ON SOUTH AMERICAN PAPILIONACEAE

BY

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INTRODUCTION.

The present paper has been written in connection with the account of the Papilionaceae for Pulle's Flora of Suriname. The investigations were chiefly carried on in the herbarium of Utrecht; I also spent some time in the herbaria of Kew, Leiden and Paris and of the British Museum of Natural History in London. I wish to tender my best thanks to the directors and staffs of these institutions for their hospitality and assistance and also to the „Miquelfonds" which enabled me to go to London and Paris. Further I am indebted to the directors of the herbaria of Berlin-Dahlem, Brussel, Geneva and Leiden for lending specimens.

Miss A. Kleinhoonte, who first was to write the account of the Papilionaceae and had already determinated a large part of the material, could, owing to lack of time, not finish the work. Some new species and critical remarks were published by her in Rec. Trav. bot. neerl. XXV and XXX. On the suggestion of Prof. A. A. Pulle I have taken over her work. I wish to thank here Prof. Pulle for his advice and interest.

Literature. The standard work for the Papilionaceae of tropical South America is still Bentham's treatment in Martius Flora Brasiliensis XV, though of course so many new species have been described that it has become very incomplete and its nomenclature is no longer up to date. Bentham's work is especially important because Bentham was well acquainted with the Papilionaceae of other parts of the world also. After Bentham monographs even of genera are rare, and most of them deal with restricted areas only. It is a pity that in Engler Das Pflanzenreich no part of the Papilionaceae has as yet appeared. A revision of

many genera appears to be desirable, especially in connection with the question, whether Bentham's large conception of the genera is justified, or whether some recent authors are right in segregrating some genera.

A. Ducke, the student of the flora of the Amazonian district, has especially paid interest to the Papilionaceae (and Mimosaceae); his various publications, chiefly in Arch. Jard. Bot. Rio de Janeiro, are also important for the study of the Papilionaceae of Guiana.

Delimination of genera. In the delimination of the genera I have chiefly followed Bentham. For many of the large genera, as *Cassia* L, *Caesalpinia* L, *Bauhinia* L (f.e. Britton and Rose in N. Am. Flora!), *Desmodium* Desv. (Schindler) a far going segregration has been proposed. A general objection to these treatments is that they take into account the species of a restricted area only (with exception of Schindler's still little surveyable division of *Desmodium).* There are also some particular objections. For example, in my opinion *Herpetica* Raf. *(Cassia alata* L) and *Chamaesenna* (Raf.) Pittier (a.o. *Cassia reticulata* Willd.) cannot be considered as distinct genera. Taubert was certainly not justified in considering *Schnella* Raf. (as genus) and *Tylotea* Vog. (as section) as one section of the genus *Bauhinia* L. The distinguishing characters are given by Vogel in Linnaea XIII and by Bentham. The species enumerated by Britton and Rose under the genus *Schnella* Raf. belong all to the section *Tylotea* Vog., *Schnella* Raf. being restricted to Brazil and Guiana.

In several smaller genera, as *Canavalia* Adans., *Clitoria* L, *Macrolobium* Schreb.(?), *Mucuna* L, the sections distinguished by Bentham appear to be so natural that they are considered by some authors as distinct genera. With as much reason this could be done in the genera *Centrosema* D.C., *Dimorphandra* Schott, *Dioclea* H.B.K., *Ormosia* Jacks., *Peltogyne* Vog. etc.

The deliminations between the genera *Vigna* Savi, *Phaseolus* L and *Dolichos* L and between the genera *Lonchocarpus* H.B.K. and

Derris Lour. are still arbitrary. The problem can perhaps best be solved by distinguishing more genera.

Unidentified species. I have tried to identify as much as possible the species described from Guiana. In the following cases this was not possible, either because the type specimen was too incomplete or because I could not obtain the type specimen. The species enumerated under the nrs. 3, 4, 9, 10 and 13 are at any rate not known from Suriname.

1. **Bauhinia Outimouta** Aubl. 1775. Fr. Guiana.
   Type specimen consists of leaves only. Perhaps *B. rubiginosa* Bong.
2. **Bauhinia Richardiana** D.C. 1825. Fr. Guiana.
   Described from leaves only. Type specimen not seen.
3. **Cassia Otterbeinii** Mey. 1818. Br. Guiana.
   Type specimen not seen. Cited by B e n t h a m, who also did not see the type, as synonym of *Cassia glandulosa* L. sensu Benth.
4. **Cynometra racemosa** Benth. 1840. Fr. Guiana.
   Only once collected? Fruit not known.
5. **Dolichos scaber** Rich. 1792. Fr. Guiana.
   Type specimen could not be traced. Judging from the description, identical with *Dioclea glabra* Benth.
6. **Dolichos comosus** Mey. 1818. Br. Guiana.
   Type specimen not seen. Probably a species of *Dioclea* sectio *Pachylobium* Benth.
7. **Eperua stipulata** Kleinh. 1930. Suriname.
   Described from leaves only.
8. **Lonchocarpus chrysophyllus** Kleinh. 1930. Suriname.
   Type specimen incomplete.

9. **Machaerium polyphyllum** (Poir. 1816) Benth. 1838. Fr. Guiana.
B e n t h a m described a duplicate of the type specimen, Patris s.n. [G DC]; this specimen could not be traced in Geneva.

10. **Melanoxylon speciosum** R. Ben. 1920. Fr. Guiana (Marowijne Riv). According to D u c k e perhaps a species of *Recordoxylon* Ducke.

11. **Nissolia dubia** Poir. 1816. Fr. Guiana.
Type specimen not seen. Apparently a species of *Machaerium* Pers.

12. **Ormosia coarctata** Jacks. 1810. Br. Guiana.
Type specimen could not be traced in Br. Museum or Geneva.

13. **Spirotropis longifolia** (D. C. 1825) Baillon 1870. Fr. Guiana.
A monotypic(?) genus of the *Sophoreae*, of which the pod is still unknown. Once collected by R i c h a r d.

14. **Vouapa Simira** Aubl. 1775. Fr. Guiana.
The type specimen consists of undeveloped leaves only. Probably a species of *Peltogyne* Vog.

The present state of our knowledge of the Flora of Suriname.

A comparison with the Papilionaceae of the neighbouring countries shows that our knowledge of the Flora of Suriname is still very incomplete. The Papilionaceae of Pará are best known. In Arch. Jard. Bot. Rio de Janeiro D u c k e gives an enumeration of the Papilionaceae of Pará. According to him there are ± **160** species of the Papilionaceae-Caesalpinoideae and ± 220 species of the Papilionaceae-Papilionateae. For Suriname these numbers are respectively ± 85 and ± 130. (The cultivated and introduced species are not taken into account). Though probably the flora of Pará, which is much larger, is richer than that of Suriname, it is not to be expected that the difference is so great. Several of the species enumerated by D u c k e (especially of the Papilionatae, many species of the Caesalpinoideae having perhaps a restricted area) are probably merely not collected in Suriname.

In the first place this must be supposed of those species, which are also known from Br. and Fr. Guiana (*Cassia Apoucouita* Aubl.; *Cassia praetexta* Vog.; *Machaerium floribundum* Benth.; *Ormosia Coutinhoi* Ducke) or also from Fr. Guiana (f.e. *Cassia calycoides* D.C.; *Cassia Spruceana* Benth.; *Crudia bracteata* Benth.; *Crudia tomentosa* (Aubl.) Macbr.; *Machaerium altiscandens* Ducke; *Platymiscium filipes* Benth.) or also from Br. Guiana (f.e. *Bowdichia virgiloides* H.B.K.; *Cynometra bauhiniaefolia* Benth.; *Etaballia guianensis* Benth.; *Hymenaea palustris* Ducke; *Lonchocarpus rariflorus* Benth.; *Mucuna rostrata* Benth.). Of course there are also species known from Suriname and Pará, which are not yet collected in Br. or Fr. Guiana. (f.e. *Ormosia fastigiata* Tul.; *Ormosiopsis flava* Ducke; *Poecilanthe effusa* (Hub.) Ducke).

Abbreviations for herbaria.

Berlin-Dahlem	B.	Stockholm	S.
British Museum	BM.	Utrecht	U.
Göttingen	GÖTT.		
Kew	K.		
Leiden	L.		
Paris	P.		

NEW AND CRITICAL SPECIES.

DIMORPHANDRA Schott.

Dimorphandra conjugata (Splitg.) Sandw. in Kew Bull. 1932. 406; — *Mora conjugata* Splitg. in Tijdschr. Nat. Gesch. en Phys. IX (1842) 109; — *Dimorphandra latifolia* Tul. in Arch. Mus. Par. IV (1844) 189; Benth. in Benth. et Hook. f. Gen. Pl. I. 2 (1865) 587; Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922), IV (1925) 44.

The description of the hitherto unknown pod can now be given:

Pod dehiscent, linear-oblong, straight or slightly falcate, shortly acuminate or apiculate, with thickened margins, subglabrate, 12—20 cm long and 2—4 cm broad. Seeds flat, obliquely ovate, up to 1 cm long, with a thick albumen. Embryo with thin foliaceous cotyledons and a straight more or less fusiform radicula.

Fructiferous specimens: Suriname, Nickerie Riv. (Stahel and Gonggrijp 3576 [U]); Br. Guiana, Demerara Riv. (F.D. 2479 [K]).

Tulasne distinguished in the genus *Dimorphandra* Schott three sections: *Pocillum* Tul., *Eudimorphandra* Tul. and *Phaneropsia* Tul. The last section, represented by *D. latifolia* Tul. (= *D. conjugata* (Splitg.) Sandw.) only, was characterized by its included, villose petals and conspicuous persistent staminodes. The other character given by Tulasne: leaves simply pinnate, is incorrect, as already pointed out by Bentham. Tulasne's mistake is due to incomplete material, in reality the leaves of D. conjugata are 1-2-pinnate with (for this genus) very large leaflets.

Bentham referred Tulasne's section *Phaneropsia* to the genus *Mora* Schomb. ex Benth. and reduced the latter to a section

of the genus *Dimorphandra* Schott. The genera *Mora* and *Dimorphandra* were again separated by D u c k e, the main differences being that in *Mora* the leaves are simply pinnate and the seeds large and exalbuminous, while in *Dimorphandra* the leaves are bipinnate and the seeds small and albuminous. *D. conjugata* was retained by him in the genus *Dimorphandra.*

While the two remaining sections, *Pocillum* and *Eudimorphandra,* were distinguished by T u l a s n e and B e n t h a m chiefly on account of their staminodes — (staminodes broad and connivent in *Pocillum,* narrow and free in *Eudimorphandra)* — other distinguishing characters (in the form of inflorescence and pod) were given by D u c k e, who moreover described several species of the section *Pocillum* with aberrant staminodes. The two sections can now be characterized as follows:

Sectio **Pocillum** Tul.

Flores sessiles vel breviter pedicellati in racemis v. spicis paucis elongatis. Calyx campanulatus. Petala exserta glabra vel parce puberula. Staminodia decidua, interdum dilatata et connivéntia, antherifera vel anantherifera, saepius angusta et libera, anthera rudimentari praedita. Legumen late falciforme, dehiscens, lignosum. Semina plana, ovata. Foliola parva numerosa.

A survey of the species belonging to this section is given by D u c k e in Journ. Wash. Ac. Sc. 25 (1935) 193—198.

Sectio **Eudimorphandra** Tul.

Flores sessiles in spicis dense paniculatis. Calyx campanulatus. Petala exserta glabra. Staminodia decidua, angusta, libera, anantherifera. Legumen lineari-oblongum, crassum, coriaceum, indehiscens. Semina cylindrica.

D. conjugata has been placed on account of the inflorescence by D u c k e as well as by S p r a g u e and S a n d w i t h in the section *Eudimorphandra;* the pod however proves that T u l a s n e's

section *Phaneropsia* has to be reestablished. The flowers also are very characteristic.

Sectio **Phaneropsia** Tul.

Flores sessiles in spicis dense paniculatis. Calyx cylindricus. Petala inclusa pilosa. Staminodia subpersistentia, libera, angusta, anantherifera, lamina crassa carnosa a stipite abrupte distincta. Legumen lineari-oblongum, planum, rectum vel leviter falcatum, dehiscens. Semina oblique ovata, plana. Foliola pauca magna.

In general the 3 sections are sharply distinguished, so that D u c k e is inclined to speak of subgenera, but the place of *D. Davisii* Sprague et Sandwith, placed by the authors under *Pocillum*, is still doubtful. At present only infertile pods are known, which agree best with those of *Phaneropsia*. The form of the staminodes, the sericeous (though exserted!) petals and the few and large leaflets also point in this direction. The form of the inflorescence and calyx is as in *Pocillum*.

Dimorphandra (sectio Eudimorphandra) **Pullei** Amsh. n. sp.

Arbor excelsa, usque ad 50 m altus (teste Stahel et Gonggrijp). Ramuli petioli inflorescentiae rubiginoso-pubescentes. Folia 20-35 cm longa; pinnae 7-9-jugae, 5-15 cm longae; foliola alternata, petiolata,6-12-juga, oblongo-lanceolata, apice acuta vel breviter acute acuminata, basi obliqua, rotundata vel obtusa, 2,5—5 cm longa, 1-1,5 cm lata, supra nitidula glabra, subtus praesertim ad costam minute stellato-pubescentia; costa supra impressa subtus prominente, nervis utrinque tenuissime impressis. Inflorescentia spicata spicis corymboso-paniculatis; spicae tenuae 2-5 cm longae. Calyx campanulatus 1,5 mm longus, extus sparse pubescens, lobis brevibus imbricatis. Petala glabra, obovato-spathulata, incurva, 2,5 mm longa, 1,5 mm lata. Staminodia decidua, libera, apice anguste ovoideo-clavata. Ovarium sparse pubescens fere glabrum, subsessile, stylo brevissimo. Legumen lineari-ob-

longum, crassum, indehiscens, glabrum, 20-24 cm longum 3,5-4,5 cm latum.

Suriname: Coppename Riv., Raleighfalls (Stahel and Gonggrijp 6300 fl. and fr. Aug., type [U]; Voltzberg (Lanjouw 913 fl. Sept.).

„Branches and petioles rubiginous-pilose; flower-bud pinkish-brown. Tree about 30 m high." (Lanjouw).

Allied to *D. exaltata* Benth. and *D. multiflora* Ducke. Both those species have only 4—5-pinnate leaves; *D. exaltata* differs moreover by the prominulous venation of the leaflets and larger calyx-lobes; *D. multiflora* by the densely hirsute ovary.

COPAIFERA L.

Copaifera epunctata Amsh. n. sp.

Arbor. Folia 7-juga, 15-20 cm longa; foliola alternantia, breviter saepe late acuminata, obliqua, coriacea, glabra, crebre venulosa, ne quidem nova pellucido-punctata, terminalia 4—6 cm longa et —2cm lata, inferiora saepe minora. Flores sessiles albidi. Spicae 10 cm longae, paniculatae. Bracteas caducissimas non vidi. Sepala ± 4 mm longa, extus rufo-tomentosa vel glabrata, intus albido-villosa. Ovarium ad suturas villosum. Legumen fere orbiculatum, brevissime stipitatum, 3 cm longum et latum, glabrum. Semen unicum, ab arillo semicinctum.

Suriname: Brownsberg (tree n. 1069, type [U], B.W. 2213 ster., 2423 ster., 4721 fr. June, 6761 fl. Feb.; tree n. 1283, B.W. 6769 fl. Jan.).

Intermediate between *C. reticulata* Ducke and *C. Langsdorfii* Desf., differing from both species by its (constantly?) 7-jugate leaves and epunctate leaflets. The flowering plant much resembles *C. reticulata* Ducke, with leaflets of the same form and size. The fruit of *C. reticulata* is however quite different, being ovoid, often 2- or more-seeded, and with a slender about 5 mm long stipe. According to Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 46, the leaflets of *C. Langsdorfii* are always smaller

and (except in a Rio de Janeiro variety) always obtuse. The color of the arillus is said to be yellow in *C. reticulata*, and red in *C. Langsdorfii;* in C. *epunctata* it is unknown. The imperfectly known *C. venezuelana* Harms et Pittier, with fewer and larger leaflets is probably also a nearly allied species.

CRUDIA Schreb.

Crudia spicata (Aubl.) Willd. emend. Amsh.

— *Apalatoa spicata* Aubl. Pl. Guiane fr. I (1775) 383 t. 147 (descr. et ill. leguminis ad Pterocarpum Rohrii Vahl pertinentis exceptis); — *Crudia spicata* Willd. Sp. Pl. II (1799) 539; Urban in Symb. Ant. VI (1909) 11 in obs.; Pulle in Rec. Trav. bot. neerl. VI (1909) 269; — non *Crudia spicata* (Aubl.) Willd. sensu Benth. in Fl. Bras. XV. 2 (1870) 238 in obs.; Huber in Bol. Mus. Goeldi V (1909) 385; Ducke in Arch. Jard. Bot. Rio de Janeiro I (1915) 23; IV (1925) 262; (= *Crudia bracteata* Benth.); — non *Crudia spicata* (Aubl.) Willd. sensu Grisebach Fl. Br. W. Ind. (1860) 216; Fawcett et Rendle Fl. Jamaica IV (1920) 21 (= *Crudia antillana* Urban).

Arbor. Ramuli petioli pubescentes, rarius glabrati. Stipulae foliaceae, acuminatae, obliquae, —3 cm longae, —12 mm latae, deciduae. Folia 6—15-foliata, saepe 13-foliata, —35 cm longa; foliola oblonga, apice acuminata vel caudato-acuminata, membranacea, utrinque parce pubescentia vel rarius glabrata, 6—9 cm longa, 2—2,5 cm lata. Racemi densiflori; rachis bracteae bracteolae pedicelli pubescentes. Bracteae ovatae, obtusae, 8—15 mm longae 4—8 mm latae. Sepala ovata, puberula, ± 5 mm longa; receptaculum oblique turbinatum, 3 mm longum. Ovarium tomentosum; stylus basi excepta glaber 8 mm longus. Legumina stipitata, juniora tomentosa, adulta non vidi.

Fr. Guiana, in sylvis Guianae (Aublet s.n. fl., type [BM]).
Surinam e: Pikien Rio near Dekweh (Tresling 212 fl. 23—7—1908); Brownsberg (tree n. 1335 unripe pods 24—9—1931).

