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THE AFRICAN DICHAPETALACEAE V

A taxonomical revision.
This third instalment of the revision of
Dichapetalum
contains the treatment of the species g–l

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INTRODUCTION AND ACKNOWLEDGEMENTS

This publication is the fifth in a series dealing with African *Dichapetalaceae*; the four preceding ones have been published in 1969, 1970, 1973, and 1978 respectively. The revision of the genus *Dichapetalum* is continued by the species g–l. It was initiated in 1973 by the species a–b and continued in 1978 by the species c–f.

As before, all specific names, whether validly published or not, are treated in alphabetical order. In the series g–l, 10 names proved to represent distinct species and two species, *D. geminostellatum* and *D. lofense*, are described for the first time. In one species 4 varieties have been distinguished, in another species 3.

All specimens cited have been examined by the author, unless marked: n.v. Their arrangement is as before, i.e. geographical arrangement of the countries, and alphabetical arrangement according to collector's name within the countries.

The author is grateful to the directors and curators of the herbaria cited, for their continued loan of material.

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TAXONOMIC TREATMENT SPECIES G–L

D. gabonense Engl. **Fig. 1 Map 1**

D. gabonense Engler, 1896-b: 137; 1896-a: 348–349, fig. 187 A–G; 1912-a: 570; Pellegrin, 1913: 644; Engler, 1915: 844; De Wildeman, 1919: B33; Engler & Krause, 1931: 6; Breteler, 1973: 8, 18, 32, XVI; Punt, 1975: 40; Breteler, 1978: 7, 77.

Type: Gabon, Munda, Sibange-Farm, *Soyaux 268* (holotype: B†; lectotype: Z; isotypes: BREM, GOET, K, LE, P, WAG).

D. soyauxii Engler, 1896-b: 137; 1896-a: 348, nomen; 1912-a: 570; Pellegrin, 1913: 644; De Wildeman, 1919: B66; Exell, 1927: 67; Engler & Krause, 1931: 6; Exell & Mendonça, 1951-b: 325; Breteler, 1973: XVI. Type: Gabon, Munda, Sibange-Farm, *Soyaux 391* (holotype: B†; lectotype: Z; isotypes: BREM, GOET, K, LE, P).

D. nitidulum Engler & Ruhland, 1902: 77; Engler, 1912-a: 570; Pellegrin, 1913: 645; De Wildeman, 1919; B54; Keay, 1958: 438; Breteler, 1973: XVI. Type: Cameroun, Batanga, *Dinklage 1351* (holotype: B†; no isotypes). Neotype: Cameroun, 6.5 km S. of Kribi, Batanga Rd., *Bos & Breteler 3100* (holotype: WAG).

D. micropetalum Engler, 1912-a: 566; De Wildeman, 1919: B51; Breteler, 1973: XVI. Type: Cameroun, Bipindi, *Zenker 3612* (holotype: B†; lectotype: WAG; isotypes: BM, BR, COI, E, GOET, K, L, M, MO, P, PRE, W, WU, Z).

D. subfalcatum Engler, 1912-a: 569; De Wildeman, 1919: B67; Breteler, 1973: XVI. Type: Cameroun, near Mimfia, *Zenker 3522* (holotype: B†; lectotype: WU; isotypes: BM, BR, E, GOET, HBG, K, L, M, MO, W).

D. verruculosum Engler, 1912-a: 585, as *D. verrucosulum*; De Wildeman, 1919: B71; Breteler, 1973: XVI. Type: Cameroun, between Ndonge and Bare, *Ledermann 6149* (holotype: B†; lectotype: BM).

D. fraternum Pierre, nomen (see Breteler, 1978: 77).

Diagnostic characters. Liana, lianescent shrub, or shrub, glabrous to sparsely appressed-puberulous in all its vegetative parts. Branches and branchlets hollow. Stipules simple, small, triangular. Leaves papery, with small glands and usually with small domatia in the axils of some lateral nerves beneath. Inflorescence rather loose, distinctly branched, with minute bracts and bracteoles, stalk usually completely adnate to petiole. Sepals suberect. Petals shortly bilobed. Pistil 2–3-merous, ovary lanate. Fruit subellipsoid, up to 4 × 2.5 × 2.5 cm, beaked, densely tomentellous to tomentose.

Description. Liana, lianescent shrub or shrub. Woodcylinder entire in stems of shrubby specimens, deeply divided in those of lianas (see BRETELER, 1973: phot. 1, 2, p. 8). *Branches* and *branchlets* hollow, often dark-reddish to purplish brown. Lenticels minute, numerous, pustular when young. Branchlets glabrous to sparsely appressed-puberulous, glabrescent. *Stipules* triangular, often narrowly so, 1–3 mm long, usually appressed-puberulous, early caducous. *Leaves*: petiole semi-terete, somewhat canaliculate above, 2–5(8) mm long, (4)6–10(15) mm long when united with peduncle, glabrous to appressed-puberulous, especially so above; blade papery when fresh, elliptic to obovate, (1.5)2–3 times as long as wide, (6)8–15(20) × (3)4–7(9) cm, cuneate to rounded at base, obtusely to acutely acuminate, the acumen (0.5)1–1.5(2.5) cm long, glabrous to sparsely appressed-puberulous on midrib and main lateral nerves both sides, glabrescent, the midrib impressed, but the (4)5–7 pairs of lateral nerves rather prominent above, small domatia (hairy or not) usually present in at least some axils of the main lateral nerves beneath, glands less than 0.2 mm diam., dispersed, mainly

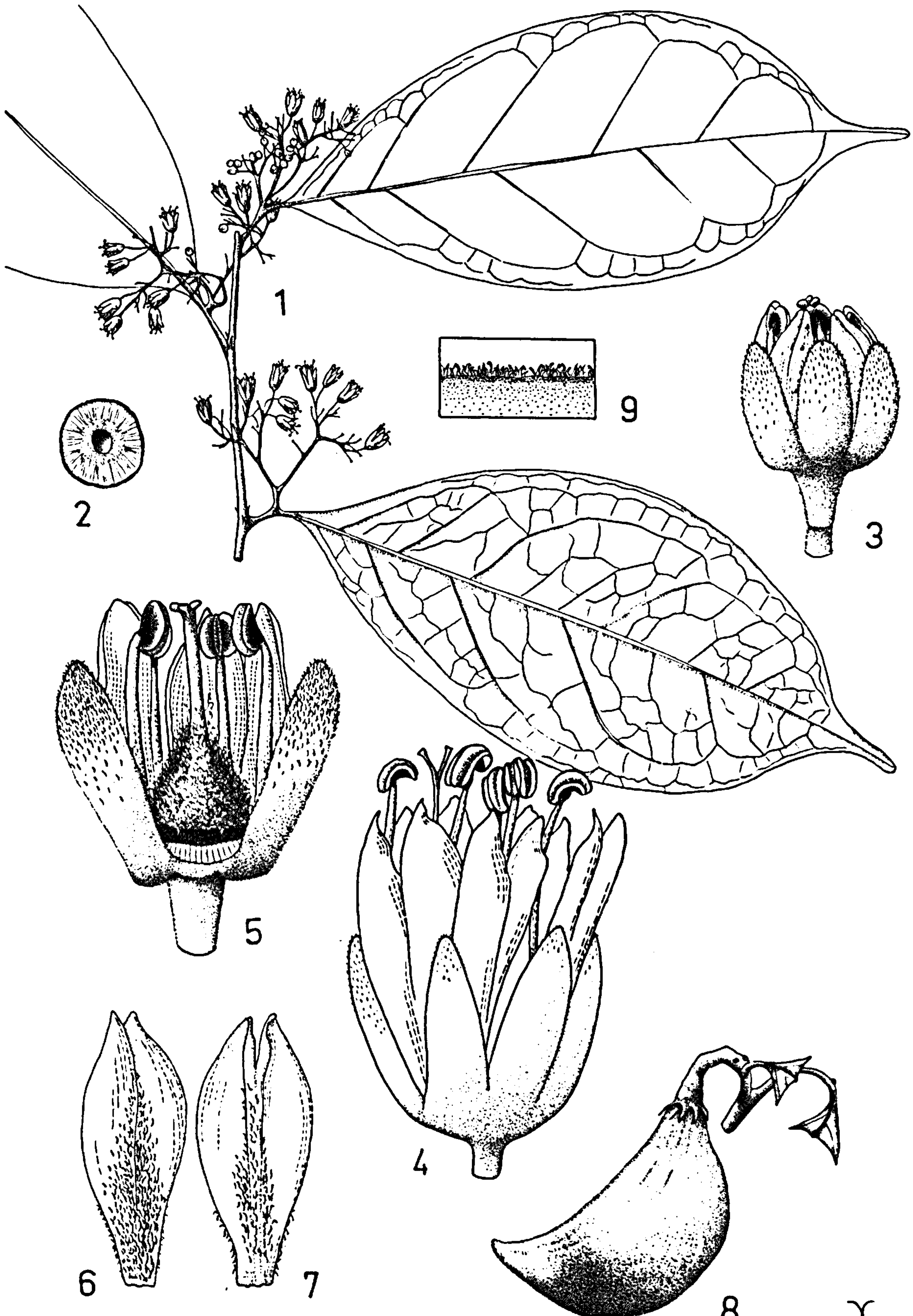
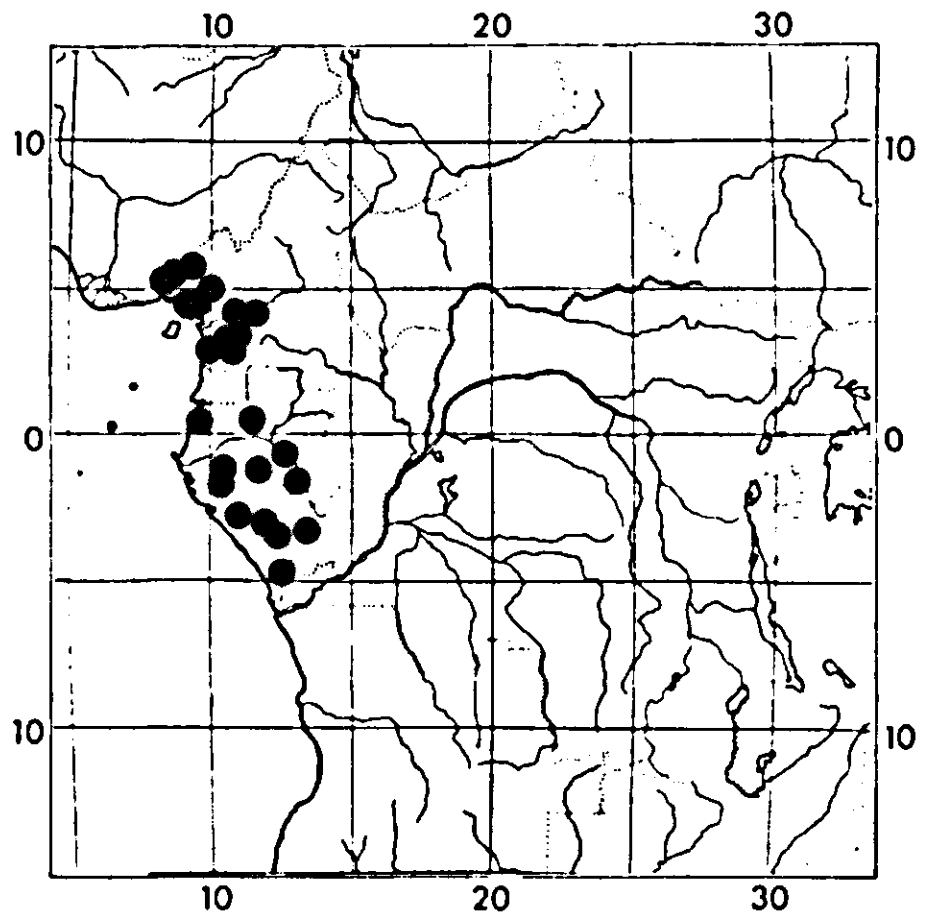


FIG. 1. *D. gabonense*: 1. flowering branchlet, $\frac{5}{6}\times$; 2. transverse section of branch, $2\frac{1}{2}\times$; 3. young flower, $5\times$; 4. flower with 2-merous pistil, $7\frac{1}{2}\times$; 5. flower, sepals and petals partly removed, showing 3-merous pistil and staminodes, $7\frac{1}{2}\times$; 6. petal outside, $7\frac{1}{2}\times$; 7. petal inside, $7\frac{1}{2}\times$; 8. fruit, $\frac{5}{6}\times$; 9. part of exocarp showing indumentum, $10\times$. (1. *Soyaux 268*; 2, 3, 5–7. *Bos & Breteler 3100*; 4. *Le Testu 9351*; 8–9. *Bos 3181*).

beneath, usually also some above. *Inflorescence* rather loose, 1–4 times distinctly branched, appressed-puberulous; peduncle usually completely adnate to petiole; bracts and bracteoles minute, triangular, up to 0.5 mm long. *Pedicel* up to 4 mm long, the lower part up to 3 mm long, the upper part at most 1.5 mm long. *Sepals* erect to somewhat spreading, oblong-elliptic to ovate-oblong, 2–4 × 1–2 mm, glabrous to puberulous-tomentellous outside especially so on the margin, inside glabrous or short-hairy mainly on upper part. *Petals* erect or nearly so, shortly adnate to filaments at base, narrowly obovate in outline, 3–4.5 mm long, 0.5–2 mm split, puberulous-tomentellous mainly on basal part outside, sparsely so inside. *Stamens* erect or nearly so, usually slightly longer than the petals, 3.5–5(6) mm long; filaments glabrous; anthers usually curved, up to 0.7 mm long, connective prominent, sometimes hairy. *Staminodes* irregular in shape, often forming a lobed ring, subquadrate, up to 0.5 × 0.5 mm, completely glabrous or hairy inside. *Pistil* 2–3-merous, 3–6 mm long; ovary 2–3-locular, densely tomentose to lanate; style usually tomentose-lanate in lower part, glabrous in upper part, 2–3-lobed, the lobes up to 1.5 mm long. *Fruit* obovoid-ellipsoid, 3–4 × 2–2.5 cm, often somewhat curved, usually distinctly beaked, 1(–3?)-seeded, the aborted cells visible as a more or less distinctive ridge, tomentellous, usually densely so, orange at maturity; exocarp firm, 1–2 mm thick, with a purplish inner layer; mesocarp 1–2 mm thick, consisting of a ca erect pallisade of juicy hairs attached to the coriaceous, fibrous endocarp which is glossy and glabrous inside. *Seed* ovoid-ellipsoid, ca 2.5 × 1.5 cm; seedcoat dark-brown with paler brown venation.

PHOT. 1. *D. gabonense*: flowering branchlet (*Breteler 6841*; phot. F. J. BRETELER).



MAP 1. *D. gabonense*

Distribution: S. E. Nigeria, Cameroun, Gabon, Congo, N. Angola (Cabinda).

Ecology: Rain forest, semi-deciduous forest.

Specimens examined:

Nigeria. Calabar: between Awi and Akamkpa, *Daramola FHI 55581* (FHI, K); Ikpai, *Latilo FHI 53998A* (FHI, K, P); *Latilo & Oguntayo FHI 70503* (K, WAG); *FHI 70504* (WAG); *Latilo & Onyeachusim FHI 54258* (BR, K); Oban, *Onochie FHI 34802* (BR, FHI, K, P); Orem, *Onochie FHI 36403* (K); Oban, *Mr. & Mrs. Talbot s.n.* (K).

Cameroun. Batanga, *Bates 184* (BM, G, K); Kumba, *Binuyo & Daramola FHI 35200* (K); 6.5 km S. of Kribi, *Bos & Breteler 3100* (WAG, neotype of *D. nitidulum*); *Bos 3181* (WAG); *4488* (WAG); sin. loc., *Büsgen 34* (B); *137* (B); Batanga, *Dinklage 1001* (HBG); between Ndonge and Bare, *Ledermann 6149* (BM, type of *D. verruculosum*); E. of Bandem, 3 km E. of Yingui, *Leeuwenberg 9173* (WAG); near Mbanga, km 81 Kribi-Ebolowa Rd., *Letouzey 9473* (P, WAG); Ayos, 30 km W.S.W. of Obala, *Letouzey 9828* (BR, K, P, WAG); near Nkong Kwala, 70 km S. of Ndikiniméki, *Letouzey 10766* (K, P, WAG); near Botmakak, 40 km N.N.E. of Eséka, *Letouzey 12269* (WAG); Bachuo Ntai, 10 km S.E. of Mamfé, *Letouzey 13568* (P, WAG); 10 km N.E. of Mamfé, *Letouzey 14160* (YA); Bipindi, *Zenker 390* (B, BR, BREM, C, G, LD, P, U, WAG); *871* (BM, E, G, GOET, K, L, LE, M, P, W, WU, Z); *1578* (B, BM, BR, COI, E, G, GOET, K, L, LE, M, P, W, WU, Z); *1670* (BM, E, G, GOET, K, L, LE, M, P, W, WU, Z); *3522* (BM, BR, E, GOET, HBG, K, L, M, MO, W, WU, type of *D. subfalcatum*); *3612* (BM, BR, COI, E, GOET, K, L, M, MO, P, PRE, W, WAG, WU, Z, type of *D. micropetalum*); *3853* (BM, E, K, MO, W, WU); *4786* (BM, BR, E, G, GOET, K, L, LE, M, P, W); *4881* (BM, E, K, LE, MO, W).

Gabon. 50 km S.E. of Lambaréné, *Breteler 5781* (WAG); *5803* (WAG); 5 km Moanda-Franceville, *Breteler 6405* (WAG); 4 km W. of Lastoursville, *Breteler 6524* (WAG); *6576* (WAG); 6 km Moanda-Franceville, *Breteler 6841* (WAG); 8 km Lastoursville-Moanda, *Breteler & J. J. F. E. de Wilde 743* (WAG); sin. loc., *Duparquet s.n.* (P); Nkogo sur l'Ogooué, *Fleury in Chevalier 26358* (P, WAG); sin. loc., *Griffon du Bellay 27* (P, WAG); near Libreville, *Jolly 181* (P); *Klaine 35* (BR, FI, K, P, WAG); *267* (P); *299* (P); *342* (P, WAG); *1584* (G, P); *1585* (P); *2175* (BM, K, LE, P, WAG); *s.n.* (BM, K, LE, P, WAG); Tchibanga, *Le Testu 1963* (BM, BR, E, K, P, WAG, Z); Echiras, *Le Testu 5062* (BM, P); Lastoursville, *Le Testu 7169* (BM, BR, P, WAG); Ipoungou, *Le Testu 8614* (BM, BR, P, WAG); La Lara, *Le Testu 9351* (BM, P); Ile de Ngegoni, *Pobéguin 191* (P, WAG); Munda, *Soyaux 268* (BREM, GOET, K, LE, P, WAG, Z, type); *391* (BREM, GOET, K, LE, P, Z, type of *D. soyauxii*); *414* (K, LE, P, Z); sin. loc., *Thollon 155* (P, WAG).

Congo. Obouèsé, 16 km Mossendjo-Mayoko, *Bouquet 1352* (P, WAG); Mouyabi, Mbila Rd., *Bouquet & Sita 2265* (WAG); Kibangore, *Sita 1199* (IEC, P).
Angola. Cabinda, Buco Zau, *Gossweiler 6735* (BM, BR, COI, K, LISJC, LISU).

Notes. The material of *D. gabonense* is rather uniform when compared to the variability generally found in other species. It is therefore surprising that this species has been described so many times as new by the same author, and notably so when comparing the types of *D. gabonense* and *D. soyauxii*, both from the same locality. These are so much alike that they could have, and even may have, been taken from the same plant. They differ only in the state of development of the flowers, one (*D. gabonense*) having open flowers, the other (*D. soyauxii*) flowerbuds. The same holds more or less for the type material of *D. micropetalum* and of *D. subfalcatum*, the first showing flowerbuds, the second immature fruits.

The type of *D. nitidulum* has been lost in Berlin, but ENGLER and RUHLAND's description clearly points to *D. gabonense*. A neotype has been designated, collected in the same area as the DINKLAGE specimen.

The fragment of the type of *D. verruculosum* found in BM undoubtedly represents *D. gabonense*. It has been designated lectotype.

D. gabonense is closely related to the largely sympatric *D. thollonii* Pellegr. a species that also has hollow branches and the peduncle adnate to the petiole. They may be distinguished as follows:

Fresh leaves papery, usually with domatia in some lateral nerve axils beneath; glands on lower surface less than 0.2 mm diam.; petals 3–4.5 mm long, usually slightly shorter than the stamens; pistil 2–3-merous, 3–6 mm long. . . . . **D. gabonense**

Fresh leaves coriaceous, without domatia; glands on lower surface 0.3–1 mm diam.; petals 5.5–8 mm long, usually slightly longer than the stamens; pistil 3-merous, 6.5–8 mm long. . . . . **D. thollonii**

D. geminostellatum Bret., *sp. nov.* **Fig. 2 Map 2**

Liana vel frutex lianescens. Rami ramulique hispidi, plerumque pilis brevibus intermixtis. Stipulae anguste triangularis usque subulatae, 4–9 mm longae, saepe curvatae, hispidae. Folia ovato-elliptica usque oblongo-obovata, (4)6–12(17) × (1)2–5(7) cm, acuminata, plerumque basi cordata, subtus et costa supra hispida. Inflorescentia sessilis, 1–3-flora, bracteis bracteolisque distinctis, subulatis. Petala erecta, linearia, 3.5–5.5 mm longa, lobis patentibus, linearibus, planis, acutiusculis. Pistillum 3-merum. Ovarium velutinum.

Type: Gabon, near Libreville, 18 km Rd to Cap Estérias, *Breteler & De Wilde 3* (holotype: WAG).

Diagnostic characters. Liana or lianescent shrub. Branches and branchlets hispid, usually mixed with short hairs. Stipules narrowly triangular to

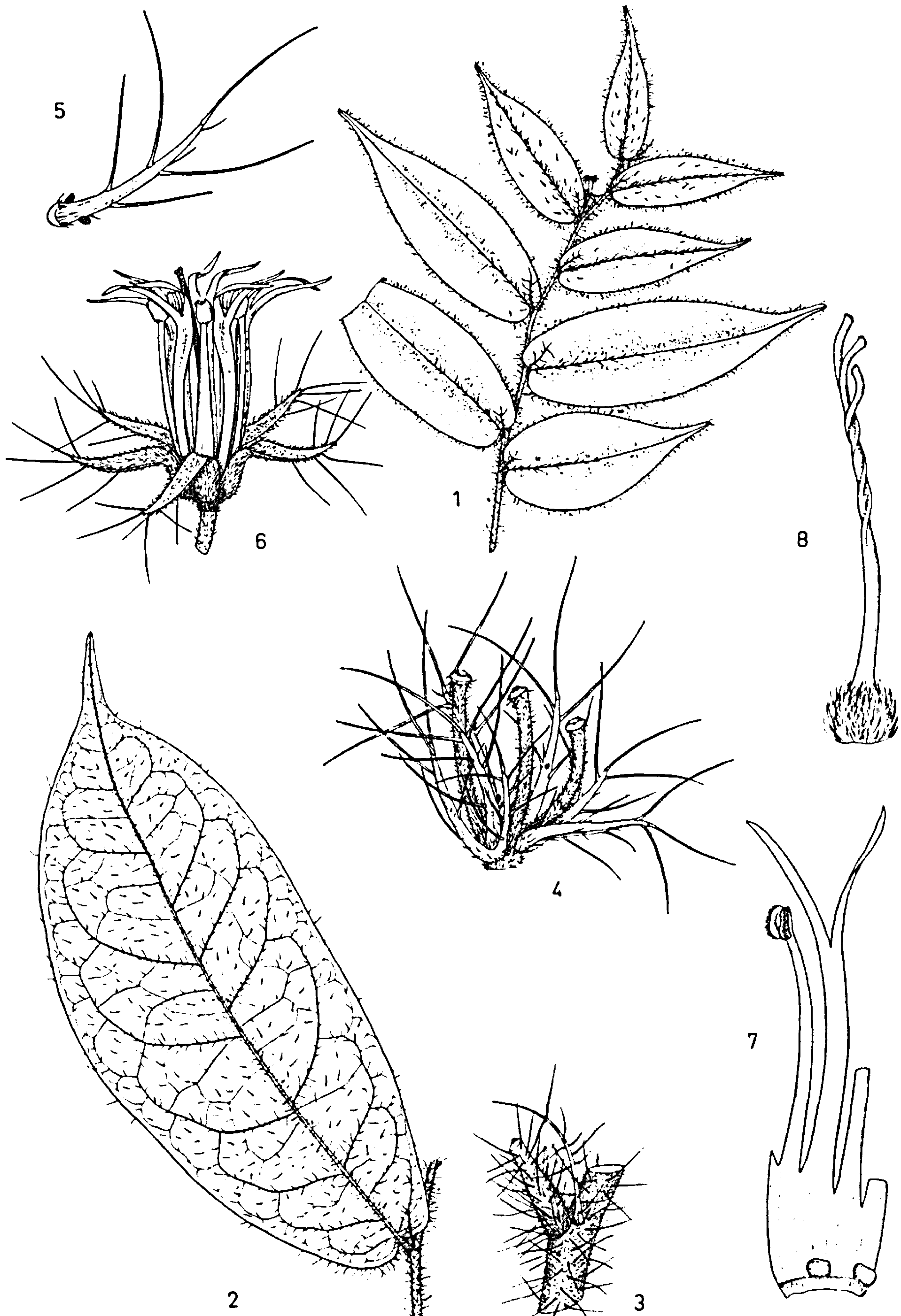


FIG. 2. *D. geminostellatum*: 1. branchlet with one flower, ½ ×; 2. large leaf, ½ ×; 3. part of branchlet with stipule and petiole, 2 ×; 4. inflorescence without flowers, 9 ×; 5. bract, 9 ×; 6. flower, 6 ×; 7. flower part showing petal, stamen, and staminodes, 12 ×; 8. pistil, 12 ×. (1, 7–8. *Hallé & Villiers 5436*; 2–3. *Breteler & J. J. de Wilde 2*; 4–5. *Klaine 2161*; 6. *Breteler & J. J. de Wilde 3*).

subulate, 4–9 mm long, often curved, hispid. Leaves ovate-elliptic to oblong-obovate, (4)6–12(17) × (1)2–5(7) cm, usually cordate at base, acuminate, hispid beneath and on midrib above. Inflorescences 1–3-flowered, sessile, with distinct, subulate bracts and bracteoles. Petals erect, linear, 3.5–5.5 mm long with spreading, linear, flat, acutish lobes. Pistil 3-merous, ovary velutinous.

Description. Liana or lianescent shrub. *Branches* and *branchlets* brown, hispid, usually mixed with a short-hairy indumentum, glabrescent with age. *Stipules* narrowly triangular to subulate, 4–9 mm long, often curved, hispid, with or without glandular warts, caducous. *Leaves*: petiole semiterete, 1–3(5) mm long, more or less hairy as branchlets; blade papery, ovate-elliptic to oblong-obovate, 2–3 times as long as wide, (4)6–12(17) × (1)2–5(7) cm, usually cordate sometimes broadly rounded at base, acutely to obtusely acuminate, the acumen 1–2.5 cm long, hispid on midrib both sides, on margin, on lateral nerves and on other parts beneath as well but usually less dense, glabrescent, the hispid hairs on the impressed midrib above usually mixed with a short-hairy indumentum; lateral nerves 5–8 pairs; glands beneath only, small, rather distinct, numerous, mainly along the midrib. *Inflorescences* axillary, puberulous, principally 3-flowered, often 1–2-flowered by reduction, sessile, grouped on leafless parts of branchlets or crowded on a very short, leafless, axillary shoot and then appearing more or less fasciculate; bracts and bracteoles narrowly triangular to subulate, usually curved, 1.5–4 mm long, with or without glandular warts, hispid. *Pedicel* up to 3 mm long, puberulous, the upper part very short or absent, i.e. the joint immediately below calyx. *Sepals* spreading at anthesis, narrowly triangular, 2–2.5 × 0.5 mm, acutish, outside appressed short-hairy usually mixed with a few hispid hairs, puberulous mainly on upper part inside. *Petals* erect, linear, 3.5–5.5 mm long, 1–1.5 mm split, ca 1 mm adnate to filaments at base, glabrous; lobes spreading, linear, flat, acutish. *Stamens* erect, 3–4.5 mm long, glabrous; anthers up to 0.5 mm long, connective prominent. *Staminodes* subquadrate, up to 0.2 × 0.2 mm, glabrous. *Pistil* 3-merous, 4.5–5 mm long; style glabrous or with a few hairs, shortly 3-lobed, twisted in apical part or not; ovary depressed-globose, velutinous. *Fruits* unknown.

