INTRODUCTION

Ivory Coast lies on the West African coast on the Gulf of Guinea. It is located between 2º30' and 8º37'W and between 4º22' and 10º55'N (Fig. 1). It comprises 322,460 km^2. 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 paralel 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	*Aerangis biloba*	1	1	16	*Angraecopsis parviflora*	1	0
2	*Aerangis calantha*	1	0	17	*Angraecopsis tridens*	0	1
3	*Aerangis kotschyana*	0	1	18	*Angraecum birrimense*	1	0
4	*Afrorchis sceptrum*	1	1	19	*Angraecum claessensii*	1	0
5	*Ancistrochilus rotschildianus*	1	1	20	*Angraecum distichum*	0	1
6	*Ancistrorhynchus akeassiae*	1	0	21	*Angraecum moandense*	1	1
7	*Ancistrorhynchus capitatus* Summerh.	1	0	22	*Angraecum multinominatum*	1	1
8	*Ancistrorhynchus cephalotes*	1	1	23	*Angraecum podochiloides*	0	0
9	*Ancistrorhynchus clandestinus*	1	1	24	*Angraecum pyriforme*	1	0
10	*Ancistrorhynchus metteniae*	1	0	25	*Angraecum subulatum*	1	1
11	*Ancistrorhynchus recurvus*	1	1	26	*Ansellia africana*	1	0
12	*Ancistrorhynchus strausii*	1	0	27	*Auxopus kamerunensis*	1	1
13	*Angraecopsis elliptica*	1	0	28	*Auxopus macranthus*	1	0
14	*Angraecopsis ischnopus*	1	1	29	*Brachycorythis buchananii*	0	1
15	*Angraecopsis macrophylla*	1	0	30	*Brachycorythis kalbreyeri*	0	1
				31	*Brachycorythis ovata*	1	0

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

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

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

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 additinally 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 oblidged 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 Cypripediaceae. 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 Cypripediaceae 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 Cypripediaceae 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. Schwartzkopffia**
– 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. Ancistrorhynchus**
– Stem elongate. Inflorescence elongate 52
52. Stem densely leaved. Inflorescence dense, many-flowered ..... **53. Calyptrochilum**
– 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. Ancistrorhynchus**
– 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. Diaphananthe**
– 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 furculate ..... **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 tuberoids. 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 Satyrieae. Staminodes 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 laterals 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 thickennings 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 staminodes. 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 180º). 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

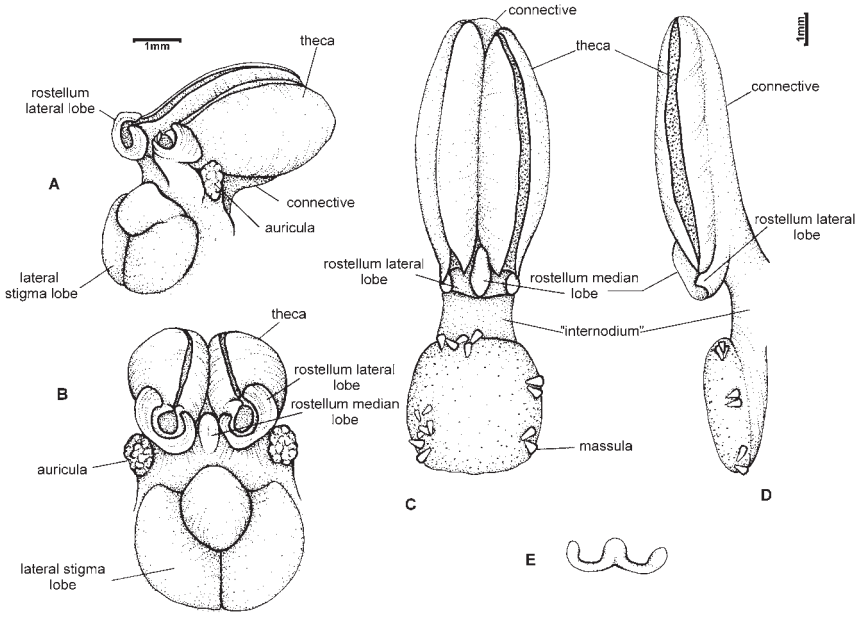

Fig. 2.–Gynostemium structure of *Disa* Bergius: A, D – gynostemium side view; B, C – gynostemium front view; E – rostellum remnant, front view (Szlachetko & Rutkowski 2000).