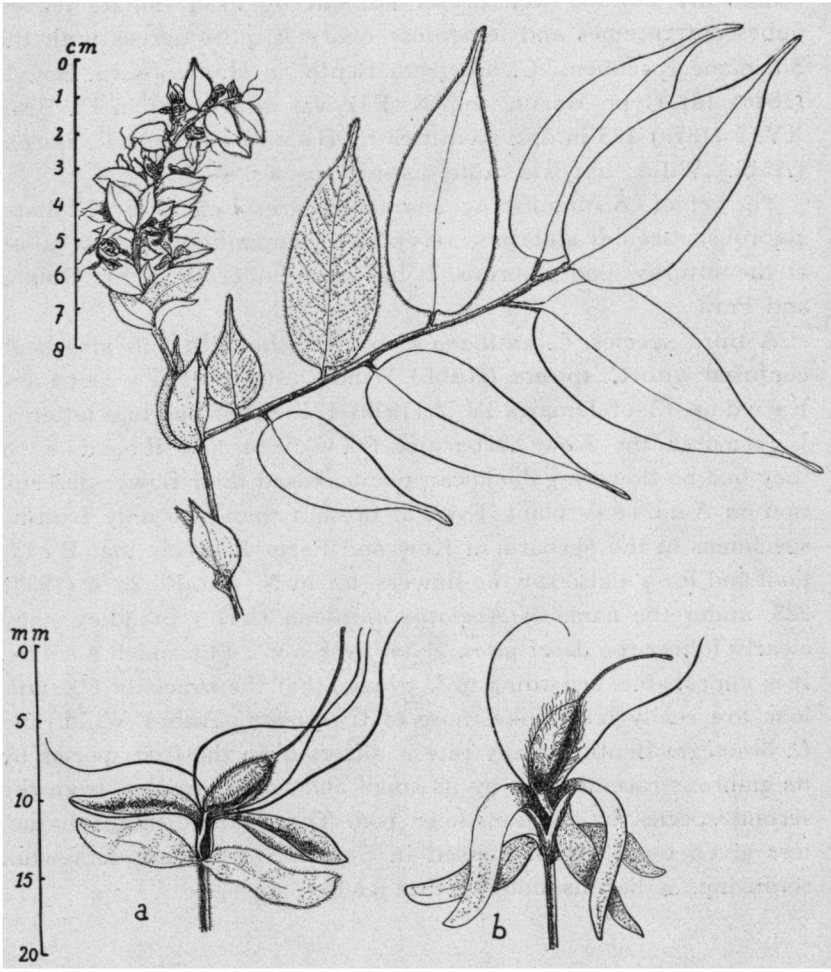

Fig. 1. *Crudia spicata* (Aubl.) Willd. (Tresling 212). a. Flower. *Crudia bracteata* Benth. b. Flower (anthers delapsed) (H.J.B.R. 5630).

The type specimen of Aublet has glabrate leaves. Its inflorescences are not too well preserved, but by its 13-foliate leaves, pubescent racemes and tomentose ovary it quite agrees with the Suriname specimens. *C. bracteata* Benth. in Hook. Journ. Bot. II (1840) 101 (type Martin s.n. [K; P]) was afterwards in Fl. Bras. XV. 2 (1870) 238 in obs. identified by Bentham with *C. spicata* (Aubl.) Willd., but is a quite distinct species.

The chief distinguishing characters are: Leaves 5—7-foliate, glabrous; racemes glabrous; receptacle campanulate; ovary pilose at the sutures; pod glabrous. It has been collected in Fr. Guiana and Pará.

A third species, *C. antillana* Urb. from Jamaica, has also been confused with *C. spicata* (Aubl.) Willd., lastly by Fawcett and Rendle, Fl. of Jamaica IV. 2 (1929) 121. According to a letter of Urban in the Kew herbarium Fawcett and Rendle, as they had no flowering Jamaican plants, based their flower-description on Aublet's plant. Even at present there are only fruiting specimens in the herbaria of Kew and Paris. It seems that Britton and Rose also saw no flowers, for in N. Am. Fl. 23. 4 (1930) 223, under the name of *Apqlatoa antillana* (Urb.) Standley, they clearly follow the description given by Fawcett and Rendle. It is improbable, according to Urban, that the bracts of *C. antillana* are really large, like those of *C. spicata* (Aubl.) Willd. and *C. bracteata* Benth. At any rate it differs from the first species by its glabrous racemes and by its small and linear stipules, from the second species by its tomentose pod. The distinguishing characters given by Urban himself in Symb. Ant. VI are somewhat confusing, as he misquotes Bentham.

Crudia aromatica (Aubl.) Willd. Sp. Pl. II (1799) 540; — *Touchiroa aromatica* Aubl. Pl. Guiane fr. I (1775) 385 t. 148; — *Crudia unifoliata* Kleinh. in Rec. Trav. bot. neerl. XXX (1933) 170.

I have compared the Suriname material with Aublet's specimen in the British Museum, which seems to be the plant figured on Aublet's tab. 148.

Crudia oblonga Benth. Bot. Sulph. (1844) 89 in obs., Fl. Bras. XV. 2 (1870) 238 in obs.; — *Crudia pubescens* Benth. in Fl. Bras. l.c. 240.

Type specimen of *C. oblonga* Benth. is Martin s.n. [K] from Fr. Guiana, though B e n t h a m afterwards in Fl. Bras. l.c. gives as type locality: America centralis and the Index Kewensis: India occidentalis. Martin's specimen has shortly acuminate leaflets, while *C. pubescens* Benth. (type Spruce [K] from the Rio Negro) is in Fr. Guiana also a more common form; it has obtuse and somewhat broader leaflets.

Since the name of the genus *Crudia* Schreb., has to be conserved against *Apalatoa* Aubl., the correct name for the species usually named *C. obliqua* Griseb. is **Crudia glaberrima** (Steud.) Macbr. (*Hirtella glaberrima* Steud., *Apalatoa glaberrima* Taub.), and for *Crudia Parivoa* D. C.: **Crudia tomentosa** (Aubl.) Macbr. (*Parivoa tomentosa* Aubl., *Apalatoa tomentosa* Taub.).

PELTOGYNE Vog.

Peltogyne paniculata Benth. in Hook. Journ. Bot. II (1840) 96, Fl. Bras. XV. 2 (1870) 231 t. 60 fig. 1; Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 94, t. 19 fig. 5; IV (1925) 265, Trop. Woods. 54 (1938) 3.

Distribution: Amazonas, Pará.

Peltogyne pubescens Benth. in Hook. Journ. Bot. II (1840) 96, Fl. Bras. XV. 2 (1870) 231, 232 in obs.; Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 95, Trop. Woods 54 (1938) 4; Sandwith in Kew Bull. 1931. 366; Britton et Rose in Ann. N. Y. Acad. Sc. 35 (1936) 65; — *Peltogyne paniculata* Benth. sensu Pulle Enum. (1906) 210; Pittier in Trab. Mus. Com. Ven. III (1928) 69; Benoist

in Arch. Bot. V. 1 (1931) 108 passim; — *Peltogyne venosa* Benth. in Fl. Bras. l.c. p.p. (quoad legumen tantum); — *Peltogyne amplissima* Pittier ex Knuth in Fedde Rep. XLIII (1928) 370 n.n.

Distribution: Guiana, Rio Branco, Venezuela, ? Colombia.

The two species are nearly allied and have often been confused. The typical *P. paniculata* and *P. pubescens* differ in the following characters:

1. Leaflets oblong, acuminate; indumentum of the inflorescence shortly adpressed-pubescent; flowers ± 5 mm long with short stipe; petals white; style as long as the ovary; pod at the upper suture narrowly marginate. ..... **P. paniculata** Benth.

2. Leaflets ovate-oblong, obtuse; indumentum of the inflorescence loosely pubescent; flowers ± 7 mm long with longer stipe; petals pink; style twice as long as the ovary (and stamens in accordance); pod not marginate. ..... **P. pubescens** Benth.

Of these characters, some have proved inconstant. The form of the leaflets in the two species for example is more variable and therefore less characteristic than many authors have realized. Specimens of *P. pubescens* from Suriname and Fr. Guiana provided with oblong and acuminate leaflets have consequently been determinated as *P. paniculata,* and D u c k e has even been inclined to consider *P. pubescens* as a variety of the latter. In Tropical Woods l.c. D u c k e however treats them as two distinct (though not sharply distinct) species.

The bark of *P. pubescens* is said to be greyish (D u c k e, Rio Branco), nearly black, rust-brown on cross section (G o n g g r ij p, Suriname) or reddish-brown (S a n d w i t h, Br. Guiana); its heart wood bright-violet (D u c k e, Rio Branco) or violaceous-brown to brown-violaceous (P f e i f f e r, Suriname). *P. paniculata* has according to D u c k e a ferrugineous, smooth bark and a red-brown to brown-purple heartwood.

In two specimens of *P. pubescens* from Suriname (B.W. 6889 and 6899) the style is only slightly longer than in *P. paniculata.*

The leaflets of these specimens are also aberrant; they are thick-coriaceous and covered with traces of a white wax. Such leaves are also known in *P. paniculata.*

P. latifolia (Hayne) Benth. (*Hymenaea latifolia* Hayne), according to Hayne a specimen of an unknown collector from Bahia, according to Bentham a plant of Sieber from Pará, was only known to Bentham from the description and figure given by Hayne. The type was kindly lent to me by the Berlin Herbarium; it is at any rate not identical with *P. pubescens,* as suggested by Bentham, but appears to approach *P. floribunda* (H.B.K.) Benth.

Peltogyne venosa (Vahl.) Benth. in Fl. Bras. XV. 2 (1870) 233 in obs. (descr. leguminis excepta); Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 98 (descr. leguminis excepta); Benoist in Arch. Bot. V. 1 (1931); — *Peltogyne confertiflora* Benth. sensu Pulle Enum. (1906) 210; Pfeiffer Houts. v. Suriname I (1926) 259 fig. 39 non Benth. 1870.

Distribution: Guiana.

Bentham's fruit description is incorrect; the fructiferous specimen of Martin [K] cited by him belonging to *P. pubescens* Benth. Bentham remarks that *P. venosa* resembles *P. densiflora* Spruce ex Benth. except for the pod and the glabrous ovary. The pod however, already correctly described by Benoist l.c., is quite similar to that of *P. densiflora.* The specimen B.W. 5852 from Suriname is a small-flowered form which on account of its tomentose ovary must be reckoned to *P. densiflora,* but agrees otherwise perfectly with the specimens of *P. venosa* from Br. Guiana (which I compared at Kew). *P. densiflora* can therefore best the treated as a variety of *P. venosa.*

Peltogyne venosa (Vahl) Benth. var. **densiflora** (Benth.) Amsh. nov. comb.; — *Peltogyne densiflora* Spruce ex Benth. in Fl. Bras.

XV 2 (1870) 232 t. 60 fig. 2; Ducke in Arch. Jard. Bot. Rio de Janeiro I (1915) 25, III (1922) 99 t. 60 fig. 2, Trop. Woods 54 (1938) 5; — *Peltogyne paraensis* Huber teste Ducke.

A specie differt ovario tomentoso, floribus roseis (rarius albis).

Distribution: Amazonian district, Suriname (Corantijne Riv. Kaboeri, tree n. 501; B.W. 4741 ster., 5852 fl. May, 5911 fr. July).

Possibly *Vouapa Simira* Aubl. belongs here. The vernacular name given by Aublet (Simira) points either to *Hymenaea Courbaril* L. (Simiri of the Caraibs) or to a *Peltogyne* species (Simirang of the Caraibs), the wood described by Aublet as violaceous, to a species of *Peltogyne*. Aublet's type specimen in the British Museum consists of a sterile branch with three very young and undeveloped 2-foliate leaves (exactly as described by Aublet). As the fruits described by Aublet can hardly belong to a member of this family, the species remains doubtful.

According to the form of the pod and the development of the receptacle, in *Peltogyne* four groups can be distinguished. Of three of these groups the pods have been described and figured by Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 98 pl. 19.

I. Receptaculum campanulatum. Legumen planum, oblique rhomboidum vel triangulare, dehiscens, coriaceum, venosum, sutura superiore anguste marginata (rarius emarginata). Semina arillo parvo praedita. (Group of *P. paniculata* Benth.).

II. Receptaculum campanulatum. Legumen planum, plus minusve orbiculatum, indehiscens, coriaceum, venosum, sutura superiore anguste sed distincte alata. Semina arillo minuto praedita. (Group of *P. venosa* (Vahl) Benth.).

III. Receptaculum brevissimum. Legumen planum, orbiculatum, indehiscens, exalatum, coriaceum, venosum. (Group of the type species, *P. discolor* Vog.).

IV. Receptaculum brevissimum. Legumen plano-compressum, dehiscens, exalatum, sublignosum. Semina exarillata.

To this group belong *P. porphyrocardia* Grisebach (Trinidad), *P.*

floribunda (H.B.K.) Benth. (Orinoco, and Rio Branco when Ducke's identification of H.J.B.R. 3860 is correct) and probably *P. latifolia* (Hayne) Benth. (Bahia?). According to Bentham, *P. porphyrocardia* Grisebach n.n. is probably synonymous with *P. floribunda* (H.B.K.) Bth., but it has been described by Williams in Flora of Trinidad and Tobago as a distinct species.

EPERUA Aubl.

Eperua stipulata Kleinh. in Rec. Trav. bot. neerl. XXX (1933) 171; — *Eperua Schomburgkiana* Benth. aff. Pfeiffer Houts. v. Suriname I (1926) 248.

This species, described from leaves only, is characterized by its large stipules and therefore in all probability identical with *E. Jenmani* Oliv., known from Br. and Fr. Guiana. As a wood sample has been collected and described by Pfeiffer l.c. it is hoped that one day my identification can be verified.

ELISABETHA Schomb. ex Benth.

Elisabetha coccinea Benth. in Hook. Journ. Bot. II (1840) 92; Ducke in Trop. Woods 37 (1934) 19; — *Elisabetha oxyphylla* Harms in Notizblatt 59 (1915) 316; Ducke in Trop. Woods. l.c.

The type specimen of *E. coccinea* Schomburgk s.n. from Br. Guiana has retuse leaflets. All other specimens seen from Br. Guiana, (Myers 5906 [K]; Im Thurn [K], Appun [K; B.M], Rich. Schomb. [B]) as well the Suriname specimens collected along the Corantijne River, have acute or obtuse leaflets. They (especially the narrow-leaved forms) agree therefore with Ule 8146 (compared at Kew) from an affluent of the Rio Branco, the type of *E. oxyphylla*, distinguished from *E. coccinea* on account of this leaf-character. As no other differences could be

seen it is probable that the type of *E. coccinea* (though badly preserved) is merely a specimen with abnormal leaflets.

Elisabetha coccinea differs from *E. princeps* Benth. and its allies by its relatively few and large leaflets and early deciduous, inconspicuous (at least not known) stipules and above all by its pod. The upper suture of the pod is in *E. princeps* and allies incrassate and dilated, in *E. coccinea* narrow and margin-like.

BAUHINIA L.

Bauhinia cinnamonea D. C. Prod. II (1825) 517; Benth. in Fl. Bras. XV. 2 (1870) in obs.; Sagot in Ann. Sc. Nat. (1882) 317 p.p. (descr. florum excepta); — *Bauhinia Versteegii* Pulle Enum. (1906) 213 t. XI.

Distribution: Fr. Guiana (Martin s.n. fr. [P], type).
Surinam e: Upper Gonini Riv. (Versteeg 163 fl. and. fr. Aug., type of *B. Versteegii* Pulle; Gonggrijp 3699 fl. Feb.); Upper Suriname Riv. near Goddo (Stahel 119 fl. and fr. Jan.).

B. cinnamonea was placed by de Candolle (to whom the flowers were unknown) in the section *Caulotretus* Rich. (= *Schnella* Raddi) and is mentioned by Bentham, who did not see the plant, as possibly identical with *B. smilacina* (Schott) Steud. Sagot even ascribed to it a detached flower belonging to some *Bauhinia* species of the section *Tylotea* Vog. (probably *B. rubiginosa* Bong.). *B. cinnamonea* however belongs to the group of *B. holophylla* (Bong.) Steud. in the section *Pauletia* D. C.

Bauhinia rubiginosa Bong. in Mem. Acad. Petrogr. VI (1836) 4; Benth. in Fl. Bras. XV. 2 (1870) 208; Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 109; — *Schnella rubiginosa* Benth. in Hook. Journ. Bot. II (1840) 97; — *Bauhinia dubia* Vog. in

Linnaea XIII (1839) 314 non G. Don 1832; — *Bauhinia coronata* Benth. in Fl. Bras. l.c. 209; Pulle Enum. (1906) 214; — *Bauhinia speciosa* Vog. l.c. non Roxb. 1825 n.n.; — *Bauhinia superba* Steud. Nom. ed. 2 (1841) 192; — *Bauhinia riparia* Splitg. ex Benth. in Fl. Bras. l.c. 208 in obs. p.p. (legumine excepto); — *Bauhinia marowijnensis* Kleinh. in Rec. Trav. bot. neerl. XXX (1933) 72.

In the typical *B. rubiginosa* the leaves are bifid. Specimens in which the leaves are bipartite or even bifoliate have, on account of this character and of the greater or lesser development of bracts and bractlets, often been described as distinct species. The division of the leaves and the size of bracts and bractlets is however very variable, often even in the same specimen (see also Ducke l.c.).

Bauhinia dubia Vog., named *B. coronata* by Bentham, type specimen Poiteau [B] from Fr. Guiana, is a form with 2-foliate leaves and relatively small bracts and bractlets (± 3 mm long). The specimen Versteeg 241, enumerated by Pulle as *B. coronata*, agrees better with the following form.

Bauhinia speciosa Vog., named *B. superba* by Steudel, type specimen Poiteau s.n. [B] from Fr. Guiana, entirely agrees with *B. marowijnensis* Kleinh., type specimen Kappler s.n. [L; U]. The leaves in this form are bipartite.

Bauhinia riparia Splitg. ex Benth., type specimen Splitgerber 548 [K; L; P] from Suriname, has completely bifoliate leaves, but otherwise agrees with *B. speciosa*. The pod Bentham describes as „legumen multo majus" (than in *B. rubiginosa)* is probably the detached pod found on a sheet of Martin s.n. [K]; this pod however does not belong to it. Curiously enough the sheet of Splitgerber 548 in the herbarium of Leiden does not bear any name, while on the duplicates sent to Kew and Paris the name *B. riparia* Splitg. was written.

In general it can be said that the specimens from N. Brazil and Guiana have deeper divided leaves and smaller flowers than those found in S. Brazil, but that those characters are in both regions variable.

Possibly *B. Outimouta* Aubl. is identical with *B. rubiginosa*. The type specimen of Aublet [B.M.], consists of very large, membranaceous, 2-foliate leaves only. Similar leaves have been collected in Suriname, but only on sterile specimens. Perhaps they are leaves from young plants or from coppice shoots.

Bauhinia guianensis Aubl. Pl. Guiane fr. I (1775) 377 t. 145; — *Bauhinia splendens* H.B.K. var. *latifolia* Benth. in Fl. Bras. XV. 2 (1870) 209; — *Bauhinia chrysophylla* Vog. in Linnaea XIII (1839) 21 teste Benth. l.c.