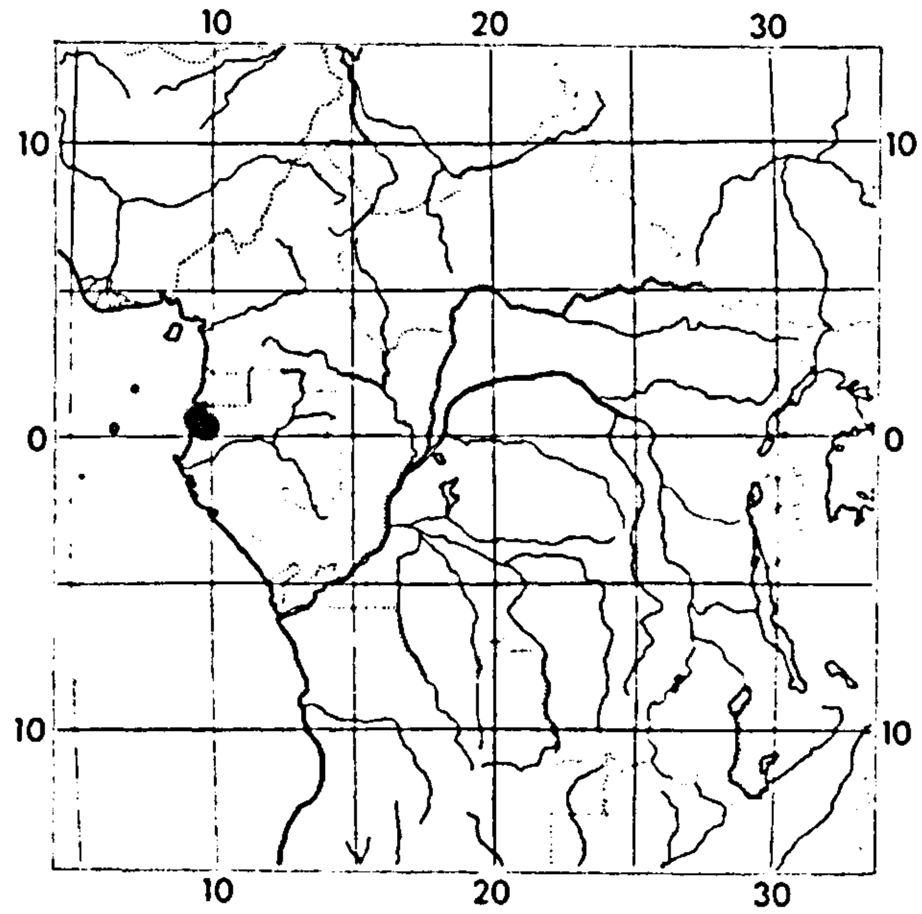
Distribution: N.W. Gabon.
Ecology: Rain forest.

Specimens examined:

Gabon. Near Libreville, 18 km Rd to Cap Estérias, *Breteler & De Wilde 2* (WAG); *3* (WAG, type); Cap Estérias, *Hallé & Villiers 5436* (P, WAG); near Libreville, *Klaine 2161* (P, WAG).

Notes. This species resembles *D. heudelotii* var. *hispidum* by its leaf shape and hispid indumentum. It differs from it by its few-flowered inflorescences and its flowers, the petals being quite different with flat instead of concave lobes.

The epithet '*geminostellatum*' points to the shape of the flower: the spreading sepals and petal lobes resemble two superposed stars.



MAP 2. *D. geminostellatum*

D. germainii Haum. **Fig. 3 Map 3**

D. germainii Hauman, 1955: 343; 1958-a: 337; Breteler, 1973: XVII; Punt, 1975: 29.
Type: Zaïre, Yangambi, *Louis 3175* (holotype: BR).

Diagnostic characters. Treelet or shrub up to ca 8 m tall, lianescent shrub, or liana. Branchlets densely villous to velutinous. Stipules rather long persistent, once to twice pinnatisect, with narrow almost threadlike lobes. Leaves shortly stalked, obovate-elliptic, 2.5–4 times as long as wide, (10)15–25(30) × (3)5–7(10) cm, usually hairy on midrib beneath, the midrib and lateral nerves impressed above. Inflorescences glomerate, few to many flowered. Sepals erect-reflexed. Petals suberect, (3)3.5–5 mm long, 0.5–1.5 mm split, glabrous. Stamens slightly shorter than petals. Pistil (2)3(4)-merous, ovary velutinous. Fruits 3–5 cm diam.; exocarp densely velutinous irregularly ridged-tuberculate, giving the fruit the aspect of a sponge.

Description. Treelet or shrub up to ca 8 m tall, lianescent shrub or liana. Woodcylinder entire (?), wood hard. *Branches* glabrescent with age, with sparse distinct lenticels or not. *Branchlets* densely villous to velutinous, the same indumentum present on stipules, petioles and on the leaves, especially on the midrib beneath. *Stipules* rather long persistent, once to twice pinnatisect, ovate to elliptic in outline, (5)7–20(40) mm long, up to 30 mm wide, the lobes very narrow, almost threadlike. *Leaves*: petiole 2–6(13) mm long; blade obovate-elliptic, (2)2.5–4 times as long as wide, (10)15–25(30) × (3)5–7(10) cm, usually gradually tapering to an obliquely cordate to rounded base, usually slender acuminate, the acumen acute to mucronate, 1–3(4) cm long; very young leaves entirely covered with a subappressed villous-velutinous indumentum, more or less persistent in mature leaves on the midrib beneath; midrib and the (8)11–16

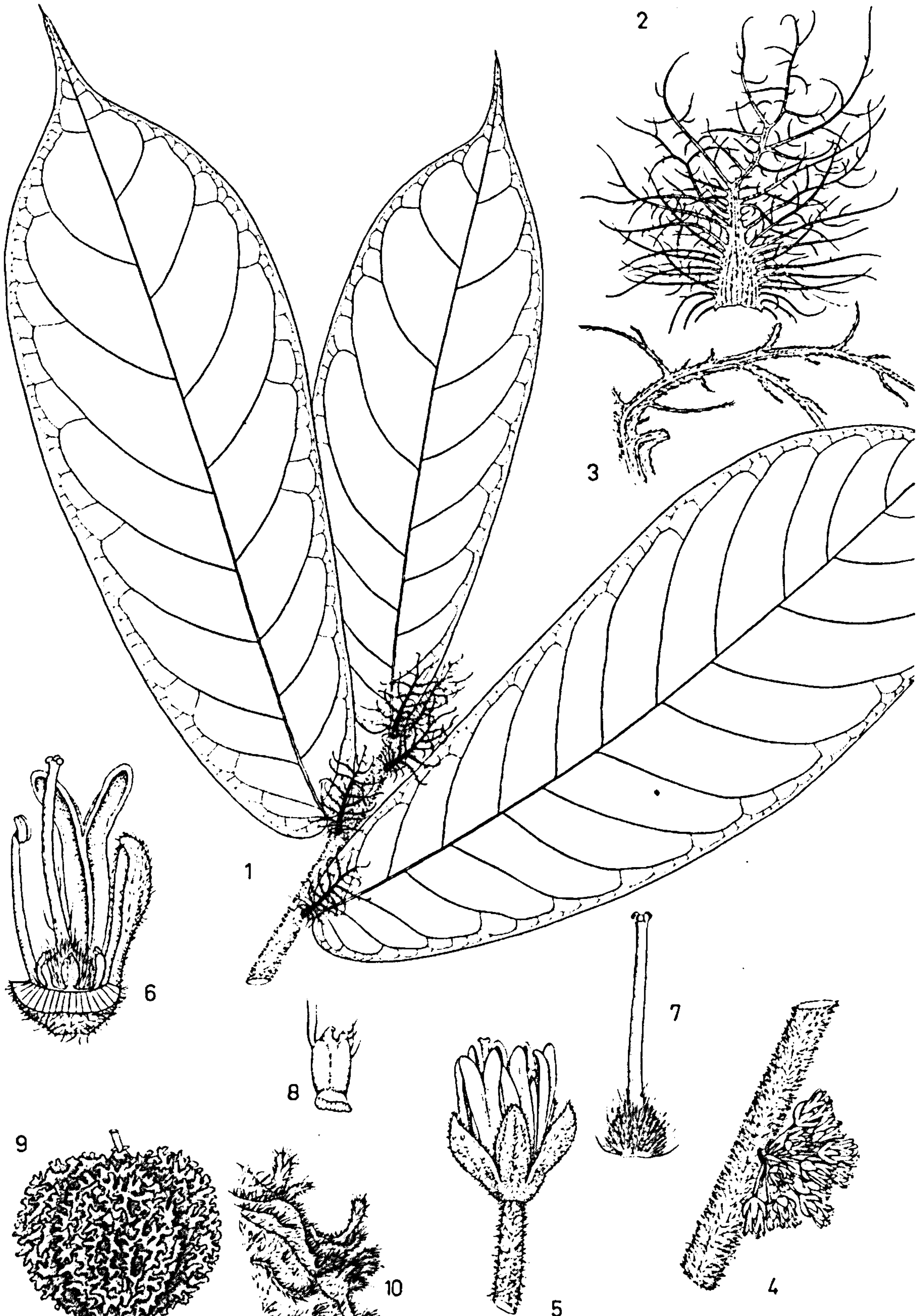


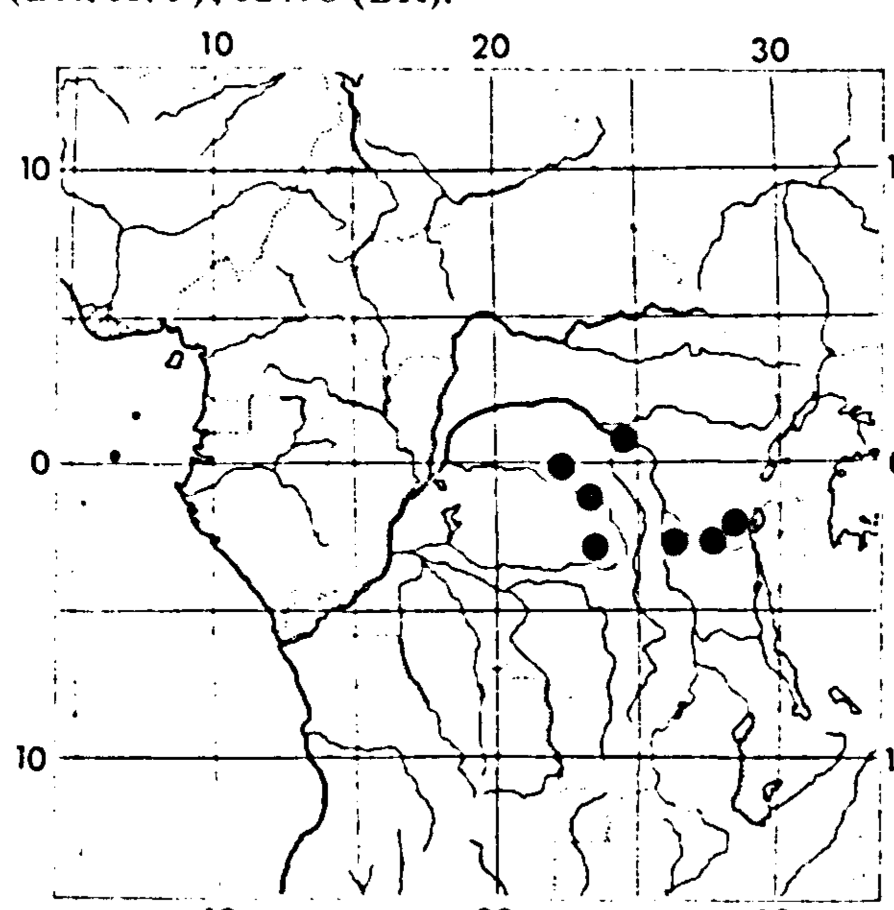
FIG. 3. *D. germainii*: 1. leafy branchlet, ½ × ; 2. stipule, 1 × ; 3. detail of stipule; 4. inflorescence, 1 × ; 5. flower, 4 × ; 6. flower partly, 6 × ; 7. pistil, 6 × ; 8. staminode inside, 12 × ; 9. fruit, ½ × ; 10. detail of fruit indumentum. (1. *Dubois 1012*; 2–3. *Pierlot 837*; 4–8. *Louis 11278*; 9–10. *Louis 4158*).

pairs of lateral nerves usually impressed above, very prominent beneath; glands flat, inconspicuous, usually absent, when present beneath near base only. *Inflorescences* glomerate, few to many flowered; bracts and bracteoles narrowly triangular, curved, the lower often pinnately lobed, up to 6 mm long, appressed-pubescent to hispidulous outside, ± glabrous inside. *Pedicel* up to ca 10 mm long, hispidulous, the upper part 0, i.e. jointed immediately below calyx. *Sepals* erect-reflexed, oblong, ovate-elliptic to obovate, (2.5)3–4(4.5) × 1–1.5 mm, puberulous to pubescent or hispidulous outside, glabrous to puberulous inside. *Petals* suberect, narrowly obovate to spathulate in outline, (3)3.5–5 mm long, 0.5–1.5 mm split, free or nearly so at base, glabrous. *Stamens* suberect, slightly shorter than petals, 3–4.5 mm long, glabrous; anthers ca 0.5 mm long. *Staminodes* subquadrate to obovate-oblong, up to ca 0.5 × 0.5 mm, emarginate to bilobed at top, glabrous or nearly so. *Pistil* (2)3(4)-merous, 3–4.5 mm long; ovary velutinous; style glabrous, very shortly (2)3(4)-lobed. *Fruits* subglobose to slightly 3-lobed, 3–5 cm diam., 1–3-seeded; exocarp densely velutinous, irregularly ridged-tuberculate, up to 6 mm thick, giving the fruit the aspect of a sponge; mesocarp rather thin, juicy (?); endocarp coriaceous-pergamentaceous, glabrous inside. *Seeds* subellipsoid, slightly laterally compressed and slightly curved, up to 25 × 18 mm, with a smooth, brown testa.

Distribution: Zaïre.
Ecology: Rain forest.

Specimens examined:

Zaïre. Yangambi, *Bolema 737* (BR); *1043* (BR); *Boutique 22* (BR, M); *Donis 3373* (BR); Ikela, *Dubois 828* (BR); *1012* (BR); Okoka, *Germain 7546* (BR, EA, PRE); Yangambi, *Germain 8566* (BR); sin. loc., *Ghesquière 41* (BR); Yangambi, *Gilbert 8260* (BR); *9680* (BR); Bunyakiri, *Gutzwiller 1748* (BR); Kamba, *E. & M. Laurent 940* (BR); Lumuna, *Lebrun 5919* (BR, LISU); Masanga, *A. Léonard 5838* (BR); Yangambi, *Louis 2958* (BM, BR); *3175* (BR, type); *3495* (BR); *3795* (BR, U); *4158* (BR, C, FI, M, SRGH, WAG); *9299* (BR, M, SRGH); *10360* (BR, W); *10472* (BR, C, LISC); *11278* (BR, COI, FI, Z); *12553* (BR, LISC, P); *14331* (BR, EA, WAG); Mingazi, *Pierlot 837* (BR); 110 km Kavumu-Walikale, *Troupin 3849* (BR, K); *4371* (BR, K, P); *12498* (BR).



MAP 3. *D. germainii*

D. gillardinii Haum. = **D. lujae** De Wild. & Th. Dur. var. **gillardinii** (Haum.) Bret.

For details see p. 72.

D. gilletii De Wild. **Fig. 4 Map 4**

D. gilletii De Wildeman, 1911-b: 270; 1912: 420; 1919: B33; Hauman, 1958-a: 311, p.p. (see notes); Breteler, 1973: XVII; Punt, 1975: 26–27.

Type: Zaïre, Kimuenza, *Gillet 1681* (lectotype: BR, designated by HAUMAN; isotype: WAG).

D. stenophyllum Krause, 1912: 508; Breteler, 1973: XVII. Type: Zaïre, Kimuenza, *Mildbraed 3764* (holotype: B†; lectotype: HBG; isotype: BM).

Diagnostic characters. Liana or lianescent shrub. Branchlets densely tomentose to hirsute. Stipules rather obscure, early caducous. Leaves elliptic to oblong-obovate, (6)8–16(20) × (2)3–7 cm, rounded to cordate at base, usually rather long acutely acuminate, hirsute on midrib above and distinctly so beneath, with (7)9–12(15) pairs of main lateral nerves. Inflorescence a slender stalked subglobose head. Sepals, petals and stamens usually more or less spreading. Pistil 3–4-merous; ovary densely lanate. Fruit subglobose, 2–5 cm diam., covered by erect, acicular irritating hairs.

Description. Liana or lianescent shrub. *Branches* glabrous or glabrescent, without or with usually obscure lenticels, more distinct on the orthotropic shoots. *Branchlets* usually densely tomentose to hirsute, the hairs reddish to very pale-brown, glabrescent with age. *Stipules* rather obscure, narrowly triangular, 2–6 mm long, appressed-hairy, early caducous. *Leaves*: petiole subterete, 2–6 mm long, hairy as branchlets; blade elliptic to oblong-obovate, 2–3 times as long as wide, (6)8–16(20) × (2)3–7 cm, rounded to cordate at base, acutely acuminate, the acumen 0.5–3 cm long, sometimes ending in a long distinct mucro, hirsute on the usually somewhat impressed midrib above, more or less hirsute on entire surface, especially the midrib, beneath and often also on margin; main lateral nerves (7)9–12(15) pairs, usually slightly impressed above; glands few when present, small, inconspicuous, beneath only. *Inflorescence* a distinctly stalked subglobose head, sometimes distinctly branched apically i.e. just under the head, axillary, sometimes grouped on short leafless, axillary branchlets or on leafless apical parts of branchlets, tomentose to hirsute; peduncle slender, 1–4 cm long, sometimes provided with a bract more or less halfway its length; bracts and bracteoles narrowly triangular, up to 5 mm long, pubescent. *Pedicel* up to 3 mm long, pubescent, the upper part 0.5 mm long at most. *Sepals* erect to spreading or even some reflexed, ovate-elliptic to oblong-obovate, 2.5–4 × 1–2 mm, pubescent to tomentose outside, puberulous inside. *Petals* erect to spreading, obovate in outline, 2.5–4.5 mm long, up to 1 mm split, with some, rather stiff

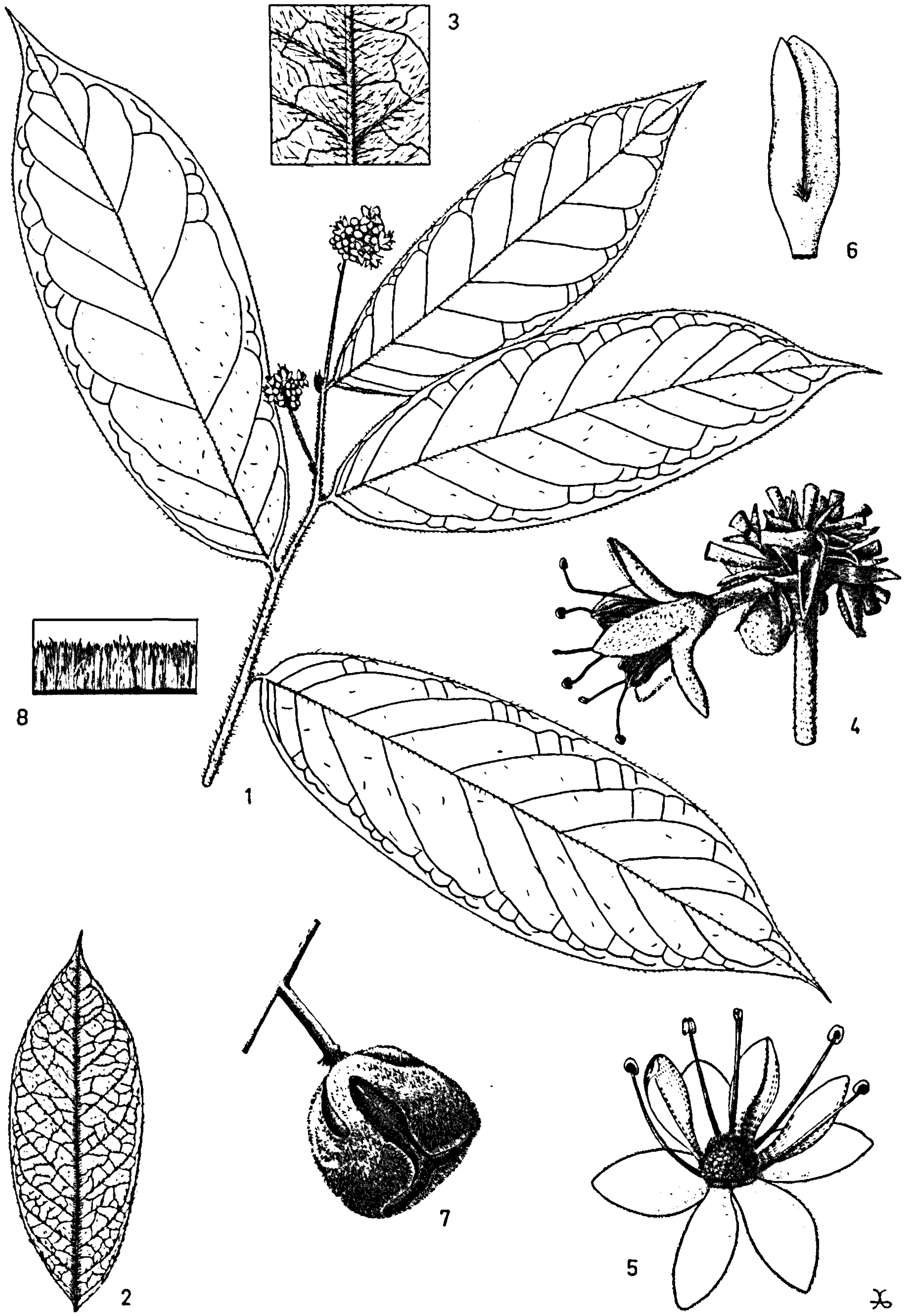


FIG. 4. *D. gilletii*: 1. flowering branchlet, $\frac{1}{2}\times$; . 2. leaf below, $\frac{1}{2}\times$; 3. detail indumentum leaf below, $2\times$; 4. inflorescence with part of peduncle, $3\times$; 5. flower, petals and stamens partly removed, $4\times$; 6. petal outside, $6\times$; 7. fruit, $\frac{1}{2}\times$; 8. detail indumentum of fruit, $3\times$. (1. *Bequaert 844*; 2–3, 7–8. *Gillet 2092*; 4–6. *Bequaert 7181*).

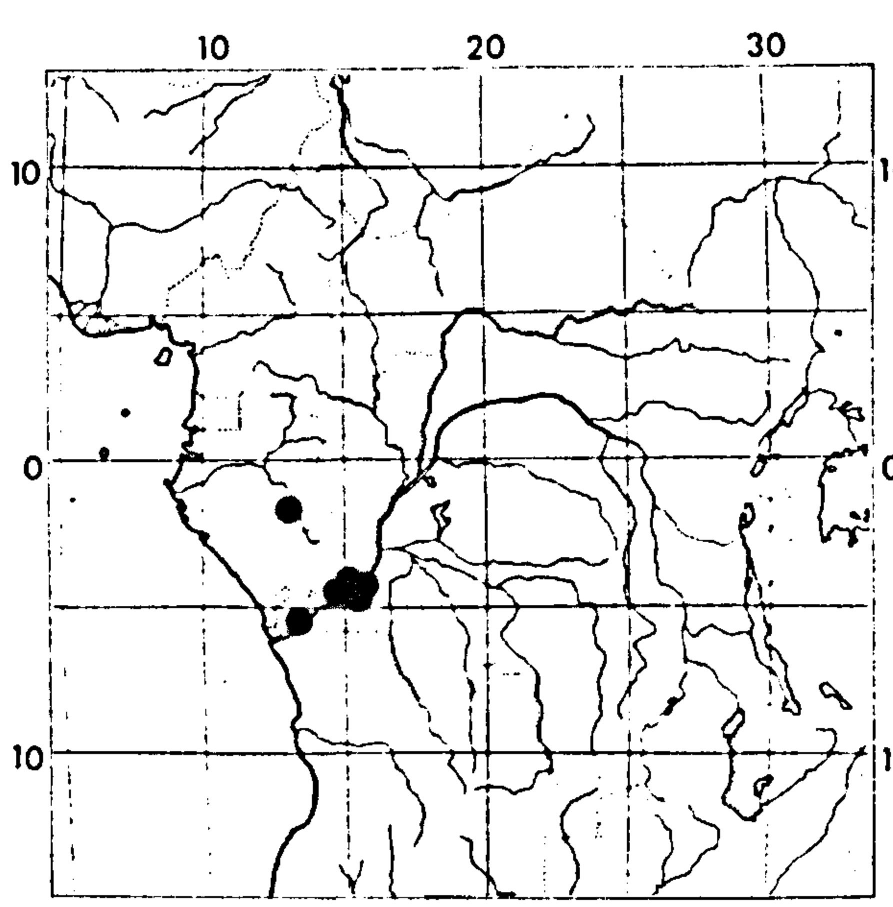
hairs below split outside, glabrous inside. *Stamens* erect to loosely spreading, 4–5.5 mm long, glabrous; anthers reniform, ca 0.5 mm diam. *Staminodes* obdeltate to transversely oblong, up to 0.3 × 0.3 mm, glabrous. *Pistil* 3–4-merous, 4–5.5 mm long; ovary densely lanate; style glabrous or nearly so, shortly 3–4-lobed, lobes coherent. *Fruits* 1–3-seeded, subglobose, 2–5 cm diam., densely covered by erect, easily deciduous, acicular, irritating hairs; exocarp dehiscent (?); mesocarp 3 mm thick, consisting of a dense, erect pallisade of fibres; endocarp hard, woody, glossy and glabrous inside. *Seed* subellipsoid, ca 12 × 8 mm; testa smooth, brown, glabrous.

Distribution: S.E. Gabon, Congo, W. Zaïre.
Ecology: Rain forest, semi-deciduous forest, gallery forest, savannah forest.

Specimens examined:

Gabon. 6 km Moanda-Bakoumba, *Breteler 6818* (WAG).
Congo. Near Brazzaville, *Koechlin 1282* (IEC); 45 km W. of Brazzaville, Kinkala Rd., *Sita 1928* (WAG).
Zaïre. Near Kinshasa, *Achten 315* (BR); *Bequaert 844* (BR); *7181* (BR, LISC); *7638* (BR, K); Nsele-Maluku Rd, *Breyne 3231* (BR); Kinshasa, Lovanium, *Carrington 133* (BR, WAG); Kimuenza, *Evrard 6476* (BR); Kinshasa, *Evrard 6654* (BR, MO); Kimuenza, *Gillet 1681* (BR, WAG, type); *2092* (BR); sin. loc., *Jans 406* (?)(BR); Kimuenza, *Mildbraed 3764* (BM, HBG, type of *D. stenophyllum*); Sanda, *Oddon s.n.* (BR).

