Lip 0.9-2 mm long, 0.5-1.2 mm wide, elliptic in general outline, rounded at apex, very thick, rather erect, not recurved, with distinct lateral lobes in the basal half, lateral lobes usually denticulate, thin, upcurved. Gynostemium 0.6-1.2 mm long.

**HABITAT.** Epiphyte in secondary forests with *Lophira alata* Banks ex C.F. Gaertn., lowland forests and hill forests, collected 2 m above the ground level on branch of *Dacryodes edulis* (G. Don) H.J. Lam. November, January.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola. Alt. 0-1000 m.

REPRESENTATIVE SPECIMENS. Danane-Guinee road, 25 Nov. 1973, Pérez-Vera 268/C (K!); Kagbé (Kagké), 27 Jan. 1967, Aké Assi 9411 (K!).

**15. *Bulbophyllum imbricatum* Lindl. in Edwards's Bot. Reg. 27: Misc. 37. 1841 (Fig. 91)**

*Megaclinium imbricatum* (Lindl.) Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 37. 1897; TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!)

*Megaclinium leucorrhachis* Rolfe in Bull. Misc. Inform. Kew. 1891: 198. 1891; TYPE: *Trevor Lawrence s.n.* 1890. (HOLOTYPE: K!)

*Bulbophyllum leucorrhachis* (Rolfe) Schltr. in Bot. Jahrb. Syst. 38: 17. 1905.

*Bulbophyllum stenorrhachis* Kraenzl. in Bot. Jahrb. Syst. 22: 25. 1895; TYPE: CAMEROON. *Preuss 1241* (HOLOTYPE: B†; DRAWING: K!)

*Megaclinium laurentianum* Kraenzl. in Durand & De Wild. in Ann. Mus. Congo, ser. 1, Bot. 1: 22. 1902; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent 741* (HOLOTYPE: B†; ISOTYPE: K!)

*Bulbophyllum kamerunense* Schltr. in Bot. Jahrb. Syst. 38: 15. 1905; TYPE: CAMEROON. *Schlechter 12430* (HOLOTYPE: B†; DRAWING: K!)

*Megaclinium ledermannii* Kraenzl. in Bot. Jahrb. Syst. 48: 394. 1912; TYPE: CAMEROON. *Ledermann 1215* (HOLOTYPE: B†)

*Megaclinium hebetatum* Kraenzl. in Vierteljahrsschr. Naturf. Ges. Zurich. 68: 423. 1923; TYPE: CAMEROON. *Spellenberg s.n.* (HOLOTYPE: HBG!)

*Bulbophyllum linderi*  
Summerh. in Bull. Misc.  
Inform. Kew. 1935: 202.  
1935; TYPE: LIBERIA.  
*Linder 1325* (HOLOTYPE: K!)

Pseudobulbs 0.7-7 cm long, 0.8-4 cm in diameter, 0.7-6 cm apart, ovoid or narrowly ovoid, more or less flattened, 3-4-angled, 1-2(3)-leaved. Leaves petiole; petiole 2-13 mm long; blade 4.5-25 cm long, 0.6-3.7 cm wide, narrowly lanceolate to linear, obtuse, thick, coriaceous. Inflorescence 5-60 cm long, 26-120-flowered, rather lax, rachis distinctly swollen widened and flattened, glabrous. Flowers small, sepals and petals cream-coloured, orange, yellow to greenish, often with dark red blotches to almost entirely dark purple, lip white

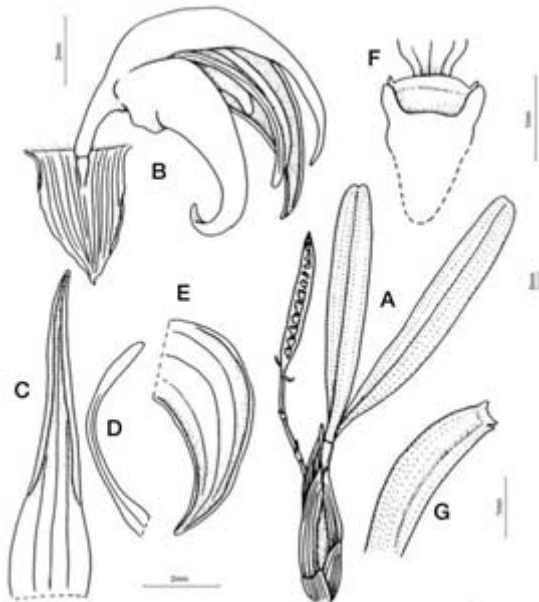


Fig. 91.—*Bulbophyllum imbricatum* Lindl.: A – habit; B – flower; C – dorsal sepal; D – petal; E – lateral sepal; F – lip; G – gynostemium (drawn by A. Kowalkowska, *Spellenberg s.n.*, HBG).

to pale greenish, often with purple spots. Floral bracts 4-6.5 mm long, elliptic, obtuse. Pedicel and ovary up to 3 mm long, erect, glabrous. Dorsal sepal 6-11 mm long, 1.4-3 mm wide, oblong-ovate to ovate-lanceolate, acute, glabrous to papillose. Petals 4-9 mm long, 0.3-1.1 mm wide, falcate, linear-lanceolate, acute. Lateral sepals 3.2-7 mm long, 1.8-5 mm wide, obliquely elliptic-triangular with recurved acute or rounded apex, glabrous or papillose. Lip 1.2-3 mm long, 0.5-2 mm wide, broadly triangular in the basal half, ligulate above, obtuse, margins fimbriate towards the base, entire towards the apex, thick, recurved, glabrous or almost glabrous. Gynostemium 2-3.3 mm long.

**HABITAT.** Epiphyte in lowland forests to lower montane forests, occasionally in littoral forests, riparian forests with *Uapaca heudelotii* Baill. and *Irvingia smithii* Hook. f., plantations and secondary forests. October-January.

**DISTRIBUTION.** Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, São Tomé, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire). Alt. up to 800 m.

**REPRESENTATIVE SPECIMENS.** Abidjan, National Park Banco Forest, 17 Nov. 1973, *De Koning* 2750 (WAG!); 8 Nov. 1974, *De Koning* 4695 (WAG!); 28 Nov. 1974, *De Koning* 4890 (WAG!); 23 Nov. 1974, *De Koning* 5064 (WAG!); Abouabou, between Abidjan and Grand Bassam, 7 Dec. 1956, *de Wilde* 1025 (WAG!); Adiopodoumé, 4°08'W, 5°20'N, 26 Nov. 1978, *Dekker* 333 (WAG!); *Dekker* 338 (WAG!); *Dekker* 339 (WAG!); Adiopodoumé, Banco Forest Reserve, 22 Nov. 1974, *De Koning* 4820 (WAG!); Anguededou, near R. Agneby, 23 Nov. 1975, *De Koning* 6193 (WAG!); NE of Banco, 9 Jan. 1976, *De Koning* 6362 (WAG!); San Pedro, 15 Oct. 1971, *Pérez-Vera* 109 (K!); 61 km N of Sassandra, 6°20'W, 5°19'N, 19 Jan. 1959, *Leenwenberg* 2488 (WAG!); Soubre-Buyo road, Oct. 1972, *Pérez-Vera* 255 (K!); Tai, Oct. 1974, *Pérez-Vera* 219/B (K!); Tiapleu (Nimbleu), 27 Oct. 1966, *Aké Assi* 9129 (K!).

## 16. *Bulbophyllum intertextum* Lindl. in J. Linn. Soc., Bot. 6: 127. 1862

TYPE: NIGERIA. Mann 527 (HOLOTYPE: K!; ISOTYPE: W-R!)

*Bulbophyllum seychellarum* Rehb. f. in Linnaea 41: 93. 1877; TYPE: SEYCHELLES. Horne 1874 (HOLOTYPE: K)

*Bulbophyllum quintasii* Rolfe in Bol. Soc. Brot. 9: 138. 1891; TYPE: PRINCIPE. Quintas 10 (HOLOTYPE: K!)

*Bulbophyllum viride* Rolfe in Bull. Misc. Inform. Kew. 1893: 170. 1893; TYPE: Crowley cult. s.n. (HOLOTYPE: K!)

*Bulbophyllum usambarae* Kraenzl. in Bot. Jahrb. Syst. 34: 58. 1904; TYPE: Engler 1025a (HOLOTYPE: B†)

*Bulbophyllum triaristellum* Kraenzl. & Schltr. in Orchis 2: 98. 1908; TYPE: CAMEROON. Schlechter 15756 (HOLOTYPE: B†; ISOTYPES: BM!, K!, P!)

*Bulbophyllum amauryae* Rendle in Rendle & Baker, Cat. Pl. Oban: 101, 146. 1913; TYPE: NIGERIA. Talbot 952 (HOLOTYPE: BM!; ISOTYPE: K!)

*Bulbophyllum pertenuae* Kraenzl. in Bot. Jahrb. Syst. 51: 385. 1914; TYPE: CAMEROON. Ledermann 6201 (HOLOTYPE: B†)

Pseudobulbs 0.4-1 cm long, 0.3-0.7 cm in diameter, 0.2-4 cm apart, ovoid to nearly orbicular, 4-5-angled, 1-leaved. Leaf shortly petiolate to sessile; blade 0.7-10 cm long, 0.3-1.1 cm wide, elliptic to linear-lanceolate, rounded or acute, thick, coriaceous. Inflorescence 2-30 cm long, laxly 2-14(20)-flowered, usually wiry, rachis terete, usually zigzag. Flowers small, very pale yellowish to greenish or purple-red. Floral bracts 1.5-4 mm long, elliptic to oblong, acuminate. Pedicel and ovary 1-2 mm long, erect, glabrous. Dorsal sepal 3-6 mm long, 0.9-2 mm wide, ovate-lanceolate, cuspidate, thin, glabrous to finely papillose. Petals 1-3 mm long, 0.5-1.6 mm wide, broadly elliptic to obovate-oblong, oblique, obtuse, very thin,



usually glabrous. Lateral sepals 2.8-6 mm long, 8-3 mm wide, obliquely triangular or ovate-triangular, cuspidate to caudate, thin, glabrous to finely papillose. Lip 1.2-4 mm long, 0.7-2 mm wide, oblong-elliptic to oblong-ovate, rounded at apex, rather thick, slightly recurved, surface glabrous, papillose towards apex, margins nearly glabrous to ciliate. Gynostemium 0.8-2.2 mm long.

**HABITAT.** Epiphyte on branch and trunk of tree in lowland forests, montane forests, high humid forests, semi-montane grasslands, rare in *Brachystegia* sp. woodlands, occasionally lithophyte. August.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Nigeria, Cameroon, São Tomé and Príncipe, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire), Angola, Ethiopia, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Seychelles, Madagascar.

REPRESENTATIVE SPECIMENS. Mt. Momi, 10 Aug. 1975, *Pérez-Vera* 813 (K!).

**17. *Bulbophyllum ivorense* P.J. Cribb & Pérez-Vera** in *Adansonia*, ser. 2, 15: 202, 206. 1975

TYPE: IVORY COAST. *Pérez-Vera* 137 (HOLOTYPE: K!; ISOTYPE: P!)

*Bulbophyllum flavidum* var. *elongatum* De Wild. in Not. Pl. Util. Congo 1: 120. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent* 124 (HOLOTYPE: BR; ISOTYPE: K!). *Bulbophyllum elongatum* (De Wild.) De Wild. in Pl. Bequaert. 1: 109. 1921.

Pseudobulbs 1-2.3 cm long, 0.6-1.8 cm in diameter, 0.6-2 cm apart, orbicular to ovoid, slightly flattened, 2-4-angled, single-leaved. Leaf shortly petiolate; petiole 4-9 mm long; blade 3.5-14 mm long, 0.7-1.8 cm wide, broadly lanceolate to narrowly linear-lanceolate, rounded at apex, coriaceous, thick. Inflorescence 7-28 cm long, 15-80-flowered, dense, rhachis terete, glabrous. Flowers small, white, or yellowish green, lip cream coloured. Floral bracts 4-7 mm long, elliptic to ovate, acute, membranous, glabrous. Pedicel and ovary 2.5-4 mm long, slender, arcuate, glabrous. Dorsal sepal 4-6 mm long, 1-1.6 mm wide, narrowly ovate-oblong to ovate-lanceolate, acute or obtuse, thin, finely papillose adaxially towards apex. Petals 0.25-0.3 mm long, 0.3-0.4 mm wide, obscure, rectangular, truncate. Lateral sepals 3.7-5.8 mm long, 1.4-1.8 mm wide, falcate, oblong- to lanceolate-ovate, acute, thin, finely papillose adaxially towards apex. Lip 1.8-2.8 mm long, 0.5-0.7 mm wide, oblong to narrowly elliptic-lanceolate in general outline, obtuse, thick, recurved especially at apex, finely papillose. Gynostemium 1.2-2 mm long.

**HABITAT.** Epiphyte in lowland to montane forest. October.

**DISTRIBUTION.** Liberia, Guinea, Ivory Coast, Nigeria, Cameroon, Gabon, Democratic Republic of Congo (Zaire). Alt. 0-700 m.

REPRESENTATIVE SPECIMENS. Mt. Tonkoui, 23 Oct. 1973, *Pérez-Vera* 137 (K!, P!).

**18. *Bulbophyllum josephii* (O. Kuntze) Summerh.** in *Bot. Mus. Leafl.* 11: 250. 1945

(Fig. 92)

*Phyllorchis josephii* O. Kuntze in Rev. Gen. Pl. 2: 676. 1891; TYPE: CAMEROON. *Mann* 2124 (HOLOTYPE: K!; ISOTYPE: W-R!)

*Bulbophyllum aurantiacum* Hook. f. in J. Linn. Soc., Bot. 7: 219. 1864; TYPE: CAMEROON. *Mann* 2124 (HOLOTYPE: K!; ISOTYPE: W-R!)



*Bulbophyllum gustavi* Schltr. in Repert. Spec. Nov. Regni Veg. 9: 165. 1911; TYPE: CAMEROON. Mann 2124 (HOLOTYPE: B†; ISOTYPE: K)

*Bulbophyllum winklerii* Schltr. in Orchis 8: 132. 1914; TYPE: CAMEROON. Winkler 157 (HOLOTYPE: B†; ISOTYPE: K!)

*Bulbophyllum schlechterii* De Wild. in Pl. Bequaert. 1: 120. 1921; TYPE: CAMEROON? Breslau cult. (Winkler s.n.) (HOLOTYPE: B†; ISOTYPE: WRS!)

Pseudobulbs 1.5-4 cm long, 0.6-2.4 cm in diameter, 0.7-3 cm apart, ovoid to orbicular or narrowly ovoid, 2-4-angled, 1-leaved. Leaf petiolate; petiole 2-35 mm long; blade 4.5-28 cm long, 0.9-3.2 cm wide, linear to linear-lanceolate, acute to obtuse, thick, coriaceous. Inflorescence 8.5-40 cm long, 7-80-flowered, dense, rhachis terete, glabrous. Flowers small, white, pale greenish, pink, sepals sometimes brownish pink, lip white, yellowish, pale greenish to bright orange red. Floral bracts 2.5-7.5 mm long, oblong to broadly lanceolate, acute to obtuse. Pedicel and ovary 1.2-6.5 mm long, straight, glabrous. Dorsal sepal 4-11.7 mm long, 1-2.2 mm wide,

ovate-lanceolate to very narrowly triangular, acute, rather thin, glabrous. Petals 1.8-5 mm long, 0.6-1.7 mm wide, oblong-obovate to obovate-lanceolate, acute to obtuse, slightly falcate or not, glabrous or papillose, thin. Lateral sepals 4-12 mm long, 1.4-3.2 mm wide, falcate-triangular, acute, rather thin, glabrous. Lip 1.5-2.7 mm long, 0.8-1.6 mm wide, elliptic-ovate to ovate-lanceolate, rounded at apex to subacute, thick at base, rather thin towards apex, slightly recurved, margins entire, glabrous or papillose, surface glabrous to finely papillose. Gynostemium 1.3-2.4 mm long.

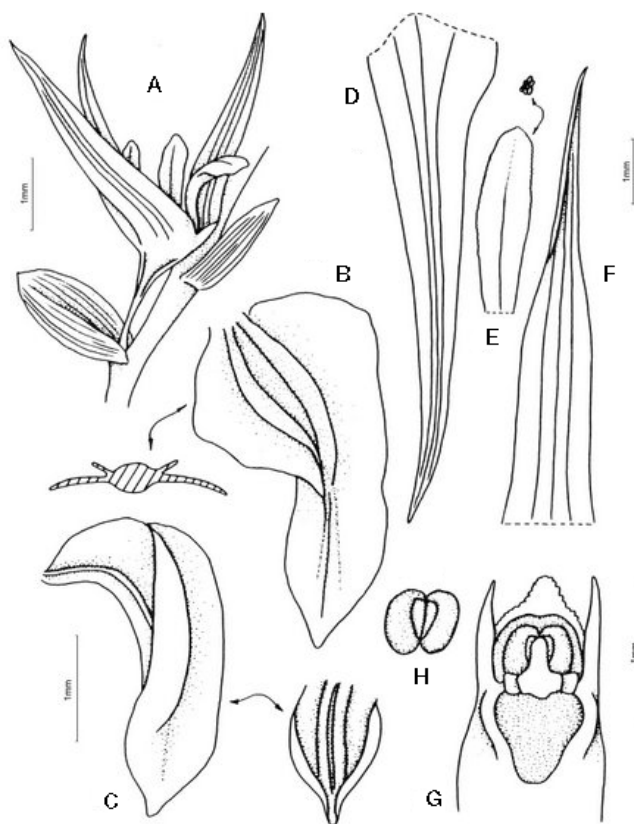


Fig. 92.—*Bulbophyllum josephii* (O. Kuntze) Summerh.: A — part of inflorescence; B & C — lip various views; D — lateral sepal; E — petal; F — dorsal sepal; G — gynostemium; H — pollinia (drawn by Kowalkowska, Braun s.n., HBG).

HABITAT. Epiphyte on branch and tree trunk in lowland to montane forests, elfin type of mossforests, and semi-montane grasslands. October-November.

DISTRIBUTION. Guinea, Liberia, Ivory Coast, Nigeria, Cameroon, Equatorial Guinea, Democratic Republic of Congo (Zaire), Ethiopia, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. up to 2300 m.

VARIABILITY. Vermeulen (1987) proposed 2 varieties in *B. josephii*, of which one is reported from Ivory Coast:

var. **mahonii** (Rolfe) J.J. Verm. in Bull. J. Bot. Nat. Belg. 56: 232. 1986

*Bulbophyllum mahonii* Rolfe in Kew Bull. 1906: 32. 1906; TYPE: MALAWI. *Mahon s.n.* (HOLOTYPE: K!)

*Bulbophyllum modicum* Summerh. in Kew Bull. 12: 114. 1957; TYPE: CAMEROON. *Gregory 193* (HOLOTYPE: K!)

Gynostemium with rather weak, deltoid, obtuse teeth along the adaxial margins, just below the base of the stelidia. Stigma base not or hardly protruding.

DISTRIBUTION. Guinea, Liberia, Ivory Coast, Nigeria, Cameroon, Equatorial Guinea, Democratic Republic of Congo (Zaire), Zambia, Malawi. Alt. up to 2300 m.

REPRESENTATIVE SPECIMENS. Mt. Tonkoui, 6 Oct. 1960, *Aké Assi 5667* (K!); 4 Nov. 1973, *Pérez-Vera 201/B* (K!).

NOTES. *B. josephii* var. *josephii* differs from var. *mahonii* by gynostemium without teeth along the adaxial margins and by stigma base usually slightly protruding.

## 19. *Bulbophyllum lupulinum* Lindl. in J. Linn. Soc., Bot. 6: 126. 1862

TYPE: CAMEROON. *Mann 783* (HOLOTYPE: K!)

*Bulbophyllum urbanianum* Kraenzl. in Bot. Jahrb. Syst. 28: 163. 1900; TYPE: CAMEROON. *Deistel 79* (HOLOTYPE: B†; DRAWING: K!)

*Bulbophyllum ituriense* De Wild. in Rev. Zool. Bot. Africanes. 9: Suppl. Bot. 29. 1921; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Bequaert 2497* (HOLOTYPE: BR; FRAGMENT OF HOLOTYPE: K!)

Pseudobulbs 2.7-7.5 cm long, 1.2-2.5 cm in diameter, 3-13 cm apart, ovoid to ellipsoid, slightly flattened, 4-angled, 2-(rarely 1-) leaved. Leaves petiolate; petiole up to 15 mm long; blade 8-23 cm long, 1.2-5 cm wide, lanceolate to linear-lanceolate, obtuse, thick, coriaceous. Inflorescence 15-38 cm long, densely 28-68-flowered, rhachis with fine dark hairs, neither swollen nor flattened. Flowers small, yellow, lip and sepals spotted or striated with dark red adaxially. Floral bracts 9.5-16 mm long, nearly triangular, obtuse to acute. Pedicel and ovary 1.3-2.2 mm long, conical, erect, with fine dark hairs. Dorsal sepal 4-5.2 mm long, 1.5-3 mm wide, broadly to narrowly triangular, acute, thick, hairy outside. Petals 2.5-3.2 mm long, 0.25-0.5 mm wide, slightly falcate, obovate-lanceolate to linear, obtuse, thick, glabrous. Lateral sepals 3.8-5.2 mm long, 1.5-2.9 mm wide, obliquely triangular, acute, thick, hairy on the outer surface. Lip 1.5-2.4 mm long, 0.8-1.7 mm wide, nearly rectangular in general outline, truncate or rounded at apex, thick, not recurved, glabrous, margins elevated, irregularly denticulate, upcurved. Gynostemium 1.8-2.6 mm long.

HABITAT. Epiphyte in lowland rainforests to montane forests, semideciduous forests, noted 25 m above the ground level, also frequently as lithophyte, on ex-

posed places as rocky mountain slopes or granite rock. January, April.

DISTRIBUTION. Guinea, Sierra Leone, Ivory Coast, Nigeria, Cameroon, Democratic Republic of Congo (Zaire), Ethiopia, Zambia. Alt. up to 1700 m.

REPRESENTATIVE SPECIMENS. Tiapleu, 18 Apr. 1974, *Pérez-Vera* 214 (K!); Mt. Tonkoui, 12 Jan. 1974, *Pérez-Vera* 569 (P!).

**20. *Bulbophyllum magnibracteatum*** Summerh. in Bull. Misc. Inform. Kew. 1935: 203. 1935

TYPE: GHANA. *Miles* 11 (HOLOTYPE: K!)

Pseudobulbs 1-3 cm long, 0.6-1.5 cm in diameter, 1.5-4.5 cm apart, ovoid to ellipsoid, more or less flattened, obtusely 3-4-angled, 1-leaved. Leaf subsessile, 3.8-12 cm long, 1-1.8 cm wide, lanceolate to oblong, obtuse, thick, coriaceous. Inflorescence 5.5-22 cm long, 10-24-flowered, rather lax, rhachis widened and flattened, more or less blade-like, glabrous. Flowers small, sepals cream coloured, stained with dark purple towards apex or entirely dark purple, petals cream colored, lip yellowish or purple. Floral bracts 5-11 mm long, broadly ovate, acute to acuminate. Pedicel and ovary 3-4 mm long, glabrous or sparsely haired, more or less arched. Dorsal sepal 6.4-8.8 mm long, 2.3-3 mm wide, oblong to ovate-lanceolate, acute, glabrous or finely papillose, especially along margins. Petals 4-6 mm long, 1.5-2 mm wide, semi-ovate to obliquely oblong-lanceolate, acute, glabrous. Lateral sepals 3.5-5.5 mm long, 3.2-4.5 mm wide, semi-orbicular to obliquely broadly ovate, acute, glabrous or finely papillose especially along margins. Lip 1.8-2.5 mm long, 1.4-2.2 cm wide, oblong above the triangular base, obtuse, recurved, thick, slightly channeled towards apex, glabrous. Gynostemium up to 3 mm long.

HABITAT. Epiphyte on bark and in the crown of trees in lowland and hill forests. February, October.

DISTRIBUTION. Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire). Alt. up to 800 m.

REPRESENTATIVE SPECIMENS. Tiapleu, 16 Feb. 1974, *Pérez-Vera* 139/B (K!).

**21. *Bulbophyllum maximum*** (Lindl.) Rchb. f. in Ann. Bot. Syst. 6: 259. 1861 (Fig. 93)

*Megaclinium maximum* Lindl. in Gen. Sp. Orchid. Pl.: 47. 1830; TYPE: SIERRA LEONE. *Smeathmann* s.n. (HOLOTYPE: BM?; ISOTYPES: S, UPS)

*Megaclinium oxypterum* Lindl. in Edwards's Bot. Reg. 25: misc. 14. 1839; TYPE: NIGERIA. *Barter* 2026 (HOLOTYPE: K!; ISOTYPE: W-R!). - *Bulbophyllum oxypterum* (Lindl.) Rchb. f. in Ann. Bot. Syst. 6: 258. 1861.

*Megaclinium purpuratum* Lindl. in J. Linn. Soc., Bot. 6: 128. 1862; TYPE: NIGERIA. *Barter* s.n. (HOLOTYPE: K!)

*Megaclinium platyrhachis* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 43. 1898; TYPE: BRITISH CENTRAL AFRICA. *O'Brien* s.n. (HOLOTYPE: K!). - *Bulbophyllum platyrhachis* (Rolfe) Schltr. in Bot. Jahrb. Syst. 38: 15. 1905.

*Bulbophyllum ciliatum* Schltr. in Bot. Jahrb. Syst. 38: 156. 1906; TYPE: CAMEROON. *Schlechter* 15758 (HOLOTYPE: B†)

*Bulbophyllum nyassanum* Schltr. in Bot. Jahrb. Syst. 53: 571. 1915; TYPE: TANZANIA. *Stolz* 1784 (HOLOTYPE: B†; ISOTYPES: BM!, K!)

*Bulbophyllum subcoriaceum* De Wild. in Rev. Zool. Bot. Africaines. 9, Suppl. Bot.: 33. 1921;  
TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Bequaert 2310* (HOLOTYPE: BR)

Pseudobulbs 3.5-10 cm long, 1-3 cm in diameter, 2-10 cm apart, ovoid or ellipsoid, 3-5-angled, 2(3)-leaved. Leaves petiolate; petiole up to 2 mm long; blade 3.8-20 cm long, 1.3-5.5 cm wide, oblong to linear-lanceolate, obtuse, thick, coriaceous. Inflorescence 15-90 cm long, laxly 16-120-flowered, rhachis flattened and widened, blade-like, glabrous. Flowers small, greenish to yellowish to purple or brownish, often purple stained or dotted, lip yellowish or cream, finely spotted purple. Floral bracts 2.5-7 mm long, elliptic or ovate, acute to acuminate. Pedicel and ovary 2-4 mm long, erect, glabrous. Dorsal sepal 4.5-8 mm long, 1.2-2 mm wide, ovate-lanceolate, acute, thick, glabrous or finely papillose. Petals 1.8-3.2 mm long, 0.3-0.8 mm wide, falcate, lanceolate to oblong, acute, glabrous. Lateral sepals 3.7-6.2 mm long, 1.9-3.7 mm wide, obliquely and transversely elliptic in the lower part, caudate or cuspidate, glabrous or finely papillose. Lip 1.5-3 mm long, 0.7-1.4 mm wide, oblong-ovate in general outline, obtuse, recurved, thick, glabrous, margins irregularly denticulate towards base. Gynostemium 1.5-2.2 mm long.

HABITAT. Epiphyte in lowland primary and secondary forests, montane or riverine forests, *Brachystegia* sp. or mixed deciduous woodlands. September, December.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, São Tomé and Príncipe, Equatorial Guinea (Annobón), Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. up to 1500 m.

REPRESENTATIVE SPECIMENS. Abouabou, 7 Dec. 1956, *Aké Assi 5202* (K!); Abouabou, between Abidjan and Grand Bassam, 7 Dec. 1956, *de Wilde 1013* (K!, WAG!); Baléko, Sep. 1955, *Nozeran s.n.* (P!); Brafouédi, Dabou and N'Douci road, ca. 1 km behind Bécédi, 9 Dec. 1956, *de Wilde 1012* (K!, WAG!); Hiré, between Kagbé and Dékadougou, 1 Dec. 1961, *Aké Assi 9333* (K!); Oureyo, 6 Dec. 1974, *Pérez-Vera 149* (K!).

**22. *Bulbophyllum melinostachyum* Schltr. in Bot. Jahrb. Syst. 26: 342. 1899**

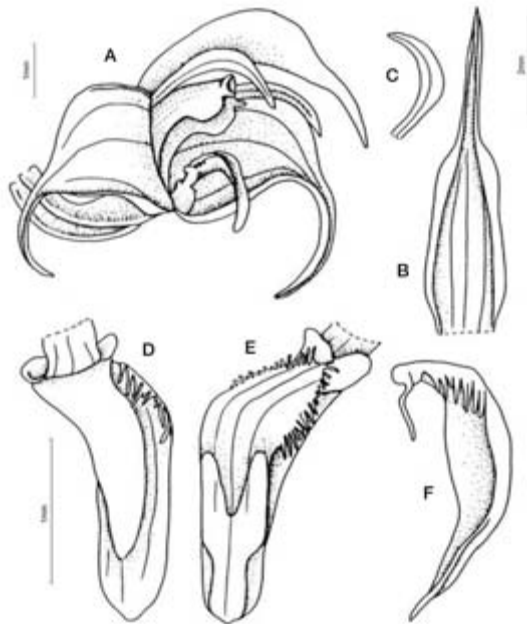


Fig. 93.—*Bulbophyllum maximum* (Lindl.) Rehb. f.: A — flower; B — dorsal sepal; C — petal; D-F — lip various views (drawn by A. Kowalkowska, *Preuss s.n.*, HBG).

TYPE: MOZAMBIQUE. *Schlechter 12250* (HOLOTYPE: B†; ISOTYPES: BM!, G, K!, Z) - *Bulbophyllum fuscum* var. *melinostachyum* (Schltr.) J.J.Verm. in Bull. Jard. Bot. Nat. Belg. 56: 240. 1986.

*Bulbophyllum obanense* Rendle in Rendle & Baker, Cat. Pl. Oban: 101, 146. 1913; TYPE: NIGERIA. *Talbot 932* (HOLOTYPE: BM!)

Pseudobulbs 1-5 cm long, 0.4-1.4 cm in diameter, up to 13 cm apart, ovoid to ellipsoid, 4-angled, 2-leaved. Leaves subsessile to shortly petiolate; blade 1.8-11 cm long, 0.4-2.2 cm wide, linear-lanceolate to oblong- or elliptic-lanceolate, obtuse, thick, coriaceous. Inflorescence 4.5-23 cm long, laxly 6-34(64)-flowered, rhachis slightly swollen and flattened, glabrous. Flowers small, sepals yellow, greenish to dark red or reddish brown, petals yellow to dark red, lip yellow, orange or dark red. Floral bracts 2.5-6 mm long, ovate to broadly triangular. Pedicel and ovary 1-2.5 mm long, conical, erect, glabrous. Dorsal sepal 2.5-5.2 mm long, 1-2 mm wide, ovate to ovate-lanceolate, acute to acuminate, thin to thick, glabrous. Petals 1.5-4 mm long, 0.2-0.5 mm wide, lanceolate to linear-lanceolate, subacute, erect, not falcate, thin, glabrous. Lateral sepals 2.2-6 mm long, 1.3-2.7 mm wide, obliquely elliptic- or ovate-triangular, acute to acuminate, thin or thick, glabrous. Lip 1.2-4 mm long, 0.8-2 mm wide, oblong to elliptic in general outline, rounded at apex, very thick, not recurved, glabrous, with no lateral lobes. Gynostemium up to 1.4 mm long.

HABITAT. Epiphyte in lowland and montane forest, secondary forest with *Lophira alata* Banks ex C.F. Gaertn., *Brachystegia* sp. woodland, on branch and tree trunk, or lithophyte on lichen-covered rocks. October-November.

DISTRIBUTION. Sierra Leone, Ivory Coast, Nigeria, Cameroon, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire), Uganda, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. up to 2100 m.

REPRESENTATIVE SPECIMENS. Mt. Momi, Oct.-Nov. 1972, *Pérez-Vera 218* (K!); Nimbleu, 28 Oct. 1966, *Aké Assi 9137* (K!).

### 23. *Bulbophyllum nigericum* Summerh. in Kew Bull. 16: 307. 1962

TYPE: NIGERIA. *King 124* (HOLOTYPE: K!)

Pseudobulbs 1.3-2.7 cm long, 0.7-1.5 cm in diameter, 0.8-2.5 cm apart, ovoid, slightly flattened, 4-angled, 2-leaved. Leaves shortly petiolate; blade 3-7 cm long, 0.5-1.2 cm wide, lanceolate to linear-lanceolate, obtuse, rather thick, coriaceous. Inflorescence 8-23 cm long, 7-30-flowered, rather dense, rhachis slightly swollen and zigzag, glabrous. Flowers small, sepals green, yellow, occasionally stained purple, petals purplish to yellow, spotted deep purple, lip bright yellow or orange. Floral bracts 7-12 mm long, ovate, acute. Pedicel and ovary 1.5-2 mm long, erect, glabrous. Dorsal sepal 4.5-7.2 mm long, 3-4.5 mm wide, broadly ovate, acute to apiculate, glabrous. Petals 2-4 mm long, 1.5-3 mm wide, rhomboid-ovate in general outline, truncate at apex with cauda 0.2-2 mm long, glabrous. Lateral sepals 6-9 mm long, 2.5-4.5 mm wide, obliquely triangular-lanceolate, acute, glabrous. Lip 2-4 mm long, 1.3-3 mm wide, more or less rectangular in general outline, truncate to rounded at apex, rather thick, slightly recurved, glabrous. Gynostemium 1.8-4 mm long.

HABITAT. Lithophyte or epiphyte on tree branch.

DISTRIBUTION. Ivory Coast, Nigeria, Cameroon. Alt. 1000-2050 m.

REPRESENTATIVE SPECIMENS. Mont Momi, *Aké Assi 9218* (K!).

**24. *Bulbophyllum nigritianum*** Rendle in Rendle & Baker, Cat. Pl. Oban: 99, 146. 1913

TYPE: NIGERIA. *Talbot 933* (HOLOTYPE: BM!; ISOTYPE: K!)

*Bulbophyllum albidum* De Wild. in Rev. Zool. Bot. Africaines. 9: Suppl. Bot. 27. 1921; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Bequaert 6501* (HOLOTYPE: BR)

*Bulbophyllum africanum* Hawkes in Lloydia 19: 92. 1956; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Bequaert 6501* (HOLOTYPE: BR)

Pseudobulbs 1.4-4 cm long, 0.6-1.5 cm in diameter, 0.3-2.5 cm apart, ovoid to narrowly ovoid, 3-4-angled, 1-leaved. Leaf petiolate; petiole 3-30 mm long; blade 7-21 cm long, 0.5-1.5 cm wide, narrowly linear-lanceolate to linear, acute to subacute, thick, coriaceous. Inflorescence 7-22 cm long, 35-150-flowered, rather dense, rhachis terete, glabrous. Flowers small, white or cream-coloured. Floral bracts 2.4-5.5 mm long, lanceolate to narrowly elliptic, acute to acuminate, membranous. Pedicel and ovary 2.2-3.8 mm long, erect, glabrous. Dorsal sepal 3-5 mm long, 0.8-1.4 mm wide, narrowly triangular, acute, thin, glabrous. Petals 0.9-1.5 mm long, 0.3-0.5 mm wide, obliquely oblong-ovate, to lanceolate, acute or obtuse, thin, glabrous, margins slightly irregular. Lateral sepals 3-5 mm long, 1-1.4 mm wide, falcate, narrowly triangular, acute, thin, glabrous. Lip 0.6-1.2 mm long, 0.4-0.7 mm wide, distinctly 3-lobed at base, thick, recurved, finely papillose; the median lobe oblong, rounded at apex; sidelobes obliquely rhomboid, rounded at apex, upcurved. Gynostemium 0.9-1.5 mm long.

HABITAT. Branch epiphyte in lowland to lower montane forests. October-January.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Gabon, Democratic Republic of Congo (Zaire). Alt. up to 1200 m.

REPRESENTATIVE SPECIMENS. Danane-Guinee road, 9 Nov. 1975, *Pérez-Vera 549* (K!); Ira, near Blapleu, 26 Jan. 1984, *Hepper & Maley 7837* (K!); Tiapleu, 7 Oct. 1966, *Aké Assi 5672* (K!); 27 Oct. 1966, *Aké Assi 9124* (K!); Forêt de Tiapleu, 27 Oct. 1966, *Aké Assi 9128* (K!).

**25. *Bulbophyllum oreonastes*** Rchb. f. in Otia Bot. Hamburg. 2: 118. 1881 (Fig. 94)

TYPE (*here designated*): CAMEROON. *Mann 2122* (LECTOTYPE: W-R!; ISOLECTOTYPES: K!, W-R!)

*Bulbophyllum hookerianum* Kraenzl. in Bot. Jahrb. Syst. 17: 49. 1893; TYPE: CAMEROON.

*Preuss 943* (HOLOTYPE: B†; ISOTYPE: K!)

*Bulbophyllum zenkerianum* Kraenzl. in Bot. Jahrb. Syst. 48: 391. 1912; TYPE: CAMEROON.

*Zenker 3902* (HOLOTYPE: HBG!; ISOTYPES: BM!, K!, W!; DRAWING: UGDA-DLSz)

*Bulbophyllum rhopalochilum* Kraenzl. in Bot. Jahrb. Syst. 51: 384. 1914; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Kassner 2380* (HOLOTYPE: BR; ISOTYPES: BM!, K!)

*Bulbophyllum infundibuliflorum* Petersen in Bot. Tidsskr. 49: 164. 1952; TYPE: *Birket Smith s.n.* (HOLOTYPE: C)

*Bulbophyllum planiaxe* Petersen in Bot. Tidsskr. 49: 166. 1952; TYPE: ? (HOLOTYPE: C; DRAWING: K)

Pseudobulbs 0.4-3.5 cm long, 0.4-1.2 cm in diameter, 0.7-4 cm apart, nearly orbicular to narrowly ovoid or ellipsoid, flattened, 4-angled, 2-leaved. Leaves



shortly petiolate; petiole up to 8 mm long; blade 0.6-8.2 cm long, 0.4-2 cm wide, broadly elliptic to linear-lanceolate, obtuse, thick, coriaceous. Inflorescence 1.5-17.5 cm long, rather laxly 5-36-flowered, rhachis slightly swollen, zigzag or not, glabrous. Flowers small, yellowish, bright yellow or bright orange, usually dark red striated, lip yellowish, brownish to purple. Floral bracts 3-7 mm long, narrowly triangular. Pedicel and ovary 1.8-3 mm long, glabrous, erect. Dorsal sepal 3-6.2 mm long, 1-1.8 mm wide, oblong-ovate, acute, thin, glabrous. Petals 1-3 mm long, 0.2-0.6 mm wide, linear, obtuse, thin, glabrous. Lateral sepals 3-7 mm long, 1.5-3.2 mm wide, obliquely oblong-triangular, acute to apiculate, thin, glabrous. Lip 1.4-2.5 mm long, 0.6-1.2 mm wide, oblong or elliptic, rounded and very thick at apex, slightly concave at base, glabrous, recurved. Gynostemium 0.8-1.2 mm long.

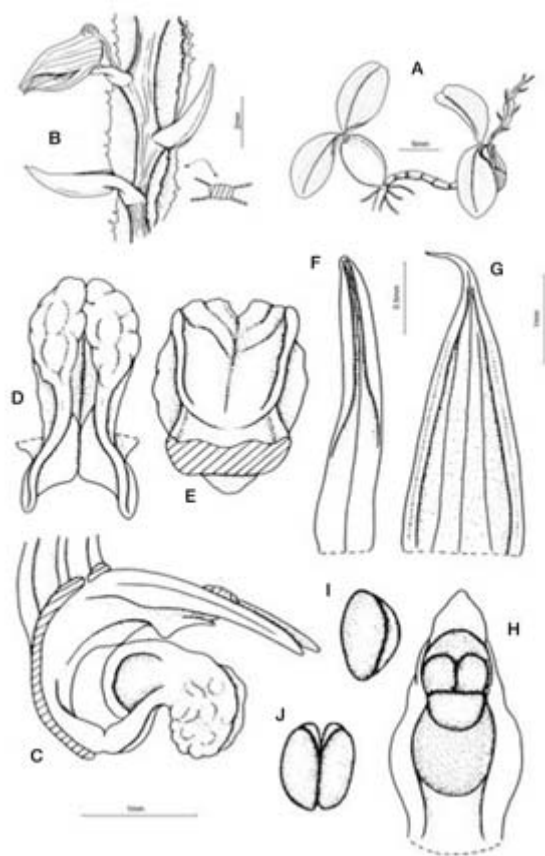


Fig. 94.—*Bulbophyllum oreonastes* Rchb. f.: A — habit; B — part of inflorescence; C — lip, gynostemium and petals; D & E — lip various views; F — petal; G — dorsal sepal; H — gynostemium; I & J — pollinia various views (drawn by A. Kowalkowska, Zenker 3902, HBG).

**HABITAT.** Epiphyte in lowland forests to montane forests, elfin forests, occasionally in *Brachystegia* sp. forests or bushes, sometimes lithophyte on rocks. May-August.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire).

**REPRESENTATIVE SPECIMENS.** Mt. Momi, 10 Aug. 1975, Pérez-Vera 814 (K!); 10 May 1976, Pérez-Vera 880 (K!).

## 26. *Bulbophyllum oxychilum* Schltr. in Bot. Jahrb. Syst. 38: 18. 1905

**TYPE:** CAMEROON. *Schlechter* 13042 (HOLOTYPE: B†) & LIBERIA. *Bos* 2336 (NEOTYPE: WAG)

*Bulbophyllum buntingii* Rendle in Rendle & Baker, Cat. Pl. Oban.: 99, 146. 1913; **TYPE:** LIBERIA. *Bunting* 29 (LECTOTYPE: BM!; FRAGMENT OF LECTOTYPE, DRAWING: K!)

*Bulbophyllum ellipticum* De Wild. in Rev. Zool. Bot. Africaines. 9: Suppl. Bot. 29. 1921; **TYPE:** DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Bequaert* 2496 (HOLOTYPE: BR; ISOTYPE, DRAWING: K!)



Pseudobulbs 0.6-2.3 cm long, 0.5-1.6 cm in diameter, 0.8-2 cm apart, ovoid to nearly orbicular, slightly flattened, 3-4-angled, single-leaved. Leaf petiolate; petiole 1-11 mm long; blade 1.6-12 mm long, 0.7-2 cm wide, elliptic to oblong-ob lanceolate, obtuse to acute, thick, coriaceous. Inflorescence 6.5-31 cm long, 15-100-flowered, rather dense, rhachis terete, glabrous. Flowers small, sepals yellow to white or entirely pink, petals white, lip yellow or white. Floral bracts 3.5-5 mm long, oblong- to ovate-lanceolate, acute. Pedicel and ovary 1.5-5.5 mm long, glabrous, slightly arcuate. Dorsal sepal 3.6-7 mm long, 1.2-2 mm wide, oblong-ovate, acute to shortly acuminate, rather thick, glabrous. Petals 1.5-3 mm long, 0.6-1.2 mm wide, rhomboid or spatulate, acute or obtuse, finely papillose towards apex. Lateral sepals 3.2-7 mm long, 1.5-2 mm wide, broadly ovate to ovate-oblong, nearly symmetric, acute, to shortly acuminate, thick, glabrous. Lip 1.5-2.3 mm long, 0.5-1 mm wide, ovate-cordate to hastate in general outline, apiculate to acute, thick, glabrous to very finely papillose. Gynostemium 0.9-1.8 mm long.

**HABITAT.** Epiphyte on branch and tree trunk in lowland to hill forests, relic forests in savanna. October-January.

**DISTRIBUTION.** Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, Gabon, Central African Republic, Democratic Republic of Congo (Zaire), Uganda. Alt. 0-500 m.

**REPRESENTATIVE SPECIMENS.** Hiré, between Kagbé and Dékadougou, 1 Dec. 1966, *Aké Assi* 9343 (K!); Mt. Momi, 30 Oct. 1966, *Aké Assi* 9193 (K!); Between Sinhé and Buyo, 3 Dec. 73, *Pérez-Vera* 253 (P!); Between Soubaé and Buyo, 10 Jan. 1974, *Pérez-Vera* 256 (K!); Tai, 22 Oct. 1961, *Aké Assi* 6033 (K!).

## 27. *Bulbophyllum phaeopogon* Schltr. in Bot. Jahrb. Syst. 38: 157. 1906

**TYPE:** CAMEROON. *Winkler* 14a (LECTOTYPE: B†; ISOLECTOTYPE: Z) & CAMEROON. *Schlechter* 15791 (PARATYPE: B†; DRAWING: K!). - *Bulbophyllum schinzianum* var. *phaeopogon* (Schltr.) J.J. Verm. in Bull. Jard. Bot. Nat. Belg. 56: 229. 1986.

Pseudobulbs 1-6 cm long, 0.8-3 cm in diameter, 0.6-7 cm apart, orbicular to narrowly ovoid, more or less 2-4-angled, 1-leaved. Leaf petiolate; petiole 0.8-4 cm long, blade 7.5-32 cm long, 1.4-6.5 cm wide, oblong, rounded, occasionally subacute, thick, coriaceous. Inflorescence 28-102 cm long, 11-102-flowered, dense to relatively lax, rhachis not thickened, glabrous. Flowers medium-sized, glabrous, not fully opened. Floral bracts 16-30 mm long, broadly elliptic to ovate-lanceolate. Pedicel and ovary 8-24 mm long, slightly curved down at base, glabrous. Dorsal sepal 9.5-11 mm long, 1.4-4 mm wide, oblong-elliptic in general outline, subacute, glabrous. Petals 6.5-8 mm long, 0.3-1 mm wide, linear falcate, acute to acuminate. Lateral sepals 9-11 mm long, 2-3 mm wide, obliquely oblong-elliptic, subacute to subobtuse, glabrous. Lip 6-7.5 mm long, 2-2.5 mm wide, rather thick, linear in the lower part, ovate to elliptic above, rounded at apex, margins densely covered by thick hairs - short on the adaxial side, and long, up to 4 mm long, on the abaxial side; adaxial surface coarsely papillose. Gynostemium 3-6 mm long.

**HABITAT.** Epiphyte on branches of large trees, primary forests, riverine forests, relic forests in savanna. July.

**DISTRIBUTION.** Ivory Coast, Ghana, Nigeria, Cameroon, Gabon, Congo, Democratic Republic of Congo (Zaire). Alt. up to 500 m.

**REPRESENTATIVE SPECIMENS.** Dab-Man road, near R. Lobo, 13 July 1975, *Pérez-Vera* 254/B (K!).

**28. *Bulbophyllum pipio* Rchb. f. in Linnea 41: 92. 1877**  
(Fig. 95)

TYPE (*here designated*): GHANA. *cult. hort. Hammoniae*, no. 2302 & 2307 (LECTOTYPE: W-R!;  
ISOLECTOTYPE: K!)

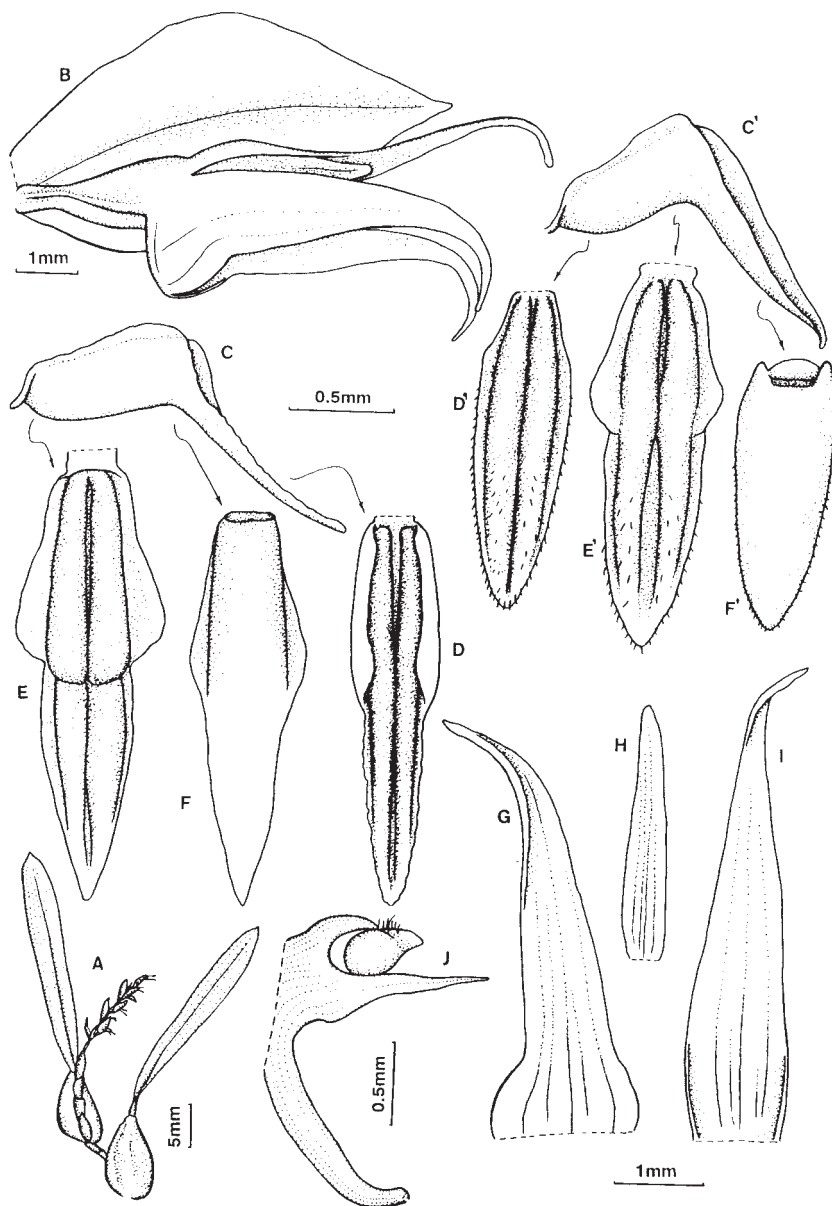


Fig. 95.—*Bulbophyllum pipio* Rchb. f.: A – habit; B – flower; C–F – lip, various views; G – lateral sepal; H – petal; I – dorsal sepal; J – gynostemium (drawn by A. Kowalkowska).

Pseudobulbs 0.5-1.5 cm long, 0.4-0.8 cm in diameter, 0.5-1.2 cm apart, 3-4-angled, single-leaved. Leaf sessile to shortly petiolate; blade 1.7-7 cm long, 0.2-0.5 cm wide, narrowly lanceolate to linear, acute, thick, coriaceous. Inflorescence 0.8-6.5 cm long, 4-25-flowered, rather dense, rhachis terete, glabrous. Flowers tiny, cream-coloured, sepals with bright yellow apices, lip cream coloured or green, usually with purple base. Floral bracts 5-7 mm long, ovate-oblong to ovate-lanceolate, acute to acuminate, membranous, glabrous. Pedicel and ovary 1.8-2 mm long, erect, slender, glabrous. Dorsal sepal 4-5 mm long, 0.8-1.2 mm wide, ovate-lanceolate to linear-lanceolate, acute, rather thin, glabrous. Petals 2-2.4 mm long, 0.3-0.6 mm wide, oblong-lanceolate to narrowly elliptic, subacute to obtuse, thin, glabrous. Lateral sepals 5-6 mm long, 1-1.5 mm wide, obliquely ovate-lanceolate, to oblong-lanceolate, acute, rather thin, glabrous. Lip 1.3-1.9 mm long, 0.5-0.9 mm wide, oblong-ovate to elliptic, rounded at apex, almost straight, rather thin, irregularly papillose adaxially and nearly glabrous abaxially. Gynostemium 1.2-1.6 mm long.

**HABITAT.** Epiphyte in mangrove forests (collected on *Rhizophora* sp.), lowland forests, savanna woodlands. October-November, March.

**DISTRIBUTION.** Sierra Leone, Ivory Coast, Ghana, Nigeria, Cameroon.

**REPRESENTATIVE SPECIMENS.** Lobo R., 30 Nov. 1967, *Aké Assi* 9797 (K!); Yapo, 26 Oct. 1974, *Pérez-Vera* 710 (K!).

## 29. *Bulbophyllum pumilum* (Sw.) Lindl. in Gen. Sp. Orchid. Pl.: 54. 1830 (Fig. 96)

*Dendrobium pumilum* Sw. in Neues J. Bot. 1(1): 97. 1805. TYPE: SIERRA LEONE. *Afzelius* s.n. in Swartz (LECTOTYPE: S; ISOLECTOTYPE: W-R!)

*Bulbophyllum recurvum* Lindl. in Gen. Sp. Orchid. Pl.: 53. 1830; TYPE: SIERRA LEONE. *cult. Hort. Kew* (HOLOTYPE: K!)

*Bulbophyllum flavidum* Lindl. in Edwards's Bot. Reg. 26: misc. 83. 1840; TYPE: SIERRA LEONE. *cult. Hort. Kew*. (HOLOTYPE: K!)

*Bulbophyllum herminostachys* (Rchb. f.) Rchb. f. in Ann. Bot. Syst. 6: 254. 1861; TYPE (*here designated*): *Hb. Reichenbach* (LECTOTYPE: W-R!)

*Bulbophyllum pavimentatum* Lindl. in J. Linn. Soc., Bot. 6: 128. 1862; TYPE: NIGERIA. *Mann* 519 (HOLOTYPE: K!; ISOTYPE: W-R!)

*Bulbophyllum gabonis* Lindl. & Rchb. f. in Flora 48: 185. 1865; TYPE: GABON. *coll.?* (HOLOTYPE: W-R!; FRAGMENT OF HOLOTYPE, DRAWING: K!)

*Bulbophyllum drallei* Rchb. f. in Gartenflora. 35: 20. 1885; TYPE (*here designated*): *cult. Dralle* s.n. (LECTOTYPE: W-R!)

*Bulbophyllum porphyroglossum* Kraenzl. in Bot. Jahrb. Syst. 22: 24. 1895; TYPE: CAMEROON. *Preuss* 1299 (HOLOTYPE: B†)

*Bulbophyllum nanum* De Wild. in Not. Pl. Util. Congo 1: 122. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent* 1903 (HOLOTYPE: BR; FRAGMENT OF HOLOTYPE: K!)

*Bulbophyllum papillosum* Finet in Bull. Mus. Hist. Nat. (Paris) 9: 303. 1903; TYPE: CONGO. *Vergnes & Lousteaux* s.n. (HOLOTYPE: P?)

*Bulbophyllum moliwense* Schltr. in Bot. Jahrb. Syst. 38: 157. 1906; TYPE: CAMEROON. *Schlechter* 15757 (HOLOTYPE: B†; DRAWING: K!)

*Bulbophyllum leucopogon* Kraenzl. in Bot. Jahrb. Syst. 48: 391. 1912; TYPE: CAMEROON. *Zenker* 3903 (HOLOTYPE: HBG!; ISOTYPES: BM!, K!, P!, W!)

*Bulbophyllum dorotheae* Rendle in Rendle & Baker, Cat. Pl. Oban.: 100, 146. 1913; TYPE: NIGERIA. *Talbot* 934 (HOLOTYPE: BM!; DRAWING: K!)

*Bulbophyllum verecundum* Summerh. in Kew Bull. 8: 582. 1954; TYPE: GABON. *Le Testu* s.n. (HOLOTYPE: K!)

*Bulbophyllum elachon* J.J. Verm. in Selbyana 7(1): 11. 1982; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Jongejan* 51 (HOLOTYPE: L)

Pseudobulbs 0.3-4 cm long, 0.3-1.8 cm in diameter, 0.2-2.8 cm apart, orbicular to narrowly ovoid, 2-4-angled, single-leaved. Leaf petiolate; petiole up to 20 mm long; blade 1.1-23 cm long, 0.6-4 cm wide, nearly orbicular to oblanceolate-linear, acute to obtuse, thick, coriaceous. Inflorescence 2-31 cm long, 3-65-flowered, rather lax, rhachis terete, zigzag or not, glabrous. Flowers small, sepals white or greenish often purple or red suffused, or entirely purple-red to purple, petals white, lip yellowish, greenish, red, purple or white. Floral bracts 2.5-6 mm long, elliptic to ovate-oblong, rounded at apex to acute, membranous, glabrous. Pedicel and ovary 0.6-3.3 mm long, arcuate, glabrous. Dorsal sepal 2.3-7.5 mm long, 0.9-2.8 mm wide, ovate-lanceolate, oblong, elliptic to triangular, or nearly spatulate, acute to shortly acuminate, rather thick, especially towards apex, glabrous abaxially, but finely or coarsely papillose adaxially. Petals 1.2-2.5 mm long, 0.5-1.2 mm wide, ovate-rhomboid, ovate-elliptic to linear-lanceolate or oblong, straight or slightly falcate, obtuse or truncate to acute, glabrous, finely papillose along margins towards apex. Lateral sepals 2.7-8 mm long, 0.9-3 mm wide, very broad and saccate at base, triangular, lanceolate-ovate above, falcate, acute, thickening towards apex, glabrous abaxially, finely or coarsely papillose adaxially. Lip 0.7-2.3 mm long, 0.5-1.2 mm wide, ovate, rounded at apex, thick, especially at base,

recurved, glabrous to finely papillose on surface, margins ciliate to papillose. Gynostemium 0.9-2 mm long.

**HABITAT.** Epiphyte on tree trunks and branches in lowland and littoral forests, relic forests in savanna and montane forests. Collected between 1 and 30 m above ground level. Occasionally lithophytic. All year round.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea (Bioko), São Tomé, Gabon, Congo, Democratic Republic of Congo (Zaire). Alt. up to 1900 m.

#### REPRESENTATIVE SPECIMENS.

Banco, 26 Nov. 1979, *van Veldhuizen 628* (WAG!); Brafouédi, 15 June 1974, *Pérez-Vera 267/B* (K!, P!); Road Danane-Mt. Nimba, 11 Mar. 1974, *Pérez-Vera 578* (K!, P!); Road Gaguoa-Sassandra, 12 Jan. 1975, *Pérez-Vera 751* (K!); Mt. Momi, *Pérez-Vera 221* (K!); Tiapleu, *Pérez-Vera 212* (K!); 'Forêt

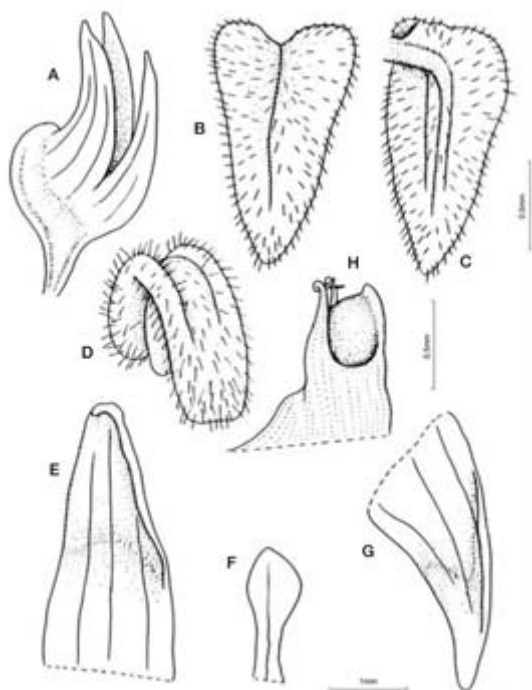


Fig. 96. *Bulbophyllum pumilum* (Sw.) Lindl.: A – flower; B–D – lip various views; E – dorsal sepal; F – petal; G – lateral sepal; H – gynostemium (drawn by Kowalkowska, *Braun s.n.*, HBG).

de N'Zida', near 'Ocapana' plantation, 3 Nov. 1956, *de Wilde* 757 (WAG!); *Sine loc.*, 11 July 1980, *van der Laan* 170 (WAG!); *Sine loc.*, 30 Nov. 1979, *van Setten* 480 (WAG!).

DOUBTFUL RECORDS. Baleko, Sep. 1955, *Nozeran s.n.* (P!). [material poorly preserved].

### 30. *Bulbophyllum purpureorhachis* (De Wild.) Schltr. in Orchideen: 328. 1914

*Megaclinium purpureorhachis* De Wild. in Not. Pl. Util. Congo 1: 126. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gentil s.n.* (HOLOTYPE: BR)

Pseudobulbs 4.5-11.5 cm long, 2-5.5 cm in diameter, 4-8 cm apart, ovoid to about rectangular, distinctly flattened, 2-3-angled, 2-leaved. Leaves petiolate; petiole 6-15 mm long; blade 12-30 cm long, 2.8-8 cm wide, oblong-obovate, rounded at apex, thick, coriaceous. Inflorescence 28-95 cm long, 20-80-flowered, lax, rhachis widened and flattened, blade-like, with dark hairs. Flowers small to medium, sepals pale greenish to white, purple striated and spotted, petals white with a purple nerve, lip white with purple dots. Floral bracts 6-8 mm long, rhomboid-ovate, acute. Pedicel and ovary ca. 5 mm long, strongly arcuate, with dark hairs. Dorsal sepal 7-14 mm long, 2.2-4 mm wide, narrowly triangular with involute margins, acute, densely hairy outside. Petals 5-9 mm long, 0.7-2.2 mm wide, obliquely lanceolate with caudate apex, glabrous. Lateral sepals 6-13 mm long, 4-7 mm wide, obliquely triangular, falcate, apiculate, hairy outside. Lip 3.3-6 mm long, 2.8-4.3 mm wide, broadly ovate in general outline with ligulate apex, obtuse, thin, glabrous, recurved. Gynostemium 2-2.5 mm long.

HABITAT. Epiphyte lowland forests, secondary forests, ca. 25-30 m above the ground level. All year round.

DISTRIBUTION. Ivory Coast, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire). Alt. 300-400 m.

REPRESENTATIVE SPECIMENS. Dakpadou-Sago road, 5°58'W, 5°16'N, 28 Mar. 1968, *Geerling & Bokdam* 2270 (WAG!); Gliké, Aug. 1942, *Schnell* 1824 (K!); Hiré, between Kagbé and Dékadorgou, 1 Dec. 1966, *Aké Assi* 9338 (K!); Tai, July 1960, *Aké Assi* 5639 (K!); 20 Apr. 1974, *Pérez-Vera* 604 (K!).

### 31. *Bulbophyllum resupinatum* Ridl. in Bol. Soc. Brot. 5: 198. 1888

TYPE (*here designated*): SÃO TOMÉ. *Quintas 10* (LECTOTYPE: BM!; ISOLECTOTYPE: COI) & *Moller s.n.* (PARATYPE: COI)

Pseudobulbs 0.8-5 cm long, 0.5-1.4 cm in diameter, 0.5-3.5 cm apart, ovoid to ellipsoid, flattened, 2-4-angled, 2-leaved. Leaves subsessile; blade 1.3-8.5 cm long, 0.5-1.6 cm wide, oblong to linear-lanceolate, obtuse, coriaceous, thick or thin. Inflorescence 1.8-40 cm long, densely or laxly 8-60-flowered, rhachis not flattened, zigzag or not. Flowers small, dark red or sepals yellow or greenish, purple spotted, lip purple with whitish base. Floral bracts 2-5.5 mm long, elliptic to ovate-oblong, acute to acuminate. Pedicel and ovary 1-4 mm long, arcuate, with fine, dark hairs. Dorsal sepal 2.2-5 mm long, 0.7-1.2 mm wide, oblong-triangular to ovate-lanceolate, acute, glabrous or with dark hairs on outer surface. Petals 1.4-3 mm long, 0.25-0.6 mm wide, linear, acute, straight or falcate, thin, usually glabrous. Lateral sepals 2-3-9 mm long, 1.2-2.8 mm wide, very obliquely triangular to elliptic-triangular, acute, glabrous or with dark hairs outside. Lip 0.9-1.6 mm long, 0.7-1.1 mm wide, broadly ovate or triangular-ovate in general outline,

obtuse or rounded at apex, recurved, thick, glabrous. Gynostemium 0.8-1.6 mm long.

HABITAT. Epiphyte in mangrove forest, lowland forest, montane forest.

VARIABILITY. Vermeulen (1987) distinguished 2 varieties in this species:

**var. resupinatum**

Inflorescence up to 8.6 cm long, dense. Flower segments glabrous or papillose on the outer surface, without dark hairs. Petals straight, not falcate.

DISTRIBUTION. Ivory Coast, Ghana, Nigeria, Cameroon, São Tomé, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. Yapo, near Abidjan, 30 Dec. 1973, *Pérez-Vera* 554 (K!); Yapo, ca. 50 km N of Abidjan, 5 Dec. 1956, *de Wilde* 980 (WAG!) (along with *Genyorchis apetala*).

**var. filiforme** (Kraenzl.) J.J. Verm. in Bull. Jard. Bot. Nat. Belg. 56: 235. 1986

*Bulbophyllum filiforme* Kraenzl. in Bot. Jahrb. Syst. 22: 25. 1895; TYPE: CAMEROON. *Preuss* 1242 (HOLOTYPE: HBG!; DRAWING: K!)

*Bulbophyllum longispicatum* Kraenzl. & Schltr. in Orchis 2: 98. 1908; TYPE: CAMEROON. *Schlechter* 15759 (HOLOTYPE: B†; DRAWING: K!)

*Bulbophyllum rubroviolaceum* De Wild. in Rev. Zool. Bot. Africaines. 9: Suppl. Bot.: 32. 1921; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Bequaert* 6705 (HOLOTYPE: BR; ISOTYPE: K!)

*Bulbophyllum daloaense* P.J. Cribb & Pérez-Vera in Adansonia, ser. 2, 15: 202, 206. 1975; TYPE: IVORY COAST. *Pérez-Vera* 270 (HOLOTYPE: K!)

*Bulbophyllum victoris* P.J. Cribb & Pérez-Vera in Adansonia, ser. 2, 15: 202, 206. 1975; TYPE: IVORY COAST. *Pérez-Vera* 553 (HOLOTYPE: K!; ISOTYPE: K!)

Inflorescence up to 40 cm long, lax. Flower segments with fine, dark hairs. Petals recurved, falcate.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Cameroon, Gabon, Congo, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. Anguededou, near R. Agneby, 23 Nov. 1975, *De Koning* 6189 (WAG!); Soubré-Buyo road, Oct. 1972, *Pérez-Vera* 270 (K!); Tai, 20 km E of Zague, 23 Nov. 73, *Pérez-Vera* 270 B (K!, P!); Yapo, 27 Dec. 1974, *Pérez-Vera* 553 (K!, P!).

**32. *Bulbophyllum saltatorium* Lindl. in Edwards's Bot. Reg. 23: 1970. 1837**

TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!; ISOTYPE: W-R!)

Pseudobulbs 1.2-4.2 cm long, 1-4.5 cm apart, orbicular to narrowly ovoid, distinctly flattened or not, single-leaved. Leaf shortly petiolate, blade 3-21 cm long, 1-5.5 cm wide, oblong-elliptic to oblong-obovate, obtuse, coriaceous, thick. Inflorescence 3.5-60 cm long, 2-80-flowered, rather dense, rachis not thickened. Flowers small, sepals dark purple adaxially, brownish purple abaxially, petals purple, lip dark purple red with purple or brownish purple hairs. Floral bracts 4.5-13 mm long, narrowly elliptic to oblong, obtuse to acute. Pedicel and ovary 4-9 mm long, erect, glabrous. Dorsal sepal 6-12.5 mm long, 2-3.8 mm wide, narrowly triangular, acute, glabrous, except finely ciliate margins. Petals 3.4-7 mm long, 0.15-0.6 mm wide, linear, apiculate, falcate, glabrous. Lateral sepals 5.8-12.5 mm long,



2-3.5 mm wide, obliquely narrow triangular or oblong-ovate, acute, glabrous, except finely ciliolate margins. Lip 5-9 mm long, 1-1.8 mm wide, oblong-lanceolate in general outline, widened at base, acute to obtuse, along margins covered by short hairs in the lower part, and longer in the apical one, recurved near the base, thick. Gynostemium up to 3.5 mm long.

HABITAT. Epiphyte in primary forests.

VARIABILITY. Vermeulen (1987) included into this species 3 varieties, of which one - var. *albociliatum* - we treated as a separate species. Two others - *saltatorium* and *calamarium* - differ in the kind of hairs covering lip.

var. **saltatorium**

Velvety hairs along adaxial margins of the lip up to its apex; hairs in the apex of lip neither longer nor coarser.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Equatorial Guinea. Alt. up to 600 m.

REPRESENTATIVE SPECIMENS. Banco Forest Reserve, 16 Jan. 1974, *De Koning* 3122 (WAG!); Banco, 3 July 1974, *Pérez-Vera* 665 (K!); Yapo, 10 Mar. 1975, *Pérez-Vera* 711 (K!, P!); *Sine loc.*, 22 Aug. 1975, *van der Burg* 753 (WAG!).

var. **calamarium** (Lindl.) J. J. Verm. in Bull. Jard. Bot. Nat. Belg. 56: 230. 1986

*Bulbophyllum calamarium* Lindl. in Edwards's Bot. Reg. 29: misc. 70, 1843; TYPE: SIERRA LEONE. *Fielding s.n.* (HOLOTYPE: K!)

*Bulbophyllum rupicola* Rchb. f. in Flora 48: 184. 1865; TYPE (*here designated*): ANGOLA. *Welwitsch* 677 p.p. (LECTOTYPE: BM!; ISOLECTOTYPE: K!)

Velvety hairs along adaxial margins of the lip up to its half-way; hairs in the apical half of the lip gradually disappear or become much coarser and longer. Flowers larger than typical variety.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Ghana, Cameroon, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola. Alt. up to 900 m.

REPRESENTATIVE SPECIMENS. Banco Forest Reserve, near R. Banco, 3 June 1976, *De Koning* 6954 (WAG!); Man-Danane road, near R. Zo, *Pérez-Vera* 187 (K!); Mar. 1975, *Pérez-Vera* 223 (K!); 6 Apr. 1975, *Pérez-Vera* 771 (K!); Ca. 15 km E of Tabou (Tahou), near the road to San Pedro, 7°15'W, 4°31'N, 11 July 1978, *Dekker* 97 (WAG!).

**33. *Bulbophyllum scaberulum* (Rolfe) Bolus in J. Linn. Soc., Bot. 25: 181. 1889**

*Megaclinium scaberulum* Rolfe in Gard. Chron., ser. 3, 4, nr. 80: 6. 1880; TYPE: SOUTH AFRICA. *Tillett s.n.* (HOLOTYPE: K!)

*Megaclinium clarkei* Rolfe in Kew Bull. 1891: 198. 1891; TYPE: WEST AFRICA. *Clarke s.n.* (HOLOTYPE: K!). - *Bulbophyllum clarkei* (Rolfe) Schltr. in Bot. Jahrb. Syst. 38: 13. 1905.

*Bulbophyllum congolanum* Schltr. in Westafr. Kautschuk-Expd.: 281. 1901; TYPE: CONGO. *Schlechter* 12693 (HOLOTYPE: B†; ISOTYPES: BM!, K!)

*Megaclinium pobeguinii* Finet in Notul. Syst. (Paris) 1: 167. 1910; TYPE: GUINEA. *Pobeguini* 636 & 925 (HOLOTYPE: P!; ISOTYPE: K!). - *Bulbophyllum pobeguinii* (Finet) De Wild. in Pl. Bequaert. 1: 95. 1921.

*Bulbophyllum chevalierii* De Wild. in Pl. Bequaert. 1: 80. 1921; TYPE: GUINEA. *Chevalier* 12838 (HOLOTYPE: BM!)



Pseudobulbs 1.8-9 cm long, 0.8-3.6 cm in diameter, 2.3-13 cm apart, orbicular to narrowly ovoid or narrowly ellipsoid, more or less flattened, 3-5-angled, 2-leaved. Leaves subsessile to petiolate; petiole up to 6 cm long; blade 3-28 cm long, 0.7-6 cm wide, elliptic to linear, obtuse to subacute, thick, coriaceous. Inflorescence 6-55 cm long, up to 100-flowered, rather lax, rhachis flattened and widened, blade-like, glabrous or finely papillose. Flowers small, sepals and petals cream, yellow or green, often spotted, striated or suffused with purple, lip cream or yellow to pale purple. Floral bracts 2-6.5 mm long, ovate to deltoid. Pedicel and ovary 2-5 mm long, glabrous, arched. Dorsal sepal 4-9 mm long, 1.2-2 mm wide, oblong-lanceolate to ovate-lanceolate, acute, glabrous or finely haired abaxially. Petals 2.3-5.5 mm long, 0.4-1.5 mm wide, falcate linear, acute, acuminate or cuspidate. Lateral sepals 3.5-7 mm long, 2.3-5 mm wide, obliquely triangular, acute, acuminate to nearly cuspidate, glabrous or finely haired abaxially. Lip 1.2-3 mm long, 1-2.2 mm wide, ovate or triangular in general outline, obtuse, glabrous, thick, recurved. Gynostemium 1.4-3 mm long.

**HABITAT.** Epiphyte often on very exposed places, in lowland rainforests, semi-deciduous or montane forests, *Brachystegia* woodlands, occasionally in secondary forests. Occasionally lithophytic.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Chad, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Ethiopia, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa. Alt. up to 2300 m.

**REPRESENTATIVE SPECIMENS.** Between Danane and Toulepleu, 18 Oct. 1974, *Pérez-Vera* 735 (K!); Dauiéfla, Oct. 1971, *Pérez-Vera* 130 (K!); 10 km N of N'Douci, 4 Dec. 1963, *Oldeman* 700 (WAG!); Between Férédougou and Mauuiuan, 23 Feb. 1975, *Pérez-Vera* 753 (K!); Guezon, Guessabo-Duékoné road, 3 Nov. 1973, *Pérez-Vera* 536 (K!); Hiré, Between Kagbé and Dékadougou, 1 Dec. 1966, *Aké Assi* 9336 (K!); Moossou, 11 Nov. 1956, *de Wilde* 805 (K!, WAG!); *Sine loc.*, *Hepper & Maley* 6262 (K!).

### 34. *Bulbophyllum scariosum* Summerh. in Kew Bull. 8: 145. 1953

TYPE: SIERRA LEONE. *Jones* 64 (HOLOTYPE: K!).

Pseudobulbs (1.2)2.5-4 cm long, 0.6-1.7 cm in diameter, 2-leaved, narrowly ovoid, 2-4.6 cm apart, slightly flattened, 4(-5)-angled. Petiole up to 0.3 cm long. Leaf blade 3-9 cm long, 0.6-1.3 cm wide, narrowly lanceolate to linear-lanceolate, tip rounded, emarginated, oblique; coriaceous. Inflorescence 5.5-20 cm long, 2-8-flowered. Rhachis arching or nodding, not or hardly swollen, 4-angled in section, with two slightly concave sides from which the flowers arise, zigzag bent towards the tip, glabrous. Floral bracts 5-8 mm long, spreading, slightly concave, triangular to about deltoid, acuminate. Flowers distichous, in a rather lax raceme, spreading, many open simultaneously, not fully open. Sepals and petals white. Lip white (?), yellow or orange. Dorsal sepal 4.5-7 mm long, 3-4.4 mm wide, not recurved, slightly concave, ovate, obtuse to slightly acuminate, glabrous. Petals 4-6 mm long, 2.3-3.8 mm wide, not recurved, not or hardly falcate, elliptic, oblique, rounded. Lateral sepals 6-9 mm long, 4-7 mm wide, hardly recurved to about spreading, not concave, not falcate, triangular, oblique. Lip 2-4.9 mm long, 1.4-2.5 mm wide, recurved, elliptic in outline, tip broadly rounded; margins entire, glabrous; thick; adaxially with 2 weak, rounded ridges in the basal half which di-

verge towards the base of the lip, with a concave basal part, surface glabrous to very finely papillose. Gynostemium 1.5-2.5 mm long, with rudimentary, deltoid, not falcate, rounded to acute stelia.

**HABITAT.** (Lower) montane forests at 1000-1800 m alt. Epiphyte in the outer part of the crown of trees, on bark or in humus deposits. Often very exposed. Also lithophytic on boulders in montane grasslands. November-December.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Liberia, Equatorial Guinea.

**REPRESENTATIVE SPECIMENS.** Mt. Nimba, 8°25'W, 7°37'N, 14 Dec. 1967, *Geerling & Bokdam 1714* (WAG!); Mt. Tonkoui, Nov. 1973, *Pérez-Vera 493* (K!, P!).

**35. *Bulbophyllum schinzianum*** Kreanzl. ex De Wild. & T. Durand in Bull. Soc. Roy. Bot. Belg. 38: 57. 1899

**TYPE:** DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent s.n.* (HOLOTYPE: BR)

*Bulbophyllum gentilii* Rolfe in Gard. Chron, ser. 3, 35: 266. 1904; **TYPE:** DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gentil s.n.* (HOLOTYPE: K!)

Pseudobulbs 1-6 cm long, 0.8-3 cm in diameter, 0.6-7 cm apart, orbicular to narrowly ovoid, obtusely to sharply 2-4-angled, single-leaved. Leaf petiolate; petiole 0.8-4 cm long; blade 7.5-32 cm long, 1.4-6.5 cm wide, oblong, rounded to subacute, coriaceous, thick. Inflorescence 28-102 cm long, up to 100-flowered, dense to relatively lax, rhachis not thickened. Flowers medium-sized, glabrous, sepals yellowish or greenish, occasionally brownish, usually red-purple spotted or entirely red-purple, petals red purple, lip yellowish green, red purple tinged, hairs brown. Floral bracts large, the lower ones 15 mm or more long. Pedicel and ovary up to 2.5 cm long, erect, glabrous. Dorsal sepal 7-14 mm long, 1.6-4.5 mm wide, oblong-ovate to elliptic-lanceolate, acute, glabrous. Petals 2.5-6 mm long, 0.2-0.7 mm wide, linear to filiform, acuminate, glabrous. Lateral sepals 6-13 mm long, 1.8-3 mm wide, obliquely oblong to linear-lanceolate, subacute, glabrous. Lip 5-11 mm long, 1.3-3.5 mm wide, rather thick, oblong-lanceolate to narrowly obovate in general outline, subacute to obtuse, margins covered by thick hairs, those on the adaxial side - short, on the abaxial side - long (4-8 mm). Gynostemium 3.2-5 mm long.

**HABITAT.** Epiphyte in the crown and on bark tree in primary forests.

**DISTRIBUTION.** Liberia, Ivory Coast, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire). Alt. up to 800 m.

**VARIABILITY.** Vermeulen (1987) distinguished 3 varieties in this species. In the present treatment *B. schinzianum* var. *phaeopogon* deserves a status of separate species.

**var. *schinzianum***

Lip oblong to broadly linear-lanceolate, apical part as wide as or wider than the basal part.

**DISTRIBUTION.** Liberia, Ivory Coast, Nigeria, Cameroon, Gabon, Democratic Republic of Congo (Zaire).

**REPRESENTATIVE SPECIMENS.** Banco Forest Reserve, 16 Jan. 1974, *De Koning 3123* (WAG!); 16 Oct. 1974, *De Koning 4098* (WAG!); Tai, Zagué, 23 Nov. 1973, *Pérez-Vera 570* (K!).

var. **irigaleae** (P.J. Cribb & Pérez-Vera) J.J. Verm. Orchid. Monogr. 2: 29. 1987

TYPE: IVORY COAST. *Pérez-Vera* 571 (HOLOTYPE: K!). – Cribb & Pérez-Vera, *Adansonia*, ser. 2, 15: 200 & 206. 1975. – Vermeulen, *Orchid Monogr.* 2: 28, fig. 2. 1987. – Aké Assi, *Fl. Côte-d'Ivoire* 2: 262. 2002. – Pérez-Vera, *Orchid. Côte-d'Ivoire*: 187. 2003.

Lip narrowly linear-lanceolate, apical part much narrower than the basal part.

DISTRIBUTION. Liberia, Ivory Coast.

REPRESENTATIVE SPECIMENS. Mt. Momi, May 1972, *Pérez-Vera* 248 (K!); Tai, 40 km E of Zagué, *Pérez-Vera* 571 (K!).

### 36. *Bulbophyllum stenopetalum* Kraenzl. in Bot. Jahrb. Syst. 22: 25. 1895

TYPE: CAMEROON. *Preuss* 1217 (HOLOTYPE: B†; ISOTYPE: HBG!; DRAWING: K!, UGDA-DLSz). – *Bulbophyllum sandersonii* subsp. *stenopetalum* (Kraenzl.) J.J. Verm. in *Bull. J. Bot. Nat. Belg.* 56: 234. 1986.

*Megaclinium minor* De Wild. in *Not. Pl. Util. Congo* 1: 125. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gentil s.n.* (HOLOTYPE: BR)

*Bulbophyllum rhodopetalum* Kraenzl. in *Bot. Jahrb. Syst.* 36: 114. 1921; TYPE: CAMEROON. *Zenker* 2895 (HOLOTYPE: B†)

Pseudobulbs 1.6-7 cm long, 0.7-2.5 cm in diameter, 1.2-2.6 cm apart, narrowly ellipsoid to narrowly ovoid, hardly to moderately flattened, more or less 3-6-angled, 2-leaved. Leaves shortly petiolate; petiole up to 7 mm long; blade 3.5-26 cm long, 0.5-2.5 cm wide, narrowly lanceolate to linear-lanceolate, obtuse or rounded, coriaceous, thick. Inflorescence 5.5-30 cm long, 4-60-flowered, dense or lax, rhachis rather thick and fleshy, flattened and widened, blade-like, glabrous to papillose. Flowers rather small, sepals yellowish green to cream, turning orange yellow after a few days, sometimes red dotted, petals yellowish green to red purple, lip yellowish with purple dots. Floral bracts 3.5-7 mm long, ovate, acute, as wide as or wider than rhachis. Pedicel and ovary up to 5 mm long, glabrous, erect. Dorsal sepal 7-15 mm long, 0.8-1.5 mm wide, linear- to oblong-lanceolate, acute, glabrous or finely ciliate or papillose, especially along margins. Petals 7-14 mm long, 0.4-0.7 mm wide, filiform, swollen towards apex. Lateral sepals 4.2-9 mm long, 2.6-4.5 mm wide, falcate ovate-lanceolate, acute, glabrous or finely ciliate or papillose, especially along margins. Lip 1.5-3 mm long, 1-2.5 mm wide, triangular, ovate to oblong-ovate in general outline, obtuse to acute, recurved, thick, with 2 elevated keels over the entire length. Gynostemium up to 3.6 mm long.

HABITAT. Epiphyte on tree trunk or branches 20-30 m above ground level in lowland forests to lower montane forests, occasionally in secondary forests. March.

DISTRIBUTION. Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, São Tomé, Gabon, Democratic Republic of Congo (Zaire), Alt. 0-1000 m.

REPRESENTATIVE SPECIMENS. Dakpadou-Sago road, 5°58'W, 5°16'N, 28 Mar. 1968, *Geerling & Bokdam* 2272 (K!, WAG!); 35 km SW of Guéyo, 30 Mar. 1962, *Leeuwernberg* 3776 (K!, WAG!)

### 37. *Bulbophyllum tetragonum* Lindl. in Gen. Sp. Orchid. Pl.: 53. 1830

TYPE: SIERRA LEONE. *Lindley s.n.* (HOLOTYPE: K!)

Pseudobulbs 4.5-7.5 cm long, 1.2-2.5 cm in diameter, narrowly ovoid to narrowly ellipsoid, 4-6-angled, 2-leaved. Leaves petiolate; petiole 4.5-10 mm long; blade 10-25 cm long, 1.2-2.6 cm wide, linear-lanceolate to linear, obtuse, thick, coriaceous. Inflorescence 15.5-28 cm long, rather densely 24-50-flowered, rhachis slightly swollen, locally densely covered by fine dark hairs. Flowers small, sepals yellowish white, with large dark red spots on outer surface, petals yellow, lip yellow, stained with dark red. Floral bracts 9-13 mm long, elliptic, acute, membranous, with dark hairs abaxially. Pedicel and ovary 1.5-2 mm long, erect, conical, with fine dark hairs. Dorsal sepal 3.5-4.5 mm long, 2.2-2.5 mm wide, ovate to oblong-ovate, acuminate, thick, with fine dark hairs on outer surface. Petals 2-3 mm long, 0.2-0.4 mm wide, very broad at base, linear-falcate to falcate-oblancheolate above, acute, rather thick, glabrous. Lateral sepals 3.2-4 mm long, 2-2.5 mm wide, obliquely ovate- or elliptic-triangular, acute, rather thick, with fine dark hairs on outer surface. Lip 1.3-2 mm long, 1-1.5 mm wide, elliptic in general outline, rounded at apex, thick, not recurved, glabrous, margins thin, elevated, denticulate, widened below apex. Gynostemium 1.6-1.8 mm long.

HABITAT. Epiphyte on branch and tree trunk in lowland and hill forests. February.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Ghana, Cameroon, Democratic Republic of Congo (Zaire), Alt. up to 900 m.

REPRESENTATIVE SPECIMENS. Ca. 20 km W of Mt. Tonkoui, 17 Feb. 1977, *van der Burg 1259* (WAG!).

### 38. *Bulbophyllum velutinum* (Lindl.) Rchb. f. in Ann. Bot. Syst. 6: 258. 1861

*Megaclinium velutinum* Lindl. in Edwards's Bot. Reg. 33: pl. 32. 1847; TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!). - *Bulbophyllum falcatum* var. *velutinum* (Lindl.) J.J. Verm. in Bull. Jard. Bot. Belg. 56: 235. 1986.

*Bulbophyllum rhizophorae* Lindl. in J. Linn. Soc., Bot. 6: 125. 1862; TYPE: NIGERIA. *Barter s.n. or 20118 ?* (HOLOTYPE: K!; ISOTYPE: W-R!)

*Bulbophyllum melanorrhachis* Rchb. f. in Gard. Chron. ser. 2, 4 (84): 162. 1875; TYPE (*here designated*): SIERRA LEONE? *Saunders 2299* (LECTOTYPE: W-R!; DRAWING: K!)

*Megaclinium minutum* Rolfe in Bull. Misc. Inform. Kew. 1893: 5. 1893; TYPE: SIERRA LEONE. *Scott Elliot s.n.* (HOLOTYPE: K!)

*Megaclinium millenii* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 40. 1898; TYPE: NIGERIA. *Millen 189* (HOLOTYPE: K!; ISOTYPE: BM!)

*Megaclinium lasianthum* Kraenzl. in Bot. Jahrb. Syst. 48: 393. 1912; TYPE: CAMEROON. *Simon 11* (HOLOTYPE: B†; DRAWING: K!)

*Bulbophyllum fractiflexum* Kraenzl. in Bot. Jahrb. Syst. 48: 392. 1912 *nom. illeg. non* J.J. Smith, 1908; TYPE: CAMEROON. *Zenker 3910* (HOLOTYPE: B†)

*Bulbophyllum brixhei* De Wild. in Bull. Jard. Bot. Etat. 5: 174. 1916; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Pynaert 1456* (HOLOTYPE: BR)

*Bulbophyllum solheidii* De Wild. in Bull. Jard. Bot. Etat. 5: 178. 1916; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Soldheid 78* (HOLOTYPE: BR)

*Bulbophyllum lanuriense* De Wild. in Rev. Zool. Bot. Africaines. 9, Suppl. Bot.: 30. 1921; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Bequaert 4489 & 4493* (HOLOTYPE: BR)

*Megaclinium angustum* Rolfe in Bull. Misc. Inform. Kew. 1922: 26. 1922; TYPE: OLD CALABAR. *Holland s.n.* (HOLOTYPE: K!)

Pseudobulbs 0.9-4.2 cm long, up to 1 cm in diameter, narrowly ovoid to nearly fusiform, 2-leaved. Leaves shortly petiolate; blade 2-15.5 cm long, 0.5-2 cm wide, narrowly lanceolate to narrowly oblanceolate, subacute to subobtuse. Inflorescence

3-28 cm long, up to 40-flowered, lax to dense, rhachis flattened and widened or not, sometimes terete. Flowers small to tiny, sepals yellowish or greenish, the dorsal one with yellow, orange or red margin thickenings, the lateral ones often partly red, lip yellow or dark red, occasionally flowers entirely red. Floral bracts ca. 2-3 mm long, oblong-ovate, acute, deflexed. Pedicel and ovary ca. 3 mm long, erect, covered by dark hairs. Dorsal sepal 2.3-6(7) mm long, 0.8-2.2 mm wide, obovate-lanceolate above short basal ribbon-like part, acute to obtuse, usually covered by dark hairs outside. Petals 1.3-3.2 mm long, 0.25-0.8 mm wide, linear-lanceolate, falcate, acute, not thickened apically. Lateral sepals 1.8-5.2 mm long, 0.8-3.5 mm wide, obliquely triangular, acute, finely papillose to coarsely puberulous adaxially. Lip 0.7-2.5 mm long, 0.5-1.8 mm wide, broadly ovate in general outline, obtuse, recurved, thick, glabrous. Gynostemium ca. 1.5 mm long.

**HABITAT.** Epiphyte, rarely lithophyte in lowland forests, relict forests in savanna, montane forests, littoral forests, mangrove forests, coffee plantation. October-January.

**DISTRIBUTION.** Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, São Tomé and Príncipe, Equatorial Guinea (Annobón), Gabon, Democratic Republic of Congo (Zaire). Alt. 0-1800 m.

**REPRESENTATIVE SPECIMENS.** Adiopodoumé, 14 Dec. 1963, *Aké Assi* 7149 (K!); Adiopodoumé, 4°08'W, 5°20'N, 11 Dec. 1978, *Dekker* 340 (WAG!); Banco Forest Reserve, 25 Nov. 1973, *De Koning* 2802 (WAG!); 25 Nov. 1973, *De Koning* 2813 (WAG!); Banco Forest Reserve, near Abobo-Gare, 9 Jan. 1976, *De Koning* 6360 (WAG!); *De Koning* 6361 (WAG!); Gagnoa (Gaguoa)-Sassandra road, Oct. 1972, *Pérez-Vera* 222 (K!); Gagnoa (Gaguoa)-Sassandra road, Dec. 1974, *Pérez-Vera* 292 (K!); Mt. Momi, 30 Oct. 1960, *Aké Assi* 9192 (K!); Naoua, Sassandra, 1 Nov. 1975, *Pérez-Vera* 857 (K!); R. Sassandra, near Gribo, ca. 8 km SSE of Soubré, 22 Nov. 1961, *de Wilde* 3292 (K!, WAG!); Tiapleu, 27 Oct. 1966, *Aké Assi* 9122 (K!); *Aké Assi* 9126 (K!); *Aké Assi* 9780 (K!); 21 Nov. 1967, *Aké Assi* 9786 (K!); Mt. Tonkoui, 16 Nov. 1967, *Aké Assi* 9767 (K!); *Sine loc.*, *Aké Assi* 9820 (K!); *Sine loc.*, 3 Jan. 1968, *Aké Assi* 9870 (K!).

Subtribe **Genyorchidinae** Schltr. in Orchideen: 336. 1915.

Pseudobulbs of single internode. Leaves usually 2, sometimes single. Flowers tiny, nonresupinate. No stelia are present. Apical clinandrium well formed. Rostellum truncate, thick. Viscidium thick, multilayered, fleshy. Tegula-like structure formed of several cell layers, relatively thick, fleshy. Pollinia 4, rather equal in size.

Three genera constitute this subtribe.

### 31. **Genyorchis** Schltr. in Westafr. Kautschuk-Exped.: 280. 1900

Plants small. Rhizome elongate, creeping, with well-spaced pseudobulbs. Pseudobulbs 1- or 2-leaved. Leaves thick, coriaceous, duplicate. Inflorescence arising from the base of the pseudobulbs, few-flowered, rather lax, peduncle filiform, rhachis sometimes zigzag. Flowers tiny, non-resupinate. Sepals rather large, dissimilar, lateral sepals oblique at base. Petals reduced to the scale-like structures, or lacking. Lip hinged, free, more or less 3-lobed, thick in the centre or along the mid-vein, canaliculate. Column foot prominent. Gynostemium short, erect, rather massive. Anther incumbent, motile, 2-chambered. Connective narrow. Pollinia four in two pairs, unequal in size, laterally flattened, ellipsoid.

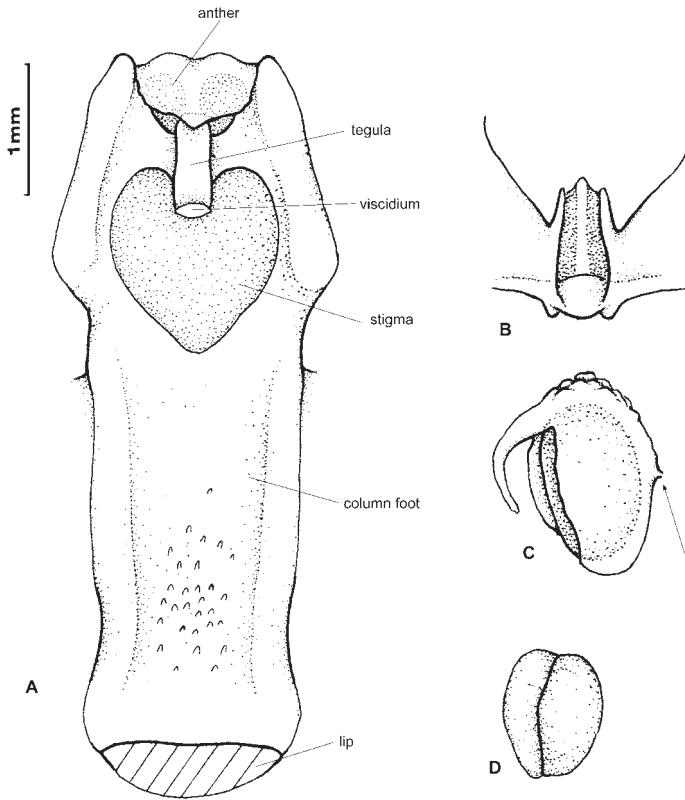


Fig. 97.—Gynostemium structure of *Genyorchis* Schltr.: A - gynostemium, bottom view; B - rostellum remnant; C - anther; D - pollinium (Szlachetko & Margońska, 2002).

Caudicles sticky. Stigma entire, oval, deeply concave. Rostellum short, truncate with elongate middle-lobe. Tegula single, oblong, rather fleshy. Viscidium oval, small, fleshy (Fig. 97).

The genus of about 10 species native to the tropical Africa.

1. ***Genyorchis apetalata*** (Lindl.) J.J.Verm. in Orchid Monogr. 2: 161. 1987, *non* Senghas 1989 (Fig. 98)

*Bulbophyllum apetalum* Lindl. in J. Linn. Soc., Bot. 6: 127, 1862. - TYPE: SIERRA LEONE.

*Afzelius* s.n. (HOLOTYPE: K!)

*Genyorchis pumila* auct. *non* (Sw.) Schltr. in Westafr. Kautschuk-Expéd.: 280. 1900.

Pseudobulbs 0.6-1.5 cm long, 0.3-0.5 mm in diameter, 1-2.5 cm apart, oblong-ovoid to conical-ovoid, 2-leaved. Leaves 0.7-2.5 cm long, 0.2-0.7 cm wide, oblong-elliptic to linear, obtuse, unequally bi-lobed, thick, coriaceous, spreading.

Inflorescence 3.5-6(18) cm long, 4-6(12)-flowered, lax, peduncle with 3-4 sheathing cauline bracts, rhachis zigzag, non-winged. Flowers small, nonresupinate, white with a yellow patch at the base and near the apex of the lip, staminodes purple. Floral bracts 1-1.7 mm long, ovate, lanceolate, acute, thin, delicate. Pedicel and ovary up to 1 mm long, slender, glabrous. Dorsal sepal 2.4-3 mm long, 1-1.75 mm wide, oblong-elliptic to oblong-lanceolate, acute, slightly cochleate, glabrous. Petals rudimentary, broadly triangular, subobtuse, as long as wide, joined with the gynostemium. Lateral sepals 2-2.2 mm long on the upper margin, 3.5-4.5 mm long on lower margin, 1.1-2 mm wide at base, oblong-ovate, oblique at base, with falcate apiculus at the top, slightly cochleate, thin, glabrous. Lip 2.2-3.5 mm long, 1-1.3 mm wide, oblong-obovate to ligulate in general outline, rather thin and deli-

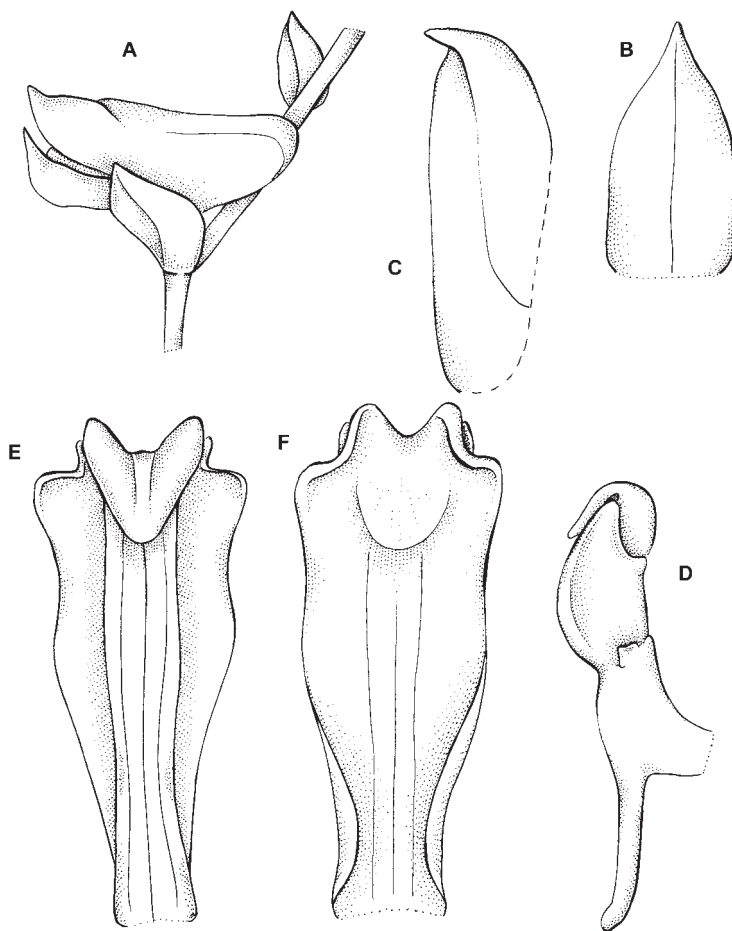


Fig. 98.—*Genyorchis apetalata* (Lindl.) J.J.Verm.: A — flower; B — dorsal sepal; C — lateral sepal; D — gynostemium side view and petal; E, F — lip, various views (drawn by H.B. Margońska, *Schlechter* 12737, P).



cate, except the fleshy base and the mid-lobe; the middle lobe triangular to cordate-ovate, obtuse, recurved, adnate to the lip lower surface; sidelobes obscure, obtuse. Spur 2-2.5 mm long, conical-saccate, blunt. Column foot 2 mm long, gynostemium up to 2.5 mm long.

**HABITAT.** Epiphyte in rain forest, on branches of *Rhizophora* sp. in mangrove swamp. All year round.

**DISTRIBUTION.** Sierra Leone, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea, Principe, Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda. Alt. 1100-1400 m.

**REPRESENTATIVE SPECIMENS.** Abidjan, National Park Banco Forest, 25 Nov. 1973, *De Koning* 2800 (WAG!); 30 Dec. 1974, *De Koning* 5086 (WAG!); 2 Dec. 1956, *Halle s.n.* (K!); Adiopodoumé, 4°08'W, 5 30'N, 11 Dec. 1978, *Dekker* 342 (WAG!); NE of Banco, 9 Jan. 1976, *De Koning* 6359 (WAG!); Banco Forest Reserve, 9 Jan. 1976, *De Koning* 6367 (WAG!); Baléko, Sep. 1955, *Nozeran s.n.* (P!); Bingerville, Abidjan, Dabou, 1905, *Chevalier* 15207 (P!); Buyo, 3 Dec. 1972, *Pérez-Vera* 156 /B (P!); Mt. Mafa, 28 July 1965, *Bonardi* 60 (P!); Tai, W part, near R. Audrénisrou, E of Pauléoula, 8 Feb. 1984, *Hepper & Maley* 8156 (K!); 26 Oct. 1974, *Pérez-Vera* 745 (K!); 5 Dec. 1956, *Pérez-Vera* 978 (WAG!); Yapo-Nord, 15-16 Mar. 1962, *Bernardi* 8680 (P!); Gare-Yapo (km 64), 2 Jan. 1907, *Chevalier* 1684bis (P!); Yapo, ok. 50 kmN of Abidjan, 5 Dec. 1956, *Pérez-Vera* 980 (WAG!) (along with *Bulbophyllum resupinatum* var. *resupinatum*); 11 Oct. 1956, *de Wilde* 689 (WAG!); *Sine loc.*, 19 Dec. 1967, *Aké Assi* 9865 (K!); *Sine loc.*, 26 Nov. 1963, *Merle* K241 (K!).

Subfamily **Vandoideae** Endl. in Gen. Pl.: 196. 1837

Leaves duplicate, but plicate in some groups. Inflorescence predominantly lateral, terminal in Polystachyeae. Seeds of *Eulophia*, *Cymbidium*, *Maxillaria* or *Vanda* types. Gynostemium usually more or less winged, with apical collar-like to cucullate apical clinandrium. Stigma usually deeply concave. Rostellum short and wide, truncate to beak-like, usually producing lamellate, sometimes multilayered viscidium and tegula, but none in few cases. Hamulus absent. Anther usually incumbent early in ontogeny, operculate. Pollinia 2 or 4, dorsiventrally flattened or superposed, with few exceptions.

A very variable group including about 30% of all orchid species. According to Szlachetko (1995) this subfamily embraces 12 tribes, only 3 of them are known from Ivory Coast.

#### KEY TO THE TRIBE AND SUBTRIBES

- 1. Plants sympodial ..... 2
- Plants monopodial ..... **Vandaeae**
- 2. Inflorescence terminal. Flowers nonresupinate ..... **Polystachyinae**
- Inflorescence lateral. Flowers resupinate ..... **Cymbidiinae**

Tribe **Polystachyeae** Pfitzer in Entwurf. Anordn. Orch.: 100. 1887<sup>1</sup>

Pseudobulbs of some internodes or absent, sometimes reed-like stem. Leaves plicate or duplicate. Inflorescence terminal or upper lateral. Flowers nonresupinate or resupinate. Lip spurred or saccate, hinged. Column foot usually

<sup>1</sup> In cooperation with J. Mytnik-Ejsmont.

prominent. Column erect, rather slender, or sometimes massive. Anther operculate, incumbent, or occasionally suberect. Pollinia 2, cleft or not, or 4 in 2 unequal pairs, ellipsoid, superposed. Caudicles 2, sticky. Tegula usually present, thin, membranous. Viscidium single, of various size.

This tribe includes 4 subtribes. Three of them - Collabiinae Schltr. in Claderiinae Szlach. and Bromhaediinae Dressler - are known from Australasia, the last one, Polystachyinae is represented in tropics of New and Old World.

Subtribe **Polystachyinae** Schltr. in Orchideen: 292. 1915

Stem reed-like, but pseudobulbs of several internodes are more frequent. Leaves duplicate. Inflorescence terminal, rarely upper lateral. Flowers usually nonresupinate. Column foot distinct, long and massive with lip hinged at its apex. Rostellum dome-like or erect, truncate to apiculate. Viscidium relatively large to small, lamellate, sticky, single. Tegula lamellate, single. Anther suberect to incumbent. Pollinia 4 in 2 pairs, unequal in size, ellipsoid, superposed, diagonally positioned in the anther. Caudicles sticky.

Ten genera have been classified in this subtribe, four of them occur in Ivory Coast.

#### KEY TO THE GENERA

1. Lip furnished with prominent cushion-like crest in the middle ..... **35. Epiphorella**  
 – Lip with a single basal (or rarely apical) callus, if any, not pulvinate ..... 2
2. Lip with a long claw, at least third of lip length ..... **34. Unguiculabia**  
 – Lip shortly clawed or sessile ..... 3
3. Whole plant pendent or creeping. Leaves imbricate ..... **33. Szlachetkoella**  
 – Plant nor pendent neither creeping. Leaves not imbricate ..... **32. Polystachya**

#### **32. Polystachya** Hook. in Exot. Fl. 2: t. 103. 1824

Plants of various size. Pseudobulbs fusiform, cylindrical, ellipsoid or ovoid, terete or flattened. Leaves 1 to many of various shape. Inflorescence terminal, branching or not, single to multi-flowered. Flowers of various size, tiny to large, nonresupinate. Sepals and petals dissimilar. Lateral sepals obliquely triangular or so, sometimes saccate or spurred at the base. Mentum (= spur) saccate, conical to cylindrical. Lip hinged, trilobed or unlobed, ecallose or more often with callus. Column foot very prominent, free from the ovary. Column part elongate, arcuate to erect, short. Anther incumbent, operculate, 4-chambered. Connective usually thick. Pollinia 4, dorsiventrally flattened, superposed, ellipsoid, unequal in size. Caudicles sticky. Stigma entire, deeply concave. Rostellum ligulate to beak-like. Tegula 1, elongate or short, thin. Viscidium 1, oblong to elliptic, thin. Rostellum remnant more or less notched (Fig. 99).

A large pantropical genus with about 230 predominantly African species. The genus - very variable in almost all aspects - requires a taxonomic revision. The only monographic treatment published by Kraenzlin (1926) so far remains unsatisfactory, due to the large number of species described since then.

## KEY TO THE SPECIES

1. Pseudobulbs much dorsiventrally flattened, prostrate on the substratum ..... 2
  - Pseudobulbs vertically placed, usually longer than wide ..... 6
2. Pseudobulbs with single leaf at apex ..... **14. P. obanensis**
  - Pseudobulbs with some leaves at apex ..... 3
3. Pseudobulbs much dorsiventrally flattened. Lip obtuse ..... 4
  - Pseudobulbs elongate, rather weakly flattened. Lip acuminate ..... 5
4. Pseudobulbs up to 5 cm in diameter. Leaves 7-20 cm long ..... **2. P. affinis**
  - Pseudobulbs 0.7-2 cm in diameter. Leaves 2-6 cm long ..... **3. P. bancoensis**
5. Lateral sepals linear-lanceolate, acuminate ..... **11. P. microbambusa**
  - Lateral sepals obliquely triangular-ovate, subobtusate ..... **10. P. leonensis**
6. Leaf single on the top of the pseudobulb ..... 7
  - Leaves more than one ..... 9
7. Lip unlobed, apiculate, with small subapical callus ..... **P. sp. 1**
  - Lip not as above ..... 8
8. Flowers tiny. Spur up to 2(5) mm long ..... **23. P. tenuissima**
  - Flowers larger. Spur more than 9 mm long ..... **7. P. galeata**
9. Stems reed-like, thickened into very obscure pseudobulbs ..... 10
  - Stem swollen basally at least into the pseudobulbs ..... 13
10. Mentum up to 2(2.6) mm long ..... **16. P. paniculata**
  - Mentum higher, at least 3 mm long ..... 11
11. Lip mid-lobe obovate-obtriangular in general outline, truncate at apex ... **20. P. rhodoptera**
  - Lip mid-lobe not as above ..... 12
12. Rhachis glabrous or almost glabrous, zigzag, lateral branches of inflorescence short, usually up to 2(4) cm long. Leaves widest near the middle ..... **6. P. fractiflexa**
  - Rhachis densely pubescent, not zigzag, lateral branches of inflorescence 2-5(12) cm long. Leaves oblanceolate, widest near the apex, (2)3-4(6) cm wide ..... **9. P. laxiflora**
13. Inflorescence simple ..... 14
  - Inflorescence branched ..... 17
14. Floral bracts setaceous ..... 15
  - Floral bracts not setaceous ..... **21. P. seticaulis**
15. Lip without any callus ..... **4. P. coriscensis**
  - Lip with callus ..... 16
16. Lip callus pubescent ..... **1. P. adansoniae**
  - Lip callus glabrous ..... **17. P. polychaete**
17. Branches of inflorescence secund, all directed in the same direction ..... 18
  - Branches of inflorescence not secund ..... 21
18. Lip without callus, but thickened at base and covered with compact cushion of hairs .... 19

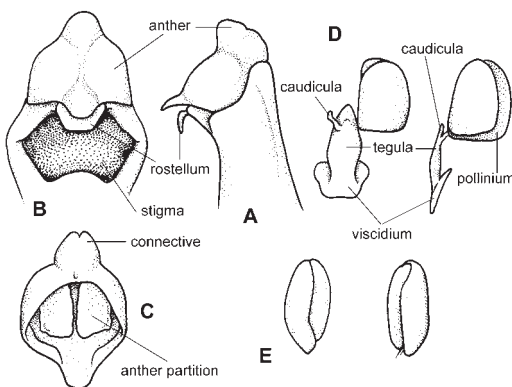


Fig. 99.—Gynostemium structure of *Polystachya* Hook.: A – gynostemium bottom view; B – gynostemium side view; C – anther; D – pollinaria various views; E – pollinia various views (Szlachetko 2003).

- Lip with callus ..... 20
- 19. Leaves rounded at apex. Inflorescence with up to 8 branches, branches up to 5 cm long ..... **8. *P. golungensis***
- Leaves acute to subacute. Inflorescence with up to 6 branches, branches up to 2 cm long ..... **12. *P. modesta***
- 20. Lip obtriangular in outline, obscurely 3-lobed at apex ..... **13. *P. mukandaensis***
- Lip distinctly 3-lobed near the middle ..... **24. *P. tessellata***
- 21. Lip without any callus ..... **19. *P. ramulosa***
- Lip with prominent callus ..... 22
- 22. Inflorescence with secondary spreading branches ..... 23
- Secondary branches of inflorescence lacking, branches upcurved ..... 24
- 23. Dorsal sepal up to 4 mm long. Lip mid-lobe ovate, obtuse, entire ..... **18. *P. puberula***
- Dorsal sepal over 4 mm long. Lip mid-lobe transversely elliptic, truncate, margins undulate ..... **15. *P. odorata***
- 24. Flowers and rhachis pubescent ..... **5. *P. dolichophylla***
- Flowers glabrous, rhachis almost glabrous. Lip lobes acute ..... **22. *P. subulata***

# 1. *Polystachya adansoniae* Rchb. f. in Flora 48: 185. 1865

(Fig. 100)

TYPE: ANGOLA. *Welwitsch* 654 (LECTOTYPE: W-R!; ISOLECTOTYPES: BM!, K!; DRAWING: UGDA-DLSz)

*Polystachya albo-violacea* Kraenzl. in Bot. Jahrb. Syst. 17: 50. 1893; TYPE: CAMEROON. *Preuss* 298 (HOLOTYPE: B†; ISOTYPE: K!)