The type specimen of Aublet [B.M.] consists of a leafy branch with a deflorated raceme and some traces of a pod. As other (flowering) specimens have been collected in Fr. Guiana (Martin s.n. [B.M.]) and in Suriname (Stahel 129 [U]) it can now be identified with certainty. The leaves of the type specimen are not completely glabrous, as described bij Aublet, but minutely pubescent beneath. Such feeble pubescence can often be found in the broad-leaved (4—5-nerved) specimens distinguished by Bentham as *B. splendens* var. *latifolia*.

The later described *B. splendens* H.B.K. must now be treated as a variety:

B. guianensis Aubl. var. **splendens** (H.B.K.) Amsh. nov. comb. — *Bauhinia splendens* H.B.K. Nov. Gen. Sp. VI (1824) 321; Benth. in Fl. Bras. XV. 2 (1870) 208; — *Schnella splendens* Benth. in Hook. Journ. Bot. II (1840) 97; — *Bauhinia guianensis* Pulle Enum. (1906) 214.

Bauhinia surinamensis Amsh. n. sp.

— *Bauhinia angulosa* Vog. sensu Pulle in Rec. Trav. bot. neerl. IX (1912) 139 non Vog. 1839.

Frutex scandens cirrhifer trunco complanato. Ramuli juniores inflorescentiae breviter ferrugineo-pilosi. Folia basi cordata vel rotundata, ad $^1/_3$ usque ad $^1/_2$ biloba lobis acuminatis, coriacea, supra glabra nitida, subtus pubescentia, 7—9-nervia; 7—10 cm

longa 5—7 cm lata. Racemi laxi. Bracteae —2 mm longae, deciduae. Pedicelli 8—12 mm longi, graciles, minute bibracteolati. Alabastra urceolato-globosa, umbone minute 5-dentato coronata, ferrugineo-pubescentia. Calycis tubus campanulatus, interdum irregulariter breviter fissus, 5—7 mm longus. Petala unguiculata, auriculata, obovata, extus villosa, 1 cm longa, summum complicatum. Stamina 10 fertilia antheris parvis ovatis. Ovarium subsessile villosum stylo glabro aequilongum. Legumen non visum.

Suriname: Upper Suriname Riv. near Kabelstation (Lanjouw 1152 fl. Nov., type [U]); Brownsberg (Stahel and Gonggrijp 712 fl. Sept.; B.W. 3258 fl. Sept.); Lucie Riv. (Hulk 357 fl. Oct., named B. angulosa by Pulle l.c.).

Nearly allied to *B. guianensis* Aubl. (*B. splendens* H.B.K.) and differing chiefly by its much longer pedicels. Moreover the leaves in *B. guianensis* seem to be constantly 2-foliate or nearly so and the indumentum of the inflorescence much shorter. *B. angulosa* Vog. has the calyx-lobes oblong as in *B. rubiginosa.*

Bauhinia cumanensis H.B.K. Nov. Gen. et Sp. VI (1824) 321; Benth. in Fl. Bras. XV. 2 (1870) 212; — *Schnella cumanensis* Britton et Rose in N. Am. Fl. 23.4 (1930) 206; — *Bauhinia columbiensis* Vog. in Linnaea XIII (1839) 313; — *Schnella columbiensis* Benth. in Bot. Voy. Sulph. (1844) 89; Britton and Rose in N. Am. Fl. l.c. and in Ann. N. Y. Acad. Sc. 35 (1936) 163; — *Schnella brachystachya* Benth. in Hook. Journ. Bot. II (1840) 98.

The Suriname specimens as well as Schomburgk, type of *Schnella brachystachya* from Br. Guiana, belong to the form with rounded leaflets described by Vogel as *B. columbiensis*, which Bentham already considered as synonymous with *B. cumanensis* H.B.K., but which Britton and Rose reinstate as a distinct species.

CASSIA L. s.l.

Cassia fruticosa Mill. Dict. ed. 8 (1768) n 10; Rel. Houst. t. 17;

Fawcett and Rendle Fl. Jamaica IV (1920) 103; — *Chamaefistula fruticosa* Pittier in Trab. Mus. Com. Ven. III (1928) 152; Britton and Rose in N. Am. Fl. 23.4 (1930) 237 quoad nomen tantum non quoad descr.; — *Cassia bacillaris* L. f. Suppl. (1781) 231; Benth. in Fl. Bras. XV. 2 (1870) 98 t. 31, Trans. Linn. Soc. 27 (1871) 521, aliis auctoribus.

Britton and Rose l.c. identify — without commentary — a Panama species with *C. fruticosa,* and cite the locality Panama as well as the figure in Rel. Houst. with an interrogation sign. *C. fruticosa* Mill. was cited by Bentham as a synonym under *C. bacillaris.* After studying the type specimen, Houston fr. in the British Museum, I see no reason for doubting the correctness of Bentham's identification. The Panama species has according to Britton and Rose suborbiculate leaflets and a turgid, very broad (—2½ cm) pod and will resemble therefore, better than the type specimen itself, the figure in Rel. Houst., of which Bentham says: „The artist has so altered the proportions, shortening the leaflets and pod, and increasing the curvature of the latter, as to make it (the plant) quite unrecognizable."

Cassia nitida Rich. in Act. Soc. Hist. Nat. Par. I (1792) 451; — *Cassia viminea* L. sensu D. C. Prod. II (1825) 494 p.p. (quoad specimina Portoricensa); — *Cassia quinquangulata* Rich. sensu Urban in Symb. Ant. IV (1905) 272 non Rich. 1792; — *Chamaefistula antillana* Britton et Rose Sc. Surv. Porto Rico V (1924) 369, N. Am. Fl. 23.4 (1930) 233.

The type specimen, Leblond s.n. [P], from the „Antilles" is one of the plants alluded to by Richard in a note at the end of his Catalogus Plantarum..... e Cayenne missarum a domino Le Blond: Pleraeque plantae Gallo-guianenses, nonnullae Martinicences. De Candolle and Bentham who did not see the

plant tried to identify it with a Guiana *Cassia* species (De Candolle with *C. Apoucouita* Aubl., Bentham with *C. viminea* L. sensu Benth.).

Cassia lucens Vog. Syn. Cass. (1837) 46, Linnaea XI (1837) 687; — *Cassia racemosa* Mill. sensu Benth. in Fl. Bras. XV. 2 (1870) 126, Trans. Linn. Soc. 27 (1871) 549; Pulle Enum. (1906) 216 aliis auctoribus; non *C. racemosa* Mill. Dict. ed. 8 (1768); Vogel in Linnaea XV (1841) 170; Craib in Kew Bull. 1912. 151 passim.

I failed to identify the type specimen of *Cassia racemosa* ([B.M] from Colombia) with any *Cassia* species known to me. At any rate it can not be identical with *C. lucens* Vog., as supposed by Bentham, the form of the inflorescence and the number, form and venation of the leaflets being different (the flowers are poorly developed). A description of Miller's plant is given by Vogel in Linnaea XV. l.c., who considered it a poor specimen of a doubtful species.

Cassia viscosa H.B.K. Nov. Gen. et Sp. VI (1824) 360; Benth. in Fl. Bras. XV. 2 (1870) 132, Trans. Linn. Soc. 27 (1871) 559; — *Grimaldia viscosa* Britton et Rose in Ann. N. Y. Acad. Sc. 35 (1936) 187; — *Cassia cuneifolia* Vog. Syn. Cass. (1837) 51, in Linnaea XI (1837) 695; — *Grimaldia cuneifolia* Britton et Rose in Ann. N. Y. Acad. Sc. l.c.; — *Cassia viscoso-pilosa* Steud. in Flora 1843. 760.

var. **acutifolia** Ducke in Arch. Jard. Bot. III (1922) 116; — *Grimaldia columbiana* Britton et Rose in Ann. N. Y. Acad. Sc. l.c.

Britton and Rose distinguish a form with ovate acute leaflets as *G. columbiana* and a form with obcordate leaflets as *G. cuneifolia* (they consider *C. viscosa* as a doubtful species perhaps synonymous with *C. hispidula* Vahl). The type specimen of *C. viscosa* H.B.K. ([P] from Colombia) shows obcordate, ovate and

intermediate leaflets. All other specimens seen from Colombia (several specimens in the Paris herbarium and in the Kew herbarium André 867 and 2922 cited by Britton and Rose under *G. columbiana)* have ovate leaflets, which may be either rounded or obtuse and aristellate at the apex or acute. This form occurs also, though less common than the form with obcordate leaflets, in Brazil and has been described by Ducke as *C. viscosa* var. *acutifolia.* The type specimen itself proves by the variability of its leaflets that it is not possible to distinguish two species on account of leaf characters only.

The pubescence of the pod in the Colombian specimens is somewhat longer than in the Brazilian specimens.

Cassia faginoides Vog. Syn. Cass. (1837) 50, — *Cassia hispidula* Vahl var. *faginoides* Benth. in Fl. Bras. XV. 2 (1870) 131; — *Cassia Killipii* Rose in Journ. Wash. Acad. Sc. 17 (1927) 167; — *Grimaldia Killipii* Britton et Rose in N. Am. Fl. 23.5 (1930) 301; — *Grimaldia decora* Britton et Rose in N. Am. Fl. l.c.

Considered by Bentham as a variety of *C. hispidula* Vahl, differs from that species by its rounded flower-buds and pubescent leaflets only (in *C. hispidula* the buds are acuminate and the leaflets glabrous). The type specimen (Sellow, duplicate seen in Paris, and several other specimens from S. Brazil in Paris and Kew) agrees well with *G. decora* Britton et Rose (type Palmer 501, duplicate seen in Kew) except for the somewhat more strongly nerved leaflets. I consider *G. Killipii* as a small-leaved, few-flowered form. The Suriname specimen, Frickers and Muller 19, belongs to this form.

Distribution: Central America, Venezuela (Gonggrijp [U]), Suriname, Brazil.

Cassia tetraphylla Desv. s.l.; — *Cassia Desvauxii* Coll.

Of the section *Chamaecrista,* to which this and the following

species belong, Bentham says (in Trans. Linn. Soc. 27 (1871) 512):

„(The section is) an exceedingly puzzling one to botanists. The nicest shades by which the majority of forms pass into each other make it impossible to settle what is to be regarded as species with any satisfaction." This citation is especially applicable to the 4-foliate *Cassiae* of the series *Xerocalyx* Vog. The apparently quite independently varying characters are: form and size of the leaflets, length of the pedicels, size of the flowers, gland (stipitate-sessile) etc. (especially if one takes into account specimens from different regions).

Bentham distinguishes in this group 8 species („species omnes vix inter se distinctae"). In Suriname 3 forms can be distinguished; according to Bentham's treatment in the Flora Bras. one must be reckoned to *C. Desvauxii* Coll., one to *Cassia uniflora* Spreng., while the third is a mountain form apparently not described before.

As probably synonymous with *C. uniflora* Spreng. Bentham cites *C. Persoonii* Coll. This name was given by Colladen in 1816 to *C. lanceolata* Pers. 1806 (non Forsk. 1775) and has been accepted by most authors, because it is the oldest (though doubtful) name and because *C. uniflora* Spreng. is a later homonym of *C. uniflora* Mill. 1768. Probably a specimen named *C. lanceolata* in the herbarium Persoon [L] has to be regarded as the type specimen. It has linear-oblong, 12—14 mm long and 3—5 mm broad leaflets, lanceolate-cordate stipules of nearly the same length, solitary sessile petiolar glands and one slender flowering pedicel about 3,5 cm long, bearing neither flowers nor fruits. Perhaps a better duplicate may be found in the herbarium Lamarck [P], from where Persoon's specimen must have come, but I could not trace it. It is however already evident that *C. lanceolata* Pers. cannot be identified with *C. uniflora* Spreng., which (according to Bentham) has oblong leaflets, a stipitate gland, and shorter and thicker pedicels.

The type specimen of *C. tetraphylla* Desv. [P] can be characterized as follows:

Stems and pedicels yellowish-short-pubescent. Leaflets obovate, — 1 cm long. Stipules cordate-lanceolate, acuminate at the apex, — 1 cm long. Petiolar gland sessile, depressed. Pedicels slender, during flowering 1—2 times as long as the leaves. Largest sepals ± 1 cm long. Petals somewhat longer than the sepals. Ovary villose. Pod oblong, — 3 cm long and 6 mm broad, adpressed pubescent.

To this species is also reckoned by Bentham an Amazonian form with ± oblong, larger leaflets, larger flowers and pedicels shorter than the leaves. Some Suriname specimens agree with this form; it is probably the same as the form identified by Britton and Rose with *C. pulchra* H.B.K. (But this species agrees perfectly with *C. tetraphylla* Desv.; compared in Paris).

In order to add as little as possible to the confusion, I have treated the 3 Suriname forms as varieties of the first legitimately published species, *C. tetraphylla* Desv. It is probable that the other species admitted by Bentham may also be considered as varieties, but the delimination of those varieties in the different regions will need a special study.

Cassia tetraphylla Desv. Journ. Bot. III (1814) 72; — *Chamaecrista tetraphylla* Britton et Rose in Ann. N. Y. Acad. Sc. 35 (1936) 183; — *Cassia Desvauxii* Coll. Hist. Cass. (1816) 131; Benth. in Fl. Bras. XV. 2 (1870) 157, Trans. Linn. Soc. 27 (1871) 568 p.p.; — *Cassia pulchra* H.B.K. Nov. Gen. et Sp. VI (1824) 362; — *Chamaecrista pulchra* Britton et Rose l.c. quoad nomen.

Distribution: S. Brazil, Colombia, ...

var. **longifolia** Amsh.

A specie differt foliolis floribus majoribus pedicellis quam folia brevioribus.

Pará: H.J.B.R. 1780 [U], type.

Distribution: Amazonian district, Surinamé (the Suriname specimens with subobtuse stipules) .....

var. **ramosa** (Vog.) Amsh. nov. comb.

— *Cassia ramosa* Vog. Syn. Cass. (1837) 55 and in Linnaea XI (1837) 704; — *Cassia uniflora* Spreng. Neue Entd. I (1820) 291; Benth. in Fl. Bras. XV. 2 (1870) 157 t. 43 fig. 1; non Mill. 1768; — *Cassia uniflora* var. *ramosa* Benth. in Fl. Bras. l.c.; — *Cassia uniflora* var. *parvifolia* Benth. in Trans. Linn. Soc. 27 (1871) 568; Pulle Enum (1906) 217; — *Cassia savannensis* Miq. in Ann. Nat. Hist. 1843, 15.

A specie praesertim differt glandula stipitata.

Distribution: Brazil, Guiana, ...

var. **saxatilis** Amsh. nov. var.

A specie differt statura parva, foliolis oblongis, glandula majore scutellata brevissime stipitata, floribus minoribus.

Suriname. Upper Litanie Riv. (mount Knopaiamoi, Rombouts 809 type [U]; mount Teeboe, Versteeg 775 named *C. uniflora* Spreng. by Pulle l.c.); Voltzberg (Pulle 267; Lanjouw 871).

Cassia glandulosa L.

In recent floras (Fawcett and Rendle Fl. of Jamaica; N. Am. Fl.) this species is restricted to Jamaica. *Cassia virgata* Swartz, treated by Bentham as a distinct species, has proved to be identical with *C. glandulosa* L. The position of *C. glandulosa* L. sensu Benth. has consequently become doubtful. Its distribution is according to Bentham: Brazil, Guiana, Colombia and Peru. Bentham cites 7 synonyms the oldest of which, *C. Otterbeinii* Mey. 1818, is known from the description only. It is also evident that Bentham's conception of the species is much larger than will be tolerated by many authors.

Cassia disadena Steud. (type Hostmann 1179 from Suriname) also cited by Bentham as synonym of *C. glandulosa* L. sensu Bentham, agrees very well with a W. Indian variety of *C. glandulosa* L, the var. *Swartzii* (Wikstr.) Macbr. (*Cassia* or *Chamaecrista Swartzii* of other authors.) The only difference is that in

the two Suriname specimens most leaves have two petiolar glands, while in the W. Indian specimens two petiolar glands are an exception.

Cassia stenocarpa Vog.

In the Suriname specimens referred by me to this species the pubescence of the pod is longer than in the typical form; they agree however in this character with the description of *C. stenocarpa* given in the N. Am. Fl. (and with *C. Broughtonii* Fawcett and Rendle, considered in the N. Am. Fl. as a synonym).

Cassia Pennelliana Amsh. nom. nov.; — *Chamaecrista Browniana* Britton and Rose in N. Am. Fl. 23.4 (1930) 293, Ann. N. Y. Acad. Sc. 35 (1936) 117 in key, non *Cassia Browniana* Kunth 1824.

Of the two specimens collected by Rombouts under nr, 420, one agrees well with *Ch. Browniana* (compared with a specimen of Pennel in Kew from Colombia); in the other specimen collected under this nr. and in Rombouts 356, the pubescence and the gland are less developed and the leaflets more obtuse.

DICORYNIA Benth.

Dicorynia guianensis Amsh. n. sp.

— *Dicorynia paraensis* Benth. in Fl. Bras. XV. 2 (1870) 81 p.p. (quoad specimen citatum Sagot tantum); Pulle in Rec. Trav. bot. neerl. IV (1907) 131; Jansonius in Verh. Kon. Acad. Wet. Amsterd. 18.2 (1914) 35; Record Timbers of Trop. America (1924) 242; Pfeiffer Houts. v. Suriname I (1926) 262 pl. XI fig. 41; Benoist in Arch. Bot. V. 1 (1931) 117 pl. IV et XXIII.