Notes. HAUMAN (l.c.: 312) observed that this species is very variable in leafshape and flower dimensions, some specimens being rather close to *D. tomentosum* Engl. In HAUMAN's treatment this is true, because his material, as cited and as used for drawing 32 on p. 313, is a mixture of *D. gilletii* and *D. tomentosum*. Of the specimens cited, *Goossens 1132* and *Laurent 661* belong to *D. tomentosum* and *Toussaint 793*, used for figure 32: B–F, belongs to this species as well. In fact *D. gilletii* and *D. tomentosum* can easily be distinguished from each other by the leaf indumentum, which is hirsute in the former and tomentose in



MAP 4. *D. gilletii*

the latter. The flowers are also quite different: sepals, petals and stamens always more or less spreading in *D. gilletii*, all parts erect in *D. tomentosum*. Only the inflorescences of both species are very similar: a slender-stalked subglobose head. As a consequence of HAUMAN's error, *D. tomentosum* is not treated by him as a species belonging to the flora of Zaïre.

Although not having seen the type material of *D. stenophyllum*, HAUMAN is quite correct in his interpretation of this name. The isotype from Hamburg, collected at the same locality as the type of *D. gilletii*, does not leave the slightest doubt.

D. glandulosum De Wild. = **D. madagascariense** Poir.

D. glandulosum De Wildeman, 1919: B33; Hauman, 1958-a: 320; Breteler, 1973: XVIII; 1978: 81. Type: Zaïre, Likimi, *Malchair 238* (holotype: BR).

Note. DE WILDEMAN noted that *D. dundusanense* De Wild., also a synonym of *D. madagascariense*, is closely related to *D. glandulosum*, both having the same flower characters, and HAUMAN (l.c.: 320) observed that *D. glandulosum* is very variable, showing links with *D. flabellatiflorum* Haum. and with *D. pynaertii* De Wild., two other synonyms of *D. madagascariense*. A forthcoming publication will discuss more detailed the variability within *D. madagascariense*.

D. glandulosum De Wild. var. *fulvialabastrum* (De Wild.) Haum. = **D. madagascariense** Poir.

For details see under *D. fulvialabastrum* (BRETELER, 1978: 80).

D. glaucosepalum Ruhl. = **D. lujae** De Wild. & Th. Dur. var. **lujae**

D. glaucosepalum Ruhland, De Wildeman, 1911-a: 225.

Note. DE WILDEMAN used this name in a text comparing his just described new species *D. thonneri* (= *D. bangii* (F. Didr.) Engl.) with related species: *D. lujae*, *D. argenteum* Engl. (= *D. bangii*) and *D. glaucosepalum*. It is evident, that *D. glaucosepalum* Ruhl. is an error for *D. leucosepalum* Ruhl.

D. glomeratum Engl. **Fig. 5 Map 5**

D. glomeratum Engler, 1912-a: 584 (March 26); De Wildeman, 1919: B35; Exell, 1927: 69; Exell & Mendonça, 1951-b: 329, p.p. (except *Gossweiler 13711*: = *D. heudelotii* var. *heudelotii*); Hauman, 1958-a: 324; Breteler, 1973: 7, 87, XVII; Punt, 1975: 29.

Type: S.W. Cameroun (?), Campo area, near Akonangi, road to Angun, *Tessmann 1008* (holotype: B†; lectotype: K; isotype: BM, HBG).

D. baturense Krause, 1912: 510 (August 27). See Breteler, 1973: 87 for full details.

D. klainei Pellegrin, 1912: 270 (Nov. 20); 1913: 585; De Wildeman, 1919: B38; Hauman, 1958-a: 324; Breteler, 1973: XVII. Type: Gabon, Libreville, *Klaine 1236* (lectotype: P; isotypes: BM, BR, LE).

D. malchairii De Wildeman, 1919: B49; Hauman, 1958-a: 323; Breteler, 1973: XVII. Type: Zaïre, Likimi, *Malchair 89* (lectotype: BR, designated by HAUMAN; isotype: WAG).

Diagnostic characters. Liana, lianescent shrub, shrub, or slender treelet up to 9 m tall. Bark of stems usually showing 5 distinct rows of large lenticels. Woodcylinder entire, wood very dense. Branchlets densely white to brown villous-tomentose. Leaves oblong-elliptic to obovate-elliptic, (4)10–16(24) × (1.5)3.5–6(12) cm, cordate to rounded at base. Young leaves entirely white to pale brown villous-tomentose, soon glabrescent, the indumentum persistent on the midrib beneath. Inflorescences glomerate, sessile, up to ca 15-flowered. Flowers sessile, persistent. Sepals, petals, and stamens erect. Pistil 3(–4)-merous, ovary velutinous. Fruits small, villous-tomentose.

Description. Liana, lianescent shrub, shrub, or slender treelet up to 9 m tall. *Stem* up to 8 dm diam. Bark rather pale coloured, usually showing 5 distinct rows of large lenticels. Woodcylinder always entire, wood very dense. *Branches* glabrous to villous-tomentose, usually becoming distinctly lenticellate. *Branchlets* densely white to brown villous-tomentose. *Stipules* suborbicular-deltoid to narrowly triangular, 1–6 × 1–2 mm, the smaller ones appressed, densely villous-tomentose outside, glabrous inside, caducous or not. *Leaves*: petiole subterete, 2–6(8) mm long, densely villous-tomentose; blade oblong-elliptic to obovate-elliptic, 2–3.5(4) times as long as wide, (4)10–16(24) × (1.5)3.5–6(12) cm, cordate to rounded at base, usually gradually acuminate, the acumen 0.5–1(2) cm long; very young leaves entirely white to pale brown villous-tomentose, soon glabrescent, the indumentum usually persistent on the midrib beneath, nervation rather obscure above, very prominent beneath, the main lateral nerves 8–12(16) pairs; glands small, rather inconspicuous, beneath only, more numerous along the midrib. *Inflorescences* glomerate, the clusters very dense, sessile, up to ca 15-flowered; bracts and bracteoles circular-ovate to elliptic-obovate, concave, 0.5–2 × 0.5–1.5 mm, appressed-pubescent outside, glabrous inside. *Pedicel* very short or absent, up to 0.5 mm long, without a distinct joint, the flowers persistent. *Sepals* suberect, free or nearly so, ovate-elliptic to oblong, 1.5–2.5 × 0.5–1.5 mm, appressed-pubescent outside, glabrous or inside tomentellous on upper part. *Petals* erect or nearly so, free or very shortly united with filaments at base, narrowly obovate-spathulate in outline, (3)4–6 mm long, 0.5–1.5 mm split, entirely glabrous or with a few subappressed hairs outside, lobes concave. *Stamens* suberect, 3.5–7 mm long, glabrous; anthers ca 0.3 mm long, connective

FIG. 5. *D. glomeratum*: 1. flowering branchlet, ½ ×; 2. large leaf, ½ ×; 3. long leaf, ½ ×; 4. part of stem showing rows of large lenticels, ½ ×; 5. flower, 6 ×; 6. flower partly, showing pistil and staminodes, 6 ×; 7. fruit, 2 ×. (1, 5-6. *Descoings 10311*; 2-3. *Breteler 6729*; 4. *Breteler 2877*; 7. *Louis 11659*).

prominent. *Staminodes* oblong, seldom subquadrate, up to 1 × 0.4 mm, glabrous. *Pistil* 3(–4)-merous, (4)5–8.5 mm long; style hairy in lower, glabrous in upper part, 3-lobed, lobes spreading, up to 0.5 mm long; ovary densely velutinous. *Fruits* 1–3-seeded, villous-tomentose, orange at maturity; 1-seeded fruits: ovoid-ellipsoid, up to 2 cm long and 1.5 cm diam.; mesocarp juicy; endocarp coriaceous, glossy and smooth inside. *Seed* subellipsoid, 8–10 × 6–7 mm; testa smooth, dark-brown.

Distribution: S. Cameroun, Gabon, Congo, Zaïre, N. Angola (Cabinda), S.W. Central African Republic.

Ecology: Rain forest, semi-deciduous forest, gallery forest.

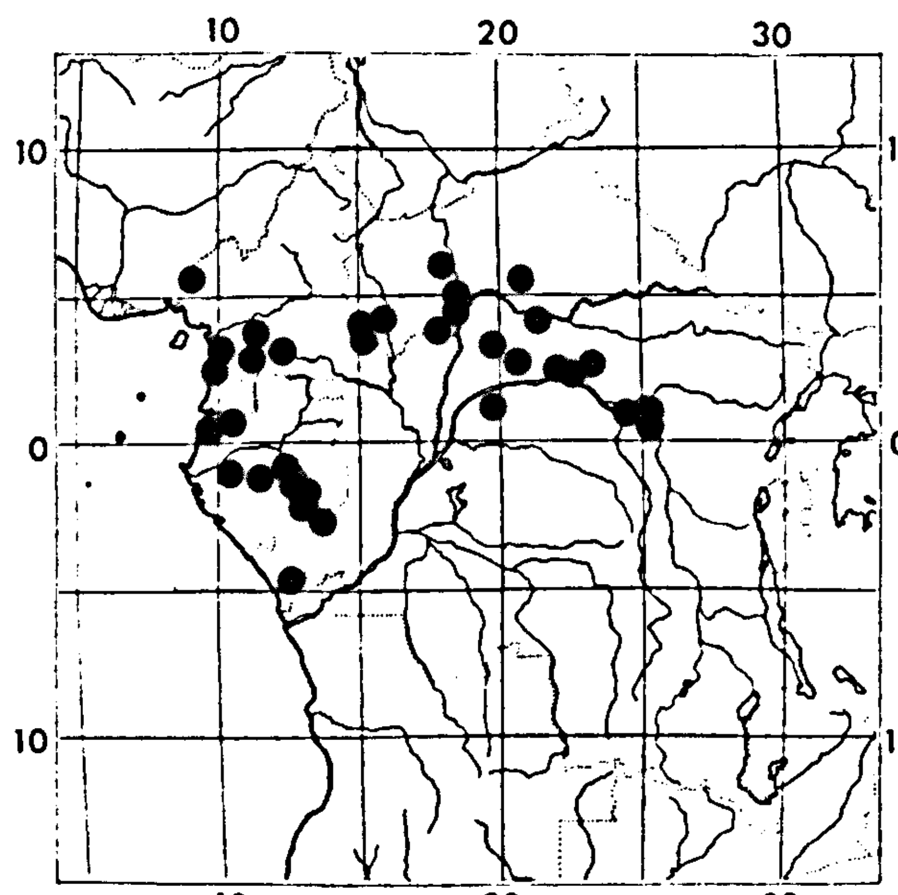
Specimens examined:

Cameroun. Bitye, *Bates 1483* (BM, Z); ca 6 km Kribi-Ebolowa, *Bos & Breteler 3114* (WAG); *Bos 3558* (WAG); *4513* (WAG); *4515* (WAG); 13 km Kribi-Ebolowa, *Bos 4562* (WAG); 8 km N. of Kribi, *Bos 4750* (WAG); 16 km Kribi-Lolodorf, *Bos 5385* (WAG); Kribi, *Bos 5410* (WAG); *5568* (WAG); ca 46 km Kribi-Lolodorf, *Bos 6527* (WAG); 45 km Kribi-Campo, *Bos & Breteler 7295* (WAG); 7 km W. of Yaoundé, *Breteler 2877* (BR, FI, K, LISC, M, P, WAG); 16 km Ebolowa-Minkok, *J. J. de Wilde 8198* (WAG); Nkoemvone, 14 km Ebolowa-Ambam, *J. J. de Wilde 8229* (WAG); 16 km Ebolowa-Minkok, *J. J. de Wilde 8259* (WAG); 22 km Yokadouma-Batouri, Mopwo, *Letouzey 5251* (P, WAG); Tabo-Agborkem, 20 km W. of Mamfé, *Letouzey 13.729* (BR, K, P, WAG); near Yokadouma, *Mildbraed 4794* (HBG, type of *D. baturense*); Campo area, near Akonangi, *Tessmann 1008* (BM, HBG, K, type).

Gabon. 50 km S.E. of Lambaréné, *Breteler 5748* (WAG); 33 km Moanda-Bakoumba, *Breteler 6729* (WAG); *6739* (WAG); 60 km S.S.W. of Moanda, *Breteler 6916* (WAG); 13 km Asok-Tschimbelé Falls, *Breteler & J. J. de Wilde 167* (WAG); Libreville, *Klaine 1236* (BM, BR, LE, P, type of *D. klainei*); *1238* (K, P); *2330* (P); Etoughi, *Le Testu 5987* (BM, P, WAG); Lastoursville, *Le Testu 8157* (BM, BR, P, WAG); Ivele, *Le Testu 8797* (BM, BR, P).

Congo. Zanaga, near Bouyala, *Sita 3319* (P).

Zaïre. Kisangani, *Bequaert 7020* (BR); 23 km Kisangani-Bengamisa, *Bokdam 4179* (WAG);



MAP 5. *D. glomeratum*

Yangambi, *Bolema 1121* (BR); Likimi, *De Giorgi 1506* (BR); Yambata, *De Giorgi 1660* (BR); Yangambi, *Devred 4170* (BR); Bas-Uele, *Dewulf 563* (BR, WAG); Yangambi, *Donis 2119* (BR); *3118* (BR); *3490* (BR); Bosobolo, Lombo Rd, *Evrard 2363* (BR, K, P); Basankusu, *Evrard 4907* (BR, K, SRGH); Yangambi, *Germain 8292* (BR); *8585* (BR, LISC, PRE); Yangambi, *Gilbert 1009* (BR); *9062* (BR); *9391* (BR); *10494* (BR); *10556* (BR, FI); Banzyville, *Lebrun 2118* (BM, BR, SRGH); Yangambi, *A. Léonard 675* (BR); *Louis 3026* (BM, BR); *3491* (BR, C, P); *7007* (BR, C, COI, EA, FI, L, LISU, M); *7252* (BR, LISC, LISU, M, SRGH); *7572* (BR, L, LD, W); *7766* (BR); *8295* (BR, COI, FI, U); *8296* (BR, C, LISC, M, WAG); *9533* (BR, EA, Z); *10269* (BR, UPS); *11659* (BR, EA, M, SRGH); *12225* (BR, C); *12932* (BR); *13140* (BM, BR, LISC); *16641* (BR); Likimi, *Malchair 89* (BR, WAG, type of *D. malchairii*); Yangambi, *Maudoux 394* (BR, K, P, WAG); Bumba, *Pynaert 111* (BR); Mobwasa, *Reygaert 775* (BR).

Angola. Cabinda, Belize, *Gossweiler 7593* (BM, COI, K, LISJC, LISU).

Central African Republic. Bangui, *Chevalier 10863* (P); *10891* (P); 45 km Bangui-Damara, *Descoings 10311* (MPU, P, WAG); Bangui, *Eaux, Forêts et Chasse 2144* (P); *Hepper 4083* (K); 30 km E. of Bessari, *Tisserant 143* (P); Bambari, *Tisserant 1444* (P); Berberati, *Tisserant 3536* (BM, BR, K, P, WAG); Boukoko, *Equipe Tisserant 635* (BM, BR, P, WAG).

Notes. HAUMAN (l.c.: 324) was already aware of the striking resemblance between *D. glomeratum*, *D. klainei*, and *D. malchairii*. As distinguishing character between *D. glomeratum* and *D. malchairii* he mentions the flowersize. According to him *D. malchairii* has sepals of 2–2.5 mm and petals of 5 mm, whereas the sizes in *D. glomeratum* are distinctly smaller. This is contradictory to ENGLER's description of *D. glomeratum* with sepals of 3 mm and petals of 6 mm. The flowers of *D. glomeratum* are in fact quite variable in size. The differences between *D. klainei* and *D. malchairii* as mentioned by HAUMAN do not constitute a differentiating character either, as the petals are always more or less united with the filaments basally.

D. glomeratum is so far the only species in which the flowers are persistent. So it is possible to find mature fruits and (old) open flowers within the same inflorescence-infructescence. Apparently the joint present in the pedicel of other species, dividing it in a lower and an upper part, does not function. I have not been able to establish if such a joint is anatomically still present or has vanished completely.

Usually sterile specimens of *D. glomeratum* can be easily distinguished from those of *D. heudelotii* by the usually persistent villous-tomentose indumentum on their branchlets and on the midrib of the undersurface of their leaves.

D. gossweileri Engl. = **D. madagascariense** Poir.

D. gossweileri Engler, 1912-a: 586; De Wildeman, 1919: B35; Exell, 1927: 70; Moss, 1928: 124; Exell & Mendonça, 1951-b: 323; Breteler, 1973: XVIII (in synonymy to *D. madagascariense*). Type: Angola, Cazengo, *Gossweiler 585* (holotype: B†; lectotype: BM; isotypes: BR, K, P).

Note. From the description and the examination of the remaining type material it is clear that *D. gossweileri* represents the variable *D. madagascariense*, a species which will be treated in a forthcoming publication.

D. gracile Exell = **D. heudelotii** (Planch. ex Oliv.) Baill. var. **ndongense** (Engl.) Bret.

For details see p. 38.

D. griseisepalum De Wild. = **D. unguiculatum** Engl.

D. griseisepalum De Wildeman, 1919: B35; Hauman, 1958-a: 301; Breteler, 1973: XX (in synonymy to *D. unguiculatum*). Type: Zaïre, Eala, *Pynaert 1418* (holotype: BR).

Note. Not having seen *Mildbraed 3246* from eastern Zaïre, the type material of *D. unguiculatum*, HAUMAN distinguished *D. unguiculatum* from *D. griseisepalum* on the basis of ENGLER's original description only. From this description the relative length of the enlarged upper part of the petal and its incision was taken as a distinctive character in his key (l.c.: 290–291). In *D. unguiculatum* this upper part is halfway split and a third in length of the lower part, while, according to HAUMAN, in *D. griseisepalum* the upper part is deeper split and half as long as the lower part. In the holotype of *D. griseisepalum*, however, at least some flowers have petals as described by ENGLER, which description is in accordance with the isotype of *D. unguiculatum* found in BM. As no other distinguishing character has been found, *D. griseisepalum* is reduced to a synonym of *D. unguiculatum*.

HAUMAN cited *Pynaert 1418* as lectotype. This is not correct as DE WILDEMAN, in his original publication, already selected this specimen as the type and it must be regarded as the holotype of *D. griseisepalum*.

D. griseo-viride Ruhl. = **D. pallidum** (Oliv.)Engl.

D. griseo-viride Ruhland, 1902: 84; Engler, 1912-a: 574; Pellegrin, 1913: 645; De Wildeman, 1919: B36; Breteler, 1973: XIX. Type: Cameroun, Bipindi, *Zenker 2451* (holotype B†; lectotype: WAG; isotypes: B, BM, BR, COI, E, G, GOET, L, M, PRE, W, WU, Z).

Note. Examination of all the available material of *D. pallidum* shows that the type material of *D. griseo-viride* fits in all its aspects within this species. Neither the leaves nor the staminodes do offer characters for specific distinction of *D. griseo-viride*, as mentioned by the author of the species.

All the type material cited bears the inscription *D. silvicola* Ruhl., a name which has never been validated.

D. guineense (DC.)Keay = **D. madagascariense** Poir.

D. guineense (DC.) Keay, 1955: 137; 1958: 436; Keay et al., 1960: 323; Breteler, 1973: 7, 10, 93, XVII; 1978: 62, 76. Basionym: *Ceanothus ? guineensis* De Candolle, 1825: 30. Type: Ghana, *Thonning s.n.* (holotype: G; isotype: C).

Note. *D. guineense* as treated by KEAY, represents a form of *D. madagascariense* which has the habit of a shrub or small tree. This form, which has been discussed before (BRETELER, 1973: 7), is not specifically distinct from the type material of *D. madagascariense.*

D. heudelotii (Planch. ex Oliv.)Baill. **Fig. 6–9 Maps 6–9**

For literature, synonyms, and typification see under the varieties.

Diagnostic characters. Liana, lianescent shrub, shrub, or treelet. Bark usually rather smooth, lenticels small rather obscure. Woodcylinder entire or more or less deeply lobed. Branchlets hairy as the leaves, glabrescent, rapidly so or not. Stipules triangular to subulate, (2)3–7(10) mm long, caducous. Leaves shortly stalked, obovate-elliptic, often narrowly so, very variable in size, (4)8–20(46) × (1.5)3–8(20) cm, rounded to cordate, often subauriculate at base, usually acuminate, the acumen mucronate if not usually very glandular beneath, entirely tomentose, villous, or velutinous-hispid when young, soon glabrescent, at least above. Inflorescences few to many flowered, glomerate, usually sessile; bracts and bracteoles minute. Flowers sessile or shortly stalked. Sepals erect-reflexed, free or partly united. Petals erect, (2)2.5–6(8) mm long, shortly split, free or up to 5 mm long united with filaments. Stamens ± as long as petals. Pistil (1.2)2–7(8) mm long, (2)3–4-merous; ovary velutinous. Fruits variable in size and shape, up to 5 × 3.5 cm, tomentose-villous to velutinous-hispid.

Description. Liana, lianescent shrub, shrub, or treelet. *Stem* up to 5 cm diam.; bark usually rather smooth, lenticels usually small and inconspicuous; woodcylinder entire or more or less deeply lobed; wood hard. *Branches* glabrous or glabrescent, distinctly lenticellate or not. *Branchlets* hispid, hirsute, tomentose or villous, sometimes a mixture of long and short hairs present, glabrescent, rapidly so or not. *Stipules* triangular to subulate, (2)3–7(10) mm long, curved or not, hairy as branchlet, sometimes with glandular warts on margin, caducous, often early so. *Leaves*: petiole subterete, (0)1–4(6) mm long, hairy as branchlet, but indumentum usually longer persistent; blade obovate-elliptic, often narrowly so, sometimes oblong, very variable in size, (4)8–20(46) × (1.5)3–8(20) cm, 2–3.5(7) times as long as wide, base rounded to cordate, obliquely so or not, often subauriculate, seldom cuneate, apex usually acuminate, the acumen up to 2.5 cm long, rounded or acute, mucronate, if not then usually very glandular beneath, entirely villous-tomentose to velutinous-hispid when young, soon glabrescent, the indumentum usually longer persistent on midrib and main lateral nerves beneath, or longer persistent on the whole lower surface especially so when villous-tomentose, midrib impressed above, the (6)7–11(15) pairs of lateral nerves not or only slightly so, the latter inconspicuous above, prominent and conspicuous beneath, the tertiary veins beneath prominent or not; glands present, beneath only, dispersed or more often mainly along midrib, more numerous near base and/or on acumen, inconspicuous to very conspicuous. *Inflorescences* few to many flowered, glomerate, sometimes grouped on leafless axillary shoots or leafless parts, i.e. not subtended by leaves, usually sessile, sometimes shortly peduncled and/or more or less once distinctly branched (var. *heudelotii*, var. *ndongense*), exceptionally up to 2 cm pedunculate (var. *heudelotii*), more or less hairy as branchlet; bracts and bracteoles ovate-triangular to elliptic, 1–2(3) mm long, hairy as calyx outside, inside glabrous or nearly so. *Pedicel* 0–3(4) mm long, the upper part absent or very short, at most 0.5 mm long. *Sepals* erect, spreading, or reflexed, free, adnate, or even united at base up to 2/3 of their length, ovate-elliptic to oblong-obovate, (1.5)2–5 × 0.5–1.5 mm, obtuse to acute at apex, tomentose-hirsute to hispid-strigose outside, puberulous-tomentellous mainly on upper part inside. *Petals* erect or nearly so, obovate-spathulate in outline (2)2.5–6(8) mm long, up to 1.5 mm split, free or up to 5 mm long united with filaments at base, glabrous inside, outside usually with a few appressed hairs on lobes and/or below lobes. *Stamens* erect, usually subequal to petals in length, glabrous; anthers broadly ovoid-ellipsoid, up to ca 0.5 mm long, connective prominent. *Staminodes* subquadrate to oblong, usually not more than 0.5 × 0.5 mm, flat to somewhat thickened, obtuse to slightly bilobed at apex, glabrous outside, inside often hairy. *Pistil* (1.2)2–7(8) mm long, (2–)3(–4)-merous; ovary subglobose, velutinous; style shortly (2–)3(–4)-lobed, glabrous or hairy mainly in the lower part. *Fruits* variable in size and shape, slightly apiculate or not, 1–3(4?)-seeded, the aborted cells usually visible as a ridge or bulge, villous-tomentose to velutinous or hispid, sometimes a mixture of long and short hairs present; 1-seeded fruits: globose to ellipsoid, 1.3–5 cm long, 0.7–3.5 cm diam.; exocarp prominently veined or not, 1–5 mm thick; mesocarp 1–5 mm thick, adhering to endocarp, consisting of a suberect, dense pallisade of juicy hairs; endocarp pergamentaceous, fibrous, smooth inside, in fresh, mature fruits closely enveloping the seed. *Seeds* subglobose to ellipsoid, straight or slightly curved, usually slightly laterally compressed, 1–3 cm long, 0.6–1.7 cm diam.; seedcoat thin, brown, glossy; hilum 0.5–2 cm long.

Seedling with a firm taproot, the epicotyle up to ca 9 cm long, shortly hispid; first leaves alternate, smaller than the subsequent ones, relatively broader than the adult leaves, sparsely velutinous-hispid.

Distribution: West and Central Africa.

Note. *D. heudelotii* is a very variable species, especially varying in its leafsize and indumentum of the vegetative parts, in its fruitsize, fruitshape, and fruit indumentum. This variability has resulted in a large number of synonyms. With the synonyms already treated (BRETELER, 1973: 43, 44, 61; 1978: 22, 32, 70, 81) it has been stated that all the type specimens differing in leafsize and indumentum

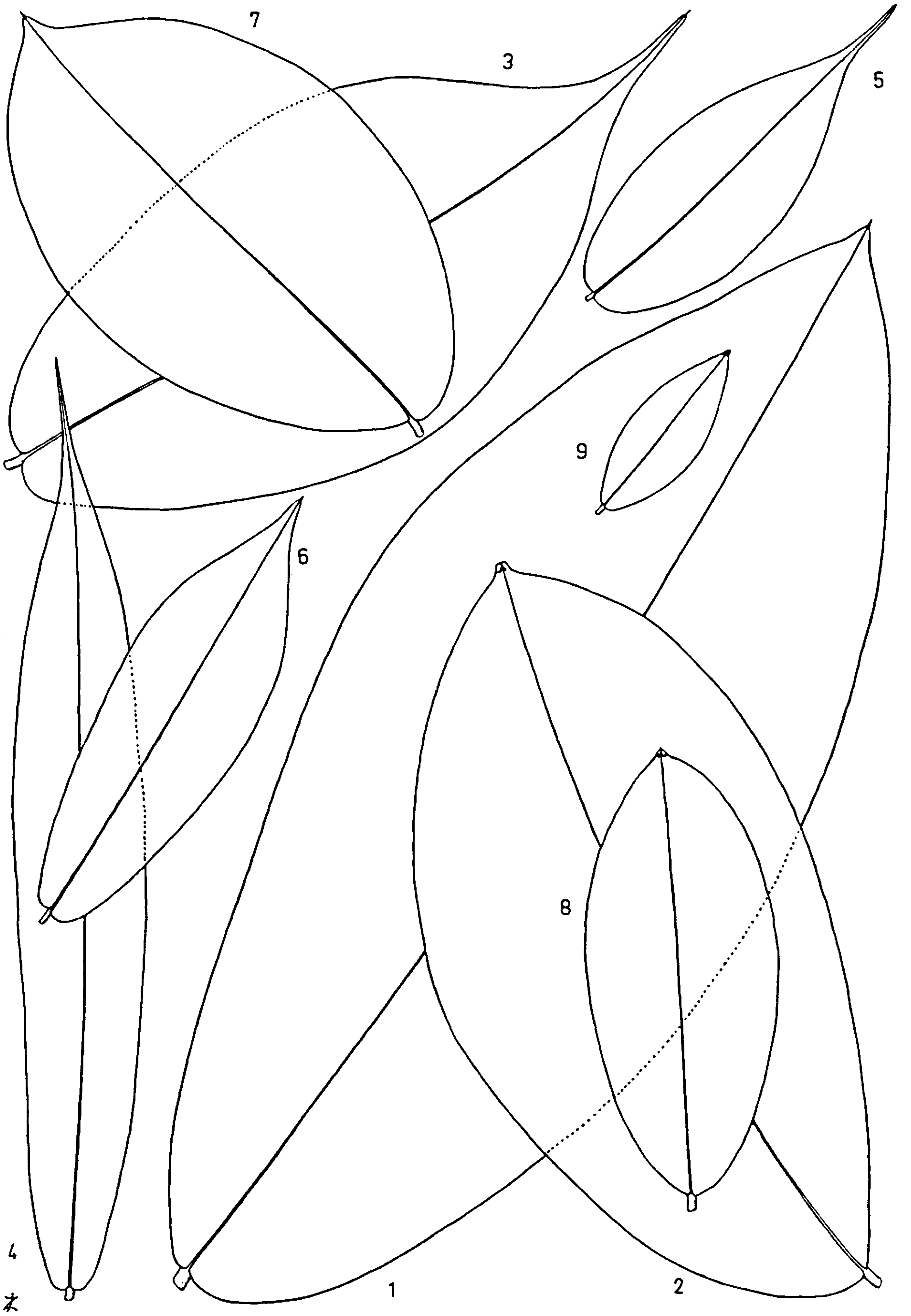


FIG. 6. *D. heudelotii*: variation in leaf size and leaf shape, ½ ×. (1. *Breteler 6606*; 2. *Klaine 1712*; 3. *Breteler & J. J. de Wilde 363*; 4. *Bos & Breteler 7243*; 5. *Leeuwenberg 9156*; 6. *J. J. de Wilde & Leeuwenberg 3601A*; 7. *Den Outer & Versteegh 265*; 8–9. *J. J. de Wilde 8227*).

are linked by many intermediates, all showing the same flower characters.