*Polystachya nigerica* Rendle in Rendle & Baker, Cat. Pl. Oban.: 103. 1913; TYPE: NIGERIA. *Talbot* 929 (HOLOTYPE: BM!; ISOTYPE: K!)

Plants up to 30 cm tall. Pseudobulbs to 9 cm long, up to 1 cm in diameter, narrowly cylindrical-conical to conical, covered at base by 1-2 sheaths and with 2-4 leaves at apex. Leaves 8-19 cm long, 0.6-1.3 cm wide, linear, narrowly oblong or linear-ligulate, unequally and obtusely bilobed, suberect. Inflorescence 5-20 cm long, densely multiflowered, subtended at base by a compressed sheath, unbranched or with single branch, up to 3 cm long, peduncle and rhachis very densely pubescent. Flowers tiny, nonresupinate, white to greenish yellow, petals, lip and anther purple or chocolate-brown. Floral bracts 2-8 mm long, setaceous, usually longer than pedicel and ovary, but in the most apical flowers can be shorter, glabrous. Pedicel and ovary 2-3(4) mm long, slender, glabrous. Dorsal sepal 2-3.5 mm long, 1.1-1.5 mm wide, ovate to oblong-ovate, acuminate, slightly concave, thin, delicate, glabrous, 1- or 3-nerved. Petals 1.2-2.8 mm long, 0.2-0.5 mm wide, linear-oblongate to linear or linear-lanceolate, acute to acuminate, glabrous, thin, delicate, single-nerved. Lateral sepals 2-4 mm long along the upper margin, 2.9-5.5 mm long along the lower margin, 2-3 mm wide, obliquely triangular-ovate, apiculate, concave, thin, delicate, glabrous, 1- or 3-nerved. Lip 1.8-3.8 mm long, 1.1-2.8 mm wide, basal part prominent, linear, canaliculate, thin, distinctly trilobed in the apical half, with apical fleshy callus long-pubescent, placed between sidelobes; the mid-lobe up to 1 mm long, up to 0.5 mm wide, triangular, acute, thin, delicate; sidelobes 0.7 mm long and wide, orbicular, thin, delicate, glabrous, cochleate. Mentum 1.5-2.5 mm long, saccate.

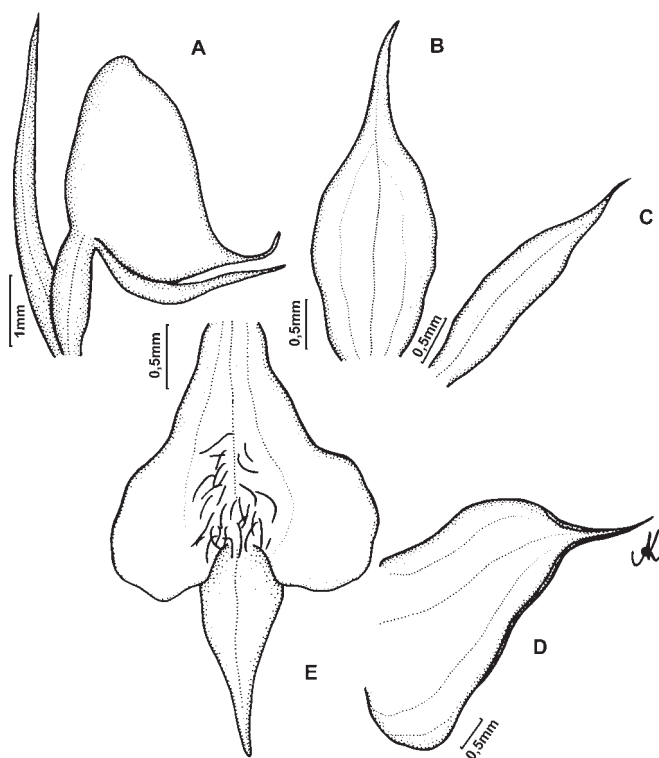


Fig. 100.—*Polystachya adansoniae* Rchb. f.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by A. Kowalkowska, *Welwitsch* 654, W-R).

**HABITAT.** Montane forests, secondary forests, savanna, swampy formations, on termitieres and epiphyte on *Brachystegia boehmii* Taub. and *Prunus africana* (Hook. f.) Kalkman. October-May.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Nigeria, Cameroon, Equatorial Guinea (Bioko), Gabon, Democratic Republic of Congo (Zaire), Angola, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe. Alt. up to 2500 m.

**REPRESENTATIVE SPECIMENS.** Banco, cult., *Veldhuizen* 627 (WAG!); Feredoufou (Feredougou)-Maninian, 23 Feb. 1975, *Pérez-Vera* 755 (P!); 7 km W of Gbaugbégauié (Gbangbéganiné), 25 km WSW of Man centre, Danane road, 29 May 1975, *van der Burg* 374 (WAG!); 7 km W of Gbaugbégauié (Gbangbéganiné), 25 km WSW of Man centre, Danane road, 28 May 1975, *van der Burg* 509 (WAG!); Keibly, Doyas, 19 Oct. 1965, *Bonardi* 233 (P!); 14 km of Lakota, Sassandra road, 11 May 1975, *van der Burg* 299 (WAG!); Lapako, 26 Mar. 1975, *Pérez-Vera* 641 (K!); Mt. Mafa, 19 Mar. 1967, *Aké Assi* (K!); 1965, *Aké Assi* s.n. (P!); 56 km N of Sassandra, E of Béyo, 6°02'W, 5°18'N, 24 Jan. 1959, *Leeuwenberg* 2557 (WAG!); 61 km N of Sassandra, W of Niapidou, 6°10'W, 5°19'N, 21 Feb. 1959, *Leeuwenberg* 2779 (WAG!); Haute Sassandra, Loura, Gouréni, 22 May 1909, *Leeuwenberg* s.n. (P!); Souné-San Pedro road (km 50), 18 Oct. 1975, *Pérez-Vera* 860 (K!); Yaou (Sanvi), 28 Mar. 1907, *Chevalier* 17760 (P!); cult., *Setten* 643 (WAG!).

**2. *Polystachya affinis* Lindl. in Gen. Sp. Orchid. Pl.: 73. 1830**  
(Fig. 101)

TYPE (*here designated*): SIERRA LEONE. *G. Don s.n.* (LECTOTYPE: K!; ISOLECTOTYPE: BM!) & SÃO TOMÉ. *Masson s.n.* (PARATYPES: K!, W-R!; DRAWING: UGDA-DLSz)

Pseudobulbs 1-4.8 cm in diameter, dorsiventrally compressed, few mm thick, subspherical, prostrate on the substratum, 2-3-leaved at apex. Leaves 9-28 cm long, 2.6-6 cm wide, petiolate; petiole 5-14 cm long, narrow, subcylindrical; blade oblanceolate, oblong-lanceolate, oblong-elliptic to obovate, acute to shortly acuminate, thin-textured. Inflorescence 6-40 cm long, laxly 8-60-flowered, branched or unbranched, erect to pendulous, peduncle with imbricating cauline bracts, peduncle and rhachis pubescent. Flowers medium-sized, nonresupinate, fragrant, white, yellow, mustard-yellow, commonly marked with brown or red-brown or green. Floral bracts up to 14 mm long, ovate-lanceolate, acuminate, papery, densely pubescent. Pedicel and ovary 5-10 mm long, slender, pubescent.

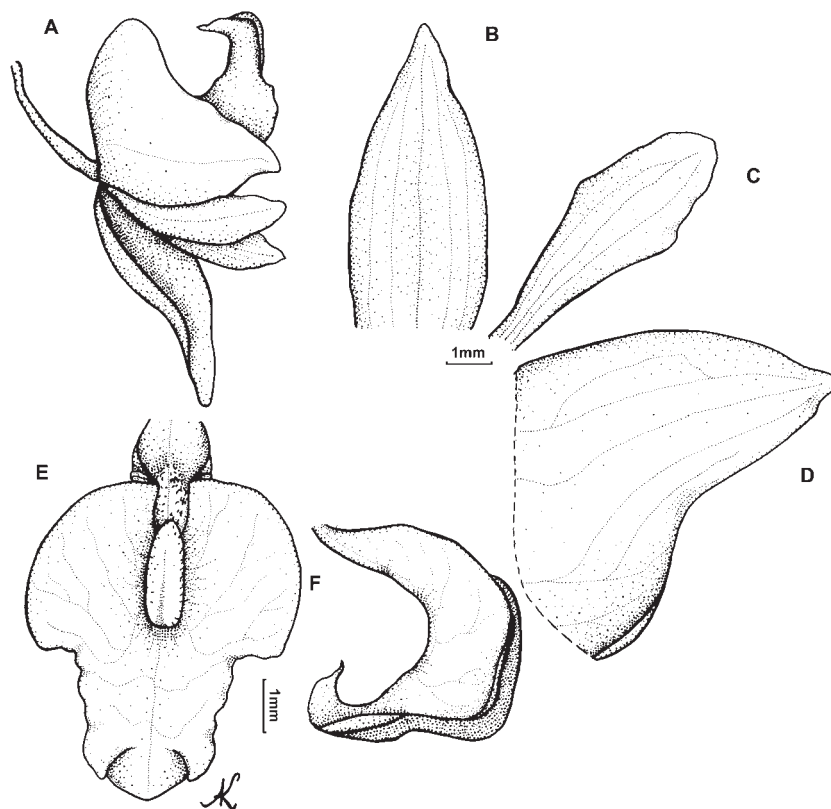


Fig. 101.—*Polystachya affinis* Lindl.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip, spread; F – lip, side view (drawn by A. Kowalkowska, *Le Testu* 6511, P).

Dorsal sepal 6.5-7 mm long, 2.7-4 mm wide, elliptic-lanceolate, oblong-elliptic, lanceolate-ovate, obtuse to subacute, densely pubescent, 5-nerved. Petals 5.7-6.5 mm long, 1.6-2.2 mm wide, oblanceolate to oblong-obovate, rounded at apex, glabrous, 3-nerved. Lateral sepals up to 7 mm long along the upper margin, up to 8 mm long along lower margin, 6 mm wide at base, obliquely ovate-triangular, acute or obtuse, slightly cochleate, densely pubescent outside, 4-nerved. Lip 6.3-8 mm long, 4.7-5.7 mm wide, canaliculate and furnished with papillate oblong callosities in the lower half, obscurely trilobed just above the middle; the middle lobe 2-2.5 mm long, 2.5-3.2 mm wide, semi-elliptic, rounded at apex; sidelobes narrowly oblong. Mentum up to 6 mm long, saccate.

**HABITAT.** Epiphyte in rain forest, atlantic ombrophilous forests with Leguminosae, riverine forests, observed on the trunk of *Gilbertiodendron dewevrei* (De Wild.) J. Leonard. All year round.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Chad, Cameroon, São Tomé, Equatorial Guinea (Annobón), Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda. Alt. 1050-1350 m.

**REPRESENTATIVE SPECIMENS.** Cavally, seashore between Tabou and Béréby, 16-17 Aug. 1907, *Chevalier 19967 bis* (P!); Cavally bank, Liepleu, 24 Feb. 1974, *Pérez-Vera 583* (K!); Séguéla-Mankono, 11 Mar. 1974, *Pérez-Vera 599* (K!); Tiapleu, 15 Feb. 1967, *Aké Assi 9418* (K!); Mt. Tonkouï, Dec. 1971, *Pérez-Vera 175* (P!); Jan. 1950, *Schnell 4082* (P!).

**3. *Polystachya bancoensis* W.J. van der Burg in Misc. Pap. Landbouwhogeschool. 19: 23. 1980 (Fig. 102)**

TYPE: GHANA. *Bowling GC 38171* (HOLOTYPE: K!; ISOTYPE: GC). - Aké Assi, Fl. Côte-d'Ivoire 2: 275. 2002.

*Polystachya affinis* var. *nana* J.B. Hall in Kew Bull. 29(2): 428. 1974; TYPE: GHANA. *Bowling GC 38171* (HOLOTYPE: K!; PHOTO: WAG!)

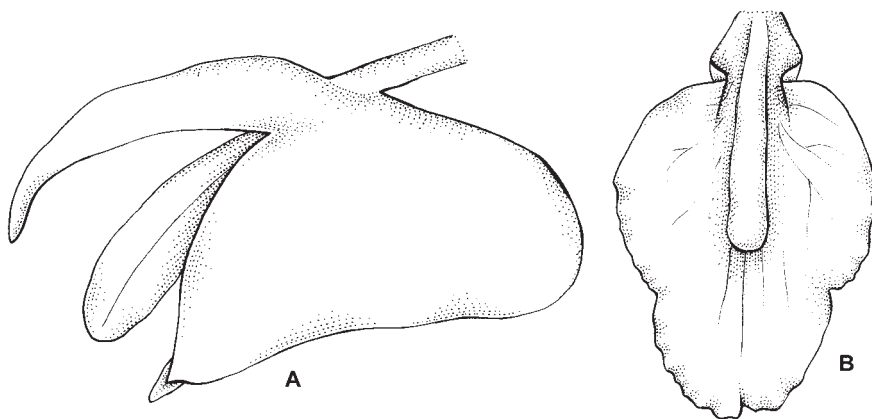


Fig. 102.—*Polystachya bancoensis* van der Burg: A — flower; B — lip (redrawn by J. Mytnik-Ejsmont from Arends & al. 1980).



Pseudobulbs 1-2 cm in diameter, dorsiventrally compressed, few mm thick, subspherical to elliptic, prostrate on the substratum, 1-3-nodial, 2-leaved at apex. Leaves 4-6 cm long, up to 2 cm wide, petiolate; petiole up to 1 cm long, narrow, subcylindrical; blade oblanceolate, lanceolate-elliptic to lanceolate-ovate, acute to shortly acuminate, thin-textured. Inflorescence 1.5-9 cm long, laxly 6-15-flowered, usually unbranched, pendent, peduncle with 1-2 bracts, peduncle and rhachis pubescent. Flowers rather small, nonresupinate, yellowish-green or yellow, minutely and densely pubescent outside. Floral bracts up to 5 mm long, transversely elliptic, acuminate, papery, densely pubescent. Pedicel and ovary 5-10 mm long, slender, pubescent. Dorsal sepal 5 mm long, 3 mm wide, elliptic-ovate or oblong-elliptic, obtuse. Petals 5 mm long, 2 mm wide, oblanceolate to oblong-obovate, rounded at apex, glabrous. Lateral sepals up to 6 mm long along the upper margin, up to 4 mm wide at base, obliquely elliptic-ovate, subacute or subobtusate, slightly cochleate. Lip up to 6 mm long and 3 mm wide, canaliculate and furnished with papillate oblong callus in the lower half, elliptic to oblong-elliptic in general outline, rounded at the apex, sometimes with 2 obscure lateral lobes tooth-shape. Mentum up to 4 mm long, saccate.

HABITAT. Trunk epiphyte in humid evergreen forests. October-January.

DISTRIBUTION. Ivory Coast, Ghana.

REPRESENTATIVE SPECIMENS. Adiopodoumé, 4°08'W, 5°20'N, *Dekker 328* (WAG!); Adiopodoumé, Nov. 1972 & 3 Dec. 1973, *Pérez-Vera 152* (K!, P!); Anguededou, 7 Jan. 1975, *De Koning 5120 A* (WAG!); Banco Forest Reserve, near entrance, 10 Dec. 1974, *De Koning 5005* (WAG!); Banco Forest Reserve, 22 Oct. 1975, *van der Burg 1245* (WAG!); Mt. Mafa, 28 Oct. 1965, *Bonardi s.n.* (P!); San Pedro, km 14 road Grand-Bereby-Tabou, 4 43 N, 7 00 W, de *Kruif A.P.M. 709* (WAG!); Téké, 22 Nov. 1966, *Aké Assi 9308* (K!); Tiapleu, 14 Nov. 1966, *Aké Assi 9228* (K!); Yapo, 3 Nov. 1974, *Pérez-Vera 722* (K!, P!).

#### 4. *Polystachya coriscensis* Rchb. f. in Otia Bot. Hamburg. 2: 112. 1881 (Fig. 103)

TYPE (*here designated*): GABON. *Mann 1884* (LECTOTYPE: W-R!; ISOLECTOTYPE: K; DRAWING: UGDA-DLSz)

*Polystachya bituberculata* Kraenzl. in Bot. Jahrb. Syst. 28: 165. 1900; TYPE: CAMEROON. *Staudt 431* (HOLOTYPE: B†; DRAWING: K!)

*Polystachya kiessleri* Schltr. in Bot. Jahrb. Syst. 38: 153. 1906; TYPE: CAMEROON. *Schlechter 15780* (HOLOTYPE: B†; ISOTYPES: BM!, BR!, HBG!, K!; DRAWING: UGDA-DLSz)

Plant up to 20 cm tall. Pseudobulbs 1.5-2.5 cm long, 0.5 cm in diameter, conical, covered at base by few sheaths, and with 2-5 leaves above. Leaves 3-8(15) cm long, 0.4-2.5 cm wide, oblanceolate, oblong-elliptic to elliptic, very obscurely bilobed at obtuse apex. Inflorescence 4.5-12 cm long, densely 10-25-flowered, branching, covered at base by 2-3 imbricating sheaths, rhachis pubescent. Flowers small, nonresupinate, greenish-white, with purple venation, pleasantly smell. Floral bracts 2-6 mm long, setaceous, minutely pubescent. Pedicel and ovary 1-1.6 mm long slender, minutely pubescent. Dorsal sepal 2.6-4 mm long, 1.3 mm wide, ovate-triangular, long-apiculate, thin, delicate, more or less pubescent on the outer surface, 3-nerved. Petals 2.1-3 mm long, 0.3-0.4 mm wide, oblong-lanceolate to linear, acute or acuminate, thin, glabrous, 1-nerved. Lateral sepals 3-4 mm long along the upper margin, 5-6 mm long along the lower one, 3-6 mm wide at base, obliquely triangular or triangular-ovate, long-apiculate, concave, thin, more or less pubescent on the outer surface, 3-nerved. Lip 3.4-4.5

mm long, 2.5-3 mm wide, distinctly 3-lobed in the apical third, thin, delicate, ecallose, basal part obtriangular to half-rotundate; the mid-lobe 1.2-1.5 mm long, 1 mm wide, oblong-ovate, apiculate; sidelobes triangular-ovate, rounded, sparsely ciliate on the inner surface. Mentum 3-5 mm long, saccate.

**HABITAT.** Epiphyte in humid forests. September.

**DISTRIBUTION.** Nigeria, Cameroon, Equatorial Guinea (Bioko), Gabon, Congo, Democratic Republic of Congo (Zaire).

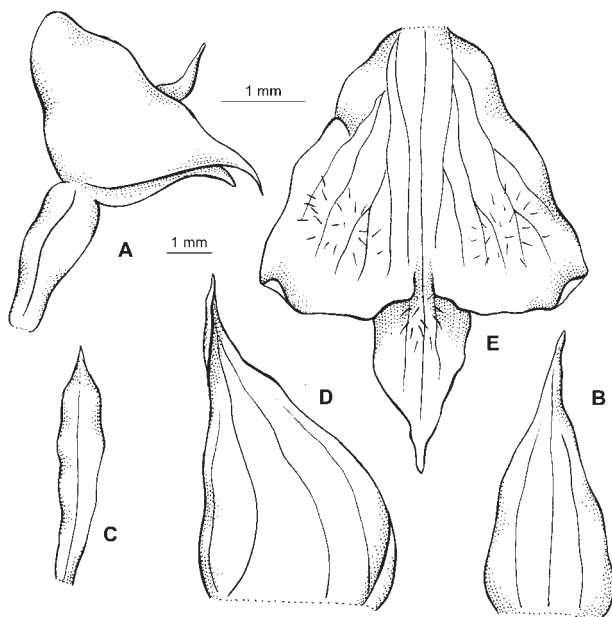


Fig. 103.—*Polystachya coriscensis* Rchb. f.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip (drawn by J. Mytnik-Ejsmont, Mann 1884, W-R).

REPRESENTATIVE SPECIMENS. Tai, 7 Sep. 1982, Dekker 441 (WAG!).

##### 5. *Polystachya dolichophylla* Schltr. in Bot. Jahrb. Syst. 38: 8. 1907 (Fig. 104)

TYPE: CAMEROON. *Schlechter* 12837 (HOLOTYPE: B†; ISOTYPE: BR!; DRAWING: K!)

*Polystachya guerzorum* A. Chev. in Explor. Bot. Afrique Occ. Franç. 1: 617. 1920, *nom. nud.*; TYPE: GUINEA. *Chevalier* 20950 (HOLOTYPE: BR!)

*Polystachya oxychila* Schltr. ex Kraenzl. in Repert. Spec. Nov. Regni Veg. Beih. 39: 61. 1926; TYPE: CAMEROON. *Baum s.n.* (HOLOTYPE: B†; DRAWING: K!)

*Polystachya simoniana* Kraenzl. in Repert. Spec. Nov. Regni Veg. Beih. 39: 98. 1926; TYPE: CAMEROON. *Simon* 14 p.p. (HOLOTYPE: B†; DRAWING: K!)

*Polystachya hamiltonii* W.W. Sm. in Notes Roy. Bot. Gard. Edinburgh 8: 347. 1936; TYPE: NIGERIA. *Hamilton s.n.* (HOLOTYPE: E?; DRAWING: K!)

Pseudobulbs 2.5-6 cm long, 0.7-1.3 mm in diameter, conical to narrowly conical, with few sheaths at base, 2-5 leaves above. Leaves 8-30 cm long, 1.2-2.2 cm wide, narrowly oblong to narrowly lanceolate, apex obtuse, bilobed, not properly developed at flowering time, rhachis pubescent. Inflorescence 12-15(25) cm long, densely multiflowered, covered at base by 1-3 imbricating sheaths, peduncle and rhachis densely pubescent, branches up to 5, suberect, multilateral. Flowers small, nonresupinate, yellow or cream coloured. Floral bracts up to 3(4) mm long, ovate-lanceolate, acuminate, densely pubescent. Pedicel and ovary 5-6 mm long slender,

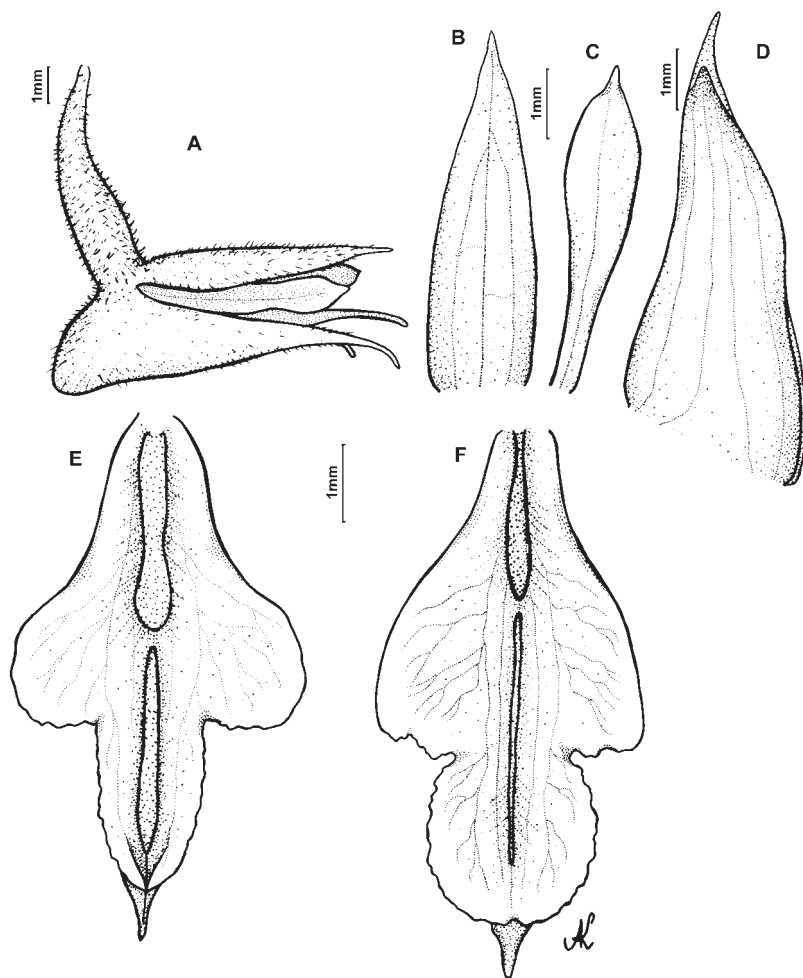


Fig. 104.—*Polystachya dolichophylla* Schltr.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E, F – lip (drawn by A. Kowalkowska, A-E – *Bos & al.* 10770, P; F – *Villiers* 168, P).

pubescent. Dorsal sepal 3.5-6 mm long, 1.6-1.8 mm wide, oblong ovate to elliptic-ovate, acute to acuminate, concave, rather thick, densely pubescent on the outer surface, 3-5-nerved. Petals 3.4-4.2 mm long, 0.6-1 mm wide, oblanceolate to linear-lanceolate, acute to shortly apiculate, glabrous, single-nerved. Lateral sepals up to 6 mm long along the upper margin, up to 8 mm long along the lower one, 3-3.3 mm wide at base, obliquely lanceolate-triangular, acuminate to apiculate, concave, rather thick, densely pubescent outside, 5-nerved. Lip 5-7.5 mm long, 3-4.6 mm wide, distinctly 3-lobed near or just below the middle, rather thin, callus a fleshy, papillate ridge in the basal third or half, above a papillate cushion of hairs

running nearly to the lip apex; the mid-lobe 2.5-3 mm long, 1.3-1.8 mm wide, oblong to orbicular, with long and fleshy apiculus at apex, margins crenulate; side-lobes obliquely obovate, triangular-ovate, rhomboid, obtuse with crenulate apical margin. Mentum 2.5-3 mm long, saccate.

**HABITAT.** On rocks or epiphyte on tree branches in forest fringing mangrove swamps, sometimes terrestrial in *Trilepis* sp. mats. March, December.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea (Bioko), Gabon. Alt. 1500 m.

**REPRESENTATIVE SPECIMENS.** Gbott, Dec. 1973, *Pérez-Vera* 551 (P!); Oureyo, 3 Mar. 1974, *Pérez-Vera* 123 (K!).

**6. *Polystachya fractiflexa* Summerh.** in Kew Bull. 11: 224. 1956  
(Fig. 105)

**TYPE:** DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Bruneel* s.n. (HOLOTYPE: BR!; DRAWING: K!)

Stems (5)18-30(45) cm tall, 0.3-0.5 cm in diameter, narrowly cylindrical, with few basal sheaths and (2)6-7 normal leaves above. Leaves 6-13 cm long, 0.8-2.3 cm wide, elliptic or oblanceolate-elliptic, shortly bilobed at apex, margins not undulate, thinly coriaceous. Inflorescence 3-11 cm long, densely branching, branches 5-8, up to 2 cm long, each branch 8-14-flowered, zigzag, peduncle and rhachis glabrous. Flowers rather small, nonresupinate, creme or orange-brunatre. Floral bracts 2-4 mm long, ovate-lanceolate, acute, glabrous. Dorsal sepal 6-7 mm long, 2 mm wide, ovate-lanceolate, apiculate, rather sparsely pubescent

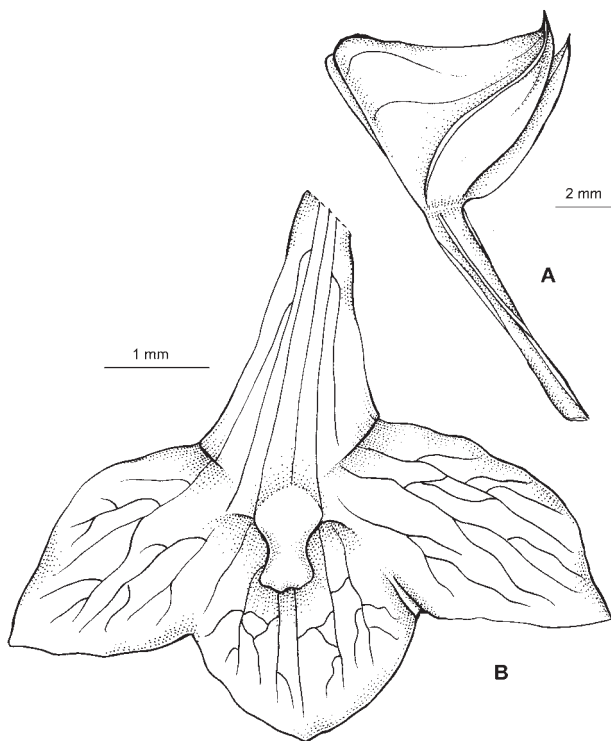


Fig. 105.—*Polystachya fractiflexa* Summerh.: A – flower; B – lip (drawn by J. Mytnik-Ejsmont, *Bruneel* s.n., BR).

abaxially. Petals 5 mm long, 2 mm wide, oblanceolate, subacute to apiculate. Lateral sepals 6 mm long along the upper margin, 7.5 mm long along the lower margin, 6-7 mm wide, obliquely triangular, acuminate, sparsely pubescent abaxially. Lip 5-8 mm long, 6-8 mm wide, with long claw, 3-lobed above the middle, large, blunt callus placed at the base of the median lobe; the mid-lobe deltoid to broadly ovate-elliptic, rounded at apex or obtuse; sidelobes obliquely triangular-ovate or rhomboid, subacute. Mentum 6-7 mm long, conical-saccate.

HABITAT. Epiphyte in humid lowland forests. June.

DISTRIBUTION. Ivory Coast, Cameroon, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. Legako-Okromodou, 9 June 1974, Pérez-Vera 640 (K!, P!).

**7. *Polystachya galeata* (Sw.) Rchb. f. in Ann. Bot. Syst. 6: 637. 1864 (Fig. 106)**

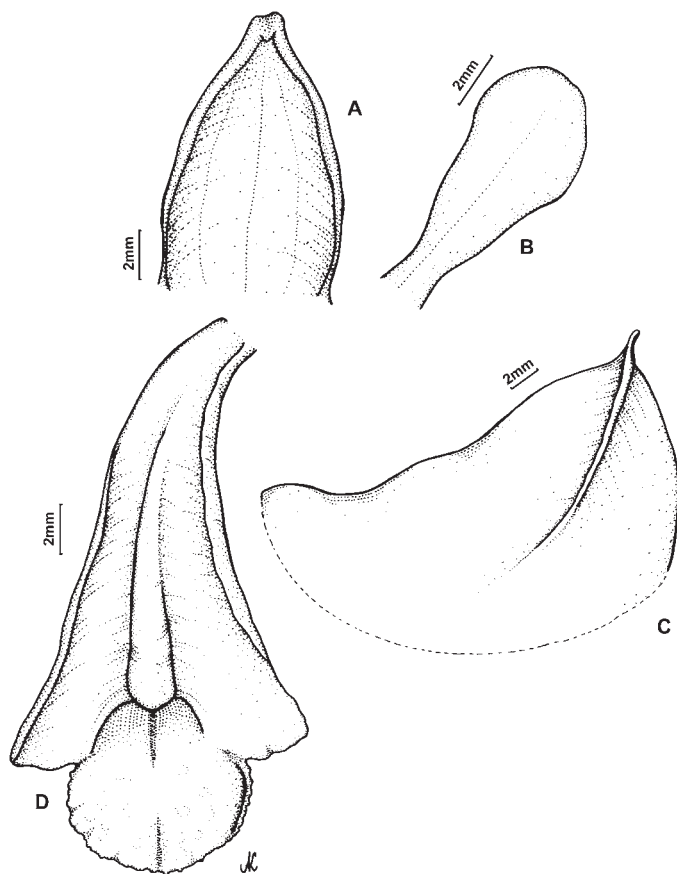


Fig. 106.—*Polystachya galeata* (Sw.) Rchb. f.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by A. Kowalkowska, *Afzelius s.n.*, W-R).

*Dendrobium galeatum* Sw. in Neues J. Bot. 1: 96. 1805; TYPE: SIERRA LEONE. *Afzelius s.n.* (LECTOTYPE: S; ISOLECTOTYPES: BM!, W-R!; DRAWING: UGDA-DLSz). - *Bulbophyllum galeatum* (Sw.) Lindl. in Gen. Sp. Orchid. Pl.: 57. 1830.

*Polystachya grandiflora* Lindl. ex Hook. in Bot. Mag. 65: t. 3707. 1839. TYPE: *Allcard s.n.* - SIERRA LEONE, fl. in cult. (Oct. 1938), (illustration in Bot. Mag. t. 3707 - lecto)

*Polystachya macrantha* Lindl. in Edwards's Bot. Reg. 25: Misc. 36. 1839; based on the same type as *P. grandiflora*.

*Polystachya cucullata* T. Durand & Schinz in Consp. Fl. Afr. 5: 34. 1895. TYPE: unknown.

*Polystachya quinqueloba* Klinge in Acta Horti Petrop. 17: 141. 1899. TYPE: SIERRA LEONE?, in cult., St. Petersburg (HOLOTYPE: LE)

*Polystachya gillettii* De Wild. in Not. Pl. Util. Congo 1: 313. 1904. TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gillet 3500*. (HOLOTYPE: BR!, ISOTYPE: K!)

Pseudobulbs 2.2-20 cm long, 0.2-0.9 cm in diameter, cylindrical, with 2-5 sheaths. Leaf single, 6-28 cm long, 0.8-6 cm wide, ligulate to narrowly oblong, acute to obtuse, coriaceous. Inflorescence 4-9 cm long, up to 6-flowered, simple, peduncle and rhachis pubescent. Flowers rather large, nonresupinate, green, greenish yellow, yellow, pink, or pure white, more or less purple or brown spotted or purple inside. Floral bracts 3-14 mm long, triangular-ovate, apiculate, sparsely pubescent. Pedicel and ovary up to 15 mm long, slender, densely pubescent. Dorsal sepal 7-17 mm long, 3-7 mm wide, oblong-elliptic to elliptic-ovate, long-apiculate, thick, fleshy, cochleate, subdensely or subclaxly pubescent outside, 3-nerved. Petals 4.5-12 mm long, 1-3.8 mm wide, spatulate to linear, obtuse or acute, thickened at apex, glabrous, obscurely 3-nerved. Lateral sepals up to 10 mm long along the upper margin, up to 30 mm long along the lower one, up to 18 mm wide at base, obliquely triangular or triangular-ovate, apiculate, thick, fleshy, cochleate, sparsely pubescent outside. Lip 10-25 mm long, 4.5-14 mm wide, basal strongly recurved in the lower third, more or less unguiculate, fleshy, pubescent inside, obscurely to distinctly trilobed in the apical third, with central, fleshy, rather obscurely trilobed callus, lateral lobes erect, triangular-ovate to elliptic-ovate, small, obtuse, 2.5-3.5 mm wide; the middle lobe 3-7 mm long, 2-8 mm wide, quadrate-orbicular to transversely elliptic, rounded or shortly apiculate, thick, fleshy, minutely papillate and sparsely pubescent. Mentum 10-22 mm long, saccate-conical, incurved, blunt.

HABITAT. Epiphyte in lowland and submontane rain forest. All year round.

DISTRIBUTION. Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire), Angola. Alt. 400-1000 m.

REPRESENTATIVE SPECIMENS. Abidjan, 29 Sep. 1974, *De Koning 4015* (WAG!); Adiopodoumé, 4°08'W, 5°20'N, 26 Feb. 1978, *Dekker 335* (WAG!); Banco Forest Reserve, 24 June 1975, *van der Burg 428* (WAG!); *van der Burg 429* (WAG!); Banco Forest Reserve, NE part, 25 Apr. 1973, *De Koning 1564* (DLSz!, WAG!); Banco Forest Reserve, N forest limit, 22 Oct. 1973, *De Koning 2481* (DLSz!, WAG !); Banco Forest Reserve, 2 Sep. 1945, *Paulian 47* (K!); 4 Nov. 1961, *de Wilde 3210* (K!, P!, WAG!); Mt. Momi, Jan. 1971, *Pérez-Vera 210* (K!, P!); Moyen Cavally, Mont Nienokué, 20 km NE of Fort Binger, 18-19 July 1907, *Chevalier 19495* (P!); Haute Sassandra, Dyolas, Man, 15 May 1909, *Ripert sub Chevalier 21533* (K!, P!); Soubré-Buyo road, 22-26 Mar. 75, *Pérez-Vera 272* (K!, P!).

## 8. *Polystachya golungensis* Rchb. f. in Flora 48: 185. 1865 (Fig. 107)

TYPE: ANGOLA. *Welwitsch* 674 (LECTOTYPE: W-R!; ISOLECTOTYPES: BM!, K!, P!; DRAWING: UGDA-DLSz)

*Polystachya mayombensis* De Wild. in Not. Pl. Util. Congo 1: 134. 1903. TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Droogmans* s.n. (HOLOTYPE: BR!; ISOTYPE: K!)

*Polystachya coriacea* Rolfe in Bull. Misc. Inform. Kew. 1913: 340. 1913; TYPE: MALAWI. *Bush* s.n. (HOLOTYPE: K)

*Polystachya johnsonii* Kraenzl. in Bull. Misc. Inform. Kew. 1926: 291. 1926; TYPE: GHANA. *Johnson* 588 (HOLOTYPE: K!)

*Polystachya spiranthoides* Kraenzl. in Bull. Misc. Inform. Kew. 1926: 294. 1926; TYPE: *cult.* – 1910 (HOLOTYPE: K!)

Plant 11-47 cm tall, stems clustered. Pseudobulbs 2-6 cm long, 0.4-0.7 cm in diameter, conical-cylindrical towards base, 2-4-leaved. Leaves 5-28 cm long, 0.3-2.5 cm wide, ligulate, rounded at apex, unequally bilobed, fleshy. Inflorescence 6-40 cm long, 50-200-flowered, much longer than leaves, peduncle and rachis pubescent, completely covered by numerous imbricating, papery, acute sheaths, branches up to 8, up to 5 cm long, secund, suberect to spreading. Flowers small or tiny, nonresupinate, yellow, yellow-green or brownish-cream, unpleasantly smelling. Floral bracts up to 1.5 mm long, ovate-lanceolate, acuminate, glabrous. Pedicel and ovary 2 mm long, rather slender, glabrous. Dorsal sepal 1.5-2.8 mm long, 0.7-1.5 mm wide, ovate, elliptic, acute or apiculate, concave, thin, delicate, glabrous, 1-nerved. Petals 1.1-2.6 mm long, 0.3-0.5 mm wide, oblanceolate to linear, hardly falcate, acute to rounded, thin, delicate, glabrous, 1-nerved. Lateral sepals 1.8-2.2 mm long along the upper margin, 2.5-3.6 mm long along the lower one, 1.2-2.4 mm wide at base, obliquely ovate- or oblong-triangular, acute concave, thin, delicate, glabrous, obscurely 2-3-nerved. Lip 2.2-3 mm long, 1.7-2.5 mm wide, rather thin, with a cushion in the basal third covered densely by multicellular farinaceous hairs, 3-lobed in the middle; the mid-lobe 1.3 mm long, 1.8

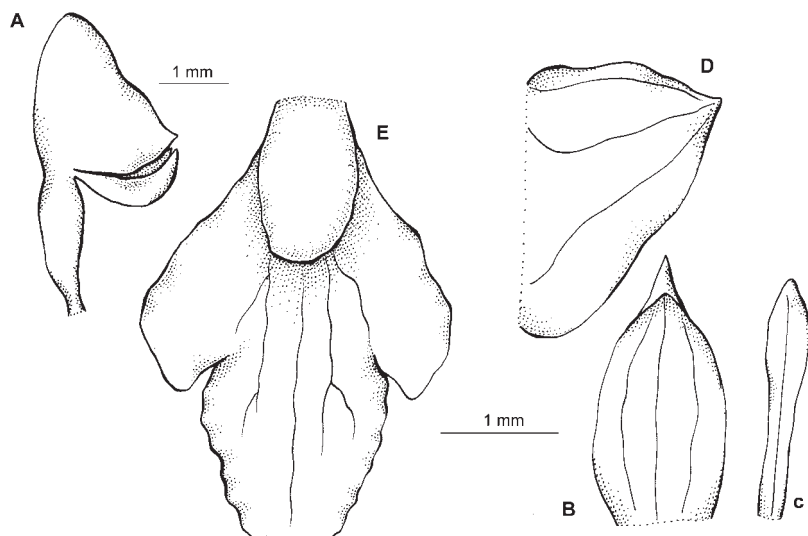


Fig. 107. – *Polystachya golungensis* Rchb. f.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by J. Mytnik-Ejsmont, *Welwitsch* 674, W-R).



mm wide, nearly orbicular to elliptic, emarginate, sparsely pubescent; sidelobes up to 0.6 mm long, obliquely obovate to oblong, obtuse, sparsely pubescent. Mentum 2 mm long, saccate-conical.

HABITAT. Epiphyte or on rocks in drier scrubs, wooded savanna, secondary forests, riverine forests, rain forest, noted on *Ficus*. December-January, August.

DISTRIBUTION. Mali, Liberia, Ivory Coast, Togo, Nigeria, Cameroon, São Tomé, Central African Republic, Gabon, Democratic Republic of Congo (Zaire), Uganda, Angola, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. 500-1800 m.

REPRESENTATIVE SPECIMENS. Bouroukrou, 20 Dec. 1906-20 Jan. 1907, *Chevalier 16906* (P!); Hiré, between Kagbé and Dekadougou, 1 Dec. 1966, *Aké Assi 9341* (K!); Séguéla-Kaui, Aug. 1972, *Pérez-Vera 142-B* (K!).

**9. *Polystachya laxiflora* Lindl.** in J. Linn. Soc., Bot. 6: 129. 1862  
(Fig. 108)

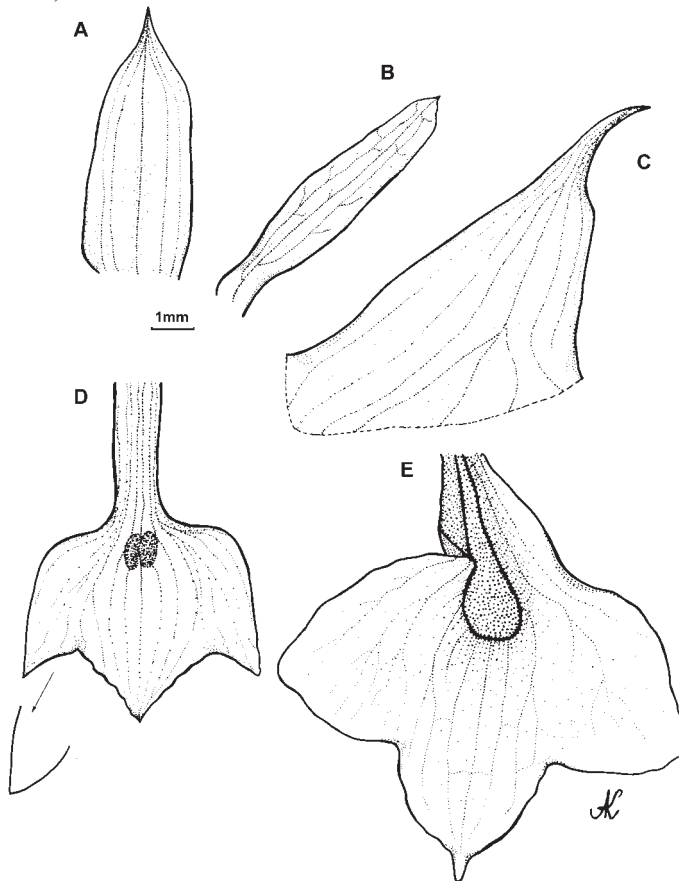


Fig. 108.—*Polystachya laxiflora* Lindl.: A – dorsal sepal; B – petal; C – lateral sepal; D, E – lip (drawn by A. Kowalkowska, A-D - *Pobeguín 1559*, P; E – *Bos 4220*, P).

TYPE (*here designated*): NIGERIA. *Barter 2106* (LECTOTYPE: K!) & BIOKO. *Mann 437* (PARATYPES: K!, W-R!; DRAWING: UGDA-DLSz)

*Polystachya galericulata* Rchb. f. in *Otia Bot. Hamburg*. 2: 111. 1881; TYPE (*here designated*): NIGERIA. *Barter 1055* (LECTOTYPE: W-R!; ISOLECTOTYPE: K!; DRAWING: UGDA-DLSz)

*Polystachya dixantha* Rchb. f. in *Gard. Chron.* 1: 294. 1882; TYPE (*here designated*): WEST CENTRAL AFRICA. *Christy s.n.* (LECTOTYPE: W-R!)

Stems (6)15-30(50) cm tall, 0.3-0.6 cm in diameter, narrowly cylindrical, with 2-3 sheaths at base and 2-6 leaves above. Leaves (8)10-26 cm long, (2)3-4(6) cm wide, elliptic to oblanceolate, acute to subacute. Inflorescence (4)8-30 cm long, more or less branched, sometimes with secondary slender branches, each 2-5(12) cm long, densely up to 13 flowers, rachis and peduncle pubescent, rachis not zigzag. Flowers medium-sized, nonresupinate, white, yellow, orange-yellow, sometimes red markings on the lip sidelobes. Floral bracts up to 10 mm long, ovate-lanceolate, acuminate, nearly glabrous. Pedicel and ovary 7-8 mm long, slender, subdensely pubescent. Dorsal sepal 6.5-10 mm long, 2.6-5 mm wide, oblong-ovate, oblong-elliptic to ovate, apiculate, cochleate, thick, pubescent on outer surface. Petals 6-8.1 mm long, 1.2-3 mm wide, oblanceolate to spatulate, hardly falcate, obtuse to rounded at apex, rather thin, except the apex, glabrous. Lateral sepals 7-10.5 mm long along the upper margins, up to 13.3 mm long along the lower one, 6.5-8.5 mm wide at base, obliquely triangular to ovate-triangular, apiculate, thick, cochleate, pubescent on the outer surface. Lip 7-10 mm long, 6.5-10 mm wide, rather fleshy, more or less pubescent along the mid-nerve, distinctly trilobed near the middle, callus in the lip centre, oblong, blunt, fleshy; the mid-lobe 2.5-3.2 mm long, 2.3-4.2 mm wide, oblong-ovate to semi-elliptic, shortly apiculate, thick; sidelobes up to 3 mm long, obliquely elliptic-triangular to rhomboid, subobtuse. Mentum 6-7.5 mm long, saccate-conical.

HABITAT. Epiphyte in lowland humid forests, sublittoral forests, savanna, noted on trunk of *Ficus mucoso* Welw. ex Ficalho and oil palm, up to 20 m above the ground level. All year round.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea (Bioko), Gabon, Democratic Republic of Congo (Zaire), Zambia. Alt. 600-1500 m.

REPRESENTATIVE SPECIMENS. Abidjan-Ndoui new road (km 35), 5°30'N, 4°17'W, 3 Oct. 1979, *de Kruif 392* (DLSz!, WAG!); Adiopodoumé, 13 Aug. 1975, *van der Burg 738* (WAG!); Adiopodoumé, 4°08'W, 5°20'N, 26 Feb. 1978, *Dekker 336* (WAG!); Anguededou, near Agneby R., *De Koning 6194* (WAG!); Banco Forest Reserve, 25 Nov. 1973, *De Koning 2797* (WAG!); Banco Forest Reserve, N part, 1 Mar. 1974, *De Koning 3400* (WAG!); Banco Forest Reserve, 29 Sep. 1974, *De Koning 4014* (WAG!); Mt. Mafa, 16 Nov. 1967, *Aké Assi 9772* (K!); Man-Daané road, 26 Nov. 1974, *Pérez-Vera 162* (K!, P!); Mt. Nimba, 26 Mar. 1982, *César & Samson 1608* (P!); Mt. Tonkoui, 16 Feb. 1964, *Aké Assi 7352* (K!, P!); 11 Jan. 1967, *Aké Assi 9403* (K!); 6 Mar. 1968, *Aké Assi 9922* (K!); 23 Nov. 1956, *De Wilde 849* (WAG!); 24 Jan. 1984, *Hepper & Maley 7741* (K!); 24 Jan. 1984, *Hepper & Maley 7744* (K!); 23 Feb. 1974, *Pérez-Vera 584* (K!, P!); Mt. Tonkoui, NW of Man, 17 Sep. 1975, *van der Burg 1053* (WAG!); Mt. Tonkoui, SW of Man, 8 Mar. 1960, *Leeuwenberg 2956* (BR!, K!, WAG!); Yapo, ca. 4 km S of Bécédi-Brignan, 6 Aug. 1963, *Oldeman 249* (WAG!); *Oldeman 250* (WAG!); *Sine loc.*, 13 Aug. 1975, *van der Burg 739* (WAG!); cult., *De Koning 4822* (WAG!); cult., *Setten 526* (WAG!); cult., *van Veldhuizen 191* (WAG!).

# **10. *Polystachya leonensis* Rchb. f. in *Otia Bot. Hamburg*. 2: 112. 1881 (Fig. 109)**

TYPE (*here designated*): NIGERIA. *Barter s.n.*  
(LECTOTYPE: K!; ISOLECTOTYPE: W-R!; DRAWING:  
UGDA-DLSz)

Pseudobulbs 1-5 cm long, ovoid-conical, 3-5-leaved. Leaves 8-30 cm long, 1-3 cm wide, lanceolate or oblanceolate, acute, coriaceous, suberect. Inflorescence 9-30 cm long, many-flowered, borne on leafy pseudobulbs, simple, pubescent, subdense. Flowers brownish or yellowish green, lip white, usually rather fleshy. Floral bracts about 1 mm long, triangular-apiculate, pubescent. Pedicel and ovary ca. 100 mm long, pubescent. Sepals minutely pubescent outside, without a horn-like projection below apices. Dorsal sepal 5 mm long, 2.5-3 mm wide, oblong-elliptic, obtuse, cochleate. Petals 5 mm long, 2-2.5 mm wide, spatulate, shortly acuminate to bifid at the apex. Lateral sepals 7 mm long, 7-8 mm wide at the base, obliquely triangular, subobtuse to subacute, concave. Mentum broad, rounded-conical. Lip 4.5-6.5 mm long, 4-6 mm wide, more or less obovate-triangular in general outline, with oblong papillate thickening running till the centre, acutely 3-lobed at the middle; the middle lobe 2 mm long and wide, triangular, acute, more or less undulate, reflexed; sidelobes obliquely oblong-triangular, acute, undulate.

HABITAT. Epiphyte on tree trunks in humid montane and submontane forests, occasionally lithophyte in full sun. February-April.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Cameroon. Alt. 1000-1500 m.

REPRESENTATIVE SPECIMENS. Haute Cavally, Dyolas, Mt. Momi, 29 Apr. 1909, *Chevalier 21 379* (P!); Mt. Tonkoui, SW of Man, 3 Mar. 1959, *Leeuwenberg 2937* (BR!, K!, P!, WAG!); Mt. Tonkoui, SW of Man, 9 Feb. 1961, *de Wit 9149* (WAG!); Mt. Tonkoui, Mar. 1972, *Pérez-Vera 174* (P!); 6 Apr. 1974, *Pérez-Vera 612* (K!); cult., *Dekker 437* (WAG!).

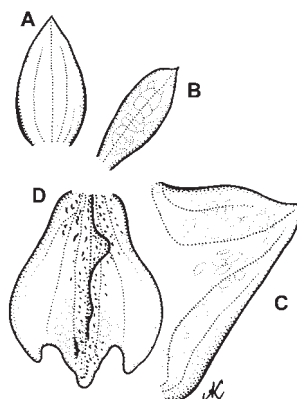


Fig. 109.—*Polystachya leonensis* Rchb. f.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (redrawn by A. Kowalkowska from Summerhayes' original drawing kept at K, *Barter s.n.*).

# 11. *Polystachya microbambusa* Kraenzl. in Bull. Misc. Inform. Kew. 1926: 245. 1926

(Fig. 110)

TYPE: IVORY COAST. *Fleury 22093* (HOLOTYPE: K!)

Plants bamboo-like. Pseudobulbs 5-20 cm long, few mm in diameter, narrowly cylindrical, erect, a new pseudobulb arising from the upper part of the preceding one. Leaves 3-9, up to 22 cm long, 0.4-1.4 cm wide, linear-lanceolate to lanceolate, gradually tapering towards the acute apex. Inflorescence simple, unbranched, laxly 3-11 flowered, peduncle and rhachis subdensely or sublaxly pubescent. Flowers medium-sized, nonresupinate, yellow. Floral bracts 4 mm long, ovate, acute to acuminate, thin, glabrous. Pedicel and ovary 6 mm long, slender, rather densely pubescent. Dorsal sepal up to 14 mm long and 3 mm wide, oblong-lance-

olate, acuminate, thin, delicate, with elevated keel outside along the mid-nerve, pubescent outside at the base, 5-nerved. Petals up to 11 mm long and 2 mm wide, narrowly oblanceolate, acuminate, thin, delicate, glabrous, 3-nerved. Lateral sepal

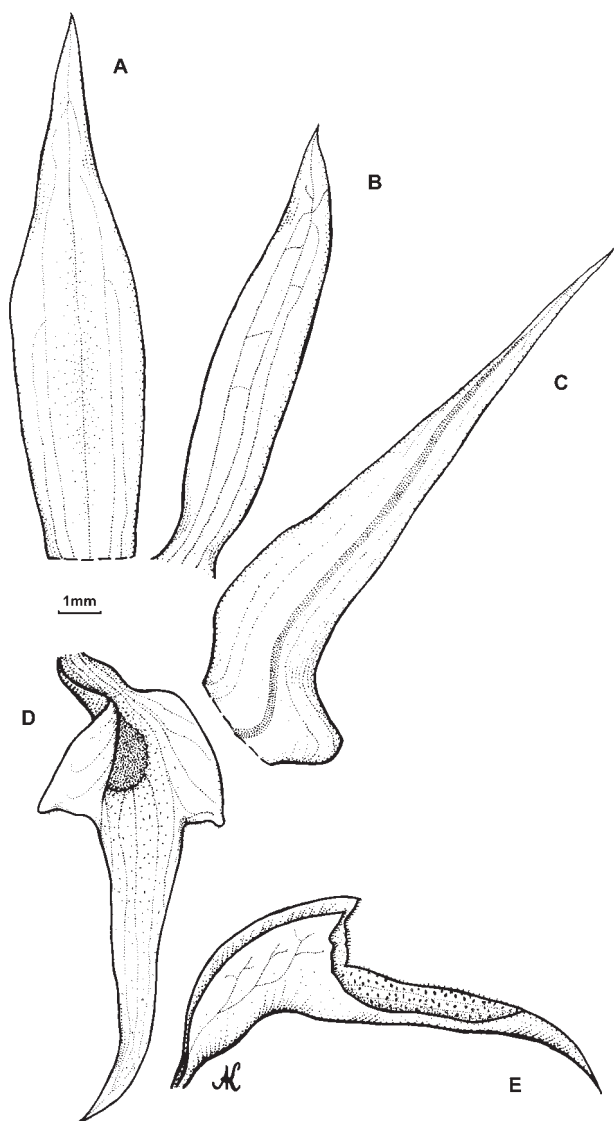


Fig. 110.—*Polystachya microbambusa* Kraenzl.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip, spread; E – lip, side view (drawn by A. Kowalkowska, Lisowski B8698, DLSz).

thin, delicate, with elevated keel outside along the mid-nerve, pubescent outside at the base, 3-5-nerved. Lip 8-13 mm long, 5-8 mm wide, rather thin, with linear-oblong, minutely papillate callus in the lower third, rather sparsely pubescent in the centre; trilobed just below the middle; the middle lobe up to 6.5 mm long, 3.3 mm wide, triangular, acute, with elevated keels along the margins connate at apex; sidelobes rhomboid or ovate-triangular, acute. Mentum up to 5 mm long, broadly saccate.

**HABITAT.** On granite outcrops often on or among the roots of *Afrotrilepis pilosa* (Boeck.) J. Raynal. Throughout the year. All year round.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Cameroon. Alt. 500-1800 m.

**REPRESENTATIVE SPECIMENS.** Baoulé-Nord, Bouaké, Mt. Lémélébon, 10 July 1909, *Fleury sub Chevalier* 22093 (K!, P!);

Haute Cavally, Dyolas, Mt. Gouan, Oua, 27 Apr. 1909, *Fleury sub Chevalier 21331* (P!); Haute Cavally, Dyolas, Mt. Gbon, Gouekangouiné, 2 May 1909, *Fleury sub Chevalier 21411* (P!); Moyen Cavally, Mt. Niénokoué, 20 km NE of Fort Binger, 18 -19 Sep. 1907, *Chevalier 19466* (K!, P!); Mt. Dou, Zoandié, 6 May 1909, *Fleury sub Chevalier 21471* (P!); Duékoué, 14 June 1965, *Bonardi 16* (P!); Dyolas, Mt. Goula, Danané, 11 Apr. 1909, *Chevalier 21208* (P!); Dyolas, Mt. Niénokoué, Mt. Kouan, 14 Apr. 1909, *Chevalier 21245* (P!); Issia, *Boughey 14696* (WAG!); Rocher d'Issia, Sep. 1955, *Nozeran s.n.* (P!); 24 Aug. 1956, *De Wilde 423* (WAG!); Korhogo, May-June 1976, *van Blom-van Teyn s.n.* (WAG!); Man, Mt. Tonkoui, 9 Feb. 1961, *De Wit 9155* (WAG!); Nimba Mts., 10 Aug. 1954, *Boughey GC 18088* (K!); Haute Sassandra, Dyolas, Haute Sassandra, Dyolas, Mt. Dou, Zoandié, 6 May 1909, *Fleury sub Chevalier 21475* (P!); Haute Sassandra, Dyolas, Mt. Dou, Zoandié, 6 May 1909, *Fleury sub Chevalier 21476* (P!); Haute Sassandra, Toura (Loura), Mt. Dourou, Koualé (Kwalé), 27 May 1909, *Fleury sub Chevalier 21739* (P!); Mt. Tonkoui, 16 Feb. 1964, *Aké Assi 7353* (K!); 6 Mar. 1968, *Aké Assi 9968* (K!); 28 Feb. 1975, *Aké Assi 12787 bis* (P!); May 1973, *Pérez-Vera 491* (K!); 6 Apr. 1975, *Pérez-Vera 768* (P!); Jan. 1962, *De Wit s.n.* (WAG!); *De Wilde s.n.* (WAG!); Mt. Tonkoui, 7° 39'W, 7°27'N, 19 Dec. 1967, *Geerling & Bokdam 1890* (WAG!); Mt. Tonkoui, NW of Man, 11 Apr. 1962, *Leeuwenberg 3857* (BR!, K!, P!, WAG!); Toulépleu, May 1942, *Schnell 1254* (K!, P!); *Sine loc.*, 1937, *Scaëtta 3289* (P!).

## 12. *Polystachya modesta* Rchb. f. in Flora 50: 114. 1867

(Fig. 111)

TYPE (*here designated*): ANGOLA. *Welwitsch 675* (LECTOTYPE: W-R!; FRAGMENT OF LECTOTYPE, DRAWING: BM!, K!, ISOLECTOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Polystachya rigidula*

Rchb. f. in Flora 50:

117. 1867. TYPE (*here*

*designated*): SOUTH

AFRICA *Gerrard*

1812. (LECTOTYPE: K!;

ISOLECTOTYPE: W-R!;

DRAWING: UGDA-

DLSz)

*Polystachya shirensis*

Rchb. f. in Otia Bot.

Hambrug. 2: 112. 1881;

TYPE (*here designated*):

SHIRE RIVER. *Meller*

*s.n.* (LECTOTYPE: K!)

*Polystachya kindtiana*

De Wild. in Ann. Mus.

Congo, Bot., Ser. 5(1):

21. 1903; TYPE: DE-

MOCRATIC REPUB-

LIC OF CONGO

(ZAIRE). *Gillet 2109*

(HOLOTYPE: BR!; FRAG-

MENT OF HOLOTYPE,

DRAWING: K!)

Plant 4-50 cm tall, stems clustered. Pseudobulbs 0.6-10 cm long, 0.3-1.5 cm in diameter, conical, cylindrical-conical or ovoid-conical, 2-5-leaved. Leaves 7-22.5 cm long,

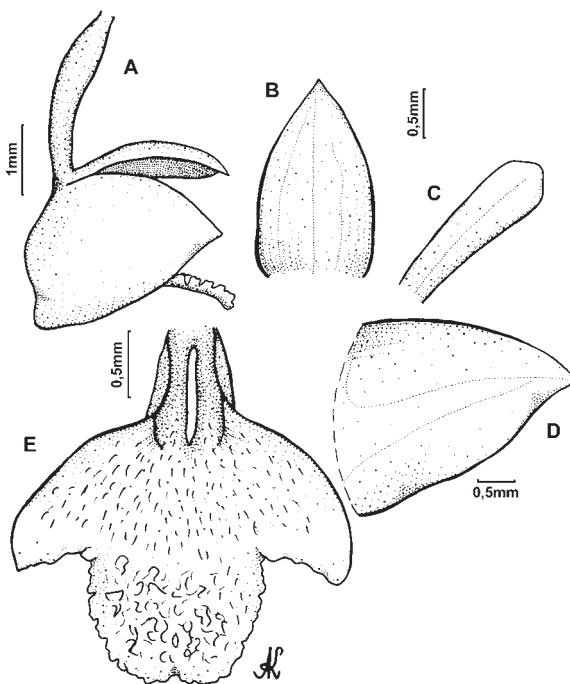


Fig. 111.—*Polystachya modesta* Rchb. f.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by A. Kowalkowska, *Tisserant 1622*, P).

0.7-2.5 cm wide, lanceolate, oblanceolate, acute to subacute, not coriaceous, suberect or spreading. Inflorescence 5-23(40) cm long, 20-200-flowered, dense, peduncle glabrous, rhachis pubescent, completely covered by imbricating, acute, papery sheaths, branched or rarely unbranched, branches up to 6, up to 2(2.7) cm long, secund or multilateral, erect to suberect. Flowers tiny, nonresupinate, yellow, yellow-green, pink, purple, lip yellow. Floral bracts up to 3 mm long, ovate-lanceolate, acuminate, glabrous. Pedicel and ovary 4-5 mm long, slender, glabrous. Dorsal sepal (2)2.5-3.2 mm long, 1.2-2.3 mm wide, elliptic to oblong-ovate, acute to shortly acuminate, concave, thin, glabrous, 3-nerved. Petals 2-2.7 mm long, 0.5-0.9 mm wide, oblong-spathulate to linear, subobtuse to subacute, thin, glabrous, single-nerved. Lateral sepals 3-3.5 mm long along the upper margin, 3.2-4.9 mm long along the lower one, 2.4-4 mm wide, obliquely triangular to elliptic-triangular, acute to shortly apiculate, concave, thin, glabrous, 3-nerved. Lip 3-4.75 mm long, 2.3-3.6 mm wide, rather thin, with pubescent cushion of hairs in the basal third or half, central part pubescent, trilobed near the middle; the mid-lobe 1-1.9 mm long, 1.2-2 mm wide, orbicular to semi-elliptic, emarginate, bullate-tessellate; sidelobes 0.6-1 mm long, obliquely ovate-triangular to ovate-oblong, obtuse, hardly falcate, thin. Mentum 2-3.3 mm long, conical-saccate.

**HABITAT.** Epiphyte or rarely lithophytic plant in riverine forests, woodlands, bushlands, wooded grasslands. September.

**DISTRIBUTION.** Guinea (?), Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Gabon, Democratic Republic of Congo (Zaire), Angola, Uganda, Rwanda, Burundi, Kenya, Tanzania, Malawi, Zambia, Zimbabwe, Mozambique, South Africa. Alt. 500-1200 m.

**NOTES.** I have seen no material of this species from Ivory Coast. Cribb & Pérez-Vera (1975) listed the following localities of *P. modesta* in this country: Daloa-Zuénoula, Pérez-Vera 627; Mt. Tonkoui, Pérez-Vera 141; Sep. 1971, Pérez-Vera 141/B.

### 13. *Polystachya mukandaensis* De Wild. in Not. Pl. Util. Congo 1: 139. 1903 (Fig. 112)

TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gentil s.n.* (HOLOTYPE: BR!; ISOTYPE, DRAWING: K!)

*Polystachya huyghei* De Wild. in Not. Pl. Util. Congo 1: 5. 1904; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent 232bis* (HOLOTYPE: BR!; ISOTYPE: K!)

*Polystachya plehniana* Schltr. in Bot. Jahrb. Syst. 38: 8. 1905. TYPE: CAMEROON. *Schlechter 12748* (LECTOTYPE: B†; ISOLECTOTYPE: BR!; DRAWING: K!)

*Polystachya dorotheae* Rendle in Rendle & Baker, Cat. Pl. Oban.: 103. 1913; TYPE: NIGERIA. *Talbot 861* (HOLOTYPE: BM!; ISOTYPE: K!)

Plant 25-60 cm tall. Pseudobulbs 1.5-2.5 cm long, 0.5-1 cm in diameter, conical-cylindrical, 2-6-leaved. Leaves 12-33 cm long, 1-3.5 cm wide, oblanceolate, ligulate, linear-lanceolate to oblong-lanceolate, unequally bilobed at subacute to acute apex, suberect. Inflorescence 10-45 cm long, much longer than leaves, 50-200-flowered, rather dense, subdensely peduncle and rhachis pubescent, almost entirely covered by scarious, imbricating sheaths, with 4 branches or unbranched, branches up to 4 cm long, secund. Flowers small, nonresupinate, brownish green marked with purple, lip pale greenish yellow. Floral bracts up to 4.5 mm long, ovate-lanceolate, acuminate. Pedicel and ovary 6 mm long, slender, glabrous.

Dorsal sepal 4-5 mm long, 1.8-2.4 mm wide, oblong-ovate to elliptic, acute to acuminate, concave, thin, delicate, glabrous, 3-nerved. Petals 3.5-4.5 mm long, 0.5-0.8 mm wide, linear to linear-oblancheolate, acute, thin, delicate, glabrous, single-nerved. Lateral sepals 5 mm long along the upper margin, 8 mm long along the lower one, 5.3-7.5 mm wide at base, obliquely trinangular-ovate, acuminate to shortly apiculate, concave, thin, delicate, glabrous, 4-nerved. Lip 5.4-7 mm long, 4.3-5 mm wide, rather thin, sparsely pubescent on the upper surface, callus centrally placed, oblong, pubescent, another one at the apex of the mid-lobe; obscurely trilobed at apex; the middle lobe 1 mm long, 2.3 mm wide, transversely elliptic, convex, shortly apiculate, margins undulate-crenulate; sidelobes longer than the mid-lobe, oblong-ovate, acute to obtuse, falcate. Mentum up to 7 mm long, conical-saccate.

**HABITAT.** Epiphyte on tree trunks and larger branches in riverine forests, rain forest. November.

**DISTRIBUTION:** Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Gabon, Angola, Democratic Republic of Congo (Zaire), Uganda.

**REPRESENTATIVE SPECIMENS.** Abidjan, Banco Forest National Park, near Chaumiere du Banco, 25 Nov. 1973, *De Koning 2805* (WAG!); Danané-Guinée road, 25 Nov. 1973, *Pérez-Vera 546* (ABI!, K!, P!); Mt. Tonkoui?, 1975, *van der Burg 1152* (WAG!).

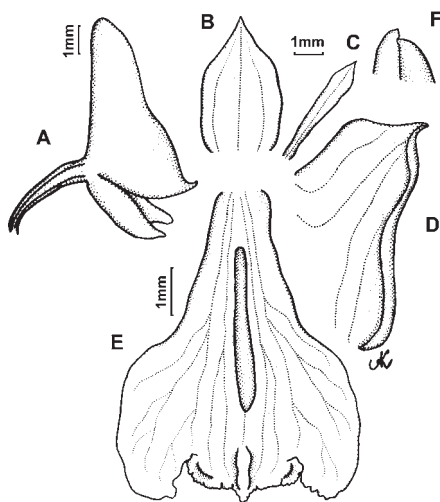


Fig. 112.—*Polystachya mukandaensis* De Wild.: A - flower; B - dorsal sepal; C - petal; D - lateral sepal; E - lip; F - leaf apex (drawn by A. Kowalkowska, *Tisserant 2653*, P).

**14. *Polystachya obanensis* Rendle in Rendle & Baker, Cat. Pl. Oban.: 102. 1913 (Fig. 113)**

**TYPE:** NIGERIA. *Talbot 930* (HOLOTYPE: BM!; ISOTYPE: K!)

Pseudobulbs 2.5-8 cm long, 0.5-2 cm wide, oblong, dorsiventrally flattened, prostrate on the substratum, with new pseudobulbs appearing at the apex of the previous one forming a kind of chain, with 1-2 sheath-like and 2 normal leaves at the base and a single leaf on apex. Leaves almost sessile, up to 19 cm long and 0.8-2.5 cm wide, oblong to linear-lanceolate, obtuse, shortly and unequally bilobed at apex. Inflorescence up to 20 cm long, 15-20-flowered, rather lax, branched or not, developing with the leaves on the young pseudobulb, peduncle and rhachis densely pubescent, rhachis with 1-2 sterile bracts. Flowers medium-sized, nonresupinate, cream or yellow. Floral bracts up to 1.8 cm long,



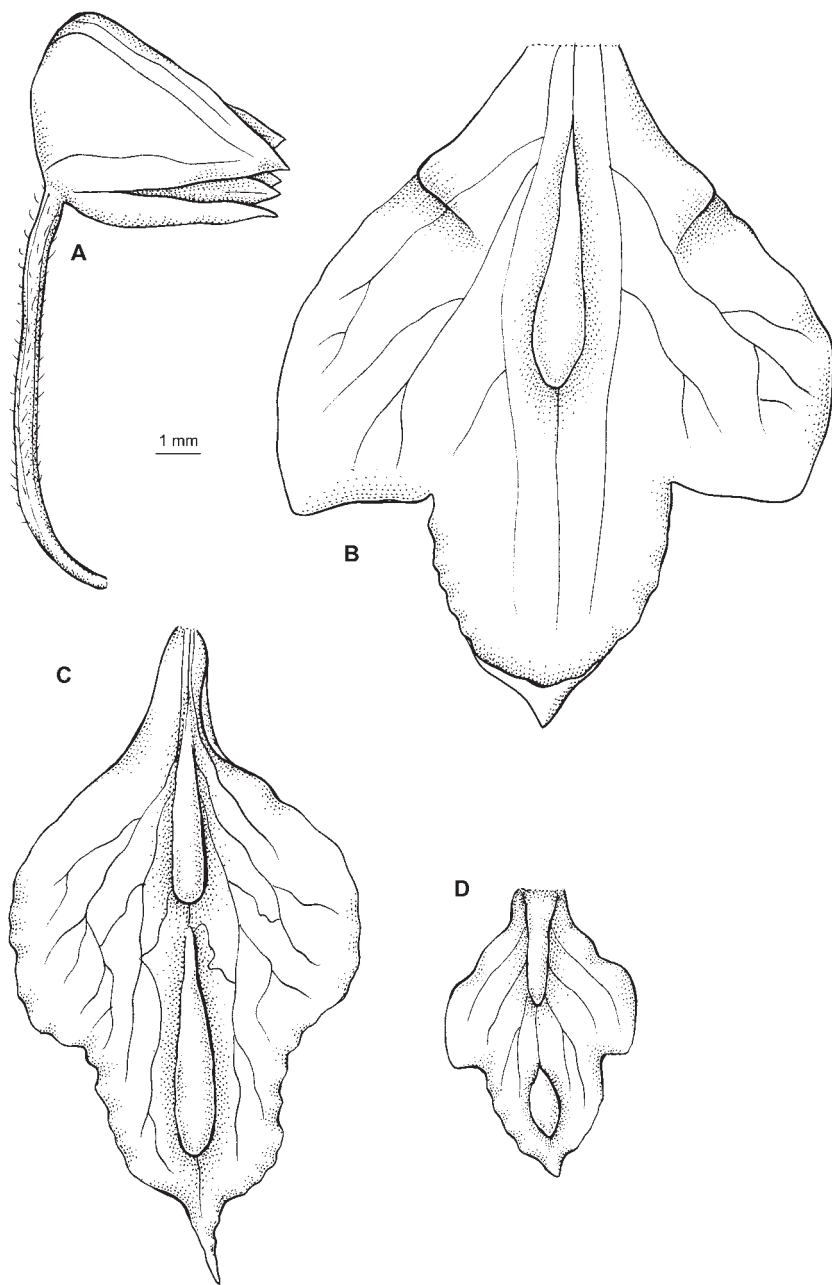


Fig. 113.—*Polystachya obanensis* Rendle: A — flower; B-D — lip (drawn by J. Mytnik-Ejsmont, A, B — Aké Assi 6026, BR; C, D — Talbot 930, K).

ovate-lanceolate at the base, acuminate above, rather thin, densely and shortly pubescent. Pedicel and ovary up to 8 mm long, slender, densely pubescent. Dorsal sepal (6.5)7-9(15) mm long, up to 2 mm wide, linear-triangular, acute, densely pubescent outside, 3-nerved. Petals up to 8 mm long, 1.2 mm wide, obliquely oblanceolate, acute, attenuating to the base, glabrous, 1-nerved. Lateral sepals 9 mm long along the upper margin, 10 mm long along the lower margin, 5 mm wide at base, obliquely triangular with slightly saccate basal lower margin, densely pubescent outside, 3-nerved. Lip 7.5-11 mm long, up to 5 mm wide, 3-lobed near the middle, rather thick, callus in the lower half elongate more or less prominent, glabrous; the middle lobe up to 4 mm long and 1.8 mm wide, ovate-triangular to ovate in outline, acute to acuminate with more or less prominent callus in the centre; sidelobes obliquely oblong to rhomboid, obtuse to subacute, rather thin and minutely ciliolate. Mentum up to 4 mm long.

HABITAT. Epiphyte in humid, lowland forests. September-October.

DISTRIBUTION. Liberia, Ivory Coast, Nigeria, Cameroon, Gabon. Alt. to 900 m.

REPRESENTATIVE SPECIMENS. Man, Mt. Tonkoui, 30 Oct. 1961, *Aké Assi 6026* (K!); Mt. Momi, 30 Oct. 1966, *Aké Assi 9205* (K!); Mt. Tonkoui, Sep. 1971, *Pérez-Vera 126* (K!, P!).

# 15. *Polystachya odorata* Lindl. in J. Linn. Soc., Bot. 6: 130. 1862

(Fig. 114)

TYPE (*here designated*): NIGERIA. *Barter 1483* (LECTOTYPE: K!) & EQUATORIAL GUINEA (BIOKO). *Mann 436* (PARATYPE: K!)

*Polystachya usambarensis* Schltr. in Notizbl. Bot. Gart. Berlin-Dahlem. 2: 250. 1898; TYPE: *cult. Hort Berol.* (HOLOTYPE: B†; DRAWING: K!)

*Polystachya striata* De Wild. in Ann. Mus. Congo, Bot., Ser. 5, 3: 58. 1909; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent 527* (HOLOTYPE: BR!; ISOTYPE: K!)

Plant 20-60 cm tall. Pseudobulbs 2-5(18) cm long, 0.6-1.5 cm in diameter, subglobose to narrowly conical, covered at base by few sheaths, 4-9-leaved above. Leaves (6)13-30 cm long, 1.5-4.5 cm wide, ligulate, elliptic-ovate, oblong-ovate, narrowly lanceolate or oblanceolate, acute, sometimes rounded, unequally bilobed at apex. Inflorescence 10-30 cm long, 25-200-flowered, dense, covered at base by 1-3 scarious sheaths, branches 6-15, up to 11 cm long, often secondarily branching, spreading, puberulous. Flowers small, nonresupinate, fragrant, white, dull red-brown, pale green, flushed or striped red or purple on sepals, lip white, mid-lobe pink marked, callus yellow towards apex. Floral bracts 3-4 mm long, ovate-lanceolate, acuminate, glabrous or pubescent. Pedicel and ovary 6-8 mm long, slender, densely pubescent. Dorsal sepal 5 mm long, 2.1-3 mm wide, ovate, oblong-ovate, ovate-triangular, acuminate, concave, rather thick, densely pubescent, 3-nerved. Petals 4-5 mm long, 1-1.5 mm wide, oblanceolate to spatulate, oblique, rounded or acute, glabrous, 1-nerved. Lateral sepals 5-5.6 mm long along the upper margin, 7-8.5 mm long along the lower one, 4-5.6 mm wide at base, obliquely triangular-ovate to triangular-elliptic, apiculate, concave, rather thick, pubescent outside, 3-5-nerved. Lip 6-7(8) mm long, 5-7.5 mm wide, 3 lobed at or just above the middle; more or less pubescent in the centre, with oblong callus in the lower half, rather thin; the mid-lobe 2.2-3 mm long, 3.3-4.6 mm wide, transversely elliptic, emarginate, margins

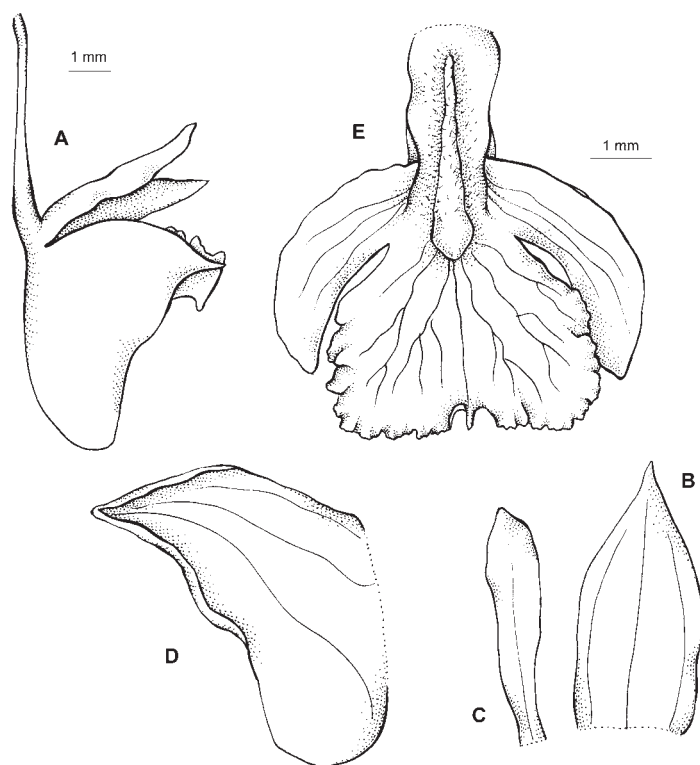


Fig. 114.—*Polystachya odorata* Lindl.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip (drawn by J. Mytnik-Ejsmont, *Halle 1400*, P).

crenulate-undulate, fleshy, glabrous or pubescent at base only; sidelobes 2-3 mm long, oblong-ovate to oblong-triangular, acute to subobtusate, falcate, thin. Mentum 4-5 mm long, saccate.

**HABITAT.** Epiphyte in primary forests, postanthropogenic forests with *Pychanthus* sp., collected on *Irvingia smithii* Hook. f., *Dialium corbisieri* Staner, *Mangifera indica* L., *Xerophyta* sp., litophyte on granit rocks, often with *Afrotrilepis pilosa* (Boeck.) J. Raynal. All year round.

**DISTRIBUTION.** Ivory Coast, Burkina Faso, Ghana, Nigeria, Cameroon, Equatorial Guinea (Bioko), Central African Republic, Gabon, Angola, Democratic Republic of Congo (Zaire), Uganda, Rwanda, Tanzania. Alt. 900-1350 m.

**REPRESENTATIVE SPECIMENS.** Bouroukrou, 20 Dec. 1906-20 Jan. 1907, *Chevalier 16604* (P!); Danane, 1 May 1975, *Pérez-Vera 784* (K!); Gbotto, Agboville, 5 July 1974, *Pérez-Vera 658* (P!); Haute Sassandra, Toura (Loura), Mt. Dourou, Konalé, 27 May 1909, *Fleury sub Chevalier 21740* (P!); Haute Sassandra, Toura (Loura), between Sanrou and Ouodé, 21 May 1909, *Chevalier 21607* (P!).

**16. *Polystachya paniculata* (Sw.) Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 113. 1898 (Fig. 115)**

*Dendrobium paniculatum* Sw. in Neues J. Bot. 1: 97. 1805; TYPE (*here designated*): SIERRA LEONE. *Afzelius* s.n. (LECTOTYPE: UPS; DRAWING: K!)

Plants 22-40 cm tall. Pseudobulbs 4-18 cm long, 1-2.2 cm in diameter, cylindrical, compressed, with 1-2 sheaths at base and 3-6 leaves above. Leaves 8-33 cm long, 2-3.8 cm wide, ligulate or oblong-elliptic, unequally bilobed, obtuse to rounded, suberect-spreading. Inflorescence 6-21 cm long, subtended at base by 1-3 obtuse to acute sheaths, peduncle and rhachis glabrous, branches up to 15, up to 6 cm long, suberect. Flowers small, nonresupinate, flame-red to orange with red

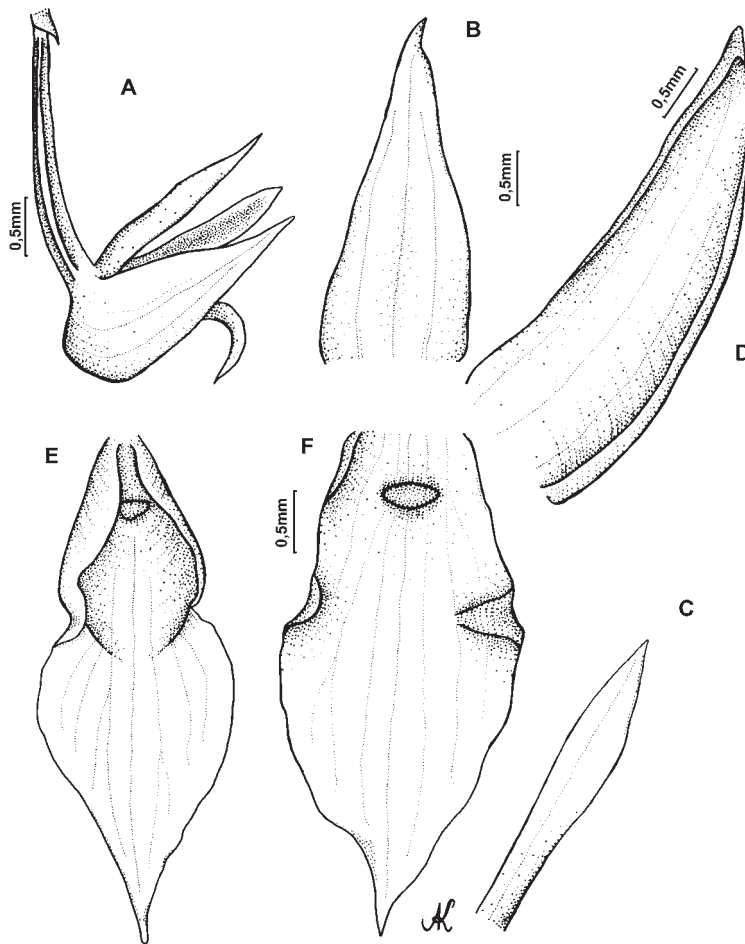


Fig. 115.—*Polystachya paniculata* (Sw.) Rolfe: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E, F – lip (drawn by A. Kowalkowska, *Tisserant* 375, P).

markings on the lip. Floral bracts 1-1.5 mm long, ovate-lanceolate, acuminate, glabrous. Pedicel and ovary 4-5 mm long, slender, glabrous. Dorsal sepal 3-4.5 mm long, 0.8-2 mm wide, lanceolate to triangular-lanceolate, acute, rather thick, cochleate, glabrous, 3-nerved. Petals 2.7-3 mm long, 0.5-0.6 mm wide, oblanceolate, subacute to acute, rather thin, delicate, glabrous, single-nerved. Lateral sepals 3.7-4 mm long along the upper margin, up to 4.5 mm long along the lower one, 1.7-1.8 mm wide at base, obliquely lanceolate to lanceolate-triangular, acute, rather thick, cochleate, glabrous, 3-nerved. Lip 2.8-4 mm long, 1.5-2 mm wide, ovate, elliptic to lanceolate-obovate, entire, acute, cochleate at base and here furnished with rounded, thick callus. Mentum up to 1.4 mm long, saccate.

**HABITAT.** Epiphyte in humid lowland forests. October-November.

**DISTRIBUTION.** Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda. Alt. 400-1150 m.

**REPRESENTATIVE SPECIMENS.** Guiglo, Tai, Inselberg Parc Nat. de Tai, *van der Maesen* 5292 (WAG!); Hiré, 16 Nov. 1967, *Aké Assi* 9781 (K!); Tiapleu, Oct.-Nov. 1972, *Pérez-Vera* 157/B (K!).

# **17. *Polystachya polychaete* Kraenzl. in Bot. Jahrb. Syst. 17: 50. 1893**

(Fig. 116)

**TYPE:** CAMEROON. *Preuss* 881 (HOLOTYPE: B†; ISOTYPE: HBG!; DRAWINGS: K!, UGDA-DLSz)

Plants 14-50 cm tall. Pseudobulbs 8-10 cm long, up to 1 cm in diameter, narrowly conical, erect, with 1-2 sheaths at base, with 3-6 leaves above. Leaves (6)12-18(30) cm long, 0.8-2.2 cm wide, ligulate, unequally roundly bilobed, suberect. Inflorescence 10-26 cm long, up to 60-flowered, dense, subtended at base by compressed sheath, rhachis ciliate. Flowers tiny, nonresupinate, yellow, yellow-green or cream-coloured. Floral bracts 3-8 mm long setaceous. Pedicel and ovary up to 2 mm long, slender, sparsely pubescent in the apical half. Dorsal sepal 1.8-2.3 mm long, 0.6-1.2 mm wide, ovate-triangular to lanceolate-ovate, acuminate, thin, delicate, almost flat, glabrous, single-nerved. Petals 1.2-1.6 mm long, 0.3-0.7 mm wide, oblong, narrowly elliptic or elliptic-lanceolate, acute or acuminate, thin, delicate, glabrous, 1-nerved. Lateral sepals 2.5-2.9 mm long, 1.5-2.25 mm wide, obliquely triangular, acuminate, concave, thin, delicate, glabrous, 1-nerved. Lip 1.2-2.2 mm long, 1.5-2.2 mm wide, shortly clawed, trilobed below the middle, with nearly basal, thick callus; the middle lobe 0.4-0.8 mm long, 0.6-1 mm wide, subquadrate to oblong, truncate at apex, apiculate, rather thick, fleshy; sidelobes 0.5-0.8 mm long, triangular, acute, thin, widely divergent. Mentum 1.3-2 mm long, saccate-conical.

**HABITAT.** Epiphyte in dense forests, swampy forests, on inselbergs, noted on *Uapaca* sp., *Cynometra* sp. October, January.

**DISTRIBUTION.** Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea (Bioko), Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda, Rwanda, Kenya, Tanzania. Alt. 800-2200 m.

**REPRESENTATIVE SPECIMENS.** Yapo, 26 Jan. 1975, *Pérez-Vera* 749 (K!); Yapo, ca. 50 km N of Abidjan, 11 Oct. 1956, *de Wilde* 806 (WAG!).

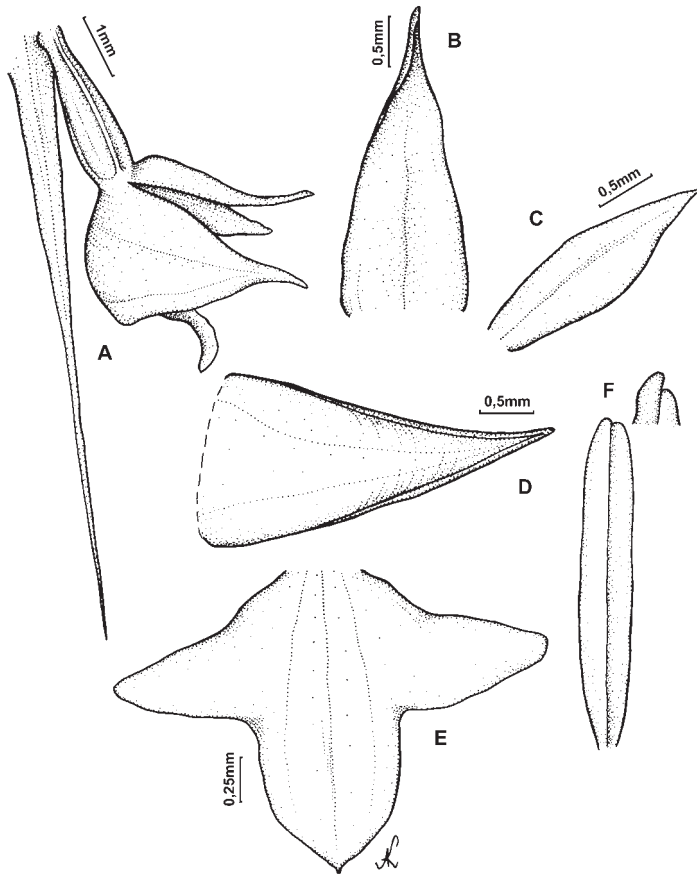


Fig. 116.—*Polystachya polychaete* Kraenzl.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip; F – leaf (drawn by A. Kowalkowska, *Le Testu* 5921, P).

**18. *Polystachya puberula* Lindl.** in Edwards's Bot. Reg. 10: t. 851. 1824 (Fig. 117)

TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!; ISOTYPE: W-R!; DRAWING: UGDA-DLSz)

Pseudobulbs ovoid, short. Leaves 5-30 cm long, 0.5-4.5 cm wide, oblanceolate or rarely almost linear, acute, arcuate, sometimes longer than inflorescence. Inflorescence 13-40 cm long, covered at base by scarious, acute bracts, branches secondarily branching, up to 10, up to 7 cm long, widely spreading, peduncle and rhachis minutely and densely pubescent. Flowers small, nonresupinate, yellow or yellow green. Floral bracts up to 2 mm long, ovate-lanceolate, acuminate, densely, minutely pubescent at base. Pedicel and ovary 4 mm long, slender, densely, minutely pubescent. Dorsal sepal 3-4 mm long, 2-2.5 mm wide, ovate-elliptic,

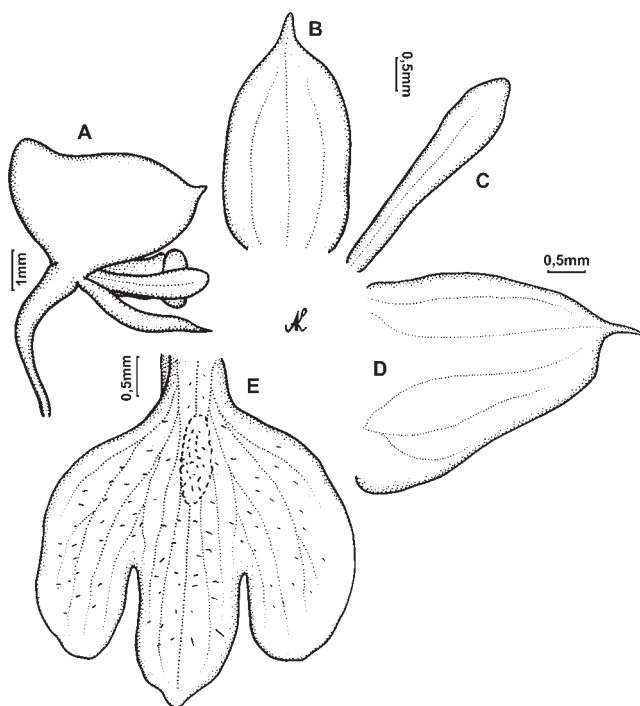


Fig. 117.—*Polystachya puberula* Lindl.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by A. Kowalkowska, *Sine coll.* W-R).

shortly apiculate, concave, thin, densely, minutely pubescent outside, 5-nerved. Petals 3-3.5 mm long, 0.75 mm wide, linear, truncate or obtuse at apex, glabrous, 1-nerved. Lateral sepals 3.5 mm long along the upper margin, 4.5 mm long along the lower one, 3 mm wide, obliquely triangular-ovate, apiculate to acute, thin, cochleate, densely and minutely pubescent on the outer surface, 5-nerved. Lip 3.8-4.5 mm long, 4-4.5 mm wide, rather thin, pubescent on the inner surface, with oblong pubescent

callus in the lower half, not continuous to the base; distinctly trilobed near the middle; the mid-lobe 1.3-1.5 mm long, 2 mm wide, ovate, elliptic to quadrate, obtuse to truncate; sidelobes obliquely semi-elliptic to oblong-ovate, obtuse. Mentum 3-3.5 mm long, conical-saccate.

HABITAT. Epiphyte. May.

DISTRIBUTION. Guinea-Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Cameroon, Gabon. Alt. 700 m.

REPRESENTATIVE SPECIMENS. Abidjan, *Kruif* 656 (WAG!); Danane, 28 May 1975, *Pérez-Vera* 793 (K!); Gbotto, Agboville, 20 May 1975, *Pérez-Vera* 791 (P!).

# **19. *Polystachya ramulosa* Lindl. in Edwards's Bot. Reg. 2: Misc. 76. 1838 (Fig. 118)**

TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!; ISOTYPE: W-R!; DRAWING: UGDA-DLSz)

Plants 8-34 cm tall. Pseudobulbs up to 2.5 cm long, 0.3-0.5 cm in diameter, ovoid, 2-3(5)-leaved. Leaves 5.5-16 cm long, up to 2.6 cm wide, elliptic, oblanceolate, oblong-oblanceolate, subacute to obtuse, spreading. Inflorescence 5-31 cm long, 25-100-flowered, dense, covered at base - up to the lowest branch - by 1-3



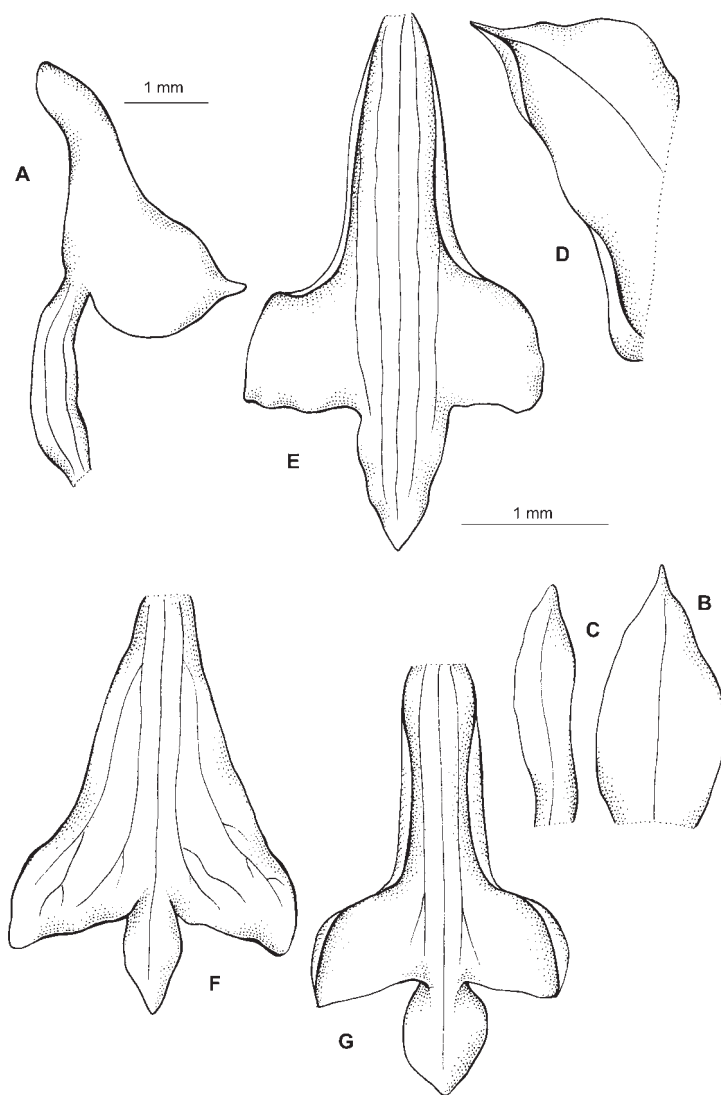


Fig. 118.—*Polystachya ramulosa* Lindl.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E-G – lip (drawn by J. Mytnik-Ejsmont, A-E - *Loddiges s.n.*, W-R; F - *Le Testu 5912*, P; G - *Braun s.n.*, HBG).

acute sheaths, branches up to 10, up to 5 cm long, suberect, spreading, multilateral, peduncle and rhachis minutely and densely pubescent. Flowers tiny, nonresupinate, pale yellow, orange, greenish yellow, lip pale pink, anther purple. Floral bracts up to 1.5 mm long, ovate-lanceolate, acuminate. Pedicel and ovary up to

1.8 mm long, slender, glabrous. Dorsal sepal 1.5-2.1 mm long, 0.9-1.5 mm wide, elliptic-ovate to ovate-orbicular, shortly acuminate, cochleate, sometimes semi-cucullate, rather fleshy, glabrous, 3-nerved. Petals 1-1.8 mm long, 0.3-0.4 mm wide, linear-oblongate to oblong-obovate, acute to subobtusate, falcate, rather thin, glabrous, single-nerved. Lateral sepals 1.3-2.5 mm long along the upper margin, up to 4 mm long along the lower one, 2-3 mm wide at base, very obliquely triangular-ovate to triangular-elliptic, shortly apiculate, cochleate, sometimes semi-cucullate, rather fleshy, glabrous, 3-nerved. Lip 2.6-2.8 mm long, 1.6-1.7 mm wide, rather fleshy, ecallose, distinctly 3-lobed in the apical quarter, basal part obtriangular in outline, sidelobes rhomboid-ovate, subacute, minutely papillate; the middle lobe 0.6-0.7 mm long, 0.4 mm wide, ovate to ovate-elliptic, acute to obtuse, convex, somewhat fleshy. Mentum 1.6-2.5 mm long, conical-cylindrical, blunt.

HABITAT. Epiphyte in dense forests, riparian forests. January, August.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda, Tanzania. Alt. 650-900 m.

REPRESENTATIVE SPECIMENS. Mt. Mafa, 9 Aug. 1965, *Bonardi 113* (P!); Mt. Niénokoué, 18 Jan. 1976, *Pérez-Vera 869* (K!).

**20. *Polystachya rhodoptera* Rchb. f. in Hamburger Garten-Blumenzeitung. 14: 214. 1858**  
(Fig. 119)

TYPE: SIERRA LEONE. *Desvaux 49* (HOLOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Polystachya wahisiana* De Wild. in Belg. Colon. 1: 183. 1904; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Hort. Laeken s.n.* (HOLOTYPE: BR!)

*Polystachya subcorymbosa* Kraenzl. in Bull. Misc. Inform. Kew. 1926: 288. 1926; TYPE: ORIGIN UNKNOWN. *cult. Hort. Kew.* (HOLOTYPE: K!)

Stems up to 50 cm long, up to 0.5 cm in diameter, slender, narrowly cylindrical, with 2-3 basal sheaths, and 3-9 leaves above. Leaves 5-20 cm long, 0.3-2.5 cm wide, lanceolate to oblong, acute, suberect. Inflorescence up to 10.5 cm long, very densely 8-40-flowered, simple or with 1-2 rather short branches, peduncle and rachis densely pubescent. Flower rather small, nonresupinate, white or yellow, often tinged rose. Floral bracts 2-4 mm long, triangular-ovate, apiculate, reflexed, glabrous. Pedicel and ovary 8-9 mm long, slender, glabrous. Dorsal sepal 5-5.5 mm long, 1.5-2.5 mm wide, oblong-ovate to oblong-elliptic, apiculate, cochleate, glabrous, 3-nerved. Petals 3.5-4.7 mm long, 1-1.7 mm wide, oblong-oblongate, oblong, acute, glabrous, single-nerved. Lateral sepals 5-6 mm long along the upper margin, 6-7 mm long along the lower one, 4-5 mm wide at base, obliquely ovate-triangular, apiculate, cochleate, glabrous, 3-4-nerved. Lip 5-6.6 mm long, 4-5.5 mm wide, distinctly three-lobed just above the base, glabrous, with oblong, glabrous, thick callus in the basal third; the mid-lobe up to 4 mm long, 3 mm wide, obovate-obtriangular, widest at truncate apex, rather thick, with short, deflexed apiculus; sidelobes up to 2 mm long, linear to oblong, subobtusate, thin, crossed to each other above the middle lobe. Mentum 4-5 mm long, conical.

**HABITAT.**  
Epihyte in dense forests, on shady branches over the water, lithophyte on rocky knoll between seashore and mangrove swamps. January, April.

**DISTRIBUTION.**  
Sierra Leone, Liberia, Ivory Coast, Nigeria, Cameroon, São Tomé and Príncipe, Equatorial Guinea (Bioko), Central African Republic, Gabon, Democratic Republic of Congo (Zaire).  
Alt. 480-980 m.

**REPRESENTATIVE SPECIMENS.** Abidjan, Sangouiné-Flauepleu, 1 Jan. 1974, *Pérez-Vera* 566 (K!); Dyolas, Boan-Danané (Fort Hittos), 16 Apr. 1909, *Chevalier* 21276 (P!).

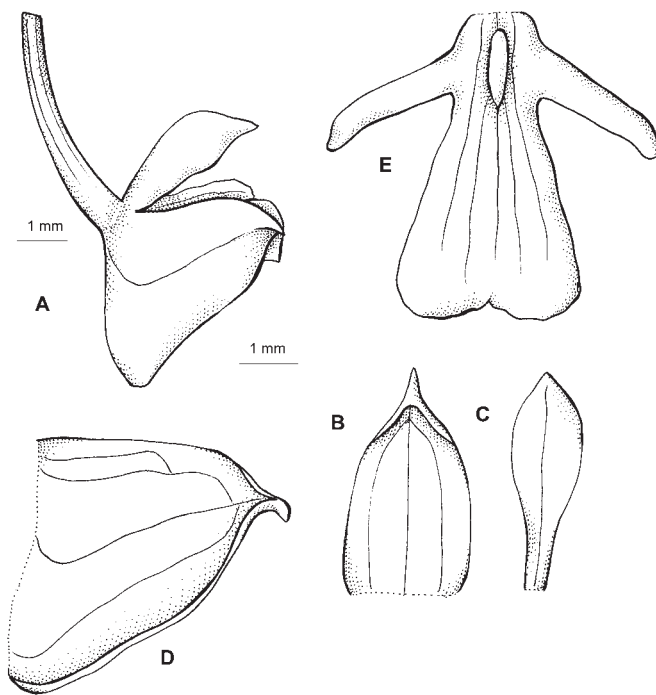


Fig. 119.—*Polystachya rhodoptera* Rchb. f.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by J. Mytnik-Ejsmont, *Halle & Villiers* 4328, P).

**21. *Polystachya seticaulis* Rendle in Rendle & Baker, Cat. Pl. Oban.: 104, 1913 (Fig. 120)**

TYPE: NIGERIA. *Talbot* 926 (HOLOTYPE: BM!; ISOTYPE: K!)

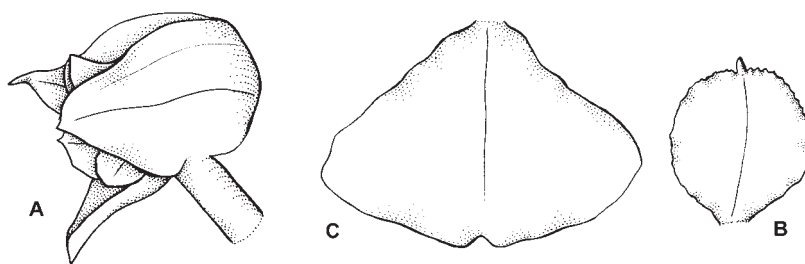


Fig. 120.—*Polystachya seticaulis* Rendle: A – flower; B – petal; C – lip (drawn by J. Mytnik-Ejsmont, *Bequaert* 2657, BR).

Plants 2.3-6.5(15) cm tall. Pseudobulbs up to 2.5 cm long, up to 0.15 cm in diameter, fusiform, with 1-2 basal sheaths and 2-6 leaves above. Leaves 1.5-5 cm long, 0.1-0.2 cm wide, linear, acute, suberect to subspreading. Inflorescence 1-3.5(10) cm long, 5-20-flowered, dense, with up to 2 branches, up to 0.7 cm long, peduncle and rhachis glabrous, filiform. Flowers tiny, nonresupinate, blanches laves de rose ou de mauve. Floral bracts up to 0.5 mm long, ovate-lanceolate, acuminate, glabrous, thin, delicate. Pedicel and ovary 1.5 mm long, slender, glabrous. Dorsal sepal 1.3 mm long, 1 mm wide, suborbicular to oval, rounded at apex to acute, almost flat, thin, delicate, glabrous, single-nerved. Petals 1 mm long, 0.5 mm wide, oblong-obovate to oblanceolate, acute to rounded at apex, hardly falcate, thin, glabrous, single-nerved. Lateral sepals 2.5 mm long along lower and upper margins, 1.7 mm wide, obliquely elliptic, obtuse, occasionally subacute, cochleate, thin, glabrous, delicate, 2-nerved. Lip 1.75-2 mm long, 2.3 mm wide, rhomboid in general outline, obscurely 3-lobed just above the middle, thin, delicate, glabrous, concave at base; the middle lobe up to 0.5 mm long, ligulate, acute, recurved, slightly thickened; sidelobes up to 0.8 mm long, obliquely triangular, acute to subacute. Mentum 1 mm long, subglobose, short.

**HABITAT.** Epiphyte in dense forests, sclerophyllous forests, collected on *Gilbertiodendron deweveri* (De Wild.) Leonard, *Nephrolepis pumicicola* F. Ballard, *Tubunaldia* sp.. November-April.

**DISTRIBUTION.** Ivory Coast, Nigeria, Cameroon, Principe, Gabon, Congo, Democratic Republic of Congo (Zaire). Alt. 50-2100 m.

**REPRESENTATIVE SPECIMENS.** Abidjan, Banco Forest National Park, 7 Mar. 1974, *De Koning* 3418 (WAG!); Banco, 12 Apr. 1968, *Aké Assi* 10027 (K!); Yapo, 3 Nov. 1974, *Pérez-Vera* 719 (K!, P!).

## 22. *Polystachya subulata* Finet in Lecomte Not. Syst. 2: 26. 1911

(Fig. 121)

TYPE: GUINEA. *Blanc s.n.* (HOLOTYPE: P!; DRAWING: UGDA-DLSz)

Pseudobulbs 1.5-4 cm long, 0.3-0.4 cm in diameter, narrowly cylindrical, conical in the lower part, covered by 3 sheaths at base, with 2-3 leaves at apex. Leaves 6-14 cm long, 0.6-1.4 cm wide, narrowly lanceolate or elliptic, acute, minutely bilobed, suberect. Inflorescence 1.5-8 cm long, 6-20-flowered, rather dense, covered at base by a single sheath, unbranched or occasionally with 1-2 branches at the base, peduncle subdensely pubescent and rhachis almost glabrous. Flowers small, nonresupinate, cream, white or greenish white, mentum or callus sometimes violet. Floral bracts 2-5 mm long, ovate-lanceolate, acuminate, glabrous. Pedicel and ovary up to 7 mm long, slender, glabrous. Dorsal sepal 4.2-8 mm long, 2-4 mm wide, elliptic-ovate or ovate-lanceolate, shortly acuminate, rather thick, glabrous, 3-nerved. Petals 3.6-7 mm long, 1.1-2 mm wide, oblanceolate, apiculate or acute, falcate, thin, glabrous, single-nerved. Lateral sepals 4-5 mm long along the upper margin, 7-8 mm long along the lower one, 5-6 mm wide, obliquely triangular-ovate, shortly apiculate, concave, rather thick, glabrous, 3-nerved. Lip 5-7.5 mm long, 3.2-5 mm wide, obscurely trilobed just above the middle, thin, rather sparsely pubescent on the inner surface, with rounded, densely pubescent callus in the centre; the mid-lobe 1.1-1.5 mm long, 1.8-2 mm wide, semi-elliptic to semi-orbicular, shortly apiculate; sidelobes semi-obovate to

rounded. Mentum 3-4 mm long, saccate.

**HABITAT.**  
Epiphyte in dry upland forests. May.

**DISTRIBUTION.**  
Guinea, Sierra Leone, Ivory Coast, Liberia, Nigeria, Cameroon, Central African Republic. Alt. above 800 m.

**REPRESENTATIVE SPECIMENS.**

Haute Sassandra, Toura (Loura), between Sanrou and Ouodé, 21 May 1909, *Chevalier 21601* (K!, P!); Haute Sassandra, Toura (Loura), between Ouodé and Gouréni, 22 May 1909, *Chevalier 21637* (K!, P!); Haute Sassandra, Toura (Loura), Gouréni, 22 May 1909, *s.n.* (P!).

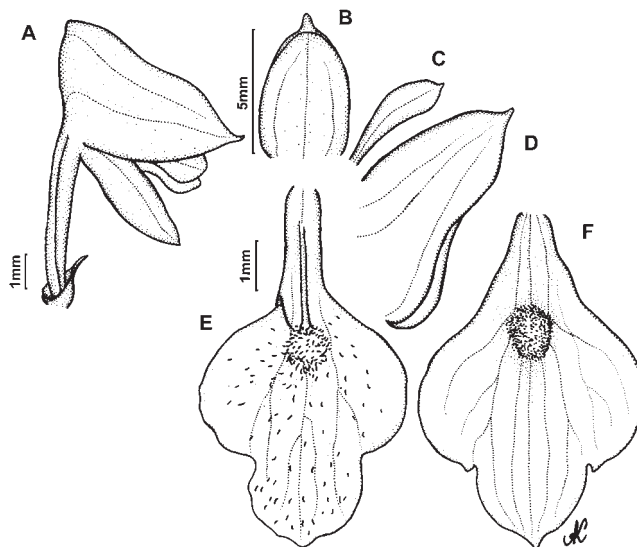


Fig. 121.—*Polystachya subulata* Finet: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E, F — lip (drawn by A. Kowalkowska, *Le Testu* 2393, P).

**23. *Polystachya tenuissima* Kraenzl. in Bot. Jahrb. Syst. 19: 250. 1894 (Fig. 122)**

TYPE: CAMEROON. *Zenker 609* (HOLOTYPE: B†; ISOTYPES: BM!, K!)

*Polystachya inconspicua* Rendle in J. Linn. Soc., Bot. 37: 215. 1905; TYPE: UGANDA. *Bagshawe 425 p.p.* (HOLOTYPE: BM!; DRAWING: K!)

*Polystachya ashantensis* Kraenzl. in Bull. Misc. Inform. Kew. 1926: 294. 1926; TYPE: GHANA *Chipp 578*. (HOLOTYPE: K!)