Arbor excelsa cortice cinereo-brunnea. Stipulas non vidi. Ramuli juniores petioli inflorescentiae aureo-tomentosi. Folia 5—7-foliata; foliola ovata vel oblongo-ovata, basi obtusa vel rotundata,

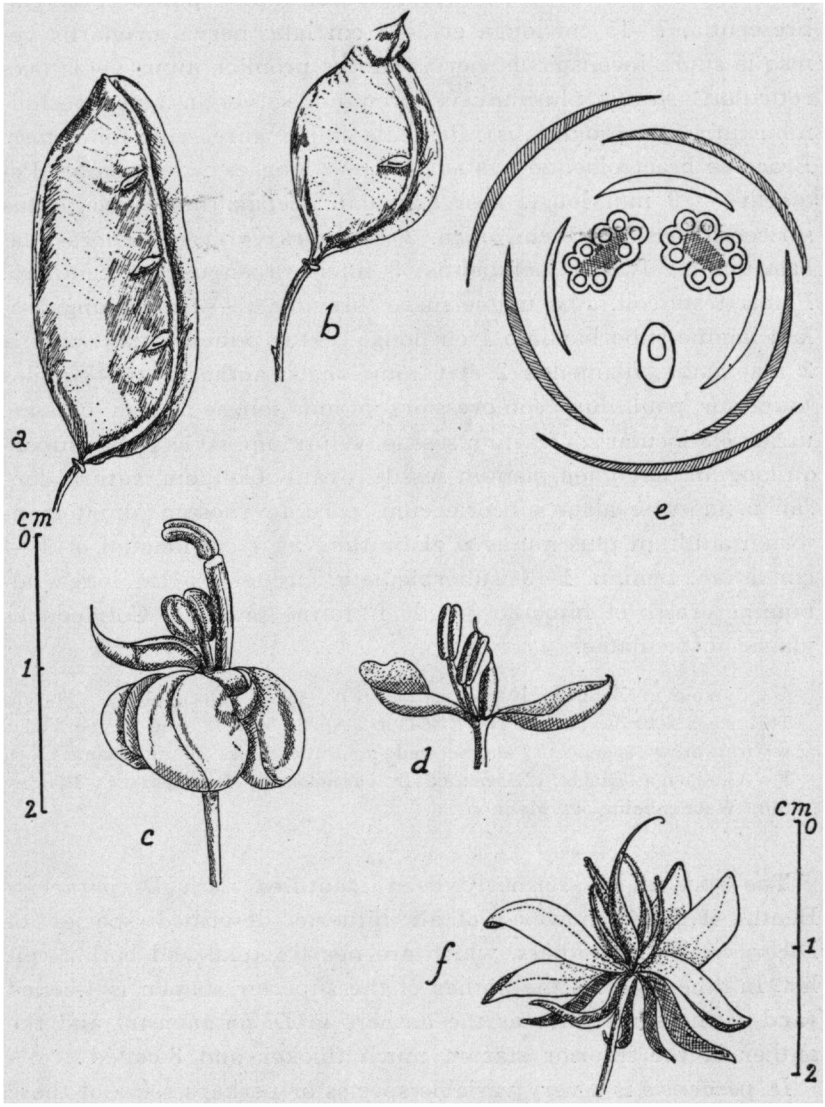

Fig. 2. *Dicorynia guianensis* Amsh. a. A 3-seeded pod. b. An 1-seeded pod. d. Flower, petals and part of the sepals removed (B.W. 452). e. Diagram. *Dicorynia paraensis* Benth. (forma? uaupensis Spruce). c. Flower. (H.J.B.R. 23319). *Martiusia parviflora* Amsh. f. Flower (B.W. 22).

apice acuminata, coriacea, supra glabra, subtus pubescentia glabrescentia, 7—15 cm longa et 3—6 cm lata; nervis primariis venisque supra inconspicuis, nervis subtus prominentibus venis laxe reticulatis subtus plusminusve prominulis (vel in aliis speciminibus utrinque prominulis). Panicula ampla, aureo-rufo-tomentosa. Bracteae bracteolaeque ovatae, —6 mm longae, caducissimae. Pedicelli — 9 mm longi, basi articulati. Sepala inaequalia extus sericeo-tomentosa, 1 cm longa, 2 exteriora coriacea, latiora, alabastrum bivalvatim includentia, 3 interiora angustiora tenuiora. Petala teste coll. alba ungue nigro, breviter (3—4 mm) unguiculata lamine suborbiculato 1 cm longo, extus pubescentia. Stamina 2 inaequalia, filamentis 2 et 6 mm longis; antherae subaequales (superior paullulum compressior) 5 mm longae 2 mm crassae, utraque 8-locularis. Ovarium sessile, velutinum, stylo glabro subaequilongum. Legumen planum sessile, ovato-oblongum, sutura dorsali 5 mm late alata subcoriaceum, parum venosum, diu tomentosum adultum plus minusve glabratum, 5—7 cm longum et 3—4 cm latum. Semina 1—3, suborbiculata, circiter 1,5 cm longa, albumine crasso et funiculo gracile filiforme praedita. Cotyledones planae, orbiculatae.

Surinam e: Zanderij I tree n. 23 (B.W. 452 fl. Dec.; 462 fr. March; 1401 ster., 4065 fl. (buds) Nov., 4643 fr. April, 6032 fl. Feb.) ,type [U]); several other specimens enumerated in Pulle Flora of Suriname.
Fr. Guiana: (Sagot 1211 named *D. paraensis* by Bentham l.c.; Benoist 510; Wachenheim 50; Melinon).

The species has formerly been identified with *D. paraensis* Benth., it differs however of all hitherto described species of *Dicorynia* by its anthers, which are nearly equal and both 8-celled. In other species the anther of the superior stamen is 4-celled (and of the same form as the anthers in *D. guianensis)* and the anther of the inferior stamen much thicker and 8-celled..

D. paraensis is a very variable species or perhaps some of those varieties have to be regarded as distinct species (according to Taubert and Ducke). The following varieties and forms have been distinguished by Bentham:

D. paraensis Benth. Type specimen from „Pará". [P]. Rio Negro (Spruce 1918 and 3501 [K]; H.J.B.R. 35072).

Leaves often 5-foliate with large leaflets.

Forma *parvifolia* Benth. Manaos (Spruce s.n. anno 1835; H.J.B.R. 20337 and 24184).

The leaves of this form resemble closely those of *D. guianensis*

D. floribunda Spruce ex Benth. (Spruce 2135, type [K]; H.J.B.R. 35075).

A small flowered and slender form with small narrow leaflets. Considered by Ducke as a good species. The small, glabrous, narrowly winged pod (quite different from that of *D. guianensis*) described and figured in the Flora Bras. belongs to Spruce 2135 cited above. The fruits of the other „forms" of *D. paraensis* are not known.

D. uaupensis Spruce ex Benth. (Rio Uaupes, Spruce 2772 type, [K]; Manaos, H.J.B.R. 23319; specimen in hb. Paris from „Pará" sent by Lissabon).

Leaflets more distinctly reticulate and shining and sepals and especially petals more pubescent than in other „forms".

According to Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 58 *D. paraensis* does not occur in Pará in its present limits, but is replaced there by *D. ingens* Ducke, easily recognizable by the dark color of the indumentum. All specimens of *D. paraensis* Benth. s.l. of which the locality is known as well as all specimens of *D. breviflora* Benth. and *D. macrophylla* Ducke have been collected along the Rio Negro or its affluents.

MARTIUSIA Benth.

Gleason recently, in Phytologia I (1935) 141, proposed to replace the name *Martiusia* Benth. 1840 by the name *Martiodendron* Gleason, because the name *Martiusia (M. physalodes)* was already used by Schultes in 1822 for a *Clitoria* species of *Clitoria* section *Neurocarpum* Benth. Some authors consider this sec-

tion as a distinct genus and use the name *Martiusia* Schult. for it (Small Fl. S.E. U.S.; Britton and Wilson in Sc. Surv. Porto Rico). The type specimen of *Martiusia physalodes* Schult. however is a specimen with cleistogamous flowers of *Clitoria rubiginosa* Juss. (*Cl. glycinoides* D. C.; see Bentham in Journ. Linn. Soc. II (1850) 39; Harms in Ber. Deutsch. Bot. Ges. XXV (1907) 165). Though cleistogamous flowers are not strictly speaking a monstrosity, I believe that art. 65 of the „Rules" is applicable and that *Martiusia* Schultes is not legitimately published.

Martiusia parviflora Amsh. n. sp.; — *Martiusia parvifolia* Benth. sensu Pulle Enum. (1906) 218 non Benth. 1840; Pfeiffer Houts. v. Suriname I (1926) 266 pl. XI fig. 44; — *Martiusia excelsa* Benth. sensu Pulle in Rec. Trav. bot. neerl. IV (1907) 131 non Benth. 1840.

Arbor excelsa, 30—35 m alta, cortice cinereo-brunnea. (B.W.). Stipulas non vidi. Petioli inflorescentiae aureo-rufo-tomentosi. Folia 7-jugata vel rarius 5-jugata; foliola ovata vel ovato-oblonga, apice breviter acuminata, basi obtusa rotundata vel subcordata, coriacea, supra glabra, subtus sparse pubescentia, flavescentia, 8—14 cm longa 4—5 cm lata, costa supra impressa subtus prominente, nervis primariis venisque supra inconspicuis subimpressis nervis subtus parum prominentibus venis dense reticulatis subtus vix prominulis. Panicula ampla. Flores flavi (B.W.). Alabastra acuminata, incurva, extus dense pubescentia, —1,5 cm longa. Sepala lanceolata, 1,5 cm longa. Petala obovata, basi attenuata, glabra, inaequalia, 16 mm longa et 6—10 mm lata. Stamina 4 filamentis 1.5 cm longis antheris parum inaequalibus 11 et 13 mm longis, pilosis. Ovarium sessile, tomentosum, stylo glabro. Legumen (infertile tantum vidi) planum, oblongum, minute tomentosum, venosum, 10—15 cm longum 5 cm latum, sutura dorsali —2 cm sutura ventrali —1 cm late alatum.

Suriname: Sectie O (B.W. 22, fl. June 1905 and fr. Aug. 1905, type [U, P], named *M. parvifolia* and *M. excelsa* by Pulle l.c.); Zanderij I (B.W. 6195 ster., a wood sample of this tree is described by Pfeiffer

l.c.; Samuels 2 fl. May [L; K.], a flowering specimen still better than the type specimen); Patrick savannah (B.W. 22 ster.); Bergendal (B.W. 5531 ster.); Beaumontline (Junker 579 ster. [D]).

Vern. names: Witte Purperhart (S.D.), Boschmahonie (S.D.), Dastan (Sar.).

The flowers are twice as small as in *M. excelsa* Benth. and *M. parvifolia* Benth. and even somewhat smaller than in *M. elata* Ducke (*Martiodendron macrocarpon* Gleason is identical with *M. elata* var. *occidentalis* Ducke). *M. parviflora* is the only one of the four hitherto described species in which a tomentose ovary and pilose anthers go together. By its large broadly winged pod it is nearly allied to *M. elata* and *M. parvifolia,* both species with 7—9-foliate leaves and narrower leaflets.

SCLEROLOBIUM Vog.

Sclerolobium Melinonii Harms in Engl. Bot. Jahrb. 33 Beibl. 72 (1903) 24.

Alcohol material of the fruits of this species has been collected in Suriname. The fruit is oblong, 1—2-seeded, 5—7 cm long and 2,5—3 cm broad. The seeds show a thin albumen and an embryo with thin foliaceous cotyledons.

In B e n t h. et H o o k. f. Gen. Pl. I. 2 (1865) 562 and in Fl. Bras. XV. 2 (1870) 46, it is stated by B e n t h a m that the seeds of *Sclerolobium* are exalbuminous. On t. XII fig. 1 in Fl. Bras. the seeds of *S. paniculatum* Vog. are figured, and in this figure indeed no albumen is visible, but in dried seeds the albumen may be inconspicuous.

T u l a s n e in Arch. Bot. Mus. Par. IV (1844) 125 describes for the seeds of *S. sericeum* Tul. (= *S. chrysophyllum* Poepp. et End.) an „integumentum interior (vel perispermum) crassimum corneo albeo" also apparently an albumen.

The presence of albumen in the seeds of *Sclerolobium* would be another argument for the near alliance of the genera *Sclero-*

lobium Vog. and *Tachigalia* Aubl., placed usually in different groups, but whose fruits too resemble each other closely. *Tachigalia* Aubl. was placed by B e n t h a m under the *Caesalpinoideae — Amherstiae* on account of the character: stipe of the ovary adnate to the wall of the receptacle; it can further be easily distinguished because of its obliquous receptacle, but in other flower-characters the two genera show much resemblance.

SWARTZIA Schreb.

Swartzia apetala Raddi Quar. Piant. Nuov. (1819) 19; Benth. in Fl. Bras. XV. 2 (1870) 30; — *Swartzia glabra* Vog. in Linnaea XI (1837) 175.

Distribution: Rio de Janeiro, Bahia, Alagoas.

var. **acuminata** Amsh. nov. var.

A specie differt foliolis distincte acuminatis venis utrinque prominulis paullulum laxius reticulatis.

S u r i n a m e: Brownsberg (B.W. 6891 fl. May, type [U]; B.W. 2066 ster.; B.W. 2093 ster.).

Swartzia apetala itself is not known from the Amazonian district. There are some small differences in the leaflets, but the flowers of the Suriname specimen agree perfectly with those of the species. In Salzmann s.n. from Bahia, the leaflets are also acuminate.

Swartzia Benthamiana Miq.

As this species has been confused with an Amazonian species a detailed description is given here.

Swartzia Benthamiana Miq. in Stirp. Sur. Sel. (1850) 15; Bentham in Fl. Bras. XV. 2 (1870) p.p. (quoad specimina citata Sagot et Kappler tantum); Pulle Enum. (1906) 220; Benoist in Arch. Bot. V. 1 (1931) 127;? Sandw. in Kew Bulletin 1934, 362.

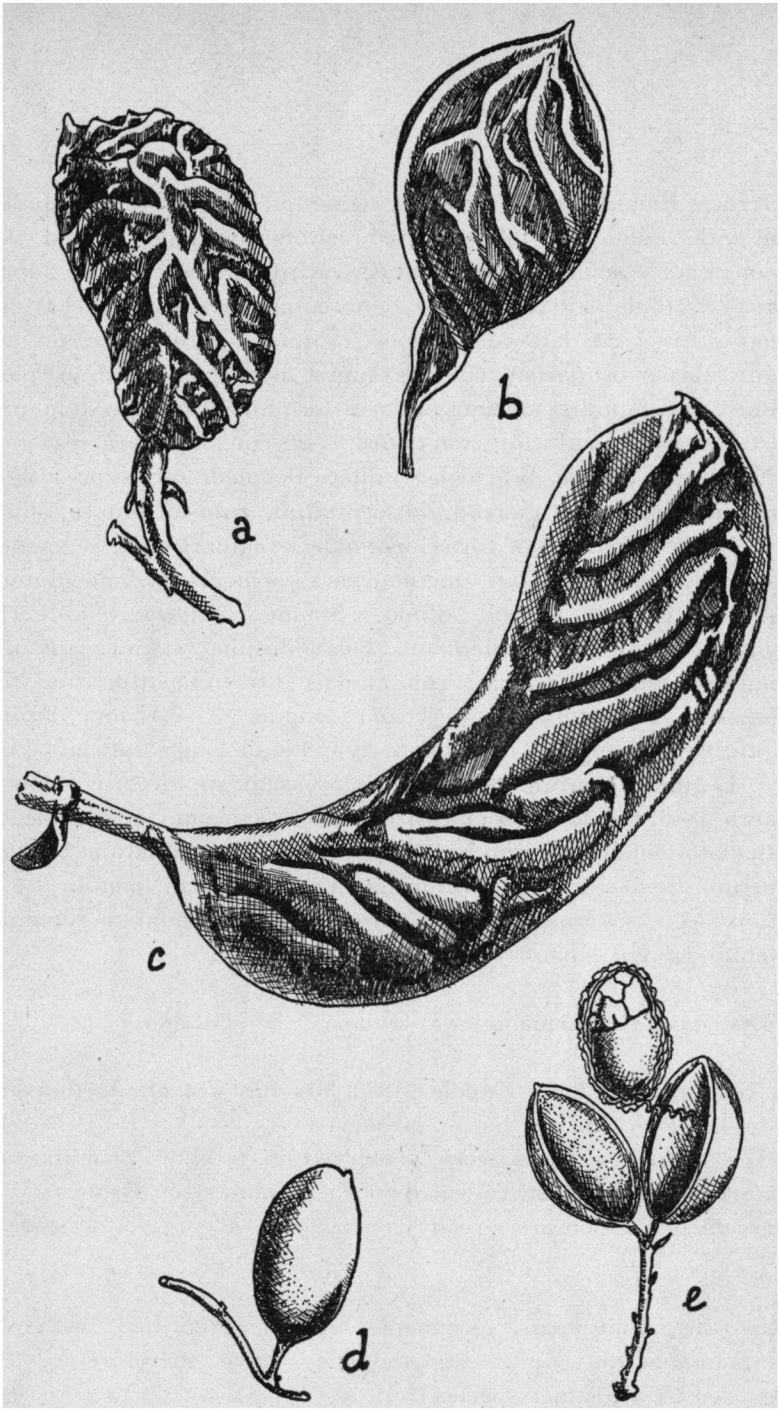

Fig. 3. *Swartzia Benthamiana* Miq. a. Pod. *Swartzia tomentosa* D. C. var. *polyanthera* (Steud.) Sandw. b. An 1-seeded pod. c. A 4-seeded pod. *Swartzia prouacensis* (Aubl.) Amsh. d. Pod.. e. Opened pod, showing the elongated clew-like funicle.

Arbor. Ramuli petioli petioluli tomentosi vel glabrati. Stipulas non vidi. Folia 5—7-foliolata rachi subterete; foliola ovata vel oblonga apice acuminata basi obtusa vel rotundata, coriacea supra glabra nitidula subtus minute cinereo-pubescentia 10—16 cm longa et 5—7 cm lata costa supra impressa subtus valde prominente nervis primariis venisque supra inconspicuis subtus plus minusve prominulis. Racemi axillares terminalesque interdum pro parte laterales, multiflori, tomentosi, —20 cm longi. Bracteae minutae 1 mm longae; bracteolae nullae. Pedicelli robustiores 4—6 mm longi. Alabastra globosa, dura, nitidula, rufo-tomentosa, adulta —7 mm longa. Calyx coriaceus valde irregulariter in segmenta 4—5 dehiscens. Petalum unguiculatum orbiculatum, deciduum, 6—9 mm longum, ex coll. album. Stamina majora 4 antheris oblongis 2 mm longis filamentis basi pilosulis; stamina minora numerosa antheris parvis 1 mm longis. Ovarium stipitatum tomentosum 4—6-ovulatum 3—4 mm longum 2—2,5 mm latum stipite tomentoso ± 4 mm longo stylo 1 mm longo uncinato glabro. Legumen ovatum paullum compressum stipite brevi crasso glabro 5—6 mm longo 4 mm in diametro, lignosum, tomentosum, reticulato-lamellatum, circiter 6 cm longum 4 cm latum 3,5 cm crassum. Semen unicum ovatum compressum 5 cm longum 3 cm latum —1,5 cm crassum arillo parvo margine crenulato funiculo dilatato 1,5 cm longo.

Distribution: Suriname, Fr. Guiana,? Br. Guiana.

The type specimen, Kappler 1929 [U] has lost all its flowers; a duplicate in Paris is better preserved.

The described fruits were preserved in alcohol. Fructiferous material has also been collected in Fr. Guiana (see Benoist l.c.). The ribs of the pod are already conspicuous in very young stades.

In the Amazonian specimens hitherto identified with *S. Benthamiana* the pod is smooth; they have therefore to be regarded as a distinct species:

Swartzia laevicarpa Amsh. n. sp.