In preparing the provisional key published in 1973, it was difficult to separate *D. heudelotii* from its close relatives, and I stated (p. XVII): 'It is closely related to *D. glomeratum*, *D. hispidum*, and *D. longitubulosum* and sometimes difficult to distinguish from these species.' And as regards *D. ndongense* I noted (p. XVIII): 'This species is very closely related to *D. heudelotii* and so far it can only be distinguished from it by its smaller flowers'. These conclusions were based on a detailed study of many specimens. Several more specimens became available since then, proving that these conclusions were correct, but leaving something very unsatisfactory, namely the impossibility to identify sterile material of these species, excepting *D. glomeratum* (see note p.21). Within other groups of closely related species it has always been possible to identify sterile material rather well, but in case of the *D. heudelotii*-complex, comprising *D. heudelotii*, *D. hispidum*, *D. longitubulosum*, and *D. ndongense* as distinguished in 1973 (p. XVII, XVIII), this was impossible for a very large number of specimens, in fact for the majority of the sterile specimens.

When comparing the *D. heudelotii*-complex with the related *D. staudtii*-complex (BRETELER, 1973: XX), which by its flower characters alone cannot be separated satisfactorily from the former, it became evident that these entities could rather easily be distinguished by their vegetative characters as follows:

Leaf acumen with a distinct mucro, if not the leaf beneath at least with distinct, large (0.2–0.7 mm diam.) glands along midrib, especially near base and/or on the acumen or top. . . . . **D. heudelotii**-complex

Leaf acumen without a distinct mucro, the acumen usually broad, obtuse; glands usually smaller than above. . . . . **D. staudtii**-complex

The fact that the *D. heudelotii*-complex is vegetatively seen an entity, together with the results of the analysis of the generative parts showing that only relatively small floral characters can be found to segregate the four taxa forming this complex, leads me to the conclusion that these four taxa have to be treated as varieties rather than as distinct species.

OLIVER (1868: 340–341), the author of *Chailletia heudelotii*, *Ch. hispida*, *Ch. macrophylla*, and *Ch. subauriculata* distinguished these taxa collectively from the other *Chailletia* species on account of: 'Ovary more or less distinctly adherent to the calyx tube', against 'Ovary superior' for the other species. To distinguish between these four, the extent of inferiority of the ovary is used: one third to half inferior in *Ch. heudelotii*, half inferior in *Ch. subauriculata*, two-thirds inferior in *Ch. macrophylla*, and wholly inferior in *Ch. hispida*. BAILLON (1874: 140) went as far as to describe the concave receptacle of *D. hispidum* as follows: 'la profondeur de cette coupe devient si considérable, que l'ovaire tout entier est plongé dans la cavité et que c'est sur le bord du réceptacle, bien plus haut que le sommet de l'ovaire, que s'insèrent le périanthe, l'androcée et les glandes du disque'. ENGLER (1896-a: 349; 1912-a: 562–564) and PELLEGRIN (1913: 580–581) also used the position of the ovary (from superior to inferior) as a key character. HUTCHINSON

& DALZIEL (1928-a: 321), followed by KEAY (1958: 433), described the ovary of the *Dichapetalaceae* ('*Chailletiaceae*') as 'superior to quite inferior', but did not use it in their keys.

In fact the receptacle of the taxa mentioned above is not more concave than generally seen in *Dichapetalum* flowers. However, the sepals may be united at their base to a varying degree, forming a short tube (see OLIVER cited above) and this calyx tube is basally adnate to the petals and stamens, which constitutes the deep cup mentioned by BAILLON. The sepals, petals, stamens, and staminodes seem to be inserted above the base of the ovary or even entirely above the ovary, but in fact they are not. The ovary is not even adnate to the tube described above, because it is laterally hairy all around. Classifying such ovaries as inferior or half inferior is also contradicted by fruit development, which is completely superior. The length of the tube varies even within narrow taxonomic boundaries, and does therefore not constitute a dependable character for specific delimitation.

Key to the varieties

1a. Petals 2–3(3.5) mm long, stamens 1.5–2.5(3) mm long, pistil 1.2–2.5 mm long; fruit usually hispid or velutinous. . . . . var. **ndongense**
b. Petals and stamens (3)3.5–6(8) mm long, pistil (3.5)4–7(8) mm long; fruit from villous-tomentose to hispid. 2
2a. Sepals erect, 3.5–5 mm long, united for $\frac{2}{5}$–$\frac{2}{3}$ of their length; petals and stamens 4.5–8 mm long, united at base into a 3–5 mm long tube. . . . . var. **longitubulosum**
b. Sepals erect or spreading, (1.5)2–3(5) mm long, not united, not or only shortly adnate to each other; petals and stamens (3)3.5–6(7) mm long, free or at most 3.5 mm united. 3
3a. Petals free or nearly so; fruits usually tomentose or villous. var. **heudelotii**
b. Petals united with filaments in a 1–3.5 mm long tube; fruits usually hispid. . . . . var. **hispidum**

D. heudelotii (Planch. ex Oliv.)Baill. var. **heudelotii** **Fig. 7: 1–6 Map 6**

D. heudelotii (Planchon ex Oliver)Baillon, 1874: 140; Engler, 1896-a: 349; 1912-a: 592; Pellegrin, 1913: 641; De Wildeman, 1919: B36; Chevalier, 1920: 120; Pellegrin, 1924: 56 (as regards *Le Testu 1422*); Hutchinson & Dalziel, 1928-a: 324; Engler & Krause, 1931: 8; Keay, 1958: 438; Breteler, 1973: 43, 44, 61, XVII; Punt, 1975: 29; Breteler, 1978: 22, 30, 32, 70, 81.

Basionym: *Chailletia heudelotii* Planchon ex Oliver, 1868: 344.

Type: Sénégambia, *Heudelot 770* (lectotype: K; isotypes: G, P, WAG).

D. subauriculatum (Oliver)Engler, 1896-a: 349; De Wildeman, 1919: B67; Hutchinson & Dalziel, 1928-a: 324 (as *D. subauriculatum* Engler); Keay, 1958: 438; Breteler, 1973: XVII; Punt, 1975: 29. Basionym: *Chailletia subauriculata* Oliver, 1868: 344. Type: Nigeria, River Old Calabar, *Mann 2260* (holotype: K).

D. acutisepalum Engler, 1896-b: 140. See Breteler, 1973: 43 for full details.

D. cuneifolium Engler, 1896-b: 141. See Breteler, 1978: 32 for full details.

D. ferrugineum Engler, 1896-b: 139. See Breteler, 1978: 70 for full details.

D. johnstonii Engler, 1896-b: 141; 1896-a: 349, nomen; 1912-a: 587; Baker, 1913: 124; De Wildeman, 1919: B38; Hutchinson & Dalziel, 1928-a: 324; Keay, 1958: 438; Breteler, 1973: XVII (in synonymy to *D. heudelotii*). Type: Nigeria, Cross River, *Johnston s.n.* (holotype: K).

D. poggei Engler, 1896-b: 141; 1896-a: 349, nomen; Th. & H. Durand, 1909: 95; Engler, 1912-a: 585; 1912-b: 442, Fig. LII, E–H; De Wildeman, 1919: B58; Hauman, 1958-a: 327 (in synonymy to *D. schweinfurthii*); Breteler, 1973: XVII (in synonymy to *D. heudelotii*). Type: Zaïre, Kasai, Mukenge, *Pogge 626* (holotype: B†; lectotype: BM, see notes).

D. schweinfurthii Engler, 1896-b: 140; 1896-a: 349, fig. 187, H–M, nomen; 1912-a: 580; 1912-b: 440; 1915: 847, fig. 395, H–M; De Wildeman, 1919: B66; Moss, 1928: 124; Engler & Krause, 1931: 6; Hauman, 1958-a: 327; Breteler, 1973: 43, 44, XVII (in synonymy to *D. heudelotii*); 1978: 70. Type: Zaïre, on the Mbruole, *Schweinfurth 3152* (holotype: B†; lectotype: P; isotype: K).

D. schweinfurthii Engl. var. *lolo* (De Wildeman & Th. Durand) Hauman, 1958-a: 330. Basionym: *D. lolo* De Wildeman & Th. Durand (see below).

D. lolo De Wildeman & Th. Durand, 1901: 42; 1902: 179, fig. 90; Th. & H. Durand, 1909: 94; Engler, 1912-a: 587; De Wildeman, 1919: B42; Breteler 1973: XVII (in synonymy to *D. heudelotii*). Type: Zaïre, Basankusu, *Dewèvre 777* (holotype: BR).

D. angustisquamulosum Engler & Ruhland, 1902: 86. See Breteler, 1973: 61 for full details.

D. conrauanum Engler & Ruhland, 1902: 88. See Breteler, 1978: 22 for full details.

D. fuscescens Engler, 1912-a: 594. See Breteler, 1978: 81 for full details.

D. jabassense Engler, 1912-a: 590; De Wildeman, 1919: B37; Engler & Krause, 1931: 8; Breteler, 1973: XVII (in synonymy to *D. heudelotii*). Type: Cameroun, Yabassi, *Ledermann 1092* (holotype: B†; lectotype: BM).

D. adolfi-friederici Engler, 1912-b: 441. For full details see Breteler, 1973: 44.

D. longifolium Engler, 1912-b: 443, fig. 52, A–D; 1912-a: 585, nomen; De Wildeman, 1919: B43; Hauman, 1958-a: 331; Breteler, 1973: XVII (in synonymy to *D. heudelotii*). Type: Zaïre, between Angalla and Majaribu, south of Irumu, *Mildbraed 2853* (holotype: B†; lectotype: BM; isotype (?): B, see notes).

D. varians Pellegrin, 1912: 275; 1913: 647; 1924: 59; Breteler, 1973: XVII (in synonymy to *D. heudelotii*). Type: Gabon, near Libreville, *Klaine 1473* (lectotype: P; isotype: WAG).

D. lescrauwaeti De Wildeman, 1919: B38; Hauman, 1958-a: 331 (as *D. lescrauwaetii*, in synonymy to *D. lukolelaense* De Wild.); Breteler, 1973: XVII (in synonymy to *D. heudelotii*). Type: Zaïre, Djoko Punda, *Lescrauwaet 404* (holotype: BR).

D. lokanduense De Wildeman, 1919: B41; Hauman, 1958-a: 330; Breteler, 1973: XVII (in synonymy to *D. heudelotii*). Type: Zaïre, Lokandu, *Claessens 528* (holotype: BR).

D. linderi Hutchinson & Dalziel, 1928-a: 324; 1928-b: 380; Keay, 1958: 438; Breteler, 1973: XVII (in synonymy to *D. heudelotii*). Type: Liberia, Suen, *Linder 1407* (holotype: K; isotype: WAG).

D. kumasiense Hoyle, 1932: 260; Keay, 1958: 438; Breteler, 1973: XVII (in synonymy to *D. heudelotii*). Type: Ghana, Kumasi, *Vigne 1635* (holotype: K).

D. whitei Torre, 1962: 67, fig. 1; 1963: 321; Breteler, 1973: XVII (in synonymy to *D. heudelotii*); Breteler, 1978: 32. Type: Zambia, Mwinilunga, *White 3364* (holotype: BM; isotypes: BR, COI, K, MO, PRE).

Distribution: West and Central Africa.
Ecology: From rain forest to gallery forest.

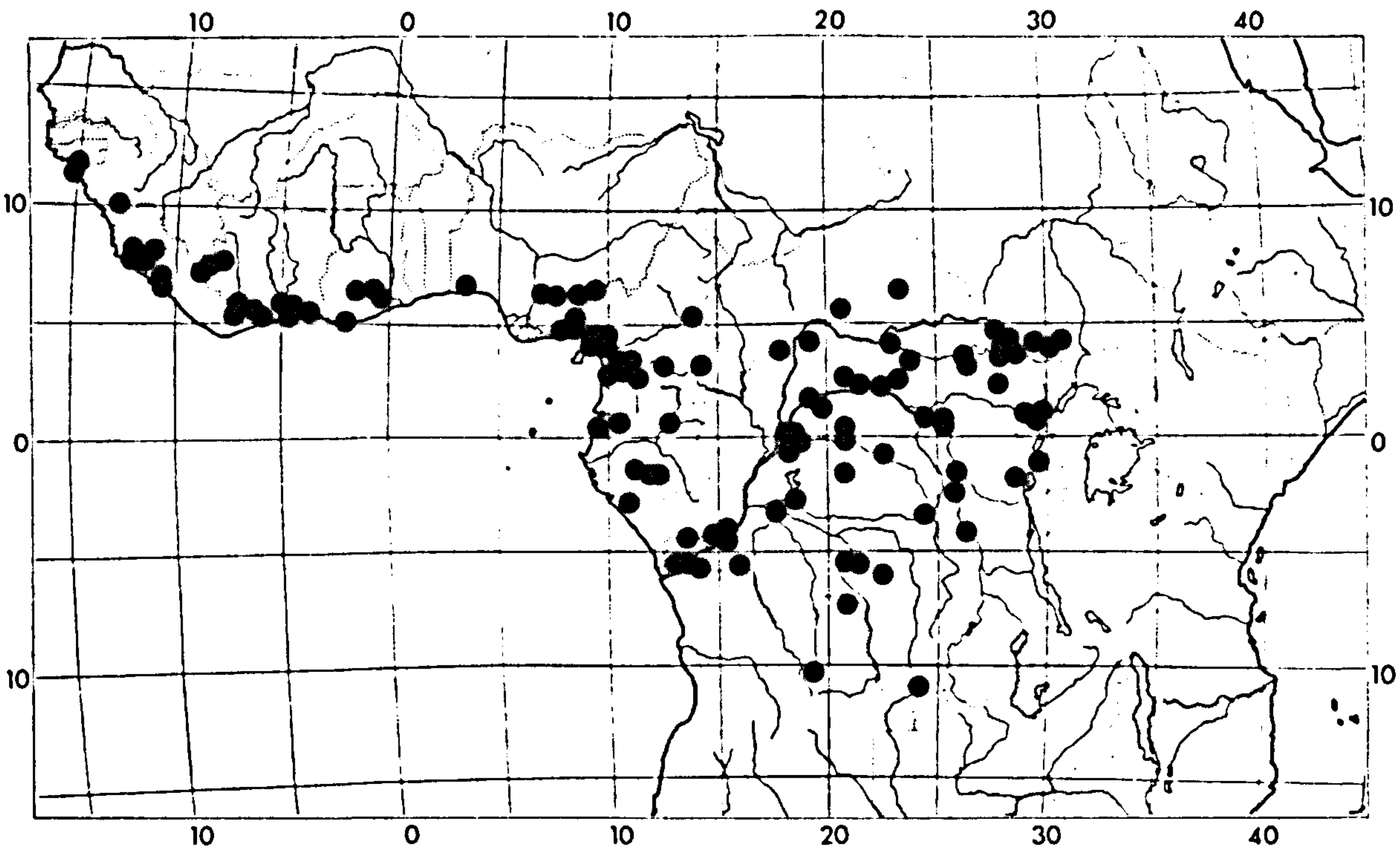
Specimens examined:

Guinea Bissau. Fulacunda, *Espirito Santo 744* (COI, LISC, WAG); Catio, *Espirito Santo 2092* (COI, K, LISC, LISJC, P); *2101* (COI, K, LISC).

Guinea. Between la Santa and Cimbo, *Chevalier 12599* (P, WAG); Friguiagbe Tondaya, *Chillou 504* (C, WAG); sin. loc., *Heudelot 770* (G, K, P, WAG, type); Boré, *Maclaud 58* (P); sin. loc., *Pobéguin s.n.* (P).

Sierra Leone. Njala, *Deighton 669* (K); *1580* (BM, K); *2999* (BR, K, P); Dodo, *Deighton 3918* (K); Bonganema (Kori), *Deighton 5949* (K, P); Tindo (Kamagai), *Deighton 6063* (K); Wondei (Kayamba), *Jordan 2098* (K, P); Bagroo R., *Mann 800* (K, P); Bandajume, *Marmo 202* (K); Limba, *Scott Elliot 5526* (BM, K, type of *D. acutisepalum*); *5587* (BM); sin. loc., *Thomas 9962* (K); *10307* (K); *10376* (K); *10494* (P); *10551* (K); *10635* (K); Njala, *Vickery 15* (K, WAG).

Liberia. Jèképa, *Adam 27719* (BR, WAG); Ganta, *De Koning 404* (WAG); Monrovia, *Dinklage 2852* (B, P, Z); *2853* (B, P, Z); Ganta, *Harley 610* (K); Suen, *Linder 1407* (K, WAG, type of *D. linderi*); Bomi Hills, *Van Meer 194* (WAG).



MAP 6. *D. heudelotii* var. *heudelotii*

Ivory Coast. Adiopodoumé, *Aké Assi 1829* (WAG); *1868* (P); Danané, Tiapleu Forest, *Aké Assi 10001* (WAG); Adiopodoumé, *Aké Assi s.n.* (WAG); Tai Forest, *Aké Assi s.n.* (WAG); 2 km S. of Aghien, *Beentje 508* (WAG); Adiopodoumé, *Breteler 5204* (WAG); *5206* (WAG); *5901* (WAG); 39 km Sassandra-Lakota, *Breteler 6061* (WAG); 3 km N. of Sikensi, *De Koning 113* (WAG); Banco Forest, *Den Outer & Versteegh 265* (WAG); Hana R. in crossing Tai-Tabou Rd, *J. J. de Wilde & Leeuwenberg 3601A* (BR, EA, K, P, WAG); 25 km S.W. of Guéyo, *Leeuwenberg 3772* (WAG); Adiopodoumé, *Leeuwenberg 4230* (BR, EA, K, P, WAG); 9 km W. of Bécédi, *Leeuwenberg 7906* (WAG); 9 km Yakassé Mé-Kodiousou, *Leeuwenberg 8101* (WAG); Dabou, *Roberty 13627* (G, Z); Angédedou Forest, *Thijssen 306* (WAG).

Ghana. Simpa near Tankwa, *Enti 1238* (K); Ejuanema Mt., *Hall & Abbiw GC 44798* (K); near Axim, *Irvine 2260* (E, K, WAG); Atewa Range F.R., *Lock 43943* (WAG); Kumasi, *Obeng-Darko 5226* (K); *Vigne 1635* (BM, K, type of *D. kumasiense*).

Nigeria. Isobu, *Ariwaodo 562* (K); Lyila, *Ariwaodo 1138* (K); Calabar, *Daramola FHI 55195* (FHI, K); Obudu Plateau, *J. B. Hall 2365* (K); Enugu, Milliken Hill, *Hepper 2234* (FHI, K, P); Cross R., *Johnston s.n.* (K, type of *D. johnstonii*); Owo F. R., *Jones FHI 3114* (FHI, FHO); Osomba, Calabar-Mamfé Rd, *Latilo & Oguntayo FHI 70570* (WAG); Old Calabar R., *Mann 2260* (K, type of *D. subauriculatum*); Lagos, *Millen 22* (K); Calabar, Aningeje F.R., *Olorunfemi FHI 34211* (FHI, K); Calabar, Ibeno-Stubbs Creek F.R., *Onochie FHI 32901* (K); Orem, 66 miles Calabar-Mamfé, *Onochie FHI 36307* (FHI, K, P); Ikorudu, *Onochie FHI 38337* (FHI, K); Oban, *Talbot 1763* (BM, K); Eket Distr., *Talbot 3204* (BM, MO); *Mr. & Mrs. Talbot s.n.* (BM, K, Z); Omo & Shasha F.R., *Tamajong 16848* (FHI, K); S. of Mbarakom, *Van Meer 1632* (WAG); Boshi Ext. F.R., *Van Meer 1755* (WAG); *1773* (WAG); Obudu Cattle Ranch, *Van Meer 1782* (WAG); *1783* (WAG); *1786* (WAG).

Cameroun. Bitye, *Bates 1683* (BM, BR, MO, Z); *1782* (K); Kumba Distr., S. Bakundu, *Binuyo & Daramola FHI 35532* (K, P); 13 km Kribi-Ebolowa, *Bos 3281* (WAG); *3458* (WAG); 9 km S. of Kribi, *Bos 3710* (WAG); 13 km Kribi-Ebolowa, *Bos 3772* (WAG); *4560* (WAG); *4561* (WAG); 8 km S. of Kribi, *Bos 4809* (WAG); 40 km Kribi-Campo, *Bos & Breteler 7283* (WAG); Banyang valley, *Conrau 106* (BM, type of *D. conrauanum*); Kumba, *Daramola FHI 29826* (FHI, K); Nkolandom, *J. J. de Wilde 7711* (WAG); 16 km Ebolowa-Minkok, *J. J. de Wilde 8202* (WAG); 14 km Ebolowa-Ambam, *J. J. de Wilde 8227* (WAG); 30 km Ebolowa-Minkok, *J. J. de Wilde 8399* (WAG); 65 km S.S.W. of Eséka, *W. J. de Wilde c.s. 2705* (P, WAG); Grand Batanga, *Dinklage 828* (HBG, P, WAG); *s.n.* (BM, type of *D. angustisquamulosum*); Yabassi, *Ledermann 1092* (BM, type of *D. jabassense*); 13 km S.W. of Eséka, *Leeuwenberg 5156* (BR, K, WAG); 58 km Edea-Kribi, *Leeuwenberg 5703* (BR, K, P, WAG); 24 km N.E. of Douala, *Leeuwenberg 6822* (WAG); *6833* (WAG); S. of Garoua Yaka, *Letouzey 3547* (P, WAG); Tonde, 25 km N.N.E. of Douala, *Letouzey 14921* (BR, K, P, WAG); Victoria, *Maitland 394* (K); Buea, *Maitland 573* (K); Assobam, *Mildbraed 5075* (HBG); Victoria-Bimbia, *Preuss 1275* (B, BREM, M, type of *D. ferrugineum*); Victoria, *Winkler 519* (G, Z); Bipindi, *Zenker 353* (B, BR, BREM, C, FI, G, LD, P, U, WAG); *3874* (BM, BR, COI, E, GOET, K, L, LE, M, MO, PRE, W, WAG, WU, Z, type of *D. fuscescens*); *4351* (B, BR, COI, E, G, GOET, K, L, LE, M, P, W, WU, Z).

Gabon. 3 km Asok-Tchimbélé Falls, *Breteler & J. J. de Wilde 290* (WAG); Mbou Rock, *N. Hallé & Villiers 5021* (P); Makokou, *Hladik 2188* (P, WAG); sin. loc., *Klaine 275* (BM, P, WAG); near Libreville, *Klaine 691* (P, WAG); *1104* (K, P); *1398* (K, P); *1455* (P); *1473* (P, WAG, type of *D. varians*); *1712* (P, this no. also under *D. heudelotii* var. *hispidum*); *s.n.* (P); Tchibanga, *Le Testu 1422* (BM, BR, P, WAG, Z); Outembo, *Le Testu 2179* (BM, BR, P, WAG); Dibagni, *Le Testu 6339* (BM, BR, P, WAG); Moupata, *Le Testu 8375* (BM, BR, P, WAG).

Congo. Brazzaville, *Chevalier 11237* (P); between Renéville and Mbamou, *Chevalier 27640* (P); Mousampa, *Sita 1887* (WAG); Pangala, *Trochain 7872* (IEC).