Pseudobulbs 0.7-10 cm long, 0.06-0.3 cm in diameter, narrowly cylindrical, tightly clustered, with 3-4 sheaths, single-leaved. Leaf 2-14.5(33) cm long, 0.2-0.7 cm wide, linear, retuse or obtuse at apex, rather fleshy, subterete to flat. Inflorescence 1.7-30 cm long, few- to 40-flowered, dense, usually with 2-6 branches, sometimes unbranched, peduncle and rhachis glabrous, stout. Flowers small, nonresupinate, mauve, yellow to yellow-green, lip sidelobes and spur marked brown-purple or red-brown. Floral bracts 0.4-2 mm long, triangular, apiculate, glabrous. Pedicel and ovary slightly longer, slender, glabrous. Dorsal sepal 1.5-3.5 mm long, 0.7-2.2 mm wide, obovate, elliptic, ovate-triangular, acute to shortly apiculate, concave, thin, delicate, glabrous, 3-nerved. Petals 1.7-3 mm long, 0.6-1.6 mm wide, linear at base, obovate above, or oblong-lanceolate to linear, subacute thin, delicate, glabrous, single-nerved. Lateral sepals 2-2.5 mm long along upper margin, 3.5-4.5 mm long along lower margin, 2-3 mm wide, very oblique at base, oblong-triangular, oblong-ovate to oblong-elliptic, acute to short-

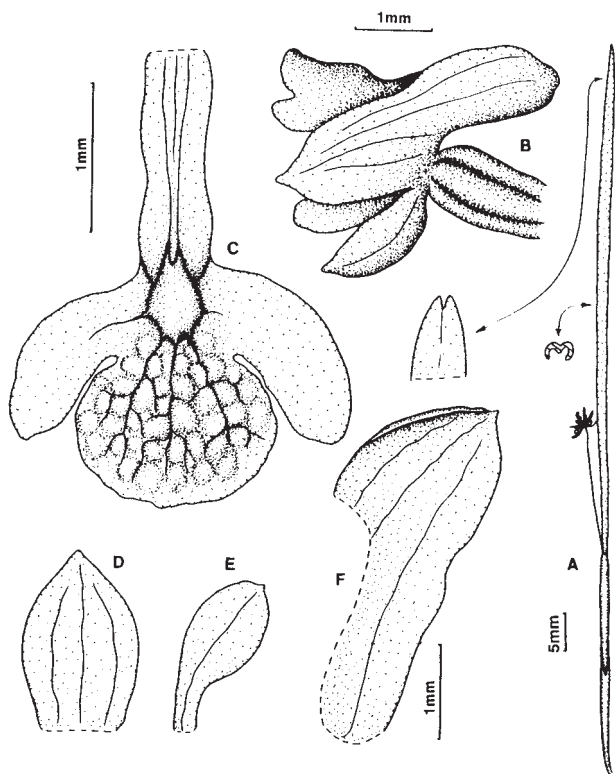


Fig. 122.—*Polystachya tenuissima* Kraenzl.: A – habit; B – flower; C – lip; D – dorsal sepal; E – petal; F – Lateral sepal (Szlachetko & Olszewski 2001a).

ly apiculate, concave, thin, delicate, glabrous, 3-nerved. Lip 2.5–6.5 mm long, 1.7–4 mm wide, glabrous, basal half linear, canaliculate, glabrous, distinctly three-lobed above, with fleshy, glabrous callus at the base of the midlobe; middle lobe 0.7–2.4 mm long, 0.8–2 mm wide, orbicular to rounded-subquadrate, rounded, slightly thickened, minutely papillate; sidelobes up to 1.5 mm long, 0.6 mm wide, linear or oblong, falcate, subobtusate to subacute, very thin, delicate, glabrous. Mentum up to 2(5) mm long, cylindrical or cylindrical-clavate.

#### HABITAT.

Epiphyte in rain forest or drier montane

woodlands, on large, sometimes exposed trees, for example on exposed moss covered cocoa. May, October–November.

DISTRIBUTION. Ivory Coast, Ghana, Cameroon, Congo, Democratic Republic of Congo (Zaire), Uganda, Kenya, Tanzania. Alt. 300–2300 m.

REPRESENTATIVE SPECIMENS. Between Danane and Tiapleu, 18 Oct. 1974, *Pérez-Vera* 703 (K!); Mt. Momi, Nov. 1973, *Pérez-Vera* 239/B (K!, P!); Orumbo-Boka, 31 May 1966, *Aké Assi* 8867 (K!); Haute Sassandra, Dyolas, Mt. Boho (Bono), Zoaulé (Zoandié), 6 May 1909, *Chevalier* 21467 (K!, P!); Tiapleu, 14 Nov. 1966, *Aké Assi* 9227 (K!).

#### 24. *Polystachya tessellata* Lindl. in J. Linn. Soc., Bot. 6: 130. 1862 (Fig. 123)

TYPE: NIGERIA. *Mann s.n.* (HOLOTYPE: K!; ISOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Polystachya rufinula* Rchb. f. in Gard. Chron. 1: 41. 1879; TYPE: MALAWI. *Kirk s.n.* (HOLOTYPE: W-R!; ISOTYPES: K!, W-R!; DRAWING: UGDA-DLSz)

*Polystachya buchananii* Rolfe in Bull. Misc. Inform. Kew. 1893: 335. 1893; TYPE: MALAWI. *Buchanan s.n.* (HOLOTYPE: K!; ISOTYPE: K!)

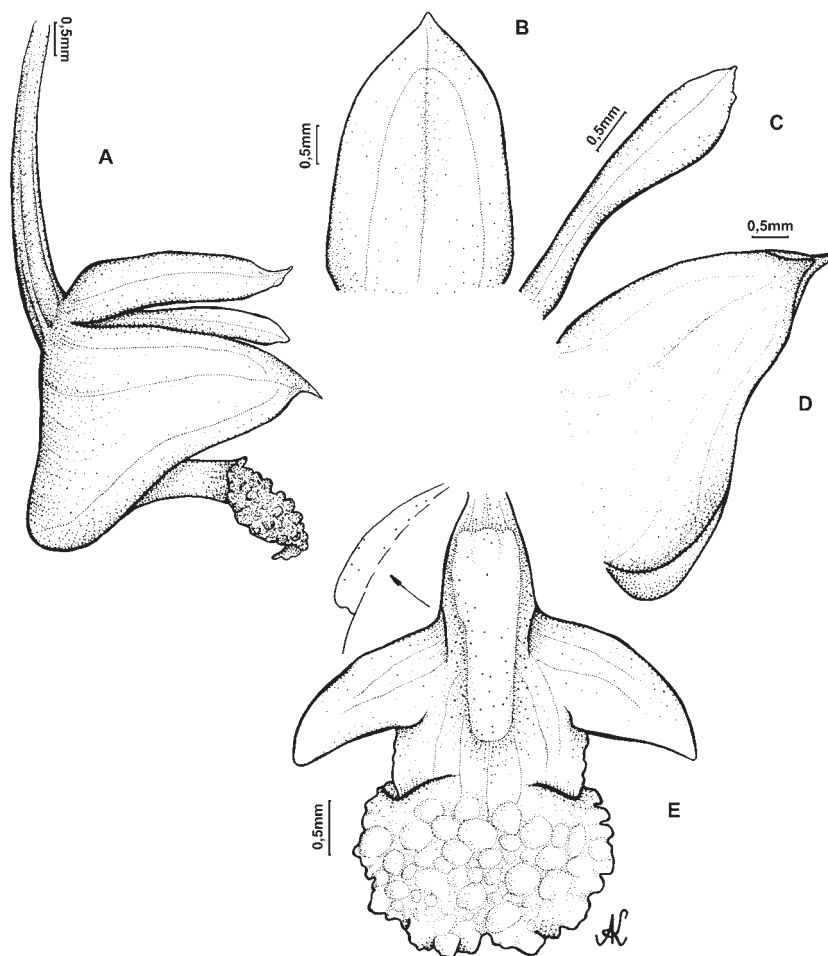


Fig. 123.—*Polystachya tessellata* Lindl.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by A. Kowalkowska, *Mildbraed 6917*, HBG).

*Polystachya lehmbachiana* Kraenzl. in Bot. Jahrb. Syst. 28: 166. 1900; TYPE: CAMEROON. *Lehmbach 5* (HOLOTYPE: B†; DRAWING: K!)

*Polystachya gracilis* De Wild. in Not. Pl. Util. Congo 1: 136. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gentil 45b* (HOLOTYPE: BR!; DRAWING: K!)

*Polystachya latifolia* De Wild. in Not. Pl. Util. Congo 1: 138. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent 1086* (HOLOTYPE: BR!; ISOTYPE, DRAWING: K!)

*Polystachya praealta* Kraenzl. in Bot. Jahrb. Syst. 36: 118. 1905; TYPE: LIBERIA. *Dinklage 2069* (HOLOTYPE: B†; DRAWING: K!)

*Polystachya lettowiana* Kraenzl. in Repert. Spec. Nov. Regni Veg. Beih. 39: 54. 1926; TYPE: MALAWI. *Stolz 1993* (HOLOTYPE: B†; ISOTYPE: K!)

*Polystachya lepidantha* Kraenzl. in Bull. Misc. Inform. Kew. 1926: 290. 1926; TYPE: UGANDA. *Snowden 726* (HOLOTYPE: K!)



Plants 9-62 cm tall. Pseudobulbs up to 15 cm long, 0.5-0.7 cm in diameter, 3-5-leaved. Leaves (3)10-30 cm long, 0.8-6 cm wide, oblanceolate, elliptic, oblong-elliptic, unequally bilobed at apex, obtuse or rounded, suberect to spreading. Inflorescence 10-50 cm long, much longer than leaves, 20-200-flowered, dense, peduncle covered by scarious, acute, imbricating sheaths, rhachis covered by papery acute sheaths, peduncle and/or rhachis sparsely pubescent, branches up to 10, 1-5 cm long, secund, distant. Flowers small, nonresupinate, creamy, yellow, pale green, pink, dull red, lip white with a pink mid-lobe. Floral bracts 2-4 mm long, ovate-lanceolate, acuminate, glabrous. Pedicel and ovary 6 mm long, slender, glabrous. Dorsal sepal 3-4.3 mm long, 1.8-2.3 mm wide, oblong-elliptic to elliptic-ovate, subobtuse or acute, concave, thin, glabrous or sparsely pubescent, 3-nerved. Petals 2-3.6 mm long, 0.6-1.1 mm wide, ligulate to oblong-spathulate, acute to apiculate, thin, glabrous, single-nerved. Lateral sepals 3-4.2 mm long along the upper margin, 5.1-5.6 mm long along the lower one, 2.8-4 mm wide at base, obliquely triangular-elliptic, acute to shortly apiculate, thin, concave, glabrous or sparsely pubescent, 3-4-nerved. Lip 3-5.2 mm long, 2.1-4 mm wide, tapering towards the base, trilobed near the middle, rather thin, delicate, pubescent on the inner surface, except margins, callus a fleshy, more or less pubescent ridge in the lower half; mid-lobe 1-2 mm long, 1.3-2.1 mm wide, elliptic, ovate to subquadrate, truncate to rounded at apex, margins crenulate-undulate, slightly fleshy; sidelobes triangular to oblong, falcate, acute to obtuse, thin. Mentum up to 3.6 mm long, saccate-conical.

**HABITAT.** Epiphyte in rain forest, savanna, collected on *Crudia harmsiana* De Wild. in *Coffea* sp., *Elaeis guineensis* Jacq., *Garcinia punctata* Oliv., *Mangifera indica* L., *Millettia laurentii* De Wild. in *Scorodophloeus zenkeri* Harms, *Uapaca heudelotii* Baill. All year round.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Equatorial Guinea (Bioko, Annobón), Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Uganda, Rwanda, Burundi, Ethiopia, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. up to 1700 m.

**REPRESENTATIVE SPECIMENS.** Abouabou, between Bouet and Grand Bassam, 7 Dec. 1956, *De Wilde* 988 (WAG!); *De Wilde* 989 (WAG!); Banco Forest Reserve, NE part, 9 Jan. 1976, *De Koning* 6345 (WAG!); Banco Forest Reserve, 22 Feb. 1976, *De Koning* 6345 (WAG!); 11 Feb. 1976, *De Koning* 6472 (WAG!); Brafouedi, 27 Sep. 1965, *Bonardi* 191 (P!); 75 km NW of Abidjan, 30 Dec. 1958, *Leeuwenberg* 2312 (BR!, K!, WAG!); Basen Haut-Nuon, Dyolas, between Sakonanta and Sampleu (Sinta), 1 Apr. 1909, *Chevalier* 21095 (P!); Danané, 23 June 1926, *Collenette* 42 (K!); *Collenette* 50 (K!); *Collenette* 51 (K!); Lagune Ebrié, Ile Boulay, ca. 20 km W of Abidjan, 22 July 1963, *Oldeman* 172 (K!, P!, WAG!); Man-Touba, 17 Feb. 1974, *Pérez-Vera* 634 (K!, ABI); Mt. Tonkoui, NW of Man, 17 Sep. 1975, *van der Burg* 1052 (WAG!); Haute Sassandra, Loura, between Sanrou and Ouodé, 21 May 1909, *Chevalier* 21626 (P!); Haute Sassandra, Loura, between Gouékouma and Sogui, 25 May 1909, *Chevalier* 21684 (P!); Haute Sassandra, Loura, Gouékouma, 24 May 1909, *Chevalier* 21686 (P!); Haute Sassandra, Loura, Sanrou, 20 May 1909, *Ripert sub Chevalier* 21600 (P!); Mt. Tonkoui, NW of Man, 17 Sep. 1975, *van der Burg* 1054 (WAG!); Zagué, May 1974, *Pérez-Vera* 185 (K!, P!); Yapo, ca. 50 km N of Abidjan, 11 Nov. 1956, *de Wilde* 804 (WAG!).

## INCERTAE SEDIS

**Polystachya sp. 1**

(Fig. 124)

This plant is known from the single collection kept at P. It is unique amongst *Polystachya* in having unlobed, apiculate lip, with digitate subapical callus and central tuft of hairs.

REPRESENTATIVE SPECIMENS.  
Mafa, 28 July 1965, *Bonardi* 62 (P!).

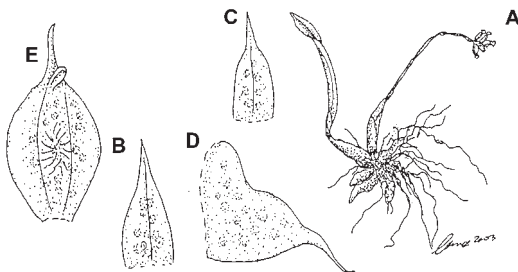


Fig. 124.—*Polystachya* sp. 1: A – habit; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (Olszewski, mscr., *Bonardi* 62, P).

**33. Szlachetkoella** Mytnik in *Richardiana* 7(2): 57-58. 2007

Creeping or pendent epiphytic plant, up to 100 cm long. Stems branching with numerous distichous leaves. Leaves fleshy, bilaterally flattened, ovate, acute. Inflorescence 1-flowered, peduncle glabrous. Flower solitary, relatively large, nonresupinate, pale brownish, pinkish, purplish or white marked with red or purple. Floral bracts glabrous. Ovary and pedicel pubescent. Dorsal sepal ovate, rounded, apiculate, ciliate on the outer surface. Petals subelliptic, obtuse, often with undulate margin, glabrous. Lateral sepals obliquely triangular, apiculate, minutely ciliate on the outer surface. Lip with a longitudinal callus in the basal third, rather obscurely 3-lobed, side lobes small, semi-ovate, rounded, the midlobe oblong, emarginate or apiculate subquadrate. Mentum conical-saccate. Gynostemium similar to that one of *Polystachya*.

Probably a monotypic genus.

**1. Szlachetkoella mystacioides** (De Wild.) Mytnik in *Richardiana* 7(2): 58. 2007 (Figs. 125, 126)

*Polystachya mystacioides* De Wild. in Not. Pl. Util. Congo 1: 133. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gentil* 1900 (HOLOTYPE: BR!; FRAGMENT OF HOLOTYPE: K!)

Plants up to 100 cm long. Stems branching, widely creeping or hanging. Each pseudobulbs arising from the apex or upper part of preceding one, some pseudobulbs with numerous distichous leaves, others 1-leaved. Leaves 2-15 cm long, 0.5-1 cm wide, obliquely ovate to linear, acute, often fleshy, often with many overlapping sheaths at base. Inflorescence single-flowered, peduncle glabrous. Flowers medium-sized, nonresupinate, almost sessile, pale brownish. to white with red or purplish markings. Floral bracts up to 15 mm long, ovate-lanceolate, acuminate, glabrous. Dorsal sepal 7-10 mm long, 3-6 mm wide, oblong-obovate, obtuse to subacute, glabrous. ciliolate on the outer surface. Petals 5.8-8.4 mm long, 1.5-3.8 mm wide, subelliptic, obtuse. Larteral sepals up to 12 mm long and 7.5 mm wide, obliquely triangular to triangular-ovate, apiculate, minutely ciliolate on the outer surface. Lip 9-12 mm long, 4-6 mm wide, trilobe, callus oblong, lip side lobes

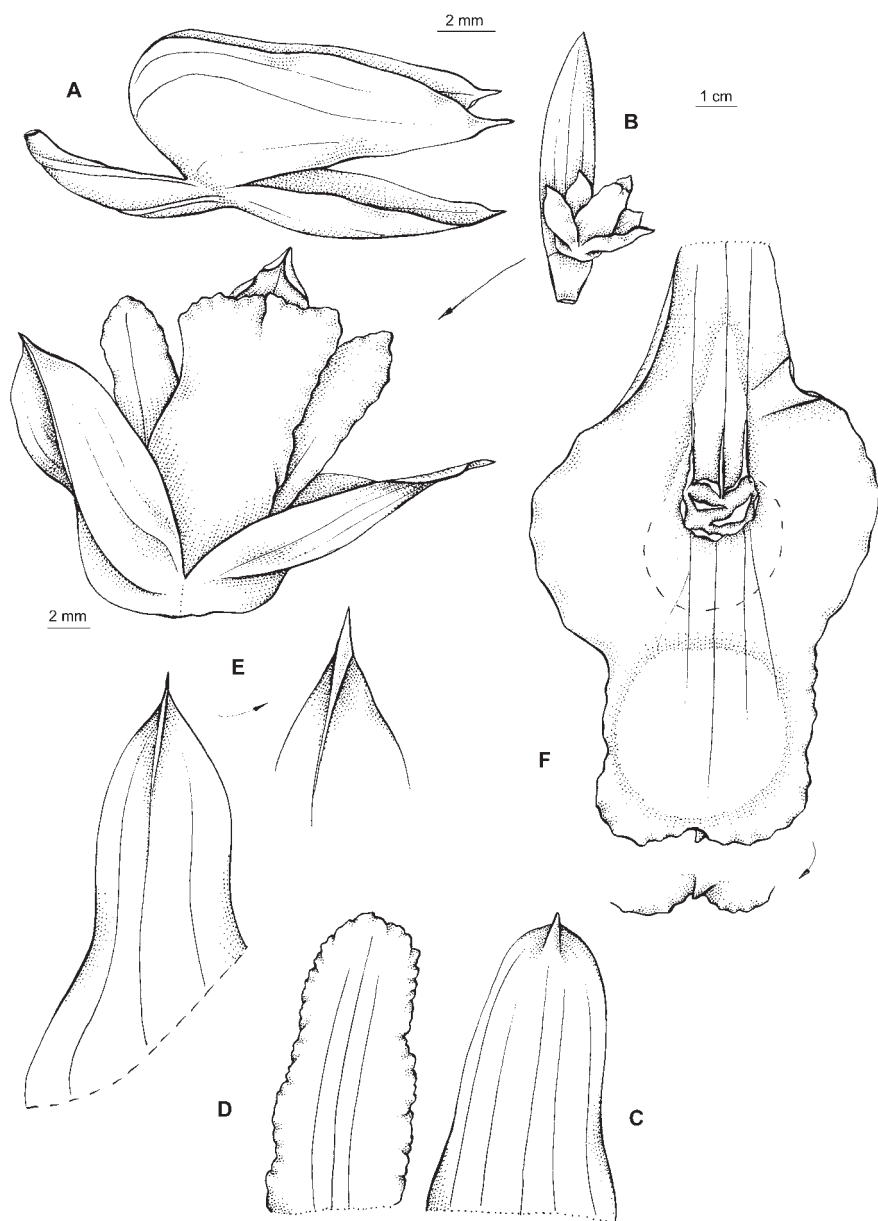


Fig. 125.—*Szlachetkoella mystacioides* (De Wild.) Mytnik: A – flower; B – leaf and flower; C – dorsal sepal; D – petal; E – lateral sepal; F – lip (drawn by J. Mytnik-Ejsmont, *Sine coll.* 3690, BR).

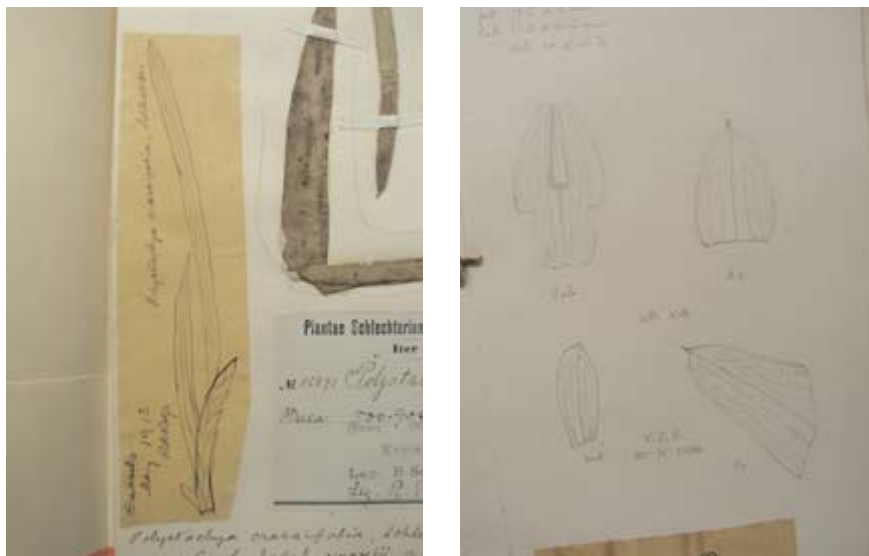


Fig. 126.—*Polystachya crassifolia* Schltr. - part of the type materials kept at K (thanks to the courtesy of J. Mytnik-Ejsmont).

rather obscurely trilobed in the apical third, the middle lobe ca. 4 mm long, subquadrate, rotundate, slightly notched in the apex; side lobes oblong-obovate, rounded. Mentum 2.5-7 mm high, conical-saccate, blunt.

HABITAT. Epiphyte in humid forests at lower altitude. October-April.

DISTRIBUTION. Ivory Coast, Cameroon, Democratic Republic of Congo (Zaire). Alt. 800-900 m.

REPRESENTATIVE SPECIMENS. Guezabó-Guezon road, 6 Apr. 1974, *Pérez-Vera* 610 (K!); Island on Sassandra R., near Louga, 8 Apr. 1973, *De Koning* 1259 (WAG!); Tai, 22 Oct. 1961, *Aké Assi* 6030 (K!, P!); Tai, 24 Mar. 1974, *Pérez-Vera* 603 (K!, P!); Zagué, 20 Dec. 1973, *Pérez-Vera* 200 (K!).

NOTES. In 1905 Schlechter described *Polystachya crassifolia*, species very similar to *P. mystacioides*. Based on the leaves' size and lip morphology, Szlachetko kept both species separately (see: Szlachetko & Olszewski 2001), but the results of recent studies conducted by Mytnik (2007) suggest that they are conspecific.

### 34. *Unguiculabia* Mytnik & Szlach. in *Richardiana* 8(1): 18-22. 2008

Pseudobulbs 0.4-7.5 cm long, 0.2-1 cm in diameter, ovoid to cylindrical- or obliquely-conical, clustered, with 1-4 sheaths at base and 2-5 leaves at apex. Leaves 1.5-11 cm long, 0.2-1 cm wide, linear-lanceolate or linear-oblong to narrowly elliptic, obtuse or slightly bilobed at rounded apex or even tridentate, spreading. Inflorescence 1.5-15 cm long, 1- to 40-flowered, lax, unbranched, peduncle and rhachis pubescent. Flowers small, nonresupinate, scented, sepals whitish, white-pinkish to rose-pink or greenish-white. Floral bracts 0.75- 8 mm long, lanceolate or linear, sometimes setose, acuminate, glabrous. Pedicel and

ovary 1.5-13 mm long, slender, pubescent. Dorsal sepal 2-7 mm long, 1.1-3.8 mm wide, oblong-ovate, ovate-lanceolate or elliptic-ovate, acute, apiculate to shortly acuminate, concave, glabrous. Petals 2-6.2 mm long, 0.3-2.2 mm wide, oblong-elliptic, oblong-lanceolate or oblanceolate to obovate, acute to subobtuse, glabrous. Lateral sepals 2-10 mm long, obliquely oblong-ovate to triangular-ovate, obliquely falcate-ovate, acute, apiculate to acuminate, concave, glabrous. Lip 4.6-9 mm long, 3-lobed, usually hard to flatten, strongly geniculate in the apical half, claw 3-4.8 mm long, canaliculate, sometimes densely pubescent inside, fleshy. Hypochile most often bilobed, sometimes 4- to 6-lobed, each lobe up to 3.8 mm long and wide, often widely divergent, usually thick, glabrous or pubescent, triangular to rhomboid or rounded to semicircular, sometimes cordate-ovate in front, always decurrent on epichile, lobes thick, acute, triangular, resembles a star, sometimes with 2 digital appendices. Epichile 5 mm long, 4 mm wide, cordate-orbicular to cordate-ovate or ovate, apiculate or obtuse, thick, fleshy, glabrous or pubescent at the base. Mentum 3.5-6 mm high, conical, cylindrical-saccate, often oblong, shallowly bilobed at apex. Gynostemium 1.5-6 mm tall.

The genus embraces 5 species, only one of them occurs in Ivory Coast.

**1. *Unguiculabia parva* (Summerh.) Szlach. & Mytnik in Richardiana 8(1): 18-22. 2008 (Fig. 127)**

*Polystachya parva* Summerh. in Bot. Mus. Leaflet. 10: 285. 1942; TYPE: ZAMBIA. *Milne-Redhead 4369* (HOLOTYPE: K!)

*Polystachya billietiana* Geerinck in Bull. Jard. Bot. Belg. 55(3-4): 501. 1985; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Schajjes 1316* (HOLOTYPE: BR!)

*Polystachya bertauxiana* Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroun 35: 590. 2001. TYPE: CAMEROON. *Letouzey 8856* (HOLOTYPE: P!)

Pseudobulbs 0.5-2 cm long, 0.4-0.5 cm in diameter, cylindrical-conical, with 2-4 sheaths at base and 2-4 leaves at apex. Leaves 2-5 cm long, 0.2-0.7 cm wide, linear-lanceolate or linear-oblong, unequally bilobed at apex, spreading. Inflorescence 5 cm long, 3-8 -flowered, lax, unbranched, peduncle and rhachis densely pubescent. Flowers small, nonresupinate, sepals whitish to white-pinkish, apex of lip green, gynostemium purple. Floral bracts 0.75-1 mm long, lanceolate, acuminate, glabrous. Pedicel and ovary 2-6 mm long, slender, pubescent. Dorsal sepal 4-5 mm long, 2-2.5 mm wide, ovate-lanceolate or elliptic-ovate, acute to shortly acuminate, concave, glabrous. Petals 3.5-4 mm long, 1-1.5 mm wide, oblong-lanceolate or oblanceolate, acute, glabrous. Lateral sepals 5.5-6 mm long along the upper margin, 9 mm long along lower margin, 3.5-5 mm wide at the base, very obliquely oblong-ovate to triangular-ovate, acute to acuminate, concave, glabrous. Lip 5.5-8 mm long, up to 5 mm wide, claw 3 mm long, up to 1.5 mm wide, canaliculate, densely pubescent inside, 3-lobed; lateral lobes have more or less parallel base and lean outwards towards their margins at an angle of about 45° forming a V-shaped trough; mid-lobe 3-5 mm long, 3.2-4 mm wide, cordate-orbicular to cordate-ovate, apiculate, thick, fleshy, glabrous, recurved, with bilobed callus at the base, each lobe 2-2.5 mm long and wide, lobes widely divergent, thick, glabrous, rhomboid. Mentum 3.5-5 mm long, cylindrical-saccate, shallowly bilobed at apex. Gynostemium 1 mm high.

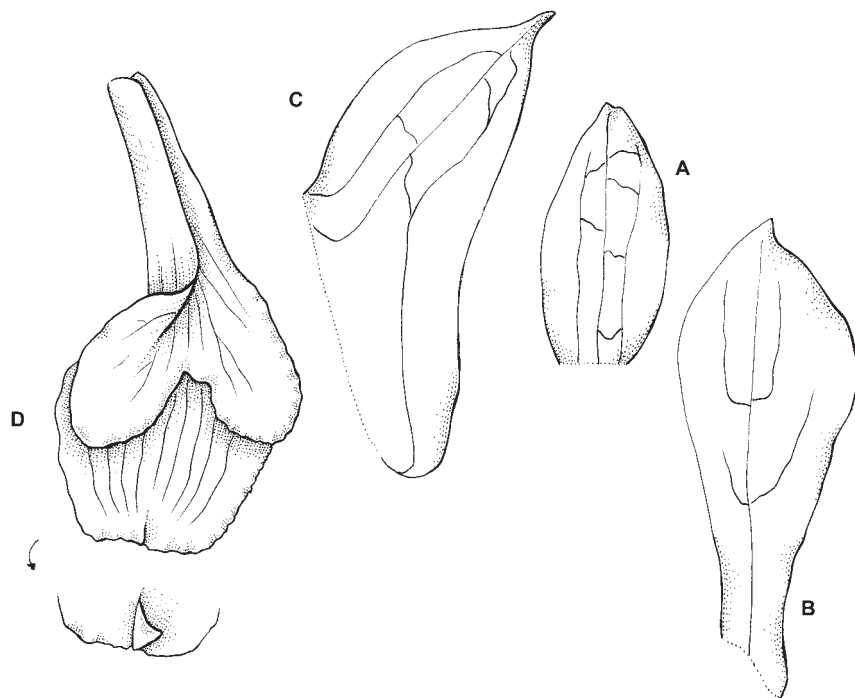


Fig. 127.—*Unguiculabia parva* (Summerh.) Szlach. & Mytnik: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by J. Mytnik-Ejsmont, *Westwood* 39, K).

**HABITAT.** Epiphyte in montane forests, upland savanna, in exposed places amongst mosses and lichens. August.

**DISTRIBUTION.** Ivory Coast, Ghana, Nigeria, Zambia. Alt. 1000-1500 m.

**REPRESENTATIVE SPECIMENS.** Mt. Tonkoui, Aug. 1973, *Pérez-Vera* 679 (K!, P!).

### 35. *Epiphorella* Mytnik & Szlach. in *Richardiana* 8(1): 12-17. 2008

Epiphytic or rarely terrestrial herbs. Stems 3-50 cm high, scarcely swollen at the base, leafy in upper part. Pseudobulbs 0.6-4 cm long, clustered, narrowly cylindrical or conical, clothed with short sheaths and bearing the leaves, sometimes in solid mats. Leaves 2-7, up to 20 cm long, 4-15 mm wide, narrowly-lanceolate to linear-oblong, grass-like, acute, subacute or obtuse, sometimes shortly bilobed, distichous, deciduous, absent at the flowering time. Inflorescence 4-15 cm long, few- to densely many-flowered, erect; peduncle appearing from the leafless pseudobulb, terete; rhachis 1.2-15 cm long, pubescent. Floral bracts 0.2-3 mm, long ovate or triangular to linear-lanceolate, acuminate, acute or apiculate. Flowers non-resupinate, often showy, pale to deep pink or cream with pale pink to plum-coloured tinge, lip often with yellow crest. Dorsal sepal 2-7.5 mm long, 1.3-

8 mm wide, broadly elliptical or ovate to oblong-elliptic, apiculate or obtuse, concave. Lateral sepals 5 mm long, 8 mm wide, obliquely-ovate to broadly triangular-ovate, very bluntly obtuse, subacute, apiculate, acuminate, mucronate, often with the cusp near the apex. Mentum 6-10 mm high, saccate to conical-saccate. Petals 2.4-5 mm long, 1-1.7 mm wide, spatulate-oblong, oblong-ob lanceolate, oblong-obovate or ovate, obtuse. Lip 5-11 mm long, 1.5-4 mm wide, often bent sharply in the centre, often with raised quadrate keel- or tooth-like callus at the base 2- or 3-lobed (at the base or pandurate), rarely entire and porrect, clawed, claw not widened or shortly rounded, sometimes with narrow lateral lobes (up to 2 mm long); mesochile spatulate-orbicular, rhombic or subquadrate, obtuse, sometimes with margins recurved and concave in the middle, epichile broadly orbicular, transversely elliptic, oblong to oblong-obovate, sometimes truncate at the base, with margins undulate, flabellate or dentate, truncate or rounded, sometimes bifid or bilobed. Lip very often furnished with 1 or 2 yellow cushions of very compactly arranged hairs in the middle or rarely at the base or in the apical part, sometimes with central, low, broad fleshy, bullate-rugulose callus. Gynostemium broad, 0.8-2 mm high. Pollinia 4, 1.2 mm long, ellipsoid, spherical. Rostellum elongate, acute. Viscidium crescent-shaped, obtuse.

The genus embraces 11 species so far, 5 of them have been collected in Ivory Coast.

#### KEY TO THE SPECIES

1. Flowering scape up to 20 cm long ..... 2
- Flowering scape 30-50 cm long ..... **3. E. pseudo-disa**
2. Lateral lobes of lip oblong, subacute, lip mid-lobe much wider than long, truncate at base ..... **4. E. reflexa**
- Lateral lobes of lip absent or short and rounded, lip mid-lobe not as above ..... 3
3. Lip deeply saccate in the middle, epichile at least twice wider than long, transversely oblong ..... **1. E. dalzielii**
- Lip not saccate, epichile as long as wide or slightly wider, oblong-ovate to orbicular ... 4
4. Lip claw not widened, hair cushions at broadest part of lip, do not reach the lip margins, margins of epichile dentate ..... **5. E. victoricae**
- Lip claw widened, hair cushions not as above, reaching nearly to the edges of mesochile, margins of epichile flabellate ..... **2. E. pobeguini**

- 1. *Epiphorella dalzielii*** (Summerh.) Mytnik & Szlach. in *Richardiana* 8(1): 12-17. 2008  
(Fig. 128)

*Polystachya dalzielii* Summerh. in Bull. Misc. Inform. Kew. 1927: 418. 1927; TYPE: GUINEA. *Dalziel* 8433 (HOLOTYPE: K!; ISOTYPE: P!; DRAWING: UGDA-DLSz)

Plants tiny. Pseudobulbs 0.5-1.5 cm long, up to 0.8 cm in diameter, ovoid-ellipsoid, covered by papery leaf-sheaths. Leaves 4-6, absent at the time of flowering, 4-20 cm long, 0.8-1.5 cm wide, linear-lanceolate. Inflorescence 5-12 cm long, rather densely 3-20-flowered, peduncle erect. Flowers small, nonresupinate, white to pinkish, hair-cushion on lip yellow to yellowish. Floral bracts 1 mm long,



ovate, acute, thin, membranous, delicate, glabrous. Pedicel and ovary 5-7 mm long, slender, erect, glabrous or with few scattered hairs. Dorsal sepal 3-5 mm long, 2-3 mm wide, oblong-ovate to elliptic, obtuse, cochleate, glabrous, with prominent apiculus. Petals 3.5-4 mm long and up to 2 mm wide, oblong-ovate, rounded at apex, obtuse, thin, delicate, glabrous. Lateral sepals up to 6.5 mm long along upper margin, about 6.5 mm wide at base, obliquely triangular-ovate, obtuse, cucullate, with short apiculus on outer surface below apex, glabrous. Lip 4-5.5 mm long, 2-4.3 mm wide, sessile, rectangular- to oblong-elliptic with tooth-like callus at the base, shortly clawed, hypochile 3-4.3 mm long, 2-4.3 mm wide, hypochile deeply saccate at or below the middle, and furnished with 2, large, oblong cushions of hairs, epichile 1.3-2 mm long, 2.8-3.7 mm wide, always broader than long, transversely elliptic, strongly reflexed and undulate. Mentum 4.5-6.5 mm long, saccate-conical. Gynostemium 1 mm high, short and massive.

**HABITAT.** Epiphyte in montane forest, amongst mosses and lichens in exposed expositions. February-March.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast. Alt. 1000-1750 m.

**REPRESENTATIVE SPECIMENS.** Haute Cavally, Dyolas, Mt. Gbon, Gouékangouéné (Gouékangouiné), 2 May 1909, *Fleury sub Chevalier 21412* (P!); Mt. Nimba, 26 Mar. 1982, *César & Samson 1643* (P!); Mt. Tonkoui, SW of Man, 4 Mar. 1959, *Leeuwenberg 2969* (K!); *Leeuwenberg 2969 a* (WAG!); Mt. Tonkoui, 23 Feb. 1974, *Pérez-Vera 585* (K!, P!); !; Mt. Tonkoui, 9 Mar. 1968, *Aké Assi 9959* (K!).

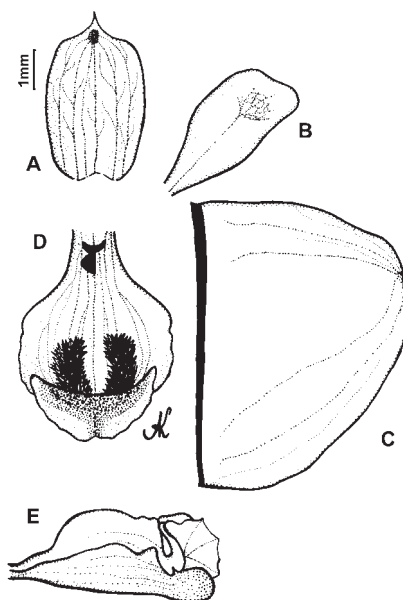


Fig. 128.—*Epiphorella dalzielii* (Summerh.) Mytnik & Szlach.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip, spread; E – lip, longitudinal section (drawn by A. Kowalkowska, *Dalziel 8433*, P).

## 2. *Epiphorella pobeguini* (Finet) Mytnik & Szlach. in *Richardiana* 8(1): 12-17. 2008 (Fig. 129)

*Polystachya pobeguini* (Finet) Rolfe in *Orchid Rev.* 26: 107. 1918. - *Epiphora pobeguini* Finet in *Notul. Syst. (Paris)* 2: 29. 1911; TYPE: GUINEA. *Pobeguini 2087* (HOLOTYPE: P!)

Pseudobulbs up to 3.5 cm long, 0.6 cm in diameter, narrowly cylindrical, slightly swollen at base, covered by 3-4 papery leaf-bases. Leaves 3-7, 2-10 cm long, 0.7-1 cm wide, absent at flowering time. Inflorescence up to 14.5 cm long, multi-flowered, dense, peduncle and rhachis rather stout, erect, slightly to densely pubescent, 2-3 sterile bracts on peduncle. Flowers rather small to medium-sized, nonresupinate, white, pink to purplish lip with orange or bright yellow hair-cushions. Floral bracts up to 2 mm long, ovate, apiculate, thin, delicate, pubescent out-

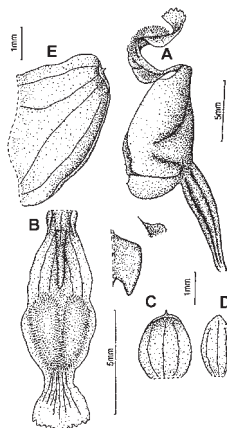


Fig. 129. — *Epiphorella pobeguinii* (Finet) Mytnik & Szlach.: A — flower; B — lip; C — dorsal sepal; D — petal; E — lateral sepal (Letouzey 10000, P).

side. Pedicel and ovary up to 9 mm long, slender, cylindrical, glabrous. Dorsal sepal ca. 4-5 mm long, 3-3.5 mm wide, elliptic to broadly-ovate, obtuse, semi-cucullate, with short apiculus below apex, cochleate in the centre, rather thick, fleshy, glabrous, 3-nerved. Petals 4 mm long, 1.8 mm wide, obliquely oblong-elliptic, obtuse, not so thick as sepals, glabrous, flat, 3-nerved. Lateral sepals 4.8-6 mm long along upper margin, 8 mm long along lower margin, 7 mm wide at base, obliquely triangular-ovate, obtuse, shortly apiculate below apex, semi-cucullate, cochleate in the centre, rather thick, fleshy, glabrous, 4-nerved. Lip 8-11 mm long, 4 mm wide, elongated and pandurately 3-lobed, sharply recurved in the middle, glabrous, clawed; claw widened, furnished with raised, high, quadrate or subquadrate wing-like keel, 2 mm long, 1.2 mm high; lateral lobes of hypochile rounded; mesochile spatulate-orbicular, obtuse, with margins recurved and concave in the middle, isthmus furnished with 2 hair-cushions, ca. 2.5 mm long, obliquely oblong-ovate, separate basally, contiguous apically, reaching nearly the edges of the lip; epichile 2.3-2.5 mm long, 3 mm wide, flabellate, truncate at apex,

not truncate at base, rather thin, delicate. Mentum 6-7 mm long, saccate. Gynostemium 2 mm high, broad.

**HABITAT.** Epiphyte collected about 25 m above ground and lithophyte. November-March.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Cameroon, Principe, Gabon.

**REPRESENTATIVE SPECIMENS.** Brafoüédi, 5 Dec. 1966, *Aké Assi* 9353 (K!); 16 Nov. 1967, *Aké Assi* 9782 (K!); Nov.-Dec. 1973, *Pérez-Vera* 512 p.p. (P!); Rocher de Brafoüédi, 30 Nov. 1965, *Bonardi s.n.* (P!); Near Brafoüédi, 75 km NW of Abidjan, 30 Dec. 1958, *Leeuwenberg* 2310 (WAG!); Mt. Tonkoui, 6 Mar. 1968, Yapo, 26 Nov. 1974, *Pérez-Vera* 740 (P!, K!); Mt. Tonkoui, NW of Man, 11 Apr. 1962, *Leeuwenberg* 3858 (WAG!).

### 3. *Epiphorella pseudo-disa* (Kraenzl.) Mytnik & Szlach. in Richardiana 8(1): 12-17. 2008 (Fig. 130)

*Polystachya pseudo-disa* Kraenzl. in Bull. Misc. Inform. Kew. 1926: 293. 1926; TYPE: UGANDA? Dawe 964 (HOLOTYPE: K!)

Pseudobulbs 30-50 cm long, 0.5-1 cm in diameter, narrowly cylindrical-conical, slightly swollen at base, covered by 3-4 papery leaf-bases. Leaves 3-5, absent at flowering time, up to 10 cm long and 1 cm wide. Inflorescence 8-15 cm long, rather laxly multi-flowered, peduncle and rhachis rather stout, erect. Flowers rather small to medium-sized, nonresupinate, mauve with yellow hair-cushions. Floral bracts 4-5 mm long, ovate, apiculate, thin, delicate. Pedicel and ovary 8-11 mm long, slender, cylindrical, glabrous. Dorsal sepal 3.5-5 mm long, 2-2.5 mm wide, elliptic-ovate, obtuse, semi-cucullate, with apiculus below apex, cochleate

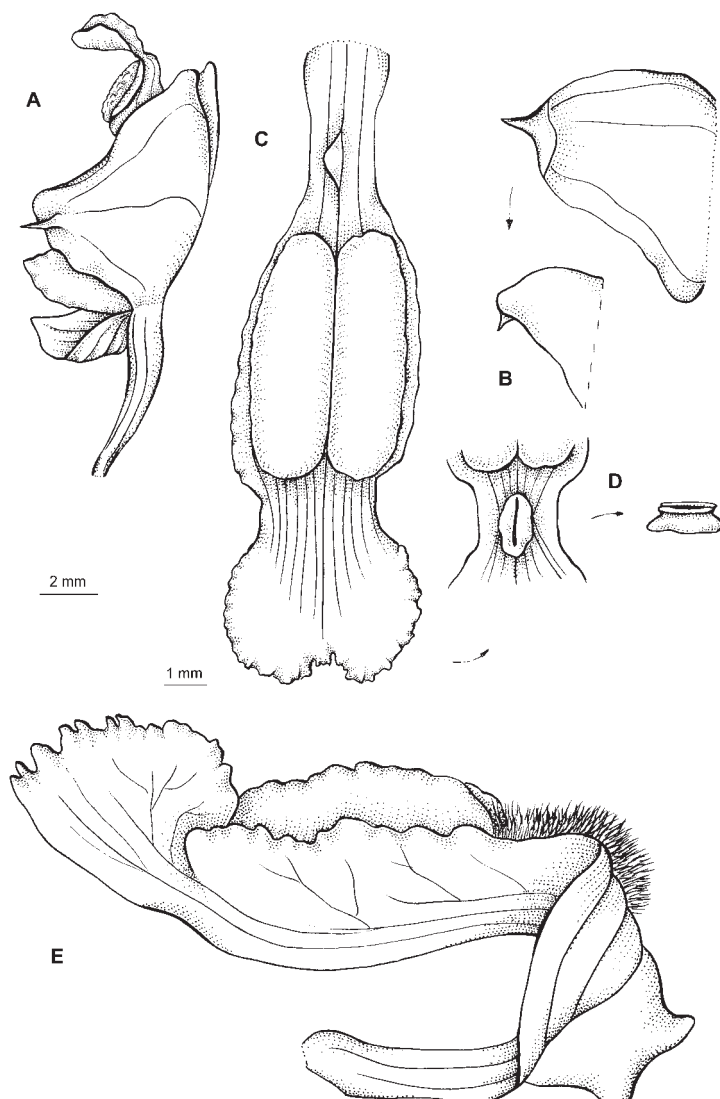


Fig. 130.—*Epiphorella pseudo-disa* (Kraenzl.) Mytnik & Szlach.: A – flower; B – lateral sepal; C – lip, spread; D – callus; E – lip, side view (drawn by J. Mytnik-Ejsmont, *Jones 170*, BR).

in the centre. Petals 3.5–4 mm long, 2 mm wide, obliquely oblong-obovate, obtuse, glabrous. Lateral sepals 4–5 mm long along upper margin, 6–8 mm long along lower margin, 7 mm wide at base, obliquely triangular, obtuse, apiculate below apex, semi-cucullate, cochleate in the centre. Lip 8–11 mm long, 2.7–4.2 mm wide, geniculate twice, constricted in the apical quarter; hypochile oblong-ovate in general outline, undulate on margins, at the base with large, subquadrate to

wing-like triangular keel 2-3 mm long, glabrous, with 2 hair-cushions in apical half, 2.5-4 mm long; epichile 2-3.2 mm long, 3-4.2 mm wide, transversely elliptic, truncate at apex, undulate on margin. Mentum 6-8 mm long, saccate.

**HABITAT.** Lithophyte on granite outcrops, in full sun, associated with *Afrotrilepis pilosa* (Boeck.) J. Raynal. April.

**DISTRIBUTION.** Sierra Leone, Liberia, Ivory Coast, Uganda?. Alt. 1000-1500 m.

**NOTES.** We have seen no materials of this species from Ivory Coast, but it was reported here by Aké Assi (2002) and Pérez-Vera (2003). Additionally, it is known from neighbouring countries.

**4. *Epiphorella reflexa* (Lindl.) Mytnik & Szlach. in Richardiana 8(1): 12-17. 2008 (Fig. 131)**

*Polystachya reflexa* Lindl. in Edwards's Bot. Reg. 27, Misc.: 18. 1841; TYPE: SIERRA LEONE. *Whitfield s.n.* (HOLOTYPE: K!)

*Polystachya smytheana* Rolfe in Bull. Misc. Inform. Kew. 1908: 71. 1908; TYPE: SIERRA LEONE. *Smythe 56* (HOLOTYPE: K!)

*Polystachya liberica* Rolfe in Bull. Misc. Inform. Kew. 1908: 72. 1908; TYPE: LIBERIA. *Johnston s.n.* (HOLOTYPE: K!).

Pseudobulbs 2-6 cm long, up to 0.8 cm in diameter, narrowly cylindrical or fusiform, covered by 3-5 papery leaf-bases. Leaves 4-6, absent at flowering

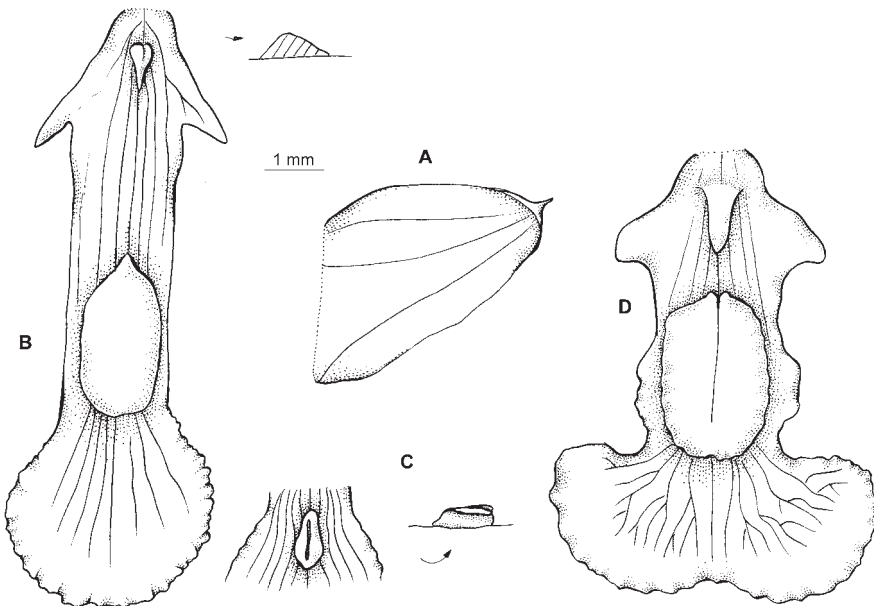


Fig. 131.—*Epiphorella reflexa* (Lindl.) Mytnik & Szlach.: A – lateral sepal; B, D – lip; C – lip callus (drawn by J. Mytnik-Ejsmont, A-C - *Rose-Funes* 887, BR; D - *Smythe* 252, K).

time, 2-9 cm long, 0.7-1 cm wide, lanceolate to oblanceolate, acute. Inflorescence 5-17 cm long, multi-flowered, dense, peduncle and rhachis erect, rather delicate, densely pubescent. Flowers medium-sized, nonresupinate, glabrous, showy, pink to purple, lip with yellow central part and hair-cushions. Floral bracts 2 mm long, ovate, apiculate, thin, delicate, sparsely pubescent outside. Pedicel and ovary 9-13 mm long, slender, cylindrical, glabrous. Dorsal sepal 5-6 mm long, 2.6-3.5 mm wide, elliptic-ovate, obtuse, semi-cucullate, with short apiculus below apex, cochleate in the centre, rather thick. Petals 4.8-6 mm long, 1.4-2.1 mm wide, obliquely oblong-oblanceolate, obtuse, flat. Lateral sepals 5-6 mm long along upper margin, 7.3-8.5 mm long along lower margin, 6.5-8.5 mm wide at base, obliquely triangular-ovate, obtuse, shortly apiculate below apex, semi-cucullate, cochleate in the centre, rather thick. Lip 9-13 mm long, 3.5-7 mm wide, hypochile 4-8 mm long, 3-3.5 mm wide, oblong-subquadrate or pandurate in general outline, with 2 small basal lateral lobes, 1.5-2 mm long, ecallose, with 2 hair-cushions near the apex, contiguous; epichile 2.5-4 mm long, 3.5-7 mm wide, transversely elliptic, obtuse, flabellate. Mentum 7 mm long, saccate. Gynostemium 2 mm high.

HABITAT. Epiphyte on mossy and lichen covered trees in montane forests. January-May.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast. Alt. 500-1700 m.

REPRESENTATIVE SPECIMENS. Man, Mt. Tonkoui, Jan. 1961, *de Wit s.n.* (WAG!); Haute Sassandra, Dyolas, Mt. Dou, Zoaulé, 6 May 1909, *Fleury sub Chevalier 21470* (P!); Mt. Tonkoui, 6 Mar. 1968, *Aké Assi 9958* (K!); 9 Mar. 1932, *Aubréville 1012* (P!); 6 Apr. 1975, *Pérez-Vera 767* (K!, P!); *Sine loc.*, 30 Nov. 1967, *Aké Assi 9798* (K!); *Sine. loc.*, *Pérez-Vera 611* (K!).

**5. *Epiphorella victoriae* (Kraenzl.) Mytnik & Szlach. in Richardiana 8(1): 12-17. 2008**  
(Fig. 132)

*Polystachya victoriae* Kraenzl. in Bot. Jahrb. Syst. 28: 165. 1900; TYPE: CAMEROON *Deistel 190*. (HOLOTYPE: HBG!; DRAWINGS: K!, UGDA-DLSz)

Pseudobulbs up to 3.5 cm long and up to 0.6 cm in diameter, narrowly cylindrical-conical, covered by leaf-bases. Leaves 5-6, up to 15.5 cm long and 2.2 cm wide, oblong-lanceolate, obtuse, unequally bilobed at apex, appearing after flowering. Inflorescence up to 20 cm long, rather densely up to 35-flowered, peduncle erect, stout, densely pubescent, with 2-3 sterile bracts. Flowers rather small to medium-sized, nonresupinate, white with conspicuous pale violet margins, lip orange or white, hair-cushions yellow. Floral bracts up to 2.5 mm long, ovate, acute, thin, delicate, glabrous. Pedicel and ovary up to 10 mm long, slender, glabrous. Dorsal sepal 4-5 mm long, 2.8-3.5 mm wide, elliptic to nearly orbicular, shortly apiculate, cochleate, rather thick and fleshy, glabrous, 3-nerved. Petals 4-5 mm long, 1.5-2 mm wide, oblanceolate, obtuse, rather thin, glabrous, obscurely 3-nerved. Lateral sepals 5.2 mm long along upper margin, 10.5 mm long along lower margin, 9.5 mm wide at base, obliquely triangular-ovate, obtuse, cochleate, thick, fleshy, glabrous, obscurely 4-nerved. Lip 8-12.5 mm long, 4-4.6 mm wide, constricted in the apical quarter or so; hypochile 6-8.5 mm long, 2.9-4.6 mm wide, shortly clawed above, rhomboid in outline, rather thick, at the

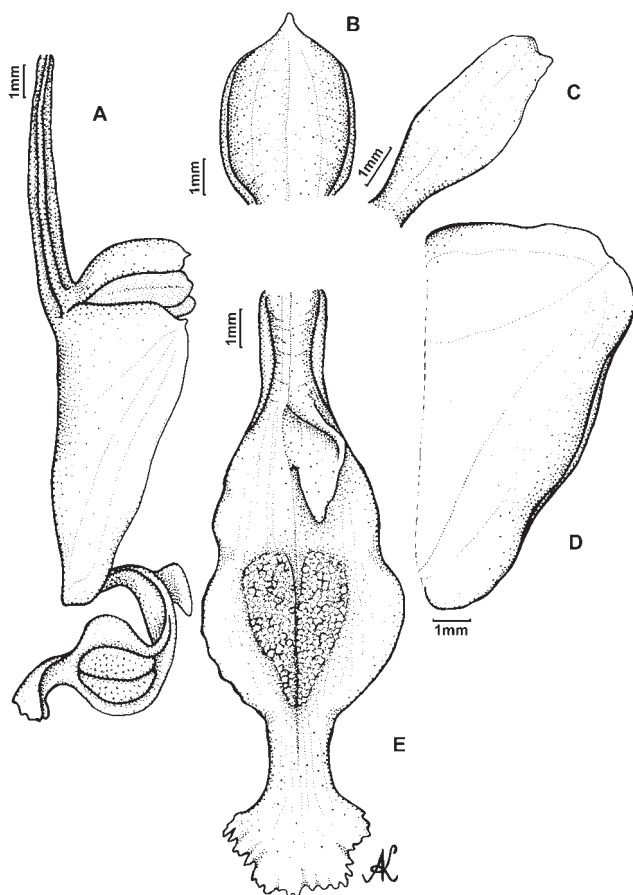


Fig. 132.—*Epiphorella victoriae* (Kraenzl.) Mytnik & Szlach.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip (drawn by A. Kowalkowska, *Halle 0923*, P).

base triangular elevated glabrous keel 2 mm long, in the centre 2 hair-cushions, 2.2–3.5 mm long, contiguous, oblong-ovate in general outline, do not reach the lip margins; epichile 1.8–4 mm long, 2–3.8 mm wide, basal part linear, apical broadly ovate, irregularly denticulate along margins, rather thin. Mentum 10 mm long, saccate.

**HABITAT.** Epiphyte on trees in mangrove swamps and sublitforale forests. November–December.

**DISTRIBUTION.** Ivory Coast, Guinea, Cameroon, Gabon. Alt. 0–950 m.

**REPRESENTATIVE SPECIMENS.** Brafouédi, Nov.–Dec. 1973, Pérez-Vera 512 p.p. (K!).

### Tribe *Cymbidiace* Pfitzer in Entwurf Anordn. Orch.: 105. 1887

Pseudobulbs formed of several internodes, usually elongate, slender, sometimes lacking. Leaves plicate or duplicate. Inflorescence upper or lower lateral. Flowers resupinate, saccate or deeply spurred at base. Gynostemium usually massive. Rostellum short and massive, dome-like. Viscidium usually large, lamellate. Tegula lamellate, single, entire or divided at the apex. Pollinia 2 or 4, dorsiventrally flattened or superposed.

Three subtribes belongs here; Goveniinae Dressler and Cyrtopodiinae Benth., are known only from neotropics. Cymbidiinae are represented in Ivory Coast.

Subtribe **Cymbidiinae** Benth. in J. Linn. Soc., Bot. 18: 287. 1881

Stem reed-like, or pseudobulbs of some internodes. Leaves plicate to duplicate. Lip hinged, spurred or saccate, sometimes fused with the basal part of the gynostemium. Column foot long and massive or sometimes reduced. Rostellum dome-like, short, massive. Viscidium single, lamellate to relatively thick, fleshy. Tegula thin or thick, entire or split at apex into V-shaped structure. Rostellum usually deeply notched after removal of the pollinarium. Anther bent forward. Pollinia 2, deeply cleft, or 4, very unequal in size, superposed. Caudicles sticky.

# KEY TO THE GENERA

1. Lip without a spur ..... **36. Ansellia**  
 – Lip usually with a prominent spur or, at least, saccate at the base ..... 2
2. Pseudobulbs 1-nodal ..... **39. Oeceoclades**  
 – Pseudobulbs of several nodes or stems caulescent ..... 3
3. Inflorescence paniculate. Rostellum beak-like ..... **38. Graphorkis**  
 – Inflorescence unbranched. Rostellum short and wide ..... **37. Eulophia**

## **36. Ansellia** Lindl. in Edwards's Bot. Reg. 30: tab. 12. 1844

Epiphytic, lithophytic or terrestrial rather large plants. Pseudobulbs clustered, fusiform, several-noded, ridged when older. Leaves at the top of the pseudobulbs, large, plicate. Inflorescence axillary, at the top of pseudobulbs, lax, many-flowered. Flowers large or medium-sized, showy. Sepals and petals spreading, similar in size, shape and colour. Lip without a spur or basal cavity, 3-lobed, with several longitudinal ridges. No column foot. Gynostemium slender, arcuate. Anther incumbent, operculate, 2-chambered. Connective very thick forming a high keel on the dorsal surface of anther. Pollinia 2, dorsiventrally flattened, ellipsoid, cleft. Caudicles sticky. Stigma entire, deeply concave. Rostellum short, truncate, wide. Tegula short and very wide, thin. Viscidium crescent-like, very narrow but wide, sticky (Fig. 133).

A monotypic genus widespread in tropical and South Africa.

### **1. Ansellia africana** Lindl. in Edwards's Bot. Reg. 30: tab. 12. 1844 (Fig. 134)

TYPE: EQUATORIAL GUINEA (BIOKO). *Ansell s.n.* (HOLOTYPE: K!)

*Ansellia gigantea* Rchb. f. in Linnaea 20: 673. 1847; TYPE (*here designated*): REPUBLIC OF SOUTH AFRICA. *Gueinzius s.n.* (LECTOTYPE: W!; ISOLECTOTYPES: W!, W-R!; DRAWING: UGDADLSz)

*Ansellia africana* var. *nilotica* Baker in Trans. Linn. Soc. London 29: 154. 1875; TYPE: TANZANIA. *Speke & Grant s.n.* (HOLOTYPE: K!; ISOTYPE: K!). - *Ansellia nilotica* (Baker) N.E. Br. in Lindenia 2: 36. 1886. - *Ansellia gigantea* var. *nilotica* (Baker) Summerh. in Bull. Misc. Inform. Kew. 1937: 462. 1937.

*Ansellia congoensis* Rodigas in Lindenia 2: 36. 1886; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Rodigas s.n.* (HOLOTYPE: BM!)

*Ansellia confusa* N.E. Br. in Lindenia 2: 36. 1886; TYPE: NIGERIA. *Rotterham?* (HOLOTYPE: K!)



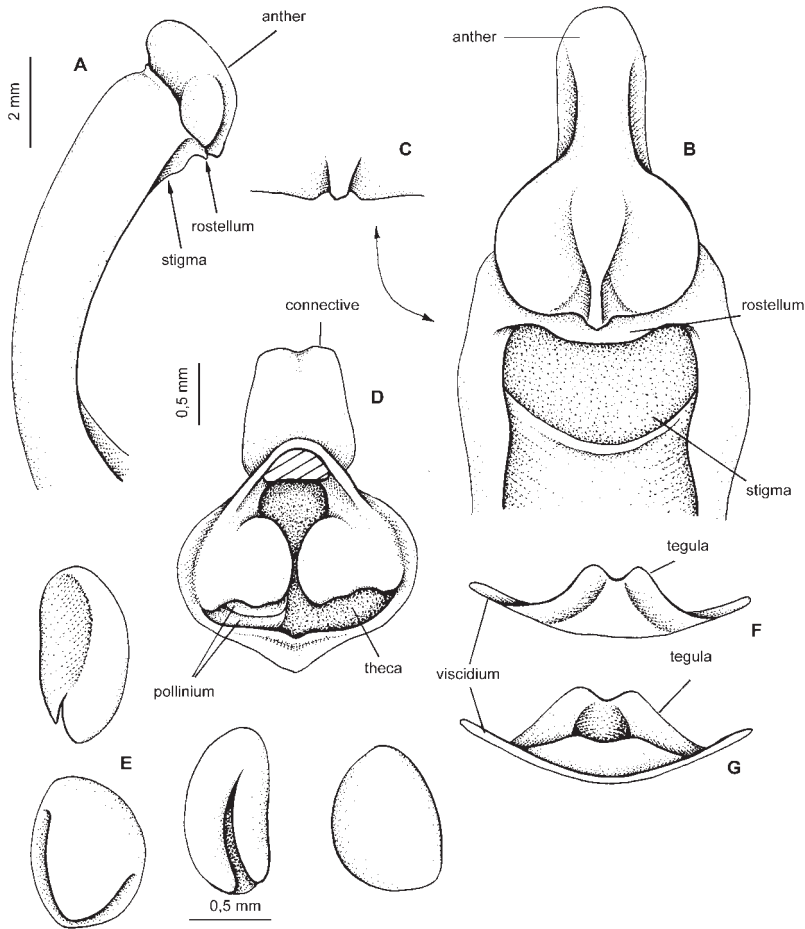


Fig. 133.—Gynostemium structure of *Ansellia* Lindl.: A – gynostemium, side view; B – apical part of the gynostemium, bottom view; C – rostellum remnant, bottom view; D – anther; E – pollinia, various views; F and G – tegula and viscidium, various views (Szlachetko 2003).

A very variable species. Pseudobulbs 10-50 cm tall, clustered, fusiform or cylindric, several-noded, ridged when older, covered by papery leaf sheaths. Leaves 8-10, 15-50 cm long, 1.4-6.5 cm wide, gathered in the apical half of pseudobulbs, narrowly lanceolate to oblanceolate, acute to obtuse, plicate. Inflorescence branched, lax, up to 40-flowered. Flowers large or medium-sized, showy, yellow, blotched with dark maroon, brown or red. Floral bracts 1-5 mm long, reduced to a scale-like structures, ovate, acute to subobtuse. Pedicel and ovary up to 4 cm long, slender, erect. Dorsal sepal 15-33 mm long, 4-10 mm wide, oblong to elliptic, shortly apiculate to obtuse, with several unbranched nerves, glabrous. Petals 15-30 mm long, 5-12 mm wide, more or less obliquely elliptic, obtuse to subacute, with several unbranched nerves, glabrous. Lateral sepa-

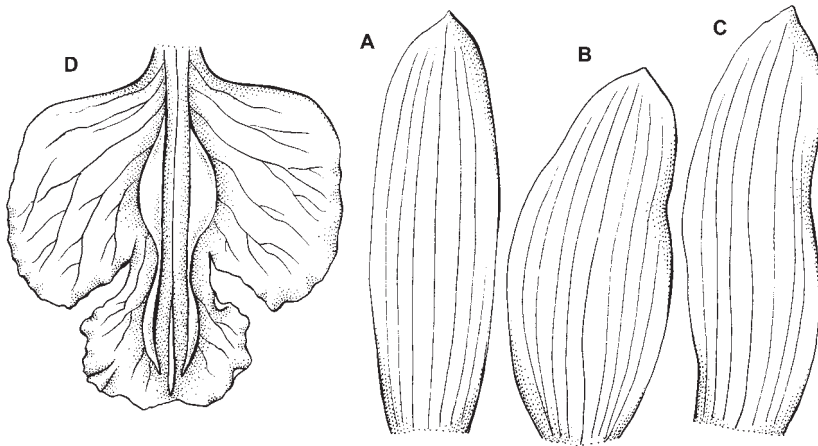


Fig. 134.—*Ansellia africana* Lindl.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by J. Mytnik-Ejsmont, *Fleury* 26421, P).

Is 15-35 mm long, 6-11 mm wide, obliquely ovate-elliptic to oblong, subacute, with several unbranched nerves, glabrous. Lip 11-25 mm long, 10-20 mm wide, with 2(3) longitudinal keels running from the base to the apex, usually more elevated in the centre or above, 3-lobed; the middle lobe 5-9 mm long, 2.5-9 mm wide, oblong to almost rotundate, truncate or obtuse at apex, with more or less undulate margins; sidelobes shorter than the middle one, rhomboid to semi-ovate, rounded at apex. Gynostemium up to 12 mm long.

**HABITAT.** Terrestrial or lithophyte on rocks in open woodlands and wooded grasslands, epiphyte on *Hyphaene guineensis* Schumach. & Thonn., *Isoberlinia doka* Craib & Stapf, *Cola acuminata* Schott & Endl. and *Pithecelobium* sp.. April, November-December.

**DISTRIBUTION.** Guinea-Bissau, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea (Bioko, Río Muni), Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa. Alt. up to 2200 m.

**REPRESENTATIVE SPECIMENS.** Between Guenabo and Duékoué, Nov. 1972, *Pérez-Vera* 160/C (P!); Hiré, Kagbe, 30 Nov. 1966, *Aké Assi* 9332 (K!, WAG!); Ouzeyo, 3 Dec. 1974, *Pérez-Vera* 160/E (K!); 56 km N of Sassandra, E of Béyo, 6°02'W, 5°18'N, 14 Apr. 1959, *Leeuwenberg* 3191 (WAG!).

### 37. *Eulophia* Lindl. in Edwards's Bot. Reg. 7: tab. 573. 1821

Terrestrial or lithophytic plants very variable in size. Perennating organs very variable: pseudobulbous, tuber-like or stem-like, several-noded, usually underground or rarely above the ground. Leaves plicate, thin-textured or fleshy or coriaceous, sometimes reduced to the scale-like structure, variable in form. Inflorescence basal, usually unbranched. Flowers of various size and form. Sepals

and petals similar or very dissimilar in size, shape and colour, spreading to tubular. Lip usually trilobed, often with a callus, ridges or papillae. Spur of various length usually present, but sometimes the lip base only saccate with no prominent spur. Column foot of various length, usually prominent, massive. Gynostemium slender or massive, arcuate. Anther incumbent, operculate, 2-chambered. Connective rather thick, fleshy. Pollinia 2, dorsiventrally flattened, cleft. Caudicles sticky. Stigma entire, deeply concave. Rostellum short, truncate, dome-like. Tegula single, thin. Viscidium single, elliptic or ovoid, thin. Rostellum notched after removal of pollinarium (Fig. 135).

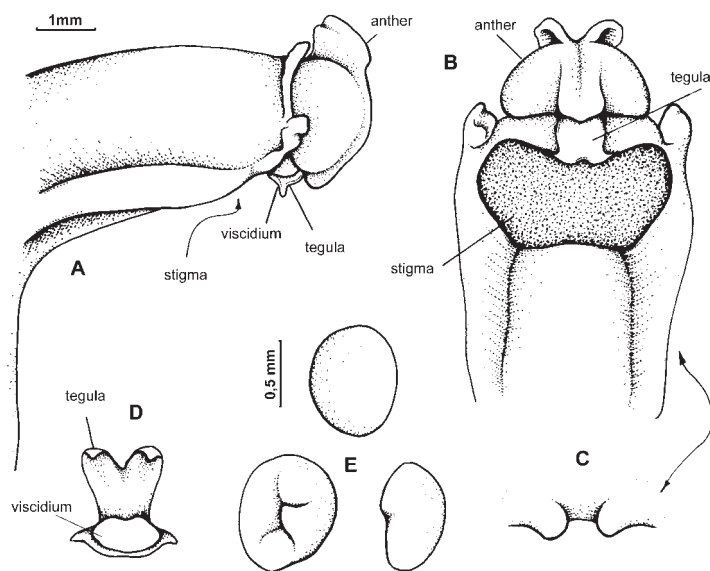


Fig. 135.—Gynostemium structure of *Eulophia* Lindl.: A – gynostemium side view; B – gynostemium bottom view; C – rostellum remnant; D – tegula and viscidium; E – pollinia various views (Szlachetko 2003).

A genus embracing ca. 250 species widely distributed in tropical and subtropical parts of Africa, Madagascar, Asia, Australia and Americas. This is one of the most variable genus in the order Orchidales. No satisfactory infra-generic classification of African *Eulophia* exists.

#### KEY TO THE SPECIES

- |   |                                   |
|---|-----------------------------------|
| 1. Spur 15-33 mm long, filiform .....   | <b>13. <i>E. guineensis</i></b>   |
| – Spur saccate to conical .....   | 2                                 |
| 2. Lip more than 11(15) mm long .....   | 3                                 |
| – Lip less than 10(14) mm long .....  | 16                                |
| 3. Basal part of the lip elongate into the conical or club-shaped, but prominent spur ..... | 4                                 |
| – Basal part of the lip saccate or saccate-conical, does not produce any prominent spur ... | 10                                |
| 4. Lip sidelobes almost entirely fused with the column foot .....                           | <b>20. <i>E. orthoplectra</i></b> |
| – Lip sidelobes fused with obscure column foot only basally .....                           | 5                                 |

5. Lip with lamellate-cristate ridges in the central part ..... 6
  - Lip with verrucose, crenulate or glabrous ridges in the center and/or in the apex, short lamellae, if present, only near the base ..... 8
6. Lamellae ribbon-like, equal in width along their length ..... **14. E. horsfallii**
  - Basal and apical lamellae distinctly narrower than much larger central ones ..... 7
7. Lateral sepals 9-10.6 mm long, 3.5-6 mm wide. Lip 14-16 mm long, 19-21 mm wide ..
  - ..... **21. E. schweinfurthii**
  - Lateral sepals 13-17 mm long, 3-4.5 mm wide. Lip 16-25 mm long and wide ..... **4. E. barteri**
8. Lip with basal wing-like lamellae, with verrucose or crenulate ridges above .....
  - ..... **8. E. cristata**
  - Lip with slightly thickened nerves at base and/or in the centre of epichile ..... 9
9. Spur cylindrical to clavate, straight. Sepals and petals subsimilar ..... **10. E. euglossa**
  - Spur saccate to saccate-conical. Sepals and petals dissimilar ..... **15. E. juncifolia**
10. Hypochile transversely elliptic, distinctly wider than long ..... 11
  - Hypochile orbicular, obovate or elliptic in general outline, as long as wide or longer ... 12
11. Epichile distinctly clawed. Petals elliptic-obovate, widest at apex ..... **6. E. buettneri**
  - Epichile sessile to subsessile. Petals oblong-elliptic to obliquely broadly elliptic-ovate, widest near the middle ..... **9. E. cucullata**
12. Hypochile widest at apex ..... 13
  - Hypochile widest near the middle ..... 14
13. Epichile as wide as hypochile, elliptic in outline ..... **11. E. flavopurpurea**
  - Epichile narrower than hypochile, attenuate towards the apex ..... **1. E. adenoglossa**
14. Epichile transversely elliptic, distinctly wider than long ..... **2. E. alta**
  - Epichile oblong to obovate, longer than wide ..... 15
15. Epichile with 5 densely papillate ridges ..... **7. E. caricifolia**
  - Epichile with 3 tall, crenulate ridges ..... **3. E. angolensis**
16. Lip transversely elliptic in general outline, truncate at apex ..... **12. E. gracilis**
  - Lip not as above ..... 17
17. Basal part of the lip much wider than the apical one ..... **16. E. leonensis**
  - Basal part of the lip only slightly wider than the apical one ..... 18
18. Spur conical, acute. Sepals and petals ca. twice as long as wide .... **19. E. odontoglossa**
  - Spur usually clavate, blunt. Sepals and petals 3-5 times longer than wide ..... 19
19. Leaves vestigial, up to 10 cm long ..... **18. E. monile**
  - Inflorescence produced before leaves. Leaves 10-30 cm long ..... 20
20. Lip with 2 longitudinal thickenings running to the mid-way of hypochile, above few clavate thickenings on hypochile. Spur conical-cylindrical ..... **17. E. milnei**
  - Lip with 3 longitudinal thickenings running to the base of epichile, no other thickenings on hypochile. Spur with ampullaceous apex ..... **5. E. brevipetala**

**1. *Eulophia adenoglossa* (Lindl.) Rchb. f. in Otia Bot. Hamburg. 1: 66. 1878 (Fig. 136)**

*Cymbidium adenoglossum* Lindl. in J. Linn. Soc., Bot. 6: 134. 1862; TYPE: NIGERIA. *Barter s.n.* (HOLOTYPE: K!)

*Eulophia aristata* Rendle in J. Bot. 33: 169. 1895; TYPE: MALAWI. *Scott Elliot 8616 p.p.* (HOLOTYPE: K!; ISOTYPE: BM!)

*Eulophia baumiana* Kraenzl. in Warburg, Kunene-Sambesi Exped.: 213. 1903; TYPE: ANGOLA. *Baum 505* (HOLOTYPE: B†; FRAGMENT OF HOLOTYPE, PHOTO: K!)

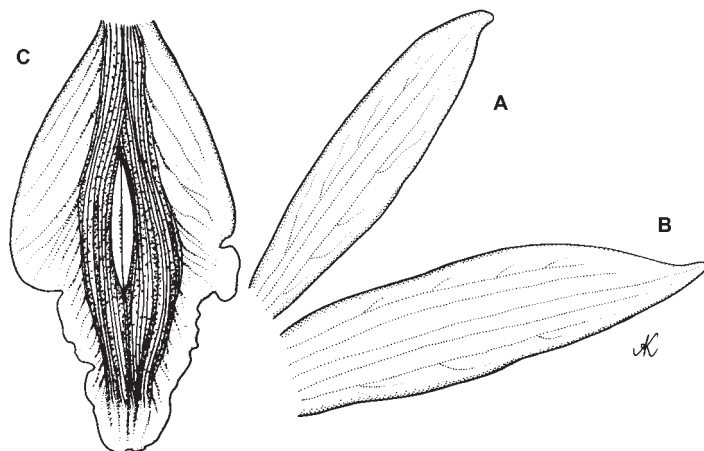


Fig. 136.—*Eulophia adenoglossa* (Lindl.) Rehb. f.: A - petal; B - lateral sepal; C - lip (redrawn by A. Kowalkowska from Summerhayes' original drawing kept at K, Barter s.n.).

Perennating organs subterranean, rhizomatous. Leaves up to 20 cm long, 0.7 cm wide, present at flowering, linear-lanceolate to linear-ob lanceolate, acuminate, plicate, erect. Inflorescence up to 35 cm tall, laxly 10-15-flowered, peduncle stout, erect, glabrous, with 3-5 sheathing cauline bracts. Flowers medium-sized, spreading to nutant, sepals and petals green-yellow, lip green near the base with purple keels, the middle lobe yellowish with brown-purple spots on margins and green verrucose projections, lateral lobes white with faint purple veins. Floral bracts up to 2.5 cm long, linear-lanceolate, acute. Pedicel and ovary up to 18 mm long, slender, glabrous. Sepals carinate with 4-5 thickened nerves. Dorsal sepal up to 20 mm long and 6 mm wide, oblong-spathulate to oblong-ligulate, shortly apiculate, glabrous. Petals 18 mm long, 5 mm wide, obliquely oblong, rounded and apiculate at apex, glabrous. Lateral sepals up to 22 mm long and 7 mm wide, oblong-ligulate, shortly apiculate, glabrous. Lip up to 25 mm long in total, 13 mm wide, with callus of 2 fleshy keels in the centre, distinctly trilobed near the middle; the middle lobe 10-14 mm long, 9-13 mm wide, elliptic, rounded at apex, more or less undulate on margins, with prominent verrucose projections in the centre; lateral lobes much smaller, obliquely oblong-ovate, rounded, entire. Spur up to 5 mm long, saccate-conical. Gynostemium 10 mm long.

HABITAT. Terrestrial in bush. May.

DISTRIBUTION. Guinea, Ghana, Nigeria, Angola, Ethiopia, Kenia, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa.

REPRESENTATIVE SPECIMENS. Becedi, 8 May 1978, van Setten 149 (WAG!).

## 2. *Eulophia alta* (L.) Fawc. & Rendle in Fl. Jamaica 1: 112. 1910 (Fig. 137)

*Limodorum altum* L. in Syst. Nat. (ed. 12), 2: 594. 1767; TYPE: based on Plumier's *Limodorum foliis nervosis lanceolatis*, etc. in Burm., Pl. Amer., t. 189. 1758.

*Govenia barbata* Poepp. & Endl. in Nov. Gen. Sp. Pl. 2: 5. 1837-8; TYPE (*here designated*): PERU. *Poeppig 2064* (LECTOTYPE: W!; DRAWING: UGDA-DLSz)

Perennating organs subterranean, rhizomatous, ca. 2 cm in diameter, fleshy, elongate. Leaves 4-8, 20-120 cm long, 1.5-10 cm wide, lanceolate to oblanceolate, acuminate, plicate, erect, Inflorescence up to 200 cm tall, laxly 15-40-flowered, peduncle, erect, rather stout, glabrous, bearing 3 cauline bracts. Flowers medium-sized, sepals olive-green or green, lip and petals red-purple, rarely white. Floral bracts 10-30(80) mm long, linear-aristate, acuminate. Pedicel and ovary 15-23 mm long, slender, glabrous.

Dorsal sepal 18-21 mm long, 4-5.5 mm wide, oblong-lanceolate to ligulate, acuminate to subacute, rather thin, glabrous. Petals 15-20 mm long, 3-8.3 mm wide, obliquely oblong-spathulate to oblong-obovate, obtuse to rounded, often semi-cucullate, thin, glabrous. Lateral sepals 18-17 mm long, 4-6.5 mm wide, obliquely oblong-ob lanceolate to ligulate, acute to

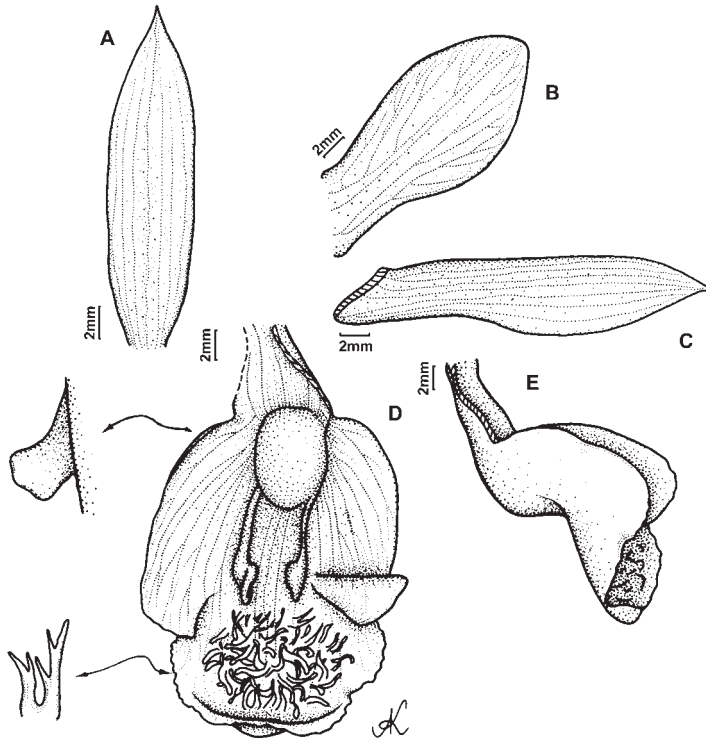


Fig. 137.—*Eulophia alta* (L.) Fawc. & Rendle: A – dorsal sepal; B – petal; C – lateral sepal; D, E – lip (drawn by A. Kowalkowska, *Thomas 2316*, P).

acuminate, thin, glabrous. Lip 14-20 mm long, 8-19 mm wide, rather fleshy, thick, with 2 fleshy, quadrate or wing-like thickenings in the centre, trilobed in apical two-third; the middle lobe up to 8 mm long and 14 mm wide, transversely elliptic, slightly concave, densely covered by fleshy, rather long papillae; sidelobes rather obscure, rounded. Spur very obscure, shallowly sac-like. Gynostemium 7-10 mm long.

HABITAT. Terrestrial in *Papyrus* sp. and other swamps, wet grasslands or lithophyte on rocky river banks. August.

DISTRIBUTION. Senegal, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Gabon, Democratic Republic of Congo (Zaire), Angola, Sudan, Ethiopia, Uganda, Burundi, Zambia, Zimbabwe, tropical and subtropical America, from Florida to Brazil and Peru. Alt. 50-1300 m.

REPRESENTATIVE SPECIMENS. Sassandra, 21 Aug. 1956, *de Wilde* 358 (K!, WAG!).

**3. *Eulophia angolensis* (Rchb. f.) Summerh. in Kew Bull. 13: 76. 1958 (Figs. 138, 139)**

*Cymbidium angolense* Rchb. f. in Flora 48: 188. 1865; TYPE: ANGOLA *Welwitsch* 734. (HOLOTYPE: BM!; ISOTYPES: G, K!, W-R!; DRAWING: UGDA-DLSz). - *Lissochilus angolensis* (Rchb. f.) Rchb. f. in Otia Bot. Hamburg. 1: 64. 1878.

*Lissochilus paludicolus* Rchb. f. in Otia Bot. Hamburg. 1: 63. 1878; TYPE (*here designated*): SUDAN. *Schweinfurth* 3983 (LECTOTYPE: K!)

*Lissochilus lindleyanus* Rchb. f. in Otia Bot. Hamburg. 1: 65. 1878; TYPE (*here designated*): NIGERIA. *Barter s.n.* (LECTOTYPE: W-R!; ISOLECTOTYPE: K!; DRAWING: UGDA-DLSz). - *Eulophia lindleyana* (Rchb. f.) Schltr. in Westaf. Kautschuk-Exped.: 279. 1900.

*Lissochilus platypterus* Rchb. f. in Flora 65: 533. 1882; TYPE (*here designated*): ANGOLA. *Mechow* 415 (LECTOTYPE: W-R!; ISOLECTOTYPE: W-R!; DRAWING: K!, UGDA-DLSz)

*Lissochilus antunesii* Rolfe in Bot. Soc. Brot. 7: 236. 1890; TYPE (*here designated*): ANGOLA. *Antunes* 19 (LECTOTYPE: K!) & 23 (PARATYPES: K!)

*Lissochilus validus* Rendle in J. Bot. 33: 197. 1895; TYPE: RWANDA-BURUNDI. *Scott Elliot* 8347 (HOLOTYPE: K!; FRAGMENT OF HOLOTYPE: BM!)

*Lissochilus latus* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 79. 1898; TYPE: TANZANIA. *Carson* 28 (HOLOTYPE: K!)

*Lissochilus ugandae* Rolfe in Bot. Mag. 131: 8044. 1905; TYPE: UGANDA. *Mahon s.n.* (HOLOTYPE: K!)

*Lissochilus katentaniensis* De Wild. in Bull. Jard. Bot. Etat. 6: 91. 1919; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Hombre* 765 (HOLOTYPE: BR; ISOTYPE: K!)

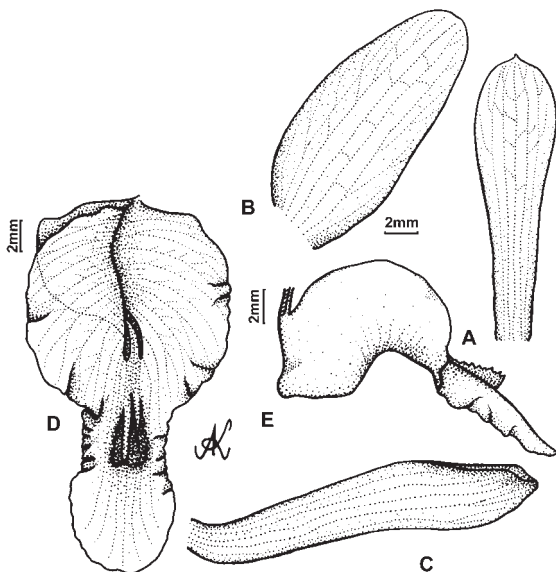


Fig. 138.—*Eulophia angolensis* (Rchb. f.) Summerh.: A – dorsal sepal; B – petal; C – lateral sepal; D, E – lip (drawn by A. Kowalkowska, *Thollon s.n.*, P).

Perennating organs underground, rhizomatous, 1-5 cm in diameter, fleshy, cylindric. Leaves 2-5, 20-130 cm long, 0.7-5 cm wide, linear-lanceolate to linear-oblongate, acuminate, plicate, erect. Inflorescence up to 210 cm tall, laxly 15-30-flowered, peduncle stout, erect, glabrous, with 3-5 sheathing cauline bracts, occasionally branching. Flowers medium-sized, spreading to subnate,



sepals purple-brown or yellow, petals and lip yellow. Floral bracts up to 2.5 cm long, ovate-lanceolate, acute. Pedicel and ovary up to 21 mm long, slender, glabrous. Dorsal sepal 15-27 mm long, 2.5-7.5 mm wide, linear-spathulate to ligulate-spathulate, obtuse to shortly apiculate, relatively thick, glabrous. Petals 15-25.5 mm long, 6-13.8 mm wide, obliquely elliptic to elliptic-ovate, rounded at apex, thin, delicate, glabrous. Lateral sepals 15-25 mm long, 4-7.5 mm wide, hardly falcate or sigmoid, linear-spathulate to ligulate-spathulate, obtuse, margins sometimes involute, rather thick, glabrous. Lip 16-28 mm long, 10-20 mm wide, callus of 2 fleshy ridges in the basal half or third, and three tall crenulate ridges in the base or centre of the mid-lobe, obscurely trilobed near the middle; the middle lobe 7-12 mm long, 5-8 mm wide, ligulate to oblong-elliptic, rounded at apex, more or less undulate on margins; sidelobes rounded, entire. Spur up to 7 mm long, saccate-conical. Gynostemium 10-11 mm long.

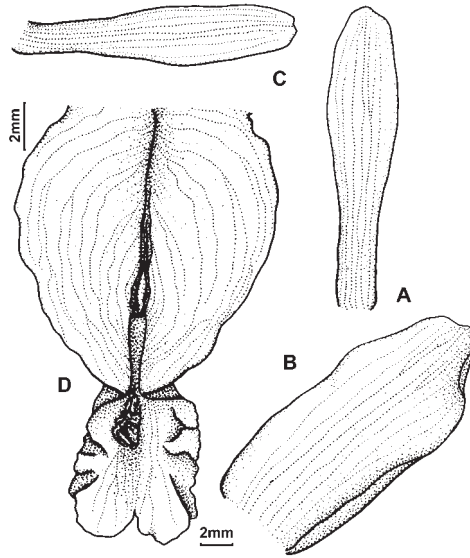


Fig. 139.—*Eulophia angolensis* (Rchb. f.) Summerh.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by A. Kowalkowska, *Chevalier* 24398, P).

HABITAT. Terrestrial in marshes, swamps, seasonally flooded grasslands, often by lakes and rivers. (May) June-August.

DISTRIBUTION. Senegal, Gambia, Guinea-Bissau, Sierra Leone, Guinea, Ivory Coast, Burkina Faso, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Ethiopia, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, South Africa. Alt. up to 2300 m.

REPRESENTATIVE SPECIMENS. Between Bandama and Marabadiassa (Warabadiassa); single specimen between Buandougou and Bandama, 2 July 1909, *Bokdam* 2875 (K!, WAG!); Baoulé-Nord, Nzi Moyen Valley, between Mbayakro and Kozakissikro (Kozakissikro), 5 Aug. 1909, *Chevalier* 22303 (P!); Baoulé-Nord, Nozi Moyen Valley, between Alanguouassou and Mobayakro, 1 Aug. 1909, *Chevalier* 22234 bis (P!); Baoulé, Aug. 1896, *Pobéguin* 114 (P!); Near Bavé, 4°09'W, 9°35'N, 7 Aug. 1967, *Geerling & Bokdam* 547 (WAG!); 27 kmS of Bavé, 4°11'W, 9°24'N, 20 June 1968, Boubonri, *Pobéguin* 731 (P!); Ca. 100 km W of Bouaké, 27 May 1963, *de Wilde* 125 (K!, P!, WAG!); 40 km E of Dabakala, Toupé road, 28 June 1969, *Cremers* 1026 (P!); NW of Doropo, 3°21'W, 9°50'N, 22 June 1967, *Geerling & Bokdam* 76 (WAG!); Mare de Dalandjougou, 4°09'W, 9°33'N, 6 Aug. 1967, *Geerling & Bokdam* 525 (WAG!); Between Daloa-Zuénoula, 23 May 1974, *Pérez-Vera* 633 (K!, P!); Near Férédougoua R., near Touba road, 12 July 1926, *Collenette* 64 (K!); N of Kau, 21 July 1974, *Pérez-Vera* 693 (K!); Lamto Reserve, 50 km S of Toumodi, 14 June 1968, *Bokdam* 2835 (WAG!); Mankono, *Chevalier* 22005 (K!, P!); Moyen Sassandra Valley, Orodougou, between Sifié and Séguéla, 2 June 1909, *Chevalier* 21831 (P!); Between Sémien and Kanébly, 6 July 1966, *Aké Assi* 9074 (K!); Yuala, 18 May 1974, *Pérez-Vera* 632 (P!).

**4. *Eulophia barteri* Summerh. in Kew Bull. 1936: 224. 1936**  
(Fig. 140)

TYPE: NGERIA. *Barter 1481* (HOLOTYPE: K!)

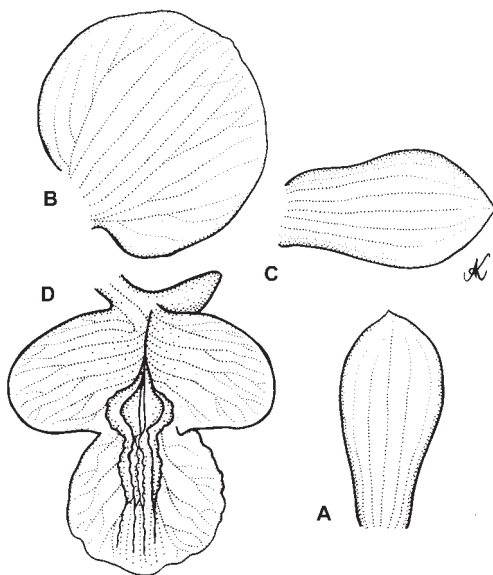


Fig. 140.—*Eulophia barteri* Summerh.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (redrawn by A. Kowalkowska from Summerhayes' original drawing kept at K, *Barter 1481*).

Perennating organs underground, tuberous, obliquely conical to ellipsoid. Leaves 60–70 cm long, 3–8 cm wide, linear-lanceolate, acuminate, plicate, erect. Inflorescence 100–200 cm tall, laxly many-flowered, peduncle erect, glabrous, with few sheathing cauline bracts. Flowers medium-sized to rather large, sepals dull pinkish, lip middle lobe purplish, sidelobes dull green the centre whitish to dull pinkish. Floral bracts 1.5–40 mm long, ovate-lanceolate, acute, glabrous. Pedicel and ovary 30–40 mm long, slender, glabrous. Dorsal sepal 13–16 mm long, 3–4.5 mm wide, lanceolate-ovate, acuminate, glabrous. Petals 25–27 mm long, 10–13 mm wide, obliquely elliptic-obovate, obtuse to rounded at apex, with short apiculus. Lateral sepals 13–17 mm long, 3–4.5 mm wide, obliquely ovate-lanceolate,

acuminate. Lip 16–25 mm long and wide, rather fleshy, glabrous, callus of 3 fleshy ridges running from the base nearly to the centre of middle lobe, distinctly trilobed in the middle; the middle lobe 10–12 mm long and wide, semicircular, margins crenulate; sidelobes obliquely elliptic, rounded. Spur 6–9 mm long, conical, blunt. Gynostemium 12–15 mm long.

**HABITAT.** Terrestrial in savanna, semideciduous forests, often near the water in full sun. June–November.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria.

**REPRESENTATIVE SPECIMENS.** Bouaké, 1 June 1962, *Leeuwenberg 4270* (K!, WAG!); Near Férédougou R., near Toubia road, 12 July 1926, *Collenette 66* (K!); Louénoufla, Nov. 1971, *Pérez-Vera 171* (P!); Ca. 140 km N of Tabou, Hana R., along Tai road, 10 Oct. 1963, *de Wilde 1047* (K!, P!, WAG!); Yúala, 7 July 1974, *Pérez-Vera 660* (K!).

**5. *Eulophia brevipetala* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 53. 1898**  
(Fig. 141)

TYPE: SIERRA LEONE. *Scott-Elliot 5224* (HOLOTYPE: K!)

Perennating organs underground, tuberous, cylindrical or ellipsoid. Leaves 10-15 cm long, 0.5 cm wide, linear, acuminate, plicate, erect, vestigial. Inflorescence 30-60 cm tall, rather lax, produced before leaves, peduncle erect, glabrous with few sheathing cauline bracts. Flowers small, spreading, sepals dull purple, petals dull pinkish, lip pinkish white yellowish callus and sidelobes, spur purplish-brown. Floral bracts 4-5 mm long, lanceolate, acuminate. Pedicel and ovary 7-9 mm long, slender, glabrous. Dorsal sepal 7.5-14 mm long, 2-3 mm wide, linear-oblongate, acute, glabrous, thicker than petals. Petals 4.5-5 mm long, 2-2.5 mm wide, oblong-obovate to elliptic-obovate, rounded at apex, delicate, thin, glabrous. Lateral sepals 7.5-14 mm long, 2-3.5 mm wide, linear-oblongate, subfalcate, acute, glabrous. Lip 6 mm long, 4 mm wide, callus of 5 ridges running from the base nearly to the apex of mid-lobe, irregularly denticulate-cristate in the apical third; distinctly 3-lobed in the two-third; the mid-lobe up to 2.5 mm long and mm wide, semicircular, obtuse, margins entire, distinctly undulate, in the centre covered by fleshy papillae. Spur 3-4 mm long, clavate, distinctly swollen and recurved at the apex, blunt. Gynostemium 3.5-4 mm long.

**HABITAT.** Terrestrial in savanna, in full sun. March-April.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Nigeria.

**REPRESENTATIVE SPECIMENS.** Boundiali-Korhago road, (km 20), 27 Apr. 1975, *Pérez-Vera* 782 (K!); Séguéla-Vavoua (Vavona) road, (km 5), 16 Mar. 1975, *Pérez-Vera* 757 (K!, P!).

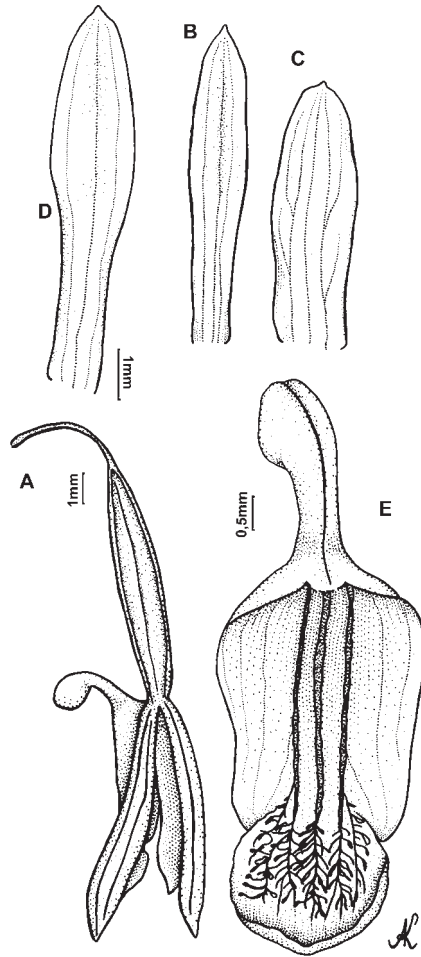


Fig. 141.—*Eulophia brevipetala* Rolfe: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip (drawn by A. Kowalkowska, *Chevalier* 819, P).

**6. *Eulophia buettneri* (Kraenzl.) Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr. 1, 2: 446. 1936 (Fig. 142)**

*Lissochilus buettneri* Kraenzl. in Bot. Jahrb. Syst. 17: 53. 1893; TYPE: TOGO. *Buettner* 415 (HOLOTYPE: B†; ICONOTYPE: K!)

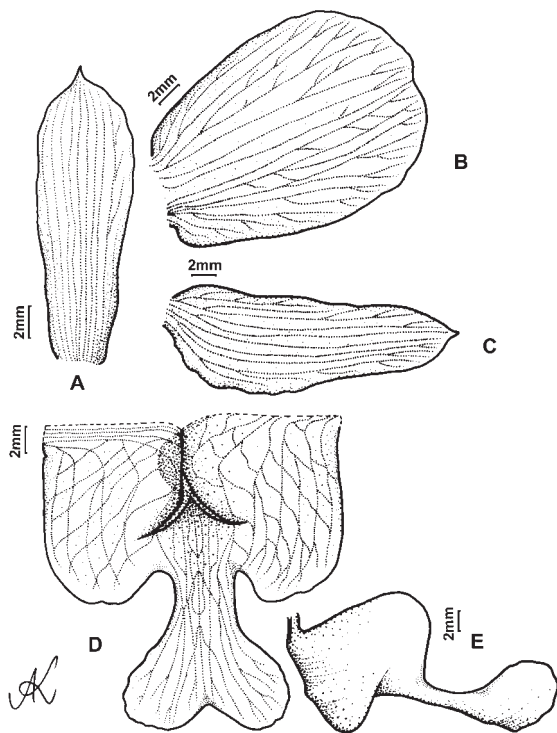


Fig. 142.—*Eulophia buettneri* (Kraenzl.) Summerh.: A — dorsal sepal; B — petal; C — lateral sepal; D, E — lip (drawn by A. Kowalkowska, *Satabie* 582, P).

Perennating organs subterranean, 2 cm long, 3.5 cm in diameter, tuberous. Leaves not seen, appearing after inflorescence. Inflorescence 70–100 cm tall, laxly 6-flowered, peduncle erect, rather delicate, glabrous, with 4 sheathing cauline bracts, 3–7 cm long, thin, scarious. Flowers rather large, violetes, fragrant. Floral bracts 16 mm long, linear-lanceolate, acuminate, thin. Pedicel and ovary 25 mm long, slender, straight, glabrous. Dorsal sepal 18 mm long, 6 mm wide, oblong to narrowly oblong-obovate, shortly apiculate, thin, glabrous. Petals 21 mm long, 14–15 mm wide, elliptic-obovate, rounded or truncate at apex, hardly oblique at base, thin, glabrous. Lateral sepals 21 mm long, 8–9 mm wide, ovate-lanceolate,

falcate, shortly apiculate, thin, glabrous. Lip 23 mm long, 24 mm wide, rather thin, glabrous, ecallose, sometimes with folds near the spur entrance, distinctly trilobed just above the middle; middle lobe 11 mm long, 12 mm wide, clawed basally, obcordate apically; sidelobes up to 11 mm long, semi-elliptic, rounded at apex. Spur up to 14 mm long, saccate. Gynostemium 11 mm long.

HABITAT. Terrestrial, in savanna of *Hymenocardia acida* Tul., *Crossopteryx febrifuga* Benth., *Annona senegalensis* Pers. and *Hyparrhenia* sp. March.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon.

REPRESENTATIVE SPECIMENS. Daloa-Zuénoula road, (km 56), 9 Mar. 1974, Pérez-Vera 595 (K!); Yualé, 10 Mar. 1974, Pérez-Vera 597 (K!, P!).

**7. *Eulophia caricifolia* (Rchb. f.) Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr., ed. 1, 2: 444. 1936 (Figs. 143, 144)**

*Lissohilus caricifolius* Rchb. f. in *Linnaea* 41: 74. 1877; TYPE: (here designated): GABON. Griffon de Belay s.n. (LECTOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Lissochilus longifolius*  
Benth. in Hook., Niger  
Fl.: 530. 1849, non  
Schlechter; TYPE: NI-  
GERIA. *Vogel 8* (HO-  
LOTYPE: K!; ISOTYPE:  
K!)

*Lissochilus anten-  
nisepalus* Rchb. f. in  
Flora 65: 533. 1882;  
TYPE (here designat-  
ed): ANGOLA. *Me-  
chow 419* (LECTO-  
TYPE: W-R?; DRAW-  
INGS: K!, UGDA-  
DLSz)

*Lissochilus wilsonii*  
Rolfe in Oliver & al.  
(eds.), Fl. Trop. Afr.  
7: 79. 1898; TYPE:  
UGANDA. *Wilson*  
5780 (HOLOTYPE: K!)

Perennating or-  
gans subterranean, 15  
or more cm long, 0.6-  
0.8 cm in diameter,  
rhizomatous, cylin-  
drical, fleshy. Leaves  
4-8, 15-140 cm long,  
0.3-1.5 cm wide, lin-  
ear, acuminate, long  
petiolate, plicate,  
erect. Inflorescence  
50-130 cm tall, laxly  
9-40-flowered, pe-  
duncle erect, gla-  
brous, bearing 3 sheathing cauline bracts, rhachis occasionally branching. Flowers  
medium-sized, spreading to subnutant, sepals grey-red to maroon, petals pink to  
white, lip pink veined red with a mauve mid-lobe, callus yellow. Floral bracts 5-  
10 mm long, ovate-lanceolate, acute. Pedicel and ovary up to 24 mm long, slender,  
erect, glabrous. Dorsal sepal 15-24 mm long, 2.5-4 mm wide, oblong-spathu-  
late, obtuse, relatively thick, glabrous. Petals 12-20 mm long, 6-10 mm wide,  
obliquely elliptic to orbicular-elliptic, rounded at apex, thin, delicate, glabrous.  
Lateral sepals 16-25 mm long, 2.5-4 mm wide, hardly falcate, linear- to oblong-  
spathulate, obtuse, relatively thick, glabrous. Lip 15-25 mm long, 10-15 mm  
wide, rather thin, with 3 verrucose ridges in the basal half, above with 5 rows of  
fleshy, dense, prominent papillae running to the centre of mid-lobe, obscurely  
trilobed near the middle; the middle lobe 5-8 mm long, 5-7 mm wide, ligulate to  
obovate or circular-quadrate, truncate, margins crenulate and undulate; side-  
lobes broadly rounded. Spur 5-7 mm long, broadly conical to conical-saccate,  
shallow. Gynostemium 8-9 mm long.

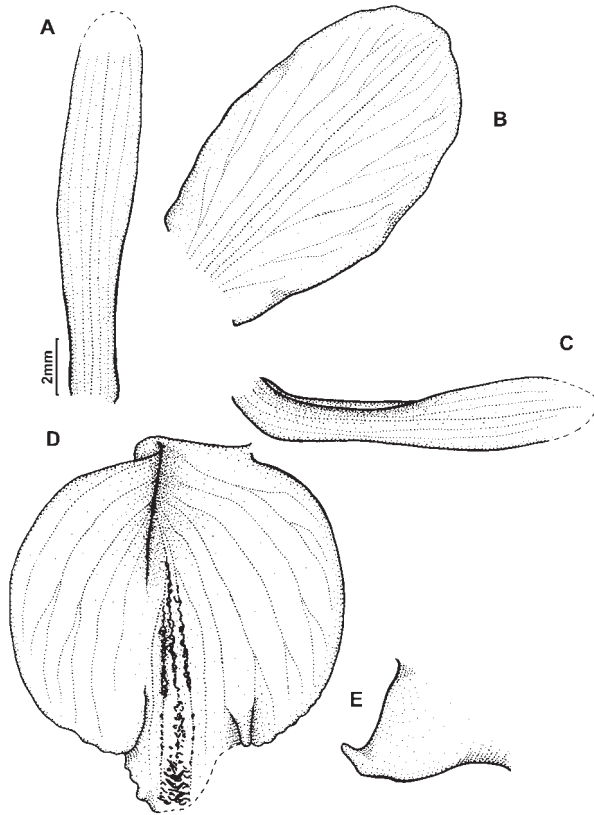


Fig. 143.—*Eulophia caricifolia* (Rchb. f.) Summerh.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip; E – spur (drawn by A. Kowalkowska, *Griffon de Belay s.n.*, W-R).

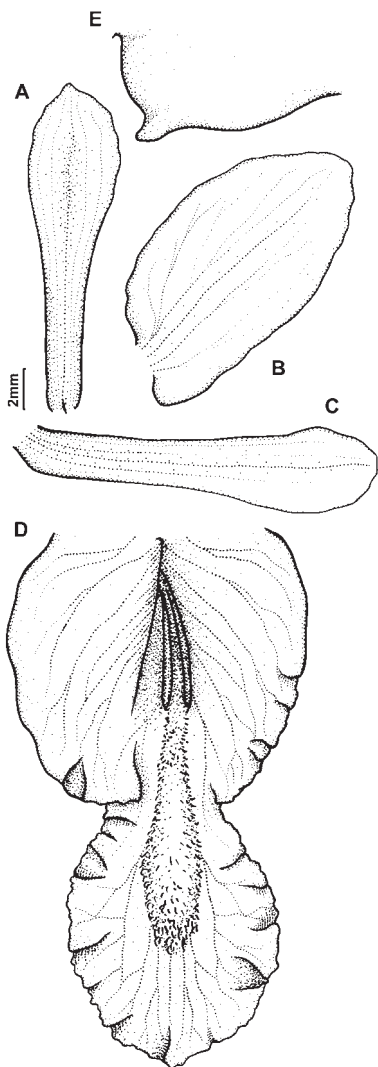


Fig. 144.—*Eulophia caricifolia* (Rchb. f.) Summerh.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip; E – spur (drawn by A. Kowalkowska, *Kalbreyer* 34, W-R).

Flowers medium-sized, lilac, violet or mauve with bright dark purple or violet-green lip, greenish gynostemium. Floral bracts 10–30 mm long, linear-lanceolate, acuminate. Pedicel and ovary 15–30 mm long, slender, glabrous. Dorsal sepal 12–23 mm long, 3–5.5 mm wide, oblanceolate to narrowly oblong-obovate, acuminate to cuspidate, thin, delicate, glabrous. Petals 12–20 mm long, 4–10 mm wide, elliptic-

HABITAT. Terrestrial in wet grasslands, marshes, swamps. January–August.

DISTRIBUTION. Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Rwanda, Burundi, Tanzania, Zambia. Alt. 1200–1350 m.

REPRESENTATIVE SPECIMENS. Abouabou, 19 km W of Grand Bassam, 7 Mar. 1965, *J. et A. Raynal* 13648 (K!, P!); Abidjan, Moossou, Apr. 1954, *Schnell* 6563 (P!); NE of Grand Bassam, 3 Sep. 1955, *De Wit* 1212 (WAG!); Moossou, 28 Jan. 1963, *Aké Assi* 6874 (K!); Moossou, Aug. 1955, *Nozeran* s.n. (P!); Moossou, 5 June 1974, *Pérez-Vera* 639 (K!); Between Moossou and Abidjan, 15 Oct. 1949, *Schnell* 3963 (P!); Moossou (Grand Bassam), 15 Apr. 1956, *De Wit* 212 (WAG!).

**8. *Eulophia cristata* (Afzel. ex Sw.) Steud. in Nomencl. Bot. (ed. 2) 1: 605. 1840 (Fig. 145)**

*Limodorum cristatum* Afzel. ex Sw. in Neues J. Bot. 1: 86. 1805; TYPE (*here designated*): SIERRA LEONE. *Afzelius* s.n. (LECTOTYPE: S)  
*Lissochilus purpuratus* Lindl. in J. Linn. Soc., Bot. 6: 133. 1862; TYPE: NIGERIA. *Barter* 3331 (HOLOTYPE: K!)  
*Lissochilus heudelotii* Rchb. f. in Otia. Bot. Hamburg. 1: 63. 1878; TYPE (*here designated*): SENEGAL. *Hendelot* s.n. (LECTOTYPE: W-R!)  
*Lissochilus uliginosus* Rolfe in Bull. Misc. Inform. Kew. 1913: 340. 1913; TYPE: GHANA *Chipp* 192. (HOLOTYPE: K!)

Perennating organs underground, 3–9 cm long, 1.3–4 cm in diameter, tuberous, cylindric-ellipsoidal. Leaves 4–6, 40–70 cm long, 0.7–3.5 cm wide, lanceolate to oblanceolate, acuminate, plicate, erect, gradually attenuating towards base. Inflorescence up to 150 cm tall, 10–40-flowered, rather lax, appearing before leaves, peduncle stout, erect, glabrous with 3–5 sheathing cauline bracts.



ovate, slightly oblique at base, acute to obtuse, thin, glabrous. Lateral sepals 13-23 mm long, 4-6.5 mm wide, oblong, oblong-lanceolate to oblong-oblanco-olate, falcate or oblique at base, acute, thin, glabrous. Lip 12.5-22 mm long, 10-16 mm wide, rather thin, delicate, with 2 fleshy, wing-like thickenings at base and 5-9 crenulate ridges in the centre of middle lobe, distinctly trilobed in the basal third or so; middle lobe 12-15 mm long, 8-12 mm wide, oblong-ovate to oblong-elliptic, obtuse to rounded at apex, crisped on margins, sidelobes 4-5 mm long, 7 mm wide, semi-orbicular to semi-elliptic. Spur 5-8 mm long, conical or saccate-conical, acute, straight. Gynostemium 6-7 mm long.