— *Swartzia Benthamiana* Miq. sensu Benth. in Fl. Bras. XV. 2. (1870) l.c. p.p. (quoad specimen citatum Spruce 1843) et in obs.; Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 290; VI (1933) 28.

A specie affini *S. Benthamiana* Miq. praesertim differt legumine laevi.

Type Spruce 1843 [K] with flowers and unripe fruits.

Swartzia lamellata Ducke which was distinguished by the author from *S. Benthamiana* on account of its lamellate pod, is probably a variety of *S. Benthamiana,* but differs in having smaller leaflets, longer bracts and bibracteolate pedicels. *S. laevicarpa* shows some variability in leaf-characters, but *S. Benthamiana* is rather uniform, at least in Fr. Guiana and Suriname. Flowering specimens are characterized by their hard, globose, rugulose flower-buds, coriaceous, very irregularly splitting calyx and the colour of the indumentum of the inflorescence. Only in Lanjouw 908 (with the same kind of leaves) the calyx is less coriaceous, so that the flower-buds are compressed and indented (in sicco) resembling those of *S. laevicarpa.* Specimens from Br. Guiana according to S a n d w i t h l.c. resemble the Amazonian species; as no fructiferous specimens have been collected in Br. Guiana their identity is still doubtful.

Swartzia remigifer Amsh. n. sp.

Arbor. Ramuli novelli ferrugineo- vel albido-tomentosi. Stipulas non vidi. Folia 7—15-foliolata rachi subterete; foliola oblonga apice acuminata basi obtusa vel rotundata, glabra, 7—12 cm longa 3—5 cm lata, coriacea, nervis primariis venisque utrinque inconspicuis. Racemi laterales rufo-tomentosi. Bracteae oblongae, concavae, —6 mm longae. Pedicelli sub alabastro —5 mm longi, bibracteolati. Alabastra conoidea-globosa, tomentosa, —9 mm longa. Flores apertos non vidi. Stamina majora 5 filamentis glabris; stamina minora numerosa. Ovarium glabrum stylo filiforme in alabastro —6 mm

longo. Legumen stipitatum, compressum, oblongum, sublaeve, circiter 8 cm longum 5 cm latum 2,5 cm crassum stipite crasso 2 cm longo. Semen unicum, compressum, 5 cm longum 2,5 cm latum 1,5 cm crassum, arillo parvo crenulato, funiculo paullulum dilatato 3 cm longo.

Suriname: Sektie O (tree n. 534, B.W. 1320 ster., 2303 fl. (buds) Aug., 2534 ster.; B.W. 5381 ster.); Brownsberg (tree n. 1011, B.W. 1790 ster.; 3308 fl. (buds) Sept.).

The tree n 1011 is described by Gonggrijp as follows:

Tree, — 60 cm in diameter. Stem crooked, form very irregular, with broad deep furrows and slanting frames, and with very high spurs. Head irregular with crooked steeply slanting branches.

Nearly allied to *S. polyphylla* D. C. from Fr. Guiana and mentioned under that name in Pfeiffer Houts. v. Suriname. *S. polyphylla* (type specimen kindly lent by Geneva; other specimens seen: Sagot fl. [P]; Melinon fr. [P]) has the flower-buds —5 mm long, globose and with darker indumentum, the bracts and bractlets minute (— 1 mm long), the leaflets smaller (— 9 cm long, usually shorter) and relatively broader. Its pod is rather similar.

The stem of *S. remigifer* and of other Swartzia species with the same type of stem is used by the Indians for the making of paddles.

Swartzia longicarpa Amsh. n. sp.

Arbor. Ramuli novelli petioli petioluli tomentosi. Stipulae anguste lanceolatae, —1 cm longae. Folia 11—13-foliolata rachi anguste alata; foliola breviter petiolulata, stipellata, oblonga, apice acuminata basi obtusa, membranacea, supra glabra subtus puberula, 4—8 cm longa 1,5—2,5 cm lata; nervis primariis supra inconspicuis subtus prominentibus venis laxe reticulatis supra inconspicuis subtus prominulis. Racemi laterales, tomentosi, 20—40 cm longi. Bracteae ovatae 2 mm longae. Pedicelli robusti minute bibracteolati, apice valde dilatata, 2—2,5 cm longi. Alabastra ovoidea basi inconspicue in pedicellum transeuntia apice obtusa, rugosa, sub-

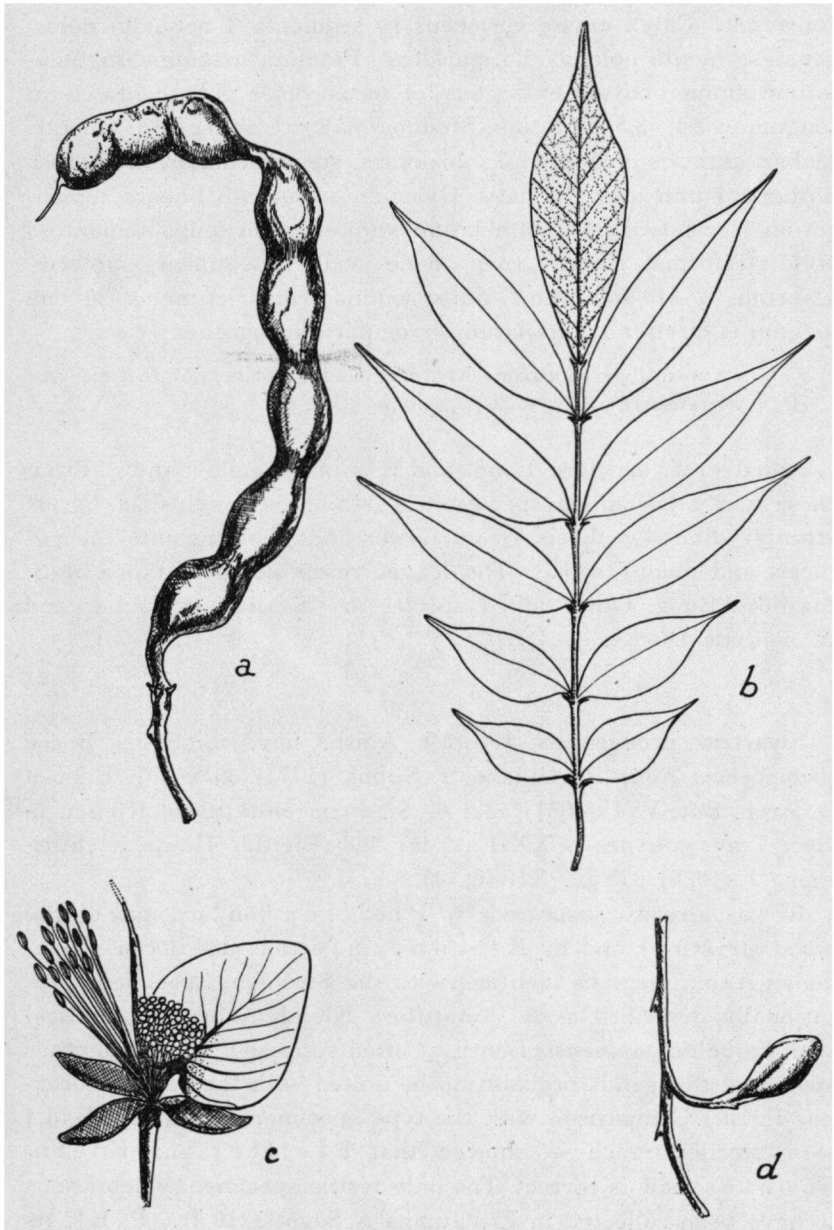

Fig. 4. *Swartzia longicarpa* Amsh.; a. Pod. (B.W. 6133); b. Leaf; c. Flower; d. Flower bud.

tomentosa. Calyx crasse coriaceus in segmenta 4 aequalia dehiscens; segmenta oblonga 1,5 cm longa. Petalum magnum unguiculatum lamine obovato extus basi et secus venas pubescente, 4 cm longum et 2,5—3,5 cm latum. Stamina majora circiter 15 filamentis glabris antheris oblongis 2,5 mm longis; stamina minora numerosa antheris 1 mm longis et latis. Ovarium stipitatum lineare tomentosum, 2 cm longum 2 mm latum stipite 6 mm longo tomentoso stylo filiforme glabro (non bene vidi). Legumen subteres, glabrum, 2—10-spermum, inter semina constrictum, —20 cm longum et circiter 1,5 cm latum, irregulariter rugosum.

Surinam e: Upper Suriname Riv. near Goddo (Stahel 137 fl. Jan., type [U]); Brownsberg (B.W. 6133 fr., cotype [U]).

Allied to *S. laxiflora* Bong. and *S. xanthopetala* Sandw. From those and other allied species it is readily distinguished by its strongly dilated pedicels, ovoid flower-buds merging into the pedicels and oblong sepals. The leaves resemble most those of *S. laxiflora* Bong. Other allied species are *S. obscura* Huber and *S. ingifolia* Ducke.

Swartzia prouacensis (Aubl.) Amsh. nov. comb.; — *Bocoa prouacencis* Aubl. Pl. Guiane fr. Suppl. (1775) 38 t. 391; Benoist in Arch. Bot. V. 1 (1931) 132; — *Swartzia minutiflora* Kleinh. in Rec. Trav. bot. neerl. XXII (1925) 408; Pfeiffer Houts. v. Suriname I (1926) 275 pl. XII fig. 47.

It was already suspected by P f e i f f e r (on account of the wood structure) and by K l e i n h o o n t e that the *Bocoa prouacensis* Aubl. might be identical with the Suriname specimens provisionally described as *S. minutiflora* Kleinh. (and not identical with *Etaballia guianensis* Benth. as often supposed, or with another species of this genus probably to be united with the genus *Inocarpus* Forst.) Comparison with the type specimen of Aublet [B.M.] — a sterile branch — showed that P f e i f f e r and K l e i n h o o n t e's view is correct. The only fertile specimen which seems to have been collected in Fr. Guiana is Sagot 1210 fr. [P, K]; its

seeds show distinctly the characteristic (—3 m long) elongated funicle.

Swartzia prouacensis (Aubl.) Amsh. belongs to the series *Stenantherae* Benth., a name not very appropriate for *S. prouacensis* in which the anthers are ovate-oblong. The group is a very natural and distinct one, characterized as follows: Flowers small in cauliflorous racemes; calyx membranaceous splitting into 3 segments; petal wanting; stamens relatively few (—30), equal; pod coriaceous, 1-seeded (as far as known).

Species belonging to this series are *S. alterna* Benth., *S. mollis* Benth., *S. racemulosa* Huber, *S viridiflora* Ducke and judging from the description *S. cubensis* (Britton et Wilson) Standley.

DIPLOTROPIS Benth. and BOWDICHIA H.B.K.

In the conception of the genus *Diplotropis* Benth. there have been large variations, from the large conception of B e n t h a m in Fl. Bras. XV. 1 (1859) 319 to its complete union by D u c k e with the genus *Bowdichia* H.B.K.

In the Fl. Bras. B e n t h a m reckons 5 species to *Diplotropis*, in which he distinguishes 2 sections: *Diplotropis* Benth. and *Clathrotropis* Benth. The latter section has been elevated by H a r m s in D a l l a T o r r e and H a r m s Gen. Siph. fasc. III (1901) 221, to the rank of genus. A key to the Brazilian genera of the affinity of *Diplotropis* is given by D u c k e in Arch. Inst. Biol. Veg. 4.1 (1938) 18.

In the section *Diplotropis* the type species *Diplotropis Martiusii* Benth. 1838 was united by B e n t h a m with the genus *Dibrachion* Tul. (*Dibrachion brasiliense* Tul. and *D. guianense* Tul.) and with *Diplotropis ferruginea* Benth. Of those plants, only the pod of *D. Martiusii* and unripe pods of *D. ferruginea* were known to him. In the generic description B e n t h a m said that the pod is thick-coriaceous or nearly woody, and tardily dehiscent. The

fruit of *D. guianensis* was described by P u l l e in 1907 and afterwards the fruit of *D. brasiliensis* by D u c k e. As those fruits proved to be membranaceous and indehiscent, D u c k e placed *D. guianensis, D. brasiliensis* and *D. ferruginea* in the genus *Bowdichia* H.B.K., retaining in the genus *Diplotropis D. Martiusii* only. (in Arch. Jard. Bot. Rio de Janeiro I (1915) 32). Afterwards (l.c. III (1922) 131, V (1930) 134) D u c k e found that the pod of *D. Martiusii* is also indehiscent, though woody-coriaceous. For this reason he united the genera *Diplotropis* and *Bowdichia* completely, distinguishing in the genus *Bowdichia* a section *Eubowdichia* Ducke (including *Dibrachion)* and a section *Diplotropis* (Benth.) Ducke.

In Rec. Trav. bot. neerl. XXII (1925) 393 *Bowdichia* H.B.K. and *Diplotropis* Benth. were considered by K l e i n h o o n t e as distinct genera, especially on account of the form of the petals. In *Bowdichia* the standard is broadly orbiculate and without lateral appendages, in *Diplotropis* the standard is oblong and biappendiculate. This difference, to which little importance is attached by D u c k e, is very well illustrated in Fl. Bras. l.c. fig. 123 *(Bowdichia virgiloides* H.B.K.) and fig. 127 *(Diplotropis brasiliensis* (Tul.) Benth.).

In Arch. Inst. Biol. Veg. 4.1 (1938) 19 D u c k e maintains his view and he now distinguishes in the genus *Bowdichia* 3 sections: Section *Eubowdichia:* Standard large without appendages; ovary distinctly stipitate; pod membranaceous; seeds few, small, hard. Section *Dibrachion:* Standard oblong, biappendiculate; ovary subsessile or nearly so; pod membranaceous; seeds few, small, soft. Section *Diplotropis:* Standard oblong, biappendiculate; ovary subsessile; pod woody-coriaceous, thick; seed one, large, reniform, soft.

There is however another character, hitherto overlooked, which, in combination with the form of the standard, seems to me to justify a separation into two genera, *Diplotropis* Benth. (sensu Kleinh.) and *Bowdichia* H.B.K.

In two species which by the form of the petals must be reckoned to *Diplotropis* Benth. (sensu Kleinh.) and which I could

study in this regard, *D. guianensis* (Tul.) Benth. and *D. racemosa* (Hoehne) Amsh. nov. comb. *(Bowdichia racemosa* Hoehne), the seeds are exalbuminate. According to the figure and description of Bentham, the seeds of *Bowdichia virgiloides* are provided with an albumen. There is no albumen mentioned for the seeds of *D. Martiusii* by Bentham. I could not study the seeds myself, but their size and softness make the presence of an albumen very improbable. In the following delimination of the genera *Bowdichia* and *Diplotropis,* these genera are also sharply characterized against the genus *Clathrotropis.*

a. Calyx incurved. Standard oblong with 2 lateral basal appendages. Wings and carinal petals free, long-unguiculate. Ovary subsessile or nearly so. Pod indehiscent. Seeds soft, exalbuminate. **Diplotropis** Benth.

1. Pod woody-coriaceous (adapted according to Ducke to transport by water). Seed one, large, reniform.
Section **Eudiplotropis** Amsh.

2. Pod membranaceous (adapted according to Ducke to transport by wind). Seeds 2—4, flat, small.
Section **Dibrachion** (Tul.) Taub. emend. Amsh.

b. Calyx incurved. Standard broadly orbiculate, without lateral appendages. Carinal petals free. Ovary distinctly stipitate. Pod membranaceous, indehiscent. Seeds few, small, compressed, hard, albuminous. **Bowdichia** H.B.K.

c. Calyx straight. Standard orbiculate, without lateral appendages. Carinal petals slightly cohaerent. Pod woody, dehiscent. Seeds few, large, compressed, without albumen.
Clathrotropis (Benth.) Harms.

Diplotropis purpurea (Rich.) Amsh. nov. comb.; — *Tachigalia? purpurea* Rich. in Act. Soc. Nat. Hist. Nat. Par. I (1792) 108;

— *Dibrachion guianense* Tul. in Ann. Sc. Nat. 2. 20 (1843) 139, Arch. Mus. Par. IV (1844) 103; — *Diplotropis guianensis* Benth. in Fl. Bras. XV. 1 (1859) 321 in obs.; Pulle in Rec. Trav. bot. neerl. IV (1907) 132; Pfeiffer Houts. v. Suriname I (1926) 285 pl. XIII fig. 50; — *Bowdichia guianensis* Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 132; Benoist in Arch. Bot. V. 1 (1931) 129.

The specimen in the Paris herbarium from the herbarium Richard is not named *Tachigalia purpurea*, but a long description (partly cited by Tulasne in Arch. Mus. Par. l.c.), has been added by Richard, in which it is said that the plant is „affinis *Tassiae*" (*Tassia* is Richard's name for *Tachigalia* Aubl.) Tulasne gives *Tachigalia? purpurea* Rich. as a synonym of his *Dibrachion guianense*. Richard's description in Act. Soc. Hist. Nat. Par. l.c. is very short („Tachigalia? purpurea petiolis teretibus foliolis ovatis panicula decomposita"). A duplicate of the type specimen (Fr. Guiana, Leblond, equally not named by Richard) was kindly lent to me by the Geneva Herbarium; this duplicate is at once the type specimen of *D. guianensis* Tul.

I quite agree with Ducke's suggestion that *D. purpurea* (*D. guianensis* (Tul.) Benth.) and *D. brasiliensis* are not specifically distinct, and I regard *D. brasiliensis* therefore as a variety of *D. purpurea*. Other varieties have been described by Ducke in Arch. Jard. Bot. Rio de Janeiro V (1930) 132 (under *Bowdichia brasiliensis* (Tul.) Ducke). The species and the varieties can be characterized as follows:

Diplotropis purpurea (Rich.) Amsh.

Leaflets ovate, obtuse or retuse, rarely shortly acuminate at the apex, coriaceous, glabrous, the veins prominulous above and less so beneath. Indumentum of the inflorescence greyish-rufous-tomentose.

Distribution: Guiana.

var. **leptophylla** (Kleinh.) Amsh. nov. comb.; — *Diplotropis leptophylla* Kleinh. in Rec. Trav. bot. neerl. XXII (1925) 392.

Leaflets shortly acuminate, subcoriaceous, with a few scattered hairs beneath. Otherwise as in the species.

Distribution: Suriname.

var. **brasiliensis** (Tul.) Amsh. nov. comb.; — *Dibrachion brasiliense* Tul. in Ann. Sc. Hist. Nat. 2. 20 (1843) 139, Arch. Mus. Par. IV (1844) 103 t. 7; — *Diplotropis brasiliensis* Benth. in Fl. Bras. XV. 1 (1862) 32 t. 1267; — *Bowdichia brasiliensis* Ducke in Arch. Jard. Bot. Rio de Janeiro I (1915) 32, III (1922) 132, IV (1925) pl. 25 fig. f., g., V (1930) 132.