Zaïre. Luebo, *Achten 411A* (BR); Kinshasa, *Achten 411B* (BR); Sikilimi, *Bamps 177* (BR, K); Kisangani, *Bequaert 7047* (K, BR); *Bokdam 3178* (WAG); 23 km Kisangani-Bengamisa, *Bokdam 4018* (WAG); Yangambi, *Bolema 634* (BR); *Boutique 25* (BR, PRE); Lisala, *Bruneel s.n.* (BR); Irangi, *Cambridge Congo Exp. 339* (BM, BR, LISC); Kisangani, *Carrington 443* (WAG); Amboko, *Claessens 444* (BR, K, WAG); Senza, *Claessens 523* (BR); Lokandu, *Claessens 528* (BR); Mambundi, *Claessens 663* (BR); Ngazi, *Claessens 724* (BR); Kizulu, *Compère 976* (BR, K); Eala, *Corbisier-Baland 1714* (BR); *Couteaux 342* (BR, U); Bangala, *De Giorgi 449* (BR); *483* (BR); sin.

loc., *De Giorgi 1735* (BR); *1770* (BR); Doruma, *De Graer 202* (BR); *401* (BR); Garamba Nat. Park, *De Saeger 137* (BR); Basankusa, *Dewèvre 777* (BR, type of *D. lolo*); near Kisanga, *Dewèvre 1081* (BR); Tshuapa, *Dubois 129* (BR); Kutubongo, *Evrard 1066* (BR); Bokwalatamana, *Evrard 1158* (BR); Befale, *Evrard 3528* (BR, WAG); *3645* (BR, LISC, SRGH); Monkote, *Evrard 4580* (BR, WAG); Yalikungu, *Evrard 5406* (K, BR); Bambesa, *Gérard 571* (BR, FI); *2880* (BR, K); Kurukwata, *Gérard 3589* (BR); *3595* (BR); *3615* (BR, P); Bambesa, *Gérard 3828* (BR); *5184* (BR); Yangambi, *Germain 8519* (BR); *8572* (BR, LD); *8581* (BR, C); *8588* (BR); *8713* (BR); sin. loc., *Goossens 2526* (BR); Bikoro, *Goossens 2547* (BR, WAG); sin. loc., *Goossens 2865* (BR); Likimi, *Goossens 4167* (BR); *4701* (BR); *6273* (BR); Boende, *Gorbatoff 120* (BR); Bokuma, *Hulstaert 83* (BR); Bokoro, *Jans 597 bis* (BR); *744* (BR); Eala, *Laurent 1194* (BR); *1235* (BR, P, Z); *Lebrun 1220* (BR, EA, Z); Bokuma, *Lebrun 1290* (BR, UPS); Ingende, *Lebrun 1307* (BR, L, LISC, SRGH); Monga, *Lebrun 2324* (BR); Nyangwe, *Lebrun 5944* (BR, LISU); between Katako Kombe and Lodja, *Lebrun 6198* (BR); sin. loc., *Leemans 67* (BR); Eala, *Leemans 537* (BR, WAG); Mobwasa, *Lemaire 90* (BR); Djoko Punda, *Lescrauwaet 404* (BR, type of *D. lescrauwaetii*); Lokutu, *Linder 1764* (K); Bumba, *Linder 1833* (K); Yangambi, *Louis 1790* (BR); *5909* (BR, LISC, SRGH); *8697* (BR, C); *8935* (BM, BR, M, SRGH); *9116* (BM, BR, L, LD, P, PRE); *10441* (BR, LISU, SRGH); *11321* (BR, PRE); *11749* (BR, LISC); *12628* (BR, UPS); *14298* (BM, BR, LISU); *14310* (BM, BR, WAG); *14789* (BR); *15067* (BR, EA); *15159* (BR, WAG); *15705* (BR, COI, FI, Z); Luki, *Maudoux 128* (BR); Yangambi, *Maudoux 369* (BR); Pojo, *Mildbraed 2824* (BM, type of *D. adolfi-friederici*); between Angaela and Majaribu, *Mildbraed 2853* (BM, B(?), type of *D. longifolium*); between Irumu and Mawambi, *Mildbraed 2885* (BM); Kimvula, *Pauwels 664* (BR, WAG); Mukenge, *Pogge 626* (BM, type of *D. poggei*); Bangala, *Pynaert 48* (BR); Kisangani, *Pynaert 72* (BR); Eala, *Pynaert 1029* (BR, P, Z); *1075* (BR, Z); *1168* (BR, Z); *1421* (BR); *1534* (BR, P, Z); Boyeka, *Robijns 440* (BR, LISU, P); Eala, *Robijns 605* (BR); *813* (BR); Lolwa, *Robijns 852* (BR); on the Mbruole, *Schweinfurth 3152* (K, P, type of *D. schweinfurthii*); Munza, *Schweinfurth 3465* (K); Mombutu Country, *Schweinfurth 3554* (K); Kusumbo, *Schweinfurth 3637* (K); Eala, *Seret 808* (BR); Gimbi, *Toussaint 625* (BR); Dungu, *Troupin 371* (BR, K, WAG); *514* (BR, WAG); *796* (BR, WAG); *803* (BR, K, WAG); La Kulu, *Van den Brande 416* (BR); Wombali, *Vanderyst 3520* (BM, BR); *3550* (BM, BR); Dima, *Vanderyst 5133* (BM, BR); Eala, *Vermoesen 2129* (BR).

Angola. Dundo, *Gossweiler 13653* (B, BM, K, P); *13711* (B, BM, K, P); *13857* (B, BM, K, P); Lunda, Tras-os-Montes, near Cucumbi R., *Gossweiler 13897* (B, BM, K); Lovo R., *Marques 212* (BM, COI, LISU, type of *D. cuneifolium*).

Central African Republic. Yalinga, *Le Testu 2615* (BM, BR, P, WAG); *4560* (BM, BR, P, WAG); Bambari, *Tisserant 482* (BM, P); Linga, 13 km N.W. of Bambari, *Tisserant 1061* (BM, P); Ouaka, 20 km N. of Bambari, *Tisserant 1841* (P); Boukoko, *Equipe Tisserant 471* (BM, P); *1432* (BM, P, WAG); *1439* (BM, BR, P, WAG); *2355* (BM, P, WAG); *2518* (BM, P).

Sudan. Lado, Yei R., *Sillitoe 386* (K).

Zambia. 4 miles N. of Kalene, *White 3364* (BM, BR, COI, K, MO, PRE, type of *D. whitei*).

Cult. (seedlings). Cameroun. Kribi, *Bos 6153* (WAG) & *6158* (WAG), grown from *Bos 3710*.

Notes. There is no doubt that BAILLON was the first author who made the combination *D. heudelotii*. In all ENGLER's publications this species is cited as *D. heudelotii* (Planch.)Engler. PELLEGRIN referred to it as *D. heudelotii* Baillon, DE WILDEMAN as *D. heudelotii* (Planchon) Baillon, CHEVALIER as *D. heudelotii* Planch. and HUTCHINSON & DALZIEL as *D. heudelotii* Engl.

The name *D. subauriculatum* Engl. (1912-a: 583) was mentioned as the only new species of the new series *Subauriculata* Engl. It must be considered as a later homonym of *D. subauriculatum* (Oliv.)Engler and has never been validated by a description, also not in 1912 as announced by ENGLER, and thus remains a homonym nudum.

The lectotype of *D. poggei* in BM consists of a single leaf. According to the original description, *Pogge 626* was a fruiting specimen, so some doubt remains

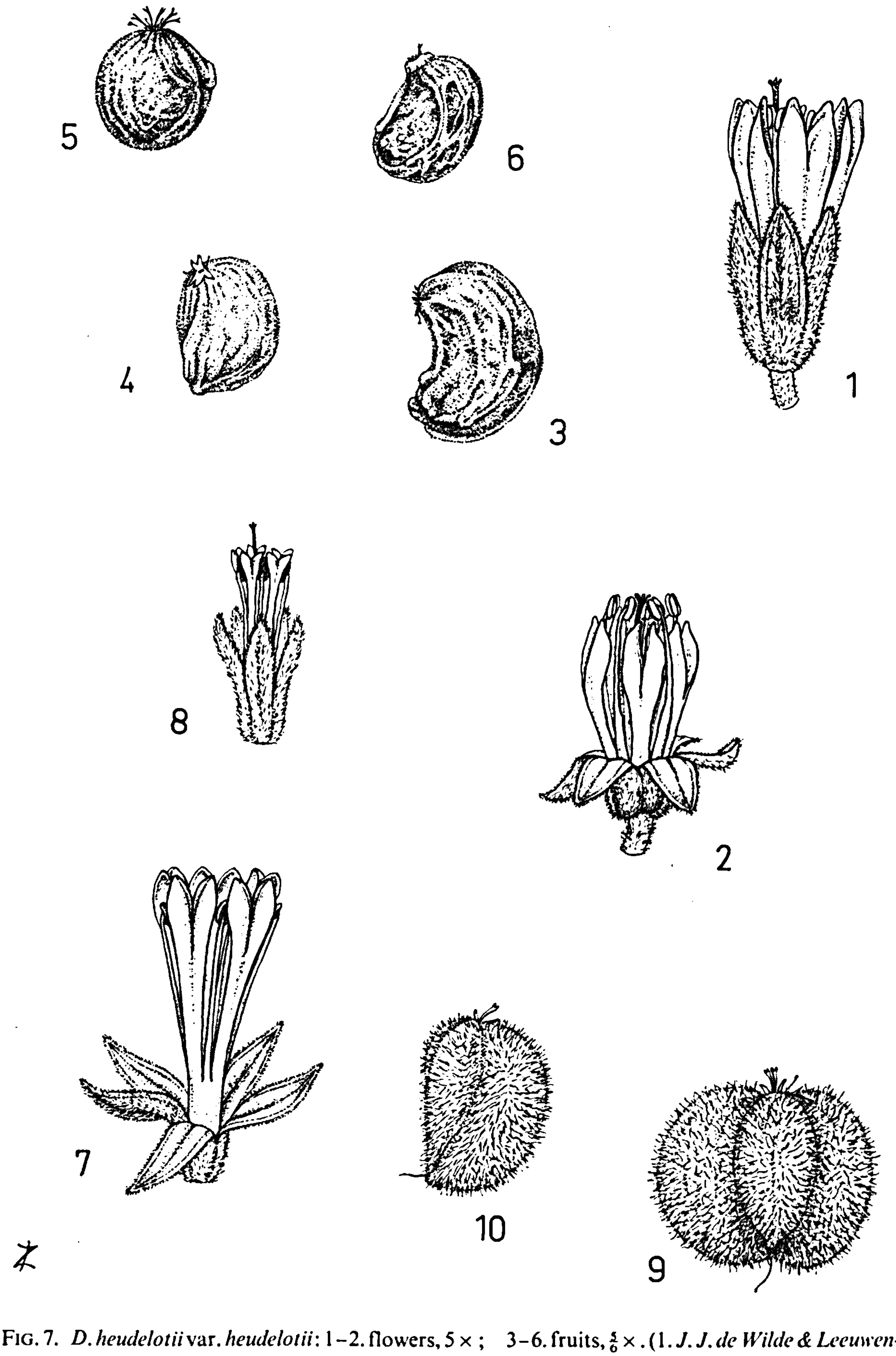


FIG. 7. *D. heudelotii* var. *heudelotii*: 1–2. flowers, 5 × ; 3–6. fruits, $\frac{5}{6}$ × . (1. *J. J. de Wilde & Leeuwenberg 3601A*; 2. *Breteler 5901*; 3–4. *De Koning 404*; 5. *Leeuwenberg 4230*; 6. *Bos 3710*).
D. heudelotii var. *hispidum*: 7–8. flowers, 5 × ; 9–10. fruits, $\frac{5}{6}$ × . (7. *Breteler & J. J. de Wilde 721*; 8. *Breteler & J. J. de Wilde 76*; 9. *Bos 3153*; 10. *Breteler 6526*).

whether it belongs to *D. heudelotii* var. *heudelotii*. However, in the original publication the fruit is described as 'dense fulvo-tomentosis', which points to *D. heudelotii* var. *heudelotii* and is in accordance with the later illustration given (ENGLER 1912-b: Fig. LII, E–H).

Mildbraed 2853, the type of *D. longifolium*, has been destroyed at Berlin. A fragment of it at BM, consisting of some leaves and flowers, has been designated lectotype. The Berlin herbarium has a specimen which, very probably, may be a duplicate of the original material. Both specimens, at B and BM, fit ENGLER's description and represent undoubtedly *D. heudelotii* var. *heudelotii*.

The variability of *D. varians* is very well described by the author PELLEGRIN. *D. varians* represents a form of *D. heudelotii* var. *heudelotii*, also described as *D. angustisquamulosum*, *D. ferrugineum*, and *D. johnstonii*, with more persistent indumentum, and with inflorescences which may be distinctly stalked and distinctly branched.

D. heudelotii (Planch. ex Oliv.)Baill. var. **hispidum** (Oliv.)Bret., *comb. & stat. nov.*

Fig. 7: 7–10 Map 7

Basionym: *Chailletia hispida* Oliver, 1868: 343. Type: Gabon, 1° N., Kongui R., *Mann 1821* (holotype: K; isotypes: LE, P, W).

D. hispidum (Oliver)Baillon, 1874: 141; Engler, 1912-a: 592; Pellegrin, 1913: 585; De Wildeman, 1919: B37, p.p.: quoad *Zenker 2513* (not *2573*); Engler & Krause, 1931: 8; Exell & Mendonça, 1951-b: 328; Breteler, 1973: XVII; Punt, 1975: 29; Breteler, 1978: 55. For basionym and type see above.

D. macrophyllum (Oliver)Engler, 1896-a: 349; 1912-a: 592; Pellegrin, 1913: 640; De Wildeman, 1919: B48; Engler & Krause, 1931: 8; Breteler, 1973: XVII (in synonymy to *D. hispidum*). Basionym: *Chailletia macrophylla* Oliver, 1868: 343. Type: Gabon, Kongui R., *Mann 1790* (holotype: K).

D. subsessilifolium Chodat, 1895: 671; Hiern, 1896: 136; Engler, 1912-a: 588; Pellegrin, 1913: 585 (in synonymy to *D. hispidum*); De Wildeman, 1919: B68; Moss, 1928: 125, p.p., see notes; Exell & Mendonça, 1951-b: 328 (in synonymy to *D. hispidum*); Breteler, 1973: XVII (in synonymy to *D. hispidum*). Type: Angola, Cuanza Norte, Golungo Alto, Sobado de Quilombo-Quiacatubia, *Welwitsch 4662* (holotype: G; isotypes: BM, BR, C, COI, K, LISU, P).

D. salicifolium Engler & Ruhland, 1902: 89; Engler, 1912-a: 587; De Wildeman, 1919: B63; Breteler, 1973: XVII (in synonymy to *D. hispidum*). Type: Cameroun, Grand Batanga, *Dinklage 1467* (holotype: B†; lectotype: HBG).

D. longipilosum Engler, nomen in herb. *Zenker* (*no. 1064*); De Wildeman, 1919: B45 (*Zenker no. 311*).

Chailletia subsessilifolia Chodat ex Barth, 1896: 497. Type: see above under *D. subsessilifolium*.

PHOT. 2. *D. heudelotii* var. *hispidum*: fruiting branchlet (*Breteler 6526*; phot. F. J. BRETELER).

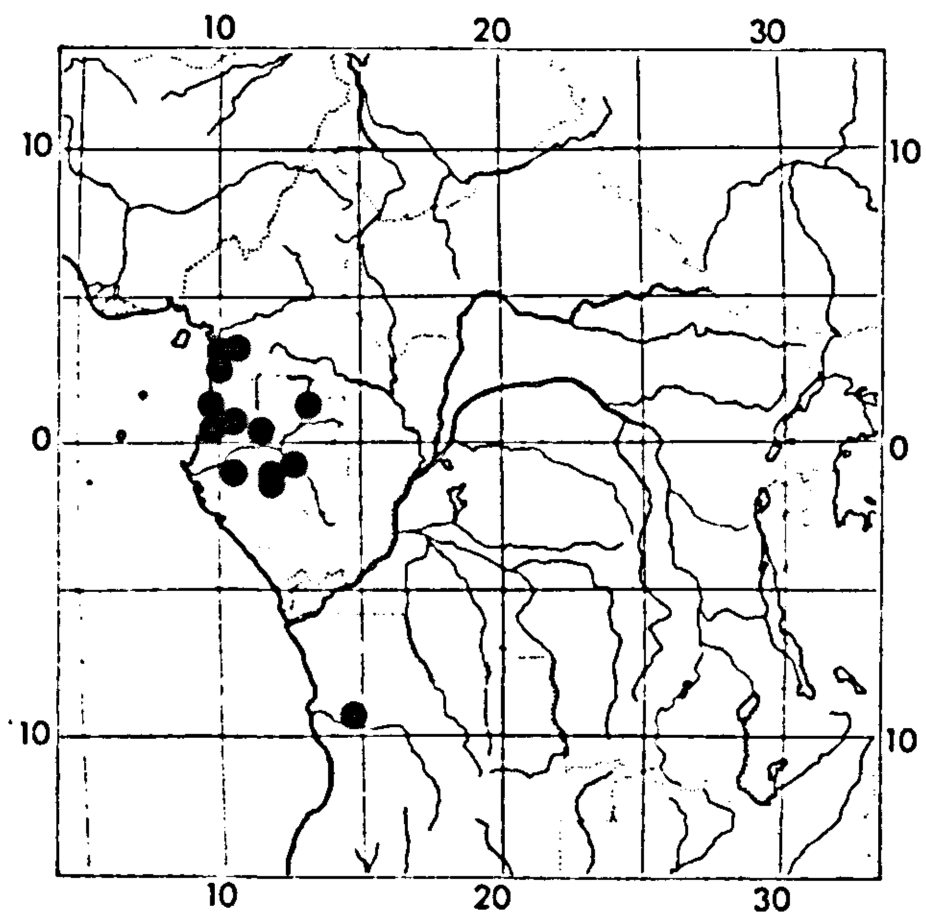
Distribution: Cameroun, Gabon, Angola.
Ecology: Rain forest, semi-deciduous forest.

Specimens examined:

Cameroun. 5 km S. of Kribi, *Bos 2951* (WAG); *3153* (WAG); 16 km Kribi-Lolodorf, *Bos 3664* (WAG); 9 km S. of Kribi, *Bos 3685* (WAG); 18 km Kribi-Lolodorf, *Bos 3870* (WAG); 9 km S. of Kribi, *Bos 4236* (WAG); Kribi, *Bos 4264* (WAG); 9 km E. of Kribi, *Bos 5000* (WAG); 9 km S. of Kribi, *Bos 5267* (WAG); Kribi, *Bos 6851* (WAG); *Bos & Breteler 7190* (WAG); 44 km Kribi-Campo, *Bos & Breteler 7292* (WAG); 36 km S. of Lobé R., Kribi-Campo Rd, *J. J. de Wilde 8053* (WAG); 5 km S. of Kribi, *W. J. de Wilde c.s. 2103* (WAG); Grand Batanga, *Dinklage 813* (HBG); *1292* (HBG, P, WAG); *1467* (BM, HBG, type of *D. salicifolium*); Bipindi, *Zenker 311* (B, BR, BREM, C, FI, G, LD, P, SRGH, U, WAG); *1064* (BM, BR, E, G, GOET, K, L, LE, M, P, W, WU, Z); *2513* (B, BM, BR, COI, G, GOET, K, L, M, P, PRE, W, WU, Z).

Gabon. 50 km S.E. of Lambaréné, *Breteler 5773* (WAG); *5786* (WAG); 4 km W. of Lastoursville, *Breteler 6526* (WAG); *6532* (WAG); ca 25 km N.E. of Asok, *Breteler & J. J. de Wilde 76* (WAG); *199* (WAG); 10 km La Lara-Makokou, *Breteler & J. J. de Wilde 457* (WAG); Bélinga, *Breteler & J. J. de Wilde 721* (WAG); *N. Hallé 3779* (P, WAG); sin. loc., *Klaine 78* (BR, K, P, WAG); *202* (K, P); near Libreville, *Klaine 316* (P, WAG); *442* (P); *709bis* (LE, P); *986* (P); *1058* (BM, P); *1330* (or *1336*) (G, P, WAG); *1361* (P, WAG); *1373* (P, WAG); *1667* (P); *1693* (FI, G, P); *1712* (P, WAG, see also *1712* under *D. heudelotii* var. *heudelotii*); *1869* (P); *1967* (P); *2470* (P, WAG); *2991* (BR); *3020* (P); *3021* (K, P); Moubighou, *Le Testu 5996* (BM, P, WAG); Ndingui, *Le Testu 6075* (BM, P, WAG); Kongui R., *Mann 1790* (K, type of *D. macrophyllum*); *1821* (K, LE, P, W, type); N. of Libreville, Mondah Forest, *Villiers 379* (P).

Angola. Golungo Alto, *Welwitsch 4662* (BM, BR, C, COI, G, K, LISU, P, type of *D. subsessilifolium*).



MAP 7. *D. heudelotii* var. *hispidum*

Notes. As with *D. heudelotii*, ENGLER cited this taxon as *D. hispidum* (Oliv.)Engl. Here also it was BAILLON who first combined *Ch. hispida* in *Dichapetalum*.

The types of *D. hispidum* and *D. macrophyllum* differ only in leafsize and somewhat in leafshape. These differences fall completely within the variation found in var. *hispidum*.

The lectotype of *D. salicifolium* in HBG is sterile. ENGLER & RUHLAND gave a description of the flower but did not mention the adnation between petals and stamens, a characteristic of var. *hispidum*. However, the description of the other flower elements as the slender sepals and petals, as well as the very long acute-acuminate leaves shown by the lectotype, point more to var. *hispidum* than to var. *heudelotii*. Although some doubt remains, I feel that this synonym is best placed under var. *hispidum*.

Besides *Welwitsch 4662*, the type of *D. subsessilifolium*, MOSS (1928: 125) cited 5 more WELWITSCH specimens as belonging to this taxon. Of these, *Welwitsch 469* certainly belongs to *D. heudelotii*, but it has only immature flowers which makes it difficult to identify it more precisely. The other WELWITSCH specimens (*3018*, *3019*, *4697*, *6718*) most probably do not belong to this genus as they are not cited by HIERN (1896) and have not been received on loan from any herbarium, nor found present under this genus in the herbaria of BM, BR, K, and P.

D. heudelotii (Planch. ex Oliv.)Baill. var. **longitubulosum** (Engl.)Bret., *comb. & stat. nov.*

Fig. 8 Map 8

Basionym: *D. longitubulosum* Engler, 1902: 90; 1912-a: 593; Pellegrin, 1913: 640; De Wildeman, 1919: B45; Engler & Krause, 1931: 9; Breteler, 1973: 25, 28, 33, 69, 86, XVII; Punt, 1975: 29; Breteler, 1978: 81. Type: Cameroun, Bipindi,

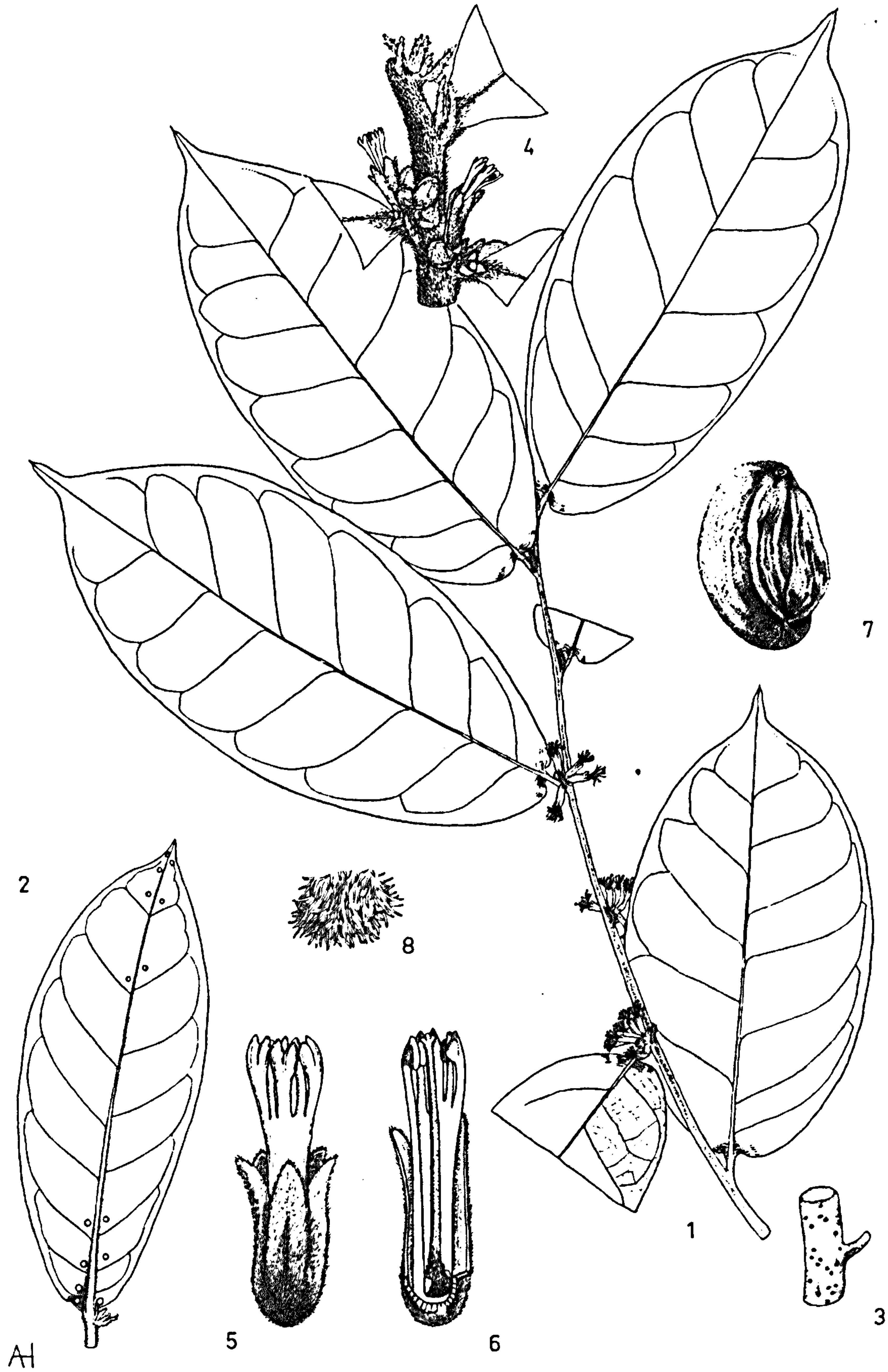


FIG. 8. *D. heudelotii* var. *longitubulosum*: 1. flowering branchlet, ½ ×; 2. small leaf beneath with glands, 1 ×; 3. part of branch with lenticels, ½ ×; 4. part of branchlet with stipules and flowers, 1½ ×; 5. flower, 6 ×; 6. flower partly, 6 ×; 7. fruit, ½ ×; 8. detail of fruit indumentum. (1. *Zenker 341*; 2, 4-6. *Bos & Breteler 3056*; 3. *Bos 4283*; 7-8. *Bos 3219*).

Zenker 2253 (holotype: B†; lectotype: G; isotypes: BM, E, GOET, K, L, M, P, W, WU, Z).

D. scabrum Engler, 1902: 86; 1912-a: 584; De Wildeman, 1919: B65; Breteler, 1973: XVII (in synonymy to *D. longitubulosum*). Type: Cameroun, Lolodorf, *Staudt 542* (holotype: B†; lectotype: B; isotype: BREM, M).

D. aurantiacum Engler, 1912-a: 593. For full details see Breteler, 1973: 69.

D. batesii Engler, 1912-a: 595. For full details see Breteler, 1973: 86.

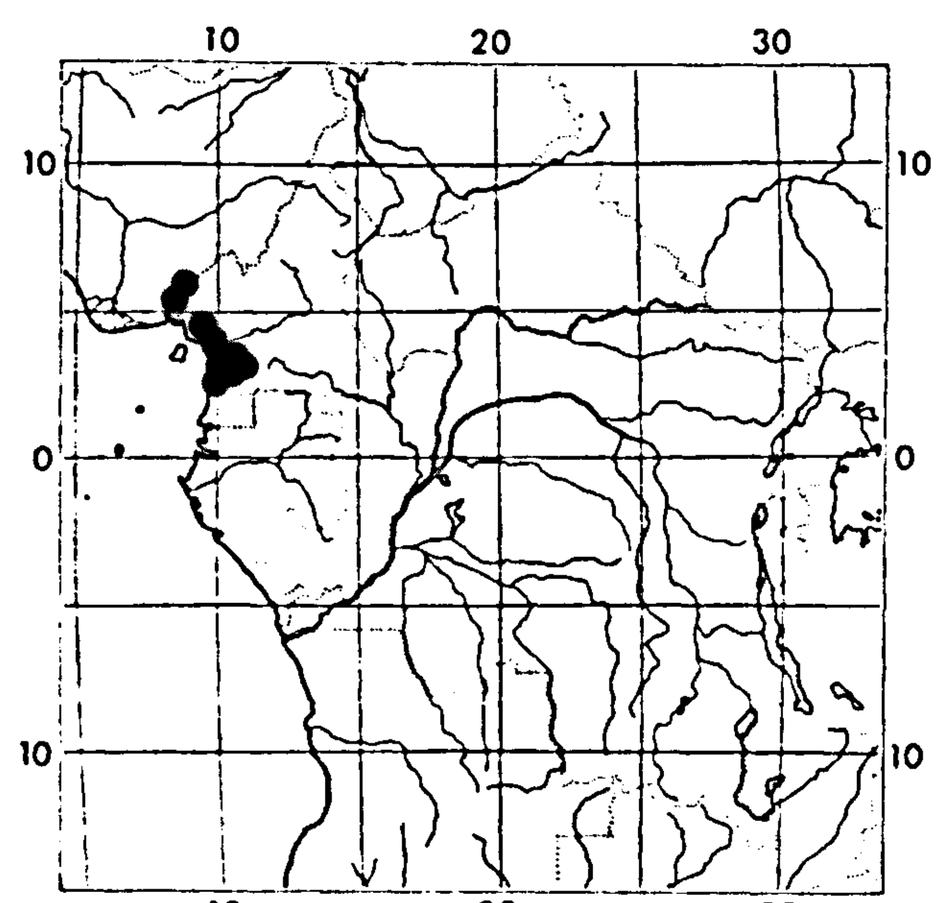
Distribution: S.E. Nigeria, S.W. Cameroun.
Ecology: Rain forest.