**HABITAT.** Terrestrial in grasslands, often seasonally burnt, in *Commiphora-Albizia* bushlands, woodlands, savana of *Daniellia oliveri* (Rolfe) Hutch. & Dalziel, *Lophira lanceolata* Banks ex C.F. Gaertn. and savanna of *Terminalia glaucescens* Planch. ex Benth.. January-April.

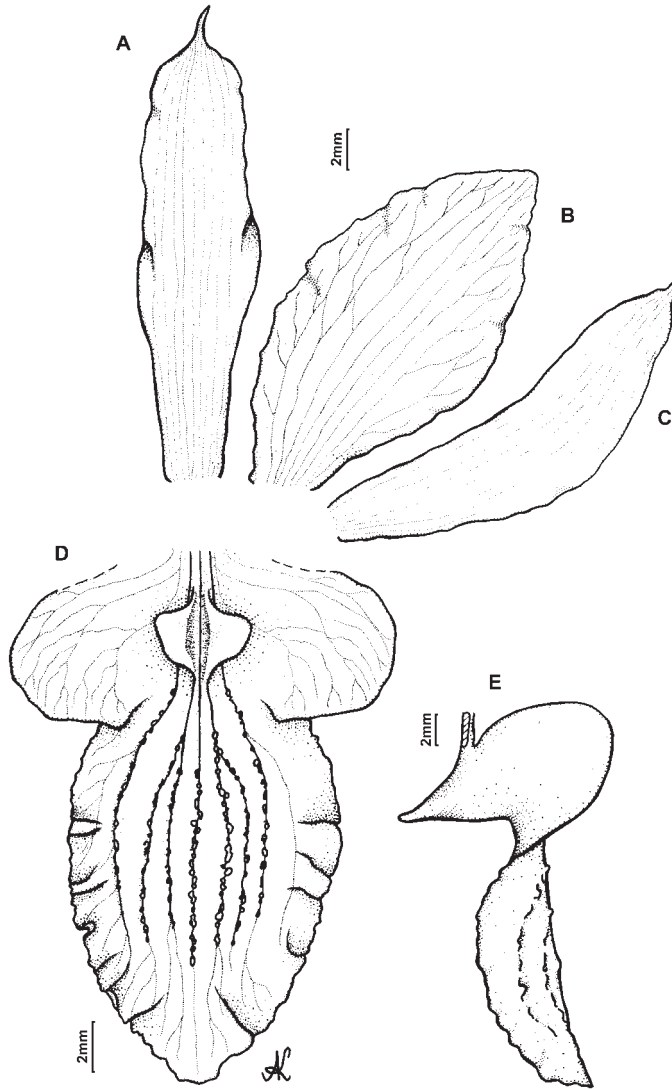


Fig. 145.—*Eulophia cristata* (Afzel. ex Sw.) Steud.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip; E – lip and spur (drawn by A. Kowalkowska, J. & A. Raynal 10546, P).



DISTRIBUTION. Senegal, Gambia, Guinea, Ivory Coast, Togo, Benin, Guinea Bissau, Nigeria, Chad, Cameroon, Central African Republic, Congo, Democratic Republic of Congo (Zaire), Sudan, Ethiopia, Uganda. Alt. 940-1700 m.

REPRESENTATIVE SPECIMENS. Between Bonna and Téhini, 5 Apr. 1966, *Aké Assi* 8636 (K!); 30 km NE of Bouaké, 2 Feb. 1977, *Peyre de Fabrègues* 3519 (P!); Ca. 92 km S of Bouna, Bondoukou road, 2 Mar. 1962, *de Wilde & Leeuwenberg* 3503 (K!, WAG!); 30 km S of Dabakala, 4°29'W, 8°03'N, 12 Feb. 1968, *Geerling & Bokdam* 2001 (K!, WAG!); Lamto, 10 Jan. 1963, *Portères* 321 (P!); Lamto, 24 Jan. 1963, *Portères* 413 (P!); Mankono, *Peyre de Fabrègues* 3542 (P!); Between Séguéla and Mankono, Feb. 1972, *Pérez-Vera* 204/C (P!); Between Yamoussokro and Bouaflé, 7 Jan. 1964, *Aké Assi* 7263 (K!); Zuénoule road (km 11), 13 Jan. 1974, *Pérez-Vera* 572 (K!).

**9. *Eulophia cucullata* (Afzel. ex Sw.) Steud. in Nomencl. Bot. (ed. 2) 1: 605. 1840 (Fig. 146)**

*Limodorum cucullatum* Afzel. ex Sw. in Kongl. Svenska Vetenskapsakad. Handl. 21: 243. 1800; TYPE: (here designated): WEST AFRICA. *Afzelius* s.n. (LECTOTYPE: S)

*Lissochilus arenarius* Lindl. in J. Linn. Soc., Bot. 6: 133. 1862; TYPE: NIGERIA. *Barter* s.n. (HOLOTYPE: K!; ISOTYPE: W-R!; DRAWING: UGDA-DLSz). - *Eulophia arenaria* (Lindl.) Bolus in J. Linn. Soc., Bot. 25: 185. 1889.

*Lissochilus dilectus* Rchb. f. in Otia Bot. Hamburg. 1: 62. 1878; TYPE (here designated): ANGOLA. *Welwitsch* 686 (LECTOTYPE: W-R!; ISOLECTOTYPES: K!, W-R!; DRAWING: UGDA-DLSz). - *Eulophia dilecta* (Rchb. f.) Schltr. in Westafr. Kautschuk-Exp.: 279. 1900.

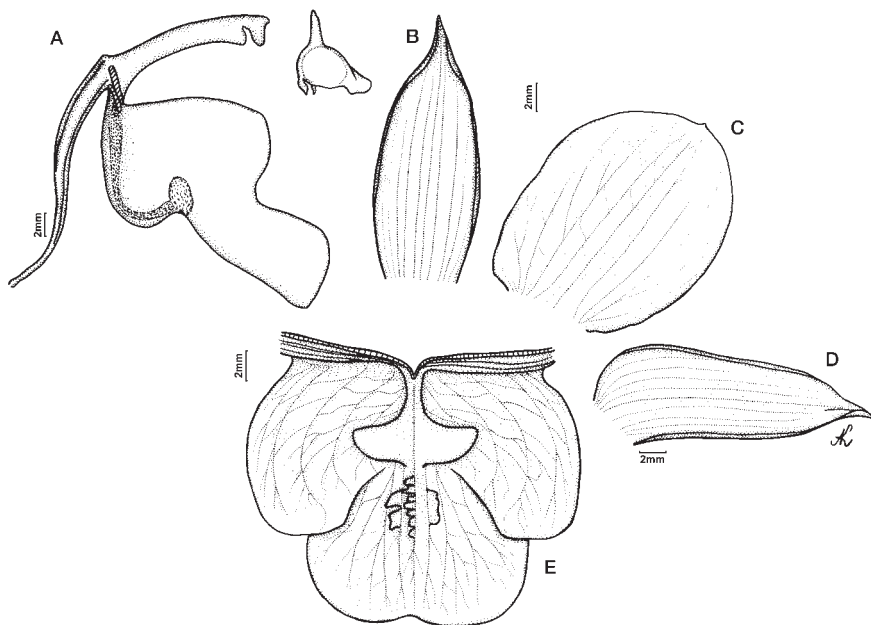


Fig. 146. - *Eulophia cucullata* (Afzel. ex Sw.) Steud.: A – lip, gynostemium, pedicel and ovary; B – dorsal sepal; C – petal; D – lateral sepal; E – lip and spur (drawn by A. Kowalkowska, *Baum* 370, HBG).

*Lissochilus monteiroi* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 83. 1898; TYPE: ANGOLA *Monteiro s.n.* (HOLOTYPE: K!). - *Eulophia monteiroi* (Rolfe) Butzin in Willdenowia 7: 589. 1975.

Perennating organs underground, 4-5.5 cm long, 2-3 cm in diameter, tuberous, potato-like. Leaves 3-4, 20-70 cm long, 0.4-2 cm wide, linear to lanceolate, acuminate, plicate, erect, gradually attenuating towards base. Inflorescence 40-130 cm tall, 3-15-flowered, lax, appearing before or with young leaves, peduncle, erect, stout, glabrous, with 2-3 sheathing cauline bracts. Flowers large, showy, sepals maroon, brown or ochre, petals rose-purple, lip rose-purple with a white to cream throat, sidelobes greenish striped with brown. Floral bracts up to 5.5 cm long, linear, acuminate. Pedicel and ovary 8-25 mm long, slender, glabrous. Dorsal sepal 14-30 mm long, 3-10 mm wide, lanceolate to ovate-lanceolate, acute to acuminate, rather thick and fleshy, glabrous. Petals 15-30 mm long, 10-21 mm wide, obliquely elliptic to obovate, acute to rounded, glabrous. Lateral sepals 14-30 mm long, 3-11 mm wide, obliquely lanceolate to oblong- or ovate-lanceolate, acute to acuminate, rather thick and fleshy. Lip 18-40 mm long, 20-40 mm wide, rather thin to rather thick, fleshy, 2 rhomboid or quadrate, parallel, rather fleshy thickenings near the centre, with obscurely fleshy 1 or 3 ridges above, distinctly trilobed just above the middle; the middle lobe 7-14 mm long, 17-30 mm wide, transversely elliptic, to elliptic-obcordate; sidelobes triangular to obliquely obovate, obtuse to rounded, papillate near the base. Spur 11-17 mm deep, broadly saccate. Gynostemium 13-15 mm long.

HABITAT. Terrestrial in grasslands, wooded grasslands, bushlands and woodlands, savannas, dry forest, pengbele, dembos, jacheres. January-July.

DISTRIBUTION. Senegal, Gambia, Mali, Guinea-Bissau, Guinea, Sierra Leone, Ivory Coast, Burkina Faso, Ghana, Togo, Nigeria, Chad, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Ethiopia, Sudan, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa, Madagascar. Alt. 100-2300 m.

REPRESENTATIVE SPECIMENS. Abokouamékro, 21 Mar. 1977, *Peyre de Fabrègue 3524* (P!); Bouaké, 23 May 1985, *César & Bigat 2043* (P!); Baoulé-Nord, Mt. Kankaniboka, Fétékro, 26 July 1909, *Chevalier 22161* (P!); Baoulé-Nord, Nzi Moyen Valley, between Alangouassou and Mbayakro, 9 Aug. 1909, *Chevalier 22234* (K!, P!); Near Comoé R., Gawi, 3°47'W, 9°00'N, 23 June 1967, *Geerling 85* (WAG!); 40 km E of Dabakala, Toupe road, 28 June 1969, *Cremers 1025* (P!); Between Daloa and Zuénoufla, Jan. 1971, *Pérez-Vera 208* (P!); 3 km E of Gansé, 3°54'W, 8°39'N, 5 Mar. 1968, *Geerling & Bokdam 2114* (K!, WAG!); Lamto, 23 Mar. 1963, *Portères 658* (P!); 6 km N of Séguéla, 6°40'W, 08°N, 19 Apr. 1959, *Leeuwenberg 3271* (WAG!); Ca. 5 km S of Tomodi, 13 Apr. 1962, *Leeuwenberg 3916* (K!, WAG!); Toumodi-Ndouci road (km 33), Apr. 1970, *Bamps 2608* (BR!, K!, P!); Yualá, 10 Mar. 1974, *Pérez-Vera 596* (K!).

**10. *Eulophia euglossa* (Rchb. f.) Rchb. f. ex Bateman in Bot. Mag. 92: t. 5561. 1866 (Fig. 147)**

*Galeandra euglossa* Rchb. f. in Bot. Zeitung (Berlin) 10: 935. 1852; TYPE (*here designated*): SIERRA LEONE. *van Hees 1288, cult.* (ICONOTYPE: W-R!; DRAWING: K!)  
*Eulophia dusenii* Kraenzl. in Bot. Jahrb. Syst. 19: 254. 1894; TYPE: CAMEROON. *Dussen 264* (HOLOTYPE: B†; DRAWING: K!)

Perennating organs above the ground level, 16-25 cm long, 1-1.5 cm in diame-

ter, cylindrical-conical. Leaves 4-12, 15-50 cm long, 1-5.5 cm wide, ovate to lanceolate, acuminate, plicate, erect, gradually attenuating towards base. Inflorescence up to 200 cm tall, 15-30- or more-flowered, lax, peduncle erect, stout, with several, sheathing cauline bracts. Flowers medium-sized, subnutant, sepals and petals green with brownish apex, lip white with a pink or purple band across base of mid-lobe, spur greenish. Floral bracts up to 5 cm long, ovate to lanceolate, acuminate. Pedicel and ovary 17-35 mm long, slender, glabrous. Dorsal sepal 18-24 mm long, 3-4.6 mm wide, lanceolate to lanceolate-ovate, acuminate, thin, glabrous. Petals 15-18 mm long, 3-5.5 mm wide, obliquely ovate- to elliptic-lanceolate, acute to acuminate, glabrous. Lateral sepals 18-24 mm long, 3-5.5 mm wide, hardly falcate, oblong-lanceolate, acuminate, glabrous, thin. Lip 13-20 mm long, 7.5-1 mm wide, minutely papillate near the base, obscurely to distinctly 3-lobed; the middle lobe 7-9 mm long, 7-8 mm wide, ovate, oblong-ovate to oblong-elliptic, acute to obtuse, more or less undulate along margins, with callus of 3-7 obscure, if any, ridges at the base of the lobe; sidelobes 1-2 mm long, obliquely triangular, acute entire or undulate along apical margins. Spur 5-9 mm long, cylindrical to clavate, blunt, straight. Gynostemium 5-7 mm long.

HABITAT. Terrestrial in dense forests of *Uapaca guineensis* Mull., *Harungana madagascariensis* Poir., *Maesopsis eminii* Engl. etc., shrubby low montane

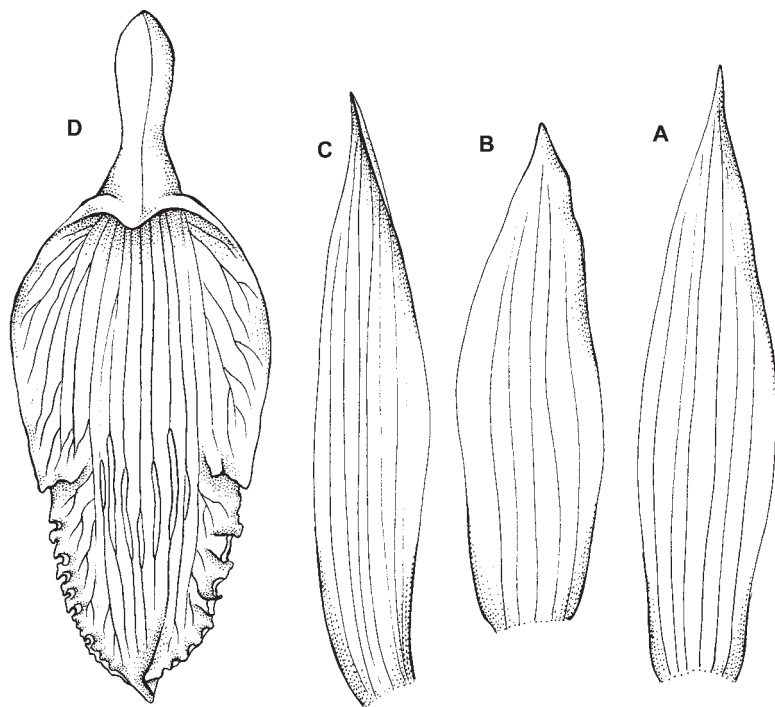


Fig. 147.—*Eulophia euglossa* (Rchb. f.) Rchb. f. ex Bateman: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by J. Mytnik-Ejsmont, *Letouzey 11453*, P).

forests, on red-brown sandy loam over ironstone, lithophytic in rocky area, also in secondary forests. April-September.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Gabon, Democratic Republic of Congo (Zaire), Angola, Ethiopia, Uganda. Alt. 500-1300 m.

REPRESENTATIVE SPECIMENS. Near Brafouédi, 75 km NW of Abidjan, 24 Apr. 1959, *Leeuwenberg* 3343 (WAG!); Dyolas, Danané, Mt. Goula, 12 Apr. 1909, *Chevalier* 21228 (P!); Rocher d'Issia, 6 May. 1962, *Leeuwenberg* 4139 (WAG!); 20 May 1974, *Pérez-Vera* 206 (K!); Mt. Mafa, 6 June 1966, *Aké Assi* 8908 (K!); *Aké Assi* 8909 (K!); Man, Apr. 1974, *Pérez-Vera* 224 (P!); Mt. Tonkouï, 26 Sep. 1979, *van Setten* 452 (WAG!); Toulépleu, May 1942, *Schnell* 1369 (P!).

**11. *Eulophia flavopurpurea* (Rchb. f.) Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 65. 1898 (Fig. 148)**

*Cyrtoptera flavopurpurea* Rchb. f. in Otia Bot. Hamburg. 1: 68. 1878; TYPE (*here designated*): SUDAN. *Schweinfurth* 3546 (LECTOTYPE: W-R!; ISOLECTOTYPE: K!)

*Lissochilus millsonii* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 79. 1898; TYPE: NIGERIA. *Millson* 86 (HOLOTYPE: K!; ISO-TYPE: K!)

*Eulophia tubifera* Kraenzl. in Bot. Jahrb. Syst. 28: 169. 1900; TYPE: CAMEROON. *Dusen* 258? (HOLOTYPE: B†; DRAWING: K!)

*Lissochilus lacteus* Kraenzl. in Bot. Jahrb. Syst. 43: 399. 1909; TYPE: TOGO. *Baumann* 24 (HOLOTYPE: B†; DRAWING: K!)

*Lissochilus andersonii* Rolfe in Bull. Misc. Inform. Kew. 1910: 159. 1910; TYPE: *Anderson* 8470 - cult. Hort. Kew. (HOLOTYPE: K!)

*Lissochilus johnsonii* Rolfe in Bull. Misc. Inform. Kew. 1910: 160. 1910; TYPE: GHANA. *Johnson* 851 (HOLOTYPE: K!; ISO-TYPE: K!)

*Lissochilus seretii* De Wild. in Ann. Mus. Congo, Bot., ser. 5, 3: 180. 1910; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Seret* 529 (HOLOTYPE: BR; ISOTYPE: K!)

*Lissochilus corbisieri* De Wild. in Bull. Jard. Bot. Etat. 6: 80. 1919; TYPE (*here designated*): DE-

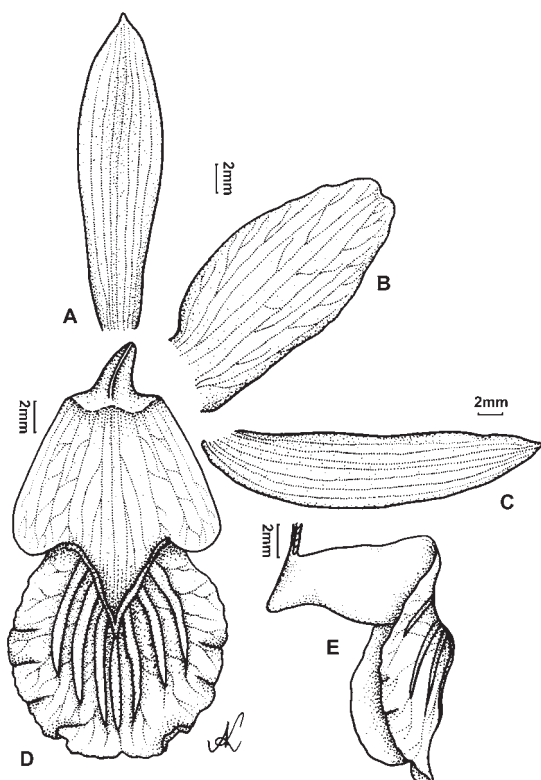


Fig. 148.—*Eulophia flavopurpurea* (Rchb. f.) Rolfe: A – dorsal sepal; B – petal; C – lateral sepal; D – lip; E – lip and spur (drawn by A. Kowalkowska, J. & A. Raynal 10520, P).

MOCRATIC REPUBLIC OF CONGO (ZAIRE). *Corbisier* 586 (LECTOTYPE: BR) & *Hock s.n.* (PARATYPE: BR; PHOTO: K!)

Perennating organs underground, 3-4 cm long, 1-2 cm in diameter, tuberous. Leaves 3-4, 5-35 cm long, 2-7.5 cm wide, linear, acuminate, plicate, erect. Inflorescence up to 100 cm tall, laxly 1-15-flowered, produced before leaves, peduncle glabrous, erect, bearing 3 sheathing cauline bracts. Flowers medium-sized, subnutant, sepals pale greenish or greenish yellow, usually tinged dull purple, petals pale greenish yellow with a purplish midvein, lip yellowish green or yellow with brunrouge marks, rarely flowers whitish. Floral bracts up to 30 mm long, linear to linear-lanceolate, acuminate. Pedicel and ovary up to 21 mm long, slender, glabrous. Dorsal sepal 20-35 mm long, 4-6 mm wide, lanceolate, oblanceolate to oblong-oblanceolate, acute to shortly acuminate, rather thin, glabrous. Petals 18-25 mm long, 7-12 mm wide, obliquely oblong-elliptic, elliptic-ovate, obtuse, thin, glabrous. Lateral sepals 24-35 mm long, 4-7 mm wide, falcate, linear-lanceolate, oblong-lanceolate, acute to shortly acuminate. Lip 20-30 mm long, 10-20 mm wide, basal part glabrous, with no thickening or callus, distinctly trilobed near the middle; the middle lobe 11-16 mm long, 12-16 mm wide, nearly orbicular to elliptic or elliptic-ovate, obtuse, callus of 7-11 low verrucose ridges in the centre, margins undulate; sidelobes 4 or so mm long, obliquely ovate, rounded. Spur 4-7 mm long, broadly saccate, subblunt. Gynostemium 12-13 mm long.

HABITAT. Terrestrial in grasslands, swamps, dembos, savanna with *Imperata* sp. Usually February-March.

DISTRIBUTION. Guinea, Ivory Coast, Ghana, Togo, Nigeria, Chad, Cameroon, Central African Republic, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Uganda, Burundi, Tanzania, Zambia, Malawi. Alt. 350-1600 m.

REPRESENTATIVE SPECIMENS. Adioukrou, Agneby Valley, Dabou, 4 Feb. 1907, *Chevalier 17119* (P!); Bouaké, 23 May 1985, *César & Bigot 2042* (P!); Dabou, 9-10 Feb. 1907, *Chevalier 17153* (P!); 6 Mar. 1955, *Hallé 3668* (P!); 23 Mar. 1963, *De Koning LAMTO 574* (P!); 30 Jan. 1957, *de Wilde 1062* (K!, P!, WAG!); Lamto, 12 Feb. 1963, *Portères 552 p.p.* (P!); Masaoué National Park, 19 Feb. 1976, *De Koning 6549* (WAG!); Oussou, 1939, *Scaëtta s.n.* (P!); Haut Sassandra and Haut Cavally, 7 Oct. 1929, *Portères 618* (P!); Between Séguéla and Mankono (Maukono), Feb. 1972, *Pérez-Vera 205/B* (P!); Between Toumodi and Yanoussoukro, near Yanoussoukro, 19 Feb. 1976, *De Koning 6520* (WAG!); *De Koning 6521* (WAG!); Yúale, Vavoua-Séguéla road (km 20), 17 Feb. 1974, *Pérez-Vera 579* (K!).

## 12. *Eulophia gracilis* Lindl. in Edwards's Bot. Reg. 9: tab. 742. 1823 (Fig. 149)

TYPE: SIERRA LEONE. *G. Don s.n.* (HOLOTYPE: K!)

*Eulophia laurentiana* Kraenzl. in Durand & De Wild. in Bull. Soc. Roy. Bot. Belg. 38: 60. 1899;

TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Dewever 514* (HOLOTYPE: BR; PHOTO: K!)

Leaves up to 6, 20-30 cm long, 0.7-2.5 cm wide, oblong-lanceolate, acuminate, plicate, long petiolate, erect. Inflorescence up to 150 cm tall, laxly 15-20-flowered, peduncle erect, glabrous, with 2-3 sheathing cauline bracts. Flowers small, spreading to subnutant, sepals and petals greenish, yellowish, violaceous, greenish-brown, lip white, yellowish, pale green, spur yellowish. Floral bracts 4.5-13 mm long, ovate-lanceolate, acuminate. Pedicel and ovary 10-13 mm long,

erect, slender, glabrous. Dorsal sepals 9.5-12 mm long, 2-5 mm wide, oblong-rhomboid to ovate or elliptic-lanceolate, acuminate, thin, glabrous. Petals 8-10.5 mm long, up to 5 mm wide, obliquely obovate to elliptic-obovate, acute to acuminate, glabrous, thin. Lateral sepals 9.5-12 mm long, 2-5 mm wide, obliquely oblong-ovate to elliptic-lanceolate, acuminate, thin, glabrous. Lip 6-7 mm long, 5-7 mm wide, transversely elliptic to elliptic-rhomboid, truncate, covered densely by fleshy, long papillae on apical margin, glabrous or minutely pubescent towards the base, fleshy, thick ridge running from the base to the apex or only at the apex of the lip, boat- or axe-shaped. Spur 3.5-8 mm long, club-shaped, blunt, straight. Gynostemium up to 5.5 mm long.

**HABITAT.** Terrestrial in dense forests, gallery forests, riverine forests, plantations of *Hevea* sp.pl. March-May.

**DISTRIBUTION.** Senegal, Guinea Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola.

**REPRESENTATIVE SPECIMENS.** Adiopodoumé, seashore, 22 Apr. 1995, *Breteler 13355* (WAG!); Adiopodoumé, 4°09'W, 5°20'N, 5 Apr. 1968, *Geerling & Bokdam 2505* (WAG!); 12 May 1955, *F. Hallé s.n./3669?* (P!); Banco Forest Reserve, 25 Apr. 1973, *De Koning 1561* (WAG!); 26 Apr. 1973, *De Koning 1598* (WAG!); Banco Forest Reserve, near Anguededou, 9 May 1973, *De Koning 1661* (WAG!); Banco Forest Reserve, N part, near Abobo-Gare, 5 Mar. 1974, *De Koning 3404* (WAG!); 23 Mar. 1976, *De Koning 6729* (WAG!); Banco Forest Reserve, ca. 17 km W of Abidjan, 21 May 1963, *Oldeman 59* (WAG!); Banco Forest Reserve, ca. 12 km N of Abidjan, 28 May 1959, *De Wit 8169* (WAG!); Between Bingerville and Lagune Potou, *Chevalier 20077* (P!); Marahoné, 13 Mar. 1975, *Pérez-Vera 779* (K!, P!); Sassandra, Sassandra R. bank, near Louga, 9 Apr. 1973, *De Koning 1322* (WAG!).

**DOUBTFUL RECORDS:** Banco Forest Reserve, 12 June 1973, *De Koning 1764* (WAG!).

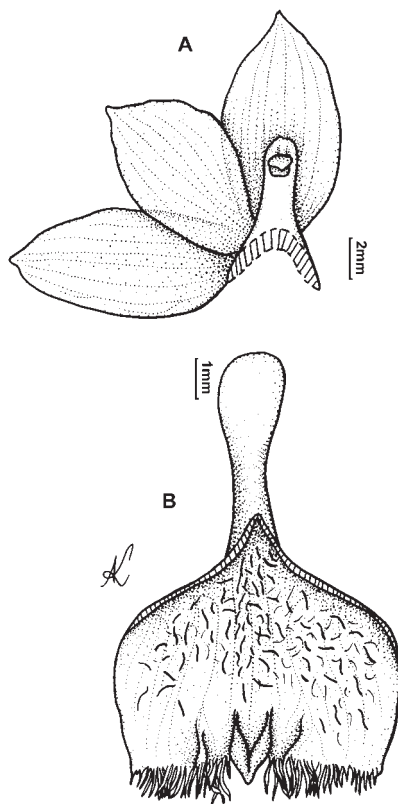


Fig. 149.—*Eulophia gracilis* Lindl.: A — tepals and gynostemium; B — lip (drawn by A. Kowalkowska, *Preuss s.n.*, HBG).

### 13. *Eulophia guineensis* Lindl. in Edwards's Bot. Reg. 8: tab. 686. 1823 (Fig. 150)

TYPE: SIERRA LEONE. *G. Don s.n.* (HOLOTYPE: K!)

Perennating organs -pseudobulbs- above ground, 3-3.5 cm long, 1.5-2 cm in diameter, conical. Leaves 3-4, gathered in the lower part of the plant, sessile to petiolate, developing at flowering time or shortly after that; petiole up to 26 cm



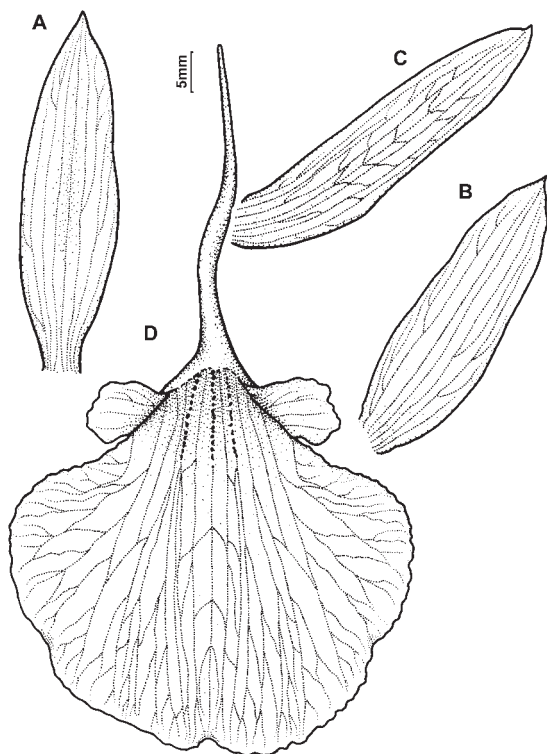


Fig. 150.—*Eulophia guineensis* Lindl.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip and spur (drawn by A. Kowalkowska, *Fotius* 1999, P).

long, narrow; blade 10-35 cm long, 3-9.5 cm wide, ovate, obovate to elliptic-lanceolate, acute to acuminate, plicate, rather thin-textured. Inflorescence up to 1 m tall, 5-45-flowered, dense or lax, peduncle with up to 7 cauline, papery sheaths. Flowers subnate, of various size, showy, sepals and petals purplish brown, lip pinkish purple, with a white or paler base and spur. Floral bracts up to 21 mm long, ovate-lanceolate, acuminate. Pedicel and ovary 13-25 mm long, slender, slightly arcuate. Dorsal sepal 16-27 mm long, 3-7 mm wide, narrowly lanceolate to elliptic-lanceolate, acute to acuminate, rather thin, glabrous. Petals 15-25 mm long, 4-8 mm wide, obliquely linear-, ovate- or oblong-lanceolate, acute to acuminate, rather thin, glabrous. Lateral sepals 16-31 mm

long, 3-8.5 mm wide, oblong to linear-lanceolate, acute to acuminate, slightly falcate at base, thin, glabrous. Lip 20-36 mm long, 13-36 mm wide, rather thin, sometimes veins thickened in the lower part, margins slightly crenulate, trilobed at base; the middle one up to 30 mm long and 36 mm wide, broadly ovate to transversely elliptic-deltoid, acute to truncate at apex; sidelobes smaller, up to 6 mm long and 8 mm wide, obliquely ovate to rhomboid, obtuse. Spur 15-33 mm long, very slender, filiform, acute, straight. Gynostemium up to 7 mm long.

**HABITAT.** Terrestrial or lithopytic in shade or semi-shade amongst rocks, in scrubs, dambos, savanna and in woodlands.

**VARIABILITY.** Three varieties can be distinguished in this species, of which one was reported in Ivoriz Coast:

#### var. *guineensis*

Leaves fully developed at flowering time, sessile, obovate-lanceolate elliptic- or broadly lanceolate. Inflorescence rather lax. Flowers large.



DISTRIBUTION. Senegal, Gambia, Mali, Guinea, Sierra Leone, Ivory Coast, Ghana, Togo, Nigeria, Chad, Cameroon, Central African Republic, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Burundi, Tanzania.

REPRESENTATIVE SPECIMENS. Baoulé, Sep. 1896, *Pobéguin 119* (P!); Baoulé, Oroumbo Boca, 30 Aug. 1955, *De Wit 1017* (WAG!); S of Gansé, 3°55'W, 8°37'N, 11 Aug. 1967, *Geerling & Bokdam 693* (WAG!); Lomo Nord, 9 Oct. 1971, *Audru 4336* (P!); Maneou, Sep. 1954, *Schnell 6801* (P!).

NOTES. *E. guineensis* var. *purpurata* Rchb. f. ex Kotschy can be characterized by leaves ovate to broadly lanceolate, developing after the inflorescence, and by large flowers gathered in rather lax inflorescence. It is widely distributed from Guinea and Senegal, cross Democratic Republic of Congo (Zaire), Sudan, Ethiopia to Uganda, Kenya, Tanzania and Malawi. *E. guineensis* var. *tisserantii* Szlach. & Olszewski has leaves fully developed during flowering, blade set on a long and narrow petiole, and flowers half as large as in typical variety gathered in dense, multi(ca.25-45)-flowered inflorescence. It was recorded in Guinea and Central African Republic.

**14. *Eulophia horsfallii* (Bateman) Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr., ed. 1, 2: 444. 1936 (Figs. 151, 152)**

*Lissochilus horsfallii* Bateman in Bot. Mag. 91: t. 5486. 1865; TYPE (*here designated*): NIGERIA. coll. Cheetham s.n., cult. *Horsfall* (LECTOTYPE: K!; FRAGMENT OF ISOLECTOTYPE: W-R?)

*Lissochilus welwitschii* Rchb. f. in Flora 48: 188. 1865; TYPE (*here designated*): ANGOLA. *Welwitsch 710* (LECTOTYPE: BM!; ISOLECTOTYPES: BM!, K!, W-R!; DRAWING: UGDA-DLSz)

*Lissochilus porphyroglossus* Rchb. f. in Otia Bot. Hamburg. 1: 61. 1878; TYPE (*here designated*): SUDAN. *Schweinfurth 2863* (LECTOTYPE: W-R!; ISOLECTOTYPE: K!; DRAWING: UGDA-DLSz)

*Eulophia elliotii* Rendle in J. Bot. 33: 169. 1895; TYPE: UGANDA. *Scott Elliot 7924* (HOLOTYPE: BM!; ISOTYPE: K!)

*Lissochilus eleogenus* Schltr. in Bot. Jahrb. Syst. 53: 589. 1915; TYPE: TANZANIA. *Stolz 452* (HOLOTYPE: B†; ISOTYPE: K!)

Perennating organs underground, 4-6 or more cm long, 2-3 cm in diameter, rhizomatous, fleshy. Leaves 3-5, long petiolate, 15-200 cm long, 1-15.5 cm wide, lanceolate to oblanceolate, acuminate, stout, plicate, erect. Inflorescence up to 300 cm tall, 5-50-flowered, lax, erect, very stout, peduncle with some sheathing cauline bracts. Flowers large and showy, sepals dull purple to brown, petals rose-purple, lip sidelobes green striped with dull purple, middle lobe purple, cristate-lamellate callus yellow. Floral bracts up to 35 mm long, elliptic to obovate, cuspidate, glabrous. Pedicel and ovary 25-40 mm long, rather slender, glabrous. Dorsal sepal 17-26 mm long, 7-12 mm wide, rhomboid-ovate to oblanceolate in general outline, apiculate, rather thin, glabrous. Petals 19-35 mm long, 15-24 mm wide, obliquely elliptic to elliptic-obovate, acute to shortly acuminate, rather thin, glabrous. Lateral sepals 17-27 mm long, 7-12 mm wide, obliquely rhomboid-ovate to oblanceolate, apiculate, rather thin, glabrous. Lip 20-40 mm long, 14-40 mm wide, rather thick, fleshy, distinctly 3-lobed below the middle, with 3-5 crests running along almost its entire length, crests ca. 4 mm tall, large, thick; the middle lobe up to 20 mm long and 15 mm wide, oblong-ovate to oblong-elliptic, acute, with undulate margins; sidelobes up to 13 mm long and 16 mm wide, semi-elliptic to semi-orbicular. Spur 4-17 mm long, shortly conical to nearly filiform, blunt to acute, usually slightly upcurved. Gynostemium ca. 10-25 mm long.

HABITAT. Terrestrial by streams, rivers and lakes, in marshes, bogs, in open and forested areas. All year round.

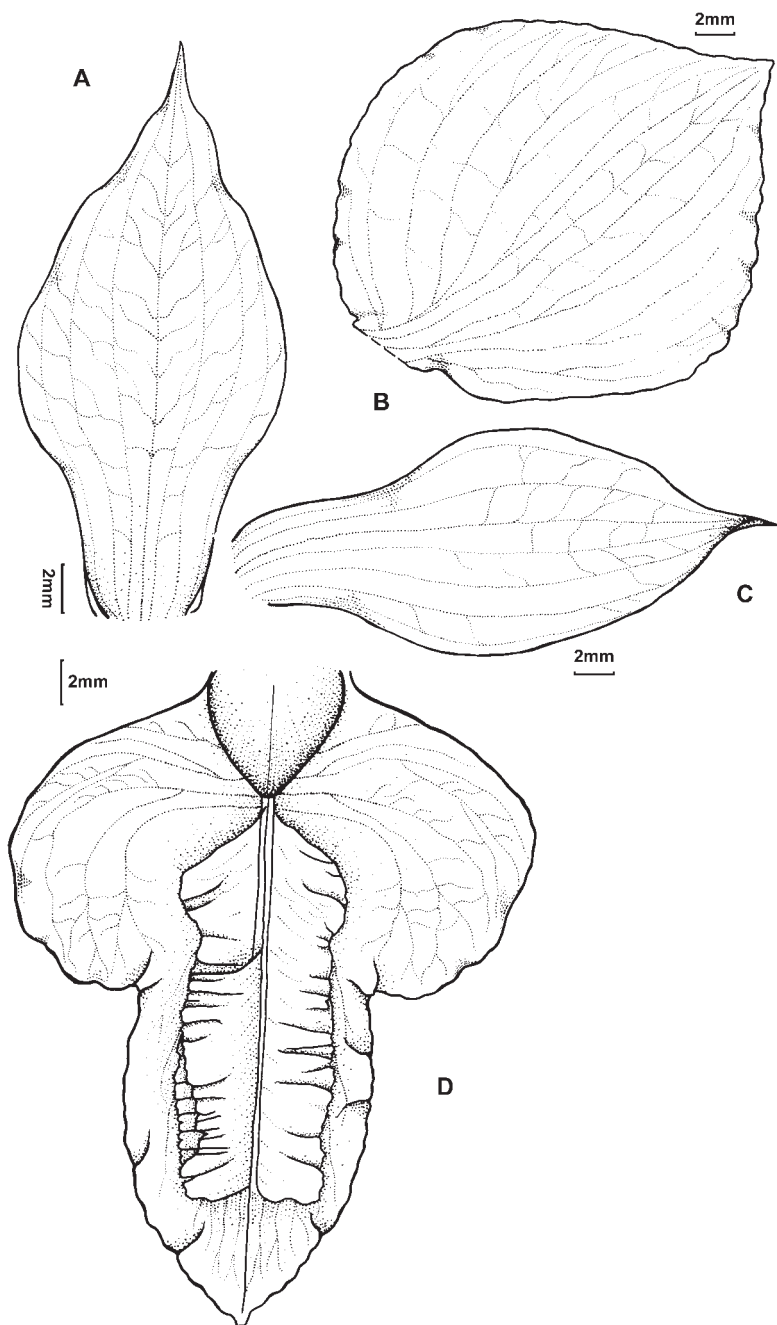


Fig. 151.—*Eulophia horsfallii* (Bateman) Summerh.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by A. Kowalkowska, *Halle* 3855, P).

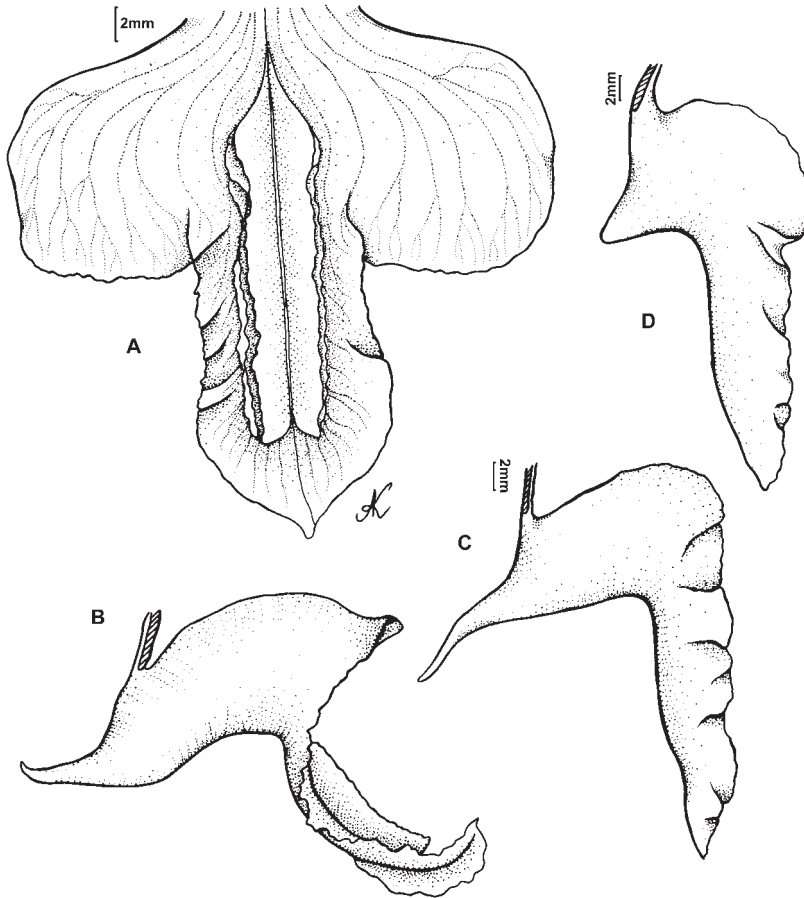


Fig. 152.—*Eulophia horsfallii* (Bateman) Summerh.: A – lip; B-D – various forms of spur and lip, side view (drawn by A. Kowalkowska, A, B – Halle 899, P; C – Letouzey 2148, P; D – Halle 3855, P).

**DISTRIBUTION.** Senegal, Guinea-Bissau, Liberia, Guinea, Ivory Coast, Ghana, Togo, Benin, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, South Africa, Swaziland. Alt. up to 2500 m.

**REPRESENTATIVE SPECIMENS.** Lagune shore near Adiopodoumé, 17 km W of Abidjan, 10 Oct. 1956, *de Wilde* 684 (WAG!); Ca. 20 km N of Abengourou, ca. 200 km NE of Abidjan, 29 Aug. 1963, *de Wilde* 845 (WAG!); 8 km SSE of Aboisso, 3°11'W, 5°25'N, 25 Aug. 1968, *Breteler* 5312 (WAG!); Aboisso-Grand Bassam road, 26 Aug. 1969, *Thijssen* 235 (WAG!); Near Akoupé, NW of Abidjan, 5°15-20'N, 4°10-15'W, 25 May 1972, *Berg* 187 (WAG!); Ayamé, 3°11'W, 5°36'N, 15 Nov. 1967, *Geerling & Bokdam* 1502 (K!, WAG!); Banco, NW of Abidjan, 12 Aug. 1956, *de Wilde* 207 (WAG!); Grand Bassam, Jan. 1897, *Pobéguin* 118 (P!); Ca. 12 km N of Béreby, 14 Nov. 1963, *Oldeman* 662 (K!, WAG!); Bingerville, Feb. 1907, *Clozel in Chevalier* 20 094 (P!); Bouaké, 1 June

1962, *Leeuwenberg* 4270 (WAG!); Cavally, between Bériby and Cabon (Labon), seashore, 20-21 Aug. 1907, *Chevalier* 20027 (P!); Dabou, 9 Sep. 1969, *Thijssen* 363 (WAG!); Danané, 23 June 1926, *Collette* 49 (K!); 18 km NW of Sassandra, 6°15'W, 5°00'N, 26 Feb. 1959, *Leeuwenberg* 2875 (WAG!); Tai, Aug. 1954, *Schnell* 6028 (P!); Tai, Aug. 1954, *Schnell* 6136 (P!); Mt. Tonkoui, 20 July 1975, *Pérez-Vera* 809 (K!); Aug. 1954, *Schnell* 6368 (P!); Yapo, 26 Aug. 1955, *Nozeran s.n.* (P!).

**15. *Eulophia juncifolia* Summerh. in Kew Bull. 12: 78. 1958**

(Fig. 153)

TYPE: GHANA. *Johnson* 1094 (HOLOTYPE: K!)

Leaves 45-75 cm long, up to 5 mm wide, long, grass-like, acuminate, rush-like, almost terete in section, developing with inflorescence. Inflorescence 50-60 cm long, 5-flowered, lax, with few, sheathing cauline bracts. Flowers medium sized, yellow or yellow-green with red veins on the petals. Floral bracts 12 mm long, linear-lanceolate, acuminate, thin. Pedicel and ovary up to 22 mm long, slender, glabrous. Dorsal sepal 6.5-11 mm long, up to 3.5 mm wide, ovate-lanceolate, acute, thin, glabrous. Petals 11-21 mm long, up to 8.5 mm wide, hardly oblique at base, oblong-elliptic, rounded at apex, thin, glabrous, distinctly longer than sepals. Lateral sepals 6.5-11 mm long, up to 5 mm wide, obliquely elliptic-ovate or oblong-ovate, acute, thin, glabrous. Lip 13 mm long and wide, rather thin, with 5-7 rather low, slightly thickened ridges on the middle lobe, distinctly 3-lobed near the middle; the middle lobe 10 mm long, 8.5 mm wide, ovate to oblong-elliptic, rounded at apex, somewhat undulate on margins;

sidelobes up to 4 mm long, obliquely obovate, somewhat undulate on apical margins, rounded at apex. Spur 3-7.5 mm long, saccate, blunt, up-curved or not. Gynostemium 10 mm long.

**HABITAT.** Terrestrial in savanna. July-October.

**DISTRIBUTION.** Guinea-Bissau, Ivory Coast, Ghana, Cameroon.

**REPRESENTATIVE SPECIMENS.**

Baoulé-Nord, between Langouassou and Fétékro, 26 July 1909, *Chevalier* 22156 (P!); Baoulé, 9 Apr. 1897, *Pobeguín* 119/115 (P!); Biafla, Bouaflé-Grüfro road, 15 July 1975, *Pérez-Vera* 799 (P!); Near Gansé, 3°55'W, 8°38'N, 11 Aug. 1967, *Geerling & Bokdam* 687 (K!, WAG!); Mankono, Between Dialakoro and Kénégoué, 1 July 1909, *Chevalier* 21977 (P!); Priakakro, 5 Oct. 1973, *Audru* 5266 (P!); Séguéla-Touba road (km 10), 20 July 1974, *Pérez-Vera* 680 (K!); *Sine loc.*, 1937, *Scäetta* 3052 (P!).

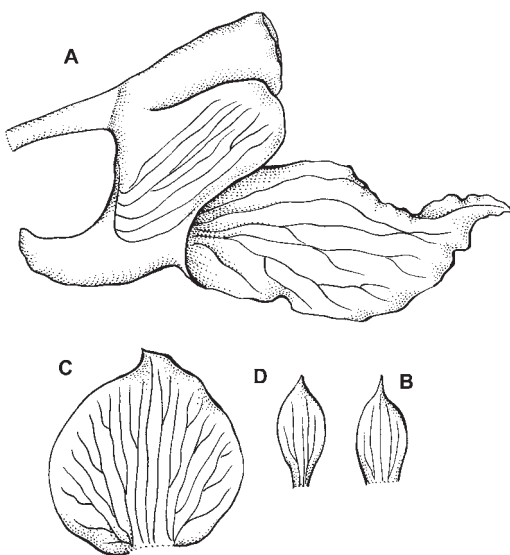


Fig. 153.—*Eulophia juncifolia* Summerh.: A – lip and spur; B – dorsal sepal; C – petal; D – lateral sepal (redrawn by J. Mytnik-Ejsmont from Summerhayes' original drawing kept at K).

**16. *Eulophia leonensis*** Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 51. 1898 (Fig. 154)

TYPE: SIERRA LEONE. *Scott Elliot 5536* (HOLOTYPE: K!)

Perennating organs underground, 2-3 cm long, 2 cm in diameter, pseudobulbous, more or less conical. Leaves 3-5, 8-28 cm long, 3-6.5 cm wide, elliptic to elliptic-lanceolate, acute to acuminate, plicate, rather erect. Inflorescence 30-60 cm tall, densely many-flowered, produced before or with young leaves, peduncle with 3-6 sheathing cauline bracts. Flowers rather small to medium-sized, pendent, sepals greenish purple, petals and lip greenish yellow. Floral bracts 4-9 mm long, linear, acuminate. Pedicel and ovary 10-15 mm long, slender. Dorsal sepal 4.5-9 mm long, 2.3-3 mm wide, oblong-obovate or oblanceolate, obtuse to acute. Petals 4.5-6 mm long, 4-5.3 mm wide, broadly ovate to elliptic, obtuse. Lateral sepals 4.5-9 mm long, 2.3-3 mm wide, obliquely oblong-obovate to oblanceolate, obtuse to acute. Lip 4.5-5.5 mm long, 5.2-6 mm wide, callus of 5 fleshy, verrucose ridges running from the base nearly to the apex, distinctly trilobed; the middle lobe 3-3.5 mm long, 2-2.5 mm wide, oblong, acute; sidelobes obliquely rhomboid to obovate, rounded. Gynostemium 2-2.5 mm long.

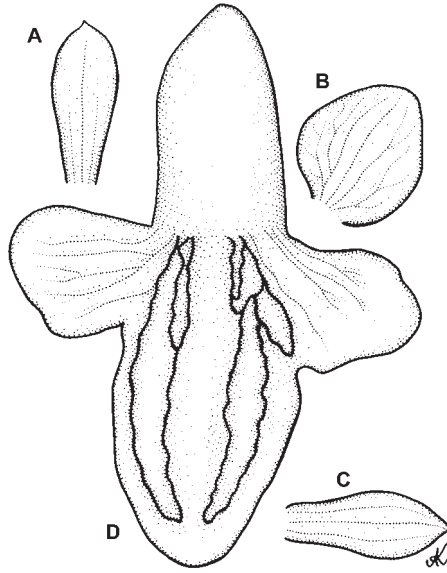


Fig. 154.—*Eulophia leonensis* Rolfe: A – dorsal sepal; B – petal; C – lateral sepal; D – lip and spur (redrawn by A. Kowalkowska from Summerhayes' original drawing kept at K, *Chevalier 12942*).

HABITAT. Terrestrial or lithophyte in short grasslands and on rocky hillsides.

DISTRIBUTION. Gambia, Guinea, Ivory Coast, Guinea-Bissau, Sierra Leone, Nigeria, Central African Republic, Uganda. Alt. 1000-1500 m.

NOTES. This species has been recorded from Odienné by Cribb & Pérez-Vera (1975, *Aké Assi 11767* collection). I have seen no material from Ivory Coast.

**17. *Eulophia milnei*** Rchb. f. in Otia Bot. Hamburg. 2: 116. 1881 (Fig. 155)

TYPE (*here designated*): EQUATORIAL GUINEA. *Milne s.n.* (LECTOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Eulophia warneckeana* Kraenzl. in Bot. Jahrb. Syst. 33: 67. 1902; TYPE: TOGO or CAMEROON? *Warnecke 328* (HOLOTYPE: HBG!; ISOTYPE: BM!; DRAWING: UGDA-DLSz)

*Eulophia pusilla* Rolfe in Bull. Misc. Inform. Kew. 1914: 212. 1914; TYPE: GHANA. *Burbridge 245* (HOLOTYPE: BM!)

Perennating organs subterranean, 1-1.3 cm long, 0.8-1 cm in diameter, ovoid, tuberous. Leaves 2-6, 10-30 cm long, 1-2 mm wide, linear, acuminate, erect, plicate. Inflorescence 25-52 cm tall, laxly or rather densely few- to many-flowered, produced before leaves, peduncle erect, with 3-5 sheathing cauline bracts. Flowers small, subnutant, yellow, sometimes with lip sidelobes reddish tinged. Floral bracts up to 10 mm long, linear-lanceolate, acuminate. Pedicel and ovary 5-8 mm long, slender, glabrous. Dorsal sepal 5.5-8.5 mm long, 2.3-3 mm wide, oblong-lanceolate to oblong-ovate, acute or obtuse, thin, glabrous, delicate. Petals 5.5-8 mm long, 2.3-3 mm wide, oblanceolate to oblong-obovate, subacute to obtuse, thin, glabrous, delicate. Lateral sepals 5.5-9.5 mm long, 2-3 mm wide, oblong-lanceolate to oblong-obovate, slightly oblique, obtuse to shortly acuminate, thin, glabrous, delicate. Lip 4.7-7 mm long, 3.5-4.5 mm wide, thin, delicate, callus of 2 basal ridges and many fleshy papillae above, distinctly trilobed above the middle; the middle lobe 2-3 mm long, 1.7-2.5 mm wide, subquadrate, oblong-obovate, truncate, irregularly denticulate along margins; sidelobes obliquely oblong to obovate, rounded or obtuse. Spur 2.5-3.5 mm long, cylindric, blunt, perpendicular to the lip. Gynostemium 2-2.7 mm long.

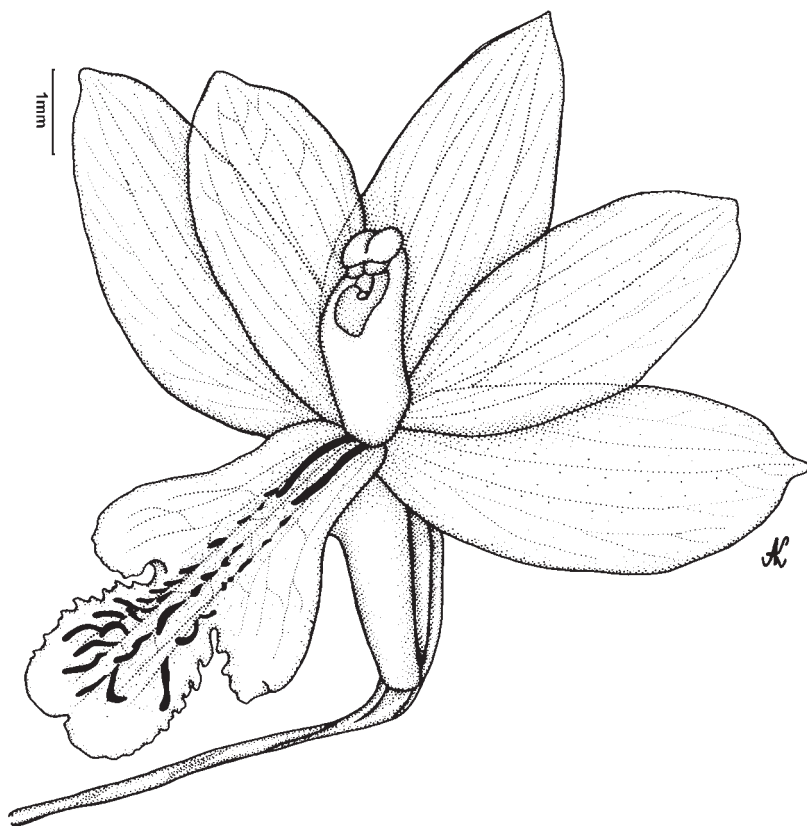


Fig. 155.—Flower of *Eulophia milnei* Rehb. f. (drawn by A. Kowalkowska, *Warnecke* 328, HBG).

**HABITAT.** Terrestrial in seasonally wet grasslands, marshes, swamps. Usually January-March.

**DISTRIBUTION.** Senegal, Guinea-Bissau, Ivory Coast, Guinea, Liberia, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire), Angola, Sudan, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa. Alt. 960-2000 m.

**REPRESENTATIVE SPECIMENS.** Boundiali-Khorogo road (km 62), 21 July 1974, *Pérez-Vera 694* (K!); 45 km NE of Dabakala, 4°08'W, 8°34'N, 13 Feb. 1968, *Geerling & Bokdam 2024* (WAG!); 8 km NE of Gué Auto, 4°14'W, 9°18'N, 8 Mar. 1968, *Geerling & Bokdam 2164* (WAG!); Lamto, 14 Jan. 1964, *Portères 675* (P!); Ouossou (Ousson), Toumodi road, Oct. 1896, *Pobèguin 139b* (P!); Ouossou, *Scaëtta s.n.* (P!); Séguéla-Maukono (Mankono) road (km 11), Kediouni, 27 Jan 1974, *Pérez-Vera 242* (K!, P!); Yúale, Vavoua-Séguéla road (km 20), 17 Feb. 1974, *Pérez-Vera 580* (K!, P!); Zoakro, 9 Mar. 1972, *Aké Assi 11668* (K!).

**18. *Eulophia monile* Rchb. f. in Flora 50: 105. 1867**  
(Fig. 156)

**TYPE** (*here designated*): ANGOLA. *Welwitsch 709* (ISCNOTYPE: BM!)

*Eulophia norlindhii* Summerh. in Bot. Not. 1937: 197. 1937; **TYPE**: ZIMBABWE. *Fries, Norlindh & Weimarck 3267a* (HOLOTYPE: K!)

Perennating organs underground, 3.3-4 cm long, 1.3-2 cm in diameter, tuberous, cylindrical or ellipsoid. Leaves 2-7, up to 10 cm long, 4-5 mm wide, linear, acuminate, plicate, erect, vestigial. Inflorescence 10-38 cm tall, 7-20-flowered, dense to rather lax, produced before leaves, peduncle erect, glabrous with few sheathing cauline bracts. Flowers small, spreading to sub-nutant, sepals yellow-green to brown, petals yellow-green, lip white with a pale green callus and sidelobes, spur brown. Floral bracts 4-7 mm long, lanceolate, acuminate. Pedicel and ovary 7-9 mm long, slender, glabrous. Dorsal sepal 7-10 mm long, 1 mm wide, linear to linear-lanceolate, acute, glabrous, thicker than petals. Petals 6-9



Fig. 156.—Flower of *Eulophia monile* Rchb. f. (drawn by J. Mytnik-Ejsmont, *Welwitsch 709*, W-R).



mm long, 1-2 mm wide, hardly falcate, linear-lanceolate to narrowly lanceolate, acute to shortly acuminate, delicate, thin, glabrous. Lateral sepals 7-10 mm long, 1 mm wide, linear, acute, glabrous. Lip 6-8.5 mm long, 2.5-4 mm wide, thin, delicate, callus of 3 ridges running from the base nearly to the apex of mid-lobe, irregularly denticulate-cristate in the apical third; distinctly 3-lobed in the two-third or three-quarter; the mid-lobe up to 3 mm long and 2.2 mm wide, oblong-elliptic or oblong-obovate, obtuse, margins entire, distinctly undulate. Spur 2-2.5 mm long, clavate, distinctly swollen towards the apex, blunt, straight. Gynostemium 2.5-3 mm long.

HABITAT. Terrestrial in savanna. May.

DISTRIBUTION. Ivory Coast, Central African Republic, Democratic Republic of Congo (Zaire), Angola, Tanzania, Zambia, Malawi, Mozambique, Zimbabwe. Alt. 870-1900 m.

REPRESENTATIVE SPECIMENS. Bondoukou, *Aké Assi* 8695 (K!); Between Kiemou and Dalambo, 16 May 1984, *César-Dulieu* 1 (P!).

# **19. *Eulophia odontoglossa* Rchb. f. in Linnaea 19: 373. 1846**

(Fig. 157)

TYPE (*here designated*): REPUBLIC OF SOUTH AFRICA. *Gueinzus s.n.* (LECTOTYPE: W-R!; ISOTYPE: W!; DRAWING: UGDA-DLSz)

*Cyrtopera shupangae* Rchb. f. in Otia Bot. Hamburg. 2: 116. 1881; TYPE (*here designated*): MOZAMBIQUE. *Kirk s.n.* (LECTOTYPE: K!; ISOLECTOTYPE: W-R!; DRAWING: UGDA-DLSz). - *Eulophia shupangae* (Rchb. f.) Kraenzl. ex Gilg. in Pflanzenw. Ost-Afrikas C: 157. 1895.

*Eulophia ochracea* Schltr. in Bot. Jahrb. Syst. 53: 583. 1915; TYPE: TANZANIA. *Stolz 1054* (HOLOTYPE: B†; ISOTYPE: K!)

*Eulophia graciliscapa* Schltr. in Bot. Jahrb. Syst. 24: 418. 1897; TYPE: MALAWI. *Wood 5916* (HOLOTYPE: B†; FRAGMENT OF HOLOTYPE, DRAWING, PHOTO: K!)

*Eulophia aurea* Kraenzl. in Bull. Herb. Boissier 5: 635. 1897; TYPE: MOZAMBIQUE OR MOZAMBIQUE. *Junod 187* (HOLOTYPE: Z; PHOTO: K!)

*Eulophia propinqua* Hutch. in Bull. Misc. Inform. Kew. 1921: 401. 1921; TYPE: NIGERIA. *Lely 353* (HOLOTYPE: K!)

*Eulophia missionis* Rendle in J. Bot. 33: 168. 1895; TYPE: MALAWI. *Scott Elliot 8618* (HOLOTYPE: BM!; ISOTYPE: K!)

Perennating organs subterranean, 2-4 cm long, 1.8-2.5 cm in diameter, tuberous, subglobose or fusiform-conical. Leaves 5-6, 40-100 cm long, 1-3.5 cm wide, oblanceolate, acuminate, plicate, erect. Inflorescence 60-100 cm tall, densely 10-30-flowered, peduncle erect, glabrous, covered by 3-7 sheathing cauline bracts. Flowers small, yellow with yellow, orange, red papillae on lip, rarely brown or crimson. Floral bracts up to 2.5 cm long, linear-aristate. Pedicel and ovary 12-21 mm long, slender, glabrous. Dorsal sepal 9.3-12 mm long, 4-5.8 mm wide, ovate-elliptic to ovate, shortly acuminate or obtuse, thin, glabrous. Petals 8-12 mm long, 3.3-5 mm wide, obliquely elliptic, obtuse to shortly apiculate, thin, glabrous. Lateral sepals 9-14 mm long, 3.8-5.3 mm wide, slightly obliquely ovate, acute to shortly apiculate. Lip 8-11.5 mm long, 4-8 mm wide, thin, delicate, with 2 fleshy, ridges in the lower half or just in the centre, elevated at their tips, distinctly trilobed near the middle; middle lobe 3.5-4.5 mm long, 3.5 mm wide, subquadrate to oblong-elliptic or obcordate, margins irregularly denticulate, rather densely covered by long papillae in the centre or entirely. Spur 1-3.2 mm

long, shortly conical. Gynostemium 4-5 mm long.

**HABITAT.** Terrestrial in grasslands, bushlands, savanna with *Daniellia oliveri* Hutchinson & Dalziel., *Terminalia macroptera* Guill. & Perr. and *Lophira lanceolata* Tiegh., savanna with *Hyparrhenia* sp., *Landetia* sp. and Cyperaceae, sometimes lithophyte in rocky area. July-September.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Ghana, Nigeria, Cameroon, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Ethiopia, Rwanda, Burundi, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa, Swaziland. Alt. 300-2350 m.

**REPRESENTATIVE SPECIMENS.** Baoulé-Nord, Mt.

Kangoroma, near Fétékro, 27 July 1909, *Chevalier* 22175 (P!); Baoulé, Sep. 1896, *Pobéguin* 113 (P!); Nimba Mts., *Boughey* GC 18155 (K!).

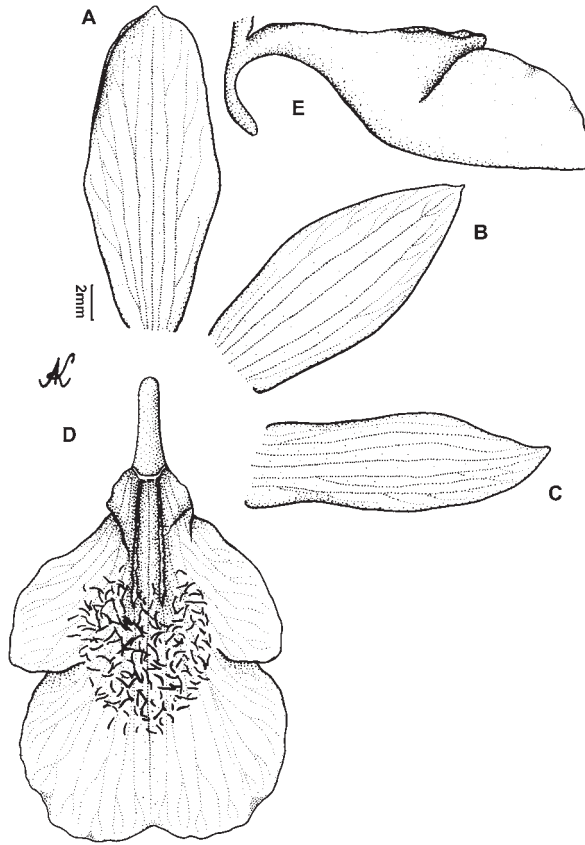


Fig. 157.—*Eulophia odontoglossa* Rchb. f.: A — dorsal sepal; B — petal; C — lateral sepal; D — lip; E — lip and spur (drawn by A. Kowalkowska, *Koechlin* 5302, P).

**20. *Eulophia orthoplectra* (Rchb. f.) Summerh. in Kew Bull. 1939: 499. 1939 (Fig. 158)**

*Lissochilus orthoplectrus* Rchb. f. in *Otia Bot. Hamburg.* 1: 63. 1878; TYPE: SUDAN. *Schweinfurth* 3270 (HOLOTYPE: W-R!; DRAWING: K!)

*Lissochilus mechowii* Rchb. f. in *Otia Bot. Hamburg.* 1: 75. 1878; TYPE: ANGOLA. *Mechow* 264 (ICONOTYPE a voucher?: K!)

*Lissochilus milanjanus* Rendle in *Trans. Lin. Soc., Bot., ser. 2, 4:* 46. 1894; TYPE: MALAWI. *Whyte s.n.* (HOLOTYPE: BM!)

*Lissochilus monticolus* Rendle in *J. Bot.* 33: 172. 1895; TYPE: UGANDA. *Scott Elliot* 7552 (HOLOTYPE: BM!; ISOTYPE: K!)

*Lissochilus kraenzlinii* Rolfe in *Oliver & al. (eds.), Fl. Trop. Afr.* 7: 97. 1897; TYPE: TANZANIA, Shira. *Volkens* 1617 (HOLOTYPE: BM!)

*Lissochilus pulcher* Schltr. in Bot. Jahrb. Syst. 53: 592. 1915; TYPE: TANZANIA. *Stolz 1381* (HOLOTYPE: B†; ISOTYPE: K!)

*Lissochilus saccatus* Rendle in J. Bot. 33: 172. 1895; TYPE: KENYA. *Scott Elliot 6988* (HOLOTYPE: K!; FRAGMENT OF HOLOTYPE: BM!)

*Eulophia bella* N.E. Br. in Gard. Chron. 2: 210. 1889; TYPE: MALAWI. *O'Brien s.n.* (HOLOTYPE: K!)

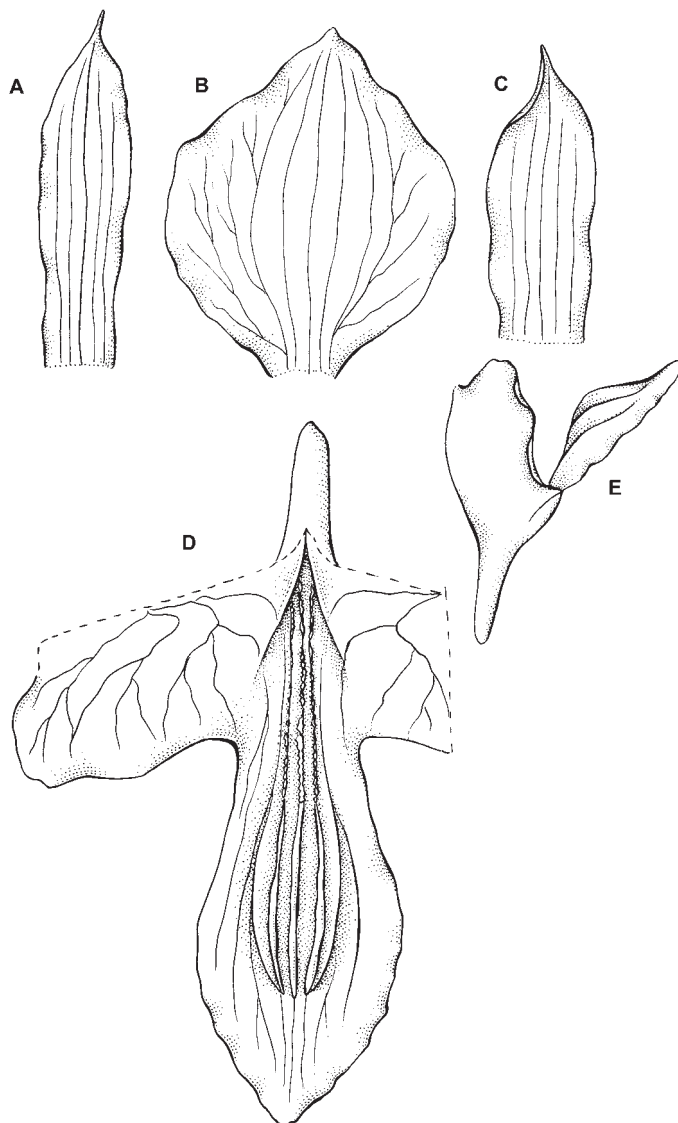


Fig. 158.—*Eulophia orthoplectra* (Rchb. f.) Summerh.: A — dorsal sepal; B — petal; C — lateral sepal; D, E — lip various views (drawn by J. Mytnik-Ejsmont, *Schweinfurth 3290*, W-R).

Perennating organs underground, 3.5-6 cm long, 2-5 cm in diameter, tuberous, more or less ovoid-fusiform, dorsoventrally flattened. Leaves 2-4, 18-50 cm long, 0.7-2 cm wide, linear, acuminate, rather fleshy. Inflorescence 60-100(200) cm tall, laxly 6-20-flowered, produced before leaves, peduncle with 4-6 sheathing cauline bracts. Flowers medium-sized, suberect, showy, sepals red-brown, petals yellow, red-brown within and red-veined, lip yellow with red-veined side-lobes, spur brown. Floral bracts 6-12 mm long, linear-lanceolate, acuminate. Pedicel and

ovary 10-19 mm long, slender, glabrous. Dorsal sepal 8.5-12.5 mm long, 3.8-6.3 mm wide, oblanceolate to lanceolate-ovate, acuminate to apiculate. Petals 12-17.5 mm long, 13-19 mm wide, elliptic-orbicular or orbicular-ovate, oblique, acute to apiculate. Lateral sepals 8.5-13 mm long, 3.8-6.2 mm wide, obliquely oblong-ovate to ovate-elliptic, apiculate to acuminate. Lip 11-20 mm long, up to 23 mm wide, rather thick, distinctly 3-lobed, sidelobes upcurved, the middle one straight; middle lobe up to 12 mm long and 8.5 mm wide, obovate, acute, with 5 very thick, fleshy and glabrous ridges, slightly decreasing in size and thickness towards the base; sidelobes obovate-rhomboid, rounded. Spur 13-16 mm long, conical-cylindrical in apical half, acute, mouth very broad. Gynostemium 7-8 mm long.

**HABITAT.** Terrestrial in grasslands, wooded grasslands, swamps and *Brachystegia* sp. woodlands, savanna with *Terminalia glaucescens* Plantch. ex Benth. April, July.

**DISTRIBUTION.** Ivory Coast, Ghana, Togo, Nigeria, Chad, Cameroon, Central African Republic, Democratic Republic of Congo (Zaire), Angola, Sudan, Ethiopia, Uganda, Rwanda, Burundi, Kenya, Tanzania, Malawi, Zambia, Zimbabwe, Mozambique.

**REPRESENTATIVE SPECIMENS.** Bianfla, *Aké Assi 9092* (K!); Between Man and Séguéla, Apr. 1954, *Schnell 6402* (P!); Zoukoussi, Lamto, 8 July 1985, *le Thomea & Devoin 32* (P!).

**21. *Eulophia schweinfurthii* Kraenzl. in Bot. Jahrb. Syst. 17: 54. 1893 (Fig. 159)**

**TYPE:** TANZANIA. *Schweinfurth?* (HOLOTYPE: B†; DRAWING: K!)

*Lissochilus aurantiacus* Rehb. f. in Flora 48: 187. 1865; **TYPE:** ANGOLA. *Welwitsch 691* (HOLOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Eulophia chrysops* Summerh. in Kew Bull. 1958: 78. 1958; **TYPE:** ANGOLA. *Welwitsch 691* (HOLOTYPE: K!; ISOTYPE: BM!)

*Lissochilus descampsi* De Wild. in Bull. Jard. Bot. Etat. 6: 81. 1919; **TYPE:** DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Descamps s.n.* (HOLOTYPE: BR; ISOTYPE: K!)

Perennating organs 3.5-5 cm long, 1.3-2.5 cm diameter, underground, creeping, thick, fleshy, irregularly constricted, ivory-white. Leaves 4-7, 21-38 cm long, 0.25-1 cm wide, in a fan, slightly succulent, conduplicate when young, linear, acuminate. Inflorescences 1-2, 45-110 cm tall, produced before the leaves; peduncle with 5-6 papery sheaths along length, lowermost 2 basal; rachis 7-23 cm long. Flowers fleshy; sepals purplish, olive to bronze, petals yellow outside, pale brownish red inside with red veins, lip yellow with pale purplish sidelobes and a purplish margin to the mid-lobe. Floral bracts 4-15 mm long, linear-lanceolate, acuminate. Pedicel and ovary 10-20 mm long. Dorsal sepal 9-10.6 mm long, 3.5-6 mm wide, reflexed, oblong, apiculate; lateral sepals similar. Petals 11.5-16.5 mm long, 9.5-17 mm wide, broadly ovate or subcircular, acute or obtuse. Lip 3-lobed, 14-16 mm long, 19-21 mm wide, callus of 3-5 verrucose ridges to apex on mid-lobe; middle lobe 7-12 mm long, convex, elliptic; lateral lobes erect, rounded. Spur 8-9 mm long, upcurved-conical.

**HABITAT.** Terrestrial among low thorn-shrubs. Very slightly undulating country with scattered low bushes of *Acacia* sp. and *Clerodendrum* sp. July.

**DISTRIBUTION.** Ivory Coast, Sudan, Ethiopia, Democratic Republic of Congo

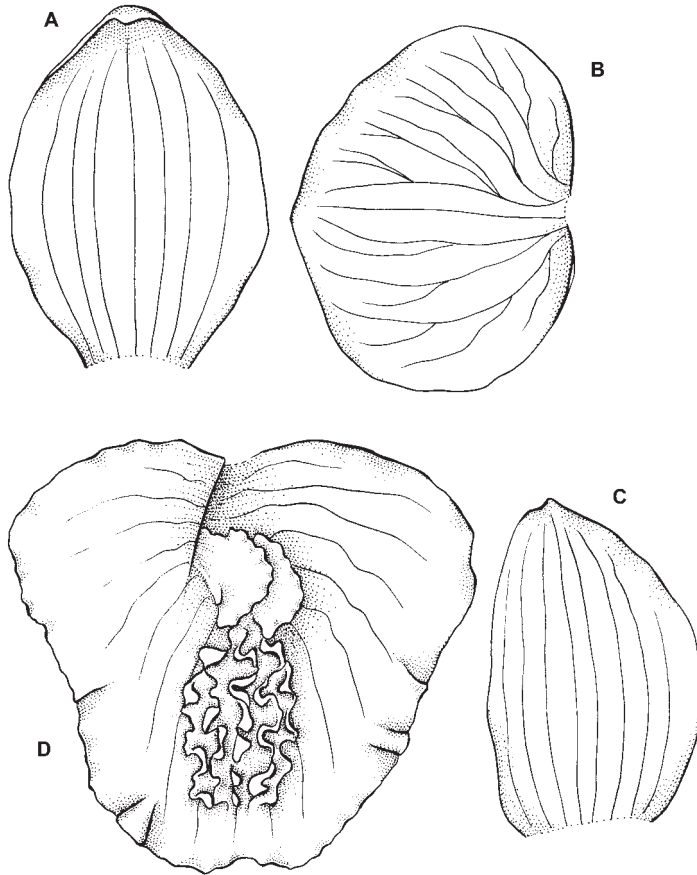


Fig. 159.–*Eulophia schweinfurthii* Kraenzl.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by J. Mytnik-Ejsmont, *Schweinfurth 3776*, W-R).

(Zaire), Angola, Uganda, Kenya, Tanzania, Zambia, Malawi, Mozambique, Zimbabwe and Botswana. Alt. 1600 m.

REPRESENTATIVE SPECIMENS. Lamto, 6°15'N, 5°31'W, 11 July 1968, *Breteler 5258* (K!, P!, WAG!).

**22. *Eulophia sordida* Kraenzl. in Bot. Jahrb. Syst. 33: 67. 1902 (Fig. 160)**

TYPE: CAMEROUN. *Warnecke 95* (HOLOTYPE: HBG!; FRAGMENT OF HOLOTYPE, PHOTO, DRAWING: BM!, K!; DRAWING: UGDA-DLSz)

Flowers small, yellow and brownish. Pedicel and ovary 15 mm long, slender, glabrous. Dorsal sepal 5 mm long, 1.8 mm wide, oblong-oblancoate, acute to shortly apiculate, glabrous, rather fleshy, delicate. Petals 6 mm long, 2.9 mm

wide, obliquely ovate to oblong-ovate, obtuse, rather fleshy, delicate, glabrous. Lateral sepals 5 mm long, 1.9 mm wide, obliquely oblong-oblongeolate, hardly falcate, acute, rather fleshy, delicate, glabrous. Lip 5.5 mm long, 3.3 mm wide, slightly convex in the centre, callus of 3 rows of fleshy, irregular knob-like appendages in the lower part, distinctly 3-lobed below the middle; middle lobe 3 mm long, 2.5 mm wide, elliptic, rounded at apex, cucullate, with callus of 3 rows of obscure thickenings in the centre; side-lobes obliquely oblong-ovate, obtuse. Spur 0.7 mm long, cylindrical-conical, blunt, perpendicular to the lip.

HABITAT. No information. April.

DISTRIBUTION. Ivory Coast, Ghana, Togo, Nigeria, Cameroon.

REPRESENTATIVE SPECIMENS. Daloa-Zuénoula road, 19 Apr. 1974, Pérez-Vera 558 (K!, P!).

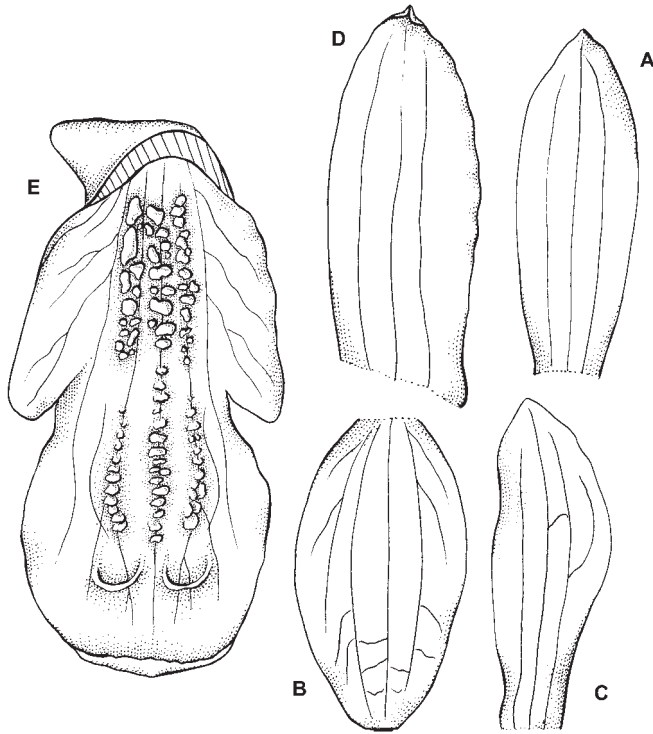


Fig. 160.—*Eulophia sordida* Kraenzl.: A — dorsal sepal; B, C — petal; D — lateral sepal; E — lip (drawn by A. Kowalkowska, Warnecke 95, HBG).

**38. Graphorkis** Thouars in Nouv. Bull. Sci. Soc. Philom. Paris 1: 318. 1809

*Eulophiopsis* Pfitzer, Entw. Nat. Anordn. Orch.: 105. 1887

Epiphytic medium-sized plants. Pseudobulbs clustered, conical-ovoid to fusiform, several-noded, partially covered by leaf-bases. Leaves narrowly elliptic to oblanceolate, petiolate, plicate. Inflorescence lateral, erect, branching, multi-flowered. Flowers small or medium-sized. Sepals and petals subsimilar, spreading. Lip trilobed, with 2 keels in the basal part, spurred. Spur narrowly cylindrical, usually bent forward. No prominent column foot. Gynostemium arcuate. Anther incumbent, operculate, 2-chambered. Connective thick, fleshy. Pollinia 2,

ellipsoid or ovoid, cleft. Caudicles sticky. Stigma deeply concave, entire. Rostellum beak-like, elongate. Tegula single, thin, short, more or less ovoid in general outline. Viscidium single, elliptic, thin. Rostellum remnant notched (Fig. 161).

The genus embraces a sole species widely distributed in tropical and South Africa and five other in Madagascar and the Mascarene Island.

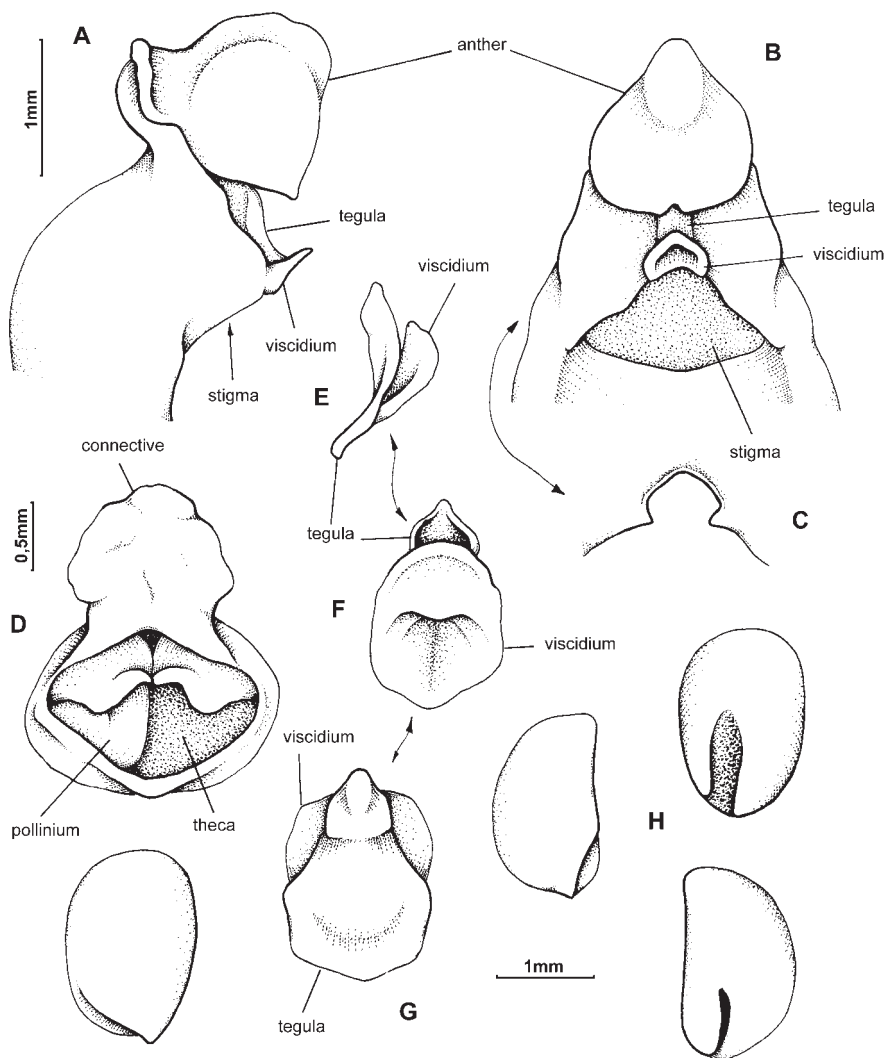


Fig. 161.—Gynostemium structure of *Graphorkis* Thouars: A – gynostemium side view; B – gynostemium bottom view; C – rostellum remnant; D – anther; E–G – tegula and viscidium various views; H – pollinia various views (Szlachetko 2003).



1. **Graphorkis lurida** (Sw.) O. Kuntze in Revis. Gen. Pl. 2: 662. 1891  
(Fig. 162)

*Limodorum luridum* Sw. in Neues J. Bot. 1: 87. 1805; TYPE: SIERRA LEONE. *Afzelius* s.n. (LECTOTYPE: UPS). - *Eulophia lurida* (Sw.) Lindl. in Gen. Sp. Orchid. Pl.: 182. 1833. - *Eulophiopsis lurida* (Sw.) Schltr. in Orchideen: 348. 1914

Pseudobulbs 3-9 cm long, 1-3 cm in diameter, 3-5-noded, usually oblong-ovoid, sometimes conical-ovoid or fusiform, 4-6-leaved. Leaves up to 40 cm long, 1.5-4 cm wide, oblanceolate to narrowly elliptic, acute to acuminate, thin-textured, plicate, gradually tapering towards base. Inflorescence up to 50 cm long, basal, erect to arcuate, paniculate, rather lax, many-flowered. Flowers small, spread, resupinate; sepals purple to brown outside, pale green inside, petals pale green or cream flushed purple or brown, lip middle lobe yellow, sidelobes greenish yellow. Dorsal sepal 5-6.5 mm long, 1.5-2 mm wide, oblong-ovate to oblong-spathulate, obtuse. Petals 4-6 mm long, 2.5-3 mm wide, oblong-elliptic to oblong-spathulate, subacute to subobtuse. Lateral sepals 5-6.5 mm long, 1.5-2 mm wide, obliquely oblong to oblong-spathulate, subobtuse to subacute. Lip 5-6 mm long, 3



Fig. 162.—*Graphorkis lurida* (Sw.) O. Kuntze: A, F — pedicel, ovary, gynostemium and lip, side view; B, G — dorsal sepal; C, H — petal; D, and — lateral sepal; E, J — lip and spur (drawn by A. Kowalkowska, A-E — Braun s.n., HBG; F-J — Mynard s.n., P).

mm wide, canaliculate, 2 fleshy keels near the base, trilobed near the middle; the middle lobe broadly obovate in general outline, more or less bifid at apex; side-lobes obliquely ovate to elliptic, rounded, divergent. Spur 3-4 mm long, cylindrical, blunt, bent forward.

**HABITAT.** Epiphyte in forests, *Berlinia* sp. forest with *Uapaca* sp., *Syzygium* sp., *Ixora* sp., often on palms, especially *Hyphaene* sp., *Elaeis guineensis* A. Chev. December-January, August.

**DISTRIBUTION.** Senegal, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Equatorial Guinea (Bioko, Río Muni), Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda, Burundi, Tanzania. Zambia. Alt. 150-1300 m.

**REPRESENTATIVE SPECIMENS.** Abidjan, Anguedou, 7 Jan. 1975, *De Koning 5119* (WAG!); Bouroukrou, 9 Jan. 1907, *Chevalier 16916* (P!); Lamto, 14 Jan. 1963, *Portères 293* (P!); Lièpleu, 24 Dec. 1974, *Pérez-Vera 588* (K!, P!); Yapo, ca. 4 km S of Bécédi-Brignan, 6 Aug. 1963, *Oldeman 245 p.p.* (K!); *Oldeman 246* (WAG!).

### 39. *Oeceoclades* Lindl. in Edwards's Bot. Reg. 18: tab. 1522. 1832

*Aceoclades* Duch. in Orbigny, Dict. 9: 170. 1849

*Eulophidium* Pfitzer in Entw. Nat. Anordn. Orch.: 87. 1887

Terrestrial or epiphytic small to medium-sized plants. Pseudobulbs close to each other, 1-noded, ovoid to fusiform. Leaves 1-3, at the apex of pseudobulbs, usually petiolate, duplicate, lanceolate, elliptic or oblong. Inflorescence at the base of the pseudobulbs, unbranched, erect, usually many-flowered. Flowers small. Sepals and petals dissimilar in size and shape, more or less spreading. Lip trilobed, with 1 or 2 quadrate or triangular calli at the base, spurred. Spur cylindrical, pendent. Column foot short, massive, prominent. Gynostemium rather massive, arcuate. Anther incumbent, operculate, 2-chambered. Connective inconspicuous. Pollinia 2, semi-ellipsoid, cleft. Caudicles sticky. Stigma entire, deeply concave. Rostellum elongate. Tegula single, thin, oblong. Viscidium single, thin, rotundate. Rostellum remnant notched (Fig. 163).

A genus of about 30 species widely distributed in tropical and subtropical Africa, Madagascar, the Mascarene Islands, Seychelles, Australasia, the Pacific Islands, South America, the Bahamas and the West Indies.

#### KEY TO THE SPECIES

1. Pseudobulbs ovoid, 1-leaved. Lip with 2 divergent keels at the base ..... **1. *O. maculata***  
 – Pseudobulbs narrowly cylindrical, 2-3-leaved. Lip without or with a central single callus ..... **2**
2. Inflorescence shorter than leaves. Lip ecallose ..... **3. *O. ugandae***  
 – Inflorescence longer than leaves. Lip with a single callus ..... **2. *O. saundersiana***

**1. *Oeceoclades maculata* (Lindl.) Lindl. in Gen. Sp. Orchid. Pl.: 237. 1833**  
 (Fig. 164)

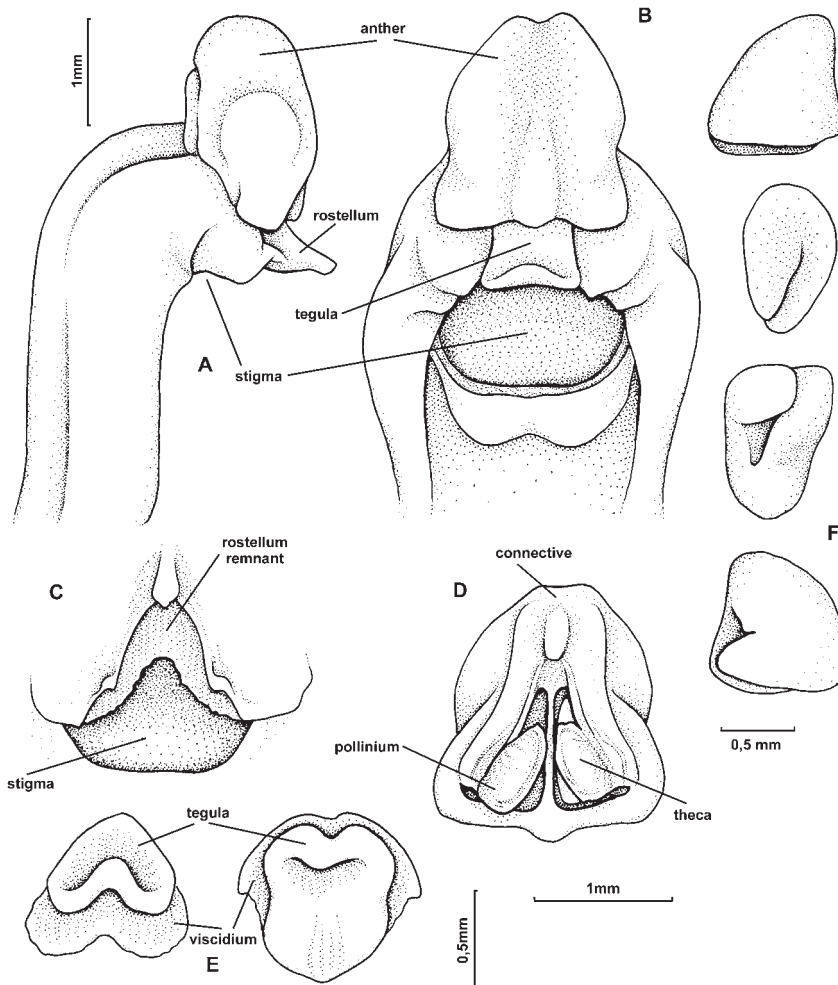


Fig. 163.—Gynostemium structure of *Oeceoclades* Lindl.: A – gynostemium side view; B – gynostemium bottom view; C – rostellum remnant; D – anther; E – tegula and viscidium various views; F – pollinia various views (Szlachetko 2003).

*Angraecum maculatum* Lindl. in Coll. Bot. Append., t. 15. 1821 (May); TYPE: BRAZIL. *Loddiges* 34.10.16. (HOLOTYPE: BM!). - *Aerobion maculatum* (Lindl.) Spreng. in Syst. Veg. 3: 718. 1836. - *Eulophia maculata* (Lindl.) Rchb. f. in Ann. Bot. Syst. 6: 647. 1863. - *Eulophidium maculatum* (Lindl.) Pfitzer in Entw. Nat. Anordn. Orch.: 88. 1887. - *Graphorkis maculata* (Lindl.) Kuntze in Rev. Gen. Pl. 2: 662. 1891

*Eulophidium warnekeanum* Kraenzl. in Bot. Jahrb. Syst. 33: 70, 1902; TYPE: TOGO *Warnecke* 196. (HOLOTYPE: B†; DRAWING: K!)

*Eulophidium nyassanum* Schltr. in Bot. Jahrb. Syst. 53: 593. 1915; TYPE (*here designated*): TANZANIA. *Stolz* 1466 (LECTOTYPE: B†; ISOLECTOTYPES: K!, W!) & 1909 (PARATYPES: B†, K!, W!)

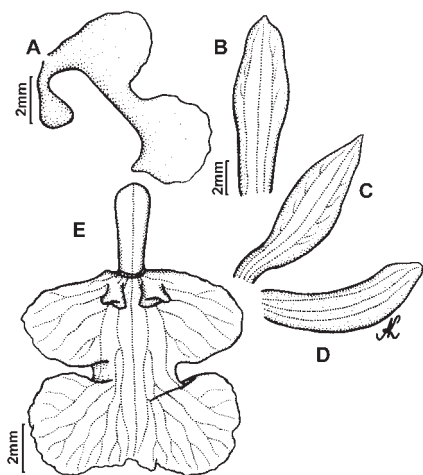


Fig. 164.—*Oeceoclades maculata* (Lindl.) Lindl.: A – lip and spur, side view; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by A. Kowalkowska, Tisserant 2075, P).

Pseudobulbs 2–4 cm long, up to 3 cm in diameter, usually ovoid, but sometimes cylindrical, 1-leaved. Leaf duplicate, coriaceous, petiolate; petiole 1–8 cm long; blade 10–40 cm long, 2.5–6 cm wide, elliptic- or oblanceolate-oblong, acute, greyish green with darker green transverse banding or mottling. Inflorescence up to 20 cm long, lateral, usually simple, unbranched, but occasionally with 1 or 2 short branches, usually 6–10-flowered, but sometimes 20-flowered, lax. Flowers small. Sepals and petals translucent greenish, pinkish to brownish white, lip greenish white or cream with pink nerves, spur greenish or brownish white. Floral bracts ca. 2–4 mm long, ovate, acute, translucent, brownish. Pedicel and ovary 10–15 mm long, slender, erect, glabrous. Dorsal sepal 8–13 mm long, 2–3.2 mm wide, oblong to linear-lanceolate or linear-elliptic, obtuse or acute, glabrous, nerves

3, branched. Petals 8.3–11.2 mm long, 2–4.6 mm wide, falcate oblong-elliptic to oblong-lanceolate, acute, glabrous, nerves 3, branched. Lateral sepals 6–11 mm long, 2–4.6 mm wide, falcate, linear-ligulate to oblong or oblong-oblanceolate, subobtuse to acute, glabrous, nerves 3, unbranched. Lip 7–10 mm long and wide, with 2 divergent keels at the base, glabrous, distinctly trilobed; the middle lobe 3.5–4.2 mm long, 6–10 mm wide, transversely elliptic, truncate in front, shortly clawed at base; sidelobes up to 4 mm long and 3.5 mm wide, semi-ovate or semi-obovate, rounded. Spur 4–5 mm long, 2 mm in diameter at apex, clavate, slightly swollen apically, blunt, more or less straight. Gynostemium 4–5 mm long.

**HABITAT.** Terrestrial in rocky forests in inselbergs, terrestrial amongst leaf-mould in shade in rain forest, shady river banks, rocky scrubs near the sea or epiphyte on savanna trees. May–August.

**DISTRIBUTION.** Senegal, Guinea-Bissau, Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, São Tomé and Príncipe, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Uganda, Burundi, Tanzania, Zambia, Zimbabwe, USA, Venezuela, Colombia, Peru, Bolivia, Argentina. Alt. up to 1200 m.

**REPRESENTATIVE SPECIMENS.** S of Gansé, 3°55'W, 8°37'N, 11 Aug. 1967, *Geerling & Bokdam* 695 (WAG!); Rocher d'Issia, May 1972, *Pérez-Vera* 164 (K!); Issia Rock, 24 Aug. 1956, *de Wilde* 417 (WAG!); Mt. Nimba, 10 July 1974, *Pérez-Vera* 695 (P!).

**2. *Oeceoclades saundersiana* (Rchb. f.) Garay & Taylor in Bot. Mus. Leaf. 24: 270. 1976 (Fig. 165)**

*Eulophia saundersiana* Rehb. f. in Bot. Zeitung (Berlin) 24: 378. 1866; TYPE: AFRICA, West Coast. *Mann s.n., cult. Saunders* (LECTOTYPE: W-R!; ISOLECTOTYPE: K!; DRAWING: UGDA-DLSz). - *Graphorchis saundersiana* (Rehb. f.) O. Kuntze in Rev. Gen. Pl. 2: 662. 1891. - *Eulophidium saundersianum* (Rehb. f.) Summerh. in Bull. Jard. Bot. Etat. 27: 401. 1957

*Lissochilus barombensis* Kraenzl. in Bot. Jahrb. Syst. 17: 52. 1893; TYPE: CAMEROON. *Preuss 96* (HOLOTYPE: B†; ISOTYPE: K!)

*Eulophia mildbraedii* Kraenzl. in Bot. Jahrb. Syst. 43: 339. 1909; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Mildbraed 2751* (HOLOTYPE: B†; FRAGMENT OF HOLOTYPE, DRAWING, PHOTO: K!)

Pseudobulbs 4-15 cm long, up to 2.5 cm in diameter near the base, narrowly ovoid to fusiform, erect to spreading, usually bi- but occasionally tri- or single-leaved. Leaves coriaceous, petiolate; petiole 6-17 cm long, narrow, erect, canaliculate; blade 10-26 cm long, 3-8 cm wide, elliptic, ovate-elliptic to lanceolate, acute or acuminate, with undulate margins, dark green. Inflorescence 16-30 cm long, 15-28 -flowered, lateral, erect, simple or occasionally branched, lax or dense. Flowers small. Sepals and petals pale greenish to yellowish, lip pale yellow or greenish cream, spur reddish brown. Floral bract 2-8 mm long, ovate, acute, thin-textured, glabrous. Pedicel and ovary 12-18 mm long, slender, erect, glabrous. Dorsal sepal 8.5-14 mm long, 3-5 mm wide, oblong-oblancoate, oblong-obovate or narrowly oblong, subacute to obtuse, glabrous, with 3 unbranched nerves. Petals 8-13 mm long, 4.5-7 mm wide, obliquely oblong-elliptic or obovate-elliptic, obtuse, with 5 nerves. Lateral sepals 9.5- 14 mm long, 3-5 mm wide, narrowly oblong, oblong-obovate to oblong-elliptic, more or less oblique, obtuse, 3-4 nerved. Lip 10-15 mm long, 7-14 mm wide, at base near the spur entrance horse-shoe-shaped callus apically and basally pubescent, above 3-4 longitudinal, fleshy, glabrous ridges; the middle lobe divided into two lobules, each 6-8 mm long and 4-6 mm wide, oblong-orbicular to oblong-obo-

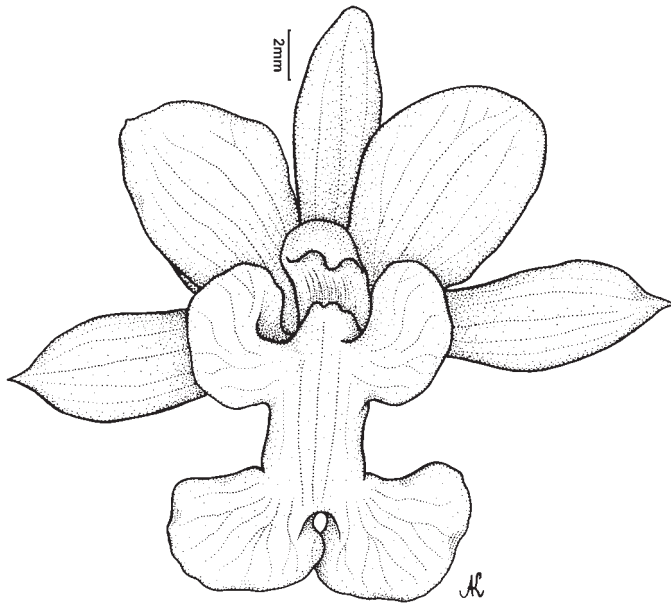


Fig. 165.—Flower of *Oeceoclades saundersiana* (Rehb. f.) Garay & Taylor (drawn by A. Kowalkowska, *Saunders 65*, W-R).

vate; sidelobes similar in size but broadly ovate, rounded. Spur 4-6 mm long, cylindrical or cylindrical-conical, blunt. Gynostemium 2.5-5 mm long.

**HABITAT.** Terrestrial in damp shady places in forests and thickets. December-February.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire), Angola, Uganda, Rwanda, Kenya, Tanzania, Zambia. Alt. up to 1200 m.

**REPRESENTATIVE SPECIMENS.** Bouroukrou, 20 Dec. 1906, *Chevalier 16679* (P!); Bouroukrou, 20 Dec. 1906, *Chevalier 16905* (P!); Guessessó, Jan. 1972, *Pérez-Vera 225* (K!); Mopri, 22 Jan. 1966, *Aké Assi 8465* (K!); Mt. Tonkoui, 2 Feb. 1976, *van der Burg 1250* (WAG!); Yaokro, between Bouaflé and Sinfra, 29 Dec. 1963, *Aké Assi 7223* (K!).

**3. *Oeceoclades ugandae* (Rolfe) Garay & Taylor in Bot. Mus. Leaflet. 24(9): 264. 1976 (Fig. 166)**

**TYPE:** UGANDA. *Brown 443* (HOLOTYPE: K!; DRAWING: UGDA-DLSz)

Pseudobulbs up to 13 cm long and 0.5 cm in diameter near the base, fusiform, erect, 2-3-nodial, 2-3-leaved. Leaves coriaceous, petiolate; petiole 4-6 cm long,

narrow, erect, canaliculate; blade 5-13 cm long, 1.5-4.5 cm wide, elliptic to ovate-elliptic, acute or acuminate, with undulate margins. Inflorescence up to 16 cm long, shorter than leaves, many-flowered, lateral, erect, simple, lax or subdense. Flowers small; white or pale greenish, lip white with purple spots, spur yellowish at the apex. Floral bract 4-6 mm long, ovate-lanceolate, acute, glabrous. Pedicel and ovary up to 10 mm long, slender, erect, glabrous. Dorsal sepal 7-9 mm long, 3-3.5 mm wide, oblong-ob lanceolate or narrowly oblong,

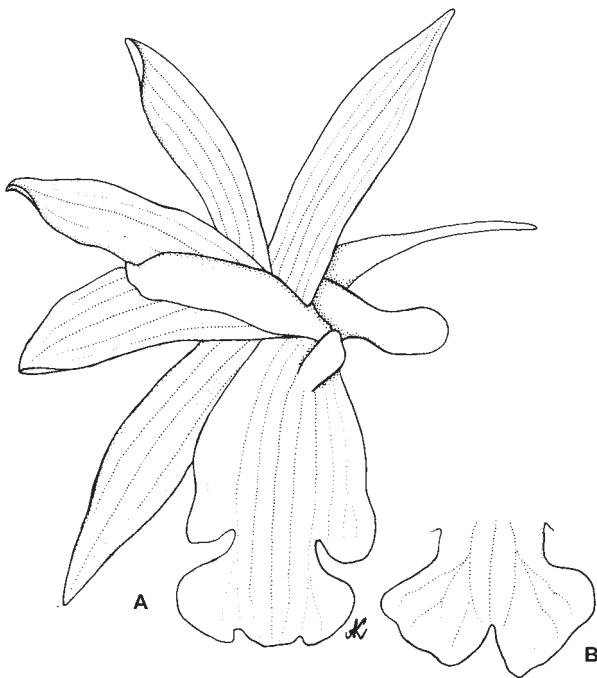


Fig. 166.—*Oeceoclades ugandae* (Rolfe) Garay & Taylor: A — flower; B — lip middle lobe (drawn by A. Kowalkowska, *Brown 443*, K).

acute, glabrous, with 3 unbranched nerves. Petals 7-9 mm long, 2.5-3 mm wide, obliquely oblong, acute, single-nerved. Lateral sepals 7-9 mm long, 3-3.5 mm wide, narrowly oblong to oblong-elliptic, more or less oblique, acute, 3-nerved. Lip 7 mm long, 4-6 mm wide, elliptic in general outline, ecallose, 3-lobed at the apex; sidelobes triangular, acute, much smaller than transversely elliptic middle lobe. Spur 3-4 mm long, cylindrical with ampullaceous apex, blunt. Gynostemium 4.5-5 mm long.

HABITAT. Terrestrial in humid submontane and montane forests. July-August.

DISTRIBUTION. Ivory Coast, Ghana, Congo, Uganda. Alt. 1000-1500 m.

NOTES. This species was reported by Pérez-Vera (1976) in Ivory Coast.

# Tribe **Vandae** Lindl. in Coll. Bot. Append. 1826

Plants exclusively monopodial, with velamen of *Vanda* type. Leaves duplicate, coriaceous or not, often terete or iridiform, sometimes reduced or lacking. Inflorescence lateral. Flowers highly differentiated as regards the organization of the perianth parts and gynostemium. Lip motile or fixed, often with spur, thread-like and long or saccate, short. Seeds relatively uniform, the *Thrixspermum* variant of the *Vanda* type. Rostellum variously shaped. Tegula and viscidium always present, both single or both double. Pollinia 4, more or less club-shaped, similar in size and shape, or ellipsoid and unequal, or 2, cleft, porate or solid.

This is one of the largest tribe in Orchidaceae, including about 110 genera and ca. 1300 species. Most of them occur in Australasia and tropical Africa with some representatives in neotropics.

## KEY TO THE GENERA

1. Tegula single or double. Viscidium single ..... 2
  - Tegula and viscidium double ..... 24
2. Rostellum 3-dentate after removal of pollinarium, the middle tooth reduced, both lateral lobes considerably larger ..... 3
  - Rostellum remnant truncate, furcate or finger-like but no 3-dentate ..... 15
3. Tegula single ..... 4
  - Tegula double or V-shaped ..... 5
4. Stem elongate. Flowers small. Spur cylindrical to club-like ..... **43. Eggelingia**
  - Stem short. Flowers rather large. Spur conical ..... **44. Eurychone**
5. Leaves iridiform ..... 6
  - Leaves terete ..... 8
  - Leaves dorsiventrally flattened ..... 9
6. Pedicel and ovary densely glandular ..... **49. Rangaeris**
  - Pedicel and ovary glabrous ..... 7
7. Flowers tiny. Spur up to 5 mm long. Inflorescence elongate, at least as long as leaves ....
  - ..... **41. Bolusiella**
  - Flowers small. Spur at least 10 mm long. Inflorescence axis much shorter than leaves ....
    - ..... **48. Podangis**
8. Lip bilobed, both lobes large, orbicular ..... **47. Nephrangis**



- Lip usually 3-lobed, rarely unlobed, sidelobes usually fimbriate ..... **51. Tridactyle**
- 9. Rostellum elongate, acute, slender ..... 10
- Rostellum lamellate, truncate, massive ..... 14
- 10. Lip 3-lobed, sidelobes fimbriate, rarely reduced to small tooth ..... **51. Tridactyle**
- Lip usually unlobed or very obscurely 3-lobed ..... 11
- 11. Rostellum very firm ..... 12
- Rostellum fleshy ..... 13
- 12. Viscidium consisting of two parts; thin, lamellate lower part and very thick, saddle-shaped upper one ..... **42. Cyrtorchis**
- Viscidium very thin, delicate, hyaline ..... **45. Homocolleticon**
- 13. Flowers translucent, resupinate ..... **59. Diaphananthe**
- Flowers fleshy, nonresupinate ..... **58. Chamaeangis**
- 14. Rostellum abruptly recurved in the apical half. Inflorescence capitate ..... **40. Ancistrorhynchus**
- Rostellum pendent. Inflorescence elongate ..... **49. Rangaeris**
- 15. Rostellum remnant truncate, fleshy. Tegula double ..... **52. Listrostachys**
- Not above combination of characters ..... 16
- 16. Rostellum remnant furcate ..... 17
- Rostellum remnant finger-like, acute ..... 22
- 17. Plants aphyllous ..... 18
- Plants with normal leaves ..... 19
- 18. Lip reduced to a small point in front of the spur. Mouth of spur with erect tooth-like callus ..... **54. Chauliodon**
- Lip usually well-developed with no callus in the spur mouth ..... **46. Microcoelia**
- 19. Spur bent in the knee-like manner ..... 20
- Spur erect or pendent ..... 21
- 20. Stem densely leaved. Inflorescence dense, many-flowered ..... **53. Calypetrochilum**
- Leaves well-spaced on stem. Inflorescence loosely few-flowered ..... **56. Lacroixia**
- 21. Lip 3-lobed ..... **55. Dinklageella**
- Lip unlobed ..... **50. Solenangis**
- 22. Pedicel twisted at base. Spur spirally twisted ..... **60. Plectrelminthus**
- Not as above ..... 23
- 23. Lateral sepals amplexicaul at the base of the spur ..... **61. Summerhayesia**
- Lateral sepals not amplexicaul at the spur base ..... **57. Aerangis**
- 24. Rostellum elongate, finger-like, fleshy ..... **62. Rhipidoglossum**
- Rostellum short, more or less truncate ..... 25
- 25. Rostellum deeply notched after removal of pollinarium ..... **64. Angraecum**
- Rostellum remnant obscurely 3-dentate ..... 26
- 26. Inflorescence pendent, many and rather densely flowered ..... **63. Angraecopsis**
- Inflorescence erect, lax and many flowered ..... **65. Cribbia**

Subtribe **Bolusiellinae** Szlach. in *Fragm. Flor. Gebot.*, Suppl. 3: 91. 1995

Rostellum long, wide, flat, firm, obtuse at the apex, bent down, U-curved in some genera. Tegula large, flat, membraneous, entire to split to the base in some cases. Viscidium single, large, lamellate. Rostellum remnant 3-dentate, the middle

tooth reduced, small, finger-like, both lateral lobes considerably larger than the middle one, wide and large, acute. Pollinia 2, cleft or porate.