Leaflets thin-coriaceous, acuminate, veins equally prominulous on both faces. Indumentum of the inflorescence greyish-ferrugineous.

Distribution: Pará, Amazonas.

var. **belemnensis** Ducke l.c.

Leaflets thin-coriaceous, acuminate, the veins prominulous above and less so beneath. Indumentum of the inflorescence canescent.

Distribution: Belem do Pará (Pará).

var. **coriacea** Ducke l.c.; — *Diplotropis triloba* Gleason in Bull. Torrey Bot. Club 60 (1933) 355.

Leaflets acuminate, coriaceous, glabrous; veins prominulous above and less so beneath. Indumentum of the inflorescence dark-rufous-pubescent. Flowers somewhat larger than in the species.

Pará, near Faro (H.A.M.P. 15686 [P]), type; N. Matto Grosso (Krukoff 1562, type of *D. triloba* Gleason); Bahia (Martius s.n. [P]).

The other specimen cited by Gleason l.c., Krukoff 1308 from the same locality, is intermediate between the var. *leptophylla* and the var. *belemnensis*.

ORMOSIA Jacks. and **ORMOSIOPSIS** Ducke.

Very characteristic for these two nearly allied genera are the seeds with thick, hard, red or black (in *Ormosia* usually red with black spot) testa and transversal cotyledons. *Ormosia* is also in flowering specimens easily recognizable by the lateral stigma; *Ormosiopsis*, with its terminal stigma, has — as far as yet can be said — the flower characters of *Clathrotropis* (Benth.) Harms. (F.e. it is quite possible that *Cl. grandiflora* (Tul.) Harms, of which the fruit is not known, will prove to be an *Ormosiopsis*). *Clathrotropis* however differs from *Ormosiopsis* by its compressed seeds with thin fragile testa and cotyledons parallel with the valves. The colour of the petals is white, while in *Ormosiopsis* the petals are yellow or lilac.

The transversal position of the cotyledons in *Ormosia* and *Ormosiopsis* appears to be due to a growth process, the cotyledons in unripe seeds being obliquous. Comparison with a nearly allied group referred to below also shows that the position of the radicula (in relation to the pod) remains unchanged, but that the cotyledons have ultimately 90° diverged from their original position (in relation to radicula and pod).

Only in 2 species of *Ormosia*, *O. melanocarpa* Kleinh. and *O. holerythra* Ducke, the cotyledons are parallel with the valves. The flowers of *O. holerythra* Ducke are still unknown, the species differs otherwise from *O. melanocarpa* by the much larger dimensions of pod and seeds only. Provisionally this rather distinct group can best be considered as a fourth section of *Ormosia* (American species). Three other sections have been described by Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 135, IV (1925) 66. The genus *Ormosia* seems to be absent in Africa (according to Harms who described 3 nearly allied African genera). The Asiatic species have been arranged by Prain; I do not know whether his section *Ormosia proper* is quite identical with the section *Bicolores* Ducke, to which the type species belongs. The division of *Ormosia* (American species) can be given as follows:

Section **Bicolores** Ducke.

Standard reflexed, mostly bicallous at the base. Ovary subsessile, densely pubescent. Pod dehiscent. Seed red, with black spot (the black spot in some species not constant), moderately compressed. Hilus small. Cotyledons transversal.

To this section belongs the majority of the American species.

Section **Flavae** Ducke.

Ovary subsessile, densely pubescent. Pod indehiscent, opening by putrefaction. Seeds orange-yellow, with small hilus. Cotyledons transversal.

Species 1, *O. excelsa* Benth.

Section **Macrocarpae** Ducke.

Ovary shortly stipitate, glabrous or nearly so. Pod indehiscent. Seeds brown-red, one-coloured, slightly compressed, with linear hilus. Cotyledons transversal.

Species 2, *O. Coutinhoi* Ducke and *O. cinerea* R. Ben.

Section **Unicolores** Amsh. nov. sect.

Ovarium breviter stipitatum, ad suturas tantum pilosum. Semina unicolora, rubra, valde compressa, hilo brevi, cotyledonibus valvis paralelis.

Species 2, *O. melanocarpa* Kleinh. and *O. holerythra* Ducke.

The 3 latter sections differ as much from the section *Bicolores (Ormosia* s.s.) as the genus *Ormosiopsis* Ducke, which is distinguished on account of its terminal stigma and globose, one-coloured, black or red seeds.

Ormosia coccinea Jacks. in Trans. Linn. Soc. X (1810) 360 t. 25; Benth. in Fl. Bras. XV. 1 (1862) 317; — *Ormosia subsimplex* Spruce ex Benth. in Fl. Bras. XV. 1 (1862) 316 t. 125; Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 68.

Bentham distinguishes an *Ormosia coccinea* with oblong leaflets which are minutely pubescent beneath, and an *O. subsimplex* with ovate or broadly oblong leaflets, nearly glabrate beneath, somewhat smaller flowers and a darker indumentum of the inflorescence. Those differences are however not constant,

and moreover the pod of both forms is exactly the same, characterized by the thick, carnous-coriaceous valves. The form of the leaflets is very variable; the type specimen of *O. subsimplex*, Spruce 2955 [K], is a plant with old and therefore very rigidly coriaceous, shining and nearly glabrate leaflets. Such leaves are also shown bij Aublet s.n. fr. [B =M.], one of the specimens cited by Jackson; the other specimen was seen by Jackson in the herb. Lambert. The flower description and figure of Jackson have apparently been made after the latter specimen, which could not be traced; judging from the figure it agrees with the narrow-leaved form to which by Bentham the name *O. coccinea* Jacks. was restricted.

Ormosia costulata (Miq.) Kleinh. in Rec. Trav. bot. neerl. XXII (1925) 392; — *Leptolobium costulatum* Miq. in Stirp. Sur. Sel. (1850) 17; — *Ormosia coccinea* Jackson sensu Pulle Enum. (1906) 221, non Jacks. 1810.

Kleinhoonte l. c. remarks that *O. costulata* is at any rate distinct from *O. coccinea,* with which species Pulle had united it, but cites the name as *O. costulata* Miq., overlooking the fact that Miquel had published the species under *Leptolobium.*

Distribution: Suriname (o.a. Hostmann 1299 [U; BM.; K; P], type); Br. Guiana (Jenman 6569 [K]).

var. **trifoliata** (Huber) Amsh. nov. comb.; — *Ormosia trifoliata* Huber in Bol. Mus. Goeldi V (1907) 398; Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 138, IV (1925) 67.

Differs from the species by its subsessile leaves only. In Pulle 473 one of the leaves is long-petiolate as in the species.

Distribution: Suriname (Pulle 473, Corantijne Riv.); Br. Guiana (Jenman 4171 and 6299 [K]); Pará; Amazonas.

Ormosia fastigiata Tul. in Arch. Mus. Par. IV (1844) 108; Benth. in Fl. Bras. XV. 1 (1862) 319; — *Ormosia stipularis* Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 65; — ? *Ormosia coarctata* Jackson in Trans. Linn. Soc. X (1810) 363 fig. 27.

The type specimen of *O. coarctata,* Anderson from Br. Guiana, could not be traced in the Br. Mus. or in Geneva. Possibly it is identical with *O. fastigiata,* with a wide distribution throughout Brazil and the most collected *Ormosia* species in Suriname. The description given by Williams in Fl. Trinidad and Tobago I, 4 (1931) of a fruiting specimen identified by him with *O. coarctata* also agrees well with *O. fastigiata,* except for the somewhat smaller fruits. The inflorescence of *O. coarctata* however is said by Jackson to be short and compact (hence the name), while the inflorescence of *O. fastigiata* is on the contrary very large. Moreover, *O. fastigiata* is not yet known from Br. Guiana, nor any other *Ormosia* species agreeing with Jackson's description of *O. coarctata,* so that *O. coarctata* Jacks. is still a doubtful species.

O. fastigiata is characterized by its thick, sulcate, densely tomentose branchlets, relatively long, linear, subpersistent stipules and tomentose pod. In the type specimen (Claussen [P]) the stipules are already thrown off, and were therefore not mentioned by Tulasne and Bentham. Ducke distinguished his *O. stipularis* only on account of the stipules.

Ormosiopsis flava Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 61 pl. 25 fig. a, b, Arch. Inst. Biol. Veg. 4,1 (1938) 20; — *Clathrotropis? flava* Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 134; — *Clathrotropis? surinamensis* Kleinh. in Rec. Trav. bot. neerl. XXII (1925) 61 fig. 11.

The type specimen of *C. surinamensis* Kleinh. differs from the type specimen of *O. flava* Ducke by its more numerous, narrower leaflets and smaller flowers. Subsequent collections of *O. flava* by Ducke in Pará have shown however that the number as well as the form of the leaflets are variable. The leaves of some of these specimens agree entirely with those of *C. surinamensis,* as already remarked by Ducke l.c. (1938); they differ by the somewhat larger flowers only.

DUSSIA Krug et Urban.

Dussia discolor (Benth.) Amsh. nov. comb.; — *Geoffroya discolor* Benth. in Hook. Journ. Bot. II (1840) 91, Journ. Linn. Soc. IV Suppl. (1860) 124; — *Dussia cayennensis* Harms in Fedde's Rep. 19 (1924) 293; — *Vexillifera micranthera* Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 140 with fig.; — *Dussia micranthera* Harms l.c. 291.

Type is Martin s.n. from Cayenne. The best specimen is in Paris, a rather bad duplicate in Kew, while the type of *D. cayennensis* Harms is apparently another badly preserved duplicate in Berlin. In Bentham's time the genus *Dussia* was still undescribed.

According to Harms, *D. cayennensis* should differ from *D. micranthera* in the smaller size of the flowers; the size of the flowers is however too variable as to be of specifical value. Moreover, the type specimen of *D. micranthera* itself is a small flowered form (Calix sub anthesi circa 8 mm longus, according to Ducke), while according to Harms in *D. cayennensis:* Calyx usque 8 mm vel ultra longus.

DALBERGIA L.

Dalbergia glauca (Desv.) Amsh. nov. comb. (non *D. glauca* Wallich Cat. (1828) 862 n.n.; Benth. in Journ. Linn. Soc. sub *D. ovatam* Grah. pro syn.); — *Ecastophyllum glaucum* Desv. in Ann. Sc. Hist. Nat. Par. 1.9 (1826) 423; Bentham in Journ. Linn. Soc. IV Suppl. (1860) 51; — *Ecastophyllum foliosum* Benth. in Hook. Journ. Bot. II (1840) 64; — *Drepanocarpus falcatus* Miq. in Linnaea XVIII (1844) 476; Benth. in Journ. Linn. Soc. l.c. 71; Pulle Enum. (1906) 228; — *Dalbergia Spruceana* Benth. sensu Pulle in Rec. Trav. bot. neerl. IX (1912) 140 non Benth. 1860; — *Dalbergia atropurpurea* Ducke in Arch. Jard. Bot. Rio de Janeiro

III (1922) 145, IV (1925) 307; — *Dalbergia revoluta* Ducke l.c. IV (1925) 73.

The type, a specimen from the herb. Desv. in herb. gen. Paris, — from Porto Rico according to Desvaux, but probably from Fr. Guiana, the species is not known from Porto Rico — bears only one falcate-oblong pod, though Desvaux described the pod as suborbiculate. The type specimen of *E. foliosum* Benth. has obliquous-ovate fruits, so that Bentham did not recognize it as a member of the section *Selenolobium* Benth. s.s. (near *D. inundata;* with falcate-oblong thick fruits), but placed it under *Ecastophyllum,* treated by Bentham as a distinct genus. Bentham even says: „Flores E. monetariae", which is not true, the calyx, the color of the petals (dark violaceous in *D. glauca,* white in *D. monetaria)* and the number of the stamens (resp. 10 and 9) being different. Taubert, in E. P. Nat. Pflanzenfam. III, 3 (1894) 385, considered *Ecastophyllum* as a section of *Dalbergia,* and even placed it under the section *Selenolobium* Benth.

Bentham thought that *Drepanocarpus falcatus* Miq. was a mixtum of *D. inundata Benth.* (the fruits) and *Dr. lunatus* (L. f.) Mey. (the leaves); this is at least not true of the type specimen in Utrecht, as already remarked by Pulle. I did not see a duplicate (according to Bentham transmitted by Miquel) in Kew. Though the leaflets resemble in form and seize those of *Dr. lunatus,* the nervature is much less crebrous.

Owing to the partly incorrect description of Bentham, the species was again described as *D. atropurpurea* Ducke. *D. revoluta* Ducke was distinguished by Ducke on account of the shorter calyx and the coriaceous leaflets. These differences however do not hold true.

The calyx of the Guiana specimens is about as long as in *D. revoluta,* but shorter than in specimens from Pará *(D. atropurpurea).* In both regions the length of the calyx is variable.

The leaves appear usually together with the flowers, so that only fruiting specimens have adult leaflets. In some Guiana specimens (f. e. Gonggrijp 2237, Jenman 4351, Lanjouw 864 partly)

the old leaves have persisted in flowering specimens; the leaflets are then rigid-coriaceous as in *D. revoluta*. The position of the leaves in *D. revoluta* shows that in this case also the leaves have persisted.

Dalbergia subcymosa Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 144, IV (1925) 74; — *Ecastophyllum pubescens* D. C. Prod. II (1825) 421; Benth. in Hook. Journ. Bot. II (1840) 64, Journ. Linn. Soc. IV (1860) 51; Pulle Enum. (1906) 227.

As there is already a *Dalb. pubescens* Hook. f. 1849, Ducke's name must be kept.

Distribution: Pará, Fr. Guiana, Suriname (Marowijne Riv.)

Dalbergia Riedeli (Radlk.) Sandwith in Kew Bulletin 1931, 358, non *Dalbergia Riedeli* (Benth.) Hoehne in Arq. Bot. Est. S. Paulo I (1938) 27 t. 24; — *Ecastophyllum Riedeli* Radlk. in Koepf. Anat. Char. Dalb. (1892) 41; — *Ecastophyllum monetaria* Pers. var. *Riedeli* Benth. in Fl. Bras. XV. 1 (1862) 229 p.p. (quoad specimen citatum Spruce 1546 tantum); — *Dalbergia enneandra* Hoehne in An. Bot. Com. Lin. Tel. Mato Grosso Amaz. VIII (1919) 78; Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 74; — *Dalbergia pachycarpa* Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 145.

The thick, corky pod and the leaflets which are ferrugineous pubescent beneath prove that *D. Riedeli* (Radlk.) Sandw. is identical with *D. pachycarpa*. According to Ducke *D. pachycarpa* is already a synonym of *D. enneandra* Hoehne; I have not seen the type specimen of this latter species myself.

Judging from figure and description and because Hoehne apparently considers the species as distinct from *D. enneandra* Hoehne, it is very improbable that *D. Riedeli* (Benth.) Hoehne is identical with *D. Riedeli* (Radlk.) Sandw. Type specimen of *E. Riedeli* Radlk. is Spruce 1546, one of the specimens cited by

Bentham under *E. monetaria* var. *Riedeli*. The other specimen, Riedel, type specimen of Bentham's variety, is according to Sandwith l.c. quite distinct from *E. Riedeli* Radlk., while Radlkofer, who did not see Riedel's specimen, conjectured that Bentham's identification of Spruce 1546 was correct. Perhaps *E. monetaria* var. *Riedeli* Benth. is identical with *D. Riedeli* Hoehne. The pod of this latter species is not known.

MACHAERIUM Pers.

Machaerium isadelphum (E. Mey.) Amsh. nov. comb.; — *Drepanocarpus isadelphus* E. Mey. in Act. Nat. Cur. (1824) 807; — *Machaerium angustifolium* Vog. in Linnaea XI (1837) 193; Benth. in Journ. Linn. Soc. IV Suppl. (1860) 55, Fl. Bras. XV. 1 (1862) 236 t. 67; Pulle in Rec. Trav. bot. neerl. IX (1912) 141, aliis auctoribus.

Drepanocarpus isadelphus E. Mey. was already cited as a synonym of *M. angustifolium* Vog. by Bentham („e descr.") and by Pulle l.c. Duplicates of the type specimen, Hostmann 629t, are in Utrecht and Paris.

The *Machaerium angustifolium* of Sagot in Ann. Sc. Nat. 6. 13 (1882) 30 is *M. altiscandens Ducke*.

Machaerium Kegelii Meissn. in Linnaea XXI (1848) 257; — *Machaerium bracteatum* Benth. var. Sagot in Ann. Sc. Nat. 6. 13 (1882) 303; Benoist in Arch. Bot. V. 1 (1931) 140 in key.

The species is easily recognizable by its large bractlets and long inferior calyx tooth. By the venation of the leaflets it belongs to the artificial group *Reticulata* Benth.

The nearly allied *M. bracteatum* Benth. (*M. marginatum* Standley) from Central America differs by the form of the leaflets and especially by its much broader, very characteristic pod.

Distribution of *M. Kegelii:*
Suriname: (Kegel 1249 fl., type [Gött; U]; Pulle 414 ster.; Kappler 2011 [S]); Fr. Guiana (Sagot 892 fl. and fr.; Benoist 955 fl. [P]); Br. Guiana (Jenman 4927 and 6981 [K]); Amazonas, Rio Acre (Ule 9461 [K]).

PTEROCARPUS L.

Pterocarpus santalinoides L'Hér. ex D. C. Prod. II (1825) 419; Bak. f. in Leg. Trop. Africa I (1926); Hutch. and Dalz. Fl. W. Trop. Africa I, 2 (1928) 376 fig. 144 C; — *Pterocarpus esculentus* Schum. et Thonn. Beskr. Pl. Guin. (1827) 330; Benth. in Journ. Linn. Soc. IV Suppl. (1860) 78; — *Pterocarpus Rohrii* Vahl sensu Griseb. Fl. Br. W. Ind. (1860) 201; Benth. in Fl. Bras. XV. 1 (1862) 267 p.p. t. 92 p.p.; Pulle Enum. (1906) 229, non *P. Rohrii* Vahl 1791; — *Pterocarpus amazonicus* Huber in Bol. Mus. Goeldi V (1908) 402; Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 83, 86, V (1930) t. XIII fig. 29.

Huber showed in 1908 that under the name of *P. Rohrii* Vahl Bentham has confused two species, *P. Rohrii* Vahl and a second species, named by Huber *P. amazonicus.* Flowering specimens of this second species can only with difficulty be distinguished by the longer bracts and bractlets and by the generally shorter pedicels; the pod however is quite distinct, being corky and attenuate at the margin only, while the pod of *P. Rohrii* has a broad membranaceous wing all around the margin. As already remarked by Ducke, the specimens of Spruce cited by Bentham under *P. Rohrii* in reality belong to this second species. As Bentham only knew the pod of *P. Rohrii,* the confusion in Bentham's description is visible in the words: *Bracteae lanceolatae-setaceae, caducissimae;* pedicelli *1* vel fere 2 lin. longi; bracteolae subulatae, calyce *paullo* vel duplo breviores. What is printed here in italics refers to *P. amazonicus* Hub. only.