Specimens examined:

Nigeria. Bendiga Ayuk, *Keay FHI 28165* (BR, FHI, K); Osomba, Calabar-Mamfé Rd, *Latilo & Oguntayo FHI 70570* (K, WAG); Ikpai, *Latilo & Onyeachusim FHI 54263* (K); Orem, Calabar-Mamfé Rd, *Onochie FHI 36473* (K); Oban, *Talbot 1383* (K).

Cameroun. Douala, *Baldwin 13973* (K); Batanga, *Bates 331* (BM, BR, E, G, K, Z); *332* (BM, Z, type of *D. batesii*); 20 km N.N.E. of Kribi, *Bos 2988* (BR, WAG); 5 km S. of Kribi, *Bos & Breteler 3056* (WAG); 20 km Kribi-Lolodorf, *Bos & Breteler 3063* (WAG); near Kribi, *Bos & Breteler 3092* (WAG); ca 5 km S. of Kribi, *Bos 3116* (WAG); *3171* (WAG); *3219* (WAG); ca 7 km Kribi-Ebolowa, *Bos 3382* (WAG); *3453* (WAG); 15 km N. of Kribi, *Bos 3577* (WAG); *3828* (WAG); 8 km S. of Kribi, *Bos 3961* (WAG); 9 km Kribi-Ebolowa, *Bos 4185* (WAG); Kribi, *Bos 4283* (WAG); 15 km N. of Kribi, *Bos 4373* (WAG); 6 km S. of Kribi, *Bos 4381* (WAG); Bidou II, *Bos 4958* (WAG); ca 9 km N.E. of Kribi, *Bos 5002* (WAG); *5006* (WAG); *5007* (WAG); *5608* (WAG); 4 km N. of Bipindi, *Bos 6763* (WAG); 6 km S. of Kribi, *Bos 7093* (WAG); Kribi, *Bos & Breteler 7186* (WAG); near Douala, *Bos & Breteler 7331* (WAG); 18 km S. of Lobé R., Kribi-Campo Rd, *J. J. de Wilde 8305* (WAG); 70 km S.W. of Eséka, *W. J. de Wilde c.s. 2817* (WAG); Edea, *Dinklage 263* (HBG); Grand Batanga, *Dinklage 787* (HBG); *795* (HBG, P, WAG); *796* (HBG); 59 km N. of Douala, *Fleury in Chevalier 33383* (P); Lolodorf, *Staudt 542* (B, BREM, M, type of *D. scabrum*); Bipindi, *Zenker 341* (B, BR, BREM, C, FI, G, LD, P, U, WAG); *2253* (BM, E, G, GOET, K, L, M, P, W, WU, Z, type); *2253A* (BM, G, K, WU); *2591* (BM, BR, E, GOET, K, P, W, WAG, WU, Z, type of *D. aurantiacum*); *3969* (BM, BR, COI, E, GOET, K, L, LE, M, MO, P, PRE, W, WU, Z); *3991* (BM, BR, E, GOET, K, L, LE, M, MO, W, WU); *4854* (BM, BR, COI, G, GOET, K, L, LE, LISC, M, P, W, Z).

Cult. Netherlands (seedlings). Wageningen, *Breteler 6230* (WAG), seedling from *Bos 5006*.



MAP 8. *D. heudelotii* var. *longitubulosum*

Notes. *Dinklage 1291* (HBG), one of the paratypes of *D. longitubulosum* and *Dinklage 1307* (HBG), the paratype of *D. batesii* lack the necessary elements to identify them as belonging to one of the four varieties, but certainly belong in *D. heudelotii*.

The lectotype and isotypes of *D. scabrum* bear flowerbuds only (as well as the holotype, according to ENGLER). These flowerbuds have been analysed and compared with buds of the same size from a specimen certainly belonging to var. *longitubulosum*, i.e. with fully developed flowers also. The buds already showed the relatively long tube formed by petals and stamens. In comparable buds of var. *hispidum* such a tube is much smaller or even absent. Therefore *D. scabrum* is placed in synonymy of var. *longitubulosum*.

D. heudelotii (Planch. ex Oliv.)Baill. var. **ndongense** (Engl.)Bret., *comb. & stat. nov.*

Fig. 9 Map 9

Basionym: *D. ndongense* Engler, 1912-a: 592; Breteler, 1973: 7, 23, 33, 39, XVIII; Punt, 1975: 29. Type: Cameroun, near Ndonge, *Ledermann 6296* (holotype: B†; lectotype: BM).

D. lukolelaense De Wildeman, 1919: B46; Hauman, 1958-a: 331, p.p.; Breteler, 1973: XVIII (in synonymy of *D. ndongense*). Type: Zaïre, Lukolela, *Pynaert 171* (holotype: BR; isotype: WAG).

D. sankuruense De Wildeman, 1919: B63; Hauman, 1958-a: 331 (in synonymy of *D. lukolelaense*); Breteler, 1973: XVII (in synonymy of *D. ndongense*). Type: Zaïre, Sankuru, *Sapin s.n.* (holotype: BR).

D. gracile Exell, 1927: 70; Exell & Mendonça, 1951-b: 330; Breteler 1973: XVIII (in synonymy of *D. ndongense*). Type: Angola, Cabinda, Pango Munga, *Gossweiler 6256* (holotype: BM; isotypes: BR, COI, LISJC, LISU).

D. mildbraedianum Exell, 1927: 69; Exell & Mendonça, 1951-b: 329; Breteler, 1973: XVIII (in synonymy of *D. ndongense*). Type: Angola, Cabinda, Pango Munga, *Gossweiler 6484* (holotype: BM; isotypes: COI, LISU).

D. martineaui Aubréville & Pellegrin in Aubréville, 1936: 4, fig. 124: 7–10 (French description only); Keay, 1958: 438; Aubréville, 1959: 10, fig. 129: 7–10; Breteler, 1973: 7, 33, XVIII (in synonymy of *D. ndongense*). See notes.

D. actidalum Engler, nomen in Herb. *Zenker* (*no. 355*). See Breteler, 1973: 39.

Distribution: West and Central Africa.
Ecology: From rain forest to gallery forest.

Specimens examined:

Guinea. Between Lola and Nzo, *Chevalier 20980* (P); Nimba Mts, *Schnell 5372* (K).

Liberia. Nimba, *Adam 21139* (K); Jekepa, *Adam 27709* (BR, WAG); Ganta, *Harley 865A* (K).

Ivory Coast. Banco, *Aké Assi 10609* (WAG); 15 km Sassandra-Lakota, *Beentje 78* (WAG); Banco, *Breteler 5216* (WAG); *5221* (WAG); *5290* (WAG); *5291* (WAG); S.E. of Agboville, *Breteler*

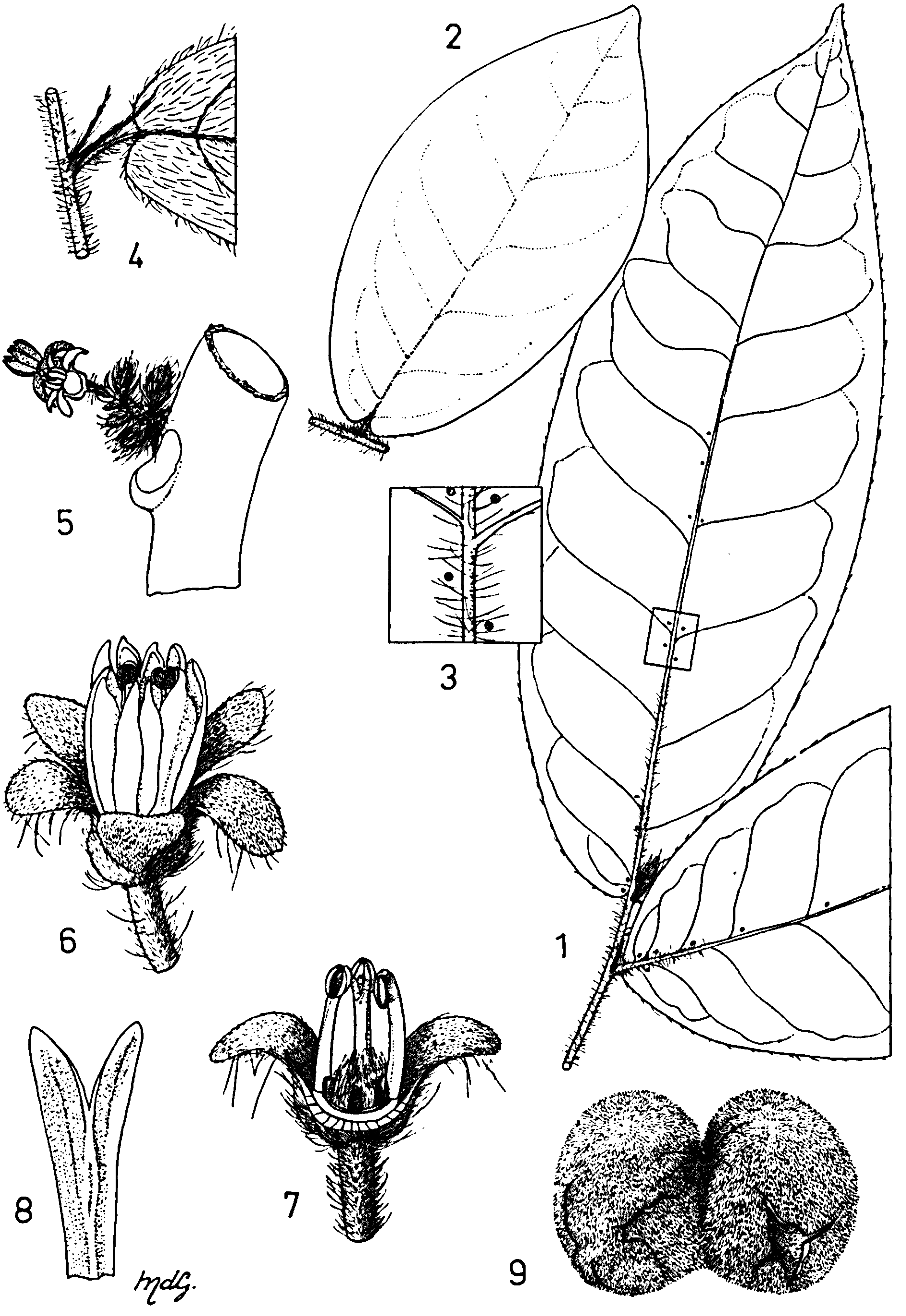
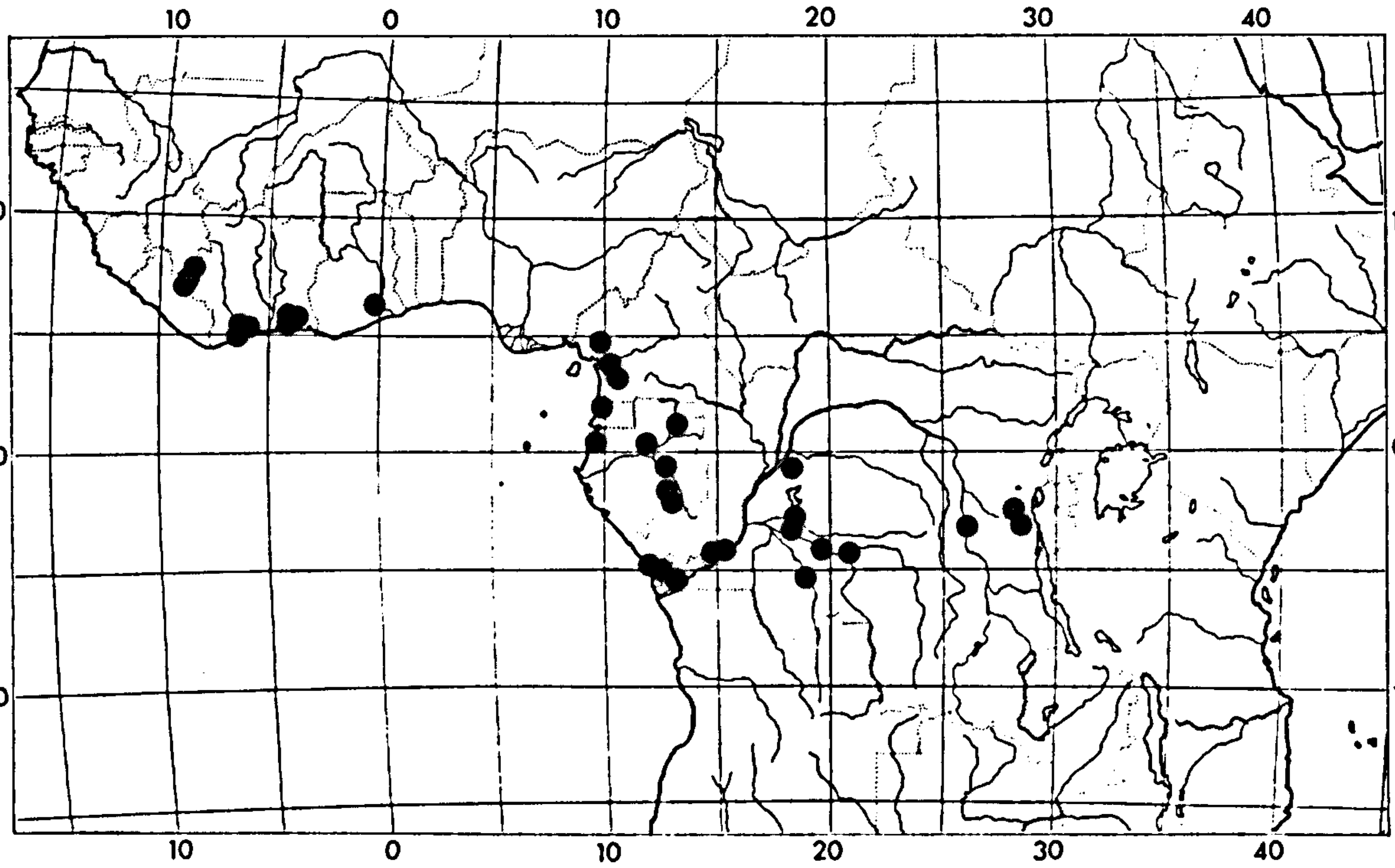


FIG. 9. *D. heudelotii* var. *ndongense*: 1. leafy branchlet, $\frac{5}{6}\times$; 2. small leaf, $\frac{5}{6}\times$; 3. detail leaf beneath, $2\frac{1}{2}\times$; 4. stipules, $2\frac{1}{2}\times$; 5. inflorescence with 2 flowers, $2\frac{1}{2}\times$; 6. flower, $10\times$; 7. flower partly, $10\times$; 8. petal inside, $15\times$; 9. 2-seeded fruit with burst exocarp, $\frac{5}{6}\times$. (1, 3. *Breteler 5221*; 2. *J. J. de Wilde 535*; 4. *Breteler 5841*; 5-8. *Breteler 5340*; 9. *Breteler 5291*).



MAP 9. *D. heudelotii* var. *ndongense*

5340 (WAG); N.W. of Sassandra, *Breteler 5829* (WAG); 56 km Sassandra-Gagnoa, *Breteler 5841* (WAG); Banco, *De Koning 83* (WAG); 30 km N. of Abidjan, *De Koning 157* (WAG); Anguédédou Forest, *J. J. de Wilde 200* (WAG); Banco, *J. J. de Wilde 535* (WAG); 9 km Yakassé Me-Kodiousou, *Leeuwenberg 8049* (WAG); Banco, *Martineau 290* (BR, P); Adiopodoumé, *Nozeran s.n.* (MPU); Banco, *Serrain s.n.* (P); *Service Forestier 483* (BR, P); Adiopodoumé, *Thijssen 102* (WAG); Anguédédou Forest, *Thijssen 308* (WAG).

Ghana. Begoro, *J. B. Hall GC 42386* (K, WAG); *Morton GC 8367* (K).

Cameroun. Bipindi, *Annet 342* (P); 8.5 km S. of Kribi, *Bos 4586* (WAG); 20 km Kribi-Lolodorf, *Bos 4846* (WAG); Ndonge, *Ledermann 6296* (BM, type); 60 km S. of Edéa, *Leeuwenberg 5556* (BR, K, P, WAG); 35 km S.W. of Edéa, *Letouzey 12672* (YA); Bipindi, *Zenker 355* (B, BR, BREM, FI, G, LD, P, U, WAG); *4837* (B, BM, BR, COI, GOET, K, L, LE, M, MO, P, W, Z).

Gabon. 70 km S.S.W. of Moanda, *Breteler 6885* (WAG); 60 km S.S.W. of Moanda, *Breteler 6962* (WAG); 15 km S.S.E. of Pana, *Breteler 6984* (WAG); 40 km La Lara-Makokou, *Breteler & J. J. de Wilde 517* (WAG); Bélinga, *Breteler & J. J. de Wilde 534* (WAG); *595* (WAG); sin. loc., *Klaine 269* (P); Libreville, *Klaine 1904* (P); *3042bis* (BR, K, P); Lastoursville, *Le Testu 7561* (BM, P, WAG); *8475* (BM, P, WAG).

Congo. Near Pointe Noire, *Farron 4816* (P); Moutampa, *Sita 1891* (WAG); Djoumouna, *Sita 2962* (P, WAG).

Zaïre. Kiyaka, *Devred 2357* (BR, WAG); Luki, *Donis 1626* (BR, K); *2350* (BR); Elundu, *Heurard 334* (BR); Bokoro, *Jans 597* (BR); Makaw, *Jans 953* (BR); Mwenga, *A. Léonard 4879* (BR, WAG); Topetope, *A. Léonard 5159* (BR, P, WAG); Luki, *Maudoux 199* (BR); Bikoro, Lukolela, *Pynaert 171* (BR, WAG, type of *D. lukolelaense*); Sankuru, *Sapin s.n.* (BR, type of *D. sankuruense*); Ipamu, *Vanderyst 12673* (BR).

Angola. Pango Munga, *Gossweiler 6014* (BM, COI, K, LISU); *6256* (BM, BR, COI, LISJC, LISU, type of *D. gracile*); *6484* (BM, COI, LISU, type of *D. mildbraedianum*).

Cult. Ivory Coast (seedling). Adiopodoumé, *Breteler 6209* (WAG, seedling from *Breteler 5216*).

Notes. HAUMAN treated *D. sankuruense* as a synonym of *D. lukolelaense*. The types of both names show the small flowers characteristic for var. *ndongense*, of which the type has not been taken into account by HAUMAN. The types of *D.*

gracile and *D. mildbraedianum* share these small flowers, but differ only in leafsize. As the size of the flower elements forms the only character by which var. *ndongense* can be distinguished within *D. heudelotii*, these four names have been treated as synonyms of this variety. The same holds for *D. martineaui*, a name originally published with a French description only and not validated since by a description or diagnosis in Latin.

The following specimens lack the necessary elements to identify them as belonging to one of the four varieties.

Sierra Leone. Joru, *Deighton 5198* (K, P); Gima, *Deighton 5859* (K); Rowala, *Thomas 1049* (K); Magbile, *Thomas 6075* (K); sin. loc., *Thomas 9951* (K); *10041* (K, P); *10143* (BR); *10212* (K).

Liberia. Nimba Mt., *Adam 20779* (WAG); *25521* (K, WAG); *25529* (K); *27547* (BR, WAG); near Bendu, *Breteler c.s. 5449* (WAG); Ganta, *Harley 939* (K); near Yoma, *Leeuwenberg 4834* (WAG); 32 km N. of Kakata, *Leeuwenberg & Voorhoeve 4958* (WAG); Gbanga, *Linder 602* (K).

Ivory Coast. Téké Forest, *Aké Assi 4340* (WAG); Anguédédou Forest, *Aké Assi, 5442* (WAG); Banco, *Bégué 3076* (P); Adiopodoumé, *Breteler 5205* (WAG); Banco, *Breteler 5208* (WAG); near Fresco, *Breteler 5359* (WAG); between Grand Bassam and Aboisso, *Breteler 5915* (WAG); near Sassandra, *Breteler 6033* (WAG); *6042* (WAG); 63 km Sassandra-Lakota, *Breteler 6070* (WAG); 29 km N. of Abidjan, *Breteler 6080* (WAG); 45 km N. of Abidjan, *Breteler 6085* (WAG); 75 km Sassandra-Gagnoa, *Breteler 6134* (WAG); 42 km Ndouci-Dabou, *Breteler 6201* (WAG); *6202* (WAG); *6203* (WAG); 60 km Sassandra-San Pedro, *Breteler 7334* (WAG); 13 km N.W. of Tabou, *Breteler 7368* (WAG); 17 km N. of Grabo, *Breteler 7416* (WAG); *7417* (WAG); 48 km Grabo-Tai, *Breteler 7428* (WAG); 16 km N.W. of Sassandra, *Breteler 7496* (WAG); Voguié, Agniéby valley, *Chevalier 16131* (P); *16131bis* (P); Adiopodoumé, *Hallé 3659* (P); *Leeuwenberg 4208* (K, WAG); 4 km N. of Aboisso, *Leeuwenberg 4496* (WAG); 9 km W. of Bécédi, *Leeuwenberg 7902* (WAG).

Ghana. Okrabi, *St. Clair Thompson 3700* (FHO); Volta R. F.R., *J. B. Hall GC 43184* (K, WAG); sin. loc., *Vigne 3043* (BM).

Nigeria. Orem, *Okafor FHI 36270* (K); *Onochie FHI 36141* (K); 15 km S.E. of Ikom, *Van Meer 1672* (WAG); Obudu Cattle Ranch, *Van Meer 1787* (WAG).

Cameroun. 5 km S. of Kribi, *Bos & Breteler 3060* (WAG); 13 km Kribi-Ebolowa, *Bos 3280* (WAG); 19 km Kribi-Ebolowa, *Bos 4030* (WAG); Longii, *Bos 4719* (WAG); *4731* (WAG); *4732* (WAG); Kribi, *Bos 4906* (WAG); *4907* (WAG); 13 km Kribi-Ebolowa, *Bos 5074* (WAG); 11 km S. of Kribi, *Bos 5272* (WAG); 36 km Kribi-Edéa, *Bos 5311* (WAG); 16 km Kribi-Lolodorf, *Bos 5384* (WAG); 10 km Kribi-Lolodorf, *Bos 5586* (WAG); 16 km Kribi-Ebolowa, *Bos 5641* (WAG); 40 km Kribi-Edéa, *Bos 6448* (WAG); 27 km Kribi-Ebolowa, *Bos 6460* (WAG); 46 km Kribi-Lolodorf, *Bos 6526* (WAG); 42 km old Kribi-Yaoundé Rd, *Bos 6932* (WAG); *6933* (WAG); Kribi, *Bos 6960* (WAG); Campo, *Bos 7035* (WAG); *7039* (WAG); *7040* (WAG); 30 km S. of Kribi, *Bos & Breteler 7233* (WAG); Elephant Mt., S.E. of Kribi, *Bos & Breteler 7239* (WAG); *7242* (WAG); *7243* (WAG); *7244* (WAG); *7246* (WAG); 45 km Kribi-Campo, *Bos & Breteler 7309* (WAG); sin. loc., *Braun 143* (BM); 35 km W. of Bertoua, *Breteler 2976* (WAG); 19 km Kribi-Campo, *J. J. de Wilde 7798A* (WAG); 16 km Ebolowa-Mintok, *J. J. de Wilde 8036* (WAG); 55 km S.W. of Eséka, *W. J. de Wilde c.s. 7163* (WAG); Grand Batanga, *Dinklage 1291* (HBG); *1307* (HBG); 10 km W. of Masok, *Leeuwenberg 5262* (BR, K, WAG); 40 km N.W. of Yaoundé, *Leeuwenberg 5442* (BR, K, P, WAG); 58 km Douala-Loum, *Leeuwenberg 8756* (WAG); Bakaka Forest near Nkongsamba, *Leeuwenberg 8764* (WAG); Bakaka Forest S. of Nkongsamba, *Leeuwenberg 8961* (WAG); 19 km Loum-Yabassi, *Leeuwenberg 9022* (WAG); E. of Bandem, 3 km E. of Yingui, *Leeuwenberg 9146* (WAG); 17 km Yingui-Yabassi, *Leeuwenberg 9156* (WAG); 20 km Loum-Yabassi, 2 km N. of Solé, *Leeuwenberg 9193* (WAG); W. side of Koupé Mt., near Mbule, *Leeuwenberg 9272* (WAG); S. Bakundu Forest, 21 km Kumba-Victoria, *Leeuwenberg 9824* (WAG); *9825* (WAG); Douala-Tiko Rd, left bank Mungo R., *Leeuwenberg 10299* (WAG); 30 km Kumba-Victoria, S. of Bombe, *Leeuwenberg 10607* (WAG); *Leeuwenberg 10618* (WAG); S.W. of Kompina, *Leeuwenberg 10644* (WAG); 125 km N.E. of Yaoundé, *Mildbraed 8300* (K); Bipindi, *Zenker 311* (B, WAG); *3520* (BM, K, WU).

Gabon. Gamba, *Breteler & Van Raalte 5602* (WAG); *5613* (WAG); *5665* (WAG); *5672* (WAG); 42 km S.E. of Lambaréné, *Breteler 5685* (WAG); *5693* (WAG); 6–9 km Moanda-Franceville, *Breteler 6245* (WAG); *6304* (WAG); 23 km Moanda-Franceville, *Breteler 6337* (WAG); 6 km Moanda-Franceville, *Breteler 6399* (WAG); 23 km Moanda-Franceville, *Breteler 6438* (WAG); 4 km S.W. of Lastoursville, *Breteler 6548* (WAG); *6606* (WAG); *6630* (WAG); 7 km Lastoursville-Moanda, *Breteler 6656* (WAG); Lastoursville, *Breteler 6689* (WAG); 23 km Moanda-Franceville, *Breteler 6776* (WAG); 70 km S.S.W. of Moanda, *Breteler 6886* (WAG); 60 km S.S.W. of Moanda, *Breteler 6907* (WAG); 15 km S.S.E. of Pana, *Breteler 6985* (WAG); 15 km Asok-Tchimbelé Falls, *Breteler & J. J. de Wilde 229* (WAG); Nkan, 8 km S.W. of Asok, *Breteler & J. J. de Wilde 363* (WAG); Mayibout I, border of Ivindo R., *Breteler & J. J. de Wilde 629* (WAG); 45 km Achouka-Lastoursville, *Breteler & J. J. de Wilde 730* (WAG); Libreville, *Klaine 1223* (BM, FI, LE, P); *1664* (P); *2879* (P).

Congo. Makana, *Bouquet 565* (P); Impfondo, *Bouquet 2042* (P); 42 km Boko-Songho-Kindamba, *de Néré 1624* (IEC, MPU, P, WAG); Meya, *Sita 1479* (IEC); M'Bamou I., *Sita 1520* (WAG).