Eighteen genera constitute this subtribe.

**40. *Ancistrorhynchus* Finet in Bull. Soc. Bot. France 54 (Mem. 9): 44. 1907**

*Cephalangraecum* Schltr. in Beih. Bot. Centralbl. 36: 135. 1918

Stem short, thick. Leaves suberect, spreading to recurved, ligulate or linear-lanceolate, sometimes tapering gradually towards the apex, unequally bilobed at apex. Inflorescence almost sessile, usually globose or ellipsoid, dense. Flowers small, resupinate. Sepals and petals dissimilar. Lip entire or 3-lobed, ecallose, spurred. Spur straight or S-formed. Gynostemium erect, relatively massive. Stigma narrow, longitudinally split-like, deeply concave, partially hidden by rostellum. Anther incumbent, operculate, thin-walled, elongate apically. Pollinia two, ellipsoid to almost globose, porate. Rostellum large, rather fleshy, elongate, in the lower half parallel to the stigma, then abruptly upcurved. Viscidium single, relatively large, lanceolate, lamellate. Tegula double, widened apically, attenuated towards the base, lamellate. Rostellum 3-dentate after removal of pollinarium, side-lobes large, massive, the middle lobe obscure, acute (Fig. 167).

A genus of about 20 species widely distributed in tropical Africa.

KEY TO THE SPECIES

1. Spur geniculate, broadly cylindrical or cylindrical-conical, abruptly constricted near the apex and again much inflated ..... 2
  - Spur straight, narrowly cylindrical, with no prominent constriction ..... 4
2. Leaves very unequally bilobed at apex, each lobe bidentate, subacute ..... **6. *A. recurvus***
  - Leaves acuminate at apex ..... 3
3. Leaves over 40 cm long, 3-6 cm wide. Inflorescence 2-4 cm long ..... **4. *A. clandestinus***
  - Leaves up to 13 cm long, up to 1.2 cm wide. Inflorescence up to 1.5 cm long ..... **1. *A. akeassiae***
4. Spur up to 3.5 mm long, ellipsoid, acute to subacute, widest near the middle ..... **7. *A. strausii***
  - Spur over 3 mm long, narrowly cylindrical, obscurely inflated near the apex, blunt ..... 4
5. Spur up to 6 mm long ..... **5. *A. metteniae***
  - Spur at least 7 mm long ..... 6
6. Lip longer than wide ..... **2. *A. capitatus***
  - Lip wider than long ..... **3. *A. cephalotes***

**1. *Ancistrorhynchus akeassiae* Pérez-Vera in Orchid. Cote d'Ivoire: 56. 2003 (Fig. 168)**

TYPE: IVORY COAST. *Aké Assi 8874* (HOLOTYPE: UCJ; ISOTYPE: K!; PHOTO: UGDA-DLSz)

Stem 5-25 cm long, pendent. Leaves numerous, 5-13 cm long, 0.3-1.2 cm wide, linear, coriaceous, rigid, very unequally bilobed at apex, acute. Inflorescence 1.2-1.4 cm long, 7-10-flowered, relatively long, subdense. Flowers

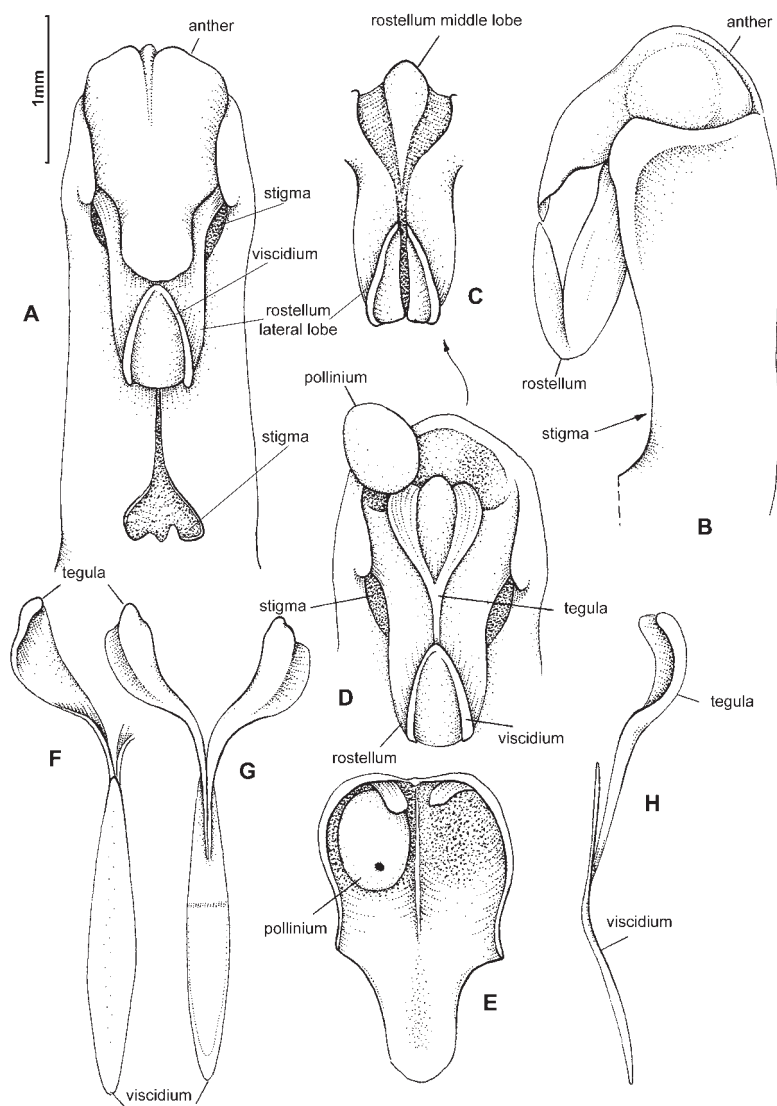


Fig. 167.—Gynostemium structure of *Ancistrorhynchus* Finet: A – gynostemium bottom view; B – gynostemium side view; C – rostellum remnant; D – rostellum with pollinarium; E – anther; F–H – tegula and viscidium various views (Szlachetko 2003).

small, white with a green mark on in the lip centre. Floral bracts 1 mm long, ovate, papery, thin, delicate. Pedicel and ovary 4–6 mm long, straight, slender, scabrid-papillose. Dorsal sepal 2–2.5 mm long, 1 mm wide, elliptic to oblong, acute, thin, delicate, scarsely scabrid-papillose outside. Petals 2–2.5 mm long, 1

mm wide, elliptic to oblong, subobtusate, thin, glabrous. Lateral sepals 2.5-3 mm long, 1-1.5 mm wide, obliquely oblong-obovate, obtuse, with small apiculus, thin, scarcely scabrid-papillose outside. Lip 5 mm long, distinctly 3-lobed near the middle; sidelobes obliquely ovate, rounded; the middle lobe ovate-elliptic, obtuse to rounded, crenate along margin. Spur 3-4 mm long, geniculate near the middle, amoullaceous at the apex, blunt.

**HABITAT.** Epiphyte in humid lowland forests. All year round.

**DISTRIBUTION.** Ivory Coast, Liberia, Nigeria. Alt. 100-500 m.

**REPRESENTATIVE SPECIMENS** Danané-Guinee road, 25 Nov. 1973, *Pérez-Vera* 620 (K!); Man-Danane road, Zo R., Dec. 1971, *Pérez-Vera* 192 (K! - drawing); Rumbo Boka, 31 May 1966, *Ake Asi* 8874 (K!); Tai, 23 Mar. 1974, *Pérez-Vera* 622 (P!).

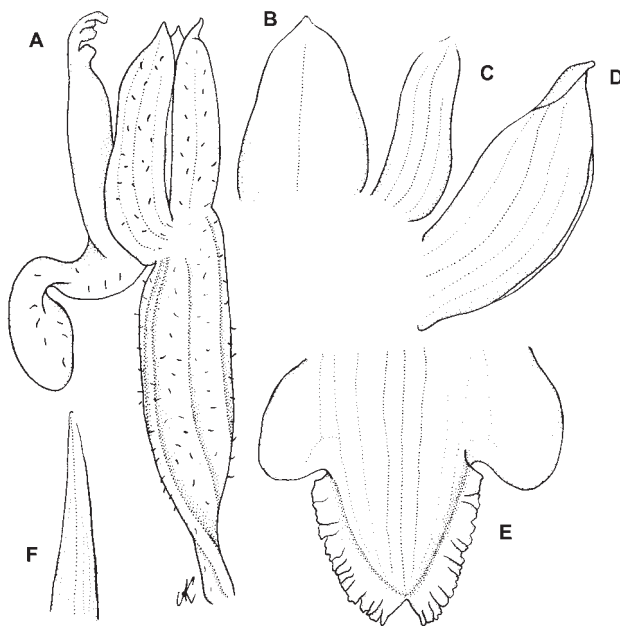


Fig. 168.—*Ancistrorhynchus akeassiae* Pérez-Vera: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — leaf apex (drawn by A. Kowalkowska, *Aké Asi* 8874, K).

**2. *Ancistrorhynchus capitatus* (Lindl.) Summerh.** in Bot. Mus. Leafl. 11: 205. 1944 (Fig. 169)

*Angraecum capitatum* Lindl. in J. Linn. Soc., Bot. 6: 137. 1862; TYPE: NIGERIA. *Barter* 1857 (HOLOTYPE: K!; ISOTYPES: K!, W-R!; DRAWING: UGDA-DLSz). - *Listrostachys capitata* (Lindl.) Rehb. f. in Flora 48: 190. 1865. - *Angorchis capitata* (Lindl.) Kuntze in Rev. Gen. Pl. 2: 651. 1891 *Cephalangraecum capitatum* (Lindl.) Schltr. in Beih. Bot. Centralbl. 36: 136. 1918 *Listrostachys gentilii* De Wild. in Not. Pl. Util. Congo 1: 147. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gentil s.n.* (HOLOTYPE: BR). - *Cephalangraecum gentilii* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 136. 1918

Stem 1-10 cm long. Leaves 3-8, 15-32 cm long, 1.1-2.1 cm wide, linear, coriaceous, unequally bilobed at apex, each lobe 2-3-toothed. Inflorescence up to 1.5(4) cm long, capitate, densely many-flowered. Flowers small, white, with green mark on the lip. Floral bracts up to 12.5 mm long, oblong-obovate to oblong-oblancoate, subobtusate to subacute, papery, thin, glabrous. Pedicel and ovary 7-9 mm long,

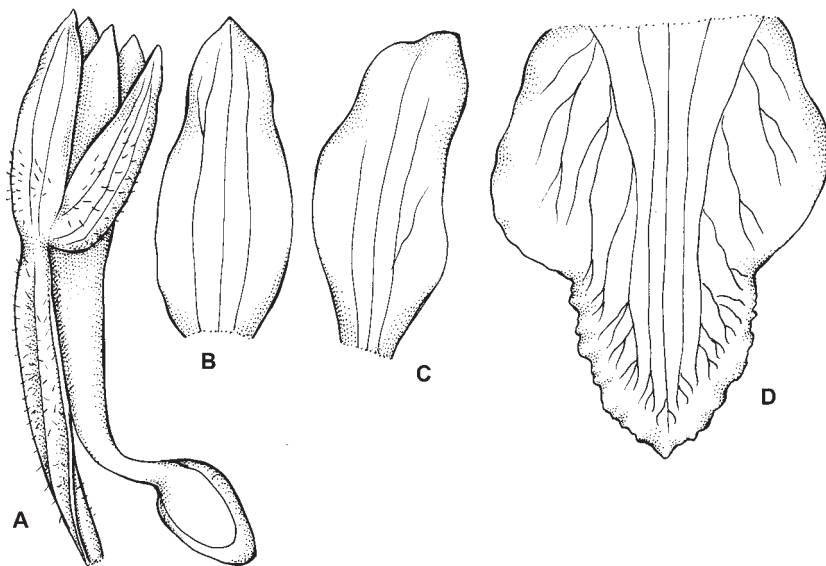


Fig. 169.—*Ancistrorhynchus capitatus* (Lindl.) Summerh.: A — flower; B — dorsal sepal; C — petal; D — lip (drawn by A. Kowalkowska, *Barter s.n.*, W-R).

straight, slender, scabrid-papillose. Dorsal sepal 5-5.5 mm long, 2-2.3 mm wide, oblong-ovate, elliptic, obtuse to rounded, thin, delicate, papillose in the upper half on outside, 3-nerved. Petals 4-5.5 mm long, 2 mm wide, oblong-obovate, more or less falcate, obtuse, thin, glabrous, 3-nerved, nerves branched. Lateral sepals 5-5.6 mm long, 2.5-2.8 mm wide, oblong to oblong-obovate, oblique, sub-obtuse, thin, delicate, sparsely papillose on the upper half on outside, 3- or 5-nerved. Lip 4.5-5.7 mm long, 4-5 mm wide, elliptic or ovate in general outline, concave at base, rounded to subobtuse, upcurved and undulate on margin. Spur 7-8.5 mm long, narrowly cylindrical, slightly incurved, clavate at apex, blunt.

**HABITAT.** Epiphyte in evergreen forests, periodically inundated forests with *Brachystegia eurycoma* Harms and *Garcinia* sp.pl., noted 3 m above the ground level, on *Gilbertiodendron dewevrei* (De Wild.) Leonard. January-July.

**DISTRIBUTION.** Ivory Coast, Sierra Leone, Liberia, Togo, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire), Uganda. Alt. 1100-1300 m.

**REPRESENTATIVE SPECIMENS.** Banco Forest Reserve, 29 July 1975, *van der Burg* 694 (WAG!); Dyolas, Danané, Mt. Kouan (Kouay), 14 Apr. 1909, *Chevalier* 21237 (P!); Man-Danané road, Zo R., Oct. 1971, *Pérez-Vera* 193 (K!, P!); Mt. Momi, Monts des Dans, 40 km N of Danane, 30 Jan. 1984, *Hepper & Maley* 7917 (K!).

3. *Ancistrorhynchus cephalotes* (Rchb. f) Summerh. in Bot. Mus. Leafl. 11: 206. 1944 (Fig. 170)

*Listrostachys  
cephalotes*  
Rchb. f. in  
Gard. Chron.  
1872: 1687.  
1872; TYPE:  
*Green s.n. -  
cult.*,  
(LECTOTYPE:  
W!; DRAWINGS:  
K!, UGDA-  
DLSz)

Stem 5-20  
cm long. Leaves  
numerous, 7-40  
cm long, 0.8-1.9  
cm wide, linear,  
coriaceous, un-  
equally bilobed  
at apex, each  
lobe obscurely  
2-toothed or en-  
tire. Inflores-  
cence up to  
1.5(2) cm long,  
capitate, densely  
many-flowered.  
Flowers small,  
white, with  
green mark on  
the lip. Floral  
bracts up to 12  
mm long, ob-

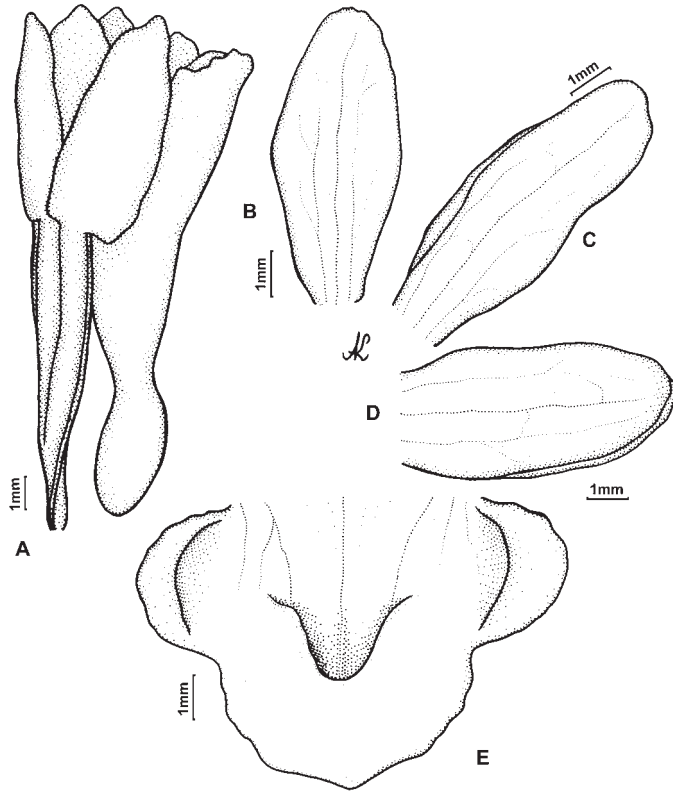


Fig. 170.—*Ancistrorhynchus cephalotes* (Rchb. f.) Summerh.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip (drawn by A. Kowalkowska, Bull 116, W-R).

long-obovate to oblong-ob lanceolate, subobtuse to subacute, papery, thin, glabrous. Pedicel and ovary 7-9 mm long, straight, slender, glabrous. Dorsal sepal 4-7 mm long, 2-3 mm wide, oblong-elliptic, obtuse to rounded, thin, delicate, glabrous, 3-nerved. Petals 6-6.5 mm long, 3 mm wide, oblong-elliptic-ovate, more or less falcate, obtuse, thin, glabrous, 3-nerved. Lateral sepals 4-7 mm long, 2-3 mm wide, oblong, oblique, subtruncate, thin, delicate, glabrous, 3-nerved. Lip 4-7 mm long, 4-9 mm wide, elliptic-ovate to triangular-ovate in general outline, entire or obscurely 3-lobed, concave at base, rounded to subobtuse, thickened on apical margin. Spur 6-10 mm long, narrowly cylindrical, straight, swollen and clavate at apex, blunt.

**HABITAT.** Epiphyte in humid evergreen forests and semi-deciduous forests. January-June.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria.

**REPRESENTATIVE SPECIMENS.** Daniëfla, 30 June 1974, *Pérez-Vera* 189 (K!); Between Lakota and Sassandra, 9 June 1974, *Pérez-Vera* 655 (P!); Mt. Mafa, *Aké Assi* 9658 (K!); Ca. 60 km N of Sassandra, Davo R. left bank, E of Beyo, 6°00'W, 5°18'N, 27 Jan. 1959, *Leeuwenberg* 2590 (WAG!); Tiapleu, 20 Apr. 1974, *Pérez-Vera* 243 (K!).

**4. *Ancistrorhynchus clandestinus* (Lindl.) Schltr. in Beih. Bot. Centralbl. 36: 138. 1918 (Fig. 171)**

*Angraecum clandestinum* Lindl. in Compan. Bot. Mag. 2: 206. 1836; TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!). - *Angorchis clandestina* (Lindl.) Kuntze in Revis. Gen. Pl. 2: 651. 1891

*Listrostachys durandianus* Kraenzl. in Bull. Soc. Roy. Bot. Belg. 38: 65. 1899; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent s.n.* (HOLOTYPE: BR). - *Ancistrorhynchus durandianus* Schltr. in Beih. Bot. Centralbl. 36(2): 138. 1918

*Angraecum brunneomaculatum* Rendle in Rendle & Baker, Cat. Pl. Oban.: 105, 146. 1913; TYPE: NIGERIA. *Talbot 943* (HOLOTYPE: BM!). - *Ancistrorhynchus brunneomaculatus* (Rendle) Schltr. in Beih. Bot. Centralbl. 36: 138. 1918

Stem up to 7(18) cm long, short. Leaves 5-10, gathered in a fan, 15-100 cm long, 0.7-0.9 cm wide, linear or tapering gradually towards the apex, acuminate at unequally bilobed apex, usually one lobe greatly reduced. Inflorescence up to 2 cm long, densely many-flowered, capitate. Flowers white. Floral bracts 2-4 mm long, elliptic-lanceolate to ovate-triangular, acute, thin, delicate, glabrous. Pedicel and ovary 7-10 mm long, slightly arcuate, slender, glabrous. Dorsal sepal 2-5 mm long, 1.2-2 mm wide, elliptic or oblong-elliptic or oblong-ovate, obtuse, rather

fleshy and thick, glabrous, 3-nerved. Petals 2-4.8 mm long, 0.6-1.8 mm wide, obliquely oblong-ovate to oblong-elliptic, obtuse, rather thick and fleshy, glabrous, 3-nerved. Lateral sepals 2.5-6 mm long, 1.3-2.7 mm wide, obliquely elliptic to oblong-ovate, obtuse, concave, rather thick and fleshy, glabrous, 3-nerved. Lip 4.5-6.5 mm long, 3.4-6.6 mm wide, distinctly 3-lobed near the middle, concave, thickened towards the apex; middle lobe up to 3.5 mm long and wide, ligulate to elliptic, obtuse to truncate, with thin margins; sidelobes trinagular, obtuse. Spur 3.2-6.2 mm long, more or less S-shaped, basal part broadly conical-cylindrical, then abruptly constricted and inflated again in the apical third, and here up to 1.8 mm in diameter, blunt.

**HABITAT.** Epiphyte on tree branches, about 3-8 m above the soil, in evergreen forests, gallery forests, dense humid forests, semi-deciduous forests with *Celtis* sp. and *Sterculiaceae*, noted on *Gilbertiodendron dewevrei* (De Wild.) Leonard. January-June.

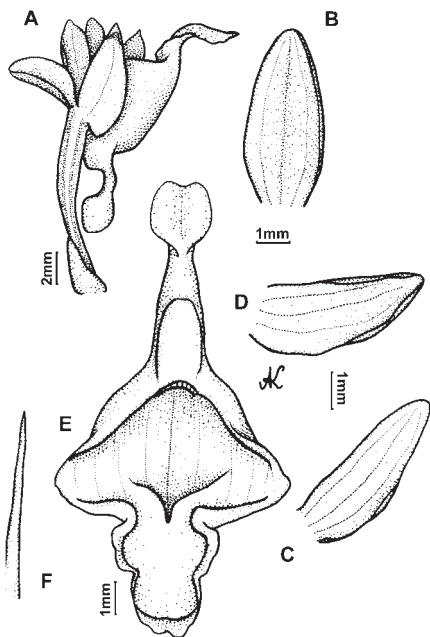


Fig. 171.—*Ancistrorhynchus clandestinus* (Lindl.) Schltr.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — leaf apex (drawn by A. Kowalkowska, *Leeuwenberg* 5480, P).



DISTRIBUTION. Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda. Alt. 500-1100 m.

REPRESENTATIVE SPECIMENS. Banco Forest Reserve, 26 Apr. 1973, *De Koning 1586* (WAG!); Kédiouni, 16 June 1974, *Pérez-Vera 649* (K!, P!); Lamto, 3 Jan. 1963, *Portères 236* (P!); 24,8 km of Sassandra-Lakota road, close to the Dassieko road, ca. 10 km W of Kpato-Aidou, 9 May 1975, *van der Burg 196* (WAG!).

**5. *Ancistrorhynchus metteniae* (Kraenzl.) Summerh. in Bot Mus. Leaf. 11: 209. 1944 (Fig. 172)**

*Listrostachys metteniae* Kraenzl. in Xenia Orchid. 3: 122, t. 270. 1893; TYPE: CAMEROON. *Braun 19* (HOLOTYPE: B†; ISOTYPES: BM!, BR!, K!; DRAWING: UGDA-DLSz). - *Cephalangraecum metteniae* (Kraenzl.) Schltr. in Beih. Bot. Centralbl. 36: 137. 1918.

*Listrostachys braunii* Durand & Schinz in Consp. Fl. Afr. 5: 48. 1895; TYPE: CAMEROON. *Braun 19* (HOLOTYPE: B†; ISOTYPES: BM!, BR, K!; DRAWING: UGDA-DLSz). - *Cephalangraecum braunii* (Durand & Schinz) Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr., ed. 1, 2: 462. 1936.

Stem 2-7(20) cm long, pendent. Leaves up to 14, 5-25 cm long, 0.7-2.5 cm wide, linear, unequally bilobed at apex, each lobe more or less 2-toothed. Inflorescence 1-3 cm long, up to 20-flowered, dense, capitate. Flowers small, white with a green mark on the lip. Floral bracts 6-10 mm long, ovate, oblong-

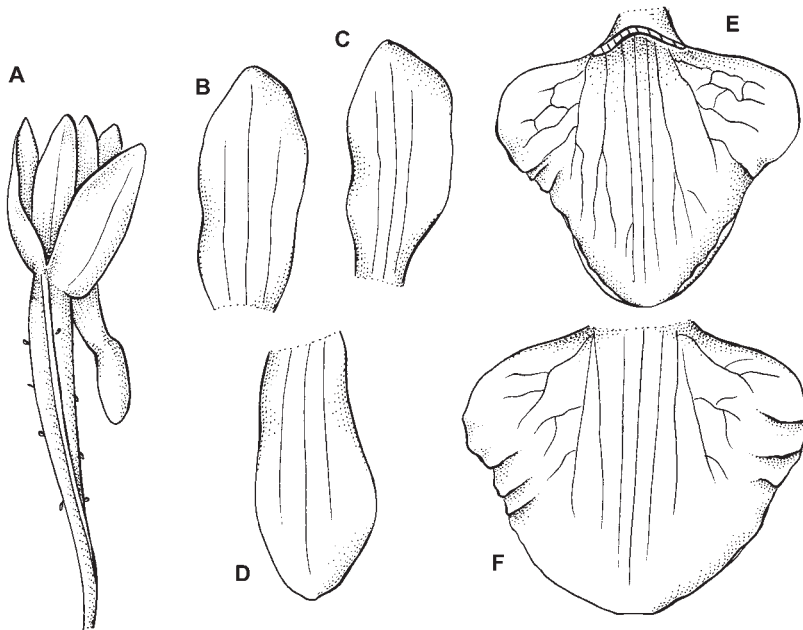


Fig. 172.—*Ancistrorhynchus metteniae* (Kraenzl.) Summerh.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E, F – lip (drawn by A. Kowalkowska, *Tisserant 1619*, P).

ovate to elliptic-ovate, acute, papery, thin, delicate, glabrous. Pedicel and ovary 4-7.5 mm long, straight, slender, scabrid papillose. Dorsal sepal 3.6-5.1 mm long, 1.8-2.3 mm wide, elliptic to oblong, obtuse, thin, delicate, glabrous, obscurely 3-nerved. Petals 3.7-4.7 mm long, 1.7-2.4 mm wide, elliptic-oblong to oblong-obovate, slightly falcate, obtuse, thin, glabrous, obscurely 3-nerved. Lateral sepals 4-5.1 mm long, 2 mm wide, obliquely oblong-obovate, obtuse, thin, glabrous, obscurely 3-nerved. Lip 3.5-4 mm long, 4.3-4.7 mm wide, broadly ovate-subcircular, obtuse to rounded, cochleate, minutely papillate in the centre or above, subcucullate at apex. Spur 3-4.3 mm long, straight or very slightly sigmoid, narrowly cylindrical-clavate, obtuse.

HABITAT. Epiphyte in evergreen forests, dense forests, gallery forests. January.

DISTRIBUTION. Sierra Leone, Nigeria, Cameroon, São Tomé, Central African Republic, Gabon, Democratic Republic of Congo (Zaire), Ethiopia, Uganda, Tanzania. Alt. 900-1300 m.

REPRESENTATIVE SPECIMENS. Lamto, 15 Jan. 1963, *Portères 742* (P! - cf. *metteniae* - ster).

**6. *Ancistrorhynchus recurvus* Finet in Mem. Soc. Bot. France 9: 46. 1907 (Fig. 173)**

TYPE (*here designated*): GABON. *Thollon s.n.* (LECTOTYPE: P!) & GABON. *Lecomte s.n.* (PARATYPE: P!; DRAWING: K!) & GUINEA. *Pobeguín 788* (PARATYPE: P!; DRAWING: UGDA-DLSz)

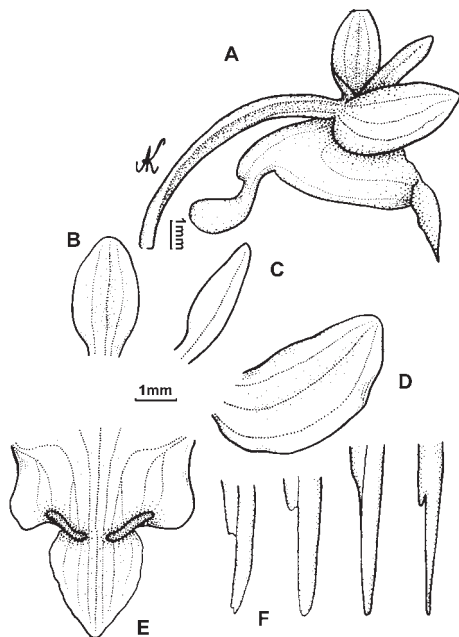


Fig. 173.—*Ancistrorhynchus recurvus* Finet: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip; F – various leaf apices (drawn by A. Kowalkowska, *Lecomte s.n.*, P).

Stem short, 1-7 cm long. Leaves up to 8, 14-38 cm long, 0.8-2 cm wide, linear, very unequally bilobed at apex, each lobe subacute to obscurely 2-toothed. Inflorescence 1-3 cm long, few- to some-flowered, capitate, dense. Flowers white, covered on outer surface with scurfy hairs. Floral bracts 2-3 mm long. Pedicel and ovary 5-9 mm long, slightly arcuate, slender, glabrous. Dorsal sepal 2.9-3.8 mm long, 1.2-1.9 mm wide, elliptic-ovate to elliptic, rounded or obtuse, thin, delicate, 3-nerved. Petals 3.1-3.7 mm long, 0.8-1.3 mm wide, obliquely oblong to oblong-obovate, or linear, falcate, obtuse, thin, 1- or 3-nerved. Lateral sepals 4-4.3 mm long, 2-2.2 mm wide, obliquely elliptic or oblong-elliptic, obtuse or shortly apiculate, thin, delicate, 3-nerved. Lip 4-7.5 mm long, 3-4.5 mm wide, rather thin, concave, 3-lobed near the middle; mid-lobe 2-3.5 mm

long, 2-3 mm wide, ovate to cordate, subobtuse to subapiculate, with more or less obscure transverse callus at the base; sidelobes rounded to triangular. Spur 4.7-6 mm long, broadly conical-cylindrical in the lower part, than abruptly constricted and swollen again at clavate apex, blunt.

HABITAT. Epiphyte in rain forest. All year round.

DISTRIBUTION. Guinea, Ivory Coast, Liberia, Ghana, Nigeria, Cameroon, Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda. Alt. 1100-1300 m.

REPRESENTATIVE SPECIMENS. Chuter, Naoua, Souhe, 9 Feb. 1975, *Pérez-Vera* 752 (P!); Guezon-Buyo road, 13 June 1974, *Pérez-Vera* 293 (K!); *Pérez-Vera* 538 (K!); Mt. Mafa, 6 June 1966, *Aké Assi* 8902 (K!); *Aké Assi* 8904 (K!); Ca. 8 km N of Tabou, 3 km behind the road to Pata Idie, 2 Oct. 1975, *van der Burg* 886 (WAG!).

**7. *Ancistrorhynchus strausii* (Schltr.) Schltr. in Beih. Bot. Centralbl. 36: 139. 1918 (Fig. 174)**

*Angraecum strausii* Schltr. in Bot. Jahrb. Syst. 38: 164. 1906; TYPE: CAMEROON. *Schlechter* 15771 (HOLOTYPE: B†; ISOTYPES: BM!, K!, P!; DRAWING: UGDA-DLSz). - *Cephalangraecum strausii* (Schltr.) Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr., ed. 1, 2: 462. 1936.

Stem 2.5 cm long, short. Leaves 5-7, 5-13 cm long, 0.3-1.3 cm wide, linear or linear-lanceolate, unequally bilobed at apex, each lobe rounded or obtuse, minutely and irregularly denticulate. Inflorescence 0.5 cm long, 5-14-flowered, capitate, dense. Flowers tiny, white, lip with 2 green spots. Floral bracts 3-4 mm long, oblong-elliptic, oblong-ovate to oblong-lanceolate, subacute to subobtuse, thin, delicate, glabrous, transparent. Pedicel and ovary up to 4 mm long, slender, erect, glabrous. Dorsal sepal up to 2.6 mm long and 1.1 mm wide, oblong- or elliptic-ovate, obtuse, rather thick and fleshy, convex, glabrous, obscurely 1-nerved. Petals up to 2.3 mm long and 1.1 mm wide, obliquely oblong-obovate to oblong-elliptic, obtuse, relatively fleshy, convex, glabrous, obscurely 1-nerved. Lateral sepals up to

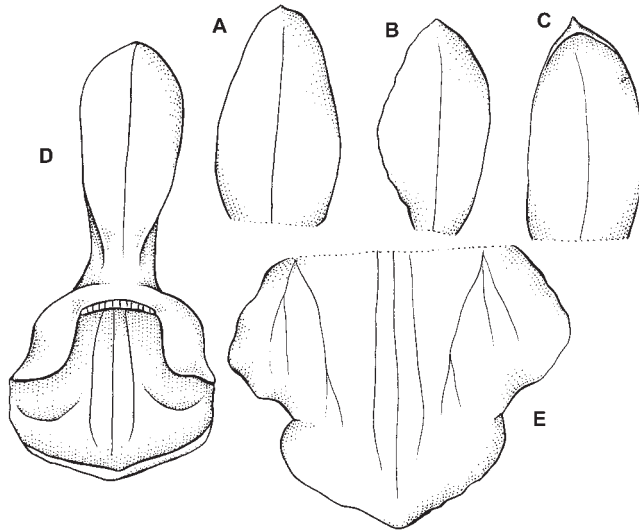


Fig. 174.—*Ancistrorhynchus strausii* (Schltr.) Schltr.: A — dorsal sepal; B — petal; C — lateral sepal; D — lip and spur; E — lip, spread (drawn by A. Kowalkowska, Halle & Villiers 5383, P).

2.5 mm long and 1.1 mm wide, oblong-elliptic, slightly subfalcate, subcucullate at apiculate apex, convex below, relatively thick and fleshy, glabrous, 1-nerved. Lip up to 2.7 mm long and 3 mm wide, very obscurely 3-lobed, concave, thickened and fleshy in the centre; middle lobe rounded or obtuse; sidelobes rounded. Spur 1.5-3.5 mm long, straight, swollen in the center, tapering gradually in both ends, usually subacute at apex, but sometimes blunt.

**HABITAT.** Epiphyte in primary forests, on branches and trunks of *Chlorophora* sp., *Hexalobus* sp., *Oxystigma mannii* Harms, 25-45 m above the soil level. May.

**DISTRIBUTION.** Ivory Coast, Nigeria, Cameroon, Gabon, Democratic Republic of Congo (Zaire). Alt. 700 m.

**NOTES.** Given by Adam (1982: *Adam 26424*) from Gangra.

#### 41. *Bolusiella* Schltr. in Beih. Bot. Centralbl. 36: 105. 1918

Small herbs. Stems abbreviated, simple. Leaves imbricate, arranged in a fan, rigid, fleshy. Inflorescence axillary, lax or dense, multi-flowered. Flowers tiny, nonresupinate, transparent. Petals and sepals subsimilar. Lip simple, entire or obscurely 3-lobed, spurred. Gynostemium elongate, erect. Stigma oblong-elliptic, deeply concave, in the major part hidden by large rostellum. Anther incumbent, operculate, thin, elongate apically. Pollinia 2, ellipsoid, slightly flattened, concave on the inner surface. Rostellum large, tongue-like, with slightly upcurved apex. Viscidium single, thin, delicate, oblong-elliptic. Tegula split nearly to the base, V-shaped, both lobes rather wide, lamellar. Rostellum remnant distinctly 3-dentate, both sidelobes distinctly larger than the middle one (Fig. 175).

A genus of c. 5 species distributed in tropical and southern Africa.

#### KEY TO THE SPECIES

1. Leaves deeply sulcate on the upper surface, more or less V-shaped in the cross section ..... **2. *B. iridifolia***
- Leaves not grooved on the upper surface, compressed in a vertical plane ..... **2**
2. Sterile bracts imbricate and more or less completely enclosing the peduncle ..... **3. *B. maudae***
- Sterile bracts well spaced on the peduncle ..... **3**
3. Inflorescence up to 20 cm long, spike dense with closely spaced flowers. Leaves with nearly rounded apices, 7 mm wide ..... **1. *B. batesii***
- Inflorescence up to 10 cm long, spike lax with well spaced flowers. Leaves acute, 12 mm wide ..... **4. *B. talbotii***

#### 1. *Bolusiella batesii* (Rolfe) Schltr. in Beih. Bot. Centralbl. 36: 106. 1918 (Fig. 176)

*Listrostachys batesii* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 167. 1897; TYPE (*here designated*): CAMEROON. *Bates 381* (LECTOTYPE: BM!; ISOLECTOTYPE: K!; DRAWING: UGDA-DLSz) & GABON. *Bates 463* (PARATYPE: K!)

Stem up to 2.5 cm long. Leaves up to 6 cm long and 0.7 cm wide, ribbon-like,

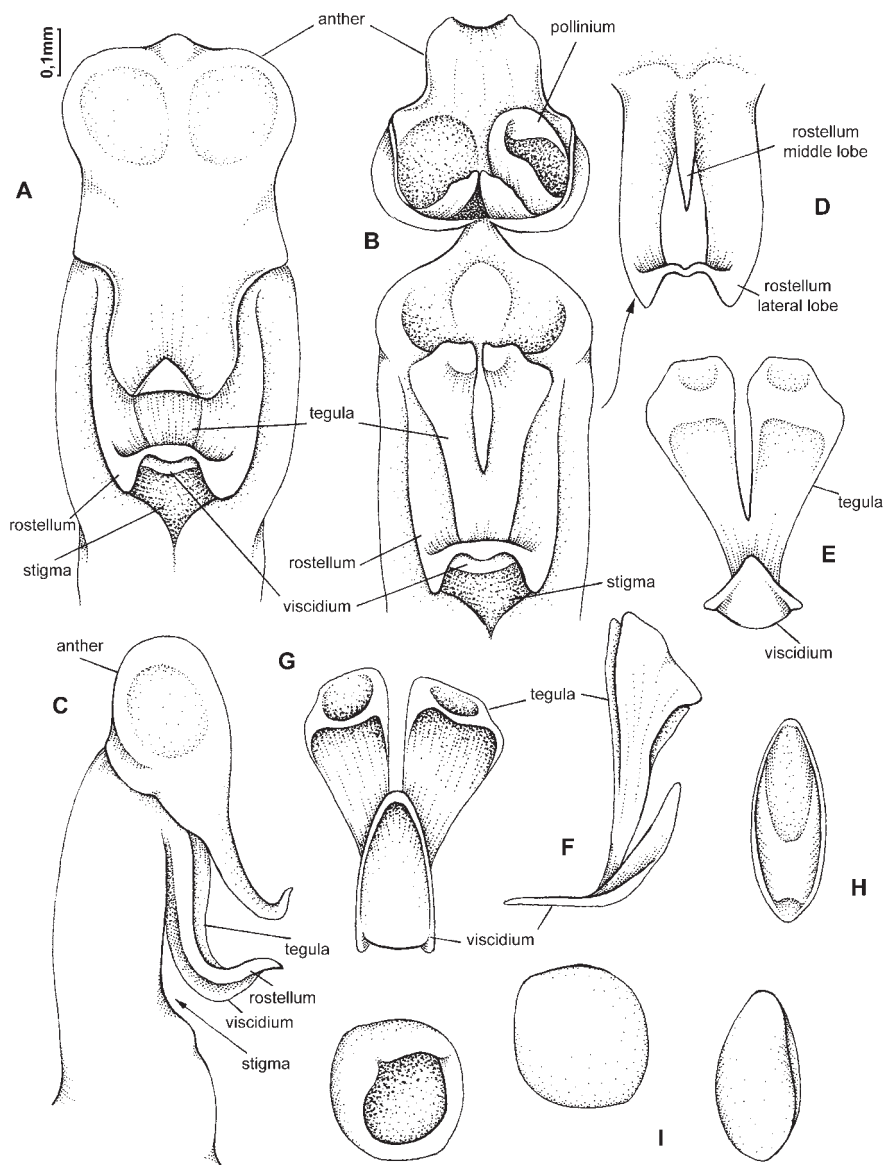


Fig. 175.—Gynostemium structure of *Bolusiella* Schltr.: A – gynostemium bottom view; B – gynostemium bottom view, anther bent back; C – gynostemium side view; D – rostellum remnant; E–H – tegula and viscidium various views; and – pollinia various views (Szlachetko 2003).

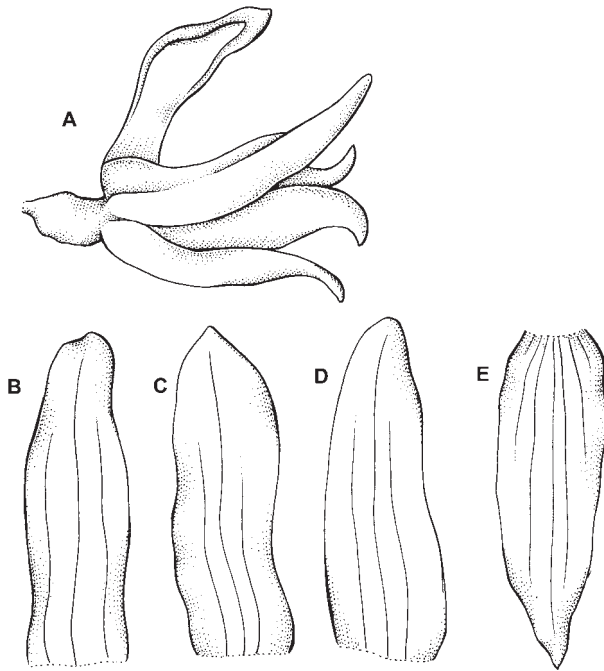


Fig. 176.—*Bolusiella batesii* (Rolfe) Schltr.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip (drawn by A. Kowalkowska, Zenker 3356b, W).

nearly rounded at apices, very stiff, slightly fleshy, not sulcate. Inflorescence up to 20 cm long, dense with flowers almost touching one another, secund, multiflowered; peduncle usually longer than the rachis. Flowers small, white. Floral bracts ca. 2 mm long, broadly ovate, apiculate. Pedicel and ovary ca. 2 mm long, erect, glabrous. Dorsal sepal up to 3 mm long, oblong, obtuse, thin, delicate. Petals shorter than sepals, oblong, obtuse, delicate. Lateral sepals up to 3 mm long, oblong, obtuse, thin, delicate. Lip ca. 3 mm

long, oblong, obtuse, slightly concave at the base, thin, delicate. Spur nearly as long as the lip, somewhat inflated, oblong-lanceolate, subacute. Gynostemium ca. 1.5 mm long.

**HABITAT.** Epiphyte on old cocoa trees at high forests edge. All year round.

**DISTRIBUTION.** Ivory Coast, Ghana, Cameroon, Equatorial Guinea (Bioko), Gabon, Congo. Alt. not given.

**REPRESENTATIVE SPECIMENS.** Rocher de Brafouédi, 28 Oct. 1957, *Aké Assi* 4437 (K!); Brafouédi, 23 Nov. 1974, *Pérez-Vera* 539 (P!); Mt. Mafa, 14 Mar. 1967, *Aké Assi* 9541 (K!); Ca. 60 km N of Sassandra, Davo R. left bank, E of Béyo, 6°00'W, 5°18'N, 27 Jan. 1959, *Leeuwenberg* 2595 (WAG!); Soubré, 3 Dec. 1974, *Pérez-Vera* 194 (K!); Tai, 22 Oct. 1961, *Aké Assi* 6034 (K!); Youkou, Gliké, Tabou, Aug. 1942, *Schell* 1689 (K!, P!); *Sine loc.*, 6 Mar. 1978, *van Setten* 111 (WAG!).

## 2. *Bolusiella iridifolia* (Rolfe) Schltr. in Beih. Bot. Centralbl. 36: 106. 1918 (Fig. 177)

*Listrostachys iridifolia* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 167. 1898; TYPE: ANGOLA. *Wehwitch* 679 (HOLOTYPE: K!; ISOTYPES: BM!, W-R!; DRAWING: UGDA-DLSz)

Stem 0.5-2 cm long. Leaves 4-6(10), 1-6 cm long, 0.15-0.6 cm wide, ensiform, obtuse, straight or falcate, sulcate on the upper surface, more or less V-shaped in the cross section. Inflorescence 2.2-6 cm long, dense, multiflowered. Flowers

small, translucent, white. Floral bracts 1-4 mm long, ovate, acute to acuminate, thin, glabrous. Pedicel and ovary 2 mm long, erect, glabrous. Dorsal sepal 1.1-3 mm long, 0.7-1.4 mm wide, oblong-ovate, acute, glabrous, obscurely single-nerved. Petals 1.1-2.8 mm long, 0.5-1.3 mm wide, oblong-elliptic, acute or obtuse, glabrous, obscurely single-nerved. Lateral sepals 1.1-3 mm long, 0.7-1.4 mm wide, oblong- or ovate-lanceolate, acute, glabrous, obscurely single-nerved. Lip 1-5 mm long, 0.5-2 mm wide, oblong-ligulate, obtuse, slightly sigmoid, thin, glabrous. Spur 0.5-2.5 mm long, cylindrical-ellipsoid, inflated or conical and saccate, blunt, strongly incurved at right angles to the lip or straight. Gynostemium 0.5-0.9 mm long.

**HABITAT.** Epiphyte in forests, montane forests and savanna, amongst lichens, on rocks in river.

**VARIABILITY.** Cribb (1977) distinguished 2 subspecies in *B. iridifolia*:

#### subsp. *iridifolia*

Stem 0.5-2 cm tall. Leaves (1.5)2-4.5 cm long, 0.2-0.4 cm wide, usually falcate-recurved. Inflorescence 3.5-6 cm long. Floral bracts 1-2(4) mm long, brown, shorter than flowers. Tepals 2-3 mm long. Lip 2-2.5(5) mm long. Spur 1.7-2 mm long, cylindrical-ellipsoid, dilated, pendent or strongly incurved at right angles to the lip.

**DISTRIBUTION.** Ivory Coast, Ghana, Cameroon, Equatorial Guinea, Democratic Republic of Congo (Zaire), Angola, Ethiopia, Uganda, Rwanda, Burundi, Kenya, Tanzania, Comores. Alt. up to 2300 m.

**REPRESENTATIVE SPECIMENS.** Between Danané and Tiapleu, 18 Oct. 1974, Pérez-Vera 697 (K!, P!).

**NOTES.** *B. iridifolia* subsp. *picea* P.J. Cribb is known from Kenya, Tanzania, Malawi, Zambia and Zimbabwe and it differs from subsp. *iridifolia* by having straight or slightly falcate leaves, floral bracts longer than flowers, shorter tepals, lip and spur.

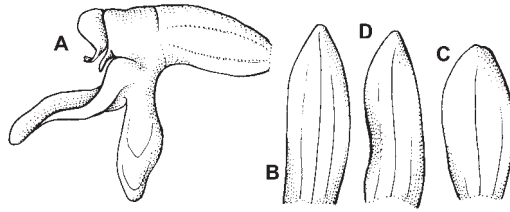


Fig. 177.—*Bolusiella iridifolia* (Rolfé) Schltr.: A – pedicel, ovary, lip and spur; B – dorsal sepal; C – petal; D – lateral sepal (redrawn by A. Kowalkowska from Summerhayes' original drawing kept at K, Schlechter 12705).

### 3. *Bolusiella maudae* (Bolos) Schltr. in Beih. Bot. Centralbl. 36: 106. 1918 (Fig. 178)

*Angraecum maudae* Bolus in Icon. Orchid. Austr.-Afr. 1: tab. 9, 1893; TYPE: REPUBLIC OF SOUTH AFRICA. *Saunders* in *Bolus Herb.* 6270 (HOLOTYPE: BOL; ISOTYPE: K!; DRAWING: UGDA-DLSz)

*Listrostachys imbricata* Rolfé in Bull. Misc. Inform. Kew. 1910: 161. 1910; TYPE: GHANA. *Anderson s.n.* (HOLOTYPE: K!). – *Bolusiella imbricata* (Rolfé) Schltr. in Beih. Bot. Centralbl. 36: 106. 1918

Stem 0.5-2(4) cm long. Leaves (2)5-8, 1-5 cm long, 0.3-1 cm wide, ensi-



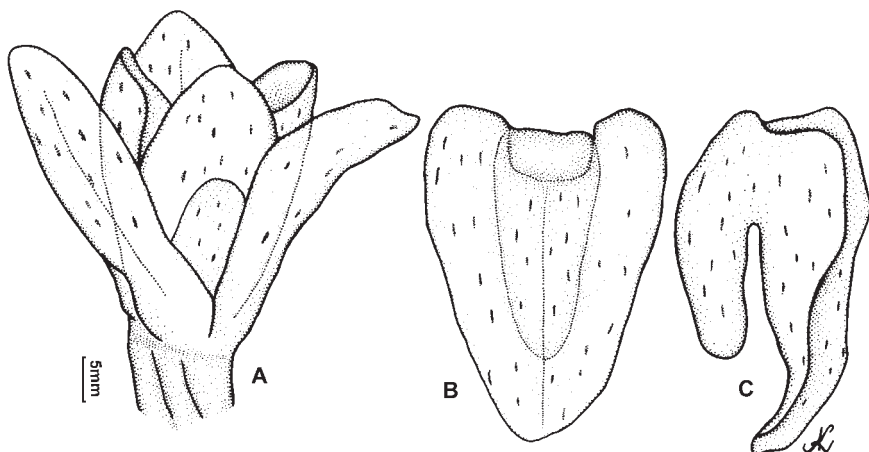


Fig. 178.—*Bolusiella maudae* (Bolus) Schltr.: A — flower; B, C — lip various views (redrawn by A. Kowalkowska from Wood in Cribb 1989).

form, obtuse, straight or falcate, not sulcate on the upper surface. Inflorescence 1.5-8 cm long, very dense. Flowers minute, white with pale olive spur, faintly scented. Floral bracts 3-4 mm long, ovate, acute to acuminate, closely imbricating. Pedicel and ovary 1.5-2 mm long, slender, glabrous, erect. Dorsal sepal 3-4 mm long, 1-2 mm wide, narrowly elliptic to oblong, obtuse, thin, glabrous, obscurely 1-nerved. Petals slightly shorter and narrower than dorsal sepal, oblong, obtuse, thin, glabrous, obscurely 1-nerved. Lateral sepals of the same size as lateral ones, oblong, obtuse, thin, glabrous, obscurely 1-nerved. Lip 2-3 mm long, 0.8-2 mm wide, cordate-ovate to elliptic-ovate in general outline, obtuse, acute to acuminate, thin, delicate, glabrous. Spur 1-2 mm long, cylindrical, slightly inflated, blunt. Gynostemium 0.6-0.8 mm long.

HABITAT. Epiphyte in forests. September-November.

DISTRIBUTION. Guinea, Ivory Coast, Ghana, Cameroon, Democratic Republic of Congo (Zaire), Uganda, Kenya, Tanzania, Malawi, Zambia, South Africa. Alt. 900-1900 m.

REPRESENTATIVE SPECIMENS. Danané, 18 Oct. 1974, *Pérez-Vera* 698 (K!); Between N'Douci and Agboville, 3 Nov. 1974, *Pérez-Vera* 718 (K!, P!); Mt. Tonkoui, Sep. 1971, *Pérez-Vera* 195 (K!).

**4. *Bolusiella talbotii* (Rendle) Summerh.** in Hutchinson & Dalziel, Fl. W. Trop. Afr., ed. 1, 2: 456. 1936  
(Fig. 179)

*Angraecum talbotii* Rendle in Rendle & Baker, Cat. Pl. Oban.: 108, t. 15, figs. 6-7. 1913; TYPE: NIGERIA. *Talbot* 941 (HOLOTYPE: BM!; ISOTYPE: K!; DRAWING: UGDA-DLSz)

Stem up to 2 cm long. Leaves 5-7, up to 8 cm long and up to 1.2 cm wide, narrowly lanceolate, distinctly narrowed in the upper half, acute,

thick, not sulcate. Inflorescence up to 10 cm long, lax, secund, multiflowered; peduncle usually shorter than the rhachis, flowers well-spaced along the rhachis. Flowers tiny, nonresupinate, white, glabrous. Floral bracts up to 2 mm long, triangular-ovate, acute, thin, glabrous. Pedicel and ovary shorter than or equalling bracts, erect, glabrous. Dorsal sepal up to 2.8 mm long and 0.7 mm wide, oblong-lanceolate, acute, thin, delicate, glabrous, 3-nerved. Petals up to 2.3 mm long and up to 0.8 mm wide, oblong-ligulate, acute, thin, glabrous, obscurely 3-nerved. Lateral sepals up to 3.1 mm long and 0.7 mm wide, obliquely lanceolate-ovate, acute, thin, delicate, glabrous, 3-nerved. Lip 1.7-2.8 mm long, up to 0.7 mm wide, narrowly elliptic in the lower half, ligulate in the apical one, acute to obtuse. Spur up to 2 mm long, conical-cylindrical, incurved, obtuse. Gynostemium up to 1.5 mm long.

HABITAT. Epiphyte. June, October.

DISTRIBUTION. Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea (Bioko, Annobón). Alt. up to 600 m.

REPRESENTATIVE SPECIMENS. Banco Forest Reserve, June 1975, *van der Burg* 658 (WAG!); Yapo, 26 Oct. 1974, *Pérez-Vera* 737 (K!, P!).

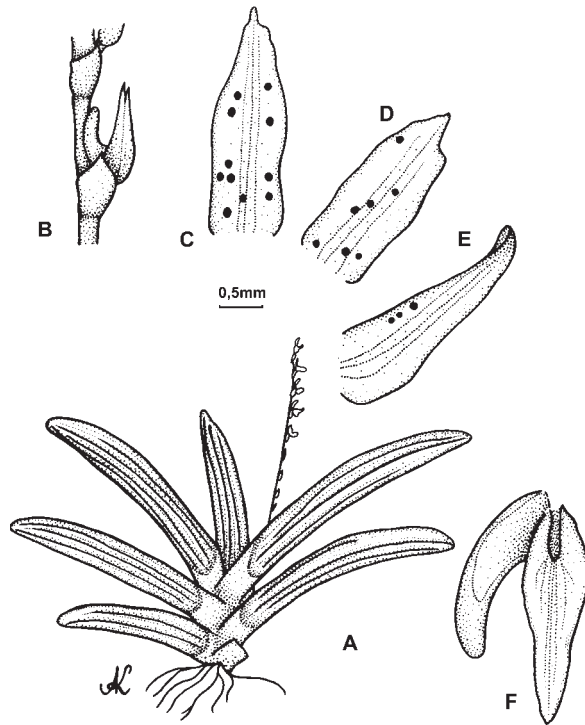


Fig. 179.—*Bolusiella talbotii* (Rendle) Summerh.: A – plant; B – part of inflorescence; C – dorsal sepal; D – petal; E – lateral sepal; F – lip (drawn by A. Kowalkowska, Villiers 854, P).

#### 42. *Cyrtorchis* Schltr. in Orchideen: 595. 1914

Stem elongate, sometimes short, erect or pendent. Leaves coriaceous or fleshy, unequally bilobed apically. Inflorescence usually shorter than leaves, many-flowered. Flowers usually medium-sized, resupinate. Sepals and petals subsimilar. Lip entire, unlobed, petaloid. Spur usually long, narrowly conical-cylindrical, often

pendent. Gynostemium short, massive, erect. Stigma oval, deeply concave. Anther incumbent, operculate, thin-walled, apical part elongate, connective rather thick. Pollinia ellipsoid, porate. Rostellum finger-like, acute, thick, longer than gynostemium. Viscidium single, relatively large, consisting of 2 parts: the lower one - thin, lamellate, hyaline, linear; and the upper one - saddle-shaped, very thick. Tegula double, elongate, thin, lamellate. Rostellum remnant 3-dentate after removal of pollinarium. Both sides lobes subulate, acute, much longer than the middle lobe (Fig. 180).

A genus of about 10 species widely distributed in tropical Africa.

#### KEY TO THE SPECIES

- |  |                          |
|--|--------------------------|
| 1. Leaves up to 1.5 cm wide, linear .....                                  | 2. <i>C. aschersonii</i> |
| – Leaves over 1.5 cm wide, usually oblanceolate or narrowly elliptic ..... | 2                        |
| 2. Spur upcurved at the apex .....   | 4. <i>C. hamata</i>      |
| – Spur pendent .....   | 3                        |
| 3. Spur over 9.5 cm long .....   | 3. <i>C. chailluana</i>  |
| – Spur up to 8.5 cm long .....   | 1. <i>C. arcuata</i>     |

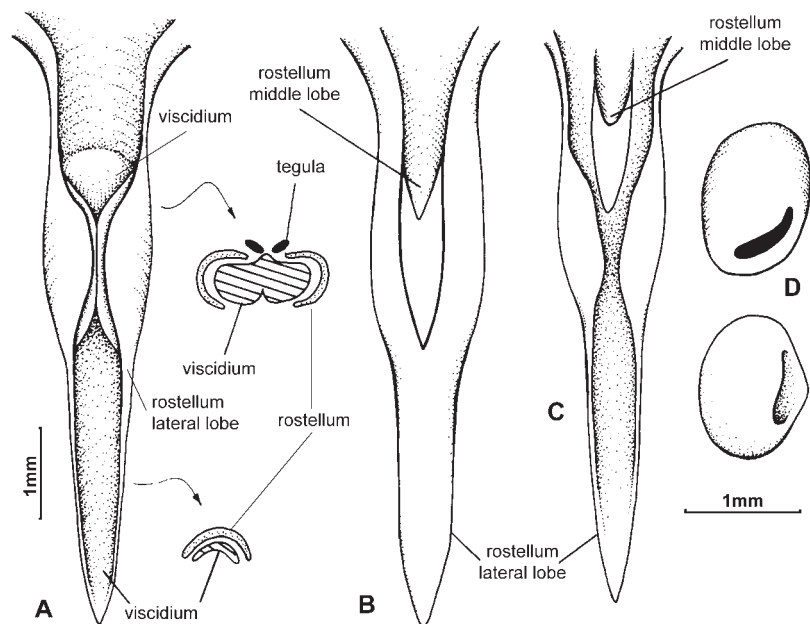


Fig. 180. – Gynostemium of *Cyrtorchis* Schltr.: A – rostellum; B, C – rostellum remnant various views; D – pollinia various views (Szlachetko 2003).

1. **Cyrtorchis arcuata** (Lindl.) Schltr. in Orchideen: 596. 1914  
(Fig. 181)

*Angraecum arcuatum* Lindl. in Compan. Bot. Mag. 2: 204. 1836; TYPE: SOUTH AFRICA. *Drege* 4580 (HOLOTYPE: K!). - *Listrostachys arcuata* (Lindl.) Rehb. f. in Ann Bot. Syst. 6: 907. 1864. - *Angorchis arcuata* (Lindl.) O. Kuntze in Revis. Gen. Pl. 2: 651. 1891.

Stem 15-30 cm long, rather stout, often forming large clusters. Leaves some, 10-22.5 cm long, 1.5-5 cm wide, imbricating basally, linear, narrowly oblong to narrowly elliptic, or oblanceolate, more or less unequally bilobed, both lobes obtuse. Inflorescence 5-20 cm long, 5-15-flowered, lax to dense. Flowers variable in size, resupinate, white with a greenish spur, sweetly scented. Floral bracts 11-33 mm long, broadly ovate or elliptic-ovate, subacute, cymbiform, thin, glabrous. Pedicel and ovary 19-40 mm long, slender, arcuate, glabrous. Dorsal sepal 18-45 mm long, 5-7 mm wide, lanceolate to ovate-lanceolate, acuminate, thickened and canaliculate apically, glabrous, nerves unbranched. Petals 14-27 mm long, 4.5-6 mm wide, lanceolate to elliptic-lanceolate, falcate, acuminate, thickened and canaliculate at apex, glabrous, nerves unbranched. Lateral sepals up to 49 mm long, 5-7 mm wide, obliquely lanceolate, acuminate, with elevated keel on the outer surface at apex, thick, glabrous, nerves unbranched. Lip 15-36 mm long, 4-8.1 mm wide, lanceolate or semi-elliptic in the lower half or third, lanceolate or narrowly triangular above, acuminate, thickened along margins, glabrous. Spur 20-85 mm long, up to 5 mm in diameter at base, conical near the mouth, filiform towards apex, acute, incurved or sigmoid. Gynostemium 2-2.5 mm long.

HABITAT. Epiphyte or lithophyte in bushes, woodlands and forests.

VARIABILITY. Summerhayes (1960) distinguished four subspecies in *C.*

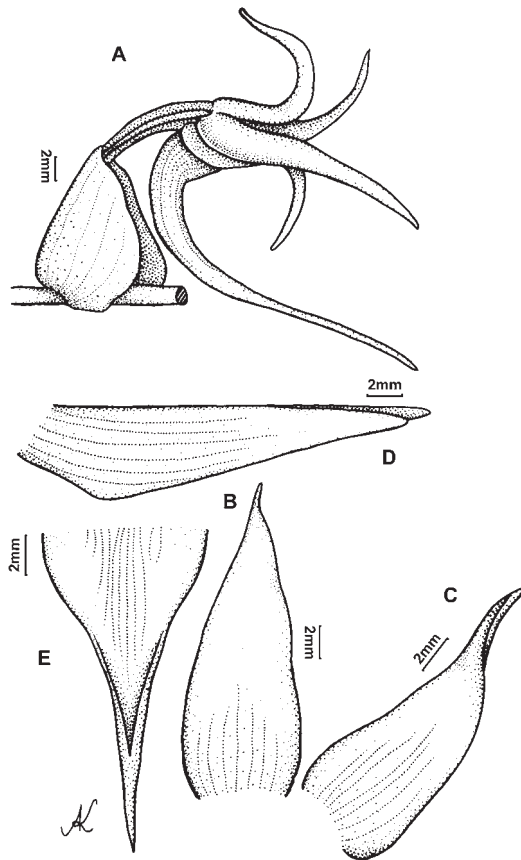


Fig. 181. - *Cyrtorchis arcuata* var. *variabilis* (Summerh.) Geerinck: A - flower; B - dorsal sepal; C - petal; D - lateral sepal; E - lip (drawn by A. Kowalkowska, Tisserant 2024, P).

*arcuata*, which have been reduced to the variety rank by Geerinck (1988). Cribb (1989) from the other hand, did not recognise infraspecific taxa in this species at all. The typical variety is known in South Africa and Mozambique, and the fourth - var. *leonensis* - is restricted in DISTRIBUTION to Sierra Leone.

var. **variabilis** (Summerh.) Geerinck in Fl. Rwanda 4: 548. 1988

*Cyrtorchis arcuata* subsp. *variabilis* Summerh. in Kew Bull. 14: 148. 1960; TYPE: TANZANIA. Moreau 20 (HOLOTYPE: K!)

*Listrostachys sedenii* Rchb. f. in Gard. Chron. ser. 2, 9: 138. 1878; TYPE: TANZANIA. *Seden s.n.* (LECTOTYPE: W-R!; DRAWING: UGDA-DLSz). - *Angraecum sedenii* (Rchb. f.) Nicholson in Ill. Dict. Gard. 1: 79. 1884. - *Angorchis sedenii* (Rchb. f.) O. Kuntze in Revis. Gen. Pl. 2: 652. 1891. - *Cyrtorchis sedenii* (Rchb. f.) Schltr. in Beih. Bot. Centralbl. 36: 132. 1918.

*Cyrtorchis bracteata* Schltr. in Bot. Jahrb. Syst. 53: 600. 1915; TYPE: TANZANIA. Stolz 715 (HOLOTYPE: B†; ISOTYPE: W!)

Spur 30-55 mm long.

DISTRIBUTION. Senegal, Guinea, Liberia, Ivory Coast, Ghana, Togo, Benin, Nigeria, Cameroon, Central African Republic, Democratic Republic of Congo (Zaire), Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. up to 2200.

REPRESENTATIVE SPECIMENS. Anguededou, near Agneby R., 23 Nov. 1975, *De Koning* 6205 (WAG!); *De Koning* 6210 (WAG!); *De Koning* 6212 (WAG!); Between Boundiali and Kaui, 27 Apr.-28 May 1975, *Pérez-Vera* 786 (P!); Haut Sassandra, Dyolas, between Zagoué-Soucourala, 19 May 1909, *Chevalier* 21580 (P!); Haut Sassandra, Loura, between Gouékouma and Sogui, 25 May 1909, *Chevalier* 21683 (P!); Haut Sassandra, Loura, Mt. Dourou, Koualé, 27 May 1909, *Fleury sub. Chevalier* 21741 (P!); Between Séguéla and Maukono, 25 May 1974, *Pérez-Vera* 179 / B (K!).

var. **whytei** (Rolfe) Geerinck in Bamps (ed.), Fl. Afr. Centr. 2: 484. 1992

*Listrostachys whytei* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 155. 1897; TYPE: MALAWI. Whyte 102 (HOLOTYPE: K!). - *Cyrtorchis arcuata* subsp. *whytei* (Rolfe) Summerh. in Kew Bull. 14: 147. 1960.

Spur 60-100 mm long.

REPRESENTATIVE SPECIMENS. Brafouédi, 16 Nov. 1967, *Aké Assi* 9765 (K!); Brafouédi, Dec. 1965, *Bonardi s.n.* (P!); Near Brafouédi, 75 km NW of Abidjan, Dec., *Leeuwenberg* 2311 (K!, WAG!); Odienné, Séguélon, 1 Nov. 1967, *Aké Assi* 9721 (K!); Ca. 64 km N of Sassandra, ca. 5 km W of Niapidou, 14 June 1963, *de Wilde* 206 (K!, P!, WAG!).

DOUBTFUL RECORDS: 7 km E of Darhala, 8°27'N, 4°18'W, 14 Oct. 1975, *van der Burg* 1224 (WAG!); Drombarakrou, Indénié, 25 Mar. 1907, *Chevalier* 17679 (P!); Odienne-Tieme road, Tougoukoli Massif, 22 Oct. 1974, *De Koning* 4313 (WAG!); Tai, 24 Jan. 1975, *De Koning* 5192 (WAG!).

2. ***Cyrtorchis aschersonii*** (Kraenzl.) Schltr. in Beih. Bot. Centralbl. 36: 129. 1918

(Fig. 182)

*Angraecum aschersonii* Kraenzl. in Mitt. Deutsch. Schutzgeb. 2: 157. 1889; TYPE: CAMEROON. Braun 83 (HOLOTYPE: B†; DRAWING: K!). - *Listrostachys aschersonii* (Kraenzl.) Durand & Schinz in Consp. Fl. Afr. 5: 48. 1895.

*Angraecum angustifolium* De Wild. in Bull. Jard. Bot. Etat. 5: 181. 1916; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Seret* 1001 (HOLOTYPE: BR). - *Cyrtorchis angustifolia* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 128. 1918.

Stem up to 30 cm tall, erect. Leaves 8-22 cm long, 0.25-1.5 cm wide, imbricating basally, linear, almost equally bilobed, lobes rounded, fleshy, with margins incurved, hence appearing almost cylindrical. Inflorescence 4-15 cm long, 6-8 -flowered. Flowers medium-sized, resupinate, white with green-brownish spur. Floral bracts 5-15 mm long. Pedicel and ovary 15 mm long, glabrous, slender. Sepals and petals 10-20 mm long, 3.5-5 mm wide, ovate-lanceolate, acuminate, concave at the base; petals smaller than sepals. Lip 9 -15(20) mm long, 6 mm wide, ovate-lanceolate, acuminate. Spur (15)20-40 mm long, recurved or more or less sigmoid. Gynostemium 2 mm long.

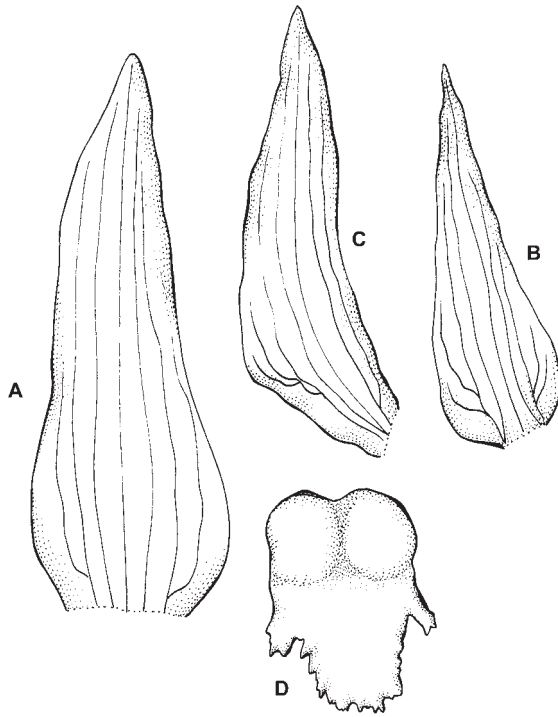


Fig. 182.—*Cyrtorchis aschersonii* (Kraenzl.) Schltr.: A – dorsal sepal; B – petal; C – lateral sepal; D – anther (redrawn by J. Mytnik-Ejsmont from Summerhayes' original drawing kept at K).

HABITAT. Epiphyte in dense forests. May-November.

DISTRIBUTION. Ivory Coast, Sierra Leone, Ghana, Nigeria, Cameroon, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. Abbé, *Aké Assi* 8893 (K!); Anguededou, 24 Aug. 1975, *van der Burg* 754 (WAG!); Niablé, 31 July 1969, *Thijssen* 157 (WAG!); Haut Sassandra, Dyolas, between Dioandougou and Niangouépleu, 12 May 1909, *Chevalier* 21526 (P!); Yapo, 3 Nov. 1974, *Pérez-Vera* 730 (P!).

### 3. *Cyrtorchis chailluana* (Hook. f.) Schltr. in Orchideen: 596. 1914 (Fig. 183)

*Angraecum chailluanum* Hook. f. in Bot. Mag. 92: t. 5589. 1866; TYPE (*here designated*): GABON. *du Chaillu s.n.* (LECTOTYPE: K!) & NIGERIA. *Mann* 521 (PARATYPE: K!). - *Listrostachys chailluanum* (Hook. f.) Rchb. f. in Flora 68: 381. 1885. - *Angorchis chailluanum* (Hook. f.) O. Kuntze in Revis. Gen. Pl. 2: 651. 1891.

Stem up to 70 cm tall, pendulous, rather stout. Leaves some, 8-25 cm long, 1.5-3.5 cm wide, linear-oblongate, roundly unequally or equally bilobed, suberect or spread. Inflorescence 12-25 cm long, 6-12-flowered, rather lax, erect to suberect. Flowers rather large, resupinate, white, scented. Floral bracts 17-23

mm long, broadly ovate, cymbiform, acute, thin, glabrous. Pedicel and ovary up to 45 mm long, slender, erect, glabrous. Dorsal sepal 31-45 mm long, 6.5-8 mm wide, linear-lanceolate to linear-ob lanceolate, acuminate to shortly caudate, thickened at apex, glabrous, nerves unbranched. Petals 29-40 mm long, 5.5-6.5 mm wide, slightly oblique, linear-lanceolate to narrowly lanceolate, acuminate, thickened at apex, glabrous, nerves unbranched. Lateral sepals 36-49 mm long, 7.2-9 mm wide, obliquely linear-lanceolate, long-acuminate, strongly falcate, thickened and canaliculate in the apical half, glabrous, nerves sparsely branched. Lip 33-42 mm long, 5-11 mm wide, linear-lanceolate or narrowly triangular, long-acuminate to almost caudate, thickened along margins, glabrous. Spur 95-145 mm long, up to 5.5 mm in diameter at base, narrowly conical at base, filiform towards the apex, acute. Gynostemium 2.5 mm long.

HABITAT. Epiphyte in dense forests.

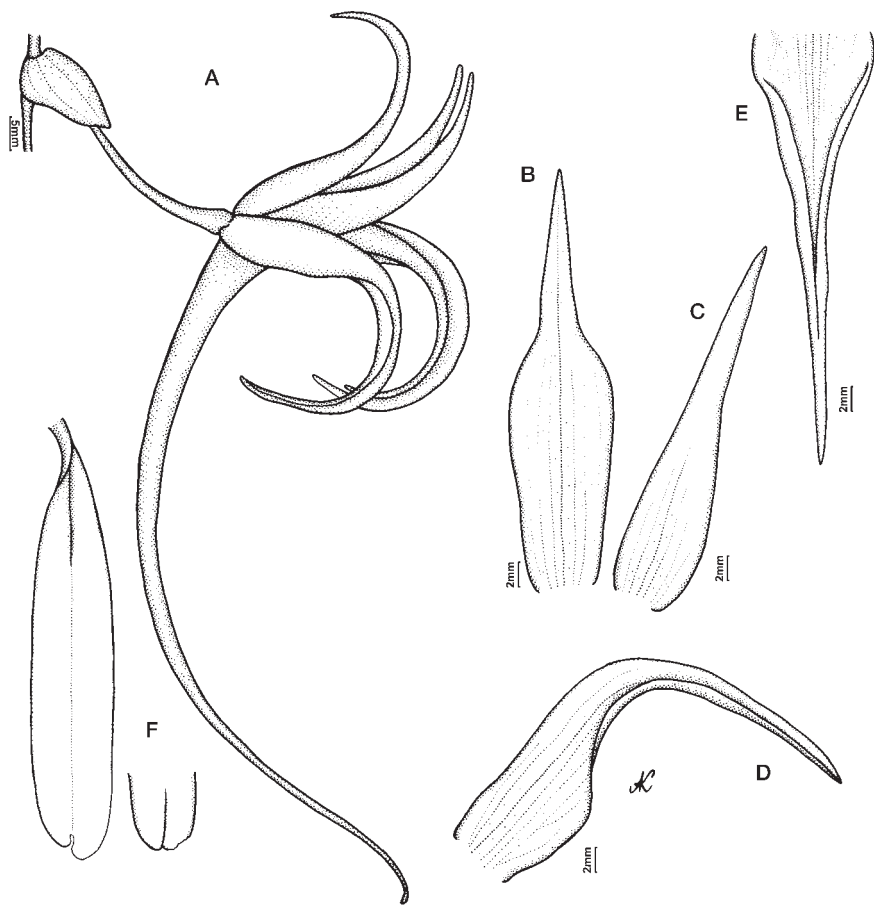


Fig. 183.—*Cyrtorchis chailluana* (Hook. f.) Schltr.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — leaf (drawn by A. Kowalkowska, Villiers 808, P).



DISTRIBUTION. Guinea, Sierra Leone, Ivory Coast, Nigeria, Cameroon, Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda, Rwanda, Burundi. Alt. up to 1250 m.

REPRESENTATIVE SPECIMENS. *Sine loc.*, *Dekker s.n.* (WAG cult. 78 -PTCI-745, *sub van der Laan* 769).

**4. *Cyrtorchis hamata* (Rolfe) Schltr. in Orchideen: 596. 1914 (Fig. 184)**

*Listrostachys hamata* Rolfe in Orchid Rev. 9: 61. 1902; TYPE: *cult. Hort. Bot. Kew.* (HOLOTYPE: K!)

Stem 10-50 cm tall, pendulous, rather stout. Leaves numerous, 9-24 cm long, 1.5-4 cm wide, linear, roundly unequally bilobed, suberect or spread. Inflorescence 10-20 cm long, 6-8-flowered, rather lax, spread or pendent. Flowers medium-sized, resupinate, white with greenish spur, scented. Floral bracts 10-12 mm long, broadly ovate, cymbiform, acute, thin, black-brown. Pedicel and ovary up to 15 mm long, slender, erect, glabrous. Dorsal sepal 13-16 mm long, 4-5 mm wide, ovate-lanceolate, acute to acuminate, thickened at apex, glabrous. Petals 10-12 mm long, 2.5-3 mm wide, obliquely lanceolate, acuminate, glabrous. Lateral sepals 13-16 mm long, 3.5-4.5 mm wide, obliquely linear-lanceolate, long-acuminate, glabrous. Lip 10-15 mm long, 5-6 mm wide, linear-lanceolate or narrowly triangular above transversely elliptic base, long-acuminate, glabrous. Spur 20-22 mm long, up to 3.5 mm in diameter at base, narrowly cylindrical-conical at base, filiform towards the apex, acute at upcurved apex.

HABITAT. High semi-deciduous forests, secondary forests. Epiphyte. June-July.

DISTRIBUTION. Ivory Coast, Ghana, Nigeria. February-June.

REPRESENTATIVE SPECIMENS. Between Daloa and Guiglo, 7 Mar. 1962, *Bernardi* 8498 (P!); Daloa, 31 May 1974, *Pérez-Vera* 244 (K!, P!); Gbotto (Agboville Region), 30 Dec. 1973, *Pérez-Vera* 552 (K!); Mt. Mafa, 1965, *Bonardi s.n.* (P!); Haut Sassandra, Dyolas, between Disandougou and N'iangouépleu, 12 May. 1909, *Chevalier* 21527 (P!); Sassandra, behind Fuyt plantation, 12 Nov. 1973, *De Koning* 2674 (WAG!); 18 km NW of Sassandra, 6°15'W, 5°00'N, 26 Feb. 1959, *Leeuwenberg* 2876 (K!, WAG!).

DOUBTFUL RECORDS: Bouroukrou, 20 Dec. 1906, *Chevalier* 16907 (P!); Niablé, 31 July 1969, *Thijssen* 158 (WAG!); Niablé, 31 July 1969, *Thijssen* 159 (WAG!); San-Pedro, 19 May 1901, *Thoiré* 257 (P!).

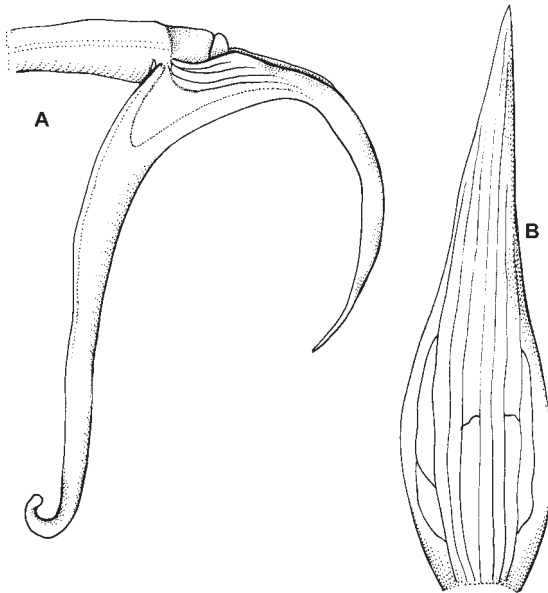


Fig. 184.—*Cyrtorchis hamata* (Rolfe) Schltr.: A – ovary, gynostemium, lip and spur; B – dorsal sepal (redrawn by J. Mytnik-Ejsmont from Summerhayes' original drawing kept at K).

**43. *Eggelingia* Summerh. in Bot. Mus. Leaf. 14: 235. 1951**

Stem elongate, occasionally branching. Leaves distichous, ligulate, unequally bilobed, with a hair-like ligule at apex opposite each leaf. Inflorescence axillary, very short, few-flowered. Flowers small, resupinate. Sepals and petals dissimilar. Lip entire or obscurely 3-lobed, ecallose. Spur cylindrical to clavate, blunt. Gynostemium short, delicate, erect. Stigma relatively narrow, deeply concave. Anther incumbent, thin-walled, operculate, elongate apically. Pollinia 2, almost globose to ellipsoid, porate. Rostellum elongate, oblong. Viscidium single, elliptic-ovate, thin, delicate. Tegula single, ribbon-like, thin, delicate. Rostellum bilobed after removal of pollinarium, middle lobe completely reduced (Fig. 185).

A small genus of 3 species widely distributed in tropical Africa.

**1. *Eggelingia clavata* Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr., ed. 2, 3: 273. 1968 (Fig. 186)**

TYPE: GABON. *Le Testu 5160* (HOLOTYPE: K!; ISOTYPE: P!; DRAWING: UGDA-DLSz)

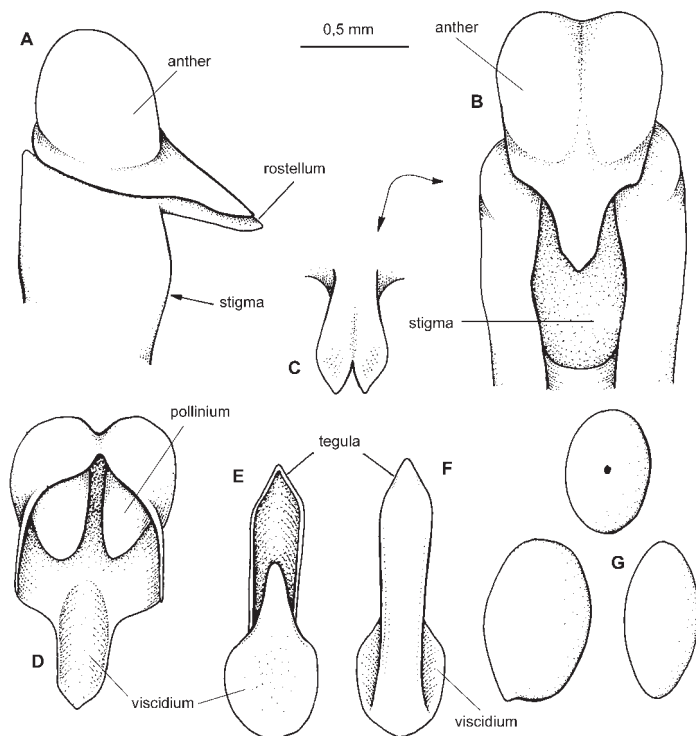


Fig. 185.—Gynostemium structure of *Eggelingia* Summerh.: A – gynostemium, side view; B – gynostemium, bottom view; C – rostellum remnant, front view; D – anther; E, F – tegula and viscidium, various views; G – pollinium, various views (Szlachetko 2003).

Stem up to 36 cm long, internodes 0.8-1.2 cm long, 0.25 cm in diameter, erect, slender. Leaves numerous, ca. up to 20 or so, 2-5 cm long, 0.5-0.9 cm wide, oblong to ligulate, unequally bilobed, each lobe obtuse, coriaceous. Inflorescence axillary, up to 1 cm long, 2-6-flowered, rather dense. Flowers small, resupinate, whitish or yellowish. Floral bract up to 1 mm long, triangular-ovate, subacute, thin, amplexicaul. Pedicel and ovary up to 5 mm long, slender, glabrous. Dorsal sepal 3-5 mm long, 1-2 mm wide, ovate to oblong-ovate, acute to shortly apiculate, cochleate, thin, glabrous, obscurely 3-nerved. Petals 2.8-4.8 mm long, 0.9-1.2 mm wide, oblong-lanceolate to ligulate-lanceolate, acute, thin, delicate, glabrous, single-nerved. Lateral sepals 4-5 mm long, 1.5-2.5 mm wide, obliquely ovate-lanceolate, acute to shortly apiculate, thin, delicate, glabrous, 3-nerved. Lip 3-3.5 mm long, up to 2.4 mm wide, oval, elliptic to oblong-ovate, acute to shortly apiculate, entire, thin, delicate, cochleate, ecallose, spurred. Spur 2.3-4 mm long, 0.8-1.4 mm in diameter, clavate, blunt. Gynostemium 1 mm long.

HABITAT. Epiphyte in dense forests. June-November.

DISTRIBUTION. Ivory Coast, Ghana, Gabon, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. Between Lagoko and Okromodau, 28 June 1966, *Aké Assi* 9017 (K!); Between Lakata (Lakato) and Sassandra, 14 Nov. 1966, *Aké Assi* 9229 (K!); San Pedro, Bérébi, 19 Oct. 1975, *Pérez-Vera* 852 (K!).

#### 44. *Eurychone* Schltr. in Beih. Bot. Centralbl. 36: 134. 1918

Monopodial herbs. Stem abbreviated. Leaves spreading, unequally bilobed at apex. Inflorescence axillary, pendulous, lax, few- or some-flowered. Flowers large, resupinate, scented. Sepals and petals subsimilar. Lip infundibuliform, entire or subentire, cucullate, ecallose. Spur conical with broad mouth, more or less swollen at apex. Gynostemium erect, strongly dorsoventrally flattened, widened towards the base. Stigma very large, almost transversely elliptic, concave. Anther incumbent, operculate, thin-walled. Pollinia 2, ellipsoid, porate. Rostellum large, oblong, widened to-

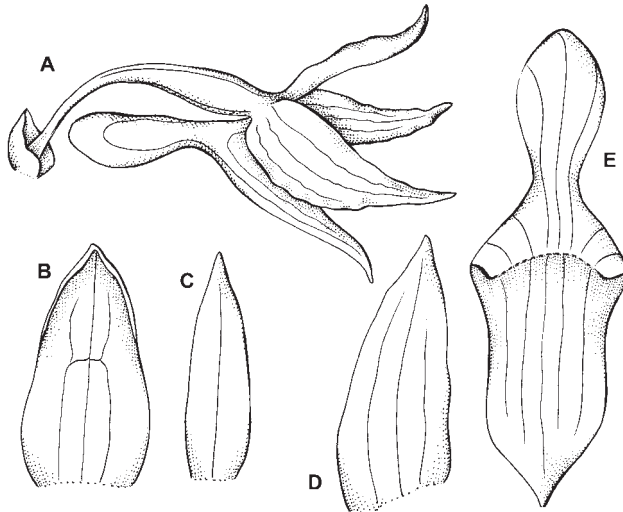


Fig. 186. *Eggingia clavata* Summerh.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by A. Kowalkowska, *Le Testu* 5160, P).

wards the truncate apex, lamellar. Viscidium single, thin, delicate, elliptic or so. Tegula single, linear, thin, delicate, much longer than viscidium. Rostellum 3-dentate at the apex after removal of pollinarium; sidelobes larger than obscure middle one (Fig. 187).

Two species are known in west and central tropical Africa.

#### KEY TO THE SPECIES

1. Leaves linear. Sepals up to 18 mm long. Spur 25-30 mm long ..... **1. *E. galeandrae***  
 – Leaves oblong-obovate. Sepals over 20 mm long. Spur 20-25 mm long ..... **2. *E. rotschildiana***

#### 1. *Eurychone galeandrae* (Rchb. f.) Schltr. in Beih. Bot. Centralbl. 36: 135. 1918

(Fig. 188)

*Angraecum galeandrae* Rchb. f. in Flora, nov. ser. 23: 189. 1865; TYPE: ANGOLA. *Welwitsch* 658 (LECTOTYPE: BM!; ISOLECTOTYPES: K!, W-R!; DRAWING: UGDA-DLSz). - *Rhaphidorhynchus galeandrae* (Rchb. f.) Finet in Bull. Soc. Bot. France 54: 43. 1907.

*Angraecum lujae* De Wild. in Not. Pl. Util. Congo 1: 142. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Luja* 272 (HOLOTYPE: BR)

Stem 4 cm long, abbreviated. Leaves few, 12-20 cm long, 1-2.5 cm wide, spreading, linear, unequally bilobed, both lobes rounded. Inflorescence 8-15 cm

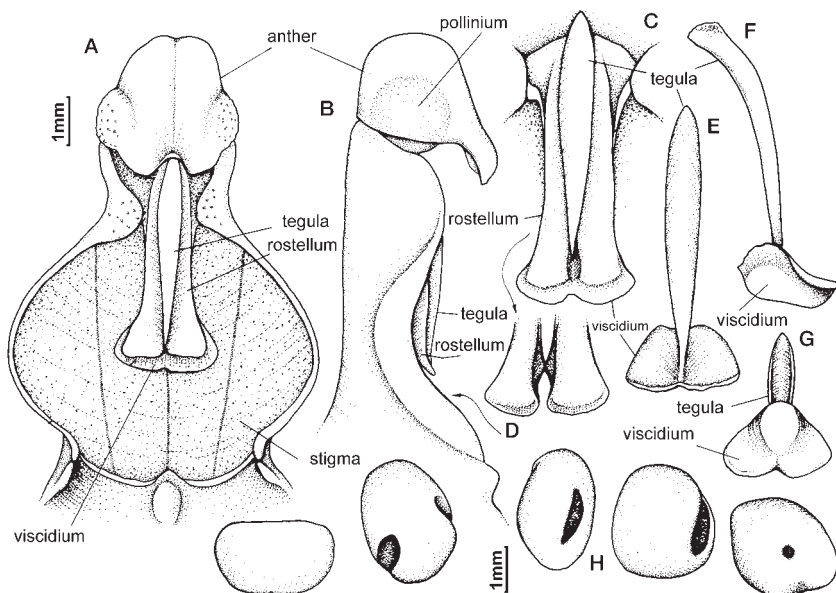


Fig. 187.—Gynostemium structure of *Eurychone* Schltr.: A – gynostemium bottom view; B – gynostemium side view; C – rostellum; D – rostellum remnant; E–G – tegula and viscidium various views; H – pollinia various views (Szlachetko 2003).

long, 3-12-flowered, lax, pendent. Flowers rather large, resupinate, salmon-creme, scented. Floral bracts 4-7 mm long, thin, delicate. Pedicel and ovary up to 18 mm long, slender, glabrous, erect. Dorsal sepal up to 15 mm long and 4 mm wide, linear or oblong-lanceolate, acute, thin, delicate, glabrous, nerves unbranched. Petals up to 15 mm long and 4 mm wide, lanceolate, acute, slightly oblique, thin, delicate, glabrous, nerves unbranched. Lateral sepals up to 18 mm long and up to 5 mm wide, oblong or lanceolate-ovate, falcate, acute to subobtusely, thin, delicate, glabrous, nerves unbranched. Lip 15-25 mm long, ca. 18-26 mm wide when spread, obscurely 3-lobed, all lobes rounded, cochleate, emarginate, thin, delicate, more or less denticulate and undulate along margins. Spur 25-30 mm long, conical with wide mouth, apical strongly recurved part 5-8 mm long, 1.2-2 mm in diameter, cylindrical, blunt. Gynostemium 6 mm long.

HABITAT. Epiphyte in savanna. November.

DISTRIBUTION. Ivory Coast, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola.

REPRESENTATIVE SPECIMENS. Danané-Guinée road, 25 Nov. 1973, Pérez-Vera 545 (K!, P!).

**2. *Eurychone rotschildiana* (O'Brien) Schltr. in Beih. Bot. Centralbl. 36: 135. 1918**  
(Fig. 189)

*Angraecum rotschildianum* O'Brien in Gard. Chron., ser. 3, 35: 130. 1903; TYPE: UGANDA. *Rattray* s.n. (cult. *Rotschild*, holotype not located).

Stem 2-8 cm long, abbreviated. Leaves 3-8, 6-21 cm long, (1.5)3-7 cm wide, oblong-obovate, oblong-elliptic, more or less oblique, unequally and subacutely or subobtusely bilobed at apex, margins undulate, thinly coriaceous. Inflorescence 3-10 cm long, 2-6(12)-flowered, lax, pendent. Flowers large, resupinate, white often with green venation, greenish tinged outside, lip white with dark green



Fig. 188.—A flower of *Eurychone galeandrae* (Rchb. f.) Schltr. (drawn by J. Mytnik-Ejsmont, *Welwitsch* 638, W-R).

spur entrance, spur greenish brown to reddish pink, pleasantly scented. Floral bracts 2-5 mm long, triangular-ovate to ovate, obtuse, glabrous, thin. Pedicel and ovary 10-12 mm long, slender, glabrous, erect. Dorsal sepal 20-25 mm long, 5.5-7 mm wide, oblong-elliptic, obtuse to subacute, thin, delicate, translucent, glabrous, nerves unbranched. Petals 18-23 mm long, 6.5-10 mm wide, obliquely oblong or oblong-elliptic, subobtusate, thin, delicate, glabrous, nerves sparsely branching. Lateral sepals 22-25 mm long, 6-7 mm wide, obliquely oblong-elliptic, subacute to acute, thin, glabrous, delicate, nerves unbranched. Lip 20-27 mm long, 20-25 mm wide, orbicular to almost ovate in general outline, cochleate in the centre, emarginate, delicate, margins undulate, erose. Spur 20-25 mm long, conical at the base, constricted near the middle, the distal part abruptly dilated, laterally compressed and geniculate, obtuse. Gynostemium 8-10 mm long.

**HABITAT.** Epiphyte in forests, in shady places, noted on *Acacia kirkii*. June.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Gabon, Equatorial Guinea (Bioko), Democratic Republic of Congo (Zaire), Angola, Uganda. Alt. 1100-1200 m.

**REPRESENTATIVE SPECIMENS.** Moyenne Sassandra, between Guidéko and Zozoro, 10-14 June 1907, *Chevalier 19053* (P!).

**45. *Homocolleticon*** (Summerh.) Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroun 36(3): 727. 2001

Monopodial plants. Stem leafy throughout. Leaves usually oblong, unequally bilobed, both lobes usually rounded. Inflorescence axillary, usually many-flowered. Flowers small to medium-sized. Sepals and petals subsimilar. Lip simple, entire, petaloid. Spur usually filiform or narrowly cylindrical. Gynostemium short, massive, erect. Stigma oval or elliptic, deeply concave. Anther incumbent, operculate, thin-walled, apical part elongate, connective rather thick. Pollinia ellipsoid, porate. Rostellum finger-like, acute, thick, longer than gynostemium. Viscidium single, relatively large, oblong, very thin, delicate, hyaline. Tegula double, elongate, thin, lamellate. Rostellum remnant 3-dentate after removal of pollinarium.

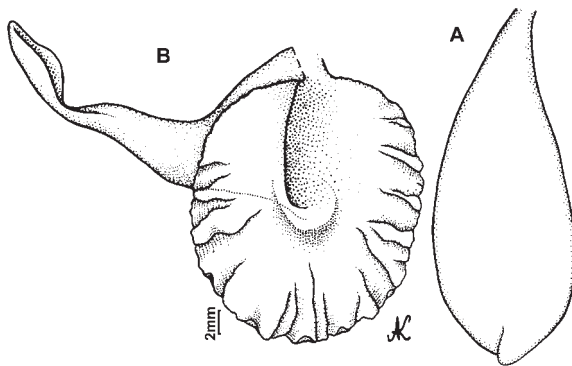


Fig. 189.—*Eurychone rotschildiana* (O'Brien) Schltr.: A — leaf; B — lip (drawn by A. Kowalkowska, *Calsalisu* 140, P).

Both sides lobes subulate, acute, much longer than the middle lobe (Fig. 190).

This group of species have been separated in the rank of section within the genus *Cyrtorchis*. The simple structure of viscidium, however, place them in an isolated position. In our opinion it is a good background to rise them to the generic level.

## KEY TO THE SPECIES

1. Pedicel and ovary 3-4 mm long. Floral bracts overlapping the flowers. Flowers small to medium ..... **1. *H. brownii***  
 – Pedicel and ovary over 10 mm long. Flower bracts shorter than pedicel and ovary. Flowers large ..... **2**

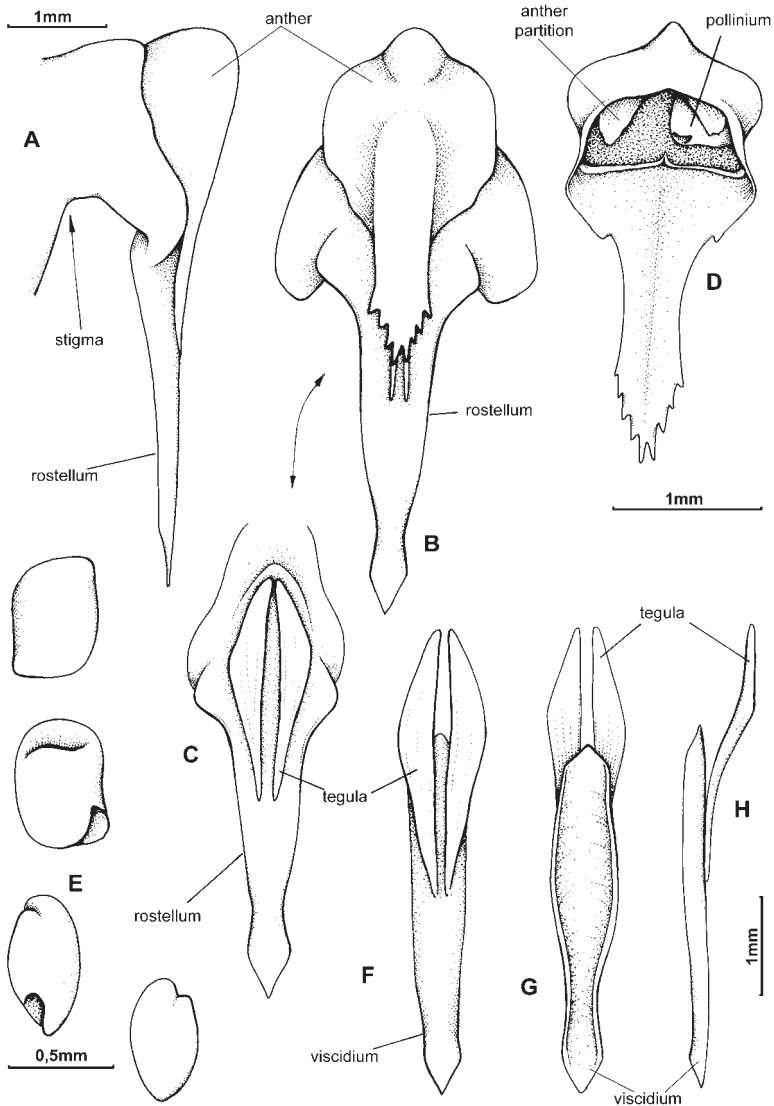


Fig. 190.—Gynostemium structure of *Homocolleticon* (Summerh.) Szlach. & Olszewski : A – gynostemium side view; B – gynostemium front view; C – rostellum; D – anther; E – pollinia various views; F-H – tegula and viscidium various views (Szlachetko 2003).



2. Spur 3.5-4.5 cm long. Leaves (2.5)3-5 cm wide. Inflorescence 18-32 cm long ..... **2. *H. monteiroae***  
 – Spur 2-3.3 cm long. Leaves 1.2-2.7 cm wide. Inflorescence 4-7(25) cm long ..... **3. *H. ringens***

**1. *Homocolleticon brownii* (Rolfe) Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroon 36(3): 728. 2001 (Fig. 191)**

*Listrostachys brownii* Rolfe in Bull. Misc. Inform. Kew. 1906: 378. 1906; TYPE: UGANDA. *Brown 248* (HOLOTYPE: BM!; ISOTYPE: K!; DRAWING: UGDA-DLSz). - *Cyrtorchis brownii* (Rolfe) Schltr. in Beih. Bot. Centralbl. 36: 129. 1918.

*Angraecum latibracteatum* De Wild. in Bull. Jard. Bot. Etat. 5: 188. 1916; TYPE (*here designated*): DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent 1773* (LECTOTYPE: BR; ISOLECTOTYPE: K!) & *Laurent 1758* (PARATYPE: BR) & *Seret 194* (PARATYPE: BR; FRAGMENT, DRAWING: K!) - *Cyrtorchis latibracteata* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 131. 1918.

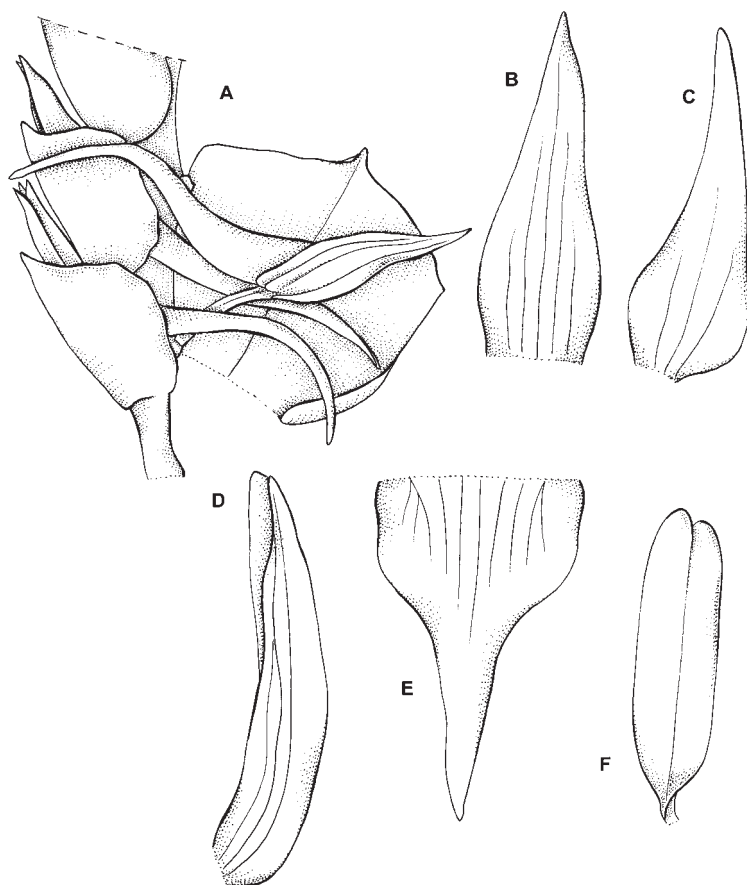


Fig. 191. – *Homocolleticon brownii* (Rolfe) Szlach. & Olszewski : A – part of inflorescence; B – dorsal sepal; C – petal; D – lateral sepal; E – lip; F – leaf (drawn by A. Kowalkowska, *Tisserant* 382, P).

Stem 8-20(40) cm tall, erect, stout, branching. Leaves 4-9, 3-12 cm long, 0.7-1.5 cm wide, imbricating basally, linear, oblong-elliptic, very coriaceous, very thick, unequally bilobed, both lobes rounded. Inflorescence 3-9 cm long, 8-20-flowered, very dense. Flowers rather small, nonresupinate, white, fragrant. Floral bracts 6-8 mm long, transversely elliptic, obtuse to shortly apiculate, amplexicaul, thin, delicate, glabrous. Pedicel and ovary 3-4 mm long, erect, glabrous. Dorsal sepal 6.5-12.5 mm long, 2-3.3 mm wide, lanceolate to ovate-lanceolate, acute or acuminate, rather thick, glabrous, nerves obscure. Petals 5.6-9.5 mm long, 1.8-2.6 mm wide, obliquely oblong-lanceolate to ovate-lanceolate, acuminate, rather thick, glabrous, nerves obscure. Lateral sepals 8-14 mm long, 1.7-3.3 mm wide, obliquely oblong-lanceolate, acute or acuminate, rather thick, with elevated keel on the upper part along the mid-nerve, nerves obscure. Lip 5.5-10.5 mm long, 2.5-3 mm wide, almost quadrate in the basal half, narrowly triangular or narrowly lanceolate in the apical half, acuminate, thick, glabrous, nerves obscure. Spur 20-30 mm long, narrowly cylindrical with conical base, acute, straight or sigmoid. Gynostemium 1.3-1.5 mm long.

**HABITAT.** Epiphyte in evergreen forests. November.

**DISTRIBUTION.** Sierra Leone, Ivory Coast, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda, Tanzania, Malawi. Alt. up to 1500 m.

**REPRESENTATIVE SPECIMENS.** Guezon, Nov. 1974, *Pérez-Vera* 733 (P!); Hiré, 14 Nov. 1966, *Aké Assi* 9225 (K!); Tai, 22 Oct. 1966, *Aké Assi* 6031 (K!); Tiapleu, 16 Nov. 1967, *Aké Assi* 9768 (K!); Mt. Tonkoui, Nov. 1972, *Pérez-Vera* 271 (K!, P!).

## 2. *Homocolleticon monteiroae* (Rchb. f.) Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroun 36(3): 728. 2001 (Fig. 192)

*Listrostachys monteiroae* Rchb. f. in *Linnaea* 41: 76.

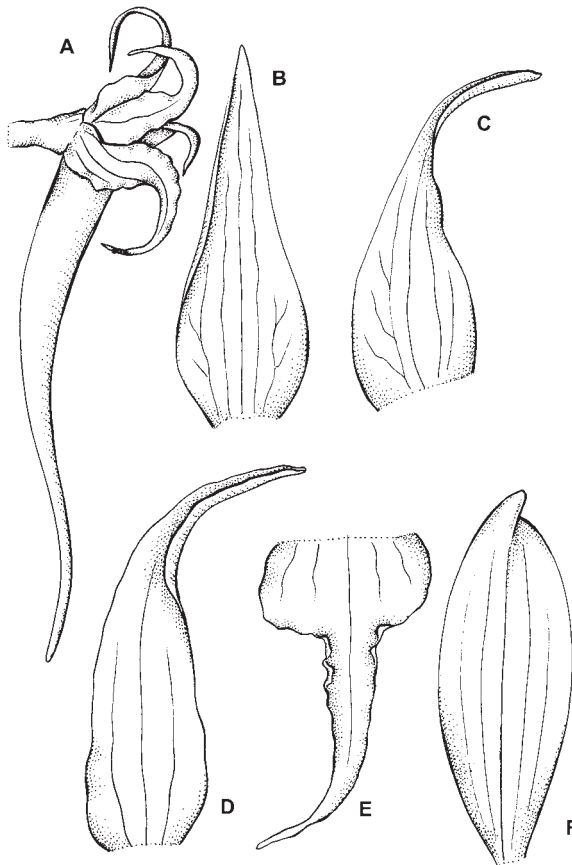


Fig. 192.—*Homocolleticon monteiroae* (Rchb. f.) Szlach. & Olszewski: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — leaf (drawn by A. Kowalkowska, *Monteiro s.n.*, W-R).

1877; TYPE: ANGOLA. *Monteiro s.n.* (LECTOTYPE: W-R!; ISOLECTOTYPE: K; DRAWING: UGDA-DLSz) - *Cyrtorchis monteiroae* (Rchb. f.) Schltr. in Orchideen: 596. 1914.

*Angraecum antennatum* Kraenzl. in Bot. Jahrb. Syst. 17: 61. 1893; TYPE: CAMEROON. *Preuss 418* (HOLOTYPE: B†; ISOTYPE: K!)

*Listrostachys droogmansiana* De Wild. in Belg. Colon. 8: 425. 1902; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gentil s.n.* (HOLOTYPE: BR; FRAGMENT OF HOLOTYPE, DRAWING: K!) - *Cyrtorchis droogmansiana* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 130. 1918.

Aerial roots up to 200 cm long. Stem up to 200 cm long, erect, stout. Leaves usually numerous, 8-21 cm long, (2.5)3-5 cm wide, obliquely oblanceolate, narrowly elliptic, tapering to both ends, fleshy, unequally bilobed at apex, both lobes rounded. Inflorescence 18-32 cm long, 10-25-flowered, pendent, lax. Flowers medium-sized, resupinate, white, tinged with orange-brown on the spur, turning orange-brown with age. Floral bracts 5-8 mm long, broadly or elliptic-ovate, obtuse, thin, glabrous. Pedicel and ovary 13-16 mm long, slender, glabrous. Dorsal sepal 15-18 mm long, 4.5-5.3 mm wide, lanceolate to ovate-lanceolate, acute to acuminate, thick, glabrous, nerves obscure. Petals 13-15 mm long, 4-4.5 mm wide, obliquely lanceolate, acuminate, thick, glabrous, obscurely nerved. Lateral sepals 15-18 mm long, 4-5 mm wide, obliquely lanceolate, acuminate, thick, glabrous, canaliculate at apex, nerves obscure. Lip 14-15 mm long, 5-5.5 mm wide, widest near the base, and then tapering towards the apex, acuminate, thick, glabrous. Spur 35-45 mm long, 2.5 mm in diameter, narrowly cylindrical, sigmoid, acute. Gynostemium 2 mm long.

HABITAT. Epiphyte in sublittoral forests, riverine forests, high forests, gallery forests, on tree in marshy site. October-December.

DISTRIBUTION. Sierra Leone, Ivory Coast, Liberia, Ghana, Nigeria, Cameroon, Principe, Gabon, Equatorial Guinea (Annobón), Congo, Central African Republic, Democratic Republic of Congo (Zaire), Angola, Uganda. Alt. 400-1300 m.

REPRESENTATIVE SPECIMENS. Road Daloa-Man, Rio Lobo, Oct. 1971, *Pérez-Vera 128* (K!); Between Legako and Okromodou, 1 Dec. 1974, *Pérez-Vera 644* (P!); Tai, 16 Nov. 1967, *Aké Assi 9778* (K!).

### 3. *Homocolleticon ringens* (Rchb. f.) Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroun 36(3): 730. 2001 (Fig. 193)

*Listrostachys ringens* Rchb. f. in Gard. Chron., ser. 2, 10: 266. 1878; TYPE: CAMEROON. *Bouche s.n.* (LECTOTYPE: W!; DRAWING: UGDA-DLSz) - *Cyrtorchis ringens* (Rchb. f.) Summerh. in Kew Bull. 13: 87. 1958.