In fig. 92 the flowering specimen belongs to *P. amazonicus,* the single flower and the fruit to *P. Rohrii* Vahl.

P. amazonicus is however identical with the W. African *P. santalinoides* L'Hér.! The name *santalinoides* was reestablished by Baker l.c.; Bentham mentions the species still as *P. esculentus.*

That *P. santalinoides* occurs in South-America was known to Bentham, who cites a fructiferous specimen of Martin from Fr. Guiana, and writes: „Perhaps introduced there by the negroes, who eat the seeds". The range of the species in South America is however much larger than Bentham suspected, so that an introduction is not very probable. Apparently it is, like *Andira inermis* (Sw.) H.B.K., *Dalbergia ecastophyllum* (L) Taub. and *Machaerium* (Drepanocarpus) *lunatum* (L. f.) Ducke, one of the species of the Dalbergieae, which are common to tropical W. Africa and South-America.

Distribution of *P. santalinoides* in South-America:
Fr. Guiana (o.a. Martin fr. [K], cited by Bentham l.c. under *P.esculentus;* Sagot 123 fl.; Mélinon 247 fl. [P], named *P. violaceus* Vog. by Benoist in Arch. Bot. V. 1(1931) 139); Surinam e (a.o. Versteeg 232 named *P. Rohrii* Vahl by Pulle l.c.; Tresling 472 cited by Ducke under *P. amazonicus);* Br. Guiana (a.o. Jenman 7260 fl.; Persaud 171 fr. [K]; Im Thurn anno 1879 fl. [K]; Archer 2393 fr. [K]); Pará and Amazonas (Krukoff 5902, 5920, 5923; several specimens distributed by Rio de Janeiro as *P. amazonicus* Huber); N. Maranhao (Froes 1948 fl.); N. Matto Grosso (Krukoff 1622 fr.); Trinidad (Swabey 12607 fr. [K], 2547 fl. [K].; the species is not mentioned in the Flora of Trinidad and Tobago); St. Vincent (a flowering specimen in Kew, named *P. Rohrii* Vahl by Grisebach).

P. Rohrii Vahl has nearly the same distribution (Guiana, Pará, Amazonas, Peru, Trinidad), but seems to be less common, or has been less often collected because it grows on dry, higher localities, while *P. santalinoides* grows along rivers or in swamps.

Except on the characters named above, the two species can also be distinguished by the following, perhaps not quite constant characters: in *P. Rohrii* Vahl the leaves are (in sicco) darker in color, more coriaceous and shining and often subcordate at the base, with generally a smaller number of primary nerves; and the indumentum of the inflorescence is browner.

Phellocarpus floridus Benth. 1838, cited by Bentham as synonym of *P. Rohrii* Vahl, is not known to me; it is perhaps a synonym of *P. santalinoides.*

Phellocarpus amazonum Mart. ex. Benth., cited by Bentham in Fl. Bras. l.c. as „*P. Rohrii* Vahl var.? (v. status monstruosus?, racemi rachide inflato-carnosa, legumine incrassato-difformi)". A duplicate of the type specimen, Martius s.n. from the Rio Negro, is in the Leiden herbarium, and proves to be a distinct species, as already suspected by Harms and Ducke.

Pterocarpus amazonum (Benth.) Amsh. nov. comb.; — *Phellocarpus amazonum* Mart. ex. Benth. in Ann. Wien. Mus. II (1838) 106; — *Pterocarpus Rohrii* Vahl var.? Benth. in Fl. Bras. XV. 1 (1862) 267; — *Pterocarpus ancylocalyx* Benth. var. *angustifolius* Benth. in Fl. Bras XV. l.c. 269; — *Pterocarpus Ulei* Harms in Verh. Bot. Ver. Brandenb. XLVIII (1907) 171; Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 83, 86.

According to Ducke, the deformation (due to ants) of the inflorescence is nearly constant in this species. There is however no reason to regard the pod as difformed.

Pterocarpus ancylocalyx is the name (incorrectly formed) given by Bentham to *Ancylocalyx acuminata* Tul. in Ann. Sc. Hist. Nat. 2. 20 (1843) 137 t. 2. It appears from Tulasne's description and figure that Tulasne mistook flower buds for adult flowers („corolla stamina inserta"!) and it is not possible that the oblong pod figured by him really belongs to a Pterocarpus species. The position of this species as well as that of *Phellocarpus acutus* Benth. cited by Bentham as synonym, remains therefore doubtful.

PLATYMISCIUM Benth.

Platymiscium trinitatis Benth. in Journ. Linn. Soc. IV Suppl. (1860) 82; Williams in Fl. Trinidad and Tobago I, 4 (1931) 257;

Marshall in Trees of Trinidad and Tobago (1934) 37 with fig.; — *Platymiscium nigrum* Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 157; — *Platymiscium Duckei* Huber var. *nigrum* Ducke l.c. IV (1925) 87.

In Arch. Jard. Bot. Rio de Janeiro IV l.c. Ducke writes: „*P. Duckei* Huber doit être très proche du *P. trinitatis* Benth., j'ignore quelles sont les differences." Comparing the two species in the Kew herbarium I found that they agree very well and that on account of its constantly 5-foliate leaves and nearly glabrous calyx *P. trinitatis* must be regarded as identical with the var. *nigrum* Ducke.

In Suriname the var. *durum* Ducke only has been collected; the genus seems to be not known from Br. Guiana. This is probably due to the fact that in flowering specimens the leaves are still undeveloped, so that species of this genus often remain unidentified.

LONCHOCARPUS H.B.K.

Lonchocarpus hedyosmus Miq. in Linnaea XVIII (1844) 564; Benth. in Journ. Linn. Soc. IV Suppl. (1860) 101 passim; Kleinh. in Rec. Trav. bot. neerl. XXX (1933) 173; — *Lonchocarpus sericeus* H.B.K. var. γ? Benth. in Journ. Linn. Soc. Suppl. IV (1860) 89 p.p.; — *Lonchocarpus sericeus* H.B.K. sensu Pulle Enum. (1906) 229 non H.B.K. 1824; — *Lonchocarpus macrocarpus* var. *sericophyllus* Benth. in Journ. Linn. Soc. IV Suppl. (1860) 91; — *Lonchocarpus paniculatus* Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 161, IV (1925) 88.

In his monograph of the genus *Lonchocarpus* in Journ. Linn. Soc. l.c. Bentham mentions this species under three different names. *Lonchocarpus hedyosmus* Miq. (type Focke 895 fl. [U]), was considered by Bentham as probably not distinct from *L. sericeus* H.B.K. Referring to another Suriname specimen (Hostmann 234), named by him *L. sericeus* var. γ? (bracteolis parvis) Bentham remarks: „Not having seen the pod of this plant,

I have some doubts of its specific identity, for the foliage, though closely resembling that of the moderately pubescent forms of L. sericeus, is also very nearly that of L. macrocarpus, of which I have not seen the flowers." The second specimen cited, Linden 2138 [P] from Cuba, however belongs really to *L. sericeus*.

L. hedyosmus Miq. was therefore treated by Pulle l.c. as synonym of *L. sericeus*. The species was reestablished by Kleinhoonte, who showed that *L. hedyosmus*, though, as long as the fruits were not known, of doubtful position, was at any rate distinct from *L. sericeus*. Flowers and fruits were afterwards collected by Ducke in Pará, who described the species as *L. paniculatus*. This collection shows that *L. hedyosmus* Miq. and *L. macrocarpus* Benth. var. *sericophylla* Benth. (type Spruce, from E. Peru [K]) are identical. Whether Bentham is correct in considering Spruce's specimen as a variety of *L. macrocarpus* I can not decide. There are some small differences in the leaves, but more material is desirable.

On account of its fruit, *L. hedyosmus* must be placed in the subgenus *Eulonchocarpus* Pittier, near *L. rugosus* Benth. from Mexico. *L. Ernesti* Harms from the Amazonian district is also nearly allied, and differs only in leaf characters. *L. sericeus* H.B.K. has quite a different pod and belongs to the subgenus *Neuroscapha* Pittier.

It is a curious fact that *L. hedyosmus* is represented in old collections only from Suriname. As far as a locality is given, those specimens have been collected in or near Paramaribo. This suggests that the species was cultivated, and is perhaps not indigenous in Suriname.

Distribution:
Suriname (a.o. Focke 865 fl., type [U]; Hostmann 234 fl. [BM., K, P, U], named *L. sericeus* var. γ by Bentham l.c.); Pará (H.J.B.R. 5314 fl. fl. and fr. [P, U] and H.A.M.P. 17006 fl., cotypes of *L. paniculatus* Ducke); E. Peru (Spruce 4597 fr [K, P], type of *L. macrocarpus* var. *sericophyllus* Benth.).

Lonchocarpus chrysophyllus Kleinh. in Rev. Trav. bot. neerl.

XXX (1933) 174; Krukoff and Smith in Am. Journ. Bot. 24 (1937) 583.

The flower description was made by Kleinhoonte after a very much insect-eaten specimen, B. W. 6802. This specimen was not named as type specimen. In the two other specimens, B. W. 6416, named as type specimen, and B. W. 6932, flower buds only are present. Fruits are still unknown. It has therefore not been possible for me to decide whether this is really a distinct species or identical with *L. Urucu* Killip et Smith (*L. Nicou* (Aubl.) D. C. sensu Ducke 1922 non D. C.), certainly nearly allied (the higher rotonone content mentioned by Krukoff and Smith may be due to cultivation), or with *L. rufescens* Benth. as suggested by Krukoff and Smith l.c.

DERRIS Lour.

It is still doubtful whether the three American species admitted by Bentham and even placed by him in the section *Euderris* Benth., really belong to the Asiatic genus *Derris*. (see Pittier in Contr. U.S. Nat. Herb. 20 (1917) 41). In the present conception of the genus *Derris* in Asia it is however not possible to exclude the American species.

Recently *Lonchocarpus negrensis* Benth. has been placed by Killip in the genus *Derris*, under the name of *D. amazonica* Killip. Though this species also has a (distinctly) winged pod, it differs strikingly from the 3 other American species by the inflorescence and by the form of the standard.

The differences between *D. longifolia* Benth. and *D. negrensis* Benth. are not quite clear to me. Bentham distinguishes the two species on leaf and on pod characters. The pods have the same dimensions, but in *D. negrensis* the pod is coriaceous and puberulous, and in *D. longifolia* membranaceous and rufous-velutinous. But perhaps this difference is largely due to the fact, that in the first case Bentham described an adult pod, and in the

second case a young one. The distinguishing leaf characters are unimportant and probably not constant.

The type specimen of *Derris pterocarpus* (D. C.) Killip *(Lonchocarpus? pterocarpus* D. C., *D. guianensis* Benth.) is Perrottet s.n. fr. in the Paris herbarium, named by De Candolle.

ANDIRA H.B.K.

Andira surinamensis (Bondt) Splitgerb. ex Pulle Enum. (1906) 229; — *Geoffroya surinamensis* Bondt de Cortice Geoffr. sur. (1788) 13 with fig.; — *Geoffroya pubescens* Rich. in Act. Soc. Hist. Nat. Par. (1792) 121; — *Geoffroya retusa* Poir. Encycl. VIII (1808) 121, Lam. ill. III (1797) t. 604 fig. 2 (without species name); — *Andira retusa* H.B.K. Nov. Gen. et Sp. VI (1824) 385; Benth. in Fl. Bras. XV. 1 (1862) 297 t. 115; Pulle Enum. l.c.; aliis auct.

The new combination is not found in the Index Kewensis, and apparently not meant as such by Pulle; yet it is validly published, as it is followed by a reference to *Geoffroya surinamensis* Bondt. Bentham choose the name *Andira retusa* (Poir. 1808) H.B.K., citing two older names, *G. surinamensis* Bondt 1788 and *G. pubescens* Rich. 1792 as synonyms.

Bondt gives a long description (though most of the characters given would apply to any *Andira* species) accompanied by a good figure and followed by the observations of several medical men on the action of the bark as a vermifuge. Leaves of the type specimen are still present in the Leiden herbarium.

DIPTERYX Schreb.

Dipteryx punctata (Blake) Amsh. nov. comb.; — *Coumarouna punctata* Blake in Contr. U. S. Nat. Herb. 20 (1924) 525; Ducke in Notizbl. 121 (1938) 123.

Ducke has shown, in various publications, that *Coumarouna* Aubl. 1775 and *Taralea* Aubl. 1775, considered by Bentham as sections of one genus, possess so totally different pods that they have to be regarded as distinct genera. Ducke keeps Aublet's names, *Coumarouna* and *Taralea*, but *Dipteryx* Schreb. 1791 is one of the nomina conservanda, and must be kept for the genus, which was first described by Aublet: *Coumarouna* Aubl.

The Suriname specimen agrees with the Amazonian specimens named *C. punctata* by Ducke. Though I could not compare the type specimen (Pittier 6464 cultivated in Venezuela) another cultivated specimen from Venezuela seen in Kew agrees well. The „Dipteryx odorata Willd." cultivated on some of the W. Indian islands is often this species.

POECILANTHE Benth.

Poecilanthe Hostmanni (Benth.) Amsh. nov. comb.; — *Cyclolobium Hostmanni* Benth. in Journ. Linn. Soc. IV Suppl. (1860) 52; Sagot in Ann. Sc. Hist. Nat. VI. 13 (1882) 306.

The description of the pod can now be added:

Legumen oblongum, stipitatum, glabrum, dehiscens, 5-spermum (teste Sagot), 14—15 cm longum 3—4 cm latum, valvis tordatis, coriaceis.

Distribution:
Surinamè (Hostmann 172 fl., type [K, P]); Fr. Guiana (Melinon s.n. anno 1845 fl. and fr.); Br. Guiana, Demerara Riv. (Hohenkerk 795 [K]).

The pod of Melinon s.n. was described by Sagot l.c., who already remarked that, when his identification was correct, the species could not be retained in the genus *Cyclolobium* (with indehiscent pod). The 4-fid calyx of *P. Hostmanni* is also characteristic for the genus *Poecilanthe;* the species was placed by Bentham in *Cyclolobium* on account of the 1-foliate leaves; the pod was not known to him.

The leaves closely resemble those of the only other known 1-foliate species of *Poecilanthe*, *P. amazonica* Ducke. This species differs in having an obovate, 1—2-seeded pod and larger flowers. Moreover, the stamens in *P. Hostmanni* are only very shortly connate and the ovary is long stipitate, characters by which it is standing apart in the genus.

CENTROSEMA D. C.

Centrosema triquetrum Benth. in Benth. et Hook. f. Gen. Pl. I (1865) 528; — *Platysema triquetrum* Hoffmans. ex Benth. in Ann. Wien. Mus. II (1838) 128; — *Centrosema latissimum* Ducke in Arch. Jard. Bot. Rio de Janeiro III (1922) 166 pl. 13.

Somehow Bentham forgot to include this species in the Flora Brasiliensis, though both specimens cited in Ann. Wien. Mus. l.c. are Brazilian (Pará, Sieber and Egas Amazonas, Poeppig). I could compare only the specimen cited by Bentham in Gen. Pl. l.c., Spruce 4906 from E. Peru, but the description of the pod, extraordinarily broad for a *Centrosema* species, leaves no doubt about the identity of *Platysema triquetrum*.

Distribution:
Peru (Spruce 4906 [K]; Ule 6311 [L]); Amazonas, Pará, Br. Guiana (Jenman 2030 fr. [K]).

As in other genera of the Phaseolae *(Dioclea, Mucuna)*, one can distinguish in *Centrosema* a section in which the seeds have only a small hilus (*Centrosema* s.s.) and a section with well developed linear hilus. To the latter section belong *C. triquetrum* Benth., *C. platycarpum* Benth., *C. Plumieri* (Turp.) Benth. and *C. roseum* Huber. Originally Bentham had created for these species the genera *Vexillaria* and *Platysema*.

Centrosema brasilianum (L) Benth. var. **angustifolium** Amsh. nov. var.; — *Centrosema angustifolium* Benth. in Fl. Bras. XV.

1 (1859) 129 p.p. (quoad descr. tantum, non quoad nomen); non *Centrosema angustifolium* Benth. in Ann. Wien. Mus. II (1838) 118; non *Clitoria angustifolia* H.B.K. Nov. Gen. et Sp. VI (1824) 417.

The flowers of the type specimen of *Cl. angustifolia* (Venezuela, Orinoco; Humboldt and Bonpland [P]), are, as already remarked by Kunth himself, badly preserved. Still, it is clear that the bractlets are falcate-oblong and that the inferior calyx tooth is lanceolate and much longer than the calyx-tube. The species is therefore nearly allied to *C. pubescens* Benth., from which it differs by its linear and glabrous leaflets only. It occurs in Venezuela, Colombia and Brazil, and has often been confused with *C. virginianum* (L) Benth. var. *angustifolium* Griseb. (*C. pascuorum* Benth.), with subequal calyx teeth.

The form described by Bentham in Fl. Bras. l.c. under the name *C. angustifolium* has large ovate bractlets and short calyx teeth, differing from *C. brasilianum* (L) Benth. only by its smaller and narrower leaflets. In Suriname it can not even be distinguished as a variety, many Suriname specimens showing both forms of leaves. Evidently it is only a savannah form of *C. brasilianum*.

Centrosema capitatum (Rich.) Amsh. nov. comb.; — *Clitoria capitata* Rich. in Act. Soc. Hist. Nat. Par. I (1792) 111; — *Centrosema virginianum* Benth. sensu Sagot in Ann. Sc. Nat. Hist. VI. 13 (1882) 299; Pulle Enum. (1906) 231 p.p. non Benth. 1837.

Herbaceum. Ramuli volubiles, pubescentes vel demum glabrati. Stipulae lanceolatae, parvae. Petioli 2—5 cm longi. Folia trifoliata; foliola ovato-oblonga vel oblonga, apice acuminata, basi rotundata, utrinque glabra, rigidule membranacea, reticulata, 4—9 cm longa 2—5 cm lata. Racemi 3—10-flori. Bracteolae falcato-lanceolatae, puberulae, 1—1,5 cm longae 3—4 mm latae. Calyx pubescens, tubo — 3 mm longo dentibus valde inequalibus superioribus — 2 mm longis, lateralibus circiter 4 mm longis inferiore 1—1,5 cm longo. Petala alba lineis purpureis notata. Vexillum 3—4 cm

longum extus sericeo-pubescens. Legumen lineare valde incurvum, puberulum demum glabratum stylo — 1 cm longo acuminatum, 10—15 cm longum et circiter 6 mm latum.