Zaïre. Madimba, *Breyne 331* (BR); Balama, *Claessens 292* (BR); Garamba Nat. Parc, *De Saeger 1376* (K); Mvuazi, *Devred 596* (BR, LISC); Kiyaka, *Devred 2357* (WAG); Bondo, *De Wulf 628* (BR, W); Yangambi, Donis *3715* (BR, M); *3721* (BR, COI); Monkoto, *Evrard 4635* (BR, WAG); Yalikunga, *Evrard 5403* (BR, WAG); Bokota, *Evrard 5671* (BR, WAG); Mawa Geitu, *Gérard 343* (BR); Kurukwata, *Gérard 3121* (BR, K); Tukpwo, *Gérard 3751* (BR); Eala, *Germain 8410* (BR); Boyeka, *Germain 8415* (BR); *8416* (BR); Yangambi, *Germain 8496* (BR, LISC); *8569* (BR, LISC, PRE); Yabwesu, *Germain 8692* (BR); *8693* (BR); Luki, *Hombert 51* (BR, K); Yangambi, *Louis 3103* (BR); *4052* (BR, M, U, W); Yaosuka, *Louis 8388* (BR, P); Yangambi, *Louis 11772* (BR); *Menawanza 3* (WAG); Kaniama-Haut Lomanie, *Mullenders 2481* (BR); Popokalaka, *Pauwels 3994* (BR); Kabenga, *Pierlot 3316* (BR, K); Luki, *Toussaint 2253* (BR); La Kulu, *Vanden Brande 440* (BR).

Angola. Golungo Alto, *Welwitsch 469* (BM, LISU).

Central African Republic. Boukoko, *Koechlin 2518* (P); Yalinga, *Le Testu 4551* (BM, P, WAG).

D. hirtellum (Tul.)Engl. = **D. bojeri** (Tul.)Engl.

For details see under *D. bojeri* (Breteler, 1973: 99).

D. hirtum Desc. = **D. leucosia** (Spreng.)Engl.

For details see p. 54.

D. hispidum (Oliv.)Baill. = **D. heudelotii** (Planch. ex Oliv.)Baill. var. **hispidum** (Oliv.)Bret.

For details see p. 33.

D. holopetalum Ruhl. = **D. crassifolium** Chod. var. **crassifolium**

For details see under *D. crassifolium* (Breteler, 1978: 29).

D. holosericeum Engl. = **D. bangii** (F. Didr.) Engl.

For details see under *D. bangii* (BRETELER, 1973: 70).

D. humbertii Desc. = **D. madagascariense** Poir. var. **beniense** (Engl.)Bret.

D. humbertii Descoings, 1960: 84, fig. 5; 1961: 9, fig. 1: 1; 1962: 50; 1973: 510; Breteler, 1973: XVIII (in synonymy of *D. madagascariense* var. *beniense*). Type: Madagascar, Ivohibé, *Decary 5538* (holotype: P; isotype: WAG).

Note. DESCOINGS (1960: 84) distinguished *D. humbertii* from *D. thouarsianum* (= *D. madagascariense*) by the shape of the petals and the glabrous staminodes ('glandes'). Glabrous or nearly glabrous staminodes are also quite often present in *D. madagascariense* var. *madagascariense*, not only in Madagascar material (e.g. *Mocquerys 98*, *Perrier de la Bâthie 404*, *408*, *4575*, *6214*, *6216*), but also in continental material (e.g. *Breteler 1338*, *Semsei 1307*, *3373*, *Winkler 58*). The different petal shape is not repeated by DESCOINGS in later publications nor used in his keys (1961: 4; 1973: 517). When treating *D. thouarsianum* in the publication of 1960, the different petals are not mentioned when comparing this species (p. 107) with *D. humbertii* (cited as *D. microphyllum*). Besides the glabrous staminodes the shorter style is mentioned, 'qui dépasse peu les étamines'. Comparing the drawings 5 and 12 of *D. humbertii* and *D. thouarsianum* respectively, it is at once clear, that such a minor difference with a variable species as *D. madagascariense* is not practical in specific delimitation. In fact *D. humbertii* from Madagascar represents the same taxon as *D. beniense* from continental Africa, and, as it shows only small differences, it has been reduced to varietal status. The pilose domatia often observed in the more hairy continental specimens of var. *beniense*, are absent in the Madagascar material.

D. hypoleucum Hiern = **D. pallidum** (Oliv.) Engl.

D. hypoleucum Hiern, 1896: 138; De Wildeman, 1919: B37; Moss, 1928: 122; Exell & Mendonça, 1951-b: 325; Breteler, 1973: XIX (in synonymy to *D. pallidum*). Type: Angola (?), sin. loc., *Welwitsch 4667* (holotype: BM; isotype: LISU).

Note. By its whitish, persistent tomentum on the lower leaf surface, *Welwitsch 4667* is at once recognized as belonging to *D. pallidum*. The collecting locality of the type is not known; according to EXELL & MENDONÇA (l.c.) it is not certain if it has been collected in Angola. The area of distribution of *D. pallidum* almost certainly includes a part of Angola (e.g. Cabinda) as this species is also reported from neighbouring Zaïre i.e. from Mayumbe and Bas-Congo (HAUMAN, 1958-a: 308).

D. insigne Engl. **Fig. 10 Map 10**

D. insigne Engler, 1912-a: 596; Pellegrin, 1913: 585; De Wildeman, 1919: B37; Breteler, 1973: 7, 18, XVII; Punt, 1975: 29.

Type: Cameroun, Bipindi, *Zenker 3004* (holotype: B†; lectotype: M; isotypes: BM, BR, E, G, GOET, K, L, P, PRE, W, WU, Z).

Diagnostic characters. Treelet, shrub, lianescent shrub or liana. Branches and branchlets densely villous-tomentose, the indumentum long-persistent. Stipules long-persistent, usually appressed, very often broader than branchlet, 4–15(20) × (2)4–6(10) mm, often distinctly parallel-veined. Leaves shortly stalked, obovate-elliptic to oblong, (9)12–23(30) × (3)5–8(12) cm, villous-tomentose all over when young, more densely and more persistently so on midrib and main lateral nerves otherwise rather soon glabrescent. Inflorescences sessile or nearly so, glomerate or with two scorpioid branches with the flowers in 2 rows. Flowers subsessile, small, 1.5–2.5 mm long. Ovary 2(–3)-locular, velutinous. Fruits villous-tomentose.

Description. Treelet, shrub, lianescent shrub, or liana, up to ca 4 cm diam. at base. Bark shallowly fissured or rather smooth, lenticels small. Woodcylinder entire (?), wood hard. *Branches* and *branchlets* densely villous-tomentose, the indumentum long-persistent; young short-noded branchlets with their large, overlapping stipules catkin-like. *Stipules* rather long-persistent, usually appressed, very often broader than the branchlet, broadly ovate to narrowly triangular or oblong, sometimes falcate, 4–15(20) × (2)4–6(10) mm, obtuse to subauriculate at base, acute to acuminate at apex, often distinctly parallel-veined, appressed-pubescent to sericeous outside, glabrous or mainly hairy on upper part inside, glabrescent with age. *Leaves*: petiole subterete, (1)2–6(10) mm long, villous-tomentose; blade papery, obovate-elliptic to oblong, (1.5)2.5–3(3.5) times as long as wide, (9)12–23(30) × (3)5–8(12) cm, obliquely rounded to cordate at base, acuminate at apex, the acumen up to 3 cm long; villous tomentose all over when young, more densely and more persistently so on midrib and main lateral nerves, otherwise rather soon glabrescent, more rapidly so above; midrib and the 8–15 pairs of main lateral nerves more or less impressed above; glands small, inconspicuous, usually on both sides, but usually more numerous beneath, above somewhat concentrated near base and on acumen, rather well dispersed beneath. *Inflorescences* sessile, rarely very shortly peduncled, often partly hidden by the stipules, glomerate or with two, up to 1.5 cm long, scorpioid branches with the flowers in 2 rows, sericeous-tomentose; sometimes several inflorescences together on relatively short, leafless, apical parts of shoots; bracts and bracteoles ovate, often broadly so, concave, 1.5–3 × 1–2.5 mm, acute to acuminate at top, entire or 2–3-fid, sericeous outside, glabrous inside. *Pedicels* up to ca 2 mm long, partly or entirely hidden by bracts and bracteoles, the upper part usually less than 0.5 mm long. *Sepals* suberect, ovate-elliptic to oblong, 1.5–2 × 1–1.5 mm, tomentose to sericeous outside,

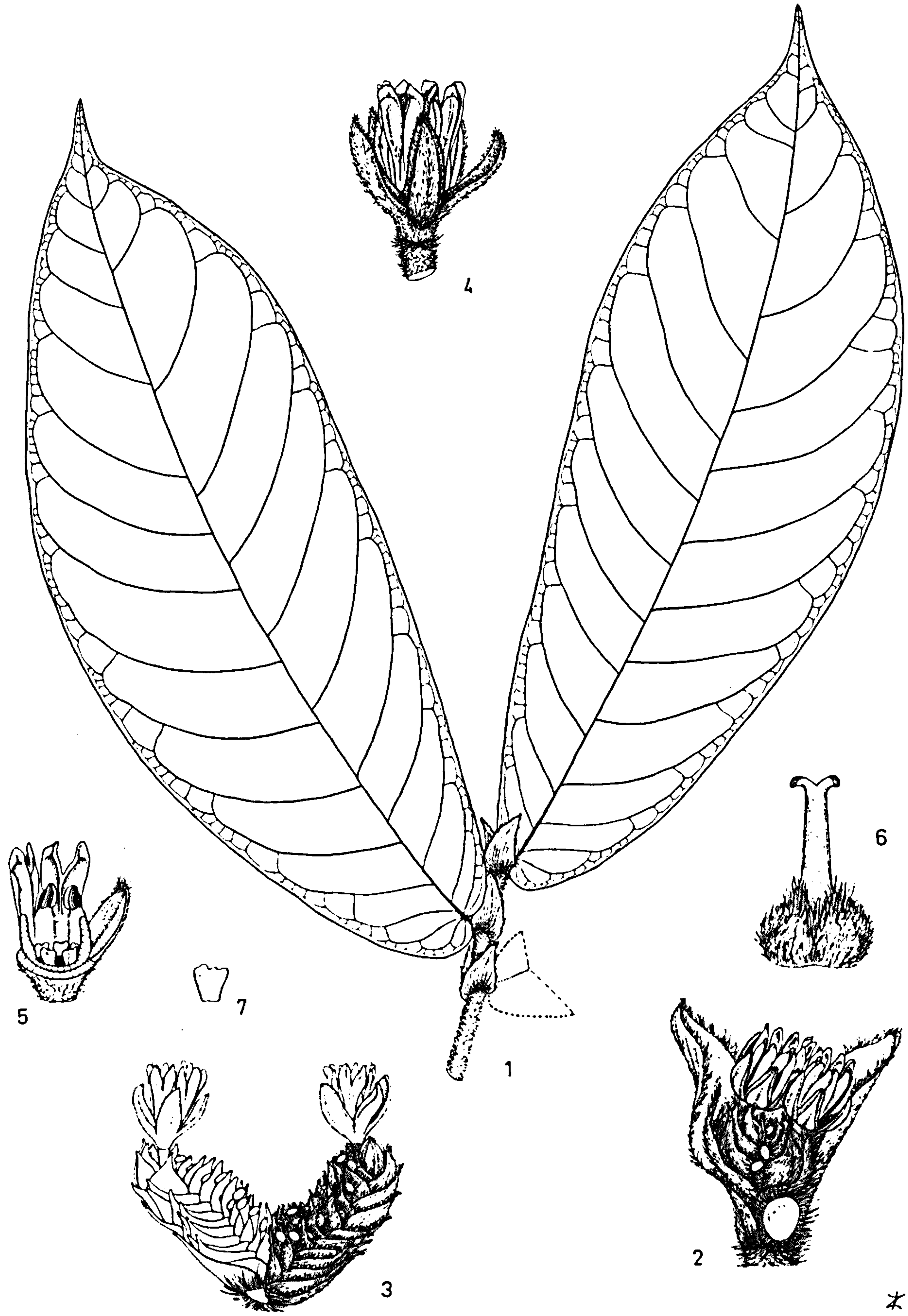


FIG. 10. *D. insigne*: 1. leafy branch with stipules, ½ × ; 2–3. inflorescences, 3 × (in 3 the hairs only drawn on the right branch); 4. flower, 6 × ; 5. flower partly, 6 × ; 6. pistil, 18 × ; 7. staminode, 12 × . (1. *Bos 7135*; 2–7. *J. J. de Wilde 8241*).

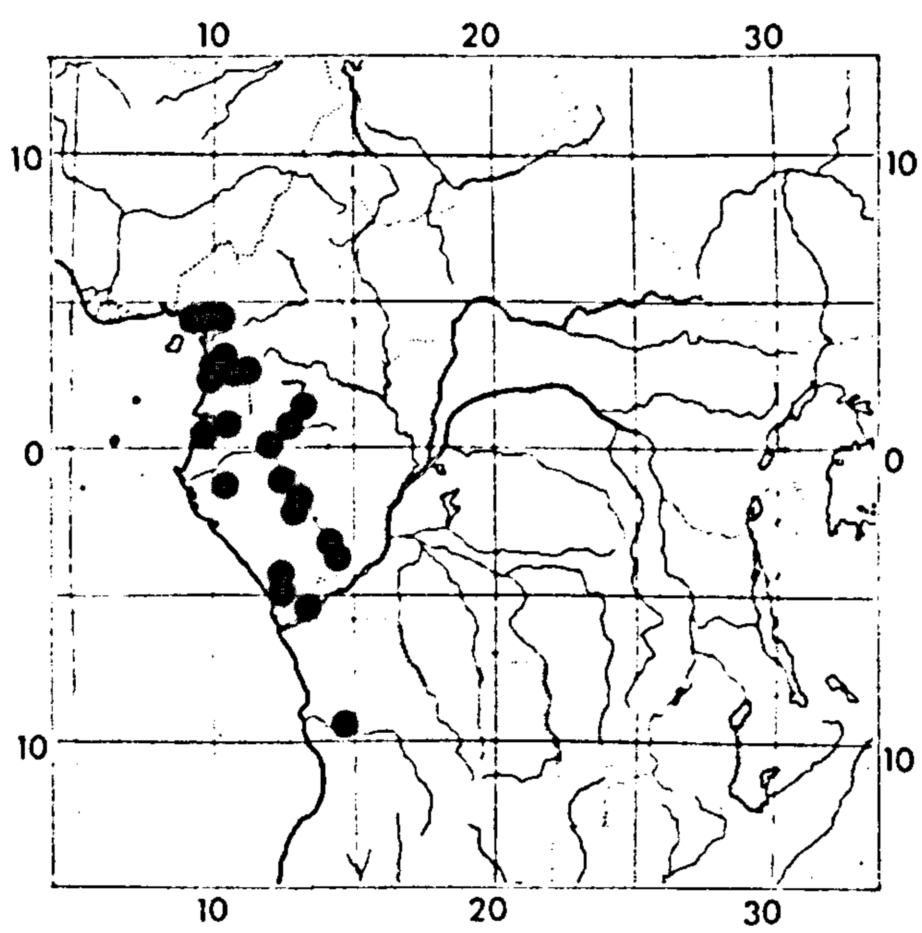
puberulous-tomentellous mainly on upper part inside. *Petals* suberect, at base 0.5–1 mm united with filaments, elliptic to obovate in outline, 1.5–2.5 mm long, ca 0.5 mm split, glabrous inside, outside with a few, often appressed hairs below split and on lower part of the lobes, rarely glabrous. *Stamens* erect, 1–1.5 mm long, glabrous; anthers ovoid-ellipsoid, 0.5 mm long, connective very prominent. *Staminodes* variously shaped, obdeltate, subquadrate, or transversely oblong, less than 0.5 × 0.5 mm, from glabrous to entirely velutinous. *Pistil* 2(–3)-merous, 1–1.5 mm long; ovary 2(–3)-locular, velutinous; style usually glabrous, with 2(–3) very short lobes. *Fruit* (only 2 immature fruits seen!) subellipsoid, villous-tomentose.

Distribution: Cameroun, Gabon, Congo, Northern Angola, Western Zaïre.
Ecology: Rain forest, semi-deciduous forest.

Specimens examined:

Cameroun. 46 km Kribi-Lolodorf, *Bos 6524* (WAG); *6525* (WAG); Campo, *Bos 7038* (WAG); 36 km Kribi-Campo, *Bos 7135* (WAG); 7.5 km Kribi-Ebolowa, *Bos & Breteler 7253* (WAG); near Ebolowa, between Nkolandom and Nkoemvone, *J. J. de Wilde 7994* (WAG); S. of Ebolowa, Nkoemvone, *J. J. de Wilde 8001* (WAG); 20 km Kribi-Ebolowa, *J. J. de Wilde 8095* (WAG); 25 km Ebolowa-Kribi, *J. J. de Wilde 8241* (WAG); Campo area, 2.17N, 9.57E, *J. J. de Wilde 8323* (WAG); S. of Kompina, 58 km Douala-Loum, *Leeuwenberg 8751* (WAG); 2 km N. of Solé, 20 km Loum-Yabassi, *Leeuwenberg 9045* (WAG); 17 km Yingui-Yabassi, *Leeuwenberg 9153* (WAG); *9154* (WAG); Campo area, Bebao, *Tessmann 586* (K); Bipindi, *Zenker 3004* (BM, BR, E, G, GOET, K, L, M, P, PRE, W, WU, Z, type).

Gabon. 50 km S.E. of Lambaréné, *Breteler 5787* (WAG); 33 km Moanda-Bakoumba, *Breteler 6759* (WAG); 60 km S.S.W. of Moanda, *Breteler 6971* (WAG); 105 km N.E. of Libreville, Tchimbélé Falls, *Breteler & J. J. de Wilde 60* (WAG); 25 km N.E. of Asok, *Breteler & J. J. de Wilde 106* (WAG); 22 km Libreville-Cap Estérias, *Breteler & J. J. de Wilde 401* (WAG); Makokou, *Farron 7598* (P); Bélinga, *N. Hallé 3756* (P, WAG); Booué, N. *Hallé & Le Thomas 265* (P); Koulamoutou, *Le Testu 8003* (BM, BR, P, WAG).



MAP 10. *D. insigne*

Congo. Bangou forest, Mayé-M'Passa Rd, *Bouquet & Sita 2522* (WAG); Mayombe, M'Vouti-Les Bandas Rd, *Sita 3133* (P); Zanaga Distr., Ngamissie forest, *Sita 3196* (P).

Angola. Cabinda, Buco Zau, *Gossweiler 6724* (BM, COI, K, LISJC, LISU); *7166* (BM, COI, LISJC, LISU); Cuanza Norte, Golungo Alto, *Welwitsch 4668* (BM, COI, K, LISU, P, cited as *D. umbellatum* Chod. by EXELL & MENDONÇA, 1951-b: 327).

Zaïre. Gimbi, *Toussaint 815* (BR).

D. integripetalum Engl. **Fig. 11 Map 11**

D. integripetalum Engler, 1902: 89; 1912-a: 588; Pellegrin, 1913: 585; Engler, 1915: 847; De Wildeman, 1919: B37, p.p.: not *Zenker 341* (= *D. heudelotii* var. *longitubulosum*); Exell, 1927: 70; Engler & Krause, 1931: 7; Exell & Mendonça, 1951-b: 330; Breteler, 1973: 4, 24, 32, XVII; Punt, 1975: 21; Breteler, 1978: 22.

Type: Cameroun, Bipindi, *Zenker 1733* (holotype: B†; lectotype: L; isotypes: BM, C(?), GOET, M, P, W).

Diagnostic characters. Liana, lianescent shrub, or shrub. Branches and older branchlets usually rather densely minutely lenticellate giving them a rugose (pustular) aspect, often becoming transversely fissured when older. Branchlets soon glabrescent. Leaves papery to coriaceous, obovate-elliptic to oblong, (13)16–20(30) × 6–10(15) cm, usually broadly rounded to truncate at base, the extreme base with revolute margin, more or less covering large glands, shortly acuminate, glabrous or nearly so. Inflorescences usually grouped on short knob-

PHOT. 3. *D. integripetalum*: coppice in cassava field near Lastoursville (phot. F. J. BRETELER).

or wart-like axillary shoots, distinctly branched. Fruits obovoid in general outline, up to 2.5 cm long and 2 cm diam., 3(4)-lobed or -angled on transverse section, 1-seeded, glabrous to sparsely puberulous.

Description. Liana, lianescent shrub, or shrub. *Stems* up to ca 7 cm diam.; woodcylinder entire (?). *Branches* and older *branchlets* usually rather densely and minutely lenticellate giving them a rugose (pustular) aspect, often becoming transversely fissured when older (see fig. 11: 5); young branchlets densely to sparsely subappressed-puberulous, often soon glabrescent. *Stipules* narrowly triangular to subulate, 2–4(6) mm long, glabrous or puberulous. *Leaves*: petiole subterete to semiterete, often grooved above, 4–10(20) mm long, glabrous to puberulous; blade papery to coriaceous, smooth, usually glossy both sides when fresh, obovate-elliptic to oblong, 1.5–2.5(3) times as long as wide, (13)16–20(30) × 6–10(15) cm, usually broadly rounded to truncate, sometimes subcordate or cuneate at base, the extreme base with revolute margin, more or less covering large glands, shortly and often abruptly acuminate, the acumen up to 1.5 cm long; midrib and the 5–8(10) pairs of main lateral nerves prominent beneath, not or hardly so above, when young sparsely appressed-puberulous, soon glabrescent, glands both sides, beneath usually with two large glands at ultimate base, close to midrib, other glands smaller, rather well-dispersed. *Inflorescences* rather loose, usually grouped on short knob- or wart-like axillary shoots, up to 4 times distinctly branched, up to ca 30-flowered, pubescent to puberulous; peduncle up

PHOT. 4. *D. integripetalum*: inflorescence (*Breteler 6567*; phot. F. J. BRETELER).

FIG. 11. *D. integripetalum*: 1. flowering branchlet, ½ ×; 2. young sprout with stipules, 1½ ×; 3. base of leaf beneath, 1 ×; 4. oblong leaf, ½ ×; 5. part of branch with transverse fissures, 1½ ×; 6. part of inflorescence, 2 ×; 7. flower, 5 ×; 8. flower partly, 5 ×; 9. pistil, 5 ×; 10. branch with young fruits, 1½ ×; 11. transverse section of fruit, 1 ×. (1. *Zenker 2871*; 2. *Breteler 5769*; 3–4. *Breteler 6521*; 5. *Breteler 6720*; 6–9. *Breteler 6567*; 10. *Veen s.n.*; 11. *Breteler & J. J. de Wilde 729*).

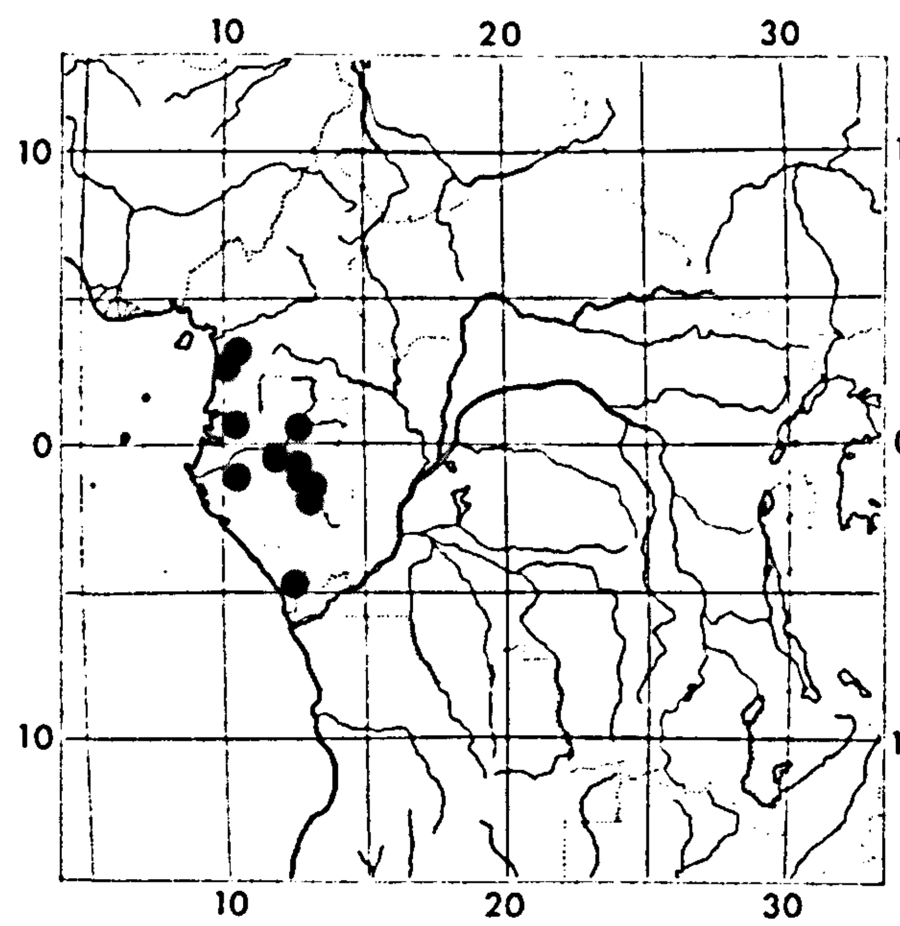
to 1 cm long; bracts and bracteoles minute, narrowly triangular to subulate, up to 1.5 mm long. *Pedicel* up to ca 6 mm long, the upper part usually less than 1 mm. *Sepals* erect to spreading, usually subequal, oblong, (4)5–6 × 1–2 mm, whitish appressed-puberulous both sides. *Petals* erect to spreading, narrowly obovate-oblong, 4.5–6.5 × 1–1.5 mm retuse to at most 1 mm split, at base 1–2 mm united with filaments, usually glabrous, sometimes with a few hairs inside near top, which may be curved inwards. *Stamens* erect, (4)5–6 mm long, glabrous; anthers 0.5–0.7 mm long, connective prominent. *Staminodes* separate or more often forming a more or less closed, lobed ring of ca 0.5 mm high, glabrous, usually adnate to tube of petals and filaments. *Pistil* 5–8 mm long, 3(4)-merous; ovary slightly 3(4)-lobed, densely, silvery to brownish velutinous; style glabrous with 3(4) up to 0.5 mm long lobes. *Fruits* obovoid in general outline, up to 2.5 cm long and 2 cm diam., 3(4)-lobed or angled in transverse section, 1-seeded, yellow(-orange) at maturity, glabrous to sparsely puberulous and glabrescent, top impressed; exocarp firm, ca 2 mm thick; mesocarp juicy (?); endocarp pergamentaceous (?). *Seed* ellipsoid, laterally compressed, 1–1.5 cm long; testa thin, smooth, brown.

Distribution: Cameroun, Gabon, N. Angola (Cabinda).
Ecology: Rain forest, semi-deciduous forest.

Specimens examined:

Cameroun. Elephant Mt., S.E. of Kribi, *Bos & Breteler 7238* (WAG); Bipindi, *Zenker 1733* (BM, C(?), GOET, L, M, P, W, type); *2871* (B, BM, BR, C, COI, E, G, GOET, K, L, M, P, W, WU, Z); *3007 A* (BM, BR, COI, E, G, GOET, K, L, M, P, W, WU, Z); *3707* (BM, BR, COI, E, GOET, K, L, M, MO, P, PRE, W, WU, Z); *s.n.* (BM, G, K).

Gabon. 50 km S.E. of Lambaréné, *Breteler 5769* (WAG); 6 km Moanda-Franceville, *Breteler 6237* (WAG); 48 km Lastoursville-Moanda, *Breteler 6446* (WAG); 100 km Moanda-Lastoursville, *Breteler 6521* (WAG); 4 km W. of Lastoursville, *Breteler 6567* (WAG); 6 km Moanda-Franceville, *Breteler 6720* (WAG); 33 km Moanda-Bakoumba, *Breteler 6763* (WAG); ca 20 km N.E. of Asok,



MAP 11. *D. integripetalum*

Breteler & J. J. de Wilde 89 (WAG); 45 km Achouka-Lastoursville, *Breteler & J. J. de Wilde 729* (WAG); Ipassa-Makokou, *Hladik 1554* (P, WAG); 4 km W. of Lastoursville, *Veen s.n.* (WAG).
Angola. Cabinda, Buco Zau, *Gossweiler 6693* (BM, COI, K, LISJC, LISU).