Stem 7-40 cm long, erect, arcuate or ascending, rather stout. Leaves 5-10, (4)7.5-20 cm long, 1.2-2.7 cm wide, imbricating basally, linear, unequally bilobed at apex, both lobes rounded, stout, rather thick. Inflorescence 4-7(25) cm long, 5-20-flowered, dense. Flowers medium-sized, resupinate, white, spur ochre-salmon, sweetly fragrant. Floral bracts 3-9 mm long, ovate to rectangular, obtuse to shortly apiculate, thin, glabrous. Pedicel and ovary 10-13 mm long, slender, erect, glabrous. Dorsal sepal 9.5-11.5 mm long, 3-3.7 mm wide, lanceolate to oblong-ovate, acute to subacute, thickened towards the apex, glabrous, nerves unbranched. Petals 9-10 mm long, 2-4 mm wide, lanceolate, to elliptic basally with

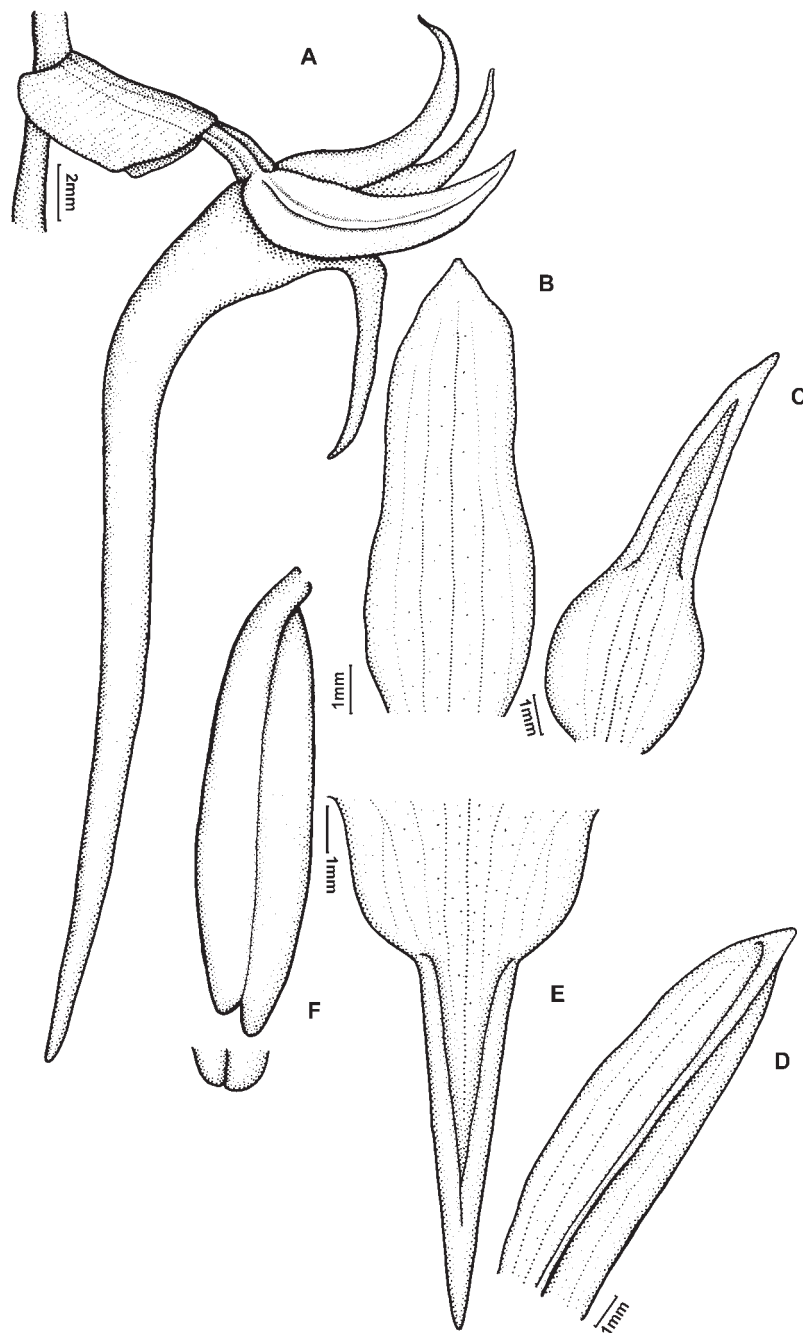


Fig. 193.—*Homocolleticon ringens* (Rchb. f.) Szlach. & Olszewski : A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — leaf (drawn by A. Kowalkowska, *Letouzey 8860*, P).

lanceolate apex, falcate or sigmoid, acute, thickened towards apex, glabrous, nerves unbranched. Lateral sepals 11-13 mm long, 3-3.3 mm wide, lanceolate to oblong-lanceolate, acute to acuminate, slightly oblique, with elevated keel near the apex on the outer surface, thickened apically, glabrous, nerves unbranched. Lip 9.5-10.5 mm long, 3-6 mm wide at base, the basal third semi-circular, linear-lanceolate above, thickened towards the apex, glabrous, nerves unbranched. Spur 20-33 mm long, 3-6 mm in diameter at base, narrowly cylindrical with conical base, acute, straight or incurved. Gynostemium 1-1.5 mm long.

**HABITAT.** Epiphyte in submontane forests with *Albizia gummifera* C.A. Sm., noted on *Cassipourea gummiflua* Tul. October-January.

**DISTRIBUTION.** Senegal, Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, São Tomé, Democratic Republic of Congo (Zaire), Rwanda, Uganda, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. 1200-2600 m.

**REPRESENTATIVE SPECIMENS.** Banco Forest Reserve, 22 Nov. 1974, *De Koning* 4819 (WAG!); 61 km N of Sassandra, W of Niapidou, 6°10'W, 5°19'N, 19 Jan. 1959, *Leeuwenberg* 2497 (WAG!); Tai, 22 Oct. 1961, *Aké Assi* 6032 (P!); Tai, 23 Jan. 1975, *De Koning* 5202 (WAG!).

#### 46. *Microcoelia* Lindl. in Gen. Sp. Orchid. Pl.: 60. 1830

*Dicranotaenia* Finet in Bull. Soc. Bot. France 54 (Mem. 9): 47. 1907

Aphyllous epiphytic or rarely lithophytic herbs. Stem short. Scale leaves acute to rostrate protecting the apex of the stem. Inflorescence axillary, racemose, produced at the apical part of the stem, with few to many flowers. Flowers small to minute, sessile to pedicellate. Sepals and petals subsimilar or dissimilar. Lip entire to distinctly 3-lobed, spurred. Gynostemium short, erect, rather slender. Stigma oval or elliptic, concave. Anther incumbent, operculate, thin-walled. Pollinia 2, ellipsoid, porate. Rostellum ligulate, short, bent towards stigma or sometimes elongate, upcurved, obtuse, rather thin, lamellate. Viscidium single, ovate to elliptic, thin, lamellate. Tegula single lamellate, thin, linear in the basal part, widened in the apical one. Rostellum remnant furcate, sidelobes wing-like, the middle one obscure (Fig. 194).

A genus of about 25-30 species distributed in tropical Africa and Madagascar with an extension to Natal (South African Republic).

#### KEY TO THE SPECIES

1. Free part of the rostellum much longer than the whole gynostemium. Lip with prominent basal auricles ..... **1. *M. macrorrhynchia***
- Free part of the rostellum usually shorter or sometimes as long as the gynostemium. Lip with no basal auricles ..... **2**
2. Spur incurved ..... **3. *M. konduensis***
- Spur straight ..... **2. *M. caespitosa***

Subgenus **Encheiridion** (Summerh.) Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroon 36(3): 792. 2001

*Encheiridion* Summerh. in Bot. Mus. Leaflet. 11: 161. 1943.

Lip with prominent basal auricles or sidelobes. Rostellum free part much elongate, longer than the whole gynostemium. Tegula and viscidium very long, narrow.

**1. *Microcoelia macrorrhynchia* (Schltr.) Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr, ed. 1, 2: 454. 1936 (Fig. 195)**

*Encheiridion macrorrhynchium* (Schltr.) Summerh. in Bot. Mus. Leafl. 11: 162. 1943; TYPE: CAMEROON. *Schlechter* 12785 (HOLOTYPE: B†) & CAMEROON. *Bates* 1429 (NEOTYPE: BM!; FRAGMENT & DRAWING: K!)

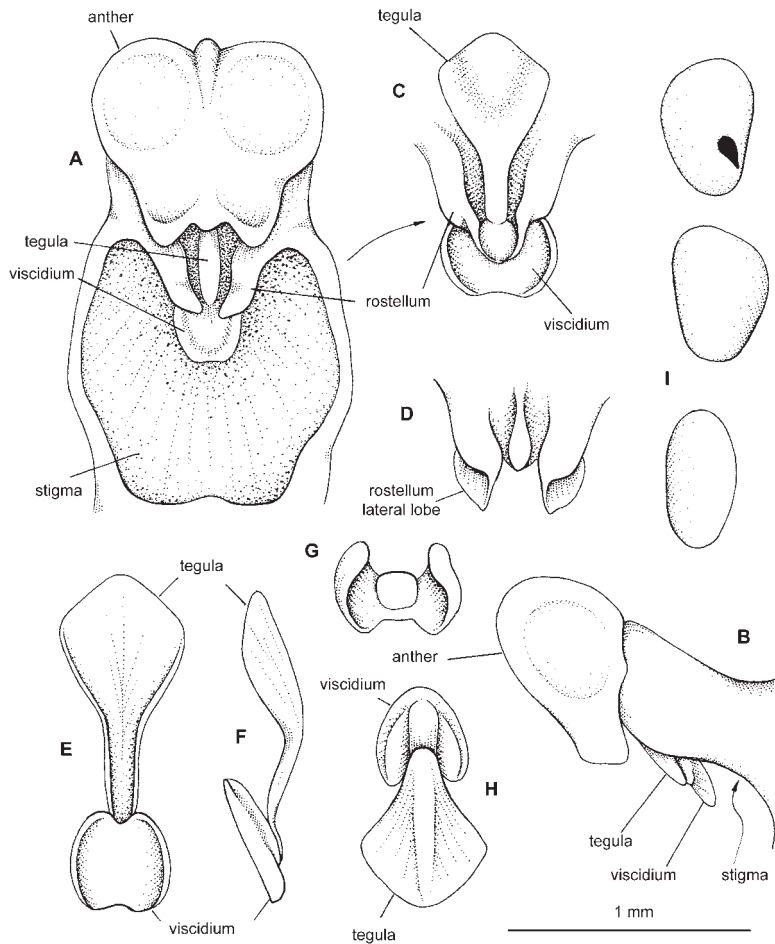


Fig. 194.—Gynostemium structure of *Microcoelia* Lindl.: A – gynostemium, bottom view; B – gynostemium, side view; C – rostellum, front view; D – rostellum remnant, front view; E–H – tegula and viscidium, various views; I – pollinia, various views (Szlachetko 2003).

Stem often small, up to 1.5(2.9) cm long, 0.15-0.3(0.5) cm in diameter. Scale leaves up to 0.4(0.7) cm long, acute to acuminate. Roots generally few, up to 7 cm long, variously spreading, undulating, terete to flattened, smooth. Inflorescence up to 10(17) cm long, up to 18(25)-flowered, erect to pendulous, dense. Flowers horizontal, dorsal sepal pale brown, lateral sepals white with brownish mid-nerve, petals white, lip white with a yellowish green spot at the base; spur pale brown to orange beige apically. Floral bracts 0.7-1.9 mm long, sheathing, acute. Pedicel and ovary up to 5.1 mm long, slender. Dorsal sepal (2)3-4.9(6) mm long, 1-2(4.3) mm wide, distinctly hood-shaped, ovate, acute, apex recurved or not, 3-nerved. Petals 3-4.5(5.5) mm long, 1.6-3.4 mm wide, obliquely ovate, obtuse to subacute, erose, 1-nerved. Lateral sepals 3.2-5.7 mm long, 1.5-2.4 mm wide, obliquely ovate, acute, apex recurved, 3-nerved. Lip 4.5-6(7.3) mm long, 3.6-5.8 mm wide, 3-lobed; mid-lobe spatulate, semicircular in outline, distinctly dentate with minutely erose margins, apically folded and distinctly decurved; sidelobes erect, oblong. Spur up to 11 mm long, pendulous, in early anthesis distinctly incurved, at late anthesis tapering apically into a distinct conical inflation.

**HABITAT.** Epiphyte usually on smaller branches and twigs in exposed positions, in rain forest, riverine forests, dense woodlands, often found in secondary forests and plantations, noted on *Citrus* sp., *Coffea* sp., *Terminalia superba* Engl. & Diels and *Theobroma cacao* Linn.. January, May-June.

**DISTRIBUTION.** Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire), Uganda, Zambia. Alt. 200-1100 m.

**REPRESENTATIVE SPECIMENS.** Buya, Benza Massola, Mayumbe, May 1930, *Flamigni 4-V bis* (BR!); Danane-Man road, 11 Jan. 1974, *Pérez-Vera 635* (K!); 40 km S of Toumodi, 14 June 1968, *Bokdam 2826* (WAG!).

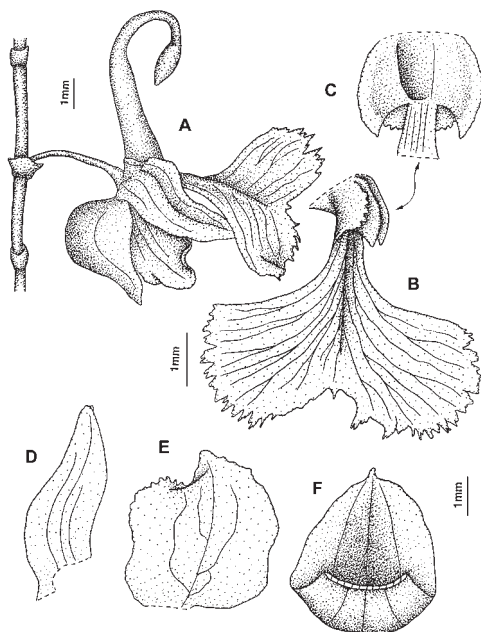


Fig. 195.—*Microcoelia macrorrhynchia* (Schltr.) Summerh.: A — flower; B — lip; C — basal part of the lip; D — lateral sepal; E — petal; F — dorsal sepal (Szlachetko & Olszewski 2001b).

### Subgenus *Microcoelia*

Lip without or with obscure basal lip auricles or sidelobes. Rostellum free part shorter than the gynostemium. Tegula and viscidium of various length, usually viscidium much shorter than tegula.

### 2. *Microcoelia caespitosa* (Rolfe) Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr., ed. 1, 2: 454. 1936 (Fig. 196)



*Angraecum caespitosum* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 150. 1897; TYPE: CAMEROON. Bates 353 (HOLOTYPE: BM!; ISOTYPE: K!) - *Gussonea caespitosa* (Rolfe) Schltr. in Beih. Bot. Centralbl. 36: 91. 1918.

*Angraecum crinale* De Wild. in Not. Pl. Util. Congo 1: 320. 1904; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). E. & M. Laurent s.n. (HOLOTYPE: BR; ISOTYPE: K!) - *Gussonea crinalis* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 91. 1918.

*Angraecum micropetalum* Schltr. in Bot. Jahrb. Syst. 38: 23. 1905; TYPE (here designated): CAMEROON. Schlechter 12779 (LECTOTYPE: B†; ICONOTYPE: K!) & 12786 (PARATYPE: B†; DRAWING: K!) - *Gussonea micropetala* (Schltr.) Schltr. in Beih. Bot. Centralbl. 36: 91. 1918. - *Microcoelia micropetala* (Schltr.) Summerh. in Bot. Mus. Leaflet. 11: 155. 1943.

*Angraecum bieleri* De Wild. in Bull. Jard. Bot. Etat. 5: 182. 1916; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). Bieler 6 (LECTOTYPE: BR) & Laurent 1780 (PARATYPE: BR). - *Gussonea bieleri* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 91. 1918. - *Microcoelia bieleri* (De Wild.) Summerh. in Bot. Mus. Leaflet. 11: 151. 1943.

Stem (0.2)1-3.1(4.5) cm long, (0.2)2.5-0.5(0.7) cm in diameter. Scale leaves up to 0.5(0.7) cm long, acuminate. Roots up to 90 cm long, terete, smooth. Inflorescence up to 3(6.5) cm long, up to 22-flowered. Flowers horizontal, whitish or fading into greenish white, sepals with a central dark greenish line, lip with a triangular central dark green blotch, spur apex tinged in pale green or not. Floral bracts up to 2(3) mm long, sheathing, acute to subacute. Pedicel and ovary up to 12.3 mm long, very sparsely glandular. Dorsal sepal (2.2)2.5-3.5(4.2) mm long, 1-1.9(2.2) mm wide, oblong, hooded, obtuse to subacute, 3-nerved. Petals (2.1)2.3-3.1(3.4) mm long, (1)1.2-1.8(2.4) mm wide, obovate, obtuse to subacute, with single nerve. Lateral sepals 2.7-4.1(5.2) mm long, (1.6)2-2.6(2.9) mm wide, obliquely ovate, obtuse to subapiculate, convex, 3-nerved, the central one slightly thickened. Lip (1.7)2.5-3.6(3.9) mm long, (1)1.1-1.9(2.1) mm wide, triangular in outline, flat or cup-like, straight or deflexed. Spur (6.5)7.4-11.3(14.2) mm long, up to 2.3 mm in diameter in the widest part, vertically pendent, basal part distinctly constricted, central part inflated, tapering into a distinctly inflated obtuse apex.

**HABITAT.** Epiphyte mostly on branches of the understorey vegetations, in rain forest, often in the vicinity of rivers. Noted on *Citrus* sp., *Coffea* sp., *Theobroma* sp., *Cleistanthus* sp., *Eriocoelum* sp. and *Plagiosiphon* sp.. All year round.

**DISTRIBUTION.** Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic,

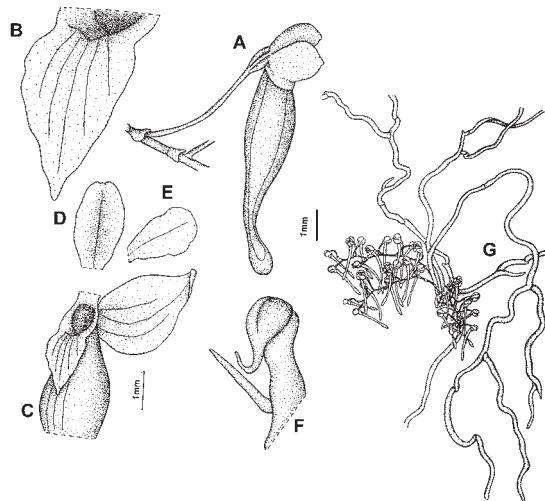


Fig. 196. - *Microcoelia caespitosa* (Rolfe) Summerh.: A - flower; B - lip; C - lip, basal part of the spur and lateral sepal; D - dorsal sepal; E - petal; F - gynostemium; G - habit (Szlachetko & Olszewski 2001b).

Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire), Uganda. Alt. 50-1100 m.

REPRESENTATIVE SPECIMENS. Anguedou, 24 Aug. 1975, *van der Burg* 755 (WAG!); Banco, 1 Sep. 1961, *Aké Assi* 6021 (K!); Banco Forest Reserve, 13 June 1975, *van der Burg* 401 (WAG!); 26 June 1975, *van der Burg* 433 (WAG!); *van der Burg* 562 (WAG!); 15 July 1975, *van der Burg* 646 (WAG!); 22 July 1975, *van der Burg* 653 (WAG!); 30 July 1975, *van der Burg* 712 (WAG!); 30 Sep. 1975, *van der Burg* 1154 (WAG!); Banco Forest Reserve, near Route des Grands Vaux, 23 Dec. 1974, *De Koning* 5056 (WAG!); Banco, NW of Abidjan, 26 Oct. 1956, *de Wilde* 731 (WAG!); Bouroukrou, 20 Dec. 1906, *Chevalier* 16917 (P!); Moyen-Comoé, Olssikasso, 18 Dec. 1909, *Chevalier* 22605 (P!); Bas Comoé, NE of Abidjan, between Bettié and Abradine, 15-17 Mar. 1907, *Chevalier* 17586 (P!); N Daloa, Lobo R., 31 May 1974, *Pérez-Vera* 281 (K!, P!); Moyenne Sassandra, between Guideko and Zozro, 12-14 June 1907, *Chevalier* 19046 (P!); Sassandra, between Zago and Gaouloubéré, 6-8 May 1907, *Chevalier* 16340 (P!); Yapo, ca. 50 km N of Abidjan, 26 July 1956, *de Wilde* 143 (WAG!).

**3. *Microcoelia konduensis* (De Wild.) Summerh. in Bot. Mus. Leaf. 11: 154. 1943 (Fig. 197)**

*Angraecum konduensis* De Wild. in Not. Pl. Util. Congo 1: 321. 1904; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent s.n.* (HOLOTYPE: BR). - *Gussonea konduensis* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 93. 1918.

Stem short, up to 1(5) cm long, (0.15)0.2-0.3(0.6) cm in diameter. Scale leaves 0.3-0.5(0.6) cm long, acuminate to rostrate. Roots many, up to 50(70) cm long,

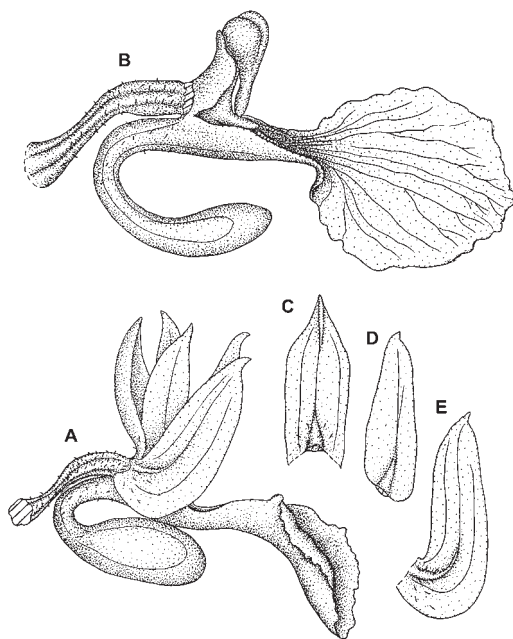


Fig. 197.—*Microcoelia konduensis* (De Wild.) Summerh.: A – flower; B – flower, tepals removed; C – dorsal sepal; D – petal; E – lateral sepal (Szlachetko & Olszewski 2001b).

slender, terete, smooth. Inflorescence up to 15(20) cm long, up to 15(30)-flowered, usually rather dense, descending, spreading. Flowers mostly twisted into a horizontal position, whitish, sepals tinged in orange-brown or salmon-coloured at the base, lip white tinged with apple-green around the spur mouth; spur apex orange-brown to salmon-coloured. Floral bracts up to 2.5(3.5) mm long. Pedicel and ovary up to 4.3 mm long, slender, covered by the glandular hairs. Dorsal sepal (2.4)3.1-5.3(6.3) mm long, 1.1-2 mm wide, hooded, oblong to elliptic, acuminate, 3-nerved. Petals 2.2-6.1(6.5) mm long, (0.5)0.8-1.6(2.1) mm wide, obliquely narrowly ovate, acute, subapiculate, 1-nerved. Lateral sepals (3)4-6.6(7.7) mm long, (1)1.3-2.3(2.7) mm

wide, obliquely narrowly ovate to ovate, convex, acute, apiculate, 3-nerved. Lip (2.8)4.5-7.9(10.3) mm long, (1.4)2.2-6(7.7) mm wide, spathulate, folded, orbicular to broadly transversely elliptic, obtuse to slightly emarginate, apically erose. Spur up to 13 mm long, distinctly incurved, obtuse, cylindrically inflated apically, and here up to 2 mm in diameter.

**HABITAT.** Epiphyte on finer branches and twigs in the crowns of small as well as very large trees, in rain forest, often in plantations and secondary forests. December-May.

**DISTRIBUTION.** Ivory Coast, Ghana, Benin, Nigeria, Democratic Republic of Congo (Zaire), Uganda. Alt. 50-500 m.

**REPRESENTATIVE SPECIMENS.** Banco Forest Reserve, 21 Jan. 1976, *De Koning* 6412 (WAG!); Banco Forest Reserve, near Banco R. spring, 29 Jan. 1976, *De Koning* 6435 (WAG!); Banco Forest Reserve, Route Martineau, 29 Jan. 1976, *De Koning* 6436 (WAG!); NW of Daloa, Lobo, 6 May 1974, *Pérez-Vera* 628 (K!, P!); NE Sassandra, Dakpadou-Sago road, 5°58'W, 5°17'N, 28 Mar. 1968, *Geerling & Bokdam* 2281 (WAG!); Yapo, ca. 50 km N of Abidjan, 24 Dec. 1956, *de Wilde* 1016 (K!, WAG!).

#### 47. *Nephrangis* (Schltr.) Summerh. in Kew Bull. 2: 301. 1948

Stem elongate, simple or branching, leafy. Leaves terete. Inflorescences abbreviated, few-flowered, much shorter than leaves. Flowers small, resupinate. Sepals and petals dissimilar. Lip with 2 large, spreading, almost orbicular lobes. Spur

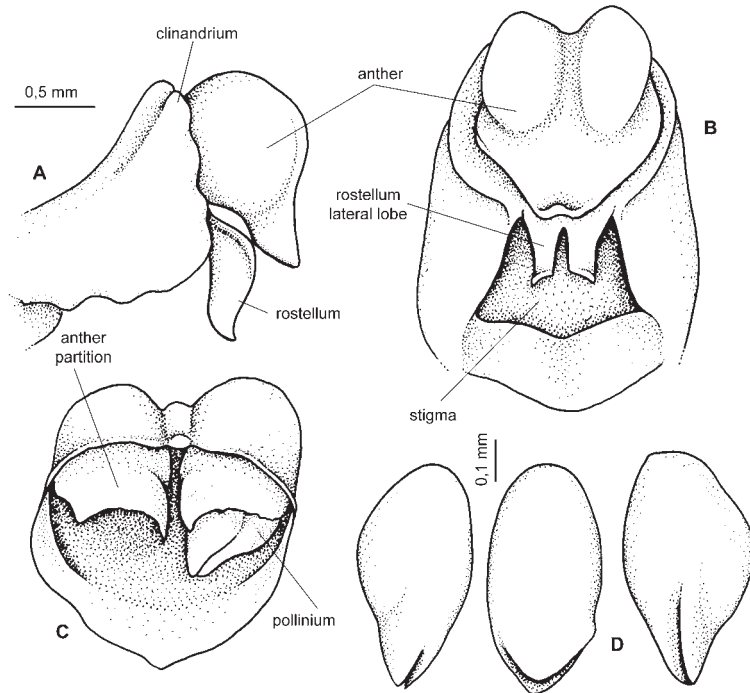


Fig. 198.—Gynostemium structure of *Nephrangis* (Schltr.) Summerh.: A – gynostemium, side view; B – gynostemium, front view; C – anther; D – pollinia, various views (Szlachetko 2003).

cylindrical, prominent. Gynostemium short, erect. Stigma oblong, deeply concave. Anther incumbent, operculate, thin-walled. Pollinia 2, ovoid, cleft. Rostellum ligulate, truncate, bent towards the stigma. Viscidium single, elliptic, membranous. Tegula double, linear, membranous. Rostellum 3-dentate after removal of pollinarium, both sidelobes narrow, acute, longer than the middle one (Fig. 198).

A genus of 2 species distributed in tropical Africa.

**1. *Nephrangis filiformis* (Kraenzl.) Summerh. in Kew Bull. 2: 302. 1948 (Fig. 199)**

*Listrostachys filiformis* Kraenzl. in Pflanz. Ost-Afr. C: 158. 1895; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Stuhlmann* 2229 (HOLOTYPE: B†) - *Tridactyle filiformis* (Kraenzl.) Schltr. in Beih. Bot. Centr. 36: 148. 1918.

Stem 3-50 cm tall, pendulous, usually branching, terete. Leaves 1.5-12 cm long, 0.1-0.2 cm in diameter, terete, fleshy, acute, arcuate. Inflorescence 0.5-1.5 cm long, 1-4-flowered, abbreviated, axillary. Flowers small, resupinate, translucent, pale brown or brownish green. Floral bract 0.5-1 mm long, ovate, acute. Pedicel and ovary 3-4 mm long, slender, erect. Dorsal sepal 1.5-3 mm long, 1-2 mm wide, broadly ovate, obtuse, more or less cochleate, thin, 3-nerved. Petals 1.5-3 mm long, 0.4-0.6 mm wide, narrowly elliptic to linear, more or less falcate to sigmoid, acute, thin, glabrous, single-nerved. Lateral sepals similar in size to the dorsal one, obliquely elliptic, subobtusate, thin, delicate, glabrous, 3-nerved. Lip 4-5(7) mm long, 3.5-5 mm wide, bilobed below the unguiculate base, both lobes obliquely elliptic-obovate or reniform, rounded, divergent. Spur 4-10 mm long, narrowly cylindrical, obtuse, erect. Gynostemium 0.6-1.2 mm long.

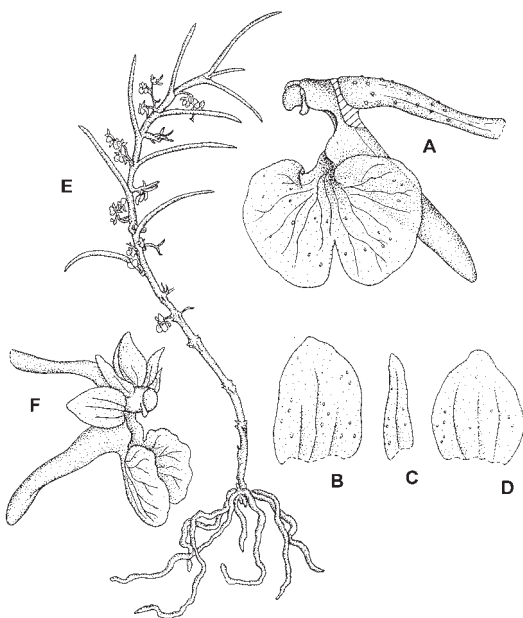


Fig. 199.—*Nephrangis filiformis* (Kraenzl.) Summerh.: A — pedicel, ovary, lip, spur and gynostemium; B — lateral sepal; C — petal; D — dorsal sepal; E — habit; F — flower (Szlachetko & Olszewski 2001b).

to the dorsal one, obliquely elliptic, subobtusate, thin, delicate, glabrous, 3-nerved. Lip 4-5(7) mm long, 3.5-5 mm wide, bilobed below the unguiculate base, both lobes obliquely elliptic-obovate or reniform, rounded, divergent. Spur 4-10 mm long, narrowly cylindrical, obtuse, erect. Gynostemium 0.6-1.2 mm long.

**HABITAT.** Epiphyte in forests and woodlands, noted on *Cryptosepalum pseudo-taxus* E.G. Baker.

**DISTRIBUTION.** Ivory Coast, Liberia, Democratic Republic of Congo (Zaire), Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia. Alt. 600-2000 m.

**NOTES.** I have examined no specimens of this taxon from Ivory Coast, but it was given by Pérez-Vera (1976).

**48. *Podangis* Schltr. in Beih. Bot. Centralbl. 36: 82. 1918**

Stem abbreviated, erect. Leaves gathered in a fan, iris-like, fleshy, imbricating at bases. Inflorescence axillary, subumbellate. Flowers resupinate. Sepals and petals dissimilar. Lip orbicular, entire, simple. Spur conical from a wide mouth, swollen at apex. Gynostemium short, rather massive. Stigma elliptic, deeply concave. Anther incumbent, operculate, thin-walled, elongate apically. Pollinia 2, ellipsoid, porate. Rostellum relatively large, tongue-like, truncate, lamellar. Viscidium single, lamellar, delicate. Tegula double, almost filiform, delicate, thin. Rostellum 3-dentate after removal of pollinarium, both sidelobes prominently larger than the small, acute middle one (Fig. 200).

A monotypic genus occurring in tropical Africa.

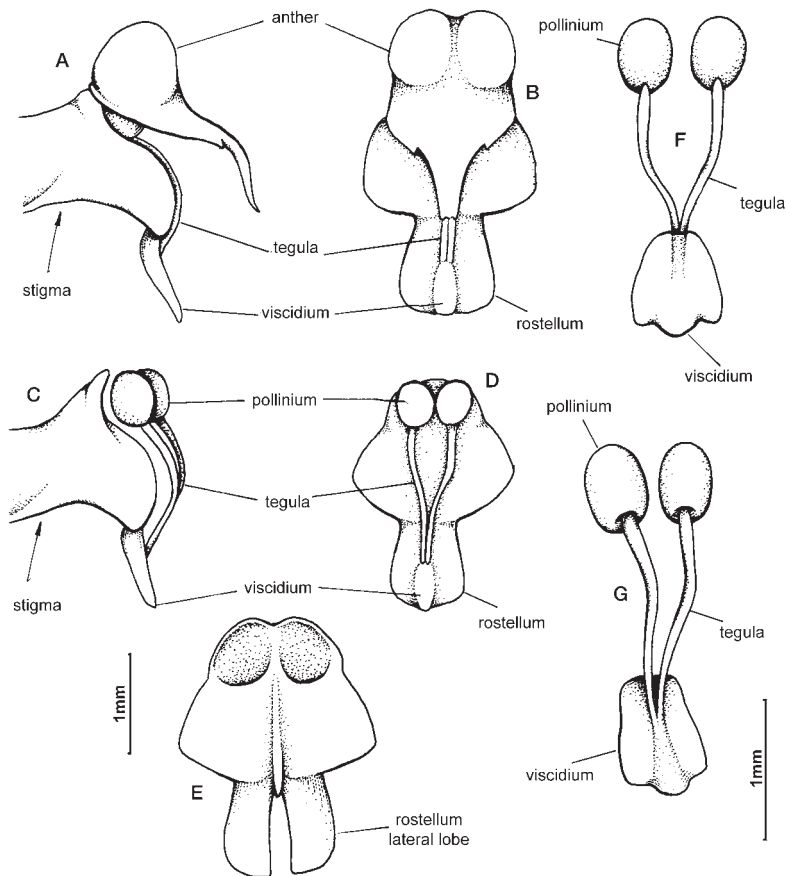


Fig. 200.—Gynostemium structure of *Podangis* Schltr.: A – gynostemium side view; B – gynostemium front view; C – gynostemium side view, anther removed; D – gynostemium front view, anther removed; E – rostellum remnant; F, G – pollinarium various views (Szlachetko 2003).

**1. *Podangis dactyloceras* (Rchb. f.) Schltr. in Beih. Bot. Centralbl. 36: 82. 1918 (Fig. 201)**

*Listrostachys dactyloceras* Rchb. f. in Flora 48: 190. 1865; TYPE: ANGOLA. *Wehwitsch* 677 (LECTOTYPE: BM!; ISOLECTOTYPES: K!, W-R!; DRAWING: UGDA-DLSz) - *Angorchis dactyloceras* (Rchb. f.) O.Kuntze in Revis. Gen. Pl. 2: 651. 1891.

Stem 1-8(20) cm tall, erect, covered in the lower parts by roots and old leaf-sheaths, with a fan of leaves above. Leaves 4-8, 4-16 cm long, 0.5-1.2 cm wide, linear-ligulate, acute, falcate, fleshy, erect or spreading. Inflorescence 1-4 cm long, 5-20-flowered, lateral, lax, subumbellate, peduncle and rhachis glabrous. Flowers small, resupinate, white, semitransparent, anther green. Floral bracts 2-5 mm long, triangular-ovate, obtuse to acute, scarious. Pedicel and ovary 20-25 mm long, slender, erect, green. Dorsal sepal 3.5-4.5 mm long, 3 mm wide, oblong-elliptic to elliptic-obovate, subacute, slightly cochleate, thin, delicate, glabrous, 3-nerved. Petals 4 mm long, 5 mm wide, broadly obovate, slightly oblique, obtuse, thin, delicate, glabrous, nerves branched. Lateral sepals 4-5 mm long, 3 mm wide, obliquely oblong-elliptic, subapiculate, carinate in the upper margin, thin, slightly cochleate, glabrous, nerves unbranched. Lip 4-6 mm long, 5 mm wide, transversely semi-elliptic or orbicular, entire, sometimes subapiculate apically, margin slightly erose, cochleate, thin, glabrous. Spur 9-11 mm long, 2-3 mm in diameter at base, conical-cylindrical from the wide mouth, inflated near the middle, swollen at apex, with 2 umbonate sacs at apex. Gynostemium 1-2 mm long.

HABITAT. Epiphyte in forests, on low trees along streams. February-March.

DISTRIBUTION. Guinea, Sierra Leone, Ghana, Ivory Coast, Togo, Nigeria, Cameroon, Democratic Republic of Congo (Zaire), Angola, Uganda, Tanzania, Madagascar? Alt. 750-1950 m.

REPRESENTATIVE SPECIMENS. Guezon-Buyo road, 3 Mar. 1974, *Pérez-Vera* 537 (K!, P!); Lobo R., 1 Feb. 1968, *Aké Assi* 9886 (K!).

**49. *Rangaeris***  
(Schltr.) Summerh. in  
Kew Bull. 1936: 227.  
1936

Stem short to elongate, usually unbranched. Leaves gathered in a fan or well-spaced along the stem, iridiform or dorsiventrally flattened,

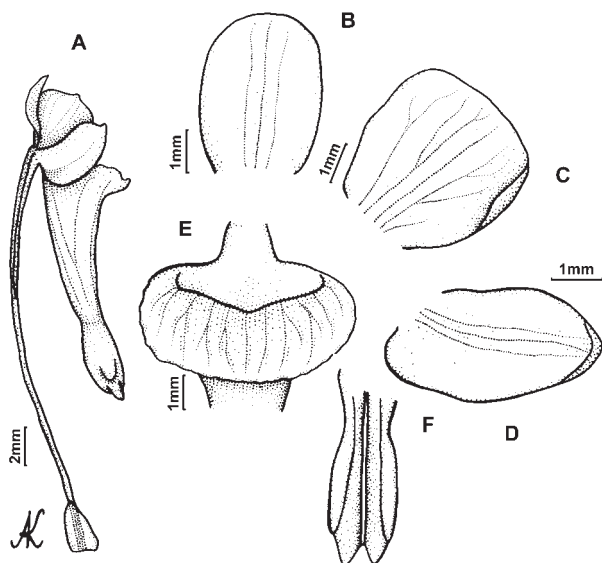


Fig. 201.—*Podangis dactyloceras* (Rchb. f.) Schltr.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — spur apex (drawn by A. Kowalkowska, *Jacques-Felix* 3006, P).

coriaceous. Inflorescence pendent, spreading to erect, few- to many-flowered. Flowers medium-sized to large, resupinate. Sepals and petals similar or dissimilar. Lip of various shape, entire to obscurely 3-lobed. Spur filiform. Gynostemium rather short and massive. Stigma entire, elliptic, deeply concave. Anther incumbent, operculate, thin, elongated apically. Pollinia 2, ellipsoid, porate. Rostellum large, tongue-like, lamellar, widest at truncate apex. Viscidium single, lamellar, thin, oblong. Tegula double, thin, delicate, filiform, sometimes twisted. Rostellum 3-dentate after removal of pollinarium. Both lateral lobes distinctly larger than the obscure middle one (Fig. 202).

A genus of 6 species confined to tropical Africa.

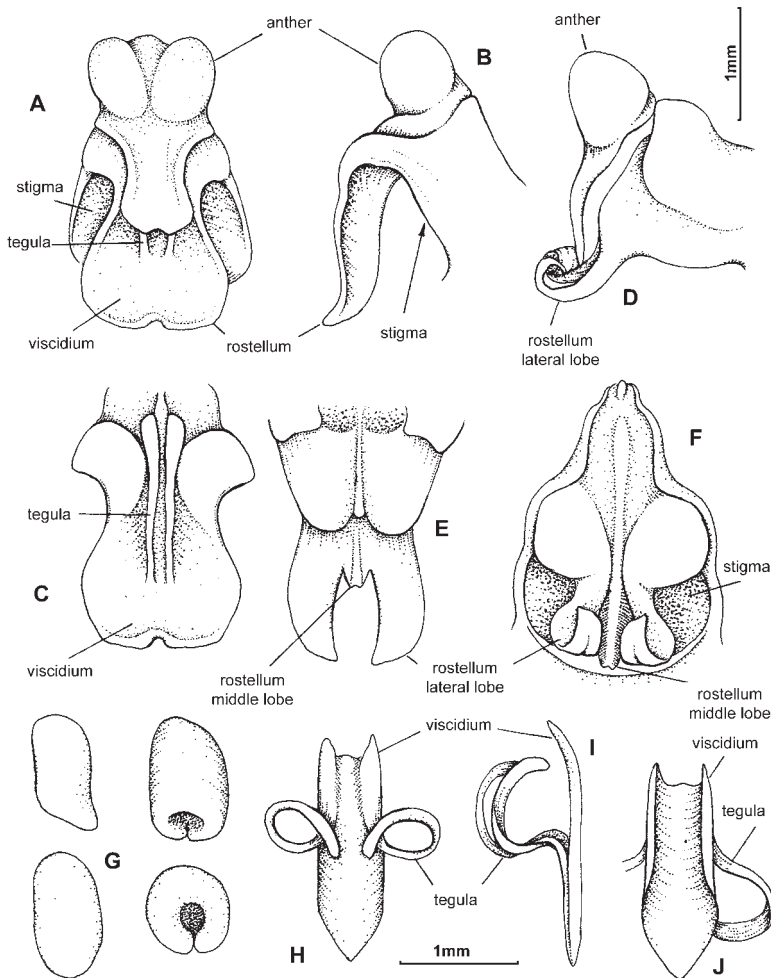


Fig. 202.—Gynostemium of *Rangaeris* (Schltr.) Summerh.: A – gynostemium front view; B, D – gynostemium side view; C – rostellum; E, F – rostellum remnant various views; G – pollinia; H–J – tegula and viscidium various views (Szlachetko 2003).



## KEY TO THE SPECIES

1. Leaves iridiform, laterally flattened. Pedicel and ovary densely glandular ..... **3. *R. rhipsalisocia***  
 – Not above combination of features ..... 2
2. Leaves well-spaced along the stem. Lip oblong-ovate, entire ..... **1. *R. longicaudata***  
 – Leaves fan-shaped, imbricating basally. Lip ovate-cordate in general outline, obscurely 3-lobed ..... **2. *R. muscicola***

- 1. *Rangaeris longicaudata* (Rolfe) Summerh.** in Hutchinson & Dalziel, Fl. W. Trop. Afr., ed. 1, 2: 449. 1936  
 (Fig. 203)



Fig. 203.—*Rangaeris longicaudata* (Rolfe) Summerh.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by A. Kowalkowska, *Thomas 4907*, P).

*Mystacidium longicaudatum* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 170. 1897; TYPE: NIGERIA. Miller 188 (HOLOTYPE: K!)

Stem elongate, internodes 1-1.5 cm long, ca. 0.5 cm in diameter, rather stout, erect or arcuate. Leaves numerous, 6-12 cm long, 1-1.5 cm wide, widely spaced along the stem, narrowly oblong, rather thick, unequally bilobed at apex, both lobes rounded. Inflorescence 8-15 cm long, 3-4-flowered, very lax. Flowers rather large, resupinate, white, turning yellow. Floral bracts 10-15 mm long, triangular-ovate, acute, amplexicaul, glabrous. Pedicel and ovary 7.2-12 cm long, very slender, glabrous. Dorsal sepal 25-35 mm long, 6-9 mm wide, ovate attenuating towards apex, acute, rather fleshy, thick, glabrous, nerves unbranched. Petals 20-30 mm long, 5-7 mm wide, obliquely oblong-ovate in the lower half, then attenuated into the long slightly canaliculate cauda, rather thick, glabrous, nerves unbranched. Lateral sepals 25-35 mm long, 5-8 mm wide, obliquely oblong-ovate to oblong-oblancheolate, attenuating into the long and canaliculate cauda, rather thick, glabrous. Lip 15-25 mm long, 5-8 mm wide, oblong-ovate, acute, entire, canaliculate towards the base, rather thick, glabrous, ecallose. Spur 100-200 mm long, 3 mm in diameter, narrowly conical at base and filiform below, acute. Gynostemium 6 mm long.

HABITAT. Epiphyte in mature forests with *Autranella* sp. and *Microberlinia* sp. November.

DISTRIBUTION.  
Ivory Coast, Nigeria, Cameroon.  
Alt. 50 m.

REPRESENTATIVE SPECIMENS. Guezon, Guenabo-Duekoué road, 1 Nov. 1973, Pérez-Vera 533 p.p. (P!); Oureyo, Nov. 1972, Pérez-Vera 146 (K!); *Sine loc.*, 26 Nov. 1978, Dekker 330 (WAG!).

**2. *Rangaeris muscicola***  
(Rchb. f.)  
Summerh. in  
Hutchinson &  
Dalziel, Fl. W.  
Trop. Afr., ed.  
1, 2: 284.  
1936  
(Fig. 204)

*Aeranthes muscicola* Rchb. f. in  
Flora 48: 190.  
1865; TYPE: AN-

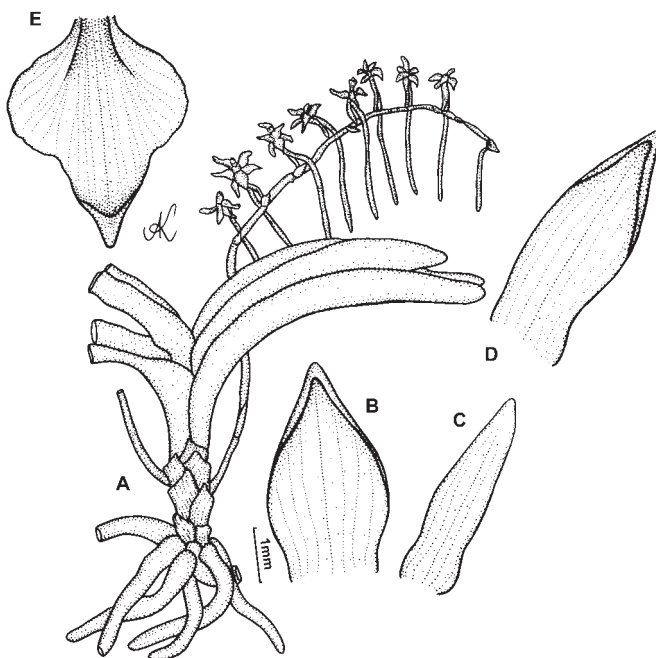


Fig. 204.—*Rangaeris muscicola* (Rchb. f.) Summerh.: A — habit; B — dorsal sepal; C — petal; D — lateral sepal; E — lip (drawn by A. Kowalkowska, Letouzey 7833, P).

GOLA. *Welwitsch* 699 (LECTOTYPE: BM!; ISOLECTOTYPES: W!, K!; DRAWING: UGDA-DLSz) - *Mystacidium muscicolum* (Rchb. f.) T. Durand & Schinz. in Consp. Fl. Afr. 5: 54. 1895. - *Listrostachys muscicola* (Rchb. f.) Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 158. 1898. - *Aerangis muscicola* (Rchb. f.) Schltr. in Bot. Jahrb. Syst. 53: 599. 1915.

*Angraecum englerianum* Kraenzl. in Bot. Jahrb. Syst. 7: 333. 1886; TYPE: CAMEROON. *Schlechter* 15770 (HOLOTYPE: B†; ICONOTYPE: K!) - *Listrostachys engleriana* (Kraenzl.) Kraenzl. in Bot. Jahrb. Syst. 19: 254. 1894, in obs. - *Aerangis englerianum* (Kraenzl.) Schltr. in Bot. Jahrb. Syst. 53: 599. 1915.

*Mystacidium batesii* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 172. 1898; TYPE: WEST AFRICA. *Bates* 382 (HOLOTYPE: BM!) - *Angraecum batesii* (Rolfe) Schltr. in Westaf. Kautschuk-Exped.: 283. 1900.

Stem 1-6(30) cm long, short, stout, erect. Leaves 5-11, 6.5-20 cm long, 0.6-2 cm wide, arranged in a fan, ribbon-like, arcuate, coriaceous, unequally bilobed at apex, both lobes rounded. Inflorescence 5-25(42) cm long, 5-15-flowered, lax, suberect or arcuate. Flowers rather small, resupinate, white or white with yellow-orange suffusion, spur pinkish olive or white, diurnally sweetly scented. Floral bracts 3-9 mm long, broadly or triangular-ovate, acute, amplexicaul. Pedicel and ovary 14-36 mm long, slender, resupinate, erect, glabrous. Dorsal sepal 7-9 mm long, 2.3-4.2 mm wide, ovate to broadly ovate, acute, thickened along margins in the upper half, glabrous, nerves unbranched. Petals 6.5-8 mm long, 1.5-3.3 mm wide, obliquely elliptic to linear-lanceolate, acute or subobtusely, thickened along margins, glabrous, unbranched. Lateral sepals 7.3-9.4 mm long, 2.3-4 mm wide, obliquely lanceolate to oblong-ovate, acute, thickened along margins in the apical half, glabrous, nerves unbranched. Lip 6.7-8.5 mm long, 4-7 mm wide, ovate to cordate-ovate, very obscurely 3-lobed, acute; the middle lobe ovate-triangular, thickened along margins; sidelobes rounded. Spur (4)5.5-10(12) cm long, filiform, pendent, acute. Gynostemium 3-4.5 mm long.

HABITAT. Epiphyte in lowland and upland evergreen forests, *Brachystegia* sp. woodlands, noted on *Brachystegia boehmii* Taub., *Erythrophloeum guineense* G. Don., *Irvingia smithii* Hook. f., lithophyte on granitic rocks along with *Asplenium stuhlmanii* Hier. and *Anthropteris* sp. April-August.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Gabon, Democratic Republic of Congo (Zaire), Angola, Uganda, Rwanda, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa. Alt. 1180-2200 m.

REPRESENTATIVE SPECIMENS. Haut Cavally, Dyolas, between Oua and Gouro, 28 Apr. 1909, *Chevalier* 21350 (P!); Daniéfla, July 1971, *Pérez-Vera* 120 (K!); Mt. Nimba, Aug. 1974, *Pérez-Vera* 806 (P!).

### 3. *Rangaeris rhipsalisocia* (Rchb. f.) Summerh. in Kew Bull. 1936: 28. 1936 (Fig. 205)

*Angraecum rhipsalisocium* Rchb. f. in Flora 48: 189. 1865; TYPE: ANGOLA. *Welwitsch* 662 (LECTOTYPE: BM!; ISOLECTOTYPES: K, W-R!; DRAWING: UGDA-DLSz)

*Listrostachys cordatiglandula* De Wild. in Bull. Jard. Bot. Etat. 5: 184. 1914; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Seret* 754 (HOLOTYPE: BR)

Stem 5-25 cm tall, erect, glabrous. Leaves few to some, gathered in the fan-like manner, 8-20 cm long, 0.3-0.8 cm wide, laterally compressed, linear or linear-lanceolate, acute, falcate, thick, imbricating basally. Inflorescence basal, 2.5-20

cm long, 6-15-flowered, lax, peduncle and rhachis glabrous. Flowers small, tubular, resupinate, whitish to yellowish, turning yellow-orange with age. Floral bracts 3-7 mm long, transversely elliptic, subacute, membranous, glabrous, amplexicaul. Pedicel and ovary up to 20 mm long, slender, erect, densely glandular. Dorsal sepal 6-12 mm long, 3-4 mm wide, ovate-lanceolate, subacute to subobtusate, glabrous, rather thin, with some, sparsely branched nerves. Petals 6-8 mm long, 2-3 mm wide, obliquely ovate-lanceolate to ovate-oblong, subacute to subobtusate, rather thin, glabrous, with some branching nerves. Lateral sepals 6-12 mm long, 2.5-3.5 mm wide, falcate at base, lanceolate to ovate-lanceolate above, apiculate, thin, glabrous, with prominent elevated keel at the apex outside, nerves sparsely branching. Lip 7-8 mm long, 4-4.5 mm wide, cochleate, canaliculate, rather thin, its basal half almost circular, its apical half narrowly triangular, subobtusate. Spur 12-15 mm long, 2 mm in diameter at base, narrowly conical at base, filiform towards acute apex, reflexed at apex. Gynostemium short and massive.

**HABITAT.**  
Epiphyte in dense forests, high-

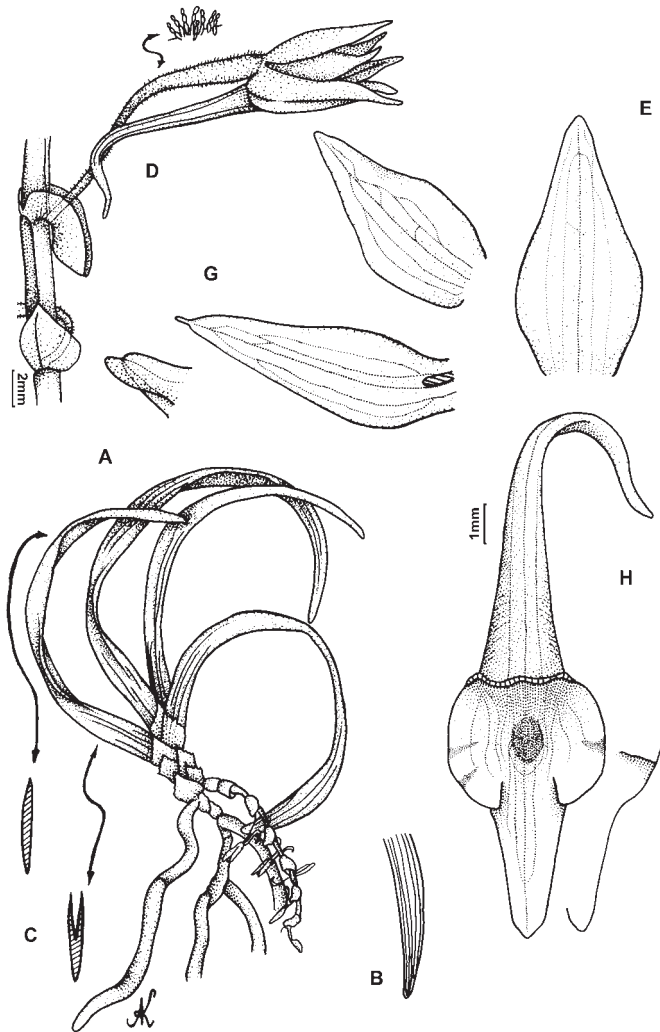


Fig. 205.—*Rangaeris rhipsalisocia* (Rchb. f.) Summerh.: A – habit; B – leaf apex; C – leaf cross sections; D – flower; E – dorsal sepal; F – petal; G – lateral sepal; H – lip (drawn by A. Kowalkowska, *Tisserant* 2625, P).

forest, gallery forests, in forest exploitation, sometimes on old coffee tree, very tolerant of dry conditions. Throughout the year.

**DISTRIBUTION.** Senegal, Guinea, Sierra Leone, Liberia, Ghana, Ivory Coast, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Democratic Republic of Congo (Zaire), Angola. Alt. up to 600 m.

**REPRESENTATIVE SPECIMENS.** Banco Forest Reserve, 19 May 1977, *van der Burg 1269 p.p.* (WAG!); Daloa, Nov. 1971, *Pérez-Vera 143* (K!); Hiré, between Kagbe and Dekadougou, 1 Dec. 1966, *Aké Assi 9334* (K!); Along Issia-Daloa road, 22 Nov. 1956, *de Wilde 841* (K!, WAG!); Mt. Mafa, Dec., *Bonardi 0114* (P!); 61 km N of Sassandra, W of Niapidou, 6°10'W, 5°19'N, 12 Apr. 1960, *Leeuwenberg 2780* (WAG!); Tai, 3 Dec. 74, *Pérez-Vera 143/C* (P!); *Sine loc.*, 19 Dec. 1967, *Aké Assi 9867* (K!).

## 50. *Solenangis* Schltr. in Beih. Bot. Centralbl. 36: 133. 1918

Epiphytic herbs of various size, small to large. Stem elongate, with or without leaves. Leaves, if present, distichous, fleshy or coriaceous, shortly unequally bilobed. Inflorescence axillary, few- to many-flowered, spreading. Flowers minute

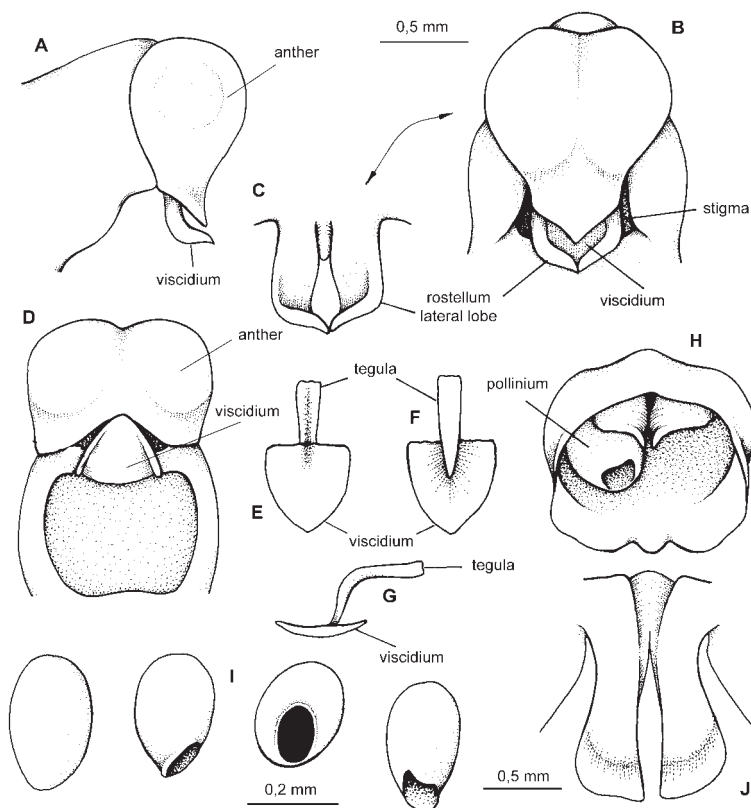


Fig. 206.—Gynostemium structure of *Solenangis* Schltr.: A – gynostemium, side view; B – gynostemium, front view; C – rostellum remnant; D – gynostemium, bottom view; E–G – tegula and viscidium, various views; H – anther; I – pollinia, various views (Szlachetko 2003).

to medium-sized, resupinate. Sepals and petals subsimilar. Lip unlobed or sometimes distinctly 3-lobed well above the base. Gynostemium erect, short, rather delicate. Stigma elliptic, deeply concave. Anther incumbent, operculate, thin-walled. Pollinia 2, ellipsoid, porate. Rostellum short, ligulate, blunt, rather thin, slightly upcurved. Viscidium single, thin, lamellate, almost triangular-cordate. Tegula single, linear, thin, lamellate. Rostellum deeply notched after removal of pollinarium. Both sidelobes large, the middle one reduced, obscure (Fig. 206).

A genus of 5 species known from tropical Africa, Madagascar and Mascarene Islands. Two of them have been collected in Ivory Coast.

## KEY TO THE SPECIES

1. Spur 5-10 mm long. Lip obscurely 3-lobed. Inflorescence 0.5-1.5(2) cm long ..... **1. *S. clavata***  
 – Spur 20-27 mm long. Lip entire. Inflorescence 2-10 cm long ..... **2. *S. scandens***

**1. *Solenangis clavata* (Rolfe) Schltr. in Beih. Bot. Centralbl. 36: 134. 1918 (Fig. 207)**

*Angraecum clavatum* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 145. 1822; TYPE: NIGERIA. *Moloney* s.n. (LECTOTYPE: K!) & SIERRA LEONE. *Scott-Elliot* 4223 (PARATYPES: BM!, K)  
*Saccolabium oenioides* Kraenzl. in Bull. Soc. Roy. Bot. Belg. 38: 62. 1899; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Dewevre* 585 (HOLOTYPE: BR; FRAGMENT OF HOLOTYPE: K!)

Stem up to over 100 cm long, wiry, scandent, internodes 1.2-2 cm long, 0.3 cm in diameter. Leaves numerous 2.5-5 cm long, 0.7-2 cm wide, oblong-elliptic to oblong-ovate, shortly and unequally bilobed, rather thin. Inflorescence 0.5-1.5(2) cm long, 6-10(14)-flowered, rather lax. Flowers small, resupinate, perianth whitish or greenish with white lip. Floral bracts up to 1.2 mm long, triangular-ovate, acute, amplexicaul, glabrous. Pedicel and ovary up to 7 mm long, very slender, glabrous. Dorsal sepal 2.6-4 mm long, 1.1-2 mm wide, oblong-

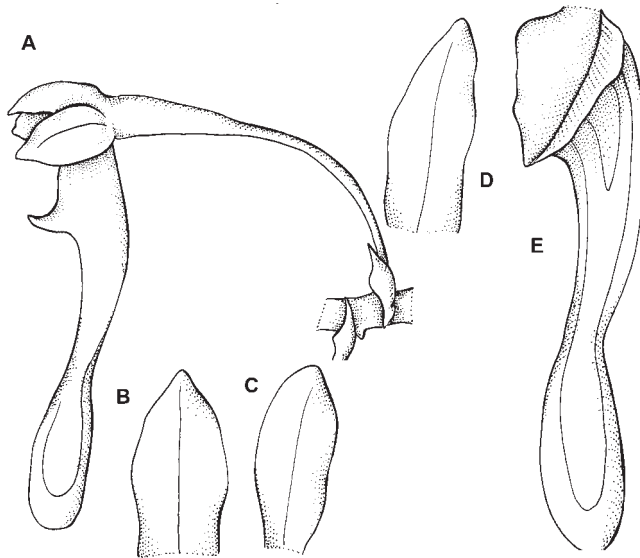


Fig. 207.—*Solenangis clavata* (Rolfe) Schltr.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by A. Kowalkowska, *Letouzey* 14953, P).

or elliptic-ovate, acute, cochleate, rather thin, single-nerved. Petals 2-3.5 mm long, 0.9-1.5 mm wide, obliquely oblong-obovate, obtuse, thin, glabrous, 1-nerved. Lateral sepals 2.3-4 mm long, 1-2 mm wide, obliquely oblong-lanceolate to oblong-ovate, subacute to subobtuse, cochleate, thin, glabrous, 1-nerved. Lip up to 2 mm long and 2 mm wide, more or less cordate in general outline, thin, slightly cochleate, ecallose, obscurely 3-lobed, the middle one acute, triangular, both sidelobes rounded. Spur 5-10 mm long, 1.2-2 mm in diameter, pendent, oblong-clavate, blunt.

**HABITAT.** Epiphyte or lithophyte, dense forests, inselbergs, noted 4 m up on *Hymenodictyon biafranum* Hiern, sur *Mitragyna* sp., on coffee and avocat trees, on branch tips. All year round.

**DISTRIBUTION.** Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Rwanda. Alt. up to 2000 m.

**REPRESENTATIVE SPECIMENS.** Attié, Alépé, 26-28 Feb.-1-3 Mar. 1907, *Chevalier* 17472 (P!); Banco, 24 Oct. 1974, *De Koning* 708 (K!); Banco Forest Reserve, 19 Nov. 1973, *De Koning* 2753 (WAG!); Banco Forest Reserve, near Route du Dos d'Ane, 8 Nov. 1974, *De Koning* 4701 (WAG!); Banco Forest Reserve, near entrance, 11 Nov. 1974, *De Koning* 4732 (WAG!); Banco Forest Reserve, near Route Martineau, 24 June 1975, *De Koning* 5850 (WAG!); Banco Forest Reserve, near Route du Val d'Abo-

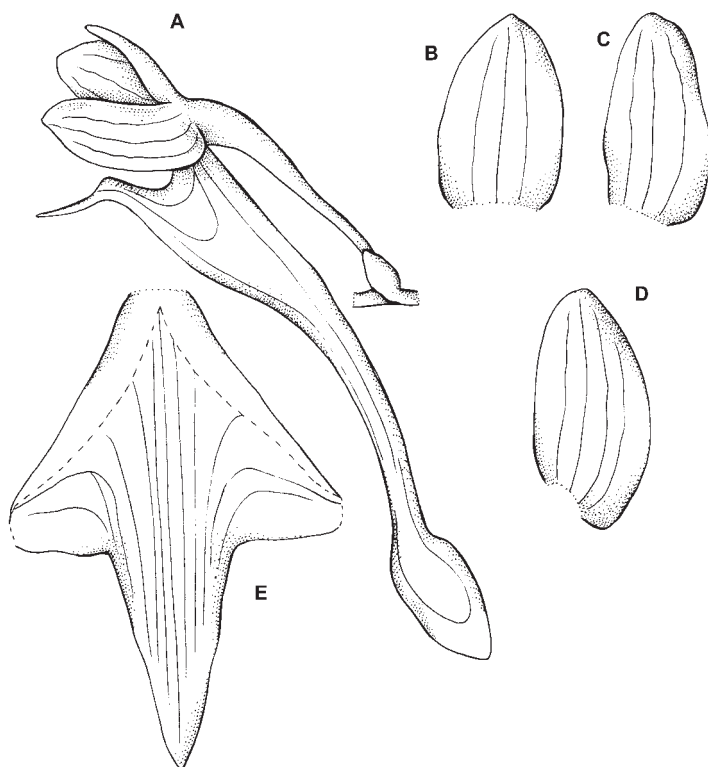


Fig. 208.—*Solenangis scandens* (Schltr.) Schltr.: A — flower; B — dorsal sepal; C — petal; D — lateral sepal; E — lip (drawn by A. Kowalkowska, Halle 3502, P).

bo, 5 Dec. 1975, *De Koning* 6246 (WAG!); Banco, NW of Abidjan, 26 Oct. 1956, *de Wilde* 733 (K!, WAG!); 28 Oct. 1961, *de Wilde* 3193 (K!, WAG!); Bouroukrou, 20 Dec.-20 Jan. 1907, *Chevalier* 16525 (P!); 20 Dec. 1906-20 Jan. 1907, *Chevalier* 16917 bis (P!); Rocher de Brafoedi, 28 Oct. 1957, *Aké Assi* 4436 (K!); Near Brafoedi, N of Adiopodoumé (Abidjan), 27 Dec. 1957, *De Wit* 473 (WAG!); Mt. Momi, Jan. 1972, *Pérez-Vera* 124/B (P!); Moyenne Cavalily, Mt. Nienokoué, 20 km NE of Fort-Binger, 18-19 July 1907, *Chevalier* 19497 bis (P!); Orcho-



nka, Achonka, 1913, *Pobeguini* s.n. (P!); 56 km N of Sassandra, E of Béyo, 6°02'W, 5°18'N, 23 Jan. 1959, *Leeuwenberg* 2540 (K!, P!, WAG!); Between Tiassole and Divo, Feb. 1948, s.n. (K!, P!).

**2. *Solenangis scandens* (Schltr.) Schltr. in Beih. Bot. Centralbl. 36: 134. 1918 (Fig. 208)**

*Angraecum scandens* Schltr. in Bot. Jahrb. Syst. 38: 24. 1906; TYPE: CONGO. *Schlechter* 12739 (HOLOTYPE: B†; ISOTYPES: BM!, K!, P!; DRAWING: UGDA-DLSz)

Stem elongate, delicate, wiry, scandent, internodes 1.2-2 cm long, up to 0.3 cm in diameter. Leaves numerous, 3-7.3 cm long, 1.2-2.5 cm wide, lanceolate-ovate, oblong-ovate, oblong-elliptic to elliptic, coriaceous, obscurely unequally bilobed, lobes rounded. Inflorescence axillary, 2-10 cm long, laxly 3-15-flowered. Flowers rather small, resupinate, perianth white, yellowish, greenish or pinkish. Floral bracts up to 3 mm long, transversely elliptic, obtuse, thin, amplexicaul. Pedicel and ovary up to 13 mm long, slender, glabrous, erect. Dorsal sepal 5-7 mm long, 2-3.6 mm wide, oblong-ovate, obtuse, rather fleshy, glabrous, 3-nerved. Petals 5-7 mm long, 2-3.6 mm wide, obliquely oblong-ovate, obtuse, rather fleshy, glabrous, 3-nerved. Lateral sepals up to 7.5 mm long and 3.8 mm wide, obliquely elliptic-ovate, obtuse, rather fleshy, glabrous, 3-4-nerved. Lip 6-8 mm long, 2.5-4 mm wide, ovate or triangular from the wider base, acute or obtuse, entire, unlobed, ecallose, rather thick, especially along the mid-vein. Spur 20-27 mm long, narrowly conical up to three-quarter from the wide mouth, in apical quarter swollen, ampulaceous, blunt, up to 3.6 mm in diameter.

HABITAT. Lithophyte or epiphyte in dense forests, swamps, noted on *Microdesmis puberula* Hook. f., *Dacryodes edulis* (G.Don) H.J. Lam, always at the tips of branches, tolerant on exposition but usually over humid base-area, in the open Cyperaceae meadows, 3 m up in *Phyllanthus discoides* Muell Arg. May-November.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, São Tomé, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire). Alt. up to 1000 m.

REPRESENTATIVE SPECIMENS. Cult., Adiopodoumé, 26 Nov. 1978, *Dekker* 337 (WAG!); Banco Forest Reserve, 26 June 1975, *van der Burg* 427 (WAG!); 1975, *van der Burg* 517 (WAG!); 29 Sep. 1975, *van der Burg* 1149 (WAG!); 29 Sep. 1975, *van der Burg* 1150 (WAG!); 17 Nov. 1973, *De Koning* 2749 (WAG!); 22 Nov. 1974, *De Koning* 4823 (WAG!); 5 Dec. 1975, *De Koning* 6247 (WAG!); 5 May 1976, *De Koning* 6857 (WAG!); 26 Oct. 1956, *de Wilde* 729 (WAG!); Banco, NW of Abidjan, 26 Oct. 1956, *De Koning* 730 (WAG!); Banco Forest Reserve, near Route Martineau, 16 Nov. 1973, *De Koning* 2736 (WAG!); Yapo, 26 Oct. 1974, *Pérez-Vera* 706 (P!).

**51. *Tridactyle* Schltr. in Orchidee: 601. 1914. & Beih. Bot. Centralbl. 36: 142. 1918**

Monopodial herbs with unbranched or sparsely branched, erect or pendulous stem. Leaves throughout the stem, terete or dorsiventrally flattened, thin or thick, fleshy, unequally bilobed at apex. Inflorescences axillary, emerging through the leaf-sheaths opposite the leaves. Flowers usually small, pale coloured, usually scented. Sepals and petals dissimilar or subsimilar. Lip usually 3-lobed, rarely unlobed, auriculated at base, lip sidelobes usually fimbriate. Spur of various length,

filiform or cylindrical. Gynostemium erect, rather slender. Stigma oval, deeply concave. Anther incumbent, operculate, thin-walled. Pollinia two, almost globose, porate. Rostellum elongate, finger-like, bent towards the stigma, blunt. Viscidium single, ovate, thin, lamellate. Tegula split in the apical half, Y-shaped, lamellate, thin, delicate. Rostellum remnant 3-dentate, both sidelobes linear, blunt, thin, delicate, much longer than teeth-like middle lobe (Fig. 209).

A genus of over 40 species known in tropical and South Africa.

#### KEY TO THE SPECIES

1. Lip entire or obscurely 3-lobed ..... 2
- Lip prominently 3-lobed ..... 6
2. Leaves terete, acute ..... **8. *T. tridentata***
- Leaves dorsiventrally flattened, unequally bilobe, lobes rounded at apex ..... 3
3. Leaves very thick, semi-circular or triangular in cross section, leaf margins curl inwards ..... **4. *T. crassifolia***
- Leaves thin, flat in cross section, leaf margins recurved ..... 4
4. Lip with prominent triangular lobules near the middle ..... **5. *T. fusifera***
- Lip unlobed or with very obscure basal lobules ..... 5
5. Spur narrowly cylindrical, glabrous ..... **1. *T. anthomaniaca***
- Spur constricted and pubescent above the base ..... **6. *T. oblongifolia***
6. Lip sidelobes distinctly longer than the middle one, more or less fimbriate ..... **3. *T. bicaudata***
- Lip sidelobes as long as or only slightly longer than middle one ..... 7

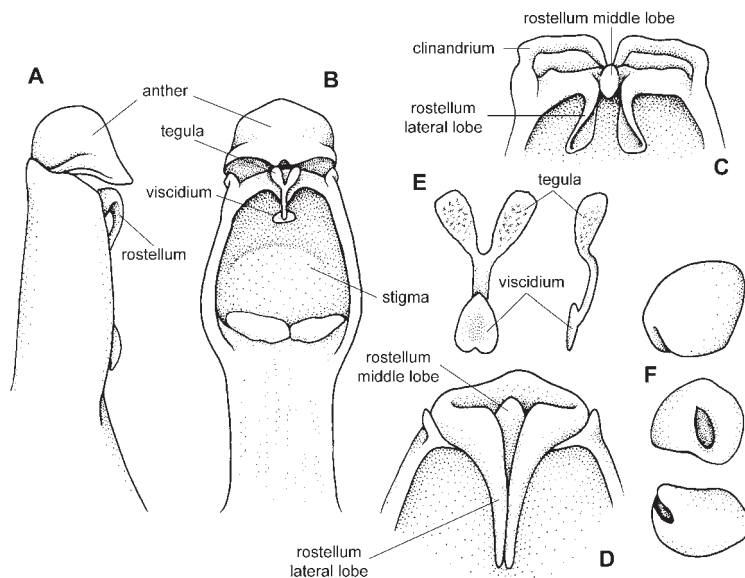


Fig. 209.—Gynostemium structure of *Tridactyle* Schltr.: A – gynostemium side view; B – gynostemium bottom view; C, D – rostellum remnant; E – tegula and viscidium various views; F – pollinia various views (Szlachetko 2003 ).

7. Lip middle lobe narrowly-triangular, lateral lobes filiform, slightly longer than the middle one, spur distinctly swollen in the apical two-thirds ..... **2. *T. armeniaca***  
 – All three lobes almost equal in length, similar in shape to one another, spur slightly swollen above the base ..... **7. *T. tridactylites***

**1. *Tridactyle anthomaniaca* (Rchb. f.) Summerh. in Kew Bull. 1948: 284. 1948 (Fig. 210)**

*Angraecum anthomaniaca* Rchb. f. in *Linnaea* 41: 75. 1877; TYPE (*here designated*): NIGERIA. *Monteiro s.n.* (LECTOTYPE: W!; ISOLECTOTYPE: K!)

*Angraecum trachyrhizum* Schltr. in *Bot. Jahrb. Syst.* 26: 343. 1899; TYPE: MOZAMBIQUE *Schlechter 12256*. (HOLOTYPE: B†; ISOTYPE: K!) - *Tridactyle trachyrhiza* (Schltr.) Schltr. in *Beih. Bot. Centralbl.* 36: 147. 1918.

Stem up to 200 cm long, 0.5-0.6 cm in diameter, semi-pendulous or upright, little branched. Leaves numerous, 3.7-11 cm long, 0.6-1.9 cm wide, linear, oblong-obovate to narrowly elliptic-oblong, unequally obtusely bilobed, coriaceous, thick, very stiff, slightly fleshy, margins recurved, pale green, glossy above, dull beneath. Inflorescence up to 1 cm long, usually 2-4-flowered. Flowers small, resupinate, pale green, green, flesh-beige, apricot-beige, turning brownish. Floral bracts 1-2 mm long, ovate, acute, glabrous. Pedicel and ovary 3-5 mm long, slender, lepidote. Dorsal sepal 3.7-5.7 mm long, 1.7-2.5 mm wide, oblong or elliptic, obtuse, acute or shortly apiculate, thin, glabrous, obscurely 3-nerved. Petals 4.1-5.2 mm long, 1-1.7 mm wide, linear-lanceolate to lanceolate, falcate, acute, thin, glabrous, single-nerved. Lateral sepals 3.7-5.3 mm long, 2-2.8 mm wide, obliquely oblong-lanceolate or elliptic-ovate, acute or apiculate, thin, glabrous, obscurely 3-nerved. Lip 3-6 mm long, 1-2 mm wide, auriculated at base, entire or obscurely 3-lobed in the apical third or half, rather thick, auricles rhomboid; the middle lobe ovate-triangular, acute to apiculate; sidelobes bi-dentate if present. Spur 6-16 mm long, filiform, slightly swollen in the apical half, blunt, straight or sigmoid. Gynostemium 1.2-2.2 mm long.

**HABITAT.** Epiphyte on tree branches, often above water, in exposed lichen covered tree in ravines, forest edges on seashore, mangrove swamps,

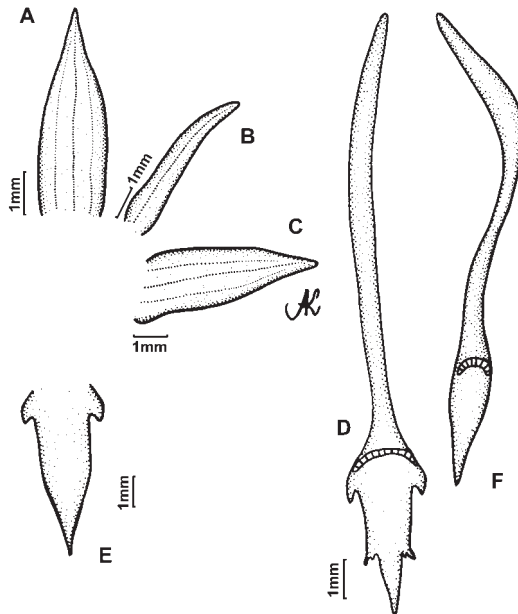


Fig. 210.—*Tridactyle anthomaniaca* (Rchb. f.) Summerh.: A – dorsal sepal; B – petal; C – lateral sepal; D-E – lip, various forms (drawn by A. Kowalkowska, A-D – *Le Testu 4314*, P; E – *Tisserant 1333bis*, P; F – *Tisserant 423*, P).

noted on *Klainedoxa gabonensis*, *Guibourtia demeusei* (Harms) Leonard, *Scorodophloeus zenkeri* Harms, coffee, cocoa and guava trees. Tolerant of exposure. February, May, November.

DISTRIBUTION. Sierra Leone, Liberia, Guinea, Ivory Coast, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Sudan, Uganda, Rwanda, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. up to 2000 m.

REPRESENTATIVE SPECIMENS. Anguededou, near Agneby R., 23 Nov. 1975, *De Koning* 6208 (WAG!); Banco Forest Reserve, near entrance, 11 Nov. 1974 *De Koning* 4731 (WAG!); Daloa-Man road, Lobo R., 8 May 1974, *Pérez-Vera* 630 (K!, P!); Moossou, Nov. 1956, *Aké Assi* 5450 (K!); 11 Nov. 1956, *de Wilde* 979 (WAG!); Tai, W part, near Audrénisrou R., E of Pauléoula, 7 Feb. 1984, *Hepper & Maley* 8121 (K!).

**2. *Tridactyle armeniaca* (Lindl.) Schltr. in Beih. Bot. Centralbl. 36: 143. 1918 (Fig. 211)**

*Angraecum armeniacum* Lindl. in Edwards's Bot. Reg. 25: Misc. 67. 1839; TYPE: SIERRA LEONE. *Loddiges cult.* (HOLOTYPE: K!)

Leaves numerous, 8-12 cm long, 1-2 cm wide, linear or linear-lanceolate, distinctly but gradually narrowed in the upper part, unequally bilobed, lobes obtuse to subobtuse. Inflorescence 5-8 cm long, 8-10-flowered, rather dense. Flowers small, resupinate, orange-green. Floral bracts 1-1.5 mm long, ovate-triangular, acute, amplexicaul. Pedicel and ovary 2-3 mm long, slender, erect, glabrous.

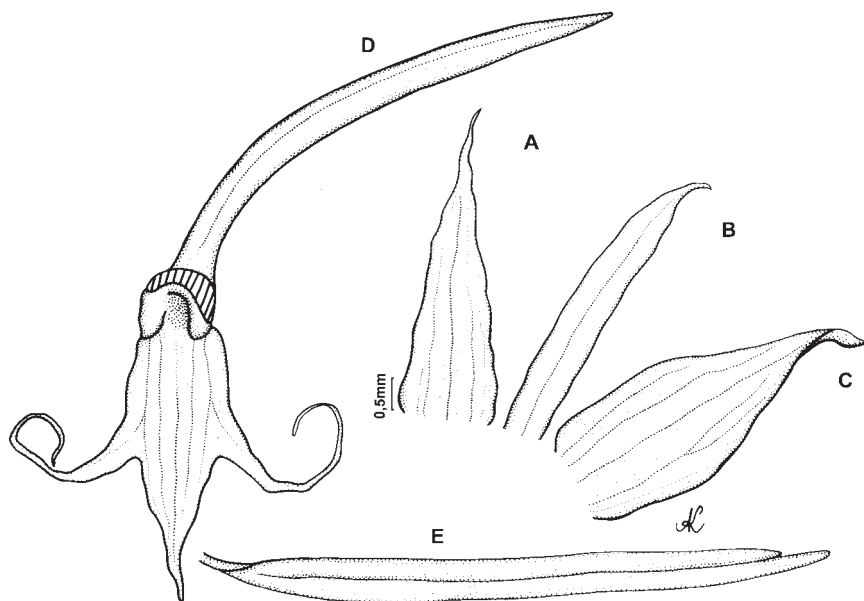


Fig. 211. - *Tridactyle armeniaca* (Lindl.) Schltr.: A - dorsal sepal; B - petal; C - lateral sepal; D - lip and spur; E - leaf (drawn by A. Kowalkowska, *Welwitsch* 685, W-R).

Dorsal sepal 2.5-4.5 mm long, 1-2 mm wide, elliptic- or ovate-lanceolate, acute, apiculate, thin. Petals 2-4 mm long, 0.7-1 mm wide, obliquely lanceolate to linear-lanceolate, acute, apiculate, glabrous, single- or 3-nerved. Lateral sepals 2.5-4.5 mm long, 1-2 mm wide, obliquely elliptic-ovate, acute, apiculate, glabrous. Lip 2.5-4.5 mm long, 3.5-5.5 mm wide across the sidelobes, shortly auriculated at base, distinctly 3-lobed near the middle, rather thin, glabrous; middle lobe 1.5-2.5 mm long, 0.7-1 mm wide, narrowly-triangular, acute; sidelobes up to 3 mm long, filiform, entire, acute, glabrous, divergent. Spur 6-8.5 mm long, 1 mm in diameter, subfalcate, clavate, blunt. Gynostemium 1.5 mm long.

HABITAT. Epiphyte in humid montane forests. February.

DISTRIBUTION. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana. Alt. 600-1500 m.

NOTES. Reported by Cribb & Pérez-Vera (1975) from Mt. Tonkoui (*Aké Assi 4147* collection kept at UCJ). I have seen no material of this species from Ivory Coast.

### 3. *Tridactyle bicaudata* (Lindl.) Schltr. in Orchideen: 602. 1914 (Fig. 212)

*Angraecum bicaudatum* Lindl. in Compan. Bot. Mag. 2: 205. 1837; TYPE: SOUTH AFRICA. *Drege s.n.* (HOLOTYPE: K!; ISOTYPES: BM!, W-R!; DRAWING: UGDA-DLSz) - *Listrostachys bicaudata* (Lindl.) Finet in Bull. Soc. Bot. France 9: 51. 1907.

*Angraecum fimbriatum* Rendle in J. Linn. Soc., Bot. 30: 387, t. 32. 1895; TYPE: KENYA. *Taylor s.n.* (HOLOTYPE: BM!) - *Listrostachys fimbriata* (Rendle) Kraenzl. in Bot. Jahrb. Syst. 33: 74. 1902, in obs. - *Tridactyle fimbriata* (Rendle) Schltr. in Bot. Jahrb. Syst. 53: 602. 1915, in obs.

*Tridactyle pulchella* Schltr. in Bot. Jahrb. Syst. 53: 602. 1915; TYPE: TANZANIA. *Stolz 716* (HOLOTYPE: B†; ISOTYPES: K!, W!; DRAWING: UGDA-DLSz)

Stems 12-80 cm long, 0.35-0.6 cm in diameter, hanging, usually with few branches. Leaves usually numerous, 9-17.5 cm long, 0.5-1.35 cm wide, usually twisted at base to lie in 1 plane, linear, unequally bilobed, lobes obtuse. Inflorescence axillary, 3.5-13 cm long, 8-25-flowered, usually spreading, lax. Flowers small to medium-sized, resupinate, white, pink, yellow, often with a green tinge, fragrant. Floral bracts 1-2 mm long, amplexicaul, subacute, thin, glabrous. Pedicel and ovary 2-4(7)

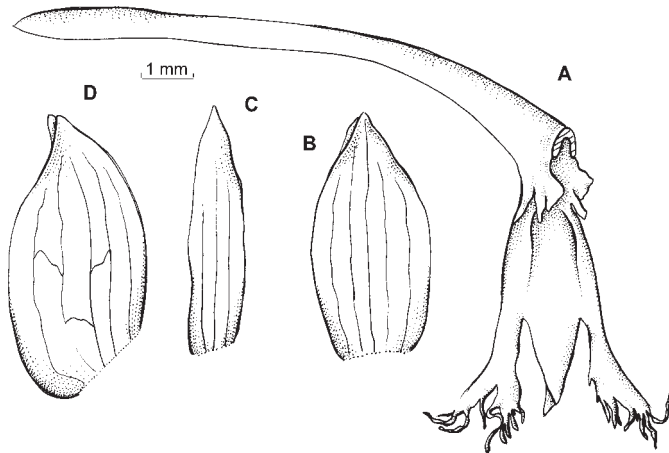


Fig. 212.—*Tridactyle bicaudata* (Lindl.) Schltr.: A – lip and spur; B – dorsal sepal; C – petal; D – lateral sepal (drawn by J. Mytnik-Ejsmont, *Stolz 716*, W).

mm long, slender, glabrous, erect. Dorsal sepal 4.4-7 mm long, 2-3.2 mm wide, oblong-ovate, ovate-triangular, acute, apiculate to caudate, rather thick, glabrous, nerves unbranched. Petals 3.7-6.2 mm long, 1.2-2.2 mm wide, oblong, linear-lanceolate to oblong-spathulate, obtuse or acute, shortly apiculate or caudate, glabrous, thin, delicate, nerves unbranched. Lateral sepals 4.7-8.4 mm long, 2.6-4 mm wide, obliquely ovate, triangular-ovate to orbicular-ovate, acute, apiculate to caudate, rather thick, slightly cochleate, glabrous, nerves unbranched. Lip 3-6.5 mm long, 8-11.5 mm wide, auriculated at base, 3-lobed in the middle or near the apex, rather thick, glabrous, auricles obliquely rhomboid; middle lobe 1-1.5 mm long, triangular or narrowly triangular, fleshily apiculate at the hook-like apex; sidelobes 3-7 mm long, ca. 1 mm wide, spreading, linear, lacinate at the apex. Spur (7.5)10-16(28) mm long, ca. 1 mm in diameter, straight, slightly swollen in the apical half, acute. Gynostemium 1-1.6 mm long.

**HABITAT.** Epiphyte in lowland to montane and riverine forests, secondary forests, plantations. Noted on *Hagenia abyssinica* J.F. Gmel. November, July.

**DISTRIBUTION.** Sierra Leone, Liberia, Ivory Coast, Togo, Ghana, Nigeria, Cameroon, Gabon, Central African Republic, Democratic Republic of Congo (Zaire), Ethiopia, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa, Swaziland. Alt. up to 2500 m.

**REPRESENTATIVE SPECIMENS.** Oureyo, July 1971, *Pérez-Vera* 147 (P!); Island on Sassandra R. near Nahoua, ca. 2 km WNW of Soubré, 27 Nov. 1961, *de Wilde* 3323 (K!, WAG!); Between Séguéla and Maukono, 11 Nov. 1974, *Pérez-Vera* 715 (K!).

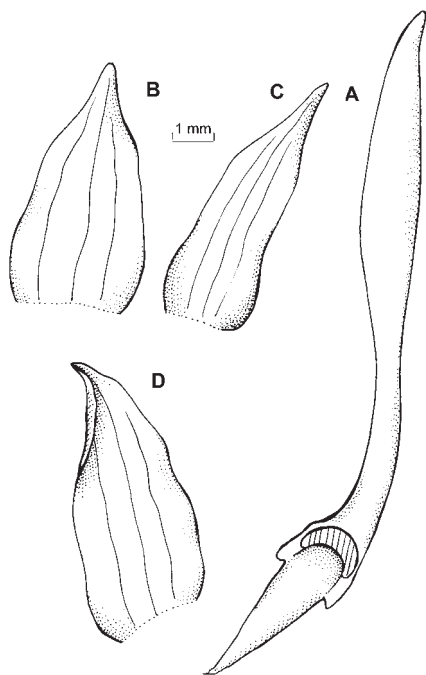


Fig. 213.—*Tridactyle crassifolia* Summerh.: A — lip and spur; B — dorsal sepal; C — petal; D — lateral sepal (drawn by J. Mytnik-Ejmont, *Le Testu* 5173, P).

#### 4. *Tridactyle crassifolia* Summerh. in Kew Bull. 1948: 285. 1948 (Fig. 213)

TYPE: GABON. *Le Testu* 5173 (HOLOTYPE: K!; ISOTYPES: BM!, K!, P!; DRAWING: UGDA-DLSz)

Stems up to 40 cm long, 4-5 mm in diameter, branched, pendulous. Leaves numerous, 3-8 cm long, 0.6-0.8 cm wide, linear-ligulate, very unequally bilobed at apex, both lobes rounded, thick, fleshy, triangular, V-shaped or semi-circular in cross section, margins curl inwards, gray-green. Inflorescence abbreviated, 1-3-flowered. Flowers very small, resupinate, yellow. Floral bracts up to 1.5 mm long, triangular, acute, glabrous. Pedicel and ovary up to 6 mm long, erect, glabrous. Dorsal sepal 4.7-5.5 mm long, 1.7-2.5 mm wide, ovate to oblong-lanceolate, acute or acuminate, slightly thickened in the centre, cochleate, glabrous, obscurely

3-nerved. Petals 4-5.2 mm long, 1.2-2 mm wide, obliquely oblong-lanceolate, acuminate, slightly cochleate, glabrous, obscurely 3-nerved. Lateral sepals 3.5-6 mm long, 2.2-3 mm wide, obliquely oblong-ovate, acute to acuminate, slightly thickened in the centre, cochleate, glabrous, obscurely 3-nerved. Lip 3.7-5.6 mm long, 1-1.8 mm wide, auriculated at the base, lanceolate or narrowly triangular, acute, thickened at the base, glabrous; auricles obliquely triangular. Spur 10-15 mm long, straight, dilatate towards the apex, blunt. Gynostemium ca. 1.5 mm long.

HABITAT. Epiphyte in high-forest. November-December.

DISTRIBUTION. Ivory Coast, Ghana, Cameroon, Gabon, Central African Republic, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. 4 km N of d'Abedem, between Lakota and Sassandra, 16 Nov. 1974, Pérez-Vera 744 (K!); Buyo, 6 Dec. 1973, Pérez-Vera 263 (K!, P!).

**5. *Tridactyle fusifera* Mansf. in Repert. Spec. Nov. Regni Veg. 36: 63. 1934 (Fig. 214)**

TYPE: LIBERIA. *Dinklage* 2143 (HOLOTYPE: B†; PHOTO: K!)

Leaves numerous, 8-18 cm long, 1-1.3 cm wide, linear, oblong to ligulate, unequally bilobed, lobes rounded. Inflorescence 3-4 cm long, 8-10-flowered.

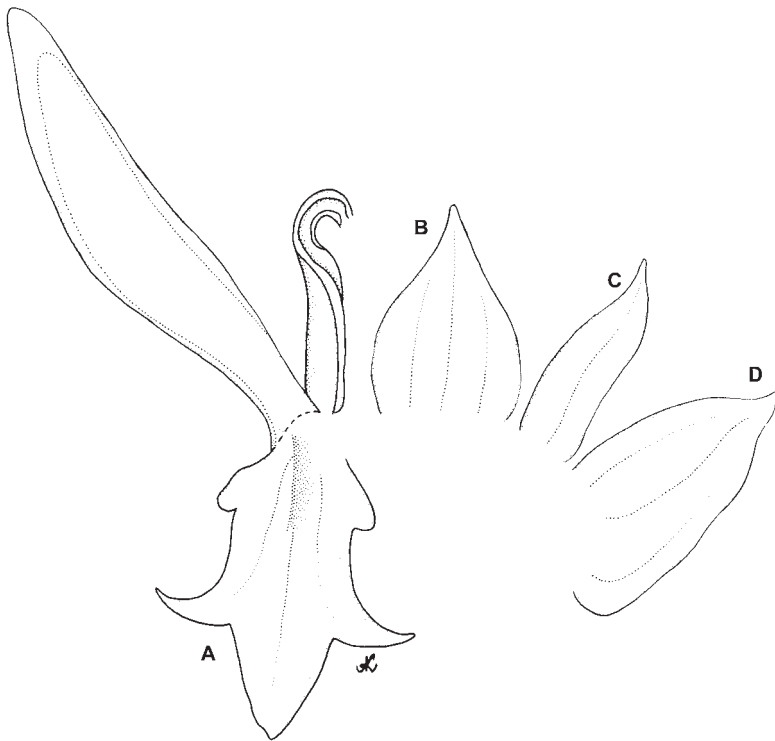


Fig. 214.—*Tridactyle fusifera* Mansf.: A – lip, spur and ovary; B – dorsal sepal; C – petal; D – lateral sepal (redrawn by A. Kowalkowska from Summerhayes' original drawing kept at K).



Flowers small, resupinate, white pale green. Floral bracts 1-1.5 mm long, ovate, acute, glabrous. Pedicel and ovary 3-4 mm long, slender. Dorsal sepal 2.5-4 mm long, 1-1.5 mm wide, oblong or oblong-elliptic, obtuse, glabrous. Petals 2.5-4 mm long, 1 mm wide, linear-lanceolate to linear, acute, thin, glabrous. Lateral sepals 2.5-4 mm long, 2 mm wide, obliquely oblong-lanceolate or oblong-ovate, acute or apiculate, thin, glabrous. Lip 2.5-4 mm long, 2.5-3.5 mm wide, auriculated at base, unequally 3-lobed near the middle, rather thick, auricles rhomboid; middle lobe ovate-triangular, acute to apiculate; sidelobes obliquely triangular, acute, much shorter than the middle lobe, entire. Spur 6.5-7 mm long, relatively massive, cylindrical-clavate, subobtuse, straight. Gynostemium 1 mm long.

HABITAT. Epiphyte in montane forests, gallery forests.

DISTRIBUTION. Sierra Leone, Liberia, Ivory Coast, Ghana, Cameroon. Alt. 600-1500 m.

REPRESENTATIVE SPECIMENS. Danane a Guinee, Nov. 1973, *Pérez-Vera* 576 (K!, P!); Seguelon, Nov. 1967, *Aké Assi* 9717 (K!, P!).

## 6. *Tridactyle oblongifolia* Summerh. in Kew Bull. 2: 286. 1948

(Fig. 215)

TYPE: REPUBLIC OF CENTRAL AFRICA. *Le Testu* 4314 (HOLOTYPE: K!; ISOTYPE: BM!; PHOTO: UGDA-DLSz)

Leaves numerous, 1-2.5 cm apart, 3-12 cm long, 0.7-1.7 cm wide, oblong-ovate to narrowly elliptic-oblong, unequally bilobed, both lobes subobtuse. Inflorescence up to 0.5 cm long, usually 2-3-flowered. Flowers small, resupinate, greenish or yellowish, turning brownish. Floral bracts 1 mm long, triangular, acute, glabrous. Pedicel and ovary 3-5 mm long, slender, lepidote. Dorsal sepal 5 mm long, 2 mm wide, oblong-obovate, acute, thin, glabrous. Petals 4.5 mm long,

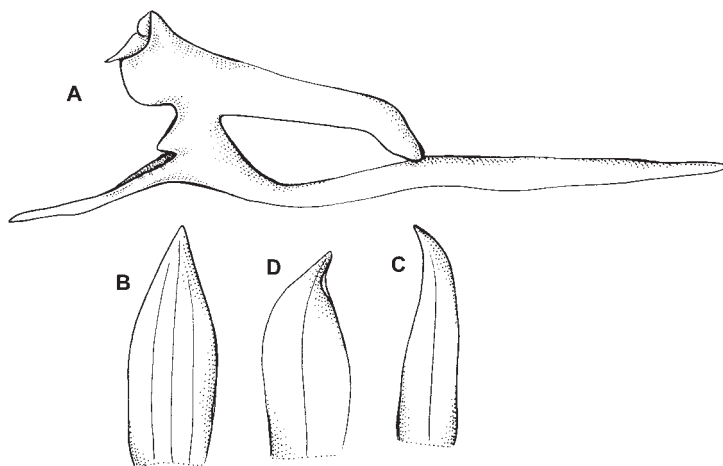


Fig. 215.—*Tridactyle oblongifolia* Summerh.: A – pedicel, ovary, lip and spur; B – dorsal sepal; C – petal; D – lateral sepal (redrawn by J. Mytnik-Ejsmont from Summerhayes' original drawing kept at K, *Bequaert* 1569).

1 mm wide, linear-lanceolate, acute, straight, minutely denticulate in upper margins, glabrous. Lateral sepals 4-5 mm long, 2-2.3 mm wide, obliquely oblong-ovate, acute or apiculate, thin, glabrous. Lip 4-5 mm long, 1-2 mm wide, entire, lanceolate-triangular to lanceolate-ovate, acute, rather thick, auriculated at base, auricles rhomboid. Spur 12-14.5 mm long, narrowly cylindrical, slightly constricted and bent down near the middle, swollen above and attenuate towards the apex, blunt, sparsely pubescent near the middle. Gynostemium 2.5 mm long.

**HABITAT.** Epiphyte in humid forests, often hanging over the water. October-November.

**DISTRIBUTION.** Sierra Leone, Ivory Coast, Nigeria, Central African Republic, Congo, Uganda.

**REPRESENTATIVE SPECIMENS.** Mt. Mafa, 14 Mar. 1967, *Aké Assi* 9540 (K!); Sassandra R., near Gribo rapids, ca. 8 km SSE of Soubré, 22 Nov. 1961, *de Wilde* 3293 (WAG!); Tiapleu, 14 Nov. 1966, *Aké Assi* 9226 (K!).

**7. *Tridactyle tridactylites* (Rolfe) Schltr. in Beih. Bot. Centralbl. 36: 148. 1918 (Fig. 216)**

*Angraecum tridactylites* Rolfe in Gard. Chron., ser. 3, 4: 34. 1888; TYPE: S I E R R A LEONE. *Griffith* s.n. (HOLOTYPE: K!)

*Aeranthes deistelianus* Kraenzl. in Bot. Jahrb. Syst. 33: 75. 1902; TYPE: CAMEROON. *Deistel* 593 (HOLOTYPE: B†; ISOTYPES: BM!, P!; DRAWING: UGDA-DLSz)

Stem 40-200 cm long, 0.4-0.5 cm in diameter, pendent, stout. Leaves numerous, 6-22 cm long, 0.6-1.3 cm wide, linear, linear-lanceolate, twisted at base, unequally bilobed, lobes subacute to sub-

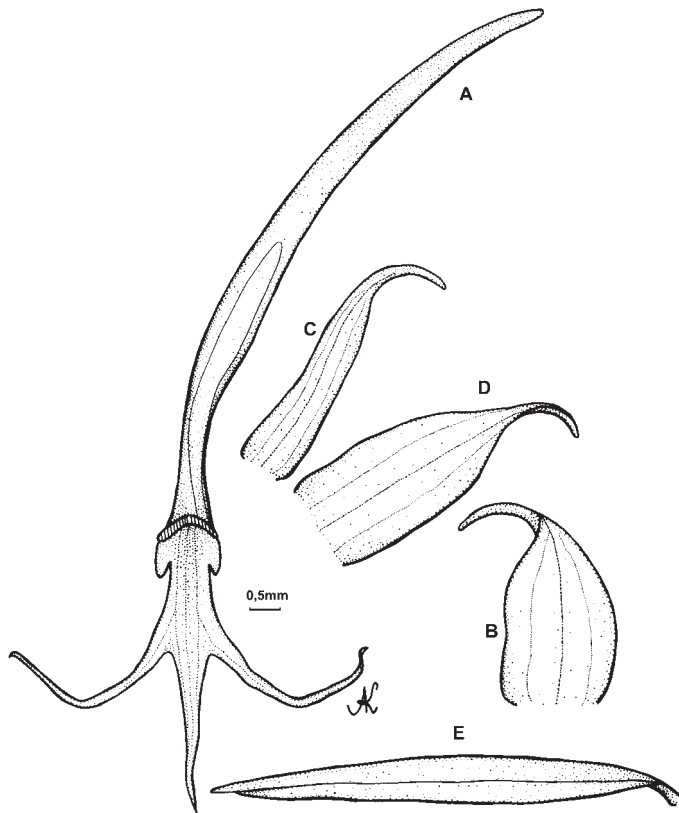


Fig. 216.—*Tridactyle tridactylites* (Rolfe) Schltr.: A — dorsal sepal; B — petal; C — lateral sepal; D — lip; E — leaf (drawn by A. Kowalkowska, *Deistel* 593, P).

obtuse. Inflorescence 3-10 cm long, up to 18-flowered, rather lax. Flowers rather small, resupinate, yellow-green. Floral bracts 1-3 mm long, ovate, acute, amplexicaul. Pedicel and ovary 3 mm long, slender, erect, glabrous. Dorsal sepal 3-5.3 mm long, 1.5-2.6 mm wide, elliptic-ovate, elliptic-obovate to elliptic-oblong, acute, apiculate to caudate, thin, glabrous, obscurely 3-nerved. Petals 3-5 mm long, 0.7-1.3 mm wide, lanceolate to linear-lanceolate, acute to caudate, thin, glabrous, single- or 3-nerved. Lateral sepals 3.3-5.6 mm long, 1.7-2.7 mm wide, obliquely ovate, obovate or elliptic-ovate, acute, apiculate to caudate, thin, delicate, glabrous, single- or 3-nerved. Lip 4-5 mm long, ca. up to 6.5 mm wide, auriculated at base, distinctly 3-lobed near the middle, rather thin, glabrous, auricles obliquely rhomboid; middle lobe 1.8-3 mm long, 0.7-1.2 mm wide, narrowly or linear-triangular, acute; sidelobes 2.3-4 mm long, narrowly triangular to filiform, acute, glabrous. Spur 6-11 mm long, 1 mm in diameter, straight, slightly swollen above the base, blunt. Gynostemium 1.4-1.9 mm long.

**HABITAT.** In sunny places, epiphyte on tree trunk in rain forest, or lithophyte on rocks. January.

**DISTRIBUTION.** Guinea, Sierra Leone, Ivory Coast, Equatorial Guinea (Bioko), São Tomé and Príncipe, Nigeria, Cameroon, Gabon, Angola, Mozambique. Alt. 350-1600 m.

**REPRESENTATIVE SPECIMENS.** Mt. Momi, Monts des Dans, 40 km N of Danané, 30 Jan. 1984, *Hepper & Maley 7914* (K!); Haut Sassandra and Haut Cavally, Mt. Dou, 22 Jan. 1931, *Portères 552* p.p. (P!); Mt. Tonkoui, near Man, 24 Jan. 1984, *Hepper & Maley 7743* (K!); Mt. Tonkoui, Jan. 1950, *Schnell 4081* (P!); Jan. 1950, *Schnell 4154* (P!).

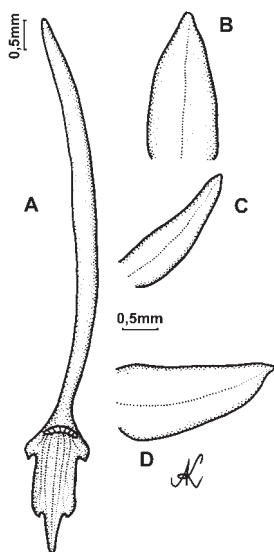


Fig. 217.—*Tridactyle tridentata* (Harv.) Schltr.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by A. Kowalkowska, *Tisserant 1124*, P).

**8. *Tridactyle tridentata* (Harv.) Schltr. in Bot. Jahrb. Syst. 53: 603. 1915, in obs. (Fig. 217)**

*Angraecum tridentatum* Harv. in Thes. Cap. 2: 6. 1863; TYPE: SOUTH AFRICA. *Sanderson 562* (HOLOTYPE: TCD?)

Stem usually 10-50 cm long, 0.2-0.5 cm in diameter, terete, erect, arcuate or pendent, usually branched. Leaves numerous, 6-10.5 cm long, 0.1-0.35 cm in diameter, erect or arcuate, acute, terete, grooved on the upper surface. Inflorescence (0.5)1.8-2.7 cm long, 4-5-flowered, lax. Flowers small, green to yellow or dull orange. Floral bracts up to 1 mm long, obconical, apiculate, amplexicaul. Pedicel and ovary 5 mm long, slender, lepidote. Dorsal sepal 2.3-5 mm long, 1-2.3 mm wide, oblong-elliptic, obtuse to subacute, thin, delicate, glabrous, single-nerved. Petals 2.2-5.4 mm long, 0.8-1.3 mm wide, lanceolate, falcate, acute to subacute, thin, delicate, glabrous, obscurely single-nerved. Lateral sepals 2.5-5.3 mm long, 1.3-3 mm wide, obliquely oblong-ovate, acute to shortly apiculate, thin, delicate, glabrous, single-nerved. Lip 2.1-5 mm long, 1.4-4 mm wide, auriculated at base, obscurely 3-dentate in the apical third, auricles rhom-

boid; middle lobe linear-triangular, acute; sidelobes obliquely rhomboid, shorter than the middle one. Spur 6-18 mm long, filiform, or dilated in the upper half, straight or incurved, subacute. Gynostemium 1-2 mm long.

HABITAT. Lithophyte or epiphyte in *Brachystegia* sp. and in open *Euphorbia candelabrum* Tremaux ex Kotschy, *Combretum* sp. and *Terminalia* sp. woodlands, secondary forests, on branches, on exposed trees. April, June.

DISTRIBUTION. Guinea, Sierra Leone, Ivory Coast, Cameroon, Central African Republic, Congo, Democratic Republic of Congo (Zaire), Uganda, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique, South Africa. Alt. 1300-2250 m.

REPRESENTATIVE SPECIMENS. Between Danané and Toulépleu, 20 Apr. 1968, *Aké Assi 10056* (K!); Ca. 5 km S of Guédeyo, ca. 40 km E of Soubré, *de Wilde 176 p.p* (K!, WAG!); Kediouni, 16 June 1974, *Pérez-Vera 648* (K!, P!).

Subtribe **Listrostachyinae** Szlach. in *Fragm. Flor. Gebot.*, Suppl. 3: 92. 1995

Rostellum short, fleshy, massive, erect. Tegula double, lamellate to thread-like, short. Viscidium single, usually as large as or larger than tegula, lamellate. Rostellum after removal of pollinarium truncate to furcate. Pollinia 2, cleft or porate.

A small subtribe including 5 genera, with a single 1 collected in Ivory Coast.

## 52. *Listrostachys* Rchb. f. in Bot. Zeitung (Berlin) 10: 930. 1852

Monopodial herbs. Stem short. Leaves distichous, rather thick, fleshy, linear, lobes obtuse. Inflorescence long, dense, multi-flowered, spread. Flowers small, resupinate, fleshy. Sepals and petals dissimilar. Sepals rather densely or subdensely covered by minute protrudings. Lip ligulate, recurved, spurred. Spur clavate, blunt. Gynostemium rather slender. Stigma large, elliptic, deeply concave at the base. Anther incumbent, operculate, thin-walled. Pollinia 2, ellipsoid, porate. Rostellum short and massive, thick, fleshy, ligulate. Viscidium single, transversely elliptic. Tegula double, thin, rather wide. Rostellum truncate after removal of pollinarium (Fig. 218).

A monotypic genus, occurring in tropical West Africa.

### 1. *Listrostachys pertusa* (Lindl.) Rchb. f. in Bot. Zeitung (Berlin) 10: 930. 1852 (Fig. 219)

*Angraecum pertusum* Lindl. in *Compan. Bot. Mag.* 2: 205. 1837; TYPE (*here designated*): NIGERIA. *Barter 1826* (LECTOTYPE: K!) & *Loddiges anno 1835* (PARATYPE: K!)

*Listrostachys jenischiana* Rchb. f. in Bot. Zeitung (Berlin) 10: 930. 1852; TYPE (*here designated*): SIERRA LEONE *cult. Jenisch*. (LECTOTYPE: W-R; DRAWINGS: K!, UGDA-DLSz)

*Listrostachys behnickiana* Kraenzl. in *Notizbl. Bot. Gart. Berlin-Dahelm* 5: 122. 1909; TYPE: CAMEROON. *Strauss s.n.* (HOLOTYPE: B†; DRAWING: K!)

Stem 3.5-7 cm long, short, abbreviated. Leaves up to 12, 10-43 cm long, 1-1.7 cm wide, linear, fleshy, spread, unequally bilobed at apex, each lobe rounded. Inflorescences usually 2-4 per plant, 14-22 cm long, densely multi-flowered, spread. Flowers small, resupinate, asymmetric, inconspicuous, sepals greenish

outside, white on the inner surface or entirely white or whitish, often with minute red spots towards the base and with red spur. Floral bracts 1 mm long, broadly or elliptically triangular, acute, amplexicaul, glabrous, apex recurved. Pedicel and ovary 2-4 mm long, slender, cylindrical, subdensely covered by minute protrudings. Dorsal sepal 2-4 mm long, 1.6-2 mm wide, oblong-semi-elliptic to elliptic-ovate, thick, fleshy, cucullate at apex, cochleate, recurved, with fleshy apendiculus at apex, covered subdensely by minute protrudings on the outer surface, glabrous on the inner one, 1-nerved. Petals up to 3 mm long and 2 mm wide, obliquely ovate-spathulate, subacute to subobtuse, rather thick and fleshy, glabrous, 1-nerved. Lateral sepals up to 4 mm long and 2 mm wide, oblong-elliptic or elliptic-ovate, oblique at base, rounded at apex, semi-cucullate, cochleate, thick and fleshy, covered subdensely by minute protrudings and with a wing-like structure near the center on the outer surface, the inner surface glabrous, 1-nerved. Lip up to 4 mm long and 2.7 mm wide, ligulate to elliptic-obovate, rounded to obtuse, thick, glabrous, with some, unbranched nerves. Spur 4.5-6 mm long, clavate, blunt, slightly incurved, sparsely covered by minute protrudings. Gynostemium 1.5 mm long.

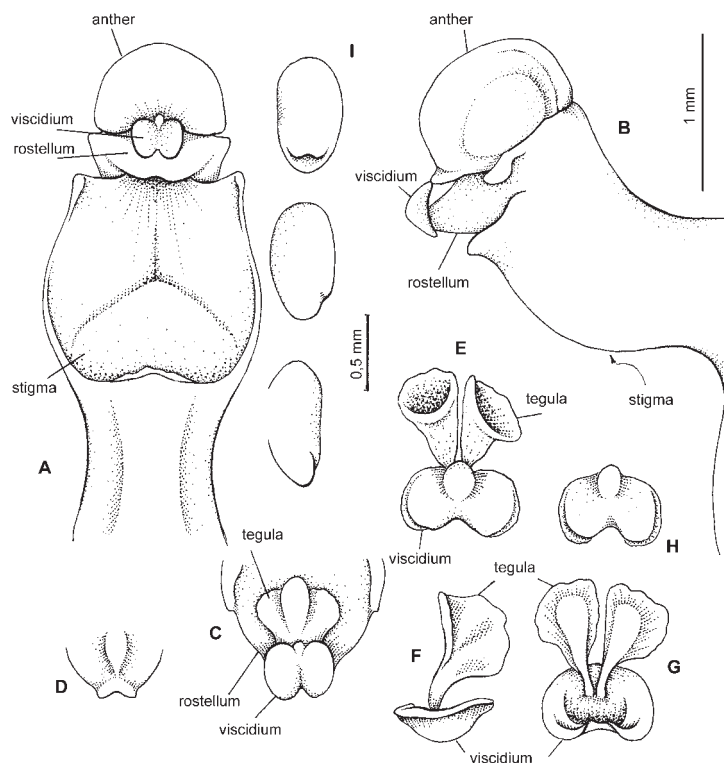


Fig. 218.—Gynostemium structure of *Listrostachys* Rchb. f.: A - gynostemium, bottom view; B - gynostemium, side view; C - rostellum, front view; D - rostellum remnant, front view; E-H - tegulae and viscidium, various views; I - pollinia, various views (Szlachetko 2003).