Fr. Guiana: without locality (Herb. Richard, Leblond, type [P]); Marowijne Riv. [Ile Portal, Sagot 1023 fl.; St. Laurent, Benoist 765 fl. and fr.); Mana (Sagot s.n. anno 1856 [all in P]).
Surinam e: Litanie Riv. (Rombouts 822 fl.); the following specimens named *C. virginianum* Benth. by Pulle l.c.: Tapanahoni Riv. (Versteeg 562 and 818); without locality (Kappler 74 [L]). Br. Guiana: Berbice Riv. (Jenman 7895 [K]).

This species is nearly allied to, and to some extent intermediate between, *C. pubescens* Benth. and *C. macrocarpon* Benth. From both species it differs by its strongly curved pod; the leaflets are glabrous and the inferior calyx tooth elongated as in *C. macrocarpon*, the dimensions of the pod are as in *C. pubescens*. The three species are however very nearly allied; from Fr. Guiana only *C. capitatum* is represented in the Paris herbarium; *C. macrocarpon* is only known from Br. Guiana and outside Guiana from Trinidad and Colombia.

The *Centrosema* species of the group of *C. pubescens* Benth. and *C. virginianum* (L) Benth. are chiefly distinguished on account of the length of the calyx teeth. This character is perhaps not quite reliable, the species are not always sharply distinct. A revision of the genus is desirable.

CALOPOGONIUM Desv.

Calopogonium mucunoides Desv. in Ann. Sc. Nat. I, 9 (1826) 423; — *Stenolobium brachycarpum* Benth. in Seem. Bot. Her. (1838) 109, Fl. Bras. XV. 1 (1859) 140; — *Calopogonium orthocarpum* Urb. in Symb. Ant. I (1899) 327; Britton and Wilson in Sc. Survey Porto Rico V (1924) 416.

Urban distinguishes a *C. mucunoides* Desv. with elongated long-pedunculate racemes and falcate pods and a *C. orthocarpum*

Urb. with short, mostly sessile racemes and straight pods. Urban himself gives no distinguishing characters (except in the name), but no other differences are known to me or appear from Urban's description.

Bentham distinguishes a *Stenolobium brachycarpum* Benth. with elongated racemes and a straight or falcate pod and a variety *brachystachyum* Benth. (*C. mucunoides* Desv. cited as synonym) with short, often subsessile racemes. The two specimens from Brazil cited by Bentham under the variety I have not seen, the Central American specimens (according to Bentham „praesertim in America centrali") have to be reckoned to *C. orthocarpum* Urb.. The type specimen of *S. brachycarpum* is from Brazil.

In the specimens from Suriname the racemes are mostly short (especially in the upper axils) as well as elongated in the same specimen, or in some specimens short only or elongated only. The pod is mostly falcate, but sometimes straight.

The differences seem also not to be sufficiently constant to justify a separation into 2 species, though *C. orthocarpum* Urb. might be distinguished as a variety distributed in Porto Rico, Hispianola, Cuba, Central America and perhaps also in Colombia.

The type specimen [P] of *C. mucunoides* Desv. is too small to be identified with either of the two forms. It bears only one short raceme with straight pods, and seems therefore identical with the form described by Urban as *C. orthocarpum* (apparently Bentham's opinion). But as type locality Fr. Guiana is given, and it may be a part of a plant showing otherwise the characters of *S. brachycarpum* Benth. (*C. mucunoides* Desv. sensu Urb.).

C. mucunoides Desv. s.l. is a weed which has also been introduced in tropical Asia and Africa.

Calopogonium velutinum (Benth.) Amsh. nov. comb. — *Stenolobium velutinum* Benth. in Tayl. Ann. Nat. Hist. III (1839) 437, Fl. Bras. XV. 1 (1859) 141; — *Rhynchosia Luschnathiana* Walp. in Linnaea XIV (1840) 295.

The combination has apparently not been made before, either

because the species is rather rare (only known from Bahia, Espirito Santo and Suriname) or because *R. Luschnathiana* is given in the Index Kewensis as the correct name.

DIOCLEA H.B.K.

Dioclea megacarpa Rolfe in Kew Bulletin 1901, 139; Williams in Fl. Trinidad and Tobago I. 4 (1931) 238; — *Dioclea reflexa* Hook. f. var.? *grandiflora* Benth. in Fl. Bras. XV. 1 (1859) 163; — *Dioclea densiflora* Huber in Bol. Mus. Goeldi V (1908) 406; Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 96; — *Dioclea reflexa* Hook. f. sensu Fawcett and Rendle in Fl. Jamaica IV. 2 (1920) 59 p.p. (p.p. *D. reflexa* Hook. f.) fig. 18.

Distribution: Brazil (a.o. Gardner 2117 type of *D. reflexa* var. *grandiflora* Benth. [K]), Colombia, Peru, Bolivia, Tobago, Trinidad (a.o. Hart 6406 type [K]), Paraguay.

Dioclea reflexa Hook. f. in Hook. Nig. Fl. (1849) 306; Benth. in Fl. Bras. XV. 1 (1859) 162 (excl. var.); Fawcett and Rendle Fl. Jamaica IV. 2 (1920) 59 p.p. (p.p. *D. megacarpa* Rolfe); Britton and Wilson in Sc. Surv. Porto Rico V (1924) 418 p.p.; Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 92, 97 pl. 4; Williams in Fl. Trinidad and Tobago IV (1931) 237 p.p. (p.p. *D. violacea* Benth.).

Distribution: Tropical Asia and Africa, tropical America (Pará, Guiana, Jamaica, Porto Rico).

Dioclea violacea Benth. in Ann. Wien Mus. II (1838) 132; Fl. Bras. XV. 1 (1859) 162; Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 97 pl. 4; — *Dioclea reflexa* Hook. f. sensu Williams in Fl. Trinidad and Tobago I. 4 (1931) 237 p.p.

Distribution: Brazil, Guiana, Trinidad (a.o. Broadway 6448, 9339; Fendler 315); Central America, also cited for Madagascar and the Hawaian islands).

The species of *Dioclea* section *Pachylobium* are in reality sharply distinct in flower and fruit characters, as has been shown by Ducke in his treatment of the Pará species of *Dioclea* in Arch. Jard. Bot. Rio de Janeiro IV (1925) 93 pl. 4—7. During my stay at Kew I could study most of the *Dioclea* material which has served for the Flora Brasiliensis and for the three recent W. Indian floras of Porto Rico, Jamaica and Trinidad, and saw that in these works the species had mostly been confused.

Dioclea megacarpa Rolfe, described from Trinidad (Rolfe also cites specimens from Brazil and Paraguay) was not recognized by Huber and Ducke, who described this species as *D. densiflora* Huber.

The two varieties of *D. reflexa* Hook. f. cited by Bentham are distinct species. The var. *grandiflora* is identical with *D. megacarpa* Rolfe. Of the specimens named var. *glabrescens* by Bentham, two (the Suriname specimen Hostmann 181 [K] and Spruce 2153 from the Rio Negro) are identical with *D. malacocarpa* Ducke, while I could not identify the third, Gardner 5988, which at any rate belongs to another species.

In the flora of Jamaica *D. reflexa* and *D. megacarpa* have been confused. In the Kew herbarium *D. reflexa* only is represented from Jamaica. The figure in the Fl. of Jamaica however clearly represents *D. megacarpa* Rolfe, as is shown by the linear pilose bracts (lanceolate and adpressed sericeous in *D. reflexa*) and the pod with straight upper suture (in *D. reflexa* the sutures of the pod are both curved). In the description it is said: Branches, petioles and inflorescences *covered with brownish spreading hairs* or glabrate. Bracts long, lanceolate or *linear*. The words printed here in italics refer to *D. megacarpa* Rolfe only.

This description and figure have been of influence on the description given in Sc. Survey of Porto Rico, though I have from Porto Rico seen specimens of *D. reflexa* Hook. f. only.

From Trinidad I saw no specimens of *D. reflexa* (though it will probably occur there), but several of *D. violacea* Benth. In the Flora of Trinidad and Tobago *D. megacarpa* Rolfe (correctly described) and *D. reflexa* only are mentioned, but *D. reflexa* is in-

correctly described, partly, it seems, because *D. violacea* has been confused with it, and partly because of the figure in the Fl. of Jamaica (also confusion with *D. megacarpa* Rolfe).

The three species can be distinguished as follows:

	D. violacea	*D. reflexa*	*D. megacarpa*
Branches and petioles	sparsely pilose or glabrate.	glabrate.	densely pilose.
Bracts	linear-lanceolate, rigid, erect, with adpressed pubescence.	lanceolate, quite reflexed, with adpressed pubescence.	densely pilose, linear, herbaceous, spreading or recurved.
Indumentum of the inflorescence.	dark brown	rufous-ferrugineous.	ferrugineous.
Flower buds	straight.	straight.	incurved.
Pod.	Adult pod nearly glabrate, with straight upper suture.	Adult pod nearly glabrate, the sutures both curved.	Adult pod still with much pubescence, the upper suture straight.

Dioclea comosa (Mey.) Kuntze in Rev. Gen. (1891) 179; — *Dolichos comosus* Meyer Fl. Esseq. (1818) 242.

Kuntze thought that *Dolichos comosus* Mey. was identical with *D. guianensis* Benth., and Bentham supposed (in Hook. Journ. Bot. II (1840) 60) that it might be identical with *D. lasiocarpa* Benth.

The pod is described by Meyer as follows: „Legumen sublignosum, oblongum, compressiusculum, 3—4-spermum. Semina orbiculata, compressa, hylo cincta."

There are two sections of Dioclea in which the seeds are half surrounded by a linear hilus, *Eudioclea* Benth. (to which *D. guianensis* and *D. lasiocarpa* belong) and *Pachylobium* Benth. In the first section the pods are flat-compressed and many-seeded, but the pod of *Pachylobium* agrees with Meyer's description. The expression: „Stipulae ..... semigittatae, pilosae", also points to *Pachylobium*, the stipules in *Eudioclea* being small and inconspicuous.

Which species of *Pachylobium* is meant remains doubtful as long as the type specimen is not known, the words: „Racemi.... coma e foliolis lanceolatis aggregatis terminati" suggest *D. reflexa* Hook. f. 1849.

Dioclea sectio **Macrocarpon** Amsh. nov. sect.

Stipulae parvae, haud productae. Carina subrostrata. Antherae omnes fertiles. Legumen oblongum, magnum, dehiscens, valvis lignoso-coriaceis convexis. Semina pauca, magna, compressiuscula, hilo brevi.

Species 2, *D. macrocarpa* Huber and *D. Huberi* Ducke.

Most of the characters enumerated above are already mentioned by Ducke l.c., but the two species were retained by him in the section *Eudioclea* Benth. The pod of the section *Macrocarpon* is however distinct from that of any of the three hitherto described sections (*Eudioclea* Benth., *Pachylobium* Benth. and *Platylobium* Benth.). The anthers are all fertile as in the section *Eudioclea*, which moreover differs by the nearly straight, obtuse keel with crenulate or fimbriate upper margin.

Dioclea virgata (Rich.) Amsh. nov. comb.; — *Dolichos virgatus* Rich. in Act. Soc. Hist. Nat. Par. I (1792) 111; — *Mucuna virgata* Desv. in Ann. Sc. Hist. Nat. I (1826) 423; — *Dioclea lasiocarpa* Mart. ex Benth. in Ann. Wien. Mus. II (1838) 133, Fl. Bras. XV. 1 (1859) 166 t. 44.

Richards l.c. describes under the names of *Dolichos vir-*

gatus and *Dolichos scaber* two species evidently belonging to *Dioclea*. In the Paris herbarium no specimens named so by Richard could be traced, but the *Mucuna virgata* from the herb. Desv. is a very good specimen of the species commonly called *D. lasiocarpa* Benth. Richard's description is very short („lignosus, foliis spicisque hirsutis, foliolis obovatis, abrupte acuminatis, spica longissima, aggregato-multiflora, legumine pruriente") but the words: „legumen pruriens", can among the *Dioclea* species of Fr. Guiana, refer to the common *D. lasiocarpa* only, in which the pod is covered with short bristly hairs (the pod is not villous as said by Bentham and the name *lasiocarpa* therefore is not appropriate).

Richard's description of *Dolichos scaber* is as follows: „Sarmentis lignosis, punctis elevatis exasperatis, foliolis ovatis, coriaceis glaberrimis, spica multiflora, receptaculis florum uncinatis." When this is really a *Dioclea* species, the description agrees very well with *D. glabra* Benth. The only other *Dioclea* species with glabrous, coriaceous leaflets, *D. macrocarpa* Huber, is not yet known from Fr. Guiana, and at any rate much less common than *D. glabra* and not represented in the herb. Richard.

Dioclea apurensis H.B.K. Nov. Gen. et Sp. VI (1824) 438 emend. Amsh.; — *Dioclea lasiophylla* Benth. sensu Pulle Enum. (1906) 233 non Benth. 1838.

Caulis fruticosus volubilus. Ramuli petioli inflorescentiae pubescentes. Stipulae parvae basi non productae. Foliola ovata vel elliptica, apice breviter abrupte acuminata, basi rotundata vel obtusa, supra glabra subtus glabrescentia, 4—8 cm longa et 2,5—5 cm lata. Fasciculi florum subsessiles. Bracteae non visae. Bracteolae ovatae, — 3 mm longae, persistentiae vel deciduae. Pedicelli — 3 mm longi. Calycis tubus incurvus, extus glaber, — 8 mm longus dentibus lateralibus tubo brevioribus inferiore paullo longiore. Vexillum ± 2¾ cm longum 2 cm latum, ungue 5 mm longa lamine orbiculato basi bicalloso. Alae oblongae apice angustiores, obtusae, 2¾ cm longae 9 mm latae. Carina 2,5 cm longa 8 mm lata,

oblonga, subrecta, obtusa, margine superiore crenulata. Antherae uniformes. Legumen oblongum, pubescens, glabrescens, 7—10 cm longum 2 cm latum, sutura vexillari leviter dilata. Semina oblonga hilo lineari semicincta.

The species belongs to the section *Eudioclea* Benth.

The type specimen of *D. apurensis*, in the Paris herbarium, from the Orinoco, bears only fruits. Those fruits agree with those of Versteeg 797 fl. and fr. from Suriname. The flowers of Versteeg 797 again agree with those of another specimen collected at the Orinoco (Chaffanjon 916 [P]). The three specimens also agree in the weakly developed pubescence of the leaves, but this character is in *Dioclea* of minor importance.

The Guiana specimens of *D. guianensis* Benth. differ in having smaller flowers, a pubescent calyx and a densely rufous, velvety pubescent, narrower pod. *D. lasiophylla* Benth. has broadly rounded wings (not narrowed at the apex), velvety pubescent leaflets and a densely pubescent pod. The species are certainly nearly allied and may prove to be identical, but the flowers of *D. apurensis* resemble most those of *D. sericea* H.B.K., a species with ribbed pod.

PHASEOLUS L.

Phaseolus trichocarpus Wright in Sauv. An. Ac. Habana 5 (1868) 337, Sauv. Fl. Cub. (1773) 30; Britton and Wilson in Sc. Surv. Porto Rico V (1924) 420; — *Phaseolus Schottii* Benth. var. *campestris* (Benth.) Hassl. f. *guianensis* Hassl. in Candollea I (1923) 463; — *Phaseolus productus* Ducke in Arch. Jard. Bot. Rio de Janeiro IV (1925) 99.

Distribution: Cuba (Wright [P]); Porto Rico; Suriname; Fr. Guiana (Sagot 142 [P]; Perrottet s.n. [P], named *P. campestris* by Piper; Richard s.n. [P], named *Ph. longifolius* by Piper); Pará (H.J.B.R. 11876 type [U] and H.J.B.R. 17285 [U], cotype of *Ph. productus* Ducke).

Phaseolus campestris Mart. ex Benth. in Ann. Wien. Mus. II (1838) 141, Fl. Bras. XV. 1 (1859) 188; Piper in Contr. U.S. Nat. Herb. 22 (1926) 678; — *Phaseolus Schottii* Benth. var. *campestris* (Benth.) Hassl. (f. *brasiliensis* Hassl.) in Candollea I (1923) 464; — *Phaseolus juruanus* Harms in Notizbl. 70 (1921) 506.

Distribution: Suriname, Pará, Amazonas.

In his revision of the Eastern South-American Phaseoli in Candollea I (1925) Hassler treats *Ph. campestris* as a variety, differing by its smaller flowers only, of *Ph. Schottii*. In Suriname there are two distinct forms, of which one is identical with the var. *campestris* (superfluously named var. *campestris* f. *brasiliensis* by Hassler), the other with var. *campestris* f. *guianensis* Hassl. Hassler distinguishes the f. *guianensis* from the variety chiefly on account of its narrower leaflets and also of the broader pod.

There are however other differences on which stress is laid by Ducke who described the f. *guianensis* as *Ph. productus*. In *Ph. campestris* the stipules are small, adnate or hardly produced, and the pod is subcylindrical; in *Ph. productus* the stipules are distinctly (2—3 mm) produced at the base and the pod is flat-compressed, shorter and broader.

Ph. productus is at any rate identical with *Ph. trichocarpus* Wright, described after a specimen of Wright from Cuba. Piper in Contr. U.S. Nat. Herb. l.c. cites *Ph. trichocarpus* as a synonym of *Ph. Schottii*, and regards *Ph. campestris* as a distinct species differing by broader leaflets and smaller flowers. Apparently Piper does not characterize *Ph. trichocarpus (Ph. productus)* in the same manner as Ducke, but at any rate *Ph. Schottii* Benth. in the sense of Hassler is different from *Ph. trichocarpus*.

In Ann. Wien. Mus. l.c. Bentham cites as type specimen of *Ph. Schottii:* Tejuco, Schott, and as type specimen of *Ph. longifolius:* Brasilia, Schott. In the Fl. Bras. l.c. Bentham unites *Ph. Schottii* and *Ph. longifolius* under the younger name of *Ph. longifolius*, and cites: Brasilia orientalis, Schüch, Tijuca in prov. Rio

de Janeiro, Schott, and Pará, Obidos, Spruce. In the Kew herbarium are present: an incomplete specimen of Schücht, from Brasilia, perhaps the type of *Ph. longifolius* Benth., without fruits; an incomplete specimen of Pohl(?), from Tepuco, without fruits; the specimen of Spruce from Obidos, bearing one subcylindrical, exceptionally long (± 9 cm) pod.

If Bentham was correct in identifying Spruce's specimen with *Phaseolus Schottii* and *longifolius*, *Ph. trichocarpus* must be regarded as a distinct species or at any rate as a very distinct variety. It is possible, the type specimen being very incomplete, that Bentham's identification was incorrect. *Ph. trichocarpus* is not yet known south of Pará. The position of *Ph. Schottii* Benth. however is still doubtful to me, so that I prefer to treat *Ph. campestris* as a distinct species and not as a variety of *Ph. Schottii*.

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