Notes. *D. integripetalum* is a rather common species in S.E. Gabon.

Although only immature (but most probably full-grown) fruits have been analysed, it is remarkable that always a single seed develops. This is not visible from the outside, as the aborted cells develop quite normally and the fruit is always 3(4)-lobed or 3(4)-angled.

According to HLADIK (no. *1554*) the mature fruits are eaten by chimpanzees.

By its leaves and flowers *D. integripetalum* might be confused with *D. barteri* Engl. These species can be distinguished as follows:

Liana, lianescent shrub, or shrub. Inflorescences usually grouped on knob- or wart-like axillary shoots. Fruit always 1-seeded, 3(4)-lobed, glabrous or nearly so, with a smooth skin. . . . . **D. integripetalum**

Small tree. Inflorescences not grouped. Fruit only lobed when more than 1-seeded, densely hairy, usually tuberculate. . . . . **D. barteri**

D. integrum Pierre = **D. crassifolium** Chod. var. **integrum** (Pierre)Bret.

For details see BRETELER 1978: 31.

D. jabassense Engl. = **D. heudelotii** (Planch. ex Oliv.)Baill. var. **heudelotii**

For details see p. 28.

D. johnstonii Engl. = **D. heudelotii** (Planch. ex Oliv.)Baill. var. **heudelotii**

For details see p. 28.

D. kamerunense Engl. = **D. oblongum** (Hook.f. ex Bth.) Engl.

D. kamerunense Engler, 1896-b: 142; 1896-a: 350, nomen; 1912-a: 593; 1912-b: 445; De Wildeman, 1919: B38; Engler & Krause, 1931: 9; Hauman, 1958-a: 297, as *D. kanseremense* Engl. (obviously a printing error); Breteler, 1973: 37, XIX, in synonymy of *D. oblongum*. Type: Cameroun, sin.loc., *Dusen 46* (holotype: B†; lectotype: BR).

Note. Comparing the types of *D. oblongum* and *D. kamerunense* it is evident that these specimens belong to the same species. *D. oblongum* is more common in

West (e.g. Ivory Coast) than in Central Africa and has only a few times been collected in Cameroun and Gabon (e.g. *Zenker 2061, 4069, 4994, Pobéguin 125*).

D. keniense Hutch. & Bruce = **D. zenkeri** Engl.

D. keniense Hutchinson & Bruce, 1931: 270; Verdcourt & Trump, 1970: 64; Breteler, 1973: XX (in synonymy of *D. zenkeri*). Type: Kenya, Malindi Distr., Arabuko, *Graham 2132* (holotype: K; isotypes: EA, G, MO, PRE).

Note. The type material of *D. keniense* differs in some aspects from the mainly Central African *D. zenkeri*. It has smaller leaves and smaller, few-flowered inflorescences. Specific characters by which to separate *D. keniense* from *D. zenkeri* have not been found. Therefore it has been reduced to synonymy.

D. klaineanum Pierre = **D. dewevrei** De Wild. & Th. Dur. var. **klaineanum** (Pellegr.)Bret.

Note. This manuscript name of PIERRE has been quoted by the Index Kewensis (1911–1915) as '*D. klaineanum* Pierre ex Pellegrin', but has never been validated as a name of a species by PELLEGRIN. For further details see under *D. dewevrei* var. *klaineanum* (BRETELER, 1978: 55).

D. klainei Pellegr. = **D. glomeratum** Engl.

For details see p. 18.

D. kribense Engl. = **D. tomentosum** Engl.

D. kribense Engler, 1912-a: 579; De Wildeman, 1919: B38; Breteler, 1973: XX (in synonymy of *D. tomentosum*). Type: Cameroun, Lunda near Kribi, *Ledermann 1024* (holotype: B†; lectotype: BM).

Note. The fragment of the holotype conserved at BM consists of a folded leaf and a long, slender stalked inflorescence with flowerbuds. These elements, together with ENGLER's original description, made it possible to identify *D. kribense* as belonging in *D. tomentosum*.

D. kumasiense Hoyle = **D. heudelotii** (Planch. ex Oliv.) Baill. var. **heudelotii**

For details see p. 29.

D. lantzianum Baill. = **D. bojeri** (Tul.) Engl.

For details see under *D. bojeri* (BRETELER, 1973: 99).

D. lebrunii Haum. = **D. stuhlmannii** Engl.

D. lebrunii Hauman, 1955: 345; 1958-a: 312; Breteler, 1973: XX (in synonymy of *D. stuhlmannii*). Type: Zaïre, between Muswhere and l'Urega, *Lebrun 5562* (holotype: BR; isotype: K).

Note. In 1973 I noted, that the differences between the specimens of Eastern Zaïre described as *D. lebrunii* and *D. michelsonii* Haum. and the East African material described as *D. schliebenii* Mildbr. and *D. stuhlmannii*, are restricted to differences in leaf indumentum only. As these differences are not constant *D. lebrunii* is reduced here into synonymy of *D. stuhlmannii* (see also under *D. luki*).

D. ledermannii Engl. = **D. rudatisii** Engl.

D. ledermannii Engler, 1912-a: 582 (not of Krause); De Wildeman, 1919: B38; Breteler, 1973: XIX (in synonymy of *D. rudatisii*). Type: Cameroun, near Kribi, *Ledermann 511* (lectotype: BM).

Note. The original syntypes, *Ledermann 511* and *Achenbach 27*, have been lost at Berlin. A fragment of *Ledermann 511*, the only original material left, is kept at BM. It consists of one leaf and two flowers. This material, together with ENGLER's description, made it possible to prove that *D. ledermannii* represents the same species as *D. rudatisii*. Both names have simultaneously been published. The latter name, having better type material, has been preferred.

D. lescrauwaeti De Wild. = **D. heudelotii** (Planch. ex Oliv.)Baill. var. **heudelotii**

For details see p. 28.

D. letestui Pellegr. = **D. lujae** De Wild. & Th. Dur. var. **letestui** (Pellegr.)Bret.

For details see p. 73.

D. leucanthum Pierre = **D. angolense** Chod.

This MS. name of PIERRE has never been validated by PELLEGRIN as quoted in the Index Kewensis (1911–1915), but he used the epithet '*leucanthum*' for his *D. angolense* Chod. var. *leucanthum* Pellegr. For further details see under *D. angolense* (BRETELER, 1973: 55, 60).

D. leucosepalum Ruhl. = **D. lujae** De Wild. & Th. Dur. var. **lujae**

For details see p. 68.

D. leucosia (Spreng.)Engl. **Fig. 12 Map 12**

D. leucosia (Sprengel)Engler, 1896-a: 348; Engler & Krause, 1931: 6; Descoings, 1960: 86; 1961: 12; 1962: 50; 1973: 510; Breteler, 1973: 37, 102; Punt, 1975: 33; Breteler, 1978: 62.

Basionym: *Chailletia leucosia* Sprengel, 1825: 931; Tulasne, 1857: 84.

Type: See under *Leucosia thouarsiana.*

Leucosia thouarsiana Roemer & Schultes, 1819: 324; De Candolle, 1825: 58. Type: Madagascar, sin. loc., *Du Petit Thouars s.n.* (holotype: P; isotypes: TAN, n.v., WAG).

D. nigrescens (Tulasne)Baillon, 1886: pl. 207; Engler, 1896-a: 348 (as *D. nigrescens* (Tul.)Engl.); Engler & Krause, 1931: 6 (as *D. nigrescens* (Tul.)Engl.); Descoings, 1960: 91; 1961: 31; 1962: 50; 1973: 517; Punt, 175: 33. Basionym: *Chailletia nigrescens* Tulasne, 1857: 85. Type: Madagascar, Nossi-Bé, *Boivin s.n.* (holotype: P; isotype: TAN, n.v.).

D. nigrescens (Tulasne)Baillon var. *pubescens* Descoings, 1960: 92; 1961: 33; 1973: 518. Type: Madagascar, Lokoho valley, near Ambalavoniho, *Humbert & Cours 22814* (holotype: P; isotype: TAN, n.v.).

D. pachypus (Tulasne)Engler, 1896-a: 348; Engler & Krause, 1931: 6; Descoings, 1960: 96; 1961: 22; 1962: 51; 1973: 510, 516. Basionym: *Chailletia pachypus* Tulasne, 1857: 87. Type: Madagascar, *A.L. de Jussieu Herbarium* (holotype: P).

D. discolor (Baker)Engler, 1896-a: 348. See Breteler, 1978: 62, for full details.

D. oleifolium (Baker)Descoings, 1960: 94; 1961: 20; 1962: 50; 1973: 513, 516; Punt, 1975: 33. Basionym: *Chailletia oleifolia* Baker, 1889: 306. Type: Madagascar, Antsihanaka, *Baron 5521* (holotype: K; isotype: P).

D. hirtum Descoings, 1960: 82; 1961: 18, fig. 4; 1973: 519. Type: Madagascar, Fort Dauphin Distr., Tsitongabarika Hill, *Decary 11020* (holotype: P; isotype: TAN, n.v.).

D. perrieri Descoings, 1960: 100, fig. 10; 1961: 27; 1973: 517; Punt, 1975: 33. Type: Madagascar, Haut Bemarivo, *Perrier de la Bâthie 4550* (holotype: P; isotype: TAN, n.v.).

D. alaotrense Descoings, 1973: 511. Type: Madagascar, Alaotra Lake, *Cours 429* (holotype: P).

FIG. 12. *D. leucosia*: 1. flowering branchlet, ½ ×; 2–9. leaves, ½ ×; 10–13. flowers, 3 ×; 14. flower partly, 5 ×; 15. pistil, 15 ×; 16. fruit, 1 ×. (1, 13–15. *Cons. Rés. Nat. 10883*; 2. *Cons. Rés. Nat. 8392*; 3, 10. *Bosser 18758*; 4. *Cons. Rés. Nat. 9254*; 5. *Perrier de la Bâthie 13212*; 6. *Cours 429*; 7. *Perrier de la Bâthie 13949*; 8. *Bosser 7108*; 9. *Perrier de la Bâthie 6244*; 11. *Cons. Rés. Nat. 8291*; 12. *Jard. Bot. Tan. 3926*; 16. *Cons. Rés. Nat. 1328*).

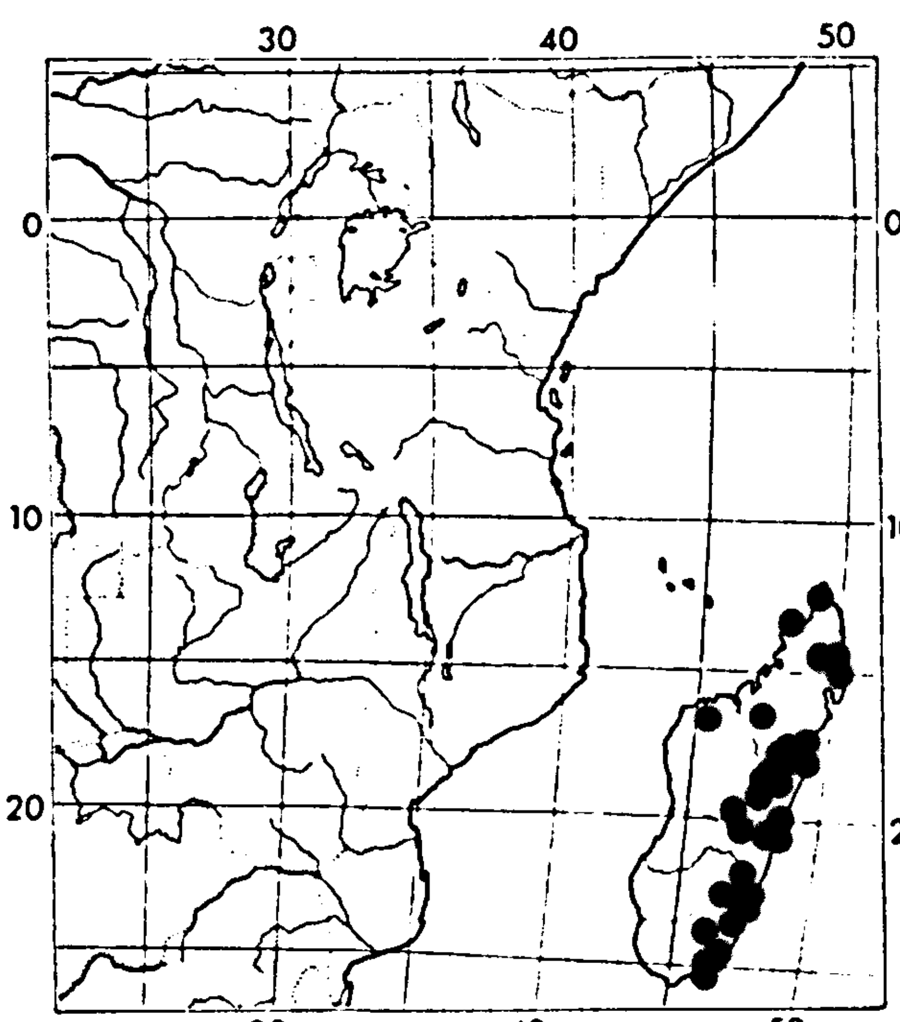
Diagnostic characters. Liana, lianescent shrub, or shrub. Stipules narrowly triangular to oblong, 1–5 mm long, usually early caducous. Leaves variable in size and shape, ovate-elliptic to narrowly oblong, (1)4–9(13) × (1)2–4(8) cm, papery to coriaceous, obtuse to cuneate at base, obtuse to shortly acuminate at top, with (4)5–7(8) pairs of main lateral nerves, from completely tomentose to (sub)glabrous. Inflorescences few to many flowered, distinctly branched, the peduncle usually adnate to petiole. Pedicel up to 5 mm long, often with a distinct upper part. Sepals erect-reflexed. Petals erect, entire or nearly so, 2.5–6 × 0.7–2 mm, usually glabrous. Pistil 3-merous, ovary glabrous to shortly velutinous. Fruits 1–3-seeded, velutinous.

Description. Liana, lianescent shrub, or shrub. *Branches* glabrous or glabrescent, usually distinctly lenticellate when old. *Branchlets* sparsely to densely puberulous-pubescent to tomentose, early glabrescent or not, the same indumentum present on stipules and petioles. *Stipules* narrowly triangular to oblong, 1–5 mm long, usually early caducous. *Leaves*: petiole terete to semi-terete, often grooved or canaliculate above, (1)3–7(10) mm long, often somewhat to distinctly longer when united with the peduncle and then up to 15 mm long; blade variable in size and shape, papery to coriaceous, ovate-elliptic-obovate to narrowly oblong, sometimes almost circular, 1–3(4.5) times as long as wide, (1)4–9(13) × (1)2–4(8) cm (leaves subtending an inflorescence often have considerably smaller blades, especially so at the end of shoots or in axillary shoots bearing many inflorescences), obtuse to cuneate at base, obtuse to shortly acuminate at top, the acumen usually not more than 0.5 cm long, with (4)5–7(8) pairs of main lateral nerves, very variable in indumentum, from completely tomentose to sparsely short-hairy only on midrib both sides when young, as a rule soon glabrescent above, more persistently hairy beneath; glands few, beneath only, usually rather small and mainly near base, at least in the lower half, often absent in more hairy leaves. *Inflorescences* up to 5 times distinctly branched, few to many flowered (ca 50), sparsely to densely hairy, the peduncle 2–12(20) mm long, usually adnate to petiole; bracts and bracteoles narrowly triangular, up to 1 mm long. *Pedicel* at most 5 mm long, the lower part up to 3 mm long, the upper part often distinct, up to 3 mm long. *Sepals* free or shortly united at base, erect-reflexed, usually more or less oblong, 2.5–5 × 1–2 mm, tomentellous-sparsely puberulous outside, glabrous to tomentellous inside. *Petals* suberect, free or shortly adnate to filaments at base, narrowly obovate-spathulate, 2.5–6 × 0.7–2 mm, usually flat, rounded to acutish and sometimes emarginate at top, glabrous or with a few appressed hairs outside. *Stamens* 2.5–6 mm long, glabrous; anthers 0.5–1 mm long. *Staminodes* subquadrate, up to 0.5 × 0.5 mm, glabrous. *Pistil* 3-merous, 2–6.5 mm long; ovary glabrous to shortly velutinous; style glabrous or with a few hairs at base, shortly 3-lobed. *Fruits* subglobose to 2–3-lobed, 1–3-seeded, velutinous, often very finely so, like sandpaper to the touch; 1-seeded fruits: subglobose to subellipsoid, ca 10–15 mm diam.; mesocarp juicy, endocarp bony, glabrous inside.

Distribution: Madagascar.
Ecology: Forest or forest relics, up to ca 1600 m alt.

Specimens examined:

Madagascar. Alamazaotra Forest, *Baron 1403* (BM, K, P, type of *D. discolor*); Antsihanaka, *Baron 5521* (K, P, type of *D. oleifolium*); North Madagascar, *Baron 6688* (K, P); Périnet, *Benoist 1179* (P); Nossi-Bé, *Boivin s.n.* (P, type of *D. nigrescens*); Périnet, *Bosser 2061* (P); *2198* (P); Ambatondrazaka, *Bosser 7108* (P); Moraramo, *Bosser 7506* (P); Périnet, *Bosser 15958* (K, P); Moramanga-Anosibe Rd, *Bosser 16584* (K, P, WAG); Ilaka, *Bosser 17012* (K, P); 15 km S. of Farafongana, *Bosser 18545* (P); Vangaindrano Lake, *Bosser 18758* (P); Analavrazaotra, *Capuron 567* (P); sin. loc., *Commerson s.n.* (C, P); Sarahara, *Cons. Rés. Nat. 43* (P); Périnet, *Cons. Rés. Nat. 1327* (P); *1328* (P); Manakambahiny, *Cons. Rés. Nat. 1572* (P); Sahocrochara, *Cons. Rés. Nat. 1917* (P); Tamatave, *Cons. Rés. Nat. 3239* (P); Manaka East, *Cons. Rés. Nat. 3751* (P); Fort Dauphin, *Cons. Rés. Nat. 4882* (P, WAG); Tamatave, *Cons. Rés. Nat. 7255* (P, WAG); Feuerive, *Cons. Rés. Nat. 7677* (P, WAG); Ambolutralana, *Cons. Rés. Nat. 8291* (P); Ambodouana, *Cons. Rés. Nat. 8337* (P); Fort Dauphin, *Cons. Rés. Nat. 8392* (P); Sambava, *Cons. Rés. Nat. 9254* (P); Tamatave, *Cons. Rés. Nat. 10854* (P); Ambatondrazaka, *Cons. Rés. Nat. 10883* (P); *10888* (P); *10914* (P); *11309* (P); Sahatavy, *Cons. Rés. Nat. 11339* (P, WAG); *11358* (P); Fontanina, Alaotra Lake, *Cours 429* (P, type of *D. alaotrense*); Ambatondrazaka, *Cours 510* (P); *1174* (P); *1207* (P, WAG); Analamanatrika, *Cours 2170* (P, WAG); Manjabe, *Cours 2518* (P, WAG); Ambatosoratra, *Cours 3341* (P, WAG); Androndramanitra, *Cours 4244* (P); Fort Dauphin, *Cremers 2928* (P); Périnet, *Croat 32274* (P); sin. loc., *Deans Cowan s.n.* (BM); Mananara, *Decary 69* (P); Fort Dauphin, *Decary 4028* (P); *4167* (C, P, PRE); Ivohibé, *Decary 5303* (C, G, P); between Voudrozo and Ivohibé, *Decary 5325* (BM, K, P); Karianga, *Decary 5569* (P, PRE); Fort Dauphin, *Decary 9965* (P); *10053* (G, P); *10539* (P, WAG); *10790* (K, P); Bevilany, *Decary 10947* (P); Fort Dauphin, *Decary 11020* (P, type of *D. hirtum*); Janadiana, *Decary 13629* (P); Sakaleona valley, *Decary 14194* (P); sin. loc., *Decary 14338* (P); sin. loc., *Herb. A.L. De Jussieu s.n.* (P, type of *D. pachypus*); Périnet, *Descoings 835* (P); *837* (P); *1103* (P); Andrambovato, *Descoings 2170* (P); sin. loc., *Du Petit Thouars s.n.* (P, WAG, type); Nossi-Bé, *Hildebrandt 3284* (BM, BREM, G, GOET, K, L, LE, M, P, W); sin. loc., *Homolle 278* (P); *2170* (P); Rianana valley, *Humbert 3600* (B, BM, G, K, P); Fort Dauphin, *Humbert 5822* (P, WAG); upper Mandrare, *Humbert 6518* (P, WAG); Ankaraoka Mt., *Humbert & Cours 17496* (P); S.E. of Alaotra Lake, *Humbert & Cours 17963* (P); Andapa, *Humbert & Capuron 21996* (P); Lokoho valley, *Humbert*



MAP 12. *D. leucosia*

& Cours 22814 (P, type of *D. nigrescens* var. *pubescens*); Périnet, *Inst. Scient. Madag. 1095* (P); Ampamaherana, *Inst. Scient. Madag. 2015* (P, WAG); Alaotra, *Inst. Scient. Madag. 2820* (P); *3069* (P); Tamatave, *Inst. Scient. Madag. 3239* (P); Alaotra, *Inst. Scient. Madag. 4244* (P); Varahina, *Jard. Bot. Tan. 2722* (P); *2755* (P); Sahamalaza, *Jard. Bot. Tan. 2779* (P); Analamazaotra, *Jard. Bot. Tan. 3741* (P, WAG); Alaotra Lake, *Jard. Bot. Tan. 3926* (P); *4352D* (P, WAG); near Périnet, *Keraudren 1765* (P); *Lam & Meeuse 5299* (P, WAG); Tanaramba, *Lantz s.n.* (P); Mangoro R., *Perrier de la Bâthie 2219* (P); upper Bemarivo R., *Perrier de la Bâthie 4550* (P, type of *D. perrieri*); *4574* (P); Samboka, *Perrier de la Bâthie 6217* (P); Amboasary, *Perrier de la Bâthie 6223* (P); lower Matitana R., *Perrier de la Bâthie 6234* (P); upper Bemarivo R., *Perrier de la Bâthie 6244* (P); sin. loc., *Perrier de la Bâthie 9622* (P); Tampoketsa, *Perrier de la Bâthie 13212* (P); S. W. of Betafo, *Perrier de la Bâthie 13949* (P, WAG); Sahandrakoto, *Perrier de la Bâthie 15128* (P); lower Mangoro R., *Perrier de la Bâthie 18284* (P, WAG); Vangaindrana, *Scott Elliot 2144* (K); Fort Dauphin, *Scott Elliot 2954* (K, P); sin. loc., *Scott Elliot 3084* (BM, K); Périnet, *Service Forestier 1095* (P); Ambatondrazaka, *Service Forestier 26280* (P); Moramanga, *Service Forestier 26845* (P); Sakaramy, *Ursch 211* (P).

Notes. The oldest valid name for this species is *Leucosia thouarsiana*. Combined in *Dichapetalum* this would constitute a heterotypic homonym of a synonym of *D. madagascariense* Poir. Therefore the oldest synonym has been used.

D. leucosia as treated here is a variable species. Its variability is not much greater than seen in some continental African species as in *D. angolense* Chod., *D. bangii* (F. Didr.)Engl., and *D. dewevrei* De Wild. & Th. Dur. In *D. heudelotii*, also treated in this paper, the variability is greater, and 4 varieties are distinguished based on floral characters. Despite the great variation in the vegetative elements of *D. leucosia*. floral characters nor characters of the fruits do permit to divide this species into two or more infraspecific taxa. And although the gaps in leafvariation, as regards shape, texture, and indumentum, are often quite large, larger than in variable continental species, intermediates do exist proving that *D. leucosia*, as treated here, is a natural entity. Dividing it in several species leads to a taxonomy of specimens rather than of species. This is illustrated by the key proposed by DESCOINGS in 1973. It may fit the specimens on which it is based, but not taxa. This may be illustrated by one example, the type of *D. nigrescens* var. *pubescens*. Compared to the few specimens of *D. nigrescens* that have been collected, it is indeed a rather hairy specimen, but when compared with *D. leucosia* in a narrow sense, as DESCOINGS preferred, it fits perfectly within it.

The reason why the number of intermediates between the former species, reduced into synonymy here, is not so high, may be found in insufficient collecting and likely as well in the enormous fragmentation which has taken place in the natural forest of Madagascar.

The following specimens are mentioned as transitional between these former species.

Cons. Rés. Nat. 9524, *Cours 3341*, *Homolle 2170*, *Humbert & Capuron 21996*, and *Ursch 211* between *D. leucosia* and *D. nigrescens*. *Baron 5521*, *Bosser 7506*, *Cours 2170* and *Humbert & Cours 17496* between *D. nigrescens* and *D. hirtum* on one hand and *D. pachypus* and *D. oleifolium* on the other. *D. oleifolium* and *D. alaotrense* are linked by *Bosser 7108*, *Cours 510*, and *Perrier de la Bâthie 13212*. *Perrier de la Bâthie 13949* links *D. oleifolium* with *D. perrieri*. Of *Bosser 2198*, *Croat 32274*, and *Service Forestier 1095*, the young leaves are *D. leucosia*-like, the older ones more like those of *D. hirtum* and *D. nigrescens*. The almost circular leaves often found in *D. leucosia* are also seen in *Cremers 2928* belonging to *D. pachypus*.

The ovary of *D. leucosia* may be glabrous or hairy. Apparently the indumentum is formed in the ultimate maturation of the flowers or may be initiated by fertilization of the pistil.

When studying this variable species, it was felt that *D. rufum* (Tul.)Engl., and *D. virchowii* (Hoffm. & Hild.)Engl. are very closely related to it. The former has distinctly smaller flowers, but is otherwise very much *D. leucosia*. More material (at present only two collections are known) may reveal that it is best treated as a small-flowered variety of *D. leucosia*. *D. virchowii* (also collected twice) has quite different leaves, but floral characters show very close affinities with *D. leucosia*. More, especially fruiting material, is needed to clear its status.

D. liberiae Engl. & Dinkl. = **D. pallidum** (Oliv.)Engl.

D. liberiae Engler & Dinklage in Engler, 1902: 84; Engler, 1912-a: 574; Hutchinson & Dalziel, 1928-a: 324; Keay, 1958: 436 (in synonymy of *D. pallidum*); Breteler, 1973: 33, 48, 52, XIX (in synonymy of *D. pallidum*); Punt, 1975: 16; Breteler, 1978: 15. Type: Liberia, Grand Bassa, *Dinklage 1832* (holotype: B†; lectotype: K).

Note. For the second edition of the Flora of West Tropical Africa, KEAY reduced *D. liberiae* to a synonym of *D. pallidum*. His decision is fully supported by the present author.

D. librevillense Pellegr. **Fig. 13 Map 13**

D. librevillense Pellegrin, 1912: 274; 1913: 647; De Wildeman, 1919: B41; Breteler, 1973: 18, 20, 64, 110, XVII; Punt, 1975: 16; Breteler, 1978: 80.
Type: Gabon, near Libreville, *Klaine 2377* (lectotype: P; isotype: WAG).

Diagnostic characters. Liana, lianescent shrub, or shrub. Lenticels rather obscure. Fresh bark and intruding phloem exuding a usually reddish, sour, sticky slime. Branchlets appressed, short red-hairy. Leaves (8)13–17(20) × 3.5–6(8) cm, usually oblong or elliptic with truncate to subcordate base, short petiole and prominent midrib above. Inflorescence densely, short, red-hairy, distinctly pedunculate, loosely and distinctly branched. Bracts and bracteoles minute. Sepals reflexed or spreading. Petals suberect to reflexed, 3–4 mm long, 0.5–1.5 mm split. Stamens subequal in length. Pistil 3-merous, ovary lanate. Fruit short stiff-hairy, like fine sand paper to the touch.

Description. Liana up to at least 5 cm diam. at base, lianescent shrub, or