**HABITAT.** Epiphyte in humid forests, secondary forest with *Lophira alata* Banks ex Gaertn. f., *Coula edulis* Baill., noted on tree trunks and branches in shady places. (July)October-January.

**DISTRIBUTION:** Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Principe, Gabon, Congo. Alt. 50 m.

**REPRESENTATIVE SPECIMENS.** Cult., Adiopodoumé, 28 Oct. 1958, *Aké Assi* 5428 (K!); 26 Nov. 1978, *Dekker* 331 (WAG!); Anguedou, 7 Jan. 1975, *De Koning* 5120 (WAG!); Banco Forest Reserve, 22 Oct. 1975, *van der Burg* 1242 (WAG!); 3 Dec. 1974, *De Koning* 4955 (WAG!); Banco Forest Reserve, near entrance, 11 Nov. 1974, *De Koning* 4730 (WAG!); Cavally, Mt. Nienokoué, 20 km NE of Fort Binger, 17-19 July 1907, *Chevalier* 19662 (P!); Moossou, Grand Bassam, 11 Nov. 1956, *de Wilde* 807

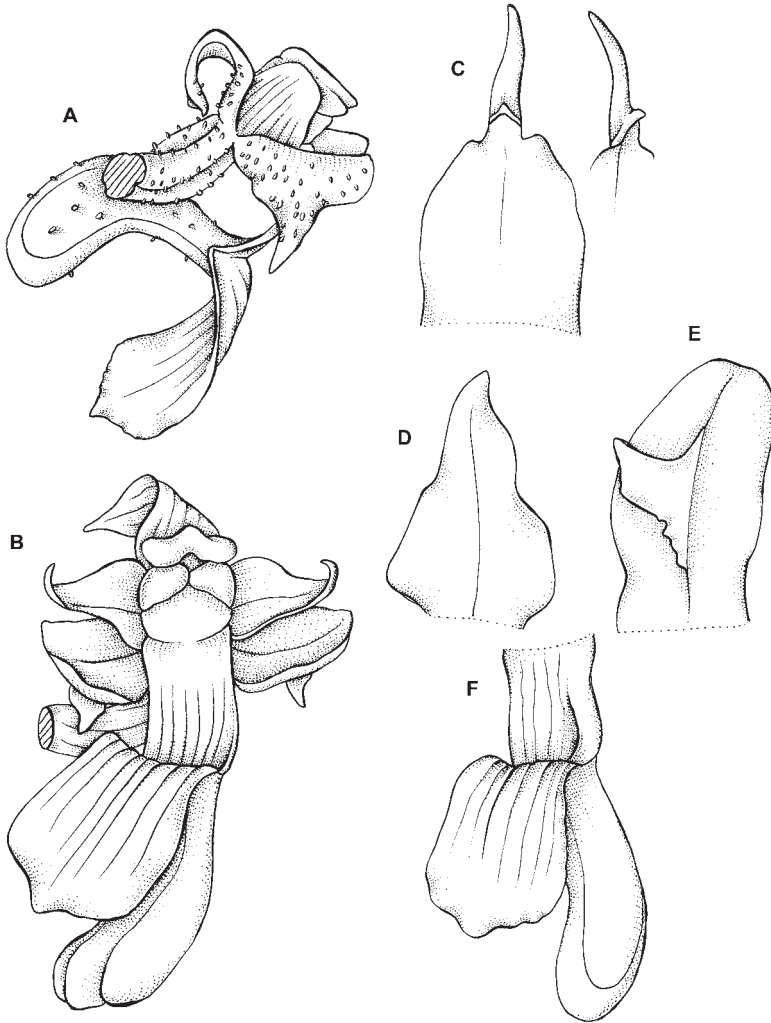


Fig. 219.—*Listrostachys pertusa* (Lindl.) Rchb. f.: A, B — flower; C — dorsal sepal; D — petal; E — lateral sepal; F — lip (drawn by J. Mytnik-Ejsmont, *Le Testu* 5172, P).

(K!, WAG!); Sassandra, Louga, near Sassandra R., *De Koning 5215* (WAG!); 64 km N of Sassandra, 3 km N of Niapidou, 6°03'W, 5°21'N, 29 Jan. 1959, *Leeuwenberg 2625* (WAG!); Between Subré and Buyo, 9 Nov. 1974, *Pérez-Vera 183/B* (K!, P!).

Subtribe **Calypetrochilinae** Szlach. in *Fragm. Flor. Gebot.*, Suppl. 3: 92. 1995

Rostellum short, triangular, fleshy, massive, bent towards the stigma. Tegula single, linear to oblong. Viscidium single, lamellate, rather large. Rostellum remnant more or less split at the apex. Pollinia 2, cleft or porate.

A subtribe of 6 genera.

### 53. *Calypetrochilum* Kraenzl. in *Bot. Jahrb. Syst.* 22: 30. 1895

A monopodial herbs. Stem elongated, stout, pendulous. Leaves twisted at base to lie in 1 plane, fleshy, unequally bilobed. Inflorescence abbreviated, lax or dense, zigzag or straight. Flowers small to medium-sized, resupinate. Sepals and petals similar or dissimilar. Lip entire or 3-lobed, ecallose, spurred. Spur bent in the knee-like manner. Gynostemium short, erect, massive, thickened and widened at base. Stigma oval to elliptic, deeply concave. Anther incumbent, operculate, thin-walled, elongate and acute at apex. Pollinia 2, ellipsoid, cleft. Rostellum short, massive, blunt. Viscidium single, thin, lamellate. Tegula 1, linear to ribbon-like, thin, lamellate. Rostellum remnant notched at apex, canaliculate (Fig. 220).

A genus of 2 species widely distributed in tropical Africa extending to Zimbabwe.

#### KEY TO THE SPECIES

1. Inflorescence lax, rhachis zigzag, bracts spaced. Lip 3-lobed, median lobe more or less split in front ..... **1. *C. christyanum***
- Inflorescence dense, rhachis straight, bracts imbricate. Lip entire, subquadrate in outline, truncate at apex, shortly apiculate ..... **2. *C. emarginatum***

#### 1. *Calypetrochilum christyanum* (Rechb. f.) Summerh. in Hutchinson & Dalziel, *Fl. W. Trop. Afr.*, ed. 1, 2: 450. 1936 (Fig. 221)

*Angraecum christyanum* Rechb. f. in *Gard. Chron.*: 806. 1880; TYPE (*here designated*): WEST AFRICA? *Christy s.n.* (LECTOTYPE: W-R!; DRAWING: UGDA-DLSz)

*Angraecum zigzag* De Wild. in *Not. Pl. Util. Congo* 1: 143. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gentil 304* (HOLOTYPE: BR) - *Calypetrochilum zigzag* (De Wild.) Schltr. in *Beih. Bot. Centralbl.* 36: 85. 1918.

*Calypetrochilum orientale* Schltr. in *Bot. Jahrb. Syst.* 53: 595. 1915; TYPE: TANZANIA. *Stolz 460* (HOLOTYPE: B†; ISOTYPE: W!; DRAWING: UGDA-DLSz)

Stem up to 100 cm long, usually pendent, stout, simple. Leaves numerous, 5–15 cm long, 0.8–2.7 cm wide, ligulate to ligulate-ovate, unequally bilobed at apex, each lobe rounded, coriaceous, fleshy, almost succulent, margins involute, twisted at base to lie in one plane. Inflorescence up to 4 cm long, 3–12-flowered, rather lax, rhachis zigzag. Flowers medium sized, resupinate, white or greenish white,



fading to apricot, base of lip yellow or green, spur yellow at base or entirely green, scented or not. Floral bracts 2-4 mm long, triangular-ovate, acute, glabrous. Pedicel and ovary 8-10 mm long, erect, swollen. Dorsal sepal 5-10 mm long, 2.5-4 mm wide, oblong-ovate to ovate-lanceolate, acute to shortly apiculate, glabrous, nerves 3, sparsely branching. Petals 5-8 mm long, 2-3 mm wide, oblong-elliptic to oblong-lanceolate, slightly falcate, acute to apiculate, glabrous, nerves 3, obscure, branching. Lateral sepals 6-11 mm long, 2.5-4 mm wide, obliquely lanceolate-ovate, acute, glabrous, nerves unbranched. Lip 7-12 mm long, 7-10 mm wide, dis-

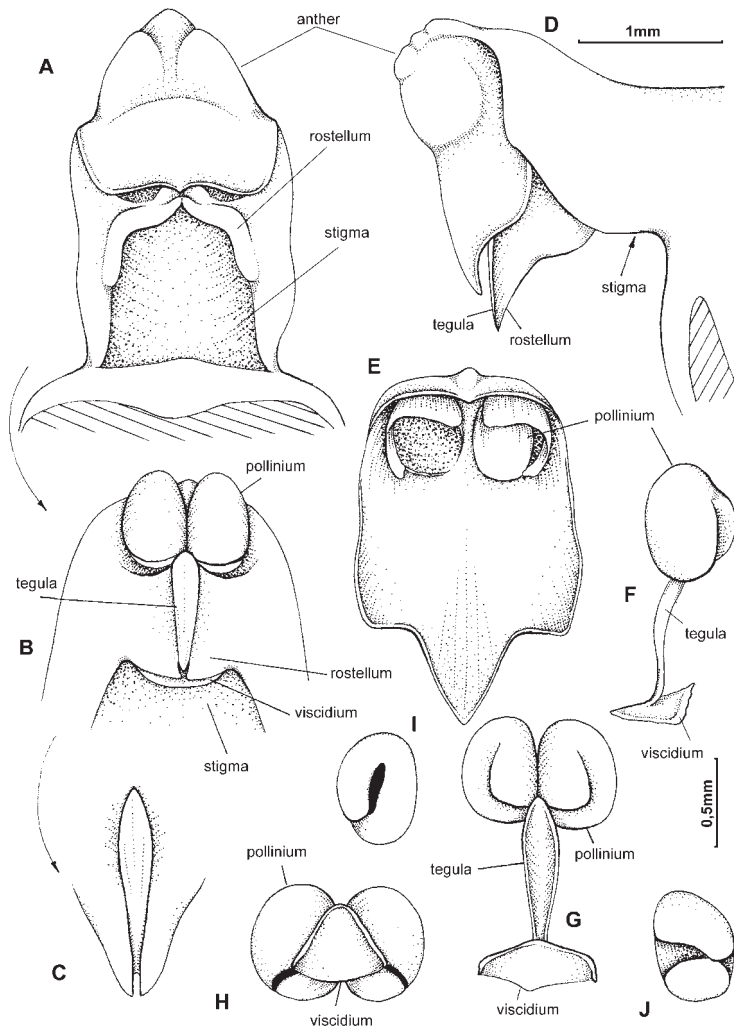


Fig. 220.—Gynostemium structure of *Calypstrochilum* Kraenzl.: A – gynostemium, bottom view; B – gynostemium front view, anther removed; C – rostellum remnant; D – gynostemium side view; E – anther; F-H – pollinarium various views; I, J – pollinia various views (Szlachetko 2003).

tinctly 3-lobed just above the base, rather thin, glabrous, canaliculate, with more or less recurved apical lobe, sometimes with elevated keels along nerves; middle lobe up to 5.3 mm long and 5.2 mm wide, oblong-elliptic, oblong-ovate to oblong-obcordate, truncate or deeply notched at apex with central apiculus; side-lobes up to 3 mm long, up to 3.5 mm wide, almost orbicular, rhomboid to obliquely ovate, rounded. Spur 9–11 mm long, its basal half broadly conical, more or less recurved, strongly constricted and bent in the knee-like manner near the middle, the apical half clavate to ellipsoid or almost globose, truncate.

**HABITAT.** Epiphyte in high forests, old secondary forests with *Celtis* sp. and Sterculiaceae, gallery forests, wooded grasslands, noted on branches up to 35 m above soil, on *Diospyros* sp. All year round.

**DISTRIBUTION.** Mali, Senegal, Gambia, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Ethiopia, Uganda, Rwanda, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. up to 1900 m.

**REPRESENTATIVE SPECIMENS.** Cult., Adiopodoumé, 26 Nov. 1978, *Dekker* 329 (WAG!); Banco Forest Reserve, 12 Dec. 1973, *De Koning* 2902 (WAG!); 30 Dec. 1974, *De Koning* 5087 (WAG!); 11 Feb. 1976, *De Koning* 6476 (WAG!); Baué (Bawé), Boual (Boural), 29 Apr. 1977, *César-Peyre de Fabrègues* 507 (P!); Béceédi-Brignan, 5 Dec. 1966, *Aké Assi* 9354 (K!); Ca. 70 km W of Bouaké,

Forêt Classée Matiemba, ca. 25 km S of Béoumi, 5 km SE of Ando, 27 May 1963, *de Wilde* 106 (WAG!); Bouroukrou, 20 Dec.–20 Jan. 1907, *Chevalier* 16526 (P!); Daloa, Vavoua, June 1947, *Mission Kerharo-Bouquet* 1142 (P!); Dyolas, Mt. Goula, Danane, 12 Apr. 1909, *Chevalier* 21229 (P!); Kakpin, 3°47'W, 8°40'N, 5 Mar. 1968, *Geerling & Bokdam* 2121 (WAG!); Kpouebo, 31 May 1966, *Aké Assi* 8875 p.p. (K!); Mt. Mafa, 6 June 1966, *Aké Assi* 8905 (K!); Mounaia, Murti, 12 Feb. 1899, *Chevalier* 413 (P!); Odienne, 29 Apr. 1981, *César* 1236 (P!); Oureyo, 22 Dec. 1974, *Pérez-Vera* 148 (K!, P!); Between Sanfouine and Mapleu, 11 Jan. 1974, *Pérez-Vera* 574 (K!); Haute Sassandra, Louira (Toura), Gouréni (Gourémi), 22 May

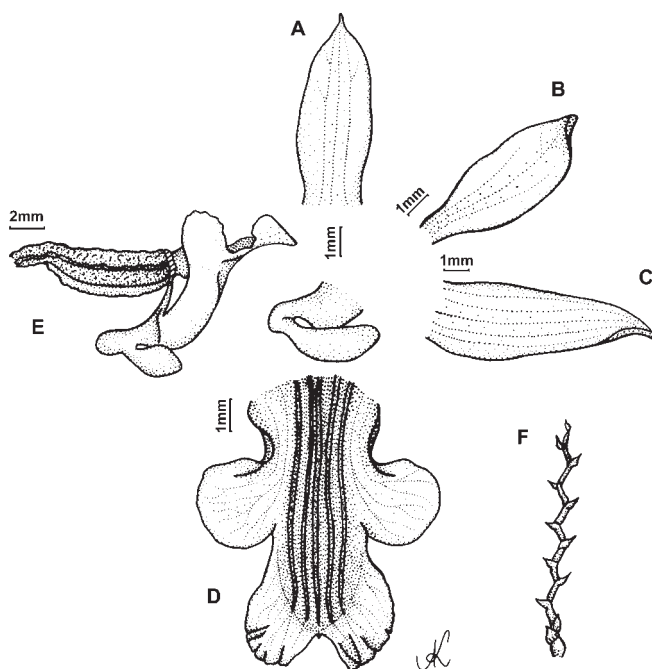


Fig. 221.—*Calypstrochilum christyanum* (Rchb. f.) Summerh.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip, spread; E – pedicel, ovary, lip and spur, side view; F – inflorescence axis (drawn by A. Kowalkowska, *Sita* 729, P).

1909, *Ripert sub Chevalier* 21640 (K!, P!); Sassandra, Fuyt, 12 Dec. 1973, *De Koning* 2686 (WAG!); 56 km N of Sassandra, E of Bélyo, 6°02'W, 5°18'N, 24 Jan. 1959, *Leeuwenberg* 2556 (K!, WAG!); Sipilou, 24 Apr. 1965, *Boudet* 2550 (P!); Surigrobo, 28 Dec. 1966, *Aké Assi* 9392 (K!); Yapo, ca. 4 km S of Bécédi-Brignan, 6 Aug. 1963, *Oldeman* 251 (WAG!); Yaune, between Sevrou and Manosonn, Casamou, Feb. 1900, *Chevalier* 2557 (P!).

**2. *Calypstrochilum emarginatum* Schltr. in Beih. Bot. Centralbl. 36: 84. 1918 (Fig. 222)**

TYPE: SIERRA LEONE. *Afzelius s.n.* (HOLOTYPE: UPS)

*Angraecum imbricatum* Lindl. in J. Linn. Soc., Bot. 6: 137. 1862, *non Angraecum imbricatum* (Sw.) Schltr., 1918; TYPE: NIGERIA. *Barter s.n.* (HOLOTYPE: K!; ISOTYPE: W-R!; DRAWING: UGDA-DLSz) - *Calypstrochilum imbricatum* (Lindl.) Schltr. in Orchideen: 608. 1914.

Stem up to 300 cm long, ca. 0.4-0.6 cm in diameter, pendulous, stout. Leaves numerous, 8-18 cm long, 2.2-4 cm wide, oblong-elliptic to oblong-narrowly ovate, coriaceous, unequally bilobed at apex, each lobe rounded, sometimes the smaller one reduced. Inflorescence 3-5 cm long, up to 20-flowered, dense, rhachis terete, straight. Flowers small, resupinate, scented, perianth white or white with pinkish suffusion. Floral bracts 4-8 mm long, triangular-ovate, acute, thin, glabrous, imbricating, brownish-black. Pedicel and ovary up to 12 mm long, slender, erect, glabrous. Dorsal sepal 8-10 mm long, 3-5 mm wide, ovate, shortly

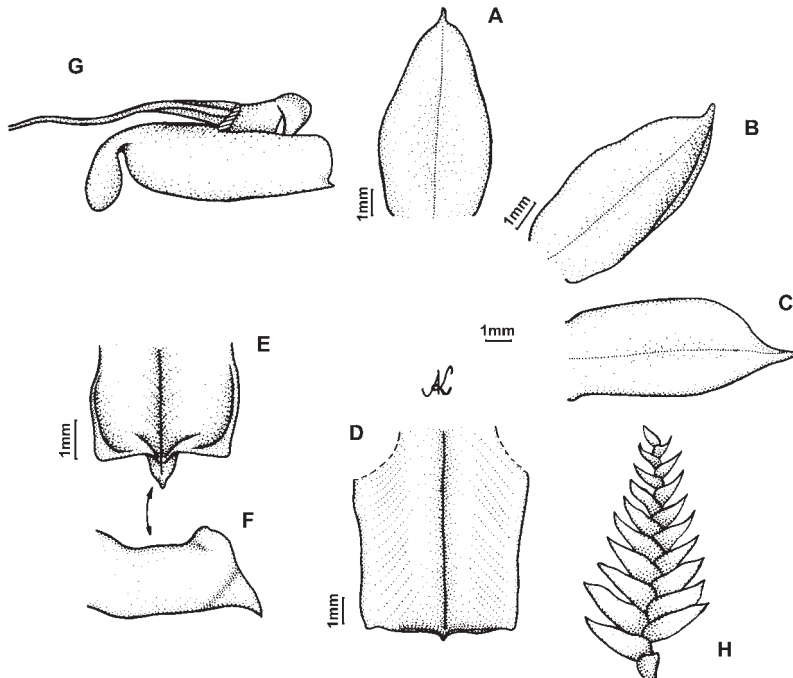


Fig. 222.—*Calypstrochilum emarginatum* Schltr.: A – dorsal sepal; B – petal; C – lateral sepal; D, E – lip, spread; F – lip, side view; G – pedicel, ovary, gynostemium, lip and spur, side view; H – inflorescence axis (drawn by A. Kowalkowska, *Le Testu* 6310, P).

apiculate, thick, rather fleshy, slightly cochleate, glabrous, single-nerved. Petals 7.2-10 mm long, 3-5 mm wide, obliquely oblong-ovate to oblong-elliptic, shortly apiculate, slightly cochleate, rather thick and fleshy, glabrous, single-nerved. Lateral sepals 9-11 mm long, 3-5 mm wide, oblong to oblong-elliptic, apiculate, slightly oblique and cochleate, thick, fleshy, glabrous, single-nerved. Lip 7-10 mm long and wide, subquadrate in general outline, entire, truncate at apex, shortly apiculate, canaliculate, rather thick, glabrous. Spur up to 10 mm long, basal part broadly cylindrical, in apical third constricted and bent in the knee-like manner, apical part clavate to obovoid, blunt, pendent. Gynostemium up to 4 mm long.

**HABITAT.** Epiphyte on tree trunks and branches up to 25 m above the ground level in dense forests, old mangrove swamps, gallery forests and semi-deciduous forests with *Celtis* sp. and Sterculiaceae, noted on *Crudia harmsiana* De Wild. in *Irvingia smithii* Hook. f., *Dialium* sp., *Triplochiton scleroxylon* K. Schum., *Chrysobalanus atocorensis* A. Chev. All year round.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Equatorial Guinea (Bioko), Ghana, Nigeria, Cameroon, Gabon, Central African Republic, Democratic Republic of Congo (Zaire), Angola. Alt. up to 560 m.

**REPRESENTATIVE SPECIMENS.** Anguededou, 24 Aug. 1975, *van der Burg* 770 (WAG!); Banco, 21 Feb. 1962, *Bernardi* 8078 (P!); Banco Forest Reserve, 18 Jan. 1973, *De Koning* 1020 (WAG!); 26 Apr. 1973, *De Koning* 1591 (WAG!); 16 Apr. 1976, *De Koning* 6790 (WAG!); Banco Forest Reserve, near Route Martineau, 16 Nov. 1973, *De Koning* 2741 (WAG!); Banco Forest Reserve, near Arboretum, 11 June 1974, *De Koning* 3706 (WAG!); Banco Forest Reserve, near Route du Rail, 6 Nov. 1974, *De Koning* 4678 (WAG!); Ca. 3 km E of Bécédi, ca. 45 km NNE of Dabou, NW of Abidjan, 14 Aug. 1963, *de Wilde* 683 (WAG!); Brafouédi, 75 km NW of Abidjan, 24 Apr. 1959, *Leeuwenberg* 3339 (K!, WAG!); Dyolas, Mt. Goula, Danané, 12 Apr. 1909, *Chevalier* 21227 (K!, P!); Gregbeu, Apr. 1974, *Pérez-Vera* 625 (P!); Issia, 24 Aug. 1956, *de Wilde* 426 (WAG!); W of bridge on Ko R., Man-Duékoné road, 27 May 1975, *van der Burg* 483 (WAG!); Lobo, July 1971, *Pérez-Vera* 188 (K!); Mt. Mafa, 7 km SW of Bécédi-Brignan. 5°52'N, 4°04'W, 21 July 1970, *Leeuwenberg* 7939 (P!, WAG!); Near Tiassalé, right bank of Bandama R., near bridge, 5°54'N, 4°49'W, 10 Dec. 1958, *Leeuwenberg* 2147 (K!, WAG!).

#### 54. *Chauliodon* Summerh. in Bot. Mus. Leaf. 11: 163. 1943

Plants aphyllous. Stem short. Roots numerous, elliptic or rounded in cross section. Inflorescence elongate, multiflowered. Sepals and petals dissimilar. Lip transversely elliptic, strongly cochleate, with large, tooth-like point in front of the spur mouth. Spur long, bent in the knee-like manner. Gynostemium rather elongate, massive, erect. Stigma ovate, deeply concave. Anther incumbent, operculate, thin-walled, greatly elongate apically. Pollinia 2, ellipsoid, porate. Rostellum elongate apically, massive towards the base, acute or subacute. Viscidium single, very small, ellipsoid or ovoid. Tegula single, greatly widened apically, attenuated towards the base, thin, lamellate. Rostellum remnant blunt, canaliculate (Fig. 223).

A monotypic genus.

#### 1. *Chauliodon deflexicalcaratum* (De Wild.) L. Jonss. in Bot. Not. 132: 381, fig. 1. 1979 (Fig. 224)

*Angraecum deflexicalcaratum* De Wild. in Bull. Jard. Bot. Etat. 5: 185. 1916; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent* 1776 (HOLOTYPE: BR) - *Gussonea deflexicalcarata* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36(2): 90. 1918. - *Microcoelia deflexi-*

*calcarata* (De Wild.) Summerh. in Bot. Mus. Leaf. 11: 152. 1943.

*Chauliodon buntingii* Summerh. in Bot. Mus. Leaf. 11: 163. 1943; TYPE: LIBERIA. *Bunting* 9 (HOLOTYPE: K!; ISOTYPE: BM!)

Stem short, up to 2.5 cm long, 0.3 mm in diameter, erect. Roots 1-1.5 mm in diameter, numerous, elliptic or rounded in cross section. Cauline bracts lanceolate, acute to acuminate. Inflorescence up to 25 cm long, laxly multiflowered. Flowers resupinate, small, perianth brownish-rose. Floral bracts up to 3 mm long, acute. Pedicel and ovary slender, glabrous. Dorsal sepal 3.5-4.5 mm long, 1.7-2.3 mm wide, oblong-obovate, shortly apiculate, cochleate to subcucullate at apex, glabrous, with 3 nerves. Petals 3-4 mm long, 1 mm wide, obliquely triangular-lanceolate, acute, single-nerved. Lateral sepals 5 mm long, 2.5 mm wide, oblong-lanceolate to oblong-ovate, falcate, acute to apiculate, 3-nerved. Lip up to 3 mm long, transversely elliptic, almost cupuliform, with revolute margins, thin, with large, tooth-like callus in front of the spur mouth. Spur 12-14 mm long, 3-3.5 mm in diameter at base, narrowly cylindrical, in the lower part, than abruptly bent in the knee-like manner just above the middle, the apical part slightly swollen, subacute. Gynostemium 3 mm long.

HABITAT. Epiphyte in dense forests, mature forest on heavy clay being felled and cleared, tree species *Aytranella* sp., *Microberlinia* sp.. January, July.

DISTRIBUTION. Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. Rocher de Brafoüé, July 1972, *Pérez-Vera* 504 (K!); Yapo, 21 Jan. 1975, *Pérez-Vera* 747 (P!).

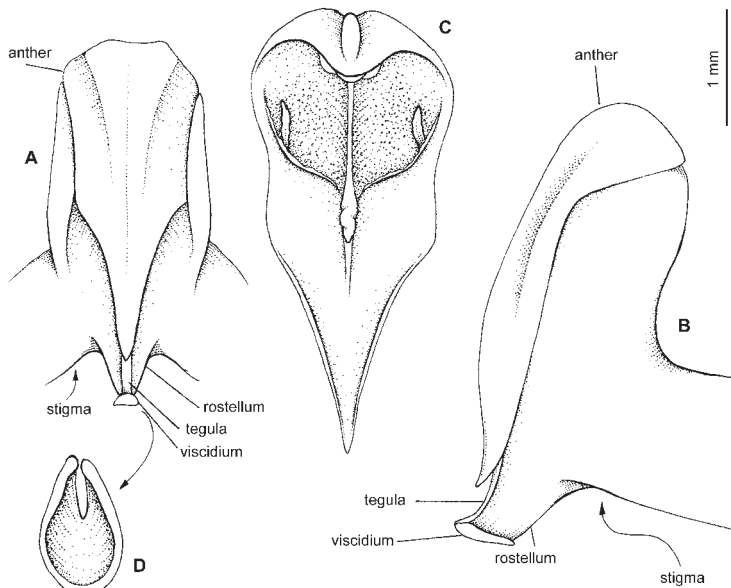


Fig. 223.—Gynostemium structure of *Chauliodon* Summerh.: A – gynostemium, front view; B – gynostemium, side view; C – anther; D – apical part of the rostellum remnant, view from below (Szlachetko 2003).

**55. Dinklageella** Mansf. in Repert. Spec. Nov. Regni Veg. 36: 63. 1934

Stem elongate, leafy throughout. Leaves bilobed at apex, coriaceous. Inflorescence axillary, rather lax or dense. Flowers medium-sized or small, resupinate. Sepals and petals subsimilar. Lip distinctly 3-lobed, both lateral lobes spread. Spur of various length. Gynostemium short and massive, erect. Stigma relatively

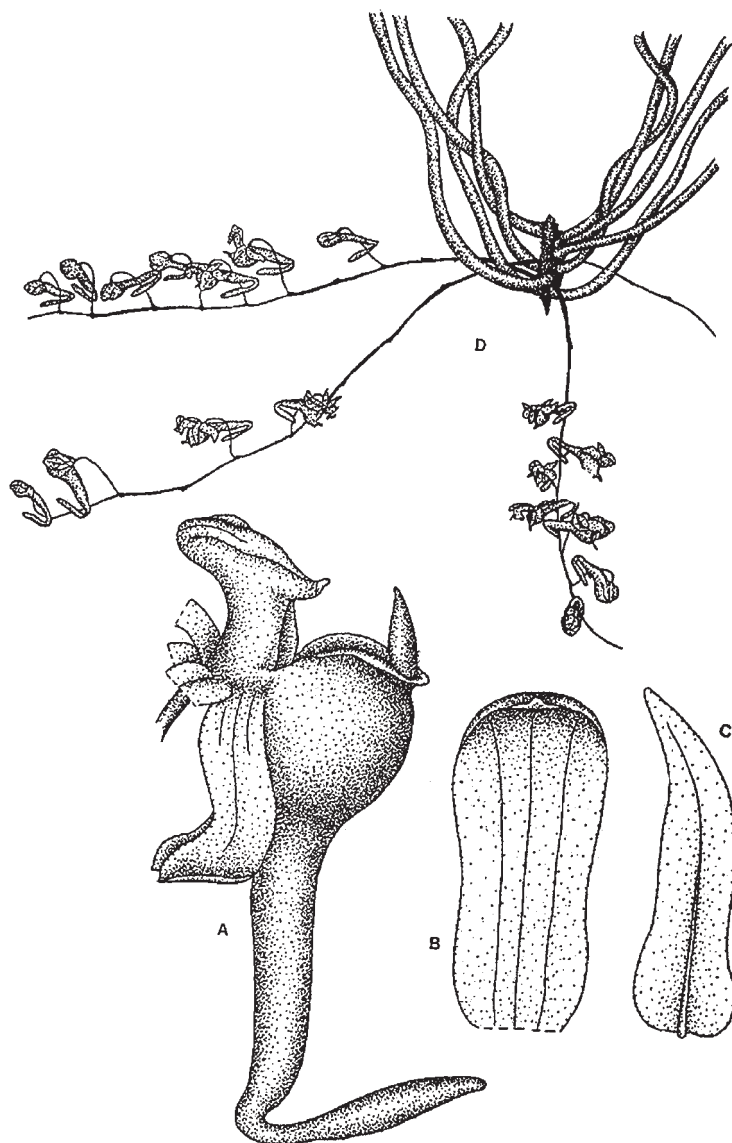


Fig. 224.—*Chauliodon deflexicalcaratum* (De Wild.) L. Jonss.: A – flower; B – dorsal sepal; C – petal; D – habit (Szlachetko & Olszewski 2001b).

small, elliptic, deeply concave. Anther incumbent, operculate, thin-walled. Pollinia two, almost globose, cleft. Rostellum rather massive, thick, fleshy, ligulate, blunt. Viscidium single, large, very thick and fleshy. Tegula large, rather thin. Rostellum remnant furcate, both lobes acute, massive (Fig. 225).

A genus of 3 species of which 1 has been collected in Ivory Coast.

**1. *Dinklageella liberica* Mansf. in Repert. Sp. Nov. Regni Veg. 36: 64. 1934 (Fig. 226)**

TYPE: LIBERIA. *Dinklage* 2321 (HOLOTYPE: B†; ICONOTYPE: K!)

Stem up to 100 cm long, pendulous or creeping, terete, glabrous, internodes 2-2.5 cm long. Leaves numerous, 1.5-4.5 cm long, 0.8-1.5 cm wide, oblong-elliptic to oblong-obovate, coriaceous, more or less equally bilobed, both lobed rounded. Inflorescence axillary up to 7 cm long, 2-6-flowered, lax, simple. Flowers medium-sized, resupinate, perianth whitish to yellowish, orange spotted. Floral bracts up to 4 mm long, transversely elliptic, truncate, amplexicaul, glabrous. Pedicel and ovary up to 10 mm long, slender, glabrous. Dorsal sepal 7-9 mm long, 4-5 mm wide, elliptic-obovate, cochleate, rounded at apex, cucullate, thin, glabrous, nerves branching. Petals 7-9 mm long, 3-4 mm wide, lanceolate-obovate, acute to

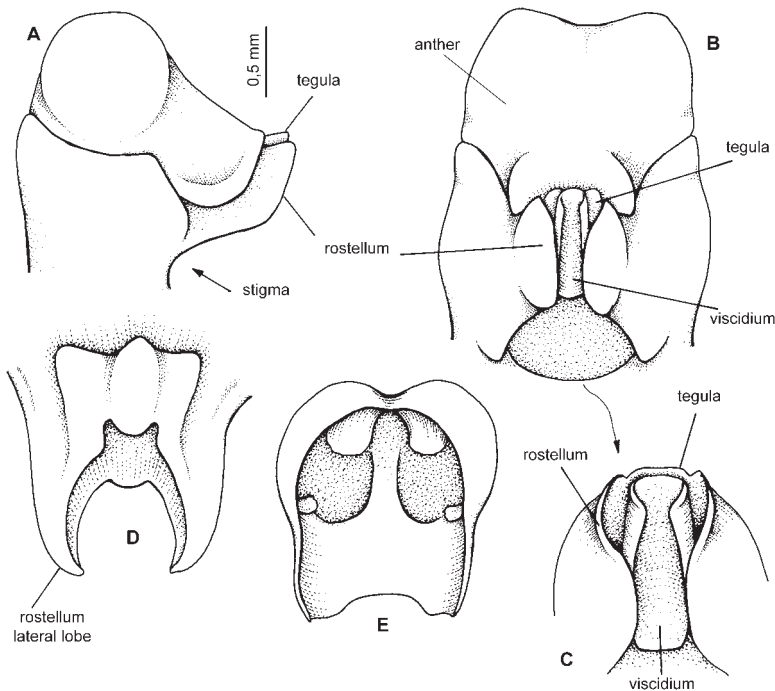


Fig. 225.—Gynostemium structure of *Dinklageella* Mansf.: A – gynostemium, side view; B – gynostemium, bottom view; C – rostellum, view from below; D – rostellum remnant; E – anther (Szlachetko 2003).



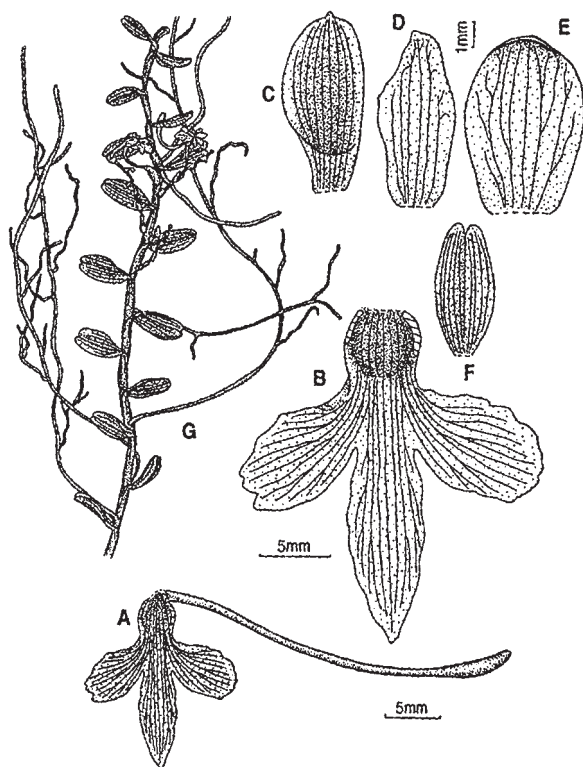


Fig. 226.—*Dinklagella liberica* Mansf.: A — lip and spur; B — lip; C — lateral sepal; D — petal; E — dorsal sepal; F — leaf; G — habit (Szlachetko & Olszewski 2001b).

subacute, thin, glabrous, nerves branching. Lateral sepals 7–9 mm long, 4–4.5 mm wide, obliquely lanceolate-obovate, cochleatae, shortly apiculate to acute, thin, glabrous, nerves unbranched. Lip distinctly 3-lobed just above the cochleate and somewhat fleshy base, ecallose, to tal length up to 16 mm; middle lobe up to 9.6 mm long, up to 3.5 mm wide, lanceolate to oblong-obovate, acute to obtuse, margins entire; sidelobes up to 7 mm long and 4 mm wide, obliquely obovate, rounded at apex, irregularly indented, widely spread. Spur up to 30 mm long, narrowly cylindrical, slightly swollen at apex, blunt and here 1.5 mm in diameter.

**HABITAT.** Epiphyte or lithophyte, forests,

rocks, noted on branch ends of cocoa and coffee trees. All year round.

**DISTRIBUTION.** Liberia, Ivory Coast, Nigeria, Cameroon, Equatorial Guinea, Gabon, Democratic Republic of Congo (Zaire). Alt. up to 1000 m.

**REPRESENTATIVE SPECIMENS.** Banco, 26 Oct. 1956, *de Wilde* 732 (WAG!); Banco Forest Reserve, 6 June 1975, *van der Burg* 516 (WAG!); Banco Forest Reserve, near Route Martineau, 6 Nov. 1974, *De Koning* 4667 (WAG!); Banco Forest Reserve, near Route du Val d'Abobo, *De Koning* 6248 (WAG!); Banco Forest Reserve, near Route des Aviateurs, 26 Feb. 1976, *De Koning* 6637 (WAG!); Rocher de Brafouédi, 28 Oct. 1957, *Aké Assi* 4435 (K!); Yapo, 3 Nov. 1974, *Pérez-Vera* 726 (K!, WAG!).

## 56. *Lacroixia* Szlach. in Ann. Bot. Fenn. 40: 69. 2003

Stem elongate, leafy throughout. Leaves bilobed at apex, coriaceous. Inflorescence axillary, rather lax or dense. Flowers medium-sized or small, resupinate. Sepals and petals subsimilar. Lip distinctly 3-lobed, both lateral lobes spread. Spur of various length. Gynostemium short and massive, erect. Stigma relatively small, elliptic, deeply concave. Anther incumbent, operculate, thin-

walled. Pollinia 2, almost globose, cleft. Rostellum rather massive, thick, fleshy, ligulate, blunt. Viscidium single, large, very thick and fleshy. Tegula large, rather thin. Rostellum remnant furcate, both lobes acute, massive (Fig. 227).

A monotypic genus.

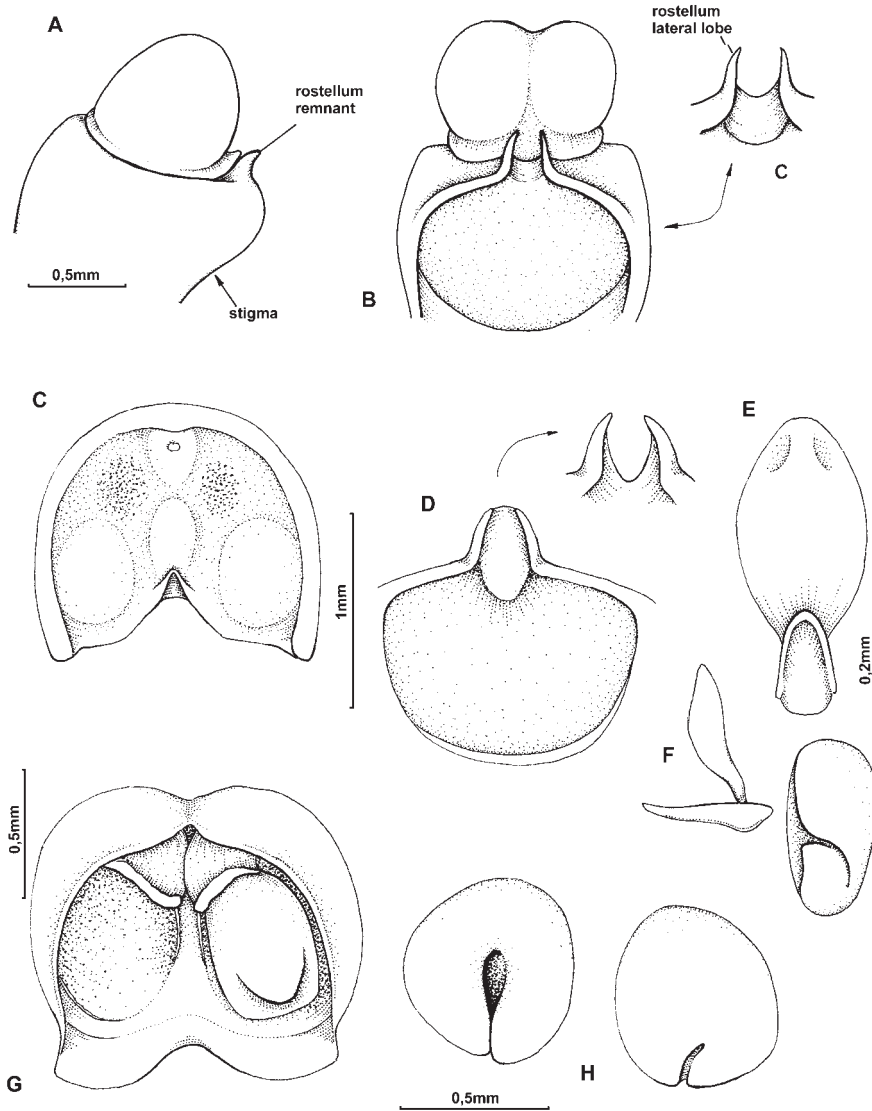


Fig. 227.—Gynostemium structure of *Lacroixia* Szlach.: A – gynostemium side view; B – gynostemium bottom view; C – rostellum remnant; D – rostellum bottom view; E, F – tegula and viscidium various views; G – anther; H – pollinia various views (Szlachetko 2003).

**1. *Lacroixia minor*** (Summerh.) Szlach. in Acta Bot. Fenn. 176: 258. 2003  
(Fig. 228)

*Dinklageella minor* Summerh. in Kew Bull. 14: 156. 1960; TYPE: LIBERIA. *Harley 2158*  
(HOLOTYPE: K!)

Stem up to 20 cm long, ca. 0.2-0.3 cm in diameter, delicate. Leaves numerous, 1.3-3 cm long, 0.5-1 cm wide, oblong-lanceolate to ligulate, subcoriaceous, unequally bilobed at apex, each lobe obtuse. Inflorescence up to 3 cm long, 2-3-flowered, rhachis fractiflex, suberect. Flowers small, resupinate, white. Floral bracts 2-3 mm long, triangular-ovate, obtuse. Pedicel and ovary up to 6 mm long, slender, erect, glabrous. Dorsal sepal 5 mm long, 2.25 mm wide, oblong ovate, obtuse, glabrous, 3-nerved. Petals 5 mm long, 1.25 mm wide, obliquely oblong to linear, obtuse, glabrous, 1- or 3-nerved. Lateral sepals 5.5 mm long, 1.6-1.7 mm wide, obliquely oblong-ob lanceolate to ligulate, obtuse, glabrous, 3-nerved. Lip 6.5-7.5 mm long, 4-4.5 mm wide, 3-lobed; middle lobe 3-3.5 mm long, 1.5 mm wide, oblong, obscurely 3-dentate at the apex, recurved; lateral lobes 2-2.5 mm long, 1.5 mm wide, oblong-ovate, obtuse. Spur 2.5 mm long, 1.5 mm in diameter, basal part broadly cylindrical, constricted near the middle and swollen above, blunt, pendent. Gynostemium up to 1 mm long.

HABITAT. Epiphyte.

DISTRIBUTION. Sierra Leone, Ivory Coast, Guinea, Liberia, Ghana.

NOTES. Given from Ivory Coast by Adam (1982).

Subtribe **Aerangidinae** Summerh. in Kew Bull. 20: 188. 1966

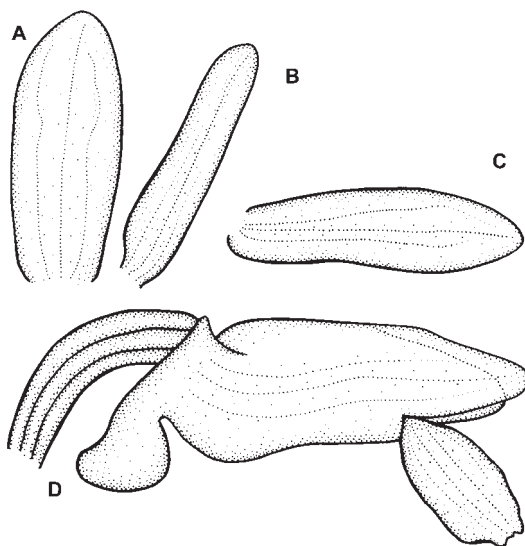


Fig. 228.—*Lacroixia minor* (Summerh.) Szlach.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip (drawn by A. Kowalkowska, *Harley 2158*, K).

Rostellum beak-like, long, narrow and fleshy, acute. Tegula single or double, linear, narrow and long. Viscidium single, elliptic, lamellate, lying on the upper surface of the rostellum apex. Rostellum after removal of the pollinarium acute, with a groove on the upper surface. Pollinia 2, porate.

Two genera, of 7 included in this subtribe, have been found in Ivory Coast.

**57. *Aerangis* Rchb. f.** in  
Flora 48: 190. 1865

Stem abbreviated, short. Leaves distichous, spread, unequally bilobed, lobes usually obtuse or rounded.

Inflorescence elongate, usually pendulous, few- to multi-flowered, often lax. Flowers resupinate, small to medium-sized, usually white or pale in colour. Sepals and petals similar or subsimilar. Lip usually petaloid, ecallose, simple, entire. Spur filiform, pendulous, much longer than pedicel and ovary. Gynostemium slender, erect. Stigma large, elliptic, more or less concave. Anther incumbent, operculate, thin-walled, sometimes with thickened connective. Pollinia 2. Rostellum elongate, finger-like, rather fleshy, blunt, sometimes more or less upcurved near the middle. Viscidium single, thin, lamellate, rather small. Tegula single, linear, thin, lamellate. Rostellum remnant acute, canaliculate (Fig. 229).

A genus of about 50 species distributed in Africa, Madagascar, Comoro Islands and Sri Lanka; about half of them are known from continental Africa.

#### KEY TO THE SPECIES

1. Leaves obovate to oblanceolate, lobes rounded. Spur (3)5-6(7.5) cm long ..... **1. *A. biloba***
- Leaves linear to linear-lanceolate, lobes acute to subacute. Spur 2.5-4 cm long ..... **2. *A. calantha***

#### 1. *Aerangis biloba* (Lindl.) Schltr. in Orchideen: 598. 1914 (Fig. 230)

*Angraecum bilobum* Lindl. in Edwards's Bot. Reg.: 69. 1840; TYPE: GHANA. *Bowdich s.n.* (HOLOTYPE: K!) - *Angorchis biloba* (Lindl.) O. Kuntze in Revis. Gen. Pl. 2: 651. 1891. - *Listrostachys biloba* (Lindl.) Kraenzl. in Bot. Jahrb. Syst. 22: 28. 1895. - *Rhaphidorhynchus bilobus* (Lindl.) Finet in Bull. Soc. Bot. France 54 (9): 32. 1907.

Stem up to 20 cm long, upright. Leaves 4-10, up to 18 cm long, 3-6 cm wide, obovate to oblong-obovate, unequally bilobed at apex, each lobe obtuse to subacute. Inflorescence 10-40(60) cm long, 8-20-flow-

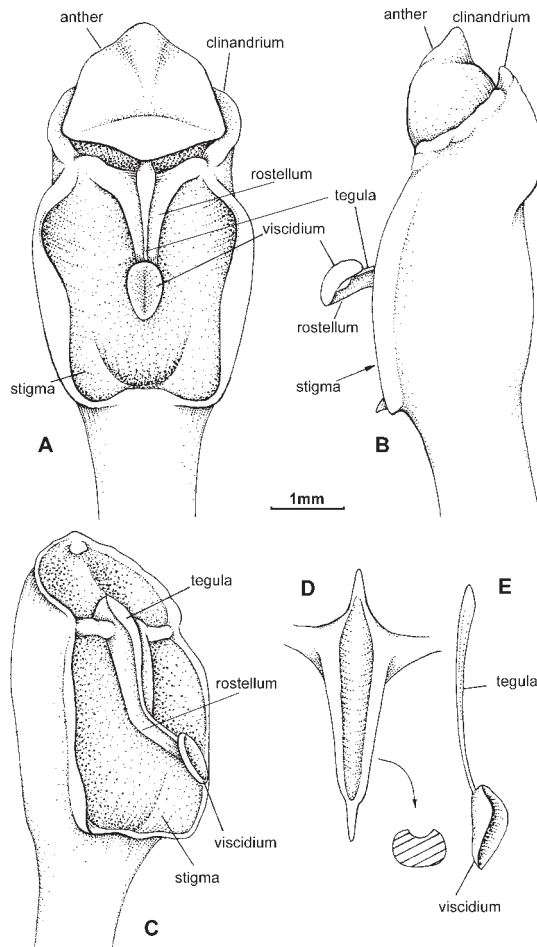


Fig. 229.—Gynostemium structure of *Aerangis* Rchb. f.: A – gynostemium bottom view; B – gynostemium side view; C – gynostemium, anther and pollinia removed; D – rostellum remnant; E – tegula and viscidium (Szlachetko 2003).

ered, lax, pendulous, rachis straight. Flowers medium-sized, resupinate, white, often tinted with pink or brown in the pedicel and spur. Floral bracts 3-4 mm long, broadly ovate, obtuse to acute. Pedicel and ovary 20-30 mm long, slender, glabrous. Dorsal sepal 12-25 mm long, up to 6 mm wide, narrowly to oblong-lanceolate, acute, glabrous, nerves unbranched. Petals up to 23 mm long, up to 6 mm wide, narrowly lanceolate to oblong-lanceolate, acute, slightly falcate, glabrous, nerves unbranched; lateral sepals up to 25 mm long, up to 5 mm wide, linear-lanceolate to oblong-lanceolate, acute, slightly falcate, glabrous, nerves unbranched. Lip 15-25 mm long, 5.3-8 mm wide, oblanceolate to oblong-oblanceolate, cuspidate, glabrous, nerves unbranched, deflexed. Spur (30)50-60(75) mm long, ca. 1.2 mm in diameter, pendulous, acute. Gynostemium 5-6 mm long.

**HABITAT.** Epiphyte in thickets, forest edges, woodlands and forests, frequently collected from plantation crops and village trees. Mostly April-May.

**DISTRIBUTION.** Senegal, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Gabon. Alt. up to 700 m.

**REPRESENTATIVE SPECIMENS.** 80 km N of Bouaké, 5°19'W, 8°35'N, 24 May 1968, *Geerling & Bokdam* 2724 (WAG!); Danané, Aug. 1942, *Schnell* 1586 (K!); Dyolas, Mt. Goula, Danane, 12 Apr. 1909, *Chevalier* 21221 (P!); Rocher d'Issia, May 1972, *Pérez-Vera* 165 (K!, P!); Kpouébo (Kpovébo), 31 May 1966, *Aké Assi* 8875 p.p. (K!); Haute Sassandra, Dyolas, Peste de Man, 15 May 1909, *Ripert sub Chevalier* 21538 (K!, P!).

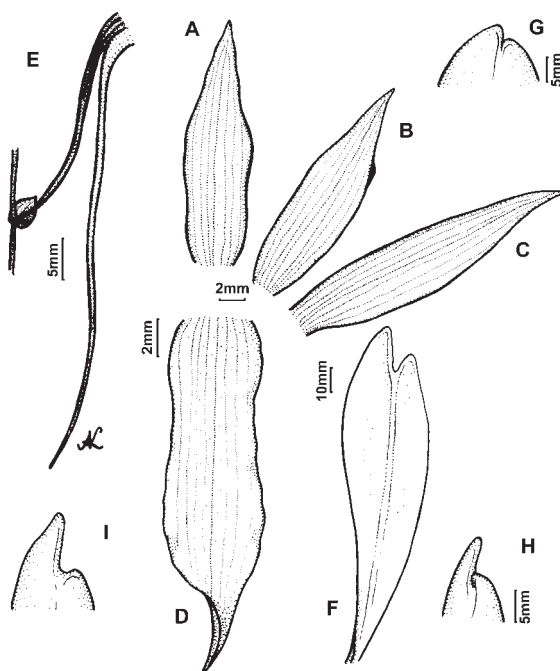


Fig. 230.—*Aerangis biloba* (Lindl.) Schltr.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip; E – floral bract, pedicel, ovary and spur; F – leaf; G-H – various leaf apices (drawn by A. Kowalkowska, A-F – *Chevalier* 21660, P; G – *Letouzey* 2347, P; H – *Sanfrod* 5264, P; and – *Halle* 2096, P).

## 2. *Aerangis calantha* (Schltr.) Schltr. in Beih. Bot. Centralbl. 36: 115. 1918 (Fig. 231)

*Angraecum calanthum* Schltr. in Bot. Jahrb. Syst. 38: 20. 1905; TYPE (here designated): CONGO. *Schlechter* 12700 (LECTOTYPE: B†) & CAMEROON. *Schlechter* s.n. (PARATYPE: B†)

*Angraecum roseocalcaratum* De Wild. in Bull. Jard. Bot. Etat. 5: 190. 1916; TYPE (here designated): DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Seret* 889 (LECTOTYPE: BR) & *Seret* 462 (PARATYPE: BR) – *Aerangis roseocalcarata* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 120. 1918.

*Angraecum sankuruense* De Wild. in Bull. Jard. Bot. Etat. 5: 190. 1916; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Luja* s.n. (HOLOTYPE: BR) – *Aerangis sankuruensis* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 120. 1918.

Stem up to 3 cm long, 0.3 cm in diameter, woody.

Leaves 2-6, 3-9 cm long, 0.4-0.8 cm wide, linear, often falcate, somewhat attenuated towards the base, unequally or subequally bilobed at apex, each lobe acute to subobtusate, thin, or rather fleshy. Inflorescence up to 11 cm long, 2-5(8)-flowered, lax, spreading to pendent, rhachis straight. Flowers small, resupinate, white, the spur often pink. Floral bracts 1-3 mm long, broadly triangular. Pedicel and ovary 12-17 mm long, slender, erect, glabrous. Dorsal sepal 7-12 mm long, 2-3.5 mm wide, ovate- to oblong-lanceolate, acute to subacute, thin, glabrous, nerves unbranched. Petals 7-10 mm long, 1.8-2.5 mm wide, linear-oblong, subacute, straight or slightly sigmoid, glabrous, nerves unbranched. Lateral sepals longer than dorsal one, up to 3 mm wide, narrowly or oblong-lanceolate, acute, slightly oblique, glabrous, thin, nerves unbranched. Lip 7-10 mm long, 2-3.5 mm wide, oblong-lanceolate, acute to apiculate, glabrous, nerves unbranched. Spur 25-40 mm long, ca. 1 mm in diameter, filiform, acute, pendent, often curved or hooked forwards in the lower part. Gynostemium 1.5-2 mm long.

**HABITAT.** Epiphyte in deep shade, usually on small twigs and branches, at low levels and in the canopy, found in primary forests and on the plantation trees, as coffee, cocoa, orange. May.

**DISTRIBUTION.** Ivory Coast, Ghana, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, Angola, Democratic Republic of Congo (Zaire), Uganda, Tanzania. Alt. 1000-1650 m.

**REPRESENTATIVE SPECIMENS.** Daloa-Man road, near Lobo R., 6 May 1974, *Pérez-Vera* 629 (K!, P!); Soubré, 3 May 1974, *Pérez-Vera* 274 (K!); *Pérez-Vera* 274/B (K!, P!).

### 58. *Chamaeangis* Schltr. in Beih. Bot. Centralbl. 36: 107. 1918

Plants monopodial. Stem abbreviated or elongate. Leaves usually narrow, fleshy or coriaceous, unequally bilobed at apex. Inflorescence elongate, densely

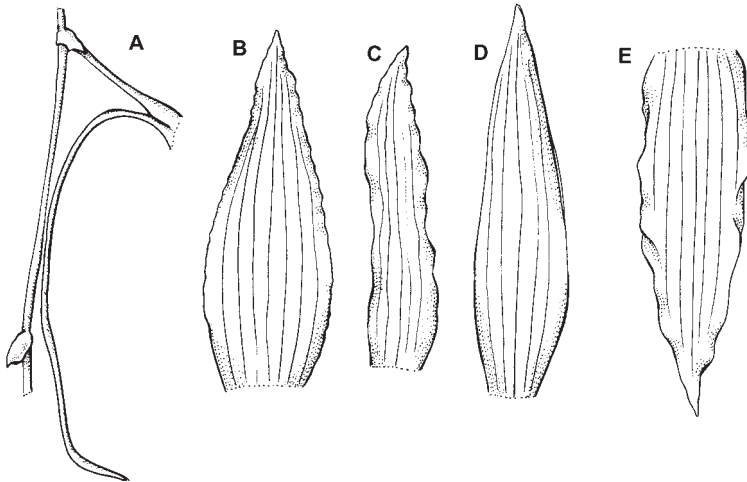


Fig. 231.—*Aerangis calantha* (Schltr.) Schltr.: A – floral bract, pedicel, ovary, lip and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (drawn by J. Mytnik-Ejsmont, *Tisserant* 1796, P).

or laxly multi-flowered, often 2- or more-flowered at each node. Flowers small, nonresupinate, green, yellow or orange. Sepals and petals dissimilar, often fleshy, convex. Lip entire, ecallose or with small callus near the spur entrance. Spur usually elongate, often swollen at apex. Gynostemium erect, short, massive. Stigma transversely elliptic, deeply concave. Anther incumbent, operculate, thin-walled. Pollinia ellipsoid to almost globose, porate. Rostellum elongate, finger-like, blunt. Viscidium single, thin, relatively small, oblong. Tegula double, each part elongate, narrow, thin. Rostellum canaliculate after removal of pollinarium (Fig. 232).

A genus of about 15 species known in tropical Africa, Madagascar and the Comores.

#### KEY TO THE SPECIES

1. Lip 3-lobed at apex ..... **1. Ch. ichneumonea**  
 – Lip entire ..... 2
2. Spur narrowly cylindrical, not inflated apically ..... **4. Ch. odoratissima**  
 – Spur ampullaceous in apical half ..... 3
3. Flowers 2-3 at each node of inflorescence ..... **6. Ch. vesicata**  
 – Flowers 1 at each node of inflorescence ..... 4
4. Leaves lobes subobtuse. Spur at least twice as long as pedicel and ovary ..... **2. Ch. lanceolata**  
 – Leaves apiculate at the apex. Spur slightly longer than pedicel and ovary ..... 5
5. Lip with 1 callus below spur entrance. Spur much swollen in the apical third, ampullaceous at the apex ... **5. Ch. pauciflora**  
 – Lip with 2 calli at both sides of spur entrance. Spur not ampullaceous ... **3. Ch. letouzeyi**

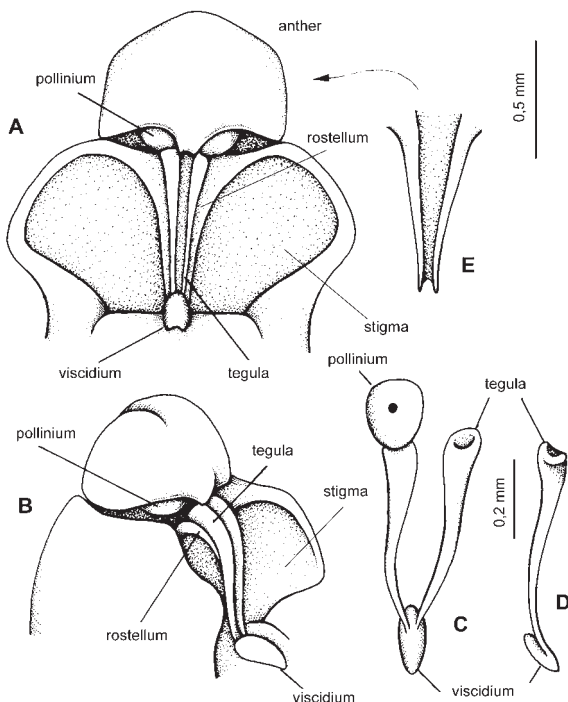


Fig. 232. – Gynostemium structure of *Chamaeangis* Schltr.: A – gynostemium, bottom view; B – gynostemium side view; C – pollinarium; D – tegula and viscidium; E – rostellum remnant (Szlachetko 2003).

#### 1. *Chamaeangis ichneumonea* (Lindl.) Schltr. in Beih. Bot. Centralbl. 36: 108. 1918 (Fig. 233)

*Angraecum ichneumoneum* Lindl. in J. Linn. Soc., Bot. 6: 136. 1862; TYPE: NIGERIA. *Barter s.n.* (HOLOTYPE: K!;



ISOTYPE: W-R!; DRAWING: UGDA-DLSz) - *Listrostachys ichneumonea* (Lindl.) Rchb. f. in Gard. Chron. 2: 681. 1887.

Stem up to 20 cm long, stout, erect or pendent. Leaves many, distichous, 17-50 cm long, 2.5-4.5 cm wide, falcately oblong-ob lanceolate or oblanceolate, flat, unequally bilobed at apex, longer lobe acute to subacute, the smaller one often reduced. Inflorescence 20-50 cm long, multi-flowered, rather dense, pendulous. Flowers always 1 at each node of inflorescence, small, white, cream coloured or greenish brown, fragrant especially during the night. Floral bracts up to 1 mm long, amplexicaul, broadly transversely elliptic, triangular, acute, thin, delicate. Pedicel and ovary 5 mm long, slender, glabrous, straight. Dorsal sepal 5-6 mm long, 2-2.5 mm wide, oblong-elliptic, obtuse, rather fleshy, thick, convex, minutely papillate, obscurely 3-nerved. Petals 5 mm long, 1.7 mm wide, falcately oblong, obtuse to subacute, rather fleshy, minutely papillate, obscurely 3-nerved. Lateral sepals 5-6.2 mm long, up to 2.3 mm wide, obliquely obovate-oblong, obtuse, convex, minutely papillate, obscurely 3-nerved. Lip 5-6 mm long, up to 3 mm wide, ecallose, oblong or rectangular in outline, shortly 3-lobed or at least 3-toothed at apex, the middle lobe the shortest, triangular, both sidelobes triangular, acute. Spur 13-18 mm long, incurved, swollen part ellipsoid-fusiform, 6-10 mm long, 3 mm in diameter.

HABITAT. Epiphyte. December-January.

DISTRIBUTION. Ivory Coast, Sierra Leone, Guinea, Liberia, Ghana, Nigeria, Cameroon, Gabon, Congo.

REPRESENTATIVE SPECIMENS. Bouroukrou, 20 Dec. 1906-20 Jan. 1907, *Chevalier 16 907 bis* (P!).

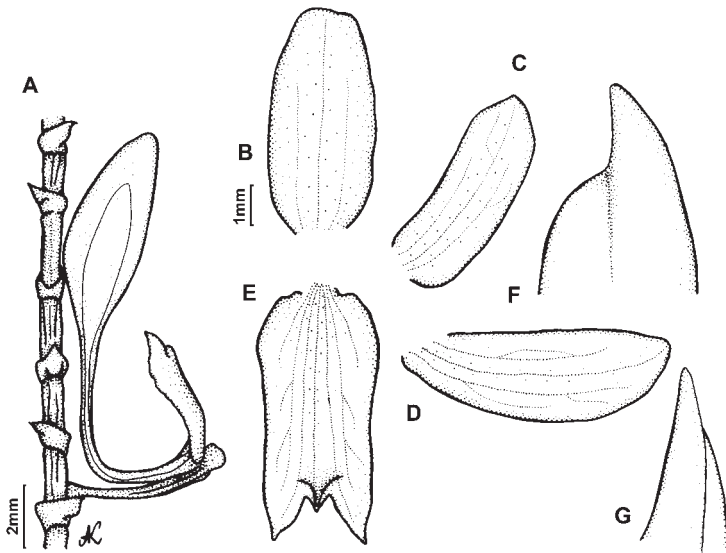


Fig. 233. - *Chamaeangis ichneumonea* (Lindl.) Schltr.: A - part of inflorescence; B - dorsal sepal; C - petal; D - lateral sepal; E - lip; F, G - leaf apices (drawn by A. Kowalkowska, A-F - *Le Testu 5765*, P; G - *Villiers 981*, P).

2. *Chamaeangis lanceolata* Summerh. in Kew Bull. 12: 279. 1958  
(Fig. 234)

TYPE: NIGERIA. *Meikle 607* (HOLOTYPE: K!; ISOTYPE: K!; DRAWING: UGDA-DLSz)

Stem short. Leaves 6-28 cm long, 0.7-2 cm wide, lanceolate, unequally bilobed at apex, each lobe obtuse to rounded. Inflorescence up to 35 cm long, up to 50-flowered. Flowers greenish ochraceous, always single at each node. Floral bracts up to 2 mm long, amplexicaul, transversely elliptic-triangular, acute, thin, delicate, glabrous, transparent. Pedicel and ovary up to 5 mm long, slender, glabrous, straight. Dorsal sepal 2.2-5 mm long, 1.4-2 mm wide, ovate-triangular to ovate-elliptic, subacute, glabrous, single-nerved. Petals 2-4 mm long, 1-2 mm wide, triangular-ovate, acute to acuminate, glabrous, single-nerved. Lateral sepals 2-5 mm long, 1-2.5 mm wide, obliquely ovate-triangular to ovate-oblong, acuminate, glabrous, single-nerved. Lip 2-3.5 mm long, 1.8-2.2 mm wide, triangular-lanceolate, ovate-triangular or lanceolate, acute at apex, glabrous. Spur up to 12 mm long, narrowly cylindrical, straight, apical inflated part ca. 3-4 mm long, ampulaceous.

HABITAT. Epiphyte over water, in forests with *Calpocalyx heitzii* Pellegr., noted 40 m above the ground. July, November.

DISTRIBUTION. Ivory Coast, Nigeria, Cameroon, Gabon, Congo.

REPRESENTATIVE SPECIMENS. Mt. Mafa, 2 Nov. 1974, *Pérez-Vera 725* (K!, P!); Yakassé Mé-Kodiousou road (km 9), 5°49'N, 3°54'W, 31 July 1970, *Leeuwenberg 8056* (P!, WAG!).

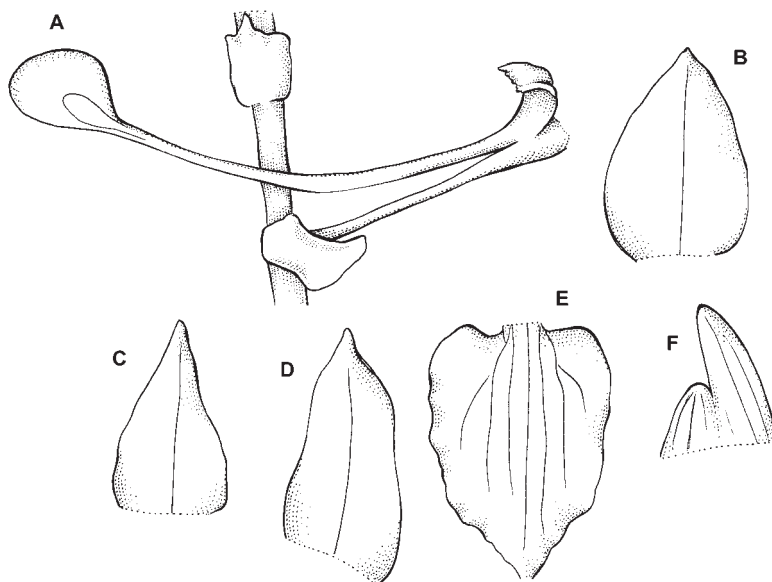


Fig. 234.—*Chamaeangis lanceolata* Summerh.: A — floral bract, pedicel, ovary, lip and spur; B — dorsal sepal; C — petal; D — lateral sepal; E — lip, F — leaf apex (drawn by J. Mytnik-Ejsmont, *Letouzey 9159*, P).

**3. *Chamaeangis letouzeyi*** Szlach. & Olszewski in Abrév. & al. (eds.), Fl. Cameroun 36(3): 754. 2001 (Fig. 235)

TYPE: CAMEROON. *Letouzey 14218* (HOLOTYPE: P!; ISOTYPE: K!; DRAWING: UGDA-DLSz)

Stem short, erect. Leaves 3, 18-20 cm long, up to 1.3(3) cm wide, narrowly or linear-lanceolate, with margins slightly revolute, spread, unequally bilobed at apex, both lobes acute. Inflorescence 5.5-25 cm long, up to 13-flowered, lax. Flowers small, yellow-orange, single at each node. Floral bracts up to 1 mm long, amplexicaul, acute, thin, delicate, glabrous. Pedicel and ovary 4-6 mm long, straight, glabrous, slender. Dorsal sepal 4 mm long, 3 mm wide, broadly ovate, obtuse, convex, fleshy, very thick, obscurely single-nerved. Petals 3.2 mm long, 1.5 mm wide, ovate-triangular, acute, convex, fleshy, thick, obscurely single-nerved. Lateral sepals 4 mm long, 2 mm wide, obliquely oblong- or elliptic-ovate, subacute to subobtuse, convex, thick, fleshy, obscurely single-nerved. Lip 3.2 mm long, 1.5 mm wide, oblong-ovate in outline, entire, subacute, ecallose, very thick, fleshy, convex, 1-nerved. Spur up to 6 mm long, slightly incurved, narrowly cylindrical, with prominent ampoules in apical fifth.

HABITAT. Epiphyte 3 m above the ground in submontane forest. May.

DISTRIBUTION. Ivory Coast, Sierra Leone, Cameroon. Alt. 500-1800 m.

REPRESENTATIVE SPECIMENS. Zague (Zagne), 20 May 1975, Pérez-Vera 275 (K!, P!).

**4. *Chamaeangis odoratissima*** (Rchb. f.) Schltr. in Beih. Bot. Centralbl. 36: 108. 1918 (Fig. 236)

*Angraecum odoratissimum* Rchb. f. in Bonplandia 4: 326. 1856; TYPE (here designated): *Herb. Reichenbach f. 7916*, coll. unknown - sine loc. (LECTOTYPE: W-R!; ISOLECTOTYPE: K; DRAWING: UGDA-DLSz)

*Listrostachys dewevrei* De Wild. in Not. Pl. Util. Congo 1: 145. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Dewevre 584* (HOLOTYPE: BR) - *Chamaeangis dewevrei* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 108. 1918.

*Listrostachys pyneritii* De Wild. in Not. Pl. Util. Congo 2: 164. 1904; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Pyneritii* s.n. (HOLOTYPE: BR)

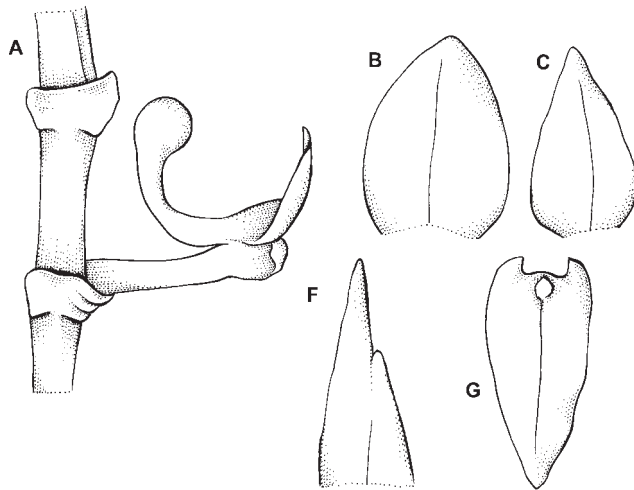


Fig. 235.—*Chamaeangis letouzeyi* Szlach. & Olszewski : A – floral bract, pedicel, ovary, lip and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip, F – leaf apex (drawn by J. Mytnik-Ejsmont, *Letouzey 14218*, P).

Stem 20-46 cm long, 0.4-0.6 cm in diameter, elongate, pendent. Leaves many, 10-24 cm long, 1.8-3.1 cm wide, well distributed along stem, oblanceolate to oblong-oblanceolate, slightly falcate, fleshy, unequally bilobed at apex, each lobe obtuse. Inflorescence 8-28 cm long, densely many-flowered, pendulous or spread. Flowers 2-6 in each nodes, small, yellow-green to yellow. Floral bracts 1 mm long, amplexicaul, obtuse, thin, delicate, transparent. Pedicel and ovary 1-2 mm long, straight, glabrous, slender. Dorsal sepal 1-1.8 mm long, 1.3-1.5 mm wide, elliptic, elliptic-ovate, broadly obovate, obtuse, fleshy, rather thick, convex, obscurely 3-nerved. Petals 1-1.4 mm long and wide, elliptic, circular to broadly obovate, obtuse, rather fleshy, glabrous, obscurely 3- or 1-nerved. Lateral sepals 1.5-2.5 mm long, 1-1.3 mm wide, obliquely obovate, elliptic or oblong-elliptic, obtuse, convex, rather thick, fleshy, obscurely 1- or 3-nerved. Lip 1.7-2 mm long, 1.3-1.5 mm wide, circular, elliptic to elliptic-ovate, obtuse to shortly apiculate, convex, sometimes with incolute margins, thick, fleshy, 1- or 5-nerved. Spur 5-11 mm long, incurved, narrowly cylindrical, obtuse, very little, if any, inflated towards the apex, twisted or not.

**HABITAT.** Epiphyte in primary and secondary forests, 2-5 m above the soil level, noted on *Bridelia micrantha* Baill. and *Sapium ellipticum* Pax. All year round, but usually October-November.

**DISTRIBUTION.** Ivory Coast, Sierra Leone, Guinea (?), Liberia, Cameroon, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Rwanda, Burundi, Kenya, Tanzania, Malawi. Alt. 900-2150 m.

**REPRESENTATIVE SPECIMENS.** Between Diapé and Adzopé, 28 Oct. 1956, *de Wilde* 746 (K!, WAG!); Ca. 18 km S of Guéyo, between Gaguoa (Gagnoa) and Sassandra, 6 Dec. 1961, *de Wilde* 3342 (WAG!); Kassamblé, Dabou road, 15 Nov. 1958, *Aké Assi* 1A 4462 (K!); Mt. Mafa, 16 Nov. 1967, *Aké Assi* 9771 (K!); 2 Nov. 1974, *Pérez-Vera* 727 (K!); Sassandra, behind Fuyt plantation, 12 Nov. 1973, *De Koning* 2681 (WAG!); Ca. 60 km N of Sassandra, left bank of Davo R., E of Béyo, 6°00'W, 5°18'N, 27 Jan. 1959, *Leeuwenberg* 2585 (K!, WAG!); Zégueguké, Nov. 1971, *Pérez-Vera* 144 (K!); *Sine loc.*, 12 Oct. 1975, *van der Burg* 1159 (WAG!); *Sine loc.*, 22 Nov. 1978, *Dekker* 332 (WAG!); *Sine loc.*, 14 June 1982, *Dekker* 435 (WAG!); *Sine loc.*, 28 Feb. 1979, *van Setten* 343 (WAG!).

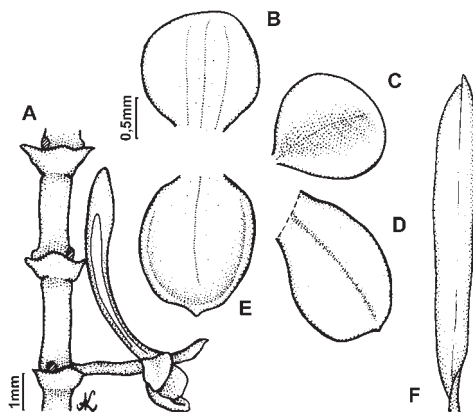


Fig. 236.—*Chamaeangis odoratissima* (Rchb. f.) Schltr.: A — part of inflorescence; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — leaf (drawn by A. Kowalkowska, Florest & Louis 1549, P).

### 5. *Chamaeangis pauciflora* Pérez-Vera in Cote d'Ivoire, Orchid.: 234. 2003 (Fig. 237)

**TYPE:** IVORY COAST. *Pérez-Vera* 275  
(HOLOTYPE: UCJ; ISOTYPES: ABI, K!, P;  
PHOTO: UGDA-DLSz)

Stem 3-6 cm long. Leaves numerous, 10-30 cm long, 0.7-1.5 cm wide, linear, falcate, coriaceous, margins revolute, very unequally bilobed at apex, lobes acute. Inflorescence up to 30 cm long, laxly 15-25-flowered, pendent. Flowers small, lime-green, to yel-

lowish, single at each node. Floral bracts up to 1 mm long, amplexicaul, obtuse or acute, thin, delicate, glabrous, transparent. Pedicel and ovary 4-5 mm long, slender, arched, glabrous. Dorsal sepal 2-3.5 mm long, 1.5-2 mm wide, ovate to elliptic-ovate, acute, fleshy, thick, convex. Petals 2.5-3 mm long, 1 mm wide, lanceolate, oblong-lanceolate, acute or acuminate, fleshy, convex, glabrous. Lateral sepals 2.5-3.5 mm long, 2 mm wide, obliquely elliptic-ovate or elliptic-lanceolate, acute, thick, fleshy, convex, glabrous. Lip 2.5-3 mm long, 1-2 mm wide, oblong-ovate, subobtuse or subacute, thick, fleshy, convex, glabrous, ecallose. Spur 4.5-7 mm long, slightly incurved, narrowly cylindrical, dilated in apical third, blunt.

HABITAT. Epiphyte in evergreen lowland and upland forests. July.

DISTRIBUTION. Ivory Coast.

REPRESENTATIVE SPECIMENS. Danané-Man road, July 1973, *Pérez-Vera* 275/B (K!).

**6. *Chamaeangis vesicata* (Lindl.) Schltr. in Beih. Bot. Centralbl. 36: 109. 1918 (Fig. 238)**

*Angraecum vesicatum* Lindl. in Edwards's Bot. Reg. 29: 6. 1843; TYPE (*here designated*): GHANA. *Loddiges s.n.* (LECTOTYPE: K!) & NIGER? *Barter s.n.* (PARATYPE: W-R!; DRAWING: UGDA-DLSz) - *Listrostachys vesicata* Rehb. f. in Flora 48: 190. 1865.

Stem 1-5(8) cm long. Leaves 3-10, 20-40 cm long, 0.7-1.6 cm wide, linear, falcate, coriaceous, margins revolute, very unequally bilobed at apex, lobes acute, usually twisted at base to lie in one plane. Inflorescence 7-30 cm long, densely up to 100-flowered, pendent. Flowers small, lime-green, yellow, orange, diurnally scented, 2 at

each node. Floral bracts up to 2 mm long, amplexicaul, obtuse or acute, thin, delicate, glabrous, transparent. Pedicel and ovary 4-5 mm long, slender, straight, glabrous. Dorsal sepal 2-3.5 mm long, 1.5-2.1 mm wide, ovate, elliptic-ovate to broadly ovate, acute to shortly apiculate, fleshy, thick, convex, obscurely 1- or 3-

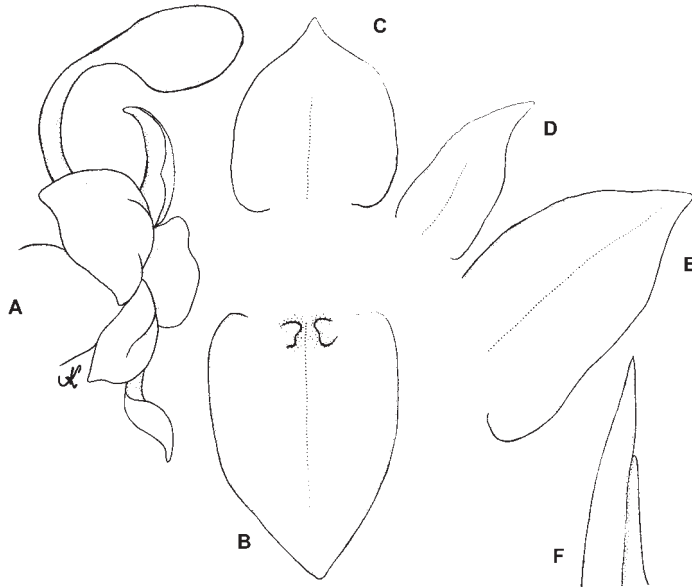


Fig. 237.—*Chamaeangis pauciflora* Pérez-Vera: A — flower, side view; B — lip; C — dorsal sepal; D — petal; E — lateral sepal; F — leaf apex (drawn by A. Kowalkowska, *Pérez-Vera* 275/B, K).

nerved. Petals 2.5-3 mm long, 0.9-1.2 mm wide, lanceolate, oblong-ovate, lanceolate-triangular, acute or obtuse, fleshy, convex, glabrous, obscurely 1-nerved. Lateral sepals 2.5-4 mm long, 2 mm wide, obliquely ovate, elliptic-ovate or oblong, shortly apiculate, thick, fleshy, convex, glabrous, obscurely 1-nerved. Lip 2.5-3 mm long, 1-2 mm wide, narrowly triangular, oblong-ovate to narrowly ovate, obtuse, subacute to shortly apiculate, thick, fleshy, convex, glabrous, with small callus at the spur mouth. Spur 7-12 mm long, incurved, narrowly cylindrical, abruptly dilated in apical third, and here up to 3 mm in diameter.

**HABITAT.** Epiphyte in riverine and montane forests, noted 5 m above the ground on *Bridelia* sp., *Juniperus procera* Hochst. ex Endl., tolerant of dry situation. All year round.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda, Rwanda, Burundi, Kenya, Tanzania. Alt. up to 2200 m.

**REPRESENTATIVE SPECIMENS.** Bouroukrou, 20 Dec. 1906-20 Jan. 1907, *Chevalier 16 907 bis* (P!); Monts des Dans, near Santa, 3 Feb. 1984, *Hepper & Maley 8057* (K!); Daloa, Oct. 1971, *Pérez-Vera 136* (K!); Rocher d'Issia, 15 Sep. 1965, *Bonardi 179* (P!); Yapo, ca. 8 km S of Bécédi-Bugnan, ca. 4 km N of Mafou R., 6 Aug. 1963, *de Wilde 640* (K!, WAG!).

### 59. *Diaphananthe* Schltr. in Orchidee: 593. 1914

Plants with short or elongate stem. Leaves distichous, coriaceous or fleshy, sometimes thin-textured, unequally bilobed at apex, often twisted at base to lie in

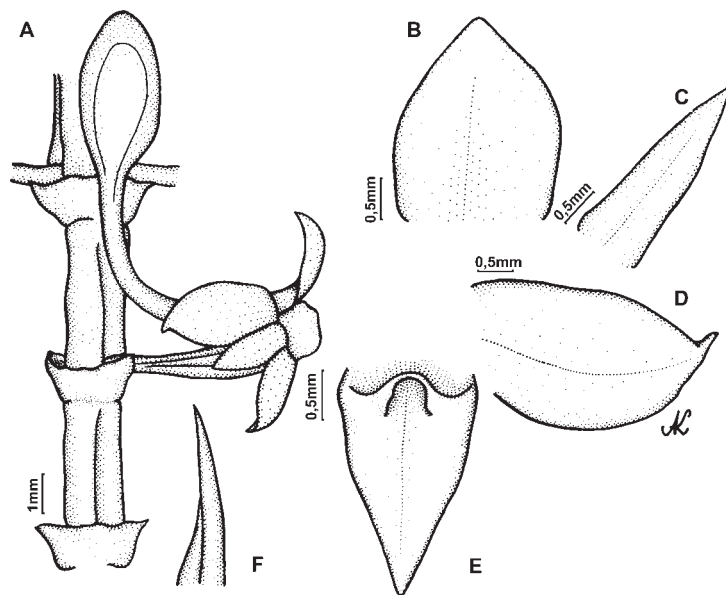


Fig. 238.—*Chamaeangis vesicata* (Lindl.) Schltr.: A — part of inflorescence; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — leaf (drawn by A. Kowalkowska, *Halle & Cours 6153*, P).

one plane. Inflorescence several- to many-flowered, usually pendent. Flowers small to relatively large, resupinate, translucent, pale coloured. Sepals and petals dissimilar, free or lateral sepals connate basally with petals. Lip entire or obscurely lobed, with entire, denticulate or fimbriate margins, ecallose or with prominent callus in the spur mouth. Spur of various length, sometimes prominently swollen. Gynostemium rather short and massive, erect. Stigma transversely elliptic to ovate, deeply concave. Anther incumbent, thin-walled, operculate. Pollinia, ellipsoid, porate. Rostellum elongate, beak-like, acute, fleshy. Tegula Y-shaped, sometimes V-shaped, attached to a single viscidium. Rostellum remnant elongate, acute (Fig. 239).

A genus of about 20-30 species confined to continental tropical Africa.

#### KEY TO THE SPECIES

1. Stem elongate, internodes long, prominent, well-seen ..... 2
- Stem abbreviated, internodes very short ..... 3
2. Leaves very unequally bi-lobed at the apex, both lobes subacute. Lip subquadrate in outline with more or less truncate apex and small apiculus ..... **1. *D. bidens***
- Leaves subequally bi-lobed at the apex, both lobes rounded. Lip elliptic in outline, 3-lobed at the apex ..... **6. *D. sarcorhynchoides***

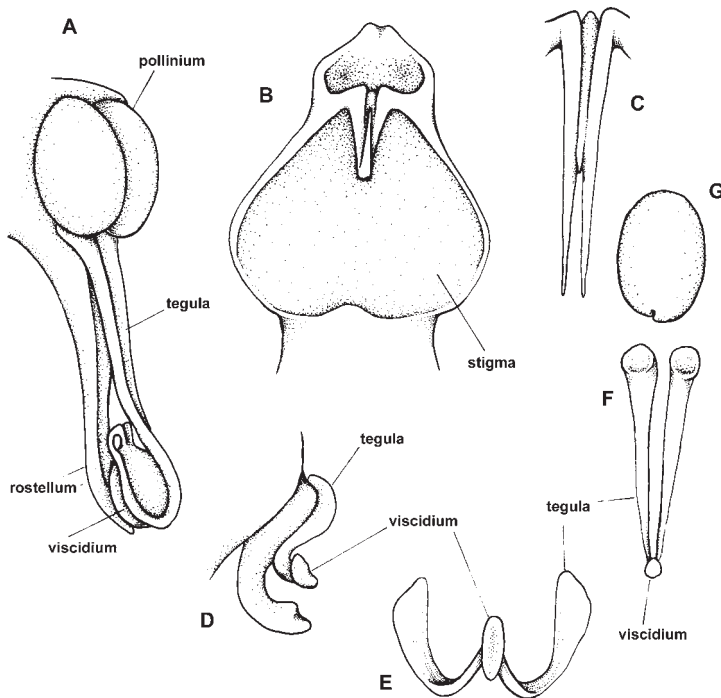


Fig. 239.—Gynostemium structure of *Diaphananthe* Schltr.: A – apical part of side view, anther removed; B – gynostemium bottom view, anther removed; C – rostellum remnant; D–F – tegula and viscidium various views; G – pollinium (Szlachetko 2003).



3. Spur longer than lip, narrowly cylindrical ..... 4  
 – Spur shorter than or equal to lip, inflated above the base ..... 5  
 4. Spur slightly longer than pedicel and ovary. Lip oblong, about twice as long as wide ..... 2. *D. bueae*  
 – Spur about twice as long as pedicel and ovary. Lip as wide as long ..... 5. *D. quintasii*  
 5. Inflorescence dense. Sepals over 8 mm long. Lip over 7.5 mm long ..... 3. *D. pellucida*  
 – Inflorescence lax. Sepals up to 8 mm long. Lip up to 6 mm long ..... 4. *D. plehniana*

**1. *Diaphananthe bidens* (Sw.) Schltr. in Orchideen: 593. 1914**

(Fig. 240)

*Limodorum bidens* Afzel. ex Sw. in Neues J. Bot. 1: 86. 1805; TYPE: SIERRA LEONE. *Afzelius s.n.* (LECTOTYPE: S)

*Listrostachys papagayi* Rechb. f. in Flora 48: 189.1865; TYPE (*here designated*): PRINCIPE. *Welwitsch 624* (LECTOTYPE: W-R!; ISOLECTOTYPE: BM!; DRAWING: UGDA-DLSz)

*Angraecum acutum* Ridl. in Bol. Soc. Brot. 5: 199. 1887; TYPE: SÃO TOMÉ. *Quintas 3* (HOLOTYPE: BM!) - *Diaphananthe acuta* (Ridl.) Schltr. in Beih. Bot. Centralbl. 36(11): 97. 1918.

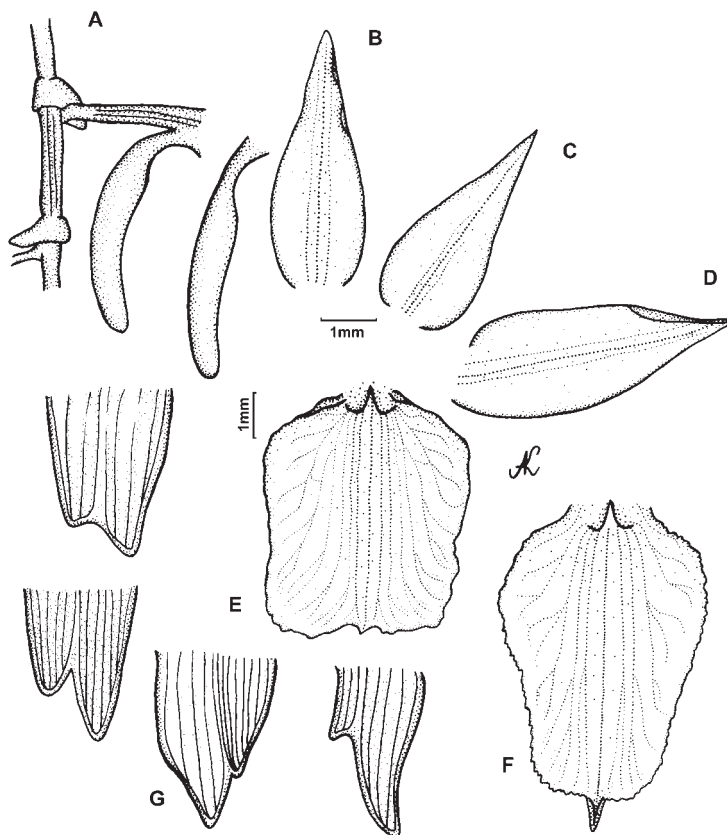


Fig. 240.—*Diaphananthe bidens* (Sw.) Schltr.: A – part of inflorescence; B – dorsal sepal; C – petal; D – lateral sepal; E, F – lip; G – leaf apex (drawn by A. Kowalkowska, *Le Testu 5798*, P).

Stem up to 200 cm long, 0.2-0.6 cm in diameter, slender, pendent. Leaves up to 22, 5-17 cm long, 1-4.5 cm wide, twisted at base to lie in one plane, ovate-elliptic, oblong, unequally bilobed at apex, lobes acute to obtuse. Inflorescence 4-22 cm long, 15-30-flowered, lax to relatively dense. Flowers small, white, cream-coloured, pale green, pale orange, rose, pale pinkish-brown. Floral bracts 1-1.5 mm long, amplexicaul, conical, acute, thin, glabrous. Pedicel and ovary 2-5 mm long, slender, straight, glabrous. Dorsal sepal 2.5-7 mm long, 1.2-2.4 mm wide, oblong-lanceolate to ovate-lanceolate, acute, thin, delicate, glabrous, obscurely 3-nerved. Petals 2.5-6 mm long, 0.6-2 mm wide, lanceolate to ovate or ovate-lanceolate, acute, thin, delicate, glabrous, obscurely 3-nerved. Lateral sepals 2.5-6.5 mm long, 1-2.8 mm wide, obliquely oblong-elliptic or oblong-ovate, sometimes broadly triangular, acute, thin, delicate, glabrous, obscurely 3-nerved. Lip 3-7 mm long, 2.6-6 mm wide, ovate, rectangular to pandurate, retuse to apiculate, margins more or less minutely denticulate, prominent finger-like callus in the spur mouth. Spur 3-7.3 mm long, up to 1 mm in diameter, incurved, narrowly cylindrical at base, slightly inflated above, blunt, parallel to the lip.

**HABITAT.** Trunk and branch epiphyte in primary forests, rain forest, postanthropogenic forests with *Pycnanthus angolensis* (Welw.) Exell, on rocks among mangrove, noted 5-20 m above soil level, on *Triphochiton* sp., *Cola* sp., *Theobroma cacao* L., *Cathormion altissimum* Hutch. & Dandy, *Conocarpus erectus* L., tolerant for dryness. Most part of the year.

**DISTRIBUTION.** Guinea-Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Equatorial Guinea (Annobón), Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Rwanda. Alt. up to 1300 m.

**REPRESENTATIVE SPECIMENS.** Adiopodoumé, 18 Nov. 1954, *Roberty 15502* (K!); Adiopodoumé, coast of the Ebrié lagoon, 11 July 1956, *de Wilde 89* (P!); Anguededou, near Agneby R., 23 Nov. 1975, *De Koning 6209* (WAG!); Banco Forest Reserve, near entrance, 11 Nov. 1974, *De Koning 4723* (WAG!); Banco Forest Reserve, 3 Apr. 1975, *De Koning 5634* (WAG!); Ca. 15 km NE of Bianouan, near Ghana border, 17 Apr. 1962, *Leeuwenberg 3959* (K!, P!, WAG!); Rocher de Brafouédi, 23 Mar. 1966, *Aké Assi 8530* (K!); Cavally, close to seashore, between Labou and Bériby, 16-18 July 1907, *Chevalier 19967* (P!); Along Dakpadou-Sago road, 5°58'W, 5°16'N, 29 Mar. 1968, *Geerling & Bokdam 2326* (WAG!); Daloa-Zuéuonla road, 28 Apr. 1974, *Pérez-Vera 626* (K!); Diapé-Adzopé road, 28 Oct. 1956, *de Wilde 747* (WAG!); Indénié, between Drámbarakrou and Borobo, 25 Mar. 1907, *Chevalier 17678* (P!); Rocher d'Issia, 21 Nov. 1956, *de Wilde 828* (WAG!); Lamto, 3 Jan. 1963, *Portères 235* (P!); *Portères 236 bis* (P!); 14 Jan. 1963, *Portères 300* (P!); Pont de Moosov, 3 Oct. 1973, *Linnavuori s.n.* (K!); Orchonka, 1913, *Pobeguini s.n.* (P!); Oureyo, 2 May 1975, *Pérez-Vera 184* (P!); Moyenne Sassandra, Guidéko, 21-23 May 1907, *Chevalier 16439* (P!); Sassandra, island on Sassandra R., near Louga, 8 Apr. 1973, *De Koning 1249* (WAG!); Sassandra, behind Fuyt plantation, 12 Nov. 1973, *De Koning 2721* (WAG!); Sassandra, bank of Sassandra R., near Louga, 9 Apr. 1973, *De Koning 1333* (WAG!); Ca. 60 km N of Sassandra, left bank of Davo R., E of Béyo, 6°00'W, 5°18'N, 27 Jan. 1959, *Leeuwenberg 2584* (WAG!); Left bank of Sassandra R., near bridge on Sassandra road (km 14), 26 Apr. 1962, *Leeuwenberg 4012* (HBG!, K!, P!, WAG!).

## 2. *Diaphananthe bucae* (Schltr.) Schltr. in Beih. Bot. Centralbl. 36: 96. 1918 (Fig. 241)

*Angraecum bucae* Schltr. in Bot. Jahrb. Syst. 38: 159. 1906; TYPE: CAMEROON. *Deistel s.n.* (HOLOTYPE: B†; ICONOTYPE: K!)

Stem short, 1.5-3 cm long, 0.5 cm in diameter. Leaves 3-5, at the stem apex, 4-

16 cm long, 0.5-2 cm wide, ligulate-lanceolate or ligulate-linear, slightly falcate, unequally bilobed at apex, acuminate, one of the lobes greatly reduced. Inflorescence up to 18 cm long, laxly multi-flowered. Flowers white and green, yellow or yellow-green. Floral bracts 3-4 mm long, amplexicaul, obtuse to apiculate, thin, delicate, glabrous. Pedicel and ovary up to 9 mm long, slender, glabrous, straight. Dorsal sepal 6-8.6 mm long, 2.5-4.1 mm wide, ovate-lanceolate, acute to acuminate, sometimes obtuse, thin, glabrous, with 5, unbranched nerves. Petals 5-8 mm long, 1.3-2.25 mm wide, oblong to oblong-ob lanceolate, slightly falcate, rounded at apex, thin, glabrous, obscurely 3-nerved. Lateral sepals 6-9 mm long, up to 3.7 mm wide, oblong-ovate to oblong-elliptic, more or less falcate, obtuse, thin, glabrous, with 5, unbranched nerves. Lip 8-9 mm long, 3.2-4.5 mm wide, ovate-lanceolate to oblong-elliptic, obtuse, entire, thin, delicate, glabrous, with small, transverse callus near the spur mouth. Spur 12-15.5 mm long, up to 1.4 mm in diameter, incurved, narrowly cylindrical, slightly swollen towards the apex, obtuse.

**HABITAT.** Epiphyte in forests, collected 2-3 m above the ground level, on *Ficus* sp. November.

**DISTRIBUTION.** Ivory Coast, Cameroon, Uganda. Alt. 1000-2200 m.

**REPRESENTATIVE SPECIMENS.** Mt. Mafa, 2 Nov. 1974, Pérez-Vera 725 p.p. (K!).

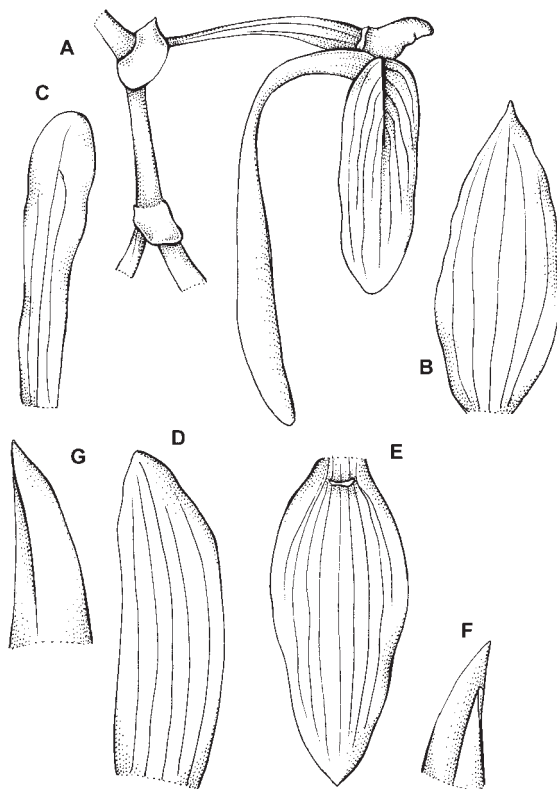


Fig. 241.—*Diaphananthe bueae* (Schltr.) Schltr.: A – floral bract, pedicel, ovary, lip and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip, F, G – leaf apex (drawn by A. Kowalkowska, Mbenkum TFM354, P).

### 3. *Diaphananthe pellucida* (Lindl.) Schltr. in Orchideen: 593. 1914 (Fig. 242)

*Angraecum pellucidum* Lindl. in J. Linn. Soc., Bot. 6: 134. 1862; TYPE (*here designated*): NIGERIA. Barter 37 (LECTOTYPE: K!; ISOLECTOTYPE: W-R!; DRAWING: UGDA-DLSz) & 1757 (PARATYPES: K!, W-R!). - *Listrostachys pellucida* (Lindl.) Rehb. f. in Ann. Bot. Syst. 6: 908. 1864.

*Angraecum althoffii* Kraenzl. in Mitt. Deutsch. Schutzgeb. 2: 160. 1889; TYPE: CAMEROON. Zenker 1053 (HOLOTYPE: W!; ISOTYPE: P!; DRAWING: UGDA-DLSz)

*Listrostachys althoffii* (Kraenzl.) T. Durand & Schinz in Cons. Fl. Afr. 5: 47. 1895; TYPE: CAMEROON. Braun s.n. (HOLOTYPE: B†)

*Listrostachys thonneriana*

Kraenzl. ex De Wild. & T. Durand in Bull. Soc. Roy. Bot. Belg. 38: 64. 1899; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Thonner 93* (HOLOTYPE: BR)

Stem up to 12 cm long, up to 1 cm in diameter. Leaves distichous, in upper part of the stem, 15-70 cm long, 2-9 cm wide, oblanceolate, slightly falcate, subacute and unequally bilobed at apex. Inflorescence 15-80 cm long, 40-60-flowered, rather dense, pendent. Flowers medium to large, pale yellow, odorless. Floral bracts 6-11 mm long, broadly ovate, obtuse, semiamplexicaul, thin, glabrous. Pedicel and ovary 2-4.5 mm long, slender, straight, glabrous. Dorsal sepal 7.8-13.5 mm long, 2.8-6.2 mm wide, ovate to oblong-ovate or oblong-lanceolate, subacute, rather thick, glabrous, nerves 3, branched. Petals 7.5-17.5 mm long, 2.6-6.5 mm wide, linear to obliquely ovate, acute, erose on margins, thin, glabrous, nerves 3, branched. Lateral sepals 8-16.5 mm long, 2.7-7.5 mm wide, lanceolate to oblong-lanceolate, acute, relatively thick, glabrous, nerves 5, unbranched. Lip 7.5-15 mm long, 7-15(18) mm wide, ovate in general outline, truncate at apex, lateral margins lacerate, a single callus in the spur mouth, spur entrance bordered on each side by a fleshy raised rim. Spur 5-15 mm long, up to 4 mm in diameter, incurved, narrowly cylindrical at base, distinctly inflated above and gradually tapering towards the blunt apex.

**HABITAT.** Epiphyte in rain forest, dense forests, secondary forests, noted 1.5-2 m above the ground level, on *Cleistanthus mildbraedii* Jablonsky, *Scorodophloeus zenkeri* Harms, often overhanging water. All year round.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Equatorial Guinea (Annobón), Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda. Alt. 900-1800 m.

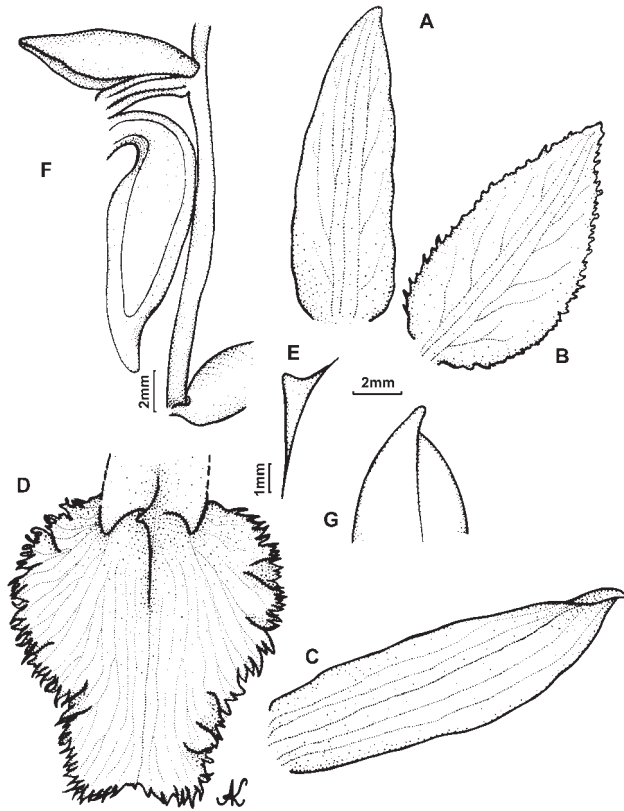


Fig. 242.—*Diaphanorhiza pellucida* (Lindl.) Schltr.: A – dorsal sepal; B – petal; C – lateral sepal; D – lip; E – lip callus, side view; F – floral bract, ovary, spur; G – leaf apex (drawn by A. Kowalkowska, Halle 1476, P).

REPRESENTATIVE SPECIMENS. Banco Forest Reserve, 22 Oct. 1975, *van der Burg* 1239 (WAG!); 3 Nov. 1973, *De Koning* 2594 (WAG!); 8 Sep. 1973, *De Koning* 2619 (WAG!); 15 Nov. 1974, *De Koning* 4776 (WAG!); 3 Dec. 1974, *De Koning* 4952 (WAG!); 13 Nov. 1961, *de Wilde* 3241 (WAG!); Banco Forest Reserve, near Chaumière, 25 Nov. 1973, *De Koning* 2807 (WAG!); Banco Forest Reserve, near Route du Rail, 6 Nov. 1974, *De Koning* 4677 (WAG!); Cavally, Lépo, Grabo, 4 Aug. 1907, *Chevalier* 19735 (P!); Massif de Dans, May 1942, *Schnell* 1293 (P!); Ira, near Blapleu, on Nzo R., 26 Jan. 1984, *Hepper & Maley* 7842 (K!); Man, 19 Sep. 1975, *van der Burg* 1137 (WAG!); Man, 1936, *Chanow* 249 (P!); Between Man and Danané, Mar. 1972, *Pérez-Vera* 151/B (K!); Mt. Niénokoué, 20 km NE of Fort Binger, *Chevalier* 19663 (P!); Oroumba Boka, S of Toumodi, 3 Oct. 1956, *de Wilde* 650 (WAG!); Mt. Tonkoui, NW of Man, 17 Sep. 1975, *van der Burg* 1050 (WAG!); Mt. Tonkoui, NW of Man, 23 Sep. 1969, *Cremers* 1147 (P!); Mt. Tonkoui, SW of Man, 4 Mar. 1959, *Leeuwenberg* 2962 (K!, WAG!).

**4. *Diaphananthe plehniana* (Schltr.) Schltr. in Beih. Bot. Centralbl. 36: 97. 1918 (Fig. 243)**

*Angraecum plehnianum* Schltr. in Bot. Jahrb. Syst. 38: 24. 1905; TYPE: CAMEROON. *Schlechter* 12780 (HOLOTYPE: B†; ISOTYPES: BM!, K!, P!; DRAWING: UGDA-DLSz)

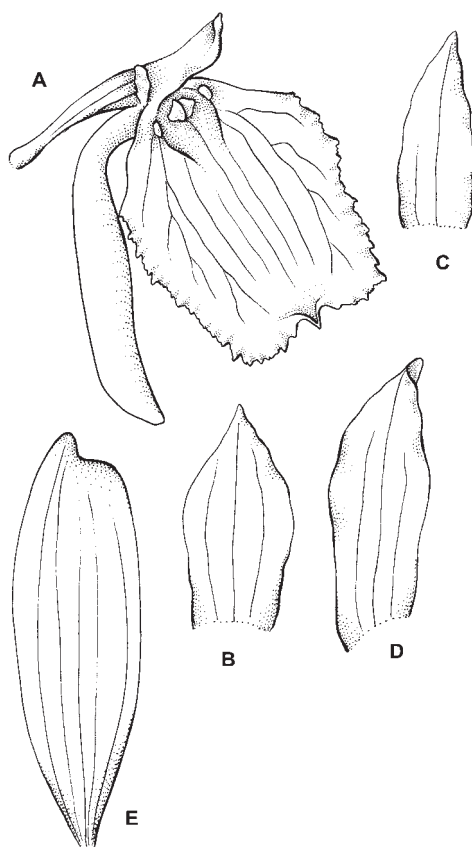


Fig. 243.—*Diaphananthe plehniana* (Schltr.) Schltr.: A — pedicel, ovary, lip and spur; B — dorsal sepal; C — petal; D — lateral sepal; E — lip, F — leaf (drawn by J. Mytnik-Ejsmont, *Schlechter* 12780, P).

Stem 4-10 cm long, short. Leaves 3-5, at the stem apex, 6-29 cm long, 1-3 cm wide, lanceolate, ligulate-oblancheolate, more or less falcate, obtusely and unequally bilobed at apex, 1 of lobes greatly reduced. Inflorescence 6-17 cm long, laxly 13-16-flowered, pendant or spread. Flowers small, greenish or pink. Floral bracts 1.5-2 mm long, thin, delicate, glabrous. Pedicel and ovary 4 mm long, slender, straight, glabrous. Dorsal sepal 5-7 mm long, 2-3 mm wide, lanceolate to obovate-lanceolate, acute to acuminate, thin, glabrous, 3-nerved. Petals 3.5-5.5 mm long, 1-1.5 mm wide, oblong-lanceolate, slightly falcate, acute or acuminate, thin, glabrous, obscurely 2-nerved. Lateral sepals slightly longer than dorsal one, 2-3 mm wide, obliquely oblong-lanceolate to oblong-oblancheolate, acute to acuminate, thin, glabrous, obscurely 3-nerved. Lip 6 mm long, 3.25-5 mm wide, ovate-rectangular in outline, widest at base, irregularly denticulate along margins, shortly 3-lobed at apex, callus 3-partite, the central part in the spur mouth the largest, 2 others below the spur entrance; middle lip lobe triangular acute,

both sidelobes rounded. Spur 6.5-8 mm long, 1.2 mm in diameter, incurved, narrowly cylindrical in the basal part, slightly inflated above, subacute.

HABITAT. Epiphyte in lowland humid forests. June.

DISTRIBUTION. Ivory Coast, Nigeria, Cameroon.

REPRESENTATIVE SPECIMENS. Forest pres de Dahiri, 27 June 1966, *Aké Assi 9003* (K!).

**5. *Diaphananthe quintasii* (Rolfe) Schltr. in Beih. Bot. Centralbl. 36(11): 99. 1918 (Fig. 244)**

TYPE: SÃO TOMÉ. *Quintas 6* (HOLOTYPE: BM!; ISOTYPE: K!)

*Angraecum rohrii* Rchb. f. in Otia Bot. Hamburg. 2: 117. 1881; TYPE: ETHIOPIA. *Rohr s.n.* (HOLOTYPE: K!)

*Diaphananthe alfredii* Geerinck in Bull. Jard. Bot. Nat. Belg. 60(1-2): 182.1990; TYPE: BURUNDI. *Reekmans 8464* (HOLOTYPE: BR?; ISOTYPE: K!)

Stem short, 2-4 cm long. Leaves 5-7, at the stem apex, 5-9 cm long, 0.5-1.5 cm wide, ligulate to oblong, slightly falcate, unequally bilobed at apex, both lobes obtuse. Inflorescence 6-25 cm long, laxly 4-7-flowered. Flowers greenish, yellowish or yellow-green. Floral bracts 1-1.5 mm long, amplexicaul, obtuse to apiculate, thin, delicate, glabrous. Pedicel and ovary up to 6 mm long, slender, glabrous, straight. Dorsal sepal 3.5-5.5 mm long, 1.5-2.5 mm wide, ovate, obtuse, thin, cochleate, glabrous. Petals 3.5-5.5 mm long, 1.2-2.2 mm wide, oblong-ovate to oblong-lanceolate, slightly falcate, subobtusate to subacute, thin, glabrous. Lateral sepals 3.5-5.5 mm long, up to 2.2 mm wide, oblong-ovate to oblong-lanceolate, more or less falcate, subacute, thin, glabrous. Lip 3-4.5 mm long and wide, ovate-elliptic to ovate-cordate, obtuse, entire, thin, delicate, glabrous, with small, tooth-like callus in the spur entrance. Spur 6.5-

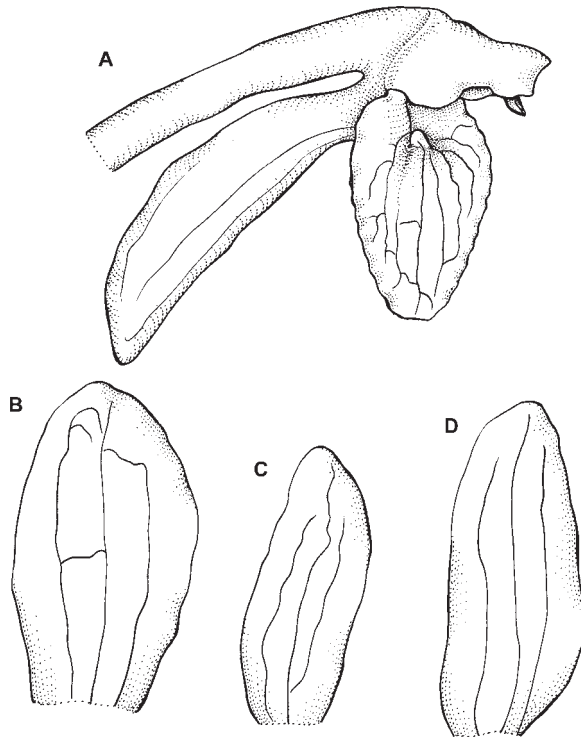


Fig. 244.—*Diaphananthe quintasii* (Rolfe) Schltr.: A – pedicel, ovary, gynostemium, spur and lip; B – dorsal sepal; C – petal; D – lateral sepal (redrawn by J. Mytnik-Ejsmont from Summerhayes' original drawing kept at K).

13.5 mm long, slightly falcate, pendent, narrowly cylindrical, gradually attenuate towards the apex, obtuse.

HABITAT. Epiphyte in evergreen forests, lowland forests with *Entandrophragma* sp., *Megaphrynium macrostachyum* (Benth.) Milne-Readh. and Sterculiaceae, secondary forests, plantations; collected 2-3 m above the ground level, on *Ficus* sp. August.

DISTRIBUTION. Ivory Coast, Ghana, Equatorial Guinea (Bioko), São Tomé, Angola, Uganda, Kenya.

REPRESENTATIVE SPECIMENS. Mt. Tonkoui, Aug. 1972, Pérez-Vera 696 (K!, P!).

**6. *Diaphananthe sarcorhynchoides* P.F. Hunt in Kew Bull. 29(2): 428. 1974 (Fig. 245)**

TYPE: GHANA. *Enti sub GC 40289* (HOLOTYPE: K?; ISOTYPE: GC)

Stem up to 100 cm or more long, slender, pendent. Leaves 6-9 cm long, 3-4 cm wide, twisted at base to lie in one plane, ovate-elliptic to oblong-elliptic, unequally

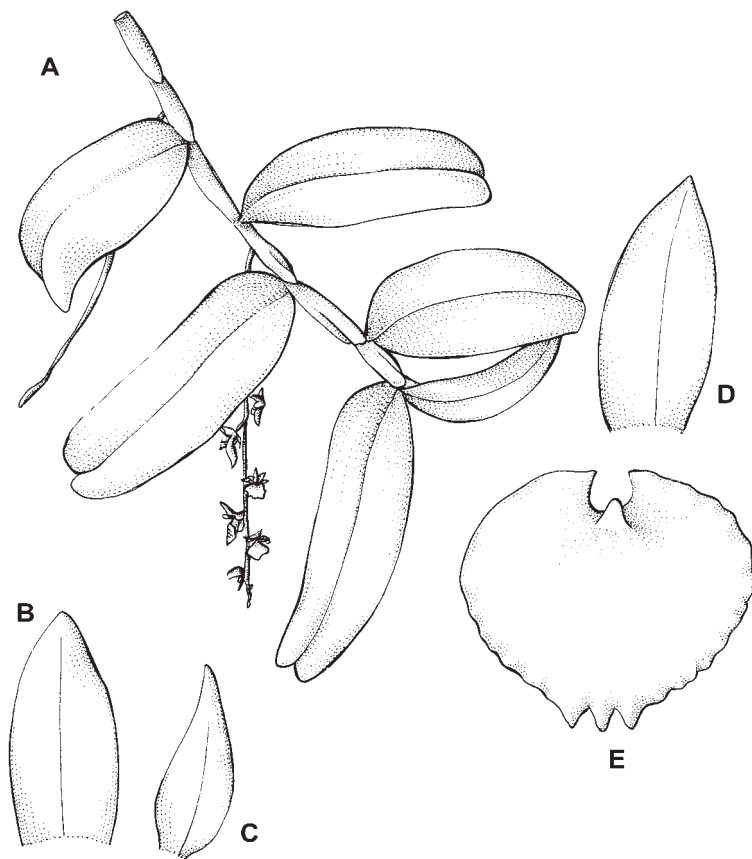


Fig. 245.—*Diaphananthe sarcorhynchoides* P.F. Hunt: A – habit; B – dorsal sepal; C – petal; D – lateral sepal; E – lip (redrawn by J. Mytnik-Ejsmont from Pérez-Vera 2003).



bilobed at apex, lobes obtuse. Inflorescence 8-12 cm long, 8-15-flowered, lax. Flowers small, pale green to greenish. Floral bracts 1-1.5 mm long, amplexicaul, conical, acute, thin, glabrous. Pedicel and ovary 4-5 mm long, slender, straight, glabrous. Dorsal sepal 6-6.5 mm long, 2-2.4 mm wide, oblong-ovate, subacute to subobtuse, thin, delicate, glabrous. Petals 4.5-5.5 mm long, 1.5 mm wide, ovate-lanceolate, acute, falcate, thin, delicate, glabrous. Lateral sepals 6-6.5 mm long, 2-2.5 mm wide, oblong-elliptic or oblong-ovate, acute, thin, delicate, glabrous. Lip 6-7 mm long and wide, suborbicular-cordate, denticulate along margins, equally 3-lobed at the apex only, lobes triangular, acute, prominent finger-like callus in the spur mouth. Spur 7-8 mm long, up to 1 mm in diameter, incurved, narrowly cylindrical at base, slightly inflated above, blunt, parallel to the lip.

HABITAT. Epiphyte in hygrophilous forests. June-November.

DISTRIBUTION. Ivory Coast, Ghana.

REPRESENTATIVE SPECIMENS. Azaguié, 20 Sep. 1961, *Aké Assi* 6023 (K!); 5 June 1974, *Pérez-Vera* 562 (K!); Bingerville, Abidjan, Dabou, 1905, *Chevalier* 15205 (P!); Mt. Mafa, 6 June 1966, *Aké Assi* 8901 (K!); 2 Nov. 1974, *Pérez-Vera* 728 (P!).

## 60. *Plectrelminthus* Raf. in Fl. Tellur. 4: 42. 1836

Herbs with erect, leafy stem. Leaves distichous, thick. Inflorescence elongate, multiflowered. Flowers large, resupinate. Pedicel twisted in the lower part. Sepals and petals subsimilar. Lip unguiculate, more or less elliptic to broadly obovate in general outline, unlobed or 3-lobed at the apex, apiculate. Spur very long, filiform, spirally twisted towards the apex. Gynostemium erect, rather massive, thickened towards the base. Stigma transversely elliptic, very large, almost flat, except the base. Anther incumbent, operculate, thin-walled, elongate towards the acute apex. Pollinia 2. Rostellum elongate, finger-like, fleshy, subacute, upcurved just above the middle. Viscidium single. Tegula single. Rostellum remnant blunt, canaliculate (Fig. 246).

A monotypic genus known from tropical Africa and Madagascar.

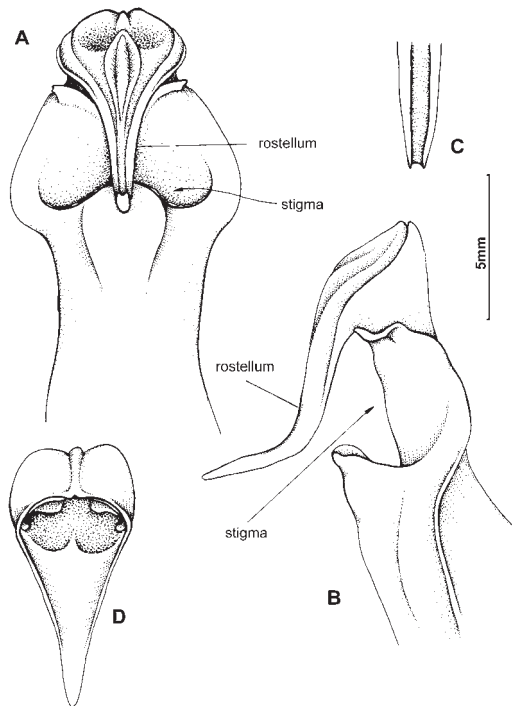


Fig. 246.—Gynostemium structure of *Plectrelminthus* Raf.: A – gynostemium bottom view, anther removed; B – gynostemium side view, anther removed; C – rostellum remnant; D – anther (Szlachetko 2003).

1. **Plectrelminthus caudatus** (Lindl.) Summerh. in Kew Bull. 1949: 441. 1949 (Fig. 247)

*Angraecum caudatum* Lindl. in Edwards's Bot. Reg. 22: tab. 1844. 1836; TYPE: SIERRA LEONE.  
*Loddiges s.n.* (HOLOTYPE: K!) - *Listrostachys caudata* (Lindl.) Rehb. f. in Ann. Bot. Syst. 6: 907.

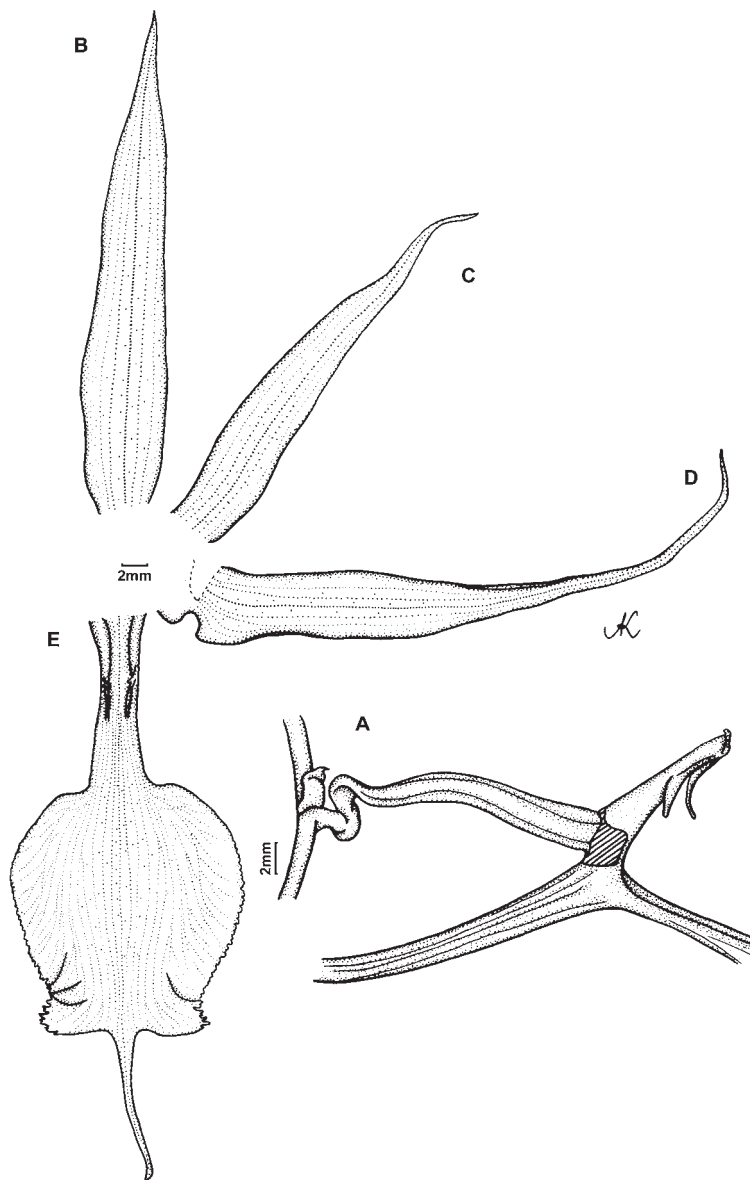


Fig. 247.—*Plectrelminthus caudatus* (Lindl.) Summerh.: A – floral bract, pedicel, ovary, gynostemium and basal part of the lip and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip; F – leaf apex (drawn by A. Kowalkowska, *Klaine* 479, P).

1885. - Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 153. 1898. - *Leptocentrum caudatum* (Lindl.) Schltr. in Orchideen: 600. 1914.

Stem 5-15 cm tall, erect, rather stout. Leaves several, up to 35 cm long, 1.5-3.5 cm wide, ribbon-like, unequally bilobed, slightly arcuate, both lobes rounded. Inflorescence up to 80 cm long, laxly 4-10-flowered, pendent, rhachis en zigzag. Flowers large, nonresupinate, perianth and spur greenish, lip white. Floral bracts up to 5 mm long, ovate-triangular, acute, amplexicaul, thin, membranous. Pedicel and ovary up to 25 mm long, slender, glabrous, base of pedicel spirally twisted. Dorsal sepal 30-41 mm long, 5-7 mm wide, oblong-lanceolate, acuminate, glabrous, with some, unbranched nerves. Petals 30-35 mm long, 4-5 mm wide, obliquely linear- or narrowly lanceolate, acuminate to apiculate, glabrous, nerves unbranched. Lateral sepals up to 50 mm long, 6-7 mm wide, oblong-lanceolate, caudate, basally joined together over the spur base, glabrous, with some, unbranched nerves. Lip up to 50 mm long in total, 10-25 mm wide, basal third linear, canaliculate with 2 small, fleshy, involute wings near the middle, lamina 15-20 mm long, 10-25 mm wide, broadly obovate or ovate to almost transversely elliptic, unlobed or prominently 3-lobed at apex, margins entire or minutely denticulate and undulate towards the apex, then abruptly attenuated into the long, filiform cauda, 8-13 mm long, Spur 15-25 mm long, filiform from the narrowly conical basal part, spirally twisted above the middle.

**HABITAT.** Epiphyte on tree trunks, in savanna, dense forests; noted on *Uapaca heudelotii* Bail.. Usually May-August.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Gabon, Democratic Republic of Congo (Zaire).

**REPRESENTATIVE SPECIMENS.** Bondoukou, May 1965, *Duffaut sub Aké Assi s.n.* (K!); Mt. Mafa, 6 Aug. 1966, *Aké Assi 9025* (K!); Mt. Mafou, 17 Aug. 1964, *F.Hallé 978* (P!); Niakaramandousou, 19 June 1975, *Pérez-Vera 794* (P!); Haute Sassandra, Loura, Mt. Dourou, near Koualé, 27 May 1909, *Chevalier 21738* (P!); Between Séguéla and Maukono, 19 Feb. 1975, *Pérez-Vera 119/B* (K!); Yapo, ca. 4 km S of Becedi-Brignan, 6 Aug. 1963, *Oldeman 245 p.p.* (WAG!).

## 61. *Summerhayesia* P.J. Cribb in Kew Bull. 32: 184. 1977

Stem short or rather elongate. Leaves unequally bilobed at apex. Inflorescence elongate, few- to some-flowered. Flowers small, resupinate. Sepals and petals subsimilar. Lip ovate-lanceolate, similar to tepals, ecallose, entire, unlobed. Spur slender, cylindrical. Gynostemium very short, massive, dorsiventrally flattened. Stigma transversely elliptic, flat. Anther incumbent, operculate, thin-walled, apically elongate. Pollinia 2. Rostellum long, finger-like, massive, acute, upcurved near the middle. Viscidium single. Tegula single. Rostellum remnant acute, canaliculate (Fig. 248).

A genus of 3 species confined to tropical Africa.

### 1. *Summerhayesia laurentii* (De Wild.) P.J. Cribb in Kew Bull. 32: 185. 1977 (Fig. 249)

*Angraecum laurentii* De Wild. in Not. Pl. Util. Congo. 1: 322. 1904; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent s.n.* (HOLOTYPE: BR; ISOTYPE: K!) - *Aerangis laurentii* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 118. 1918.

Stem up to 20 cm long, elongate, glabrous. Leaves few to some, 15-25 cm long, 0.5-0.8 cm wide, linear to oblong, rounded at the apex. Inflorescence up to 50 cm long, up to 15-flowered, rather lax. Flowers small, perianth whitish to yellowish. Floral bracts up to 3 mm long, glabrous, delicate. Sepals 7 mm long, 1.5 mm wide, elliptic, apiculate, thin, delicate, glabrous. Lateral sepals of similar size but with oblique base. Petals 7 mm long, 2 mm wide, elliptic, acute, thin, delicate, glabrous. Lip 7 mm long, 3 mm wide, subelliptic, apiculate, ecallose, thin, delicate, glabrous. Spur 60-70 mm long, filiform, pendant.

**HABITAT.** Epiphyte in dense forest, collected on *Antiaris welwitschii* Engl. and *Scorodophloeus zenkeri* Harms. February, April.

**DISTRIBUTION:** Liberia, Ivory Coast, Ghana, Gabon, Democratic Republic of Congo (Zaire).

**REPRESENTATIVE SPECIMENS.** Man-Danané road (km 20), 6 Apr. 1975, Pérez-Vera 770 (P!); Tiapleu, 25 Feb. 1974, Pérez-Vera 232 (K!).

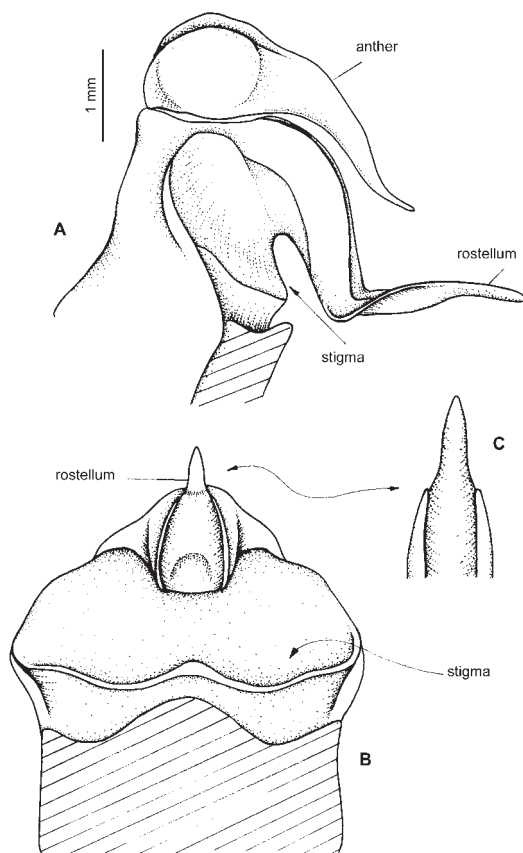


Fig. 248.—Gynostemium structure of *Summerhayesia* P.J. Cribb: A — gynostemium, side view; B — gynostemium, view from below; C — rostellum remnant, apical part, view from above (Szlachetko 2003).

**Subtribe Rhaesteriinae**  
Szlach. in Fragm. Flor.  
Geobot., Suppl. 3: 92. 1995

This group can be described as having prominent fleshy rostellum, which produces 2 well-separated pollinaria. Tegulae are usually thick, fleshy, papillate or not. Viscidia are thin and lamellate. The rostellum after removal of pollinaria is 3-dentate or non-lobed. In the latter case there are 2 cavities at the base of the elongate part of the rostellum.

**62. Rhipidoglossum** Schltr.  
in Beih. Bot. Centralbl. 36: 80.  
1918

*Sarcorhynchus* Schltr. in Beih. Bot.  
Centralbl. 36: 104. 1918

Plants with short or long stem, pendent or upright,

branched or not. Leaves coriaceous or fleshy, or thin-textured, unequally bilobed at apex. Inflorescence emerging through the sheathing leaf-bases in upper part of the stem. Flowers usually small to tiny, translucent. Sepals and petals dissimilar. Lip entire or obscurely 2-, 3- or 4-lobed, ecallose or with transverse or finger-like callus in the spur mouth. Spur prominent. Gynostemium erect, rather slender, distinctly swollen towards the base. Stigma elliptic, deeply concave. Anther incumbent, operculate, slightly elongate towards apex. Pollinia 2, ellipsoid, porate. Rostellum finger-like, fleshy, rather thick, acute. Viscidia double, more or less ovate-triangular, thin, delicate, lamellate. Tegulae double, linear, thin, delicate, lamellate. Both viscidia and tegulae produced on both sides of the rostellum. Rostellum acute, finger-like after removal of pollinaria (Fig. 250).

A genus of about 20-30 species confined to continental Africa.

#### KEY TO THE SPECIES

1. Spur shorter than ovary and pedicel, swollen and blunt at the apex ..... **2. R. laxiflorum**
- Spur longer than pedicel and ovary, filiform or narrowly cylindrical, acute ..... **2**
2. Leaves oblong-obovate. Spur over 10 mm long ..... **1. R. curvatum**
- Leaves linear-oblanceolate. Spur up to 7 mm long ..... **3. R. rutilum**

#### 1. *Rhipidoglossum curvatum* (Rolfe) Garay in Bot. Mus. Leaf. 23: 195. 1972 (Fig. 251)

*Mystacidium curvatum* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 174. 1897; TYPE: GHANA. *Laurence s.n.* (HOLOTYPE: K!) - *Angraecum curvatum* (Rolfe) Schltr. in Bot. Jahrb. Syst. 38: 22. 1905. - *Diaphananthe curvata* (Rolfe) Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr., ed. 1, 2: 456. 1936.

Stem 2.5-7 cm long, erect or sometimes semi-pendent. Leaves 3-5, 8-17 cm long, 2-4.5 cm wide, elliptic-oblanceolate to oblong-obovate, unequally bilobed at

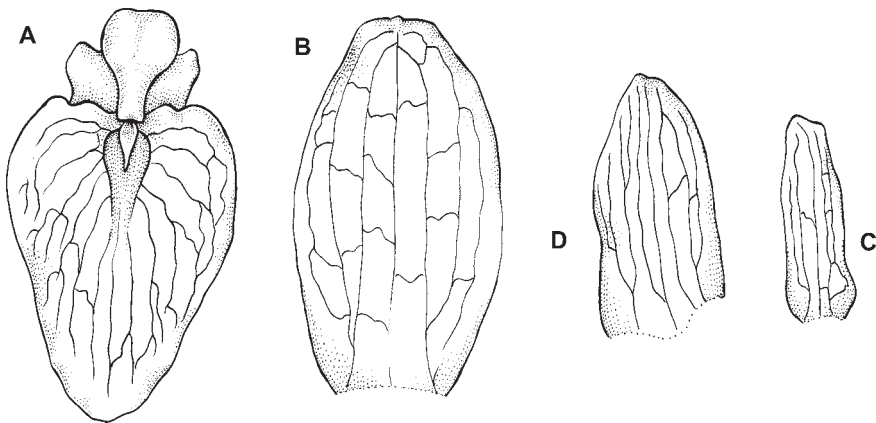


Fig. 249. – *Summerhayesia laurentii* (De Wild.) P.J. Cribb: A – lip and gynostemium; B – dorsal sepal; C – petal; D – lateral sepal (redrawn by J. Mytnik-Ejsmont from Summerhayes' original drawing kept at K).

apex, each lobe acute, sometimes the smaller one very reduced. Inflorescence 15–42 cm long, laxly up to 21-flowered, pendulous. Flowers small, resupinate, white, pale green or yellowish green. Floral bracts up to 1.5 mm long, transversely elliptic, apiculate, amplexicaul, thin, glabrous. Pedicel and ovary up to 7 mm long, slender, delicate, glabrous, almost straight. Dorsal sepal 2.2–4 mm long, up to 2 mm wide, ovate to elliptic-ovate, subobtuse, thin, delicate, glabrous, nerves branching. Petals up to 2.2 mm long and 2 mm wide, elliptic to almost orbicular, obtuse or rounded, slightly oblique at abase, thin, delicate, glabrous, nerves branched. Lateral sepals up to 5 mm long and wide, obliquely orbicular-ovate or elliptic-ovate, obtuse or rounded at apex, thin, delicate, glabrous, nerves branched. Lip up to 3 mm long and wide, ovate-cordate in outline, subacute to subobtuse, recurved, thin, delicate, with keel-like callus in the spur mouth. Spur up to 16 mm long, 0.6 mm in diameter, filiform, acute, falcate, much longer than pedicel and ovary.

**HABITAT.** Epiphyte in humid lowland forests. All year round.

**DISTRIBUTION.** Sierra Leone, Ivory Coast, Ghana, Nigeria, Cameroon, Congo.

**REPRESENTATIVE SPECIMENS.** Banco, 9 Nov. 1966, *Aké Assi* 9221 (K!); Rocher de Brofouédi, 23 Mar. 1966, *Aké Assi* 9023 (K!); Ebrié Lagune, Boulay Island, 18 Nov. 1956, *de Wilde* 827 (K!, WAG!); Mt. Mafa, 28 Oct. 1965, *Bonardi s.n.* (P!); 2 Nov. 1974, *Pérez-Vera* 741 (K!); Between Moyenne Sassandra and Moyenne Cavally, 27 June–2 July 1907, *Chevalier* 19248 (P!); Oroumbo-Bocca, near Assakra, ca. 35

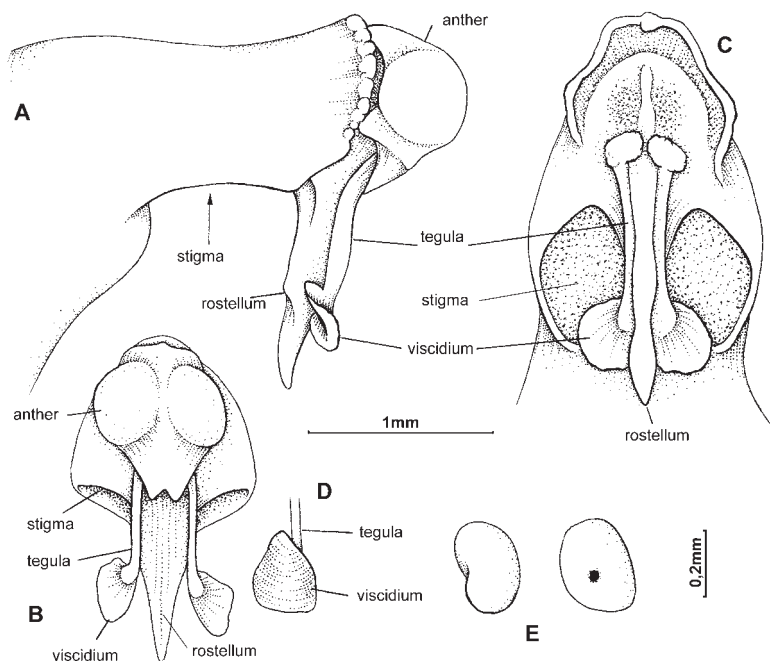


Fig. 250.—Gynostemium structure of *Rhipidoglossum* Schltr.: A – gynostemium front view; B – gynostemium front view, anther removed; C – gynostemium front view, anther removed; D – viscidium and tegula apex; E – pollinia various views (Szlachetko 2003).

km SW of Dimbokro, 7 Nov. 1961, *de Wilde* 3217 (K!, WAG!); Souhé-Buyo road, Mar. 1972, *Pérez-Vera* 279/B (P!).

**2. *Rhipidoglossum laxiflorum***  
 Summerh. in  
 Kew Bull. 1936:  
 225. 1936  
 (Fig. 252)

TYPE: GHANA.  
*Coll.?* 858 (HOLO-  
 TYPE: K!)

Stem 10-35 cm long, upright or semi-pendulous. Leaves numerous, 4-11 cm long, 0.5-1 cm wide, linear to oblong, unequally bilobed at apex, both lobes rounded. Inflorescence 8-12 cm long, 10-42-flowered, loose. Flowers small, dull green, greenish to whitish. Floral bracts 0.5 mm long, amplexicaul, conical, subobtusate to subacute, thin, delicate, glabrous. Pedicel and ovary 2 mm long, slender, erect, glabrous. Dorsal sepal 2-2.5 mm long, 1-1.5 mm wide, elliptic-ovate, obtuse, thin, delicate, glabrous. Petals 2-2.5 mm long, 1-1.8 mm wide, oblique, broadly ovate, obtuse, thin, delicate, glabrous. Lateral

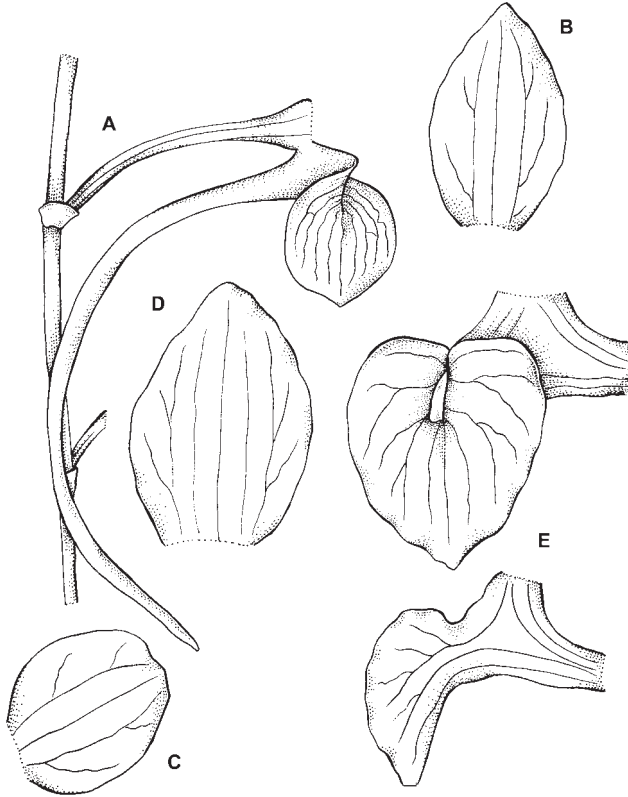


Fig. 251.—*Rhipidoglossum curvatum* (Rolfe) Garay: A – floral bract, pedicel, ovary, lip and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip, various views (drawn by J. Mytnik-Ejsmont, *F. Halle* 1784, P).

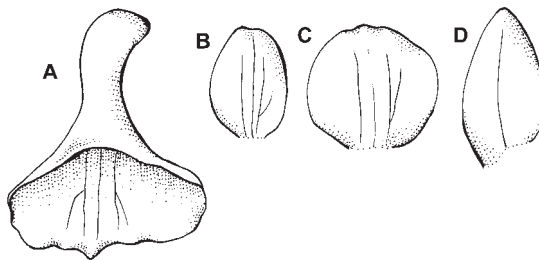


Fig. 252.—*Rhipidoglossum laxiflorum* Summerh.: A – lip and spur; B – dorsal sepal; C – petal; D – lateral sepal (redrawn by J. Mytnik-Ejsmont from Summerhayes' original drawing kept at K, *Coll.?* 858).



sepals 2-2.5 mm long, 1-1.8 mm wide, obliquely elliptic-ovate, obtuse to rounded, thin, delicate, glabrous. Lip 1.4-2 mm long and wide, suborbicular to flabellate, entire, delicate, ecallose. Spur up to 2 mm long, narrowly cylindrical, incurved and slightly swollen at blunt apex.

**HABITAT.** Epiphyte in humid evergreen forests, lowland and upland forests. April.

**DISTRIBUTION.** Ivory Coast, Ghana.

**REPRESENTATIVE SPECIMENS.** Dyolas, Mt. Goula, near Danané, 12 Apr. 1909, *Chevalier 21213* (P!); Macougouiné (Macongouine), Tiapleu, 13 Apr. 1974, *Pérez-Vera 598* (K!, P!).

**3. *Rhipidoglossum rutilum* (Rchb. f.) Schltr. in Beih. Bot. Centralbl. 36: 81. 1918 (Fig. 253)**

*Aeranthes rutilus* Rchb. f. in Flora 68: 382. 1885; TYPE (*here designated*): WEST AFRICA. *von Laubach s.n.* (LECTOTYPE: W!; DRAWING: UGDA-DLSz) - *Listrostachys rutilus* (Rchb. f.) Ridl. in Bol. Soc. Brot. 5: 200. 1887. - *Mystacidium rutilum* (Rchb. f.) T. Durand & Schinz in Consp. Fl. Afr. 5: 54. 1895. - *Diaphananthe rutila* (Rchb. f.) Summerh. in Kew Bull. 14: 143. 1960. *Listrostachys margaritae* De Wild. in Not. Pl. Util. Congo 1: 150. 1903; TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gentil 30* (HOLOTYPE: BR) - *Diaphananthe margaritae* (De Wild.) Schltr. in Beih. Bot. Centralbl. 36: 98. 1918.

Stem 3-40 cm long, 0.2-0.6 cm in diameter, upright or semi-pendulous, occasionally branched. Leaves 3-10, in upper part of the stem, 3-15 cm long, 0.5-2.5 cm wide, linear, narrowly elliptic to obovate, unequally bilobed at apex, both lobes rounded, twisted basally to lie in one plane. Inflorescence 5-20 cm long, 10-40-flowered, dense. Flowers small, dull pink with a purplish tinge, white-pink, pale green or pale purple-green. Floral bracts 1-2 mm long, amplexicaul, conical, sub-

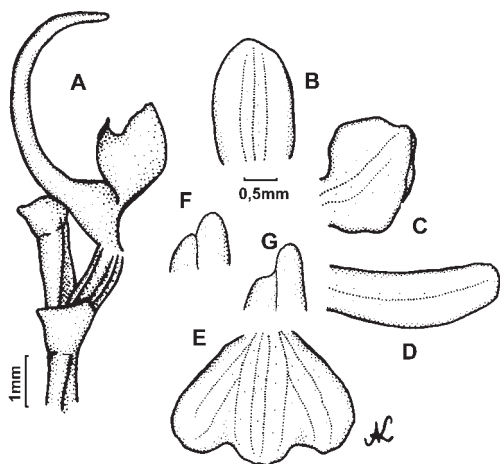


Fig. 253.—*Rhipidoglossum rutilum* (Rchb. f.) Schltr.: A — part of inflorescence; B — dorsal sepal; C — petal; D — lateral sepal; E — lip; F — leaf apex (drawn by A. Kowalkowska, *Tisserant 1166*, P).

obtuse to subacute, thin, delicate, glabrous. Pedicel and ovary 1-2 mm long, slender, erect, glabrous. Dorsal sepal 1.5-3.3 mm long, 1-2.5 mm wide, elliptic, oblong to obovate, obtuse, thin, delicate, glabrous, obscurely 3-nerved. Petals 1.5-2.8 mm long, 1.1-3.5 mm wide, circular, broadly ovate, oblique, obtuse, thin, delicate, glabrous, obscurely 2-nerved. Lateral sepals 2-4.3 mm long, 1.2-2.1 mm wide, oblong to linear, slightly falcate, obtuse to rounded, thin, delicate, glabrous, single-nerved. Lip 1.4-3.7 mm long, 2.5-4.7 mm wide, flabellate, retuse at apex, thin, delicate, ecallose. Spur 4.3-7 mm long, 0.5 mm in diameter, incurved, narrowly cylindrical, acute.

**HABITAT.** Epiphyte on tree branches in canopy of high-forests, riverine and montane forests, noted on cocoa and coffee trees, on *Anonidium mannii* Engl. & Diels., *Chytranthus laurentii* De Wild. May-July.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, São Tomé, Equatorial Guinea, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Sudan, Uganda, Rwanda, Burundi, Kenya, Tanzania, Zambia, Malawi, Zimbabwe, Mozambique. Alt. 600-2200 m.

**REPRESENTATIVE SPECIMENS.** Mt. Mafa, 6 June 1966, *Aké Assi* 8894 (K!); Mt. Momi, 20 May 1974, *Pérez-Vera* 230 (K!); Tiapleu, 20 July 1965, *Aké Assi* 8152 (K!).

Subtribe **Angraecinae** Summerh. in Kew Bull. 20: 188. 1966

Rostellum deeply notched, dome-like, wide and short. Tegula single to double, usually small, sometimes papillate near the attachment of the pollinia. Viscidium single or double, oblong to elliptic, as large as or smaller than tegula. Rostellum remnant deeply notched to obscurely 3-dentate, all 3 teeth usually equal in size, sometimes both lateral lobes longer than the middle one. Pollinia 2, cleft or porate.

A large group, with most of the genera distributing in Madagascar and tropical Africa, but with some members in New World.

### 63. **Angraecopsis** Kraenzl. in Bot. Jahrb. Syst. 28: 71. 1900

*Holmesia* P.J. Cribb in Kew Bull. 32: 175. 1977, *non* Agardh, 1890

*Microholmesia* P.J. Cribb in Mabberly, The Plant Book: 371. 1987

Monopodial plants. Leaves distichous, ligulate to oblanceolate, often falcate, unequally bilobed at apex. Inflorescence axillary, racemose, few- to many-flowered. Flowers small, resupinate. Sepals and petals dissimilar, petals connate basally with lateral sepals. Lip 3-lobed or almost entire, ecallose or with prominent callosity at the base of the lip, of various length and form. Gynostemium erect, rather slender. Stigma oblong to elliptic, deeply concave. Anther incumbent, operculate, thin-walled, dome-like. Pollinia 2, ellipsoid, porate. Rostellum shortly ligulate, wider than long. Viscidia double, thin, sticky. Tegulae double, oblong to linear, thin, lamellate, delicate. Rostellum shortly 3-dentate after removal of pollinaria, all lobes almost equal in size (Fig. 254).

A genus of about 15 species distributed in tropical Africa and Mascarene Islands.

#### KEY TO THE SPECIES

1. Spur equal to or shorter than lip ..... **1. A. elliptica**  
– Spur longer than lip ..... 2
2. Spur 12-38 mm long. Inflorescence 3-9 cm long ..... **2. A. ischnopus**  
– Spur up to 9(10.5) mm long. Inflorescence (5)10-25 cm long ..... 3
3. Leaves 3-6, 22-34 cm long, 1.8-3 cm wide ..... **3. A. macrophylla**  
– Leaves 4-9, 6-16 cm long, 0.4-1.2 cm wide ..... **4. A. parviflora**

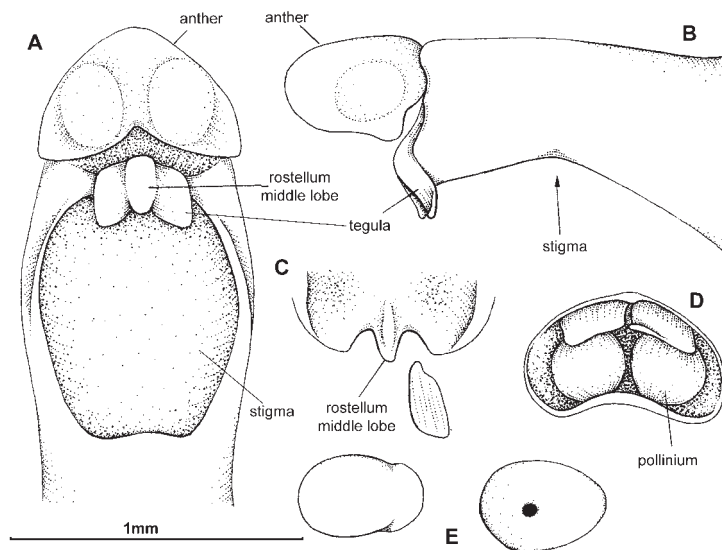


Fig. 254.—Gynostemium structure of *Angraecopsis* Kraenzl.: A – gynostemium bottom view; B – gynostemium side view; C – rostellum remnant; D – anther; E – pollinia various views (Szlachetko 2003).

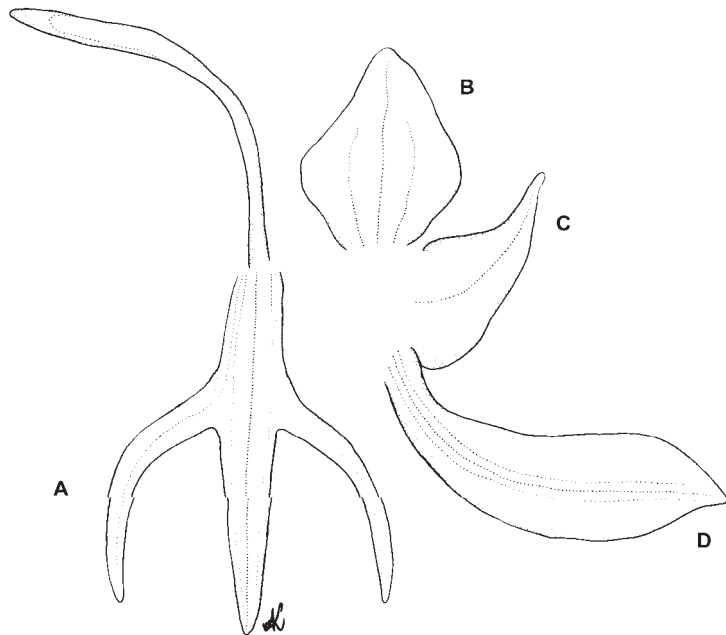


Fig. 255.—*Angraecopsis elliptica* Summerh.: A – lip and spur; B – dorsal sepal; C – petal and lateral sepal (drawn by A. Kowalkowska, Pérez-Vera 543, K).

**1. *Angraecopsis elliptica*** Summerh. in Bot. Mus. Leaf. 14: 250. 1951  
(Fig. 255)

TYPE: CAMEROON. *Gregory 194* (HOLOTYPE: K!; PHOTO: UGDA-DLSz)

Stem short, 2.5-4 cm long, rarely up to 8 cm. Leaves 3-4, at the apex of stem, 4-10(14) cm long, 1-2.5 cm wide, oblong-elliptic to oblong, unequally bilobed, both lobes rounded. Inflorescence (3.5)10-20 cm long, laxly 10-20-flowered. Flowers pale green. Floral bracts 1.5-2 mm long, acute. Pedicel and ovary 3-5 mm long, glabrous, slightly falcate. Dorsal Sepal 2-2.5 mm long, 1.2 mm wide, ovate, obtuse to subobtusely, delicate, glabrous. Petals 2-2.5 mm long, 1.7 mm wide, obliquely triangular-ovate, acute to acuminate. Lateral sepals 3-4.7 mm long, 0.8-1.4 mm wide, falcate, oblanceolate to oblong-obovate, subacute to acute. Lip 3-5 mm long and wide, distinctly 3-lobed near the middle; middle lobe 1.4-2.5 mm long, 0.7-0.9 mm wide, triangular-lanceolate, acute; sidelobes 0.8-1 mm long, linear, acute, divergent. Spur 2.7-5.2 mm long, narrowly cylindrical, blunt.

HABITAT. Epiphyte in humid, submontane and montane forests, on exposed tree trunk, gallery forests. September-November.

DISTRIBUTION. Ivory Coast, Nigeria, Cameroon, Democratic Republic of Congo (Zaire), Uganda. Alt. 900-1500 m.

REPRESENTATIVE SPECIMENS. Mt. Tonkoui, 4 Nov. 1973, *Pérez-Vera 543* (K!, P!); Zo R., Mandanané road, 27 Sep. 1972, *Pérez-Vera 234* (K!).

**2. *Angraecopsis ischnopus***  
(Schltr.) Schltr.  
in Orchideen:  
601. 1914  
(Fig. 256)

*Angraecum ischnopus* Schltr. in Notizbl. Bot. Gart. Berlin-Dahlem. 4: 179. 1905; TYPE: CAMEROON. *Deistel s.n.* (HOLOTYPE: B†; ICONO-TYPE: K!)

Stem 5 cm long, erect. Leaves 2-5, 2-11.5 cm long, 0.4-1.3 cm wide, linear, ligulate to elliptic-oblong, unequally and subobtusely bilobed at apex. Inflorescence 3-9 cm long, up to

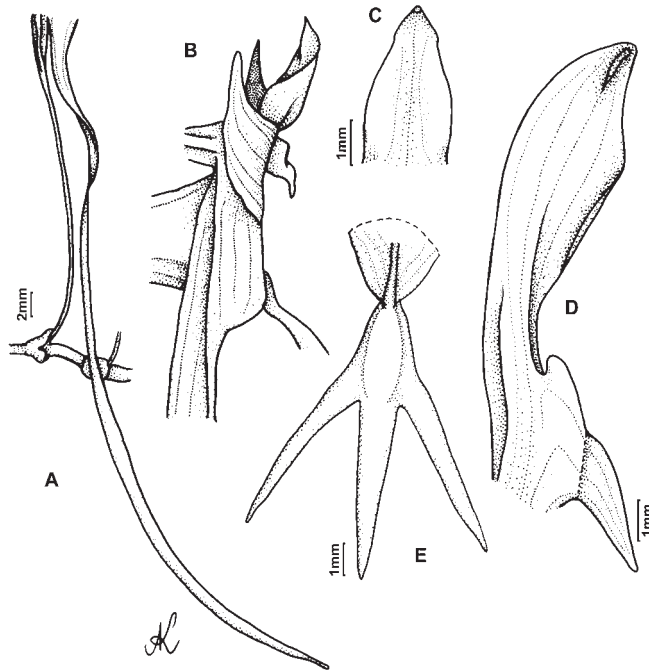


Fig. 256.—*Angraecopsis ischnopus* (Schltr.) Schltr.: A — floral bract, pedicel, ovary and spur; B — tepals, side view; C — dorsal sepal; D — petal and lateral sepal; E — lip (drawn by A. Kowalkowska, *Letouzey 14224*, P).

10-flowered, lax, erect. Flowers small, resupinate, pale green or greenish yellow. Floral bracts up to 2.5 mm long, amplexicaul, obtuse, thin, delicate. Pedicel and ovary up to 20 mm long, slender, erect, glabrous. Dorsal sepal 2-3.5 mm long, 1-2 mm wide, oblong-ovate, obtuse, cucullate, cochleate, thin, delicate, glabrous, obscurely 3-nerved. Petals 1.5-3.8 mm long, 2-3 mm wide, obliquely ovate to triangular, acute to acuminate, auriculated at the outer margin, thin, delicate, glabrous, 3-nerved, connate basally with lateral sepals. Lateral sepals 5-10.5 mm long, up to 2.8 mm wide, oblong-spathulate to oblong-obovate, subobtuse, thin, delicate, glabrous, nerves unbranched. Lip up to 8.5 mm long, distinctly 3-lobed below the middle, rather thick; middle lobe 2.5-5.5 mm long, up to 1.2 mm wide, narrowly triangular to linear-lanceolate, acute; sidelobes up to 5 mm long and up to 1 mm wide, linear-lanceolate, acute. Spur 12-38 mm long, up to 2.8 mm in diameter at base, filiform, inflated, more or less twisted at base, acute. Gynostemium up to 2.2 mm long.

**HABITAT.** Epiphyte, lowland and upland humid forests, collected 3 m above the ground level. August.

**DISTRIBUTION.** Sierra Leone, Ivory Coast, Guinea, Nigeria, Cameroon, Equatorial Guinea. Alt. up to 1800 m.

**REPRESENTATIVE SPECIMENS.** Mt. Tonkoui, 22 Aug. 1975, *van der Burg* 752 (WAG!).

**3. *Angraecopsis macrophylla* Summerh.**  
in Bot. Mus. Leaf. 14: 249. 1951  
(Fig. 257)

**TYPE:** UGANDA. *Eggeling* 5386 (HOLOTYPE: K!;  
**PHOTO:** UGDA-DLSz)

Stem 4-10 cm long, erect to pending. Leaves 3-6, 22-34 cm long, 1.8-3 cm wide, oblong-ob lanceolate to narrowly oblanceolate, very unequally bilobed, both lobes obtuse to surounded, twisted at base. Inflorescence 11-21 cm long, 8-25-flowered, erect or semi-pendent, subdense. Flowers small, resupinate, pale green to

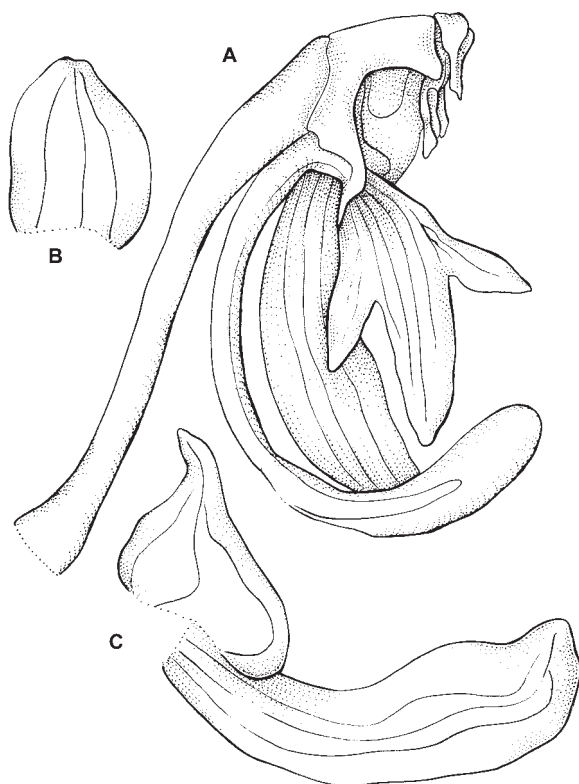


Fig. 257.—*Angraecopsis macrophylla* Summerh.: A — gynostemium, lip, lateral sepal and spur; B — dorsal sepal; C — petal and lateral sepal (redrawn by J. Mytnik-Ejsmont from Summerhayes' original drawing kept at K).

greenish white. Floral bracts 1-1.5 mm long, ovate-triangular, acute, thin, delicate. Pedicel and ovary 7-9 mm long, slender, glabrous. Dorsal sepal 2.5 mm long, 2.1 mm wide, elliptic-ovate, obtuse to rounded, glabrous, 3-nerved. Petals 2.5 mm long, 2.8 mm wide, obliquely triangular, acute to acuminate, glabrous, 3-nerved. Lateral sepals 5.6 mm long, 1.8 mm wide, ligulate-oblongate, obtuse to rounded, glabrous, 3-nerved. Lip 5.5 mm long and wide, 3-lobed near the middle; middle lobe 2.5 mm long, 1 mm wide, oblong-ovate, obtuse; sidelobes 1.3 mm long, 0.6 mm wide, oblong-lanceolate, obtuse. Spur 10.5 mm long, cylindrical, slightly inflated at the apex, incurved, blunt. Gynostemium 1.9 mm long.

**HABITAT.** Epiphyte in lower montane forests, in shady places, noted on trunks of large trees. February.

**DISTRIBUTION.** Ivory Coast, Ethiopia, Uganda. Alt. 1200 m.

**REPRESENTATIVE SPECIMENS.** Sassandra, Chutez Naoua, 9 Feb. 1975, *Pérez-Vera* 750 (K!, P!).

**4. *Angraecopsis parviflora* (Thouars) Schltr. in Orchideen: 601. 1914 (Fig. 258)**

*Angraecum parviflorum* Thouars in Hist. Orchid.: tab. 60. 1822; TYPE: MAURITIUS. *du Petit Thouars* 30 (LECTOTYPE: P!; DRAWING: UGDA-DLSz)

*Mystacidium pedunculatum* Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 175. 1897; TYPE (here designated): MALAWI. *Stolz* K51 (LECTOTYPE: BM!; ISOLECTOTYPE: K!) & TANZANIA. *Johnston* 29, *Last s.n.* & *Meller* 3 (PARATYPE: K!)

Stem 1-3(10) cm long, pendent to spreading. Leaves 4-9, 6-16 cm long, 0.4-1.2 cm wide, falcate, linear or oblanceolate, unequally acutely or subacutely bilobed at the apex, twisted at base. Inflorescence 5-10(25) cm long, 2-8-flowered, horizontal or semi-pendent, dense. Flowers small, resupinate, pale green to

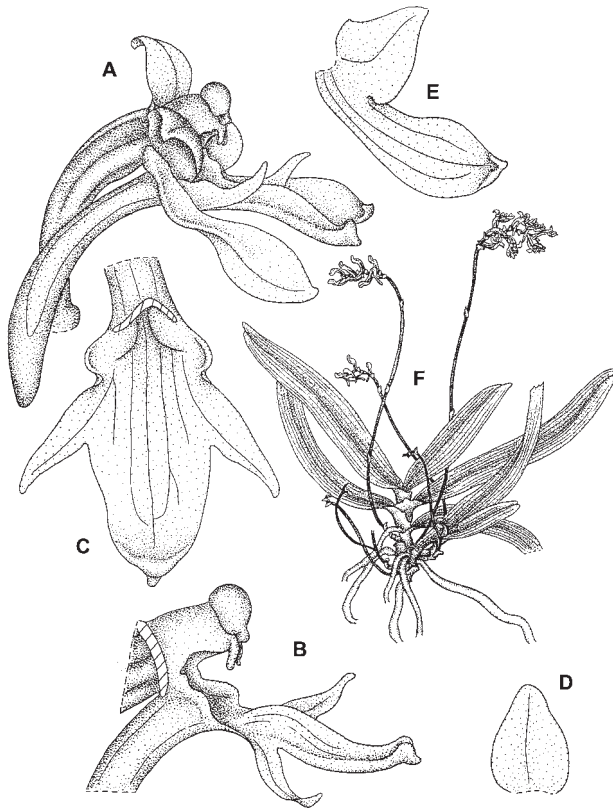


Fig. 258.—*Angraecopsis parviflora* (Thouars) Schltr.: A – flower; B – lip, basal part of the spur and gynostemium; C – lip; D – dorsal sepal; E – petal and lateral sepal; F – habit (Szlachetko & Olszewski 2001b).

greenish white. Floral bracts 1-1.5 mm long, ovate-triangular, acute, thin, delicate. Pedicel and ovary 7-9 mm long, slender, glabrous. Dorsal sepal 2-3 mm long, 1 mm wide, ovate, triangular, obtuse to acute, glabrous, single-nerved. Petals 1.5-2.5 mm long, 1.3-1.5 mm wide, obliquely triangular, acute to acuminate, glabrous, 1-nerved. Lateral sepals 3.5-6(7.5) mm long, 1 mm wide, oblanceolate or spathulate, obtuse to apiculate, glabrous, 3-nerved. Lip 3-5 mm long and wide, 3-lobed near the middle; middle lobe up to 2.75 mm long, linear to oblong-ovate, acute to shortly apiculate; sidelobes shorter than the middle one, linear, acute. Spur 5-9 mm long, cylindrical, slightly inflated at the apex, incurved, blunt. Gynostemium 1-1.5 mm long.

**HABITAT.** Epiphyte in lower montane forests.

**DISTRIBUTION.** Ivory Coast, Cameroon, Tanzania, Malawi, Zimbabwe, Mozambique, Madagascar, Maurice, Reunion. Alt. 600-1600 m.

**NOTES.** I have studied no material of this species from Ivory Coast, but it was reported by Pérez-Vera (1976).

#### 64. *Angraecum* Bory in Voy. Iles Afrique 1: 359. 1804

Monopodial herbs of various size. Stems short or elongate, branching or unbranched. Leaves dorsiventrally flattened or laterally compressed, imbricating basally or well-spaced, thin-textured or fleshy, coriaceous. Inflorescence erect to spread or pendent, single- to many-flowered. Flowers tiny to large, resupinate or not. Sepals and petals subsimilar. Lip simple, usually entire, ecallose or with a callosus, spurred. Gynostemium short and massive, erect. Stigma large, deeply concave, elliptic. Anther incumbent, operculate, dorsiventrally flattened, thin-walled, notched in front. Pollinia 2, ellipsoid or obovate, cleft, dorsiventrally flattened. Rostellum deeply notched, short, dome-like. Viscidia double oblong, thin, deli-

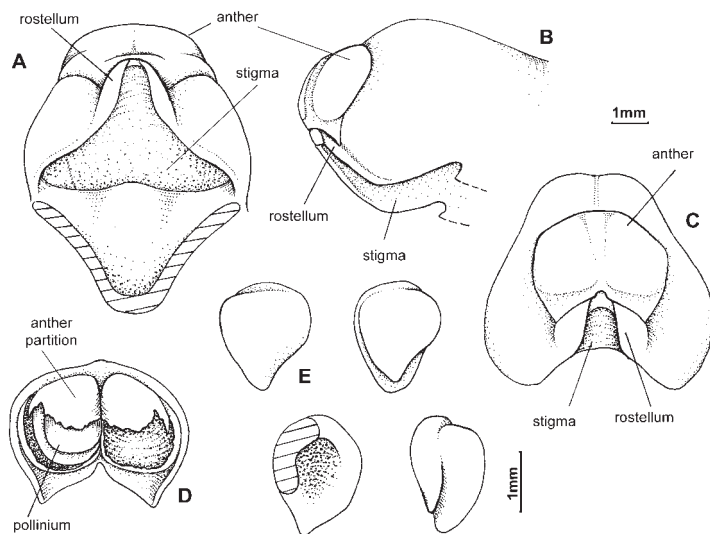


Fig. 259.—Gynostemium structure of *Angraecum* Bory: A – gynostemium bottom view; B – gynostemium side view; C – gynostemium front view; D – anther; E – pollinia various views (Szlachetko 2003).



cate. Tegulae double, linear, delicate, lamellate. Rostellum deeply notched after removal of pollinaria (Fig. 259).

A genus including about 200 species, distributed in tropical Africa, Madagascar and adjacent islands and Sri Lanka.

KEY TO THE SPECIES

1. Leaves cylindrical, apiculate ..... 6. *A. subulatum*
- Leaves not as above ..... 2
2. Sepals over 3 cm long ..... 1. *A. birrimense*
- Sepals up to 1.5 cm long ..... 3
3. Inflorescence over 15 cm long, many-flowered ..... 2. *A. claessensi*
- Inflorescence up to 4 cm long, 1-4-flowered ..... 4
4. Spur inflated in the apical half, obtuse ..... 5. *A. pyriforme*
- Spur cylindrical, attenuate towards the apex ..... 5
5. Inflorescence much shorter than leaves. Viscidium double ..... 4. *A. multinominatum*
- Inflorescence longer than or equal to leaves. Viscidium single ..... 3. *A. moandense*

**1. *Angraecum birrimense* Rolfe in Bull. Misc. Inform. Kew. 1914: 214. 1914 (Fig. 260)**

TYPE: GHANA. *Miles s.n.* (HOLOTYPE: K!)

Stem up to 100 cm long, bilaterally compressed, pendent, internodes 2.5-3 cm long, 0.7 cm in diameter. Leaves numerous, 7.5-14 cm long, up to 2-3.5 cm wide, twisted at base to lie in 1 plane, oblong-ovate, oblong-elliptic to narrowly ligulate, coriaceous, unequally bilobed at apex, both lobes rounded, thick, slightly glossy, medium green. Inflorescence 2-7.5 cm long, 1- or rarely 2-flowered, pendent. Flowers rather large, resupinate, yellowish-white with green spur, fragrant. Floral bracts 6-8 mm long, ovate-trian-

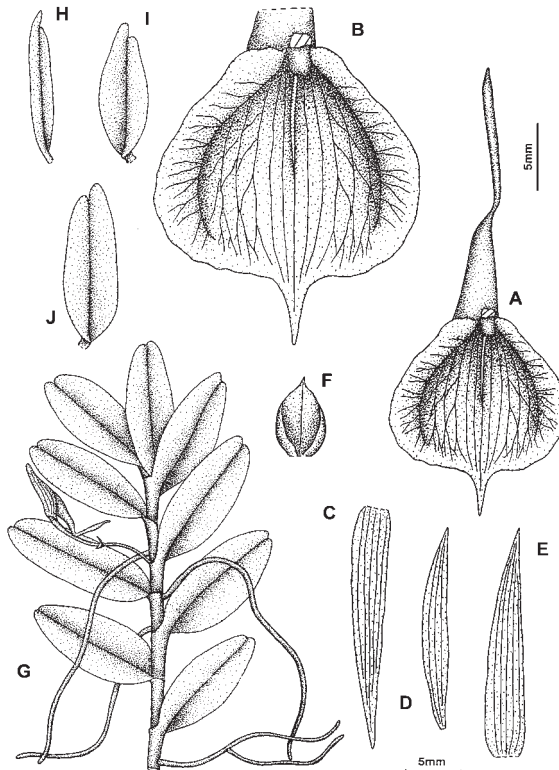


Fig. 260. – *Angraecum birrimense* Rolfe: A – lip and spur; B – lip; C – lateral sepal; D – petal; E – dorsal sepal; F – floral bract; G – habit; H-J – leaves (Szlachetko & Olszewski 2001b).

gular, acute or shortly apiculate, thin, glabrous. Pedicel and ovary 40-50 mm long, slender, glabrous, pendent. Dorsal sepal up to 45 mm long, up to 7 mm wide, narrowly or linear-lanceolate, acute to acuminate, rather thin, glabrous. Petals up to 40 mm long and 5 mm wide, narrowly lanceolate, slightly falcate, acute to acuminate, rather thin, glabrous. Lateral sepals up to 47 mm long, up to 7 mm wide, linear or narrowly lanceolate, acuminate, slightly falcate, rather thin, glabrous. Lip up to 40 mm long, up to 35 mm wide, almost orbicular to broadly obovate, apiculate at apex, concave, with small, elevated keel in the basal half, entire. Spur 35-45 mm long, its basal half narrowly conical, constricted near the middle, apical half very narrowly cylindrical, acute.

**HABITAT.** Epiphyte in gallery forests, marshy sites, or lithophyte on mossy rocks. Most of the year.

**DISTRIBUTION.** Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Gabon, Alt. 650-950 m.

**REPRESENTATIVE SPECIMENS.** Danané, Gbon' Hounyé, 6 Sep. 1962, *Aké Assi* 6284 (K!); Danané-Guinee road, 9 July 1974, *Pérez-Vera* 674 (P!); Ca. 5 km S of Guédeyo, ca. 40 km E of Soubré, 12 June 1963, *de Wilde* 175 (K!, WAG!); Between Legako and Okromodou, 9 June 1974, *Pérez-Vera* 645 (K!); Moyenne Cavally, Mt. Niénokoué, 20 km NE of Fort Binger, *Chevalier* 19465 (P!); 62 km N of Sassandra, 1 km N of Niapidou, 14 Jan. 1959, *Leeuwenberg* 2425 (K!, P!, WAG!).

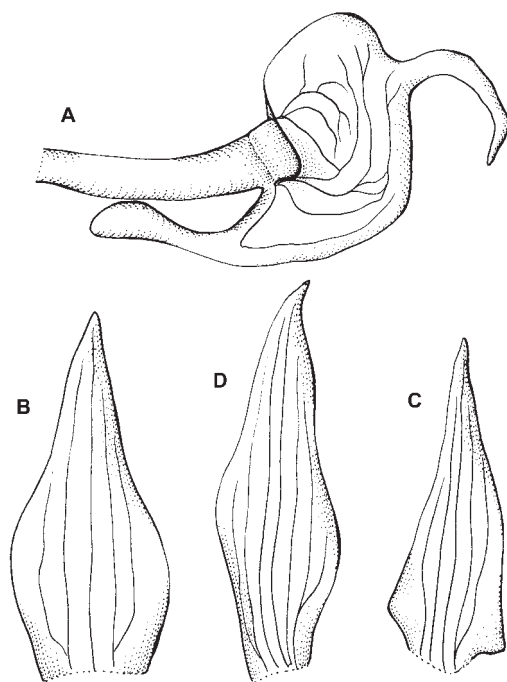


Fig. 261.—*Angraecum claessensii* De Wild.: A – lip and spur, side view; B – dorsal sepal; C – petal; D – lateral sepal (redrawn by J. Mytnik-Ejsmont from Summerhayes' original drawing kept at K).

## 2. *Angraecum claessensii* De Wild. in Bull. Jard. Bot. Etat. 5: 184. 1916 (Fig. 261)

TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Claessens* 748 (HOLOTYPE: BR; ISOTYPE: K!)

Stem up to 100 cm long, semi-pendent. Leaves numerous, 6-12 cm long, 1.5-4 cm wide, ovate-lanceolate, oblong-elliptic, unequally bilobed at apex, each lobe obtuse. Inflorescence 5-30 cm long, 5-8-flowered, lax. Flowers rather small, whitish, yellowish, greenish, orange or purplish. Floral bracts 2.25 mm long, triangular, acute. Pedicel and ovary 10 mm long, slender. Dorsal sepal 9-10 mm long, 2.25-2.75 mm wide, ovate-lanceolate in the lower part, lanceolate above, acuminate, glabrous. Petals 7-9 mm long, 1-1.5 mm wide, ovate at the base, falcate above, acuminate,

glabrous. Lateral sepals 10-11 mm long, 2-2.25 mm wide, oblong-elliptic, acuminate, glabrous. Lip up to 8 mm long and 7 mm wide, subovate, obscurely 3-lobed near the middle, apiculate, margins more or less undulate. Spur 5-6 mm long, 0.5 mm in diameter, conical at the base, compressed downwards but slightly swollen on the elliptic apex.

HABITAT. Epiphyte in dense forests, low shrub-vegetation with *Clappertonia* sp., noted on *Chytranthus laurentii* De Wild. May.

DISTRIBUTION. Ivory Coast, Liberia, Nigeria, Democratic Republic of Congo (Zaire).

REPRESENTATIVE SPECIMENS. Mt. Momi, May 1976, Pérez-Vera 876 (K!, P!).

**3. *Angraecum moandense* De Wild. in Bull. Jard. Bot. Etat. 5: 188. 1916 (Fig. 262)**

TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Gillet s.n.* (HOLOTYPE: BR)

*Angraecum chevalieri* Summerh in Hutchinson & Dalziel, Fl. W. Trop. Afr., ed. 1, 2: 452. 1936;

TYPE: IVORY COAST. *Chevalier 21690* (HOLOTYPE: K!; ISOTYPE: P!; DRAWING: UGDA-DLSz)

Stem 6-13 cm long, erect, internodes 0.5-1 cm long, 0.2-0.3 cm in diameter, leafy throughout. Leaves several, 2.8-6.8 cm long, 4.5-10 mm wide, ligulate to oblong-linear, margins revolute, coriaceous, unequally bilobed at apex, each lobe obtuse to subobtuse. Inflorescence up to 5 cm long, 1-4-flowered, erect, lax. Flowers medium-sized or small, resupinate, parchment green. Floral bracts 2-3 mm long, narrowly elliptic to broadly ovate, acute, thin. Pedicel and ovary up to 17 mm long, slender, glabrous, arcuate at apex. Dorsal sepal 8.2-15 mm long, 1.6-3 mm wide, narrowly lanceolate to lanceolate, acuminate, rather thick, especially in the lower part, glabrous, nerves unbranched. Petals 9-11.5 mm long, 1-1.2 mm wide, linear-lanceolate, slightly falcate, acute to acuminate, thin, delicate, glabrous, nerves unbranched. Lateral sepals up to 14 mm long and up

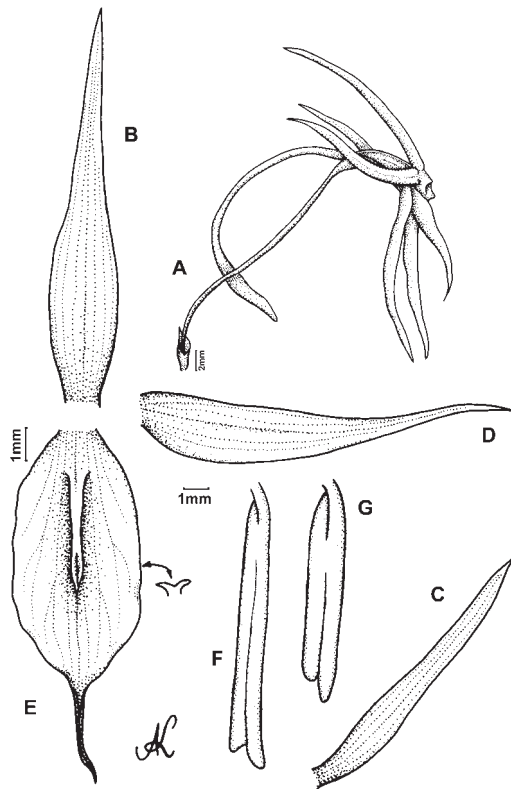


Fig. 262.—*Angraecum moandense* De Wild.: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip; F, G – leaves (drawn by A. Kowalkowska, *Chevalier 21690*, P).

to 2.1 mm wide, narrowly lanceolate or lanceolate, acuminate, more or less sigmoid, rather thick in the lower part, glabrous, nerves unbranched. Lip 7-10.5 mm long, 2.1-3.7 mm wide, oblong-elliptic, cuspidate to caudate at apex, slightly cochleate in the centre, with prominent linear callus. Spur 15-20 mm long, 0.4 mm in diameter near the middle, 0.9 mm in diameter at apex, filiform above the narrowly conical base, slightly inflated at acute apex, arcuate.

**HABITAT.** Epiphyte on low bushes and trees over the river on exposed areas, in rain forest, collected on old coffee trees, *Dialium pachyphyllum* Harms, *Pavetta* sp. May.

**DISTRIBUTION.** Guinea, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Equatorial Guinea (Bioko), Gabon, Congo, Democratic Republic of Congo (Zaire), Uganda, Tanzania. Alt. 1100-1200 m.

**REPRESENTATIVE SPECIMENS.** Between Man and Danané, Zo R., 31 May 1974, *Pérez-Vera* 252 (K!, P!); Haute Sassandra, Toma, between Sogui and Koualé, 26 May 1909, *Chevalier* 21690 (K!, P!).

**4. *Angraecum multinominatum*** Rendle in Rendle & Baker, Cat. Pl. Oban.: 107. 1913  
(Fig. 263)

**TYPE:** SIERRA LEONE. *Scott Elliot* 5555 (HOLOTYPE: BM!) - *Mystacidium clavatum* (Rendle) Rolfe in Oliver & al. (eds.), Fl. Trop. Afr. 7: 172. 1898.

Stem erect, internodes 1.2-1.5 cm long, up to 0.5 cm wide. Leaves several, (3)7.5-8(10) cm long, 1-3.5 cm wide, twisted at base to lie in one plane, oblong-obovate to obovate-elliptic, obscurely and obtusely bilobed at apex. Inflorescence 4-

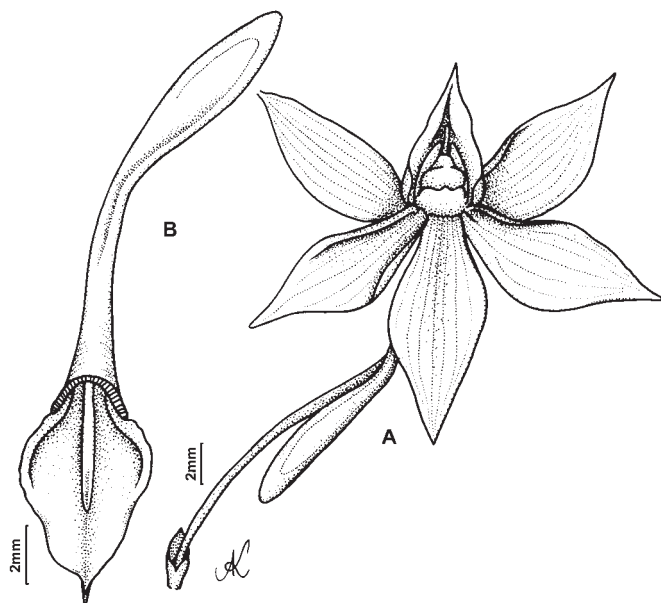


Fig. 263.—*Angraecum multinominatum* Rendle: A – flower; B – lip and spur (drawn by A. Kowalkowska, Halle & Villiers 4532, P).

5 cm long, 2-flowered, lax. Flowers rather small, nonresupinate, green, yellow-green, often tinged with orange. Floral bracts 3-4 mm long, broadly triangular-ovate, acute, thin, glabrous. Pedicel and ovary up to 25 mm long, slender, glabrous, sigmoid. Dorsal sepal 9-12 mm long, 3-5.6 mm wide, lanceolate to broadly lanceolate, acute to apiculate, rather thick, glabrous, nerves

branching or not. Petals 8-10.5 mm long, 2-4.2 mm wide, oblong-lanceolate to obliquely and broadly lanceolate, acuminate, rather thick, glabrous, nerves unbranched. Lateral sepals 9-10 mm long, 3-4 mm wide, obliquely ovate-lanceolate to broadly lanceolate, acute to acuminate, rather thick, glabrous, nerves unbranched. Lip 7-8.5 mm long, 4-6 mm wide, broadly ovate to almost ovate-rhomboid, acuminate, cochleate, in the centre with prominent ridge-like callus in the lower two-third. Spur up to 12.5 mm long, 2 mm in diameter, slightly swollen near the middle, tapering towards both ends, subacute to subobtuse, slightly sigmoid.

HABITAT. Epiphyte on moss covered tree, collected 2 m above the soil level.

DISTRIBUTION. Guinea, Ivory Coast, Sierra Leone, Ghana, Togo, Nigeria, Cameroon, Gabon.

REPRESENTATIVE SPECIMENS. Oroumbo Boka, Nov. 1993, *Pérez-Vera 1164* (P!).

**5. *Angraecum pyriforme* Summerh. in Kew Bull. 1936: 230. 1936 (Fig. 264)**

TYPE: NIGERIA. *Talbot 888* (HOLOTYPE: BM!; DRAWING: K!)

Stem erect, internodes 1.5-2 cm long. Leaves several, 7-11 cm long, 1-2 cm wide, oblong-lanceolate, unequally and obtusely bilobed at apex. Inflorescence 2-

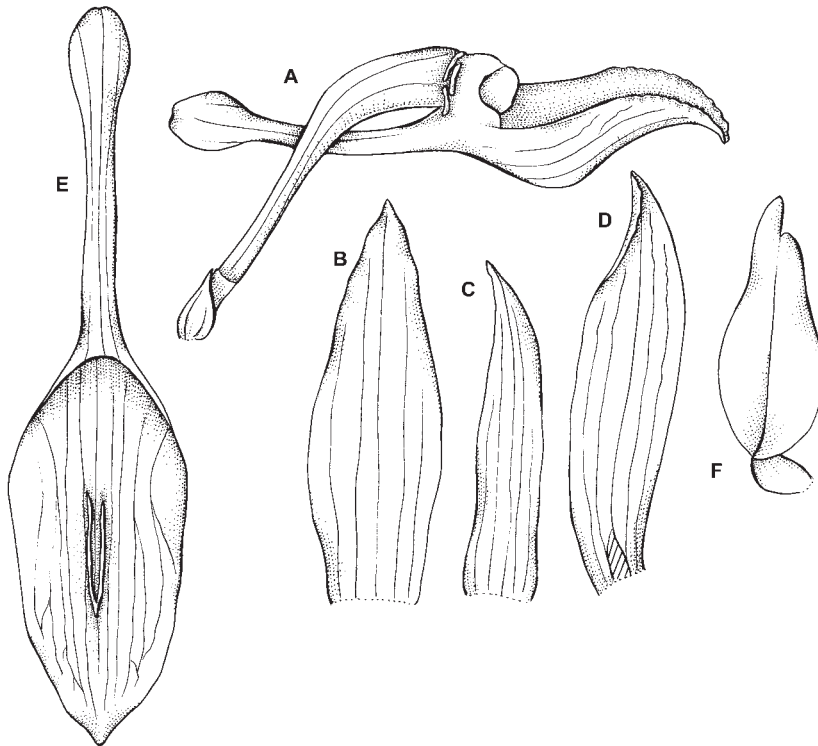


Fig. 264.—*Angraecum pyriforme* Summerh.: A – floral bract, pedicel, ovary, lip and spur; B – dorsal sepal; C – petal; D – lateral sepal; E – lip and spur; F – leaf (drawn by J. Mytnik-Ejsmont, *Letouzey 14128*, P).

4 cm long, 2-flowered, lax. Flowers rather small, nonresupinate, perfumed at night, greenish, yellow-green, yellow to apricot-yellow. Floral bracts 3-4 mm long, broadly triangular-ovate, acute, thin, glabrous. Dorsal sepal 10 mm long, 3-4 mm wide, oblong-elliptic to oblong-lanceolate, acute to subobtusate, glabrous. Petals 8 mm long, 2-2.5 mm wide, oblong-lanceolate to narrowly lanceolate, acute, glabrous. Lateral sepals 9 mm long, 3 mm wide, obliquely ovate-lanceolate to broadly lanceolate, acute to acuminate, glabrous. Lip 7.5 mm long, 4.5 mm wide, broadly ovate to ovate, acute, cochleate, in the centre, ecallose. Spur 11-11.5 mm long, narrowly cylindrical, straight, distinctly swollen at the apex, blunt.

HABITAT. Epiphyte in lowland humid forests. June-October.

DISTRIBUTION. Ivory Coast, Nigeria.

REPRESENTATIVE SPECIMENS. Right bank of the Bandama R., 6°15'N, 5°03'W, 10 July 1968, *Breteler* 5232 (P!, WAG!); Dahiri, 27 June 1966, *Aké Assi* 9002 (K!); Tai, 21 Oct. 1961, *Aké Assi* 6028 (K!); Yapo, 24 June 1975, *van der Burg* 430 (WAG!).

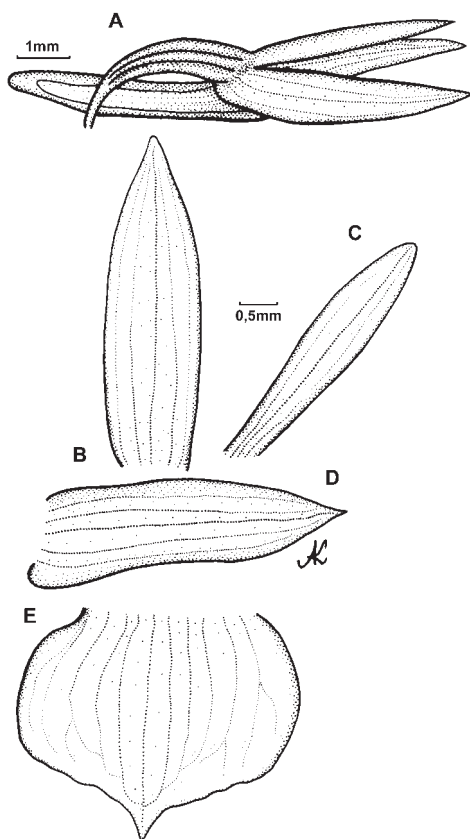


Fig. 265.—*Angraecum subulatum* Lindl.: A—flower; B—dorsal sepal; C—petal; D—lateral sepal; E—lip (drawn by A. Kowalkowska, *Andoh* 5535, P).

**6. *Angraecum subulatum* Lindl.**  
in *Compan. Bot. Mag.* 2: 206.  
1837  
(Fig. 265)

TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!) - *Listrostachys subulata* (Lindl.) Rchb. f. in *Ann. Bot. Syst.* 6: 909. 1864.

*Angraecum canaliculatum* De Wild. in *Bull. Jard. Bot. Etat.* 5: 193. 1916; TYPE (here designated): DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Laurent* 1767 (LECTOTYPE: BR!) & *Pynaert* 477 (PARATYPE: BR!)

Stem up to 35 cm long, 0.2-0.4 cm in diameter, suberect to pendent, terete. Leaves several, 3-13 cm long, 0.1-0.3 cm in diameter, linear, acuminate, subcylindric, falcate, well-spaced along the stem. Inflorescence abbreviated, 1-2-flowered. Flowers small, resupinate, white or creamy white. Floral bracts very short, amplexicaul. Pedicel and ovary 3-4 mm long, slender, slightly swollen towards the apex, glabrous, arcuate. Dorsal sepal 4.5-6 mm long, 1.3-2.5 mm wide, oblong-lanceolate, acute, thin, delicate, glabrous, nerves unbranched. Petals 4-5.5 mm long, 0.5-1.5 mm wide, linear-oblonganceolate, obtuse to shortly

apiculate, thin, delicate, glabrous, nerves 3, unbranched. Lateral sepals 4.5-6 mm long, 1.2-2.5 mm wide, obliquely oblong-lanceolate to elliptic-lanceolate, shortly apiculate, thin, delicate, glabrous, nerves unbranched. Lip 2-3 mm long, 2-3.2 mm wide, usually slightly wider than long, more or less transversely elliptic, apiculate, slightly cochleate in the centre, canaliculate, thin, delicate, glabrous, entire. Spur up to 5 mm long, 1-1.5 mm in diameter, straight, narrowly cylindrical, slightly laterally compressed, tapering towards the apex, subacute.

**HABITAT.** Epiphyte in forests and periodically inundated swampy gallery forests with *Raphia* sp., *Pandanus* sp. and *Marantaceae* sp., noted on *Gilbertiodendron dewevrei* (De Wild.) Leonard. May-December.

**DISTRIBUTION.** Sierra Leone, Liberia, Guinea, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea (Bioko), Congo, Democratic Republic of Congo (Zaire). Alt. up to 700 m.

**REPRESENTATIVE SPECIMENS.** Cult., Adiopodoumé, 6 May 1958, *Aké Assi 5411* (K!); 18 Sep. 1961, *Aké Assi 6022* (K!); 1 Aug. 1975, *van der Burg 720* (WAG!); Bouroukrou, 20 Dec. 1906-20 Jan. 1907, *Chevalier 16524* (P!); Buyo, 8 May 1975, *Pérez-Vera 789* (K!, P!); Ca. 5 km S of Guédéyo, ca. 40 km E of Soubré, 12 June 1963, *de Wilde 176 p.p.* (P!, WAG!); Between Moyenne Sassandra and Moyenne Cavally, 27 June-2 July 1907, *Chevalier 19217* (P!); Morokro (Morolero), 12 km N of N'douci, 17 Feb. 1964, *Oldeman 988* (K!, WAG!); W of Soubré, near Niamagbi, 11 June 1963, *de Wilde 162* (WAG!); Ca. 8 km N of Tabou, 3 km behind the road to Pata Idie, 2 Sep. 1975, *van der Burg 884* (WAG!); Mt. Tonkoui, 40 km NW of Man, 18 Sep. 1975, *van der Burg 1146* (WAG!).

## 65. *Cribbia* Senghas in Die Orchideen 36: 19. 1985

*Azadehdelia* Braem in Schlechteriana 1(2): 34. 1988

Stem short. Leaves usually linear-oblong, unequally bilobed at apex, twisted at base to lie in one plane. Inflorescence few- to many-flowered, simple. Flowers small, pale coloured. Sepals and petals subsimilar. Lip simple, entire, ecallose, spurred. Spur cylindrical, obtuse to subacute. Gynostemium rather elongate, erect, slightly swollen towards the base. Stigma transversely elliptic, deeply concave. Anther incumbent, operculate, thin-walled. Pollinia 2, ellipsoid, porate. Rostellum very short and wide. Viscidia double, small, ovate, thin, lamellate, delicate. Tegulae double, linear, thin, lamellate, delicate. Rostellum remnant obscurely 3-dentate, all tooth similar in size (Fig. 266).

### KEY TO THE SPECIES

1. Spur as long as or longer than tepals. Leaves roundly or obtusely bilobed ..... **1. *C. brachyceras***
- Spur shorter than tepals. Leaves acutely or subacutely bilobed ..... **2. *C. confusa***

## 1. *Cribbia brachyceras* (Summerh.) Senghas in Die Orchideen 36 (1): 19. 1985 (Fig. 267)

*Aerangis brachyceras* Summerh. in Kew Bull. 1934: 213. 1934, TYPE: DEMOCRATIC REPUBLIC OF CONGO (ZAIRE). *Burt 3123* (HOLOTYPE: K!) - *Rangaeris brachyceras* (Summerh.) Summerh. in Bull. Misc. Inform. Kew. 1936: 228. 1936. - *Azadehdelia brachyceras* (Summerh.) Braem in Schlechteriana 1: 34. 1988.



Stem up to 20(40) cm long, erect or ascending. Leaves some, 8-20 cm long, 0.5-2 cm wide, suberect or spreading, straight or slightly falcate, linear-oblong, unequally and obtusely or roundly bilobed at apex. Inflorescence 4-20 cm long, 7-30-flowered, rather dense or lax, suberect. Flowers resupinate, small, pale yellow or white with yellow spur, somewhat translucent. Floral bracts 2.5-5 mm long, lanceolate, acuminate, thin. Pedicel and ovary 3-8 mm long, erect, slender, glabrous. Dorsal sepal 5.5-7.6 mm long, 1.5-2 mm wide, oblong-lanceolate, acute to shortly acuminate, thin, delicate, glabrous, 3-nerved. Petals 5-7.6 mm long, 1.4-2 mm wide, oblong, oblong-elliptic to oblong-lanceolate, obtuse, rounded to acute, thin, delicate, glabrous, 3-nerved. Lateral sepals 6-10 mm long, 1.2-1.6 mm wide, linear or linear-oblong to linear-lanceolate, slightly falcate at base, acute to acuminate, thin, delicate, glabrous, 3-nerved. Lip 5-9 mm long, 3-5 mm wide, lanceolate, ovate-lanceolate to oblong-lanceolate, sometimes slightly constricted near the middle, entire, acute to shortly apiculate, ecallose, cochlate at the base, canaliculate, margins entire or minutely denticulate. Spur 5-9.5 mm long, cylindrical, straight or decurved, slightly inflated at apex, obtuse to subacute. Gynostemium 2 mm long.

**HABITAT.** Epiphyte on mossy trunk of trees 3-10 m above the ground level, on mossy rocks in forests, montane and submontane forests on basalt, gallery forests, makias.

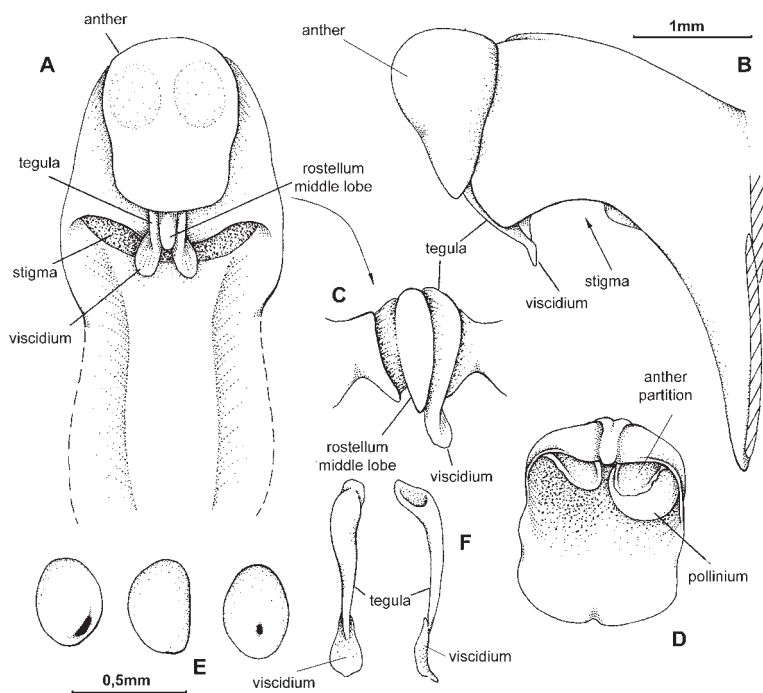


Fig. 266.—Gynostemium structure of *Cribbia* Senghas: A – gynostemium front view; B – gynostemium side view; C – rostellum; D – anther; E – pollinia various views; F – tegula and viscidium various views (Szlachetko 2003).

DISTRIBUTION. Ivory Coast, Guinea, Sierra Leone, Liberia, Nigeria, Cameroon, São Tomé, Democratic Republic of Congo (Zaire), Uganda, Rwanda, Kenya, Zambia, Malawi. Alt. 1500-2200 m.

REPRESENTATIVE SPECIMENS. Mt. Tonkoui, *Aké Assi IA 3702* (K!).

**2. *Cribbia confusa*** P.J.Cribb in Kew Bull. 51(2): 359. 1996  
(Fig. 268)

TYPE: CAMEROON. *Thomas 9365* (HOLOTYPE: K!; ISOTYPE: YA)

Stem up to 4 cm long, more or less horizontal, leafy. Leaves few, 5-7 cm long, 0.8-1.3 cm wide, suberect to spread, twisted at base to lie in one plane, linear-oblongate, unequally bilobed at apex, each lobe acute or subacute. Inflorescence 9-11 cm long, pendulous, simple, laxly few- to some-flowered. Flowers small, resupinate, yellow-green. Floral bracts 3 mm long, ovate, acute, thin, delicate. Pedicel and ovary 4-6 mm long, longer than bract, slender, glabrous. Dorsal sepal 8-9 mm long, 2 mm wide, lanceolate, acute or acuminate, delicate, glabrous, 3-nerved. Petals 6-8 mm long, 1.5 mm wide, lanceolate, acuminate, slightly falcate, thin, glabrous, 3-nerved. Lateral sepals 7-9 mm long, 2 mm wide, falcate-lanceolate, acuminate, glabrous, 3-nerved. Lip 11 mm long, 3 mm wide, porrect-decurved, lanceolate or ovate-lanceolate, acuminate, ecallose, slightly cochleate in the centre, canaliculate. Spur 5-5.5 mm long, cylindrical, blunt, pendent. Gynostemium 0.8 mm long.

HABITAT. Epiphyte in mist forests of *Aguaria salicifolia* on old lava; trunk epiphyte in forests of *Syzygium staudtii* (Engl.) Mildbr., *Schefflera abyssinica* Harms, *Canthium dunlapii* Hutchinson & Dalziel, at edge of *Pennisetum* sp. grasslands with *Hypericum* sp., *Crassocephalum* sp. and *Loudetia simplex* (Nees) C.E. Hubbard; on outermost branches of *Parinari excelsa* Sabine in montane forests and in secondary forests. January.

DISTRIBUTION. Liberia, Ivory Coast, Cameroon, São Tomé. Alt. 1300-2100 m.

REPRESENTATIVE SPECIMENS. Tiapleu, Jan. 1972, *Pérez-Vera 237* (K!).

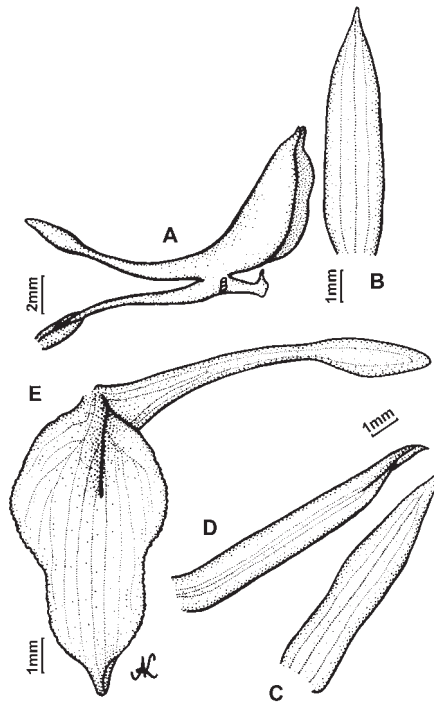


Fig. 267.—*Cribbia brachyceras* (Summerh.) Senghas: A – floral bract, pedicel, ovary, spur and lip; B – dorsal sepal; C – petal; D – lateral sepal; E – lip and spur (drawn by A. Kowalkowska, *Le-touzey 14240*, P).

**66. *Dolabrifolia* (Pfitzer) Szlach. & A. Romowicz in Richardiana 7(2): 54. 2007**

*Mystacidium* sect. *Dolabrifolia* Pfitzer in Engler & Prantl, Naturl. Pflanzenfam. 2(6): 216. 1889. -  
*Angraecum* sect. *Dolabrifolia* (Pfitzer) Garay in Kew Bull. 28(3): 499. 1973 (publ. 1974)

Plants small, epiphytic. Leaves numerous, laterally compressed, thick, imbricating basally. Inflorescence single-flowered, shorter than leaves. Flowers small, nonresupinate, white, on short peduncle. Sepals and petals subsimilar, spread. Lip canalliculated, entire or obscurely 3-lobed, ecallose. Spur narrowly cylindrical. Gynostemium similar to that of *Angraecum*.

KEY TO THE SPECIES

- 1. Leaves oblong-lanceolate, acute ..... **3. *D. podochiloides***
- Leaves elliptic to ovate, obtuse ..... **2**
- 2. Tepals over 3.5 mm long. Lip over 3 mm long. Spur over 5.5 mm long .... **2. *D. disticha***
- Tepals up to 2 mm long. Lip up to 1.5 mm long. Spur up to 5 mm long **1. *D. bancoense***

**1. *Dolabrifolia bancoense* (van der Burg) Szlach. & A. Romowicz in Richardiana 7(2): 54. 2007**

*Angraecum bancoense* van der Burg in Misc. Pap. Landbouwhogeschool. 19: 26. 1980; TYPE: IVORY COAST. van der Burg 304 (HOLOTYPE: WAG!).

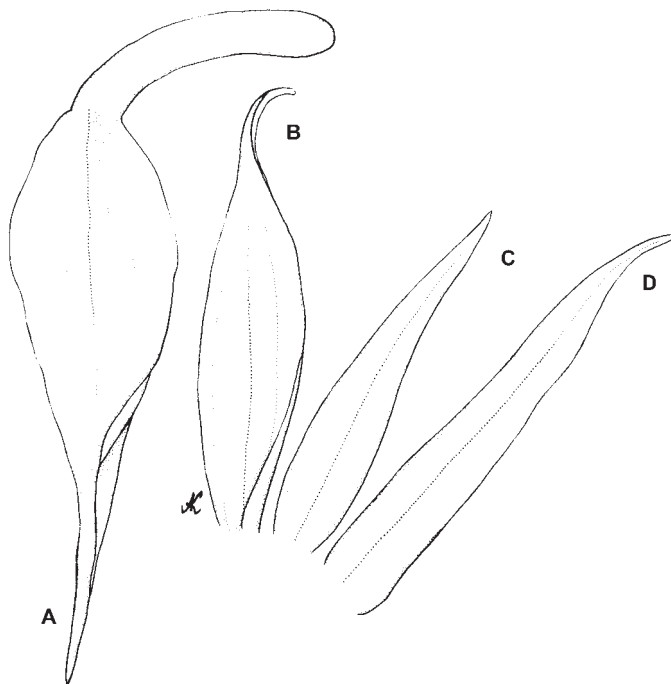


Fig. 268.—*Cribbia confusa* P.J. Cribb: A – lip and spur; B – dorsal sepal; C – petal; D – lateral sepal (drawn by A. Kowalkowska, Thomas 9365, K).

Stem up to 25 cm long, pendent or ascending. Leaves numerous, 0.5–1.1 cm long, (0.25) 0.3–0.6(0.7) cm broad, falcately oblong-elliptic, rounded at apex, very stiff, shiny bright to dark green, groove on the upper surface short. Inflorescence single-flowered, abbreviated. Flowers small, pure white, sometimes with faintly pinkish suffusion. Floral bracts 1 mm long, broadly

ovate, subacute, thin, delicate, glabrous. Pedicel and ovary 4-5 mm long, slender, erect, glabrous. Dorsal sepal 1.5-2 mm long, 0.8-1 mm wide, oblong-elliptic to elliptic, obtuse, thin, delicate, glabrous, obscurely 3-nerved. Petals 1.5 mm long, 0.7 mm wide, oblong or oblong-elliptic, slightly falcate, obtuse, thin, delicate, glabrous, obscurely 3-nerved. Lateral sepals 1.8-2 mm long, 0.9-1 mm wide, oblong-ovate to oblong-elliptic, slightly falcate to oblique, obtuse, thin, delicate, glabrous, more or less 3-nerved. Lip 1-1.5 mm long and wide, obscurely 3-lobed, cochleate in the centre, thin, delicate; the middle lobe triangular, acute, short; sidelobes rounded, small. Spur 2.5-5 mm long, shorter than pedicel and ovary, straight, narrowly cylindrical, attenuate towards the apex.

HABITAT. Epiphyte. Throughout the year.

DISTRIBUTION. Ivory Coast, Nigeria (?), Cameroon.

REPRESENTATIVE SPECIMENS. Cult., Adiopodoumé, 11 Dec. 1978, *Dekker 341* (WAG!); Anguededou, 25 Aug. 1975, *van der Burg 797* (WAG!); 18 Feb. 1977, *van der Burg 1260* (WAG!); Banco Forest Reserve, in the central part, 14 May 1975, *van der Burg 304* (WAG!); Banco Forest Reserve, 24 Apr. 1973, *De Koning 1535* (WAG!); Banco Forest Reserve, near Route Reste, 7 Dec. 1973, *De Koning 2901* (WAG!); Banco Forest Reserve, near Anguededou Forest, 28 Feb. 1974, *De Koning 3387* (WAG!); Buyo, 5 May 1975, *Pérez-Vera 792* (K!, P!); E of Dakpadou, 6°00'W, 5°16'N, 22 Aug. 1967, *Geerling & Bokdam 764* (WAG!); Ca. 8 km N of Tabou, 3 km behind the road to Pata Idie, 2 Sep. 1975, *van der Burg 883* (WAG!); Yapo, 11 Oct. 1956, *de Wilde 686* (WAG!); *Sine loc.*, 26 Mar. 1979, *van Setten 353* (WAG!).

**2. *Dolabrifolia disticha* (Lindl.) Szlach. & A. Romowicz in Richardiana 7(2): 54. 2007 (Fig. 269)**

*Angraecum distichum* Lindl. in Edwards's Bot. Reg. 21: tab. 1781. 1836; TYPE: SIERRA LEONE. *Loddiges s.n.* (HOLOTYPE: K!) - *Mystacidium distichum* (Lindl.) Pfitzer in Engler, Nat. Pflanzenfam. 2(6): 216. 1889.

Stem up to 25 cm long, pendent or ascending. Leaves numerous, 0.5-1.1 cm long, (0.25)0.3-0.6(0.7) cm broad, falcately oblong-elliptic, rounded at apex, very stiff, shiny bright to dark green, groove on the upper surface short. Inflorescence 1-flowered, abbreviated. Flowers small, pure white with faintly yellowish to greenish gynostemium. Floral bracts 1-2 mm long, broadly ovate, subacute, thin, delicate, glabrous. Pedicel and ovary 5-6.5 mm long, slender, erect, glabrous. Dorsal sepal 3.5-5 mm long, 1.5-2.5 mm wide, oblong-elliptic to elliptic, obtuse, thin, delicate, glabrous, obscurely 3-nerved. Petals 3-5 mm long, 1-1.5 mm wide, oblong or oblong-elliptic, slightly falcate, obtuse, thin, delicate, glabrous, obscurely 3-nerved. Lateral sepals 3.5-5 mm long, 1.5-2.5 mm wide, oblong-ovate to oblong-elliptic, slightly falcate to oblique, obtuse, thin, delicate, glabrous, more or less 3-nerved. Lip 3-5 mm long, 2-4 mm wide, obscurely 3-lobed, cochleate in the centre, thin, delicate; the middle lobe triangular, acute, short; sidelobes rounded, small. Spur 5.5-7 mm long, shorter than pedicel and ovary, straight, narrowly cylindrical with apiculate apex.

HABITAT. Epiphyte in semideciduous forests with *Celtis* sp. and Sterculiaceae, in high forests, rain forest, in mangrove swamps, on trunk and branches, often mossy, 1 to 30 m above ground in shade and high humidity, on branch over stream, noted on *Lophira alata* Banks ex C.F. Gaertn.. Throughout the year.

**DISTRIBUTION.** Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Benin, Nigeria, Cameroon, São Tomé and Príncipe, Central African Republic, Gabon, Congo, Democratic Republic of Congo (Zaire), Angola, Uganda, Rwanda, Mozambique. Alt. 800-1750 m.

**REPRESENTATIVE SPECIMENS.** Cult., Adiopodoumé, 11 Dec. 1978, *Dekker 343* (WAG!); Attié, between Lagune Potou and Alépé, between Douté and Montégo (Montezo), 24-26 Feb. 1907, *Chevalier 17393* (P!); Baleko, Sep. 1955, *Nozeran s.n.* (P!); 15 km NE of Bianouan (Bianovan), close to the Ghana border, 17 May 1962, *Leeuwenberg 3961* (K!, WAG!); Cavally, Lépo, between Loula and Nekaougnié, 25 July 1907, *Chevalier 19574* (P!); Along Dakpadou-Sago road, 5°58'W, 5°16'N, 28 Mar. 1968, *Geerling & Bokdam 2286* (K!, WAG!); Dyolas, between Danané and Goutokouma, 25 Apr. 1909, *Chevalier 21300* (K!, P!); Mt. Mafa, 6 July 1966, *Aké Assi 9026* (K!); Island on Sassandra R., near Louga, 8 Apr. 1973, *De Koning 1260* (WAG!); 56 km N of Sassandra, E of Béyo, 6°02'W, 5°18'N,

24 Jan. 1959, *Leeuwenberg 2555* (K!, WAG!); 61 km N of Sassandra, W of Niapidou, 6°10'W, 5°19'N, 19 Feb. 1959, *Leeuwenberg 2750* (K!, P!, WAG!); 11 May 1959, *De Wit s.n.* (WAG!); Soubré, 5°40'W, 6°20'N, Feb. 1969, *Bamps 2071* (K!, P!); Yapo, 2 Jan. 1907, *Chevalier 16841* (P!); Youkou (Yonkou), Aug. 1942, *Schnell 1653* (K!, P!); *Sine loc.*, 18 July 1978, *van Setten KS-173* (WAG!); *Sine loc.*, 12 Sep. 1978, *van Setten KS-224* (WAG!).

**DOUBTFUL RECORDS:** Cult., Adiopodoumé, 6 July 1975, *van der Burg 436* (WAG!); Grabo-Fete road (km 2), 4°55'N, 7°30'W, 11 Apr. 1974, *Breteler 7347* (WAG!); Bac de Moossou, 20 Aug. 1961, *F. Hallé 239* (P!); Between Moyenne Sassandra and Moyenne Cavally, 27 June-2 July 1907, *Chevalier 19217 bis* (P!).

**3. *Dolabrifolia podochiloides*** (Schltr.) Szlach. & A. Romowicz in *Richardiana* 7(2): 54. 2007 (Fig. 270)

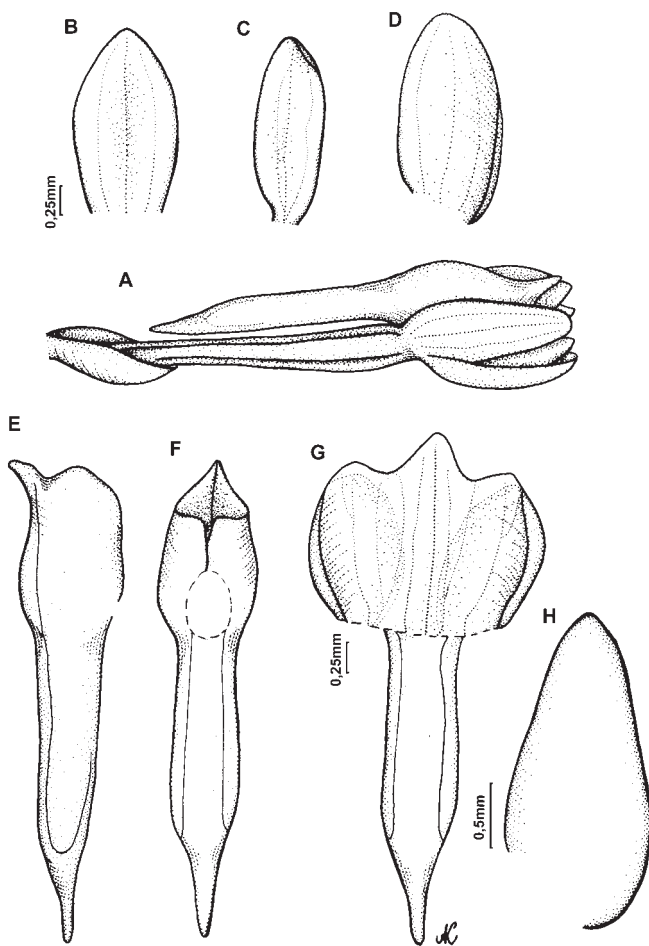


Fig. 269.—*Dolabrifolia disticha* (Lindl.) Szlach. & A. Romowicz: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E–G – lip, various views; H – leaf (drawn by A. Kowalkowska, *Letouzey 9404*, P).

*Angraecum podochiloides* Schltr. in Bot. Jahrb. Syst. 38: 161. 1906; TYPE: CAMEROON. *Schlechter 15769* (HOLOTYPE: B†; ISOTYPES: BM!, BR, K!, P!; DRAWING: UGDA-DLSz)

Stem up to 60 cm long, pendent to ascending, branching. Leaves numerous, 1-2 cm long, 0.15-0.3 cm wide, oblong-lanceolate, acute to subobtuse, thick, fleshy, laterally compressed, imbricating basally. Inflorescence 1-flowered, abbreviated. Flowers small, resupinate, whitish or yellowish. Floral bracts small, amplexical. Pedicel and ovary up to 8 mm long, slender, glabrous, slightly arcuate. Dorsal sepal 3.6-4.5 mm long, 1.1-1.4 mm wide, oblong-lanceolate to linear-lanceolate, widest at base, acute to subacute, thin, very delicate, glabrous, obscurely 3-nerved. Petals 3.5-4.5 mm long, 0.9-1 mm wide, linear, falcate, subobtuse thin, delicate, glabrous, single-nerved. Lateral sepals 4-5 mm long, 0.7-1 mm wide, linear-lanceolate to oblong-lanceolate, falcate, subacute to subobtuse, thin, delicate, glabrous, obscurely 3-nerved. Lip 3.5-5 mm long, 3.5-5 mm wide, transversely elliptic in general outline, apiculate at apex, thin, cochleate in the centre, apex recurved, canaliculate. Spur 3-7.5 mm long, narrowly conical, acute, slightly falcate.

HABITAT. Epiphyte in dense forests, noted on *Gilbertiodendron deweveri* (De Wild.) Leonard and *Dialium corbisieri* Staner. Most fo the year.

DISTRIBUTION. Ivory Coast, Ghana, Nigeria, Cameroon, Gabon, Democratic Republic of Congo (Zaire). Alt. up to 1500 m.

REPRESENTATIVE SPECIMENS. Cult., Adiopodoumé, 6 Nov. 1961, *Aké Assi 6040* (K!); Cavally, Lépo, between Loula and Nékaougné, 25 July 1907, *Chevalier 19 573* (P!); Cavally, 23 Nov. 1974, *Pérez-Vera 150/B* (K!, P!); Gliké (Cerele de Tabou), Aug. 1942, *Schnell 1688* (K!); Grabo-Feté road (km 2), 4°55'N, 7°30'W, 11 Apr. 1974, *Breteler 7348* (P!, WAG!).

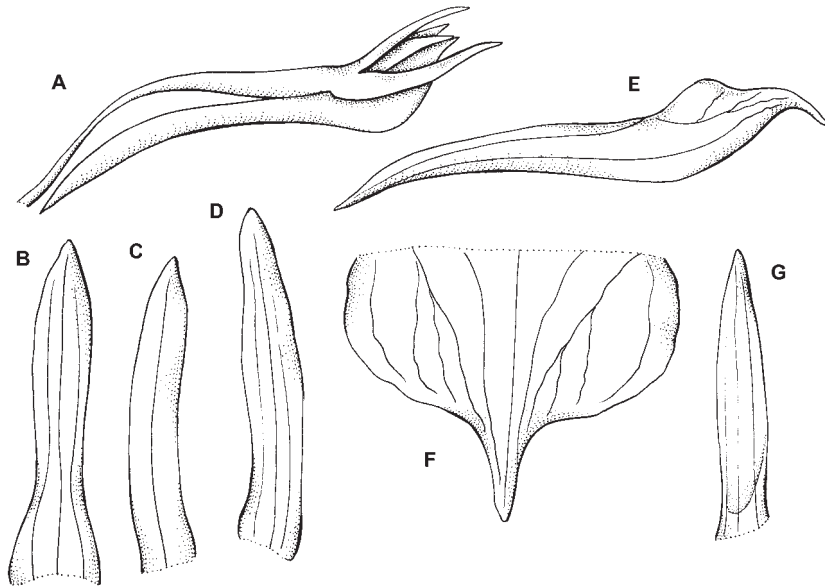


Fig. 270.—*Dolabrifolia podochiloides* (Schltr.) Szlach. & A. Romowicz: A – flower; B – dorsal sepal; C – petal; D – lateral sepal; E – lip, F – lip and spur, side view; G – leaf (drawn by J. Mytnik-Ejsmont, *Halle & Villiers 5382*, P).





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 Winkler 14a (30.27), 157 (30.18), 240 (28.4)  
 Wood 4122 (17.1), 5916 (37.19)  
 Ybert 245 (23.2), 246 (23.5), 248 (23.5), 249 (23.5), 252 (23.1), 255 (23.3)  
 Yeoward *s.n.* (30.7)  
 Zenker & Staudt 503 (10.6), 626 (22.2)  
 Zenker 492B (9.1), 609 (32.23), 1053 (59.3), 1387 (28.5), 2894 (30.4), 2895 (30.36), 3670 (10.5), 3902 (30.25), 3903 (30.29), 3910 (30.38)  
 Zeyher 1584 (23.5)  
 Zollinger 762 (23.3)





*Dariusz L. Szlachetko*

(*Polystachyeae* prepared with JOANNA MYTNIK-EJSMONT)

## ORCHIDACEAE OF IVORY COAST

Ivory Coast has 322,460 km<sup>2</sup> lies on the West African coast on the Gulf of Guinea, located between 4°22' and 10°55' N and 2°30' and 8°37' W. Ivory Coast's terrain can generally be described as a large plateau, rising gradually towards the north up to 1218 m above sea level (Mt. Tonkouï), the highest elevation is Mt. Nimba, at 1752 m above sea level in the far west of the country along the border with Guinea. The lowest elevation is at sea level on the coasts.

The Flora of the Orchidaceae of Ivory Coast is relatively well known mainly thanks to the recent works of two botanists: Laurent Aké Assi (2002) and Francisco Pérez-Vera (2003). However, the first elaboration of the orchid flora of Ivory Coast was prepared by Summerhayes (1968) within Flora of Tropical West Africa.

Now, based on the study of 2,212 herbarium specimens, a synthesis of the Orchid flora of Ivory Coast is presented. Out of a total of eight subfamilies within the family of Orchidaceae in the world, seven have been found in Ivory Coast. This monograph includes keys to determination of genera and species. Morphological description, habitat, geographical distribution, representative specimens are provided for each species and subspecies. Most of the considered taxa are illustrated with original drawings.

In the present work, 234 species representing 66 genera are distinguished. Pérez-Vera recognized only 229 species in 48 genera. The differences between these works are the result of different taxonomic conceptions, especially on the generic level.

The diversity in the species of Ivory Coast is startling in comparison to a West African background, i.e. in neighboring Guinea, where 153 species and 54 genera are reported (Szlachetko & Kowalkowska 2007). Several species, or even genera, have their geographical boundary just in the Ivory Coast area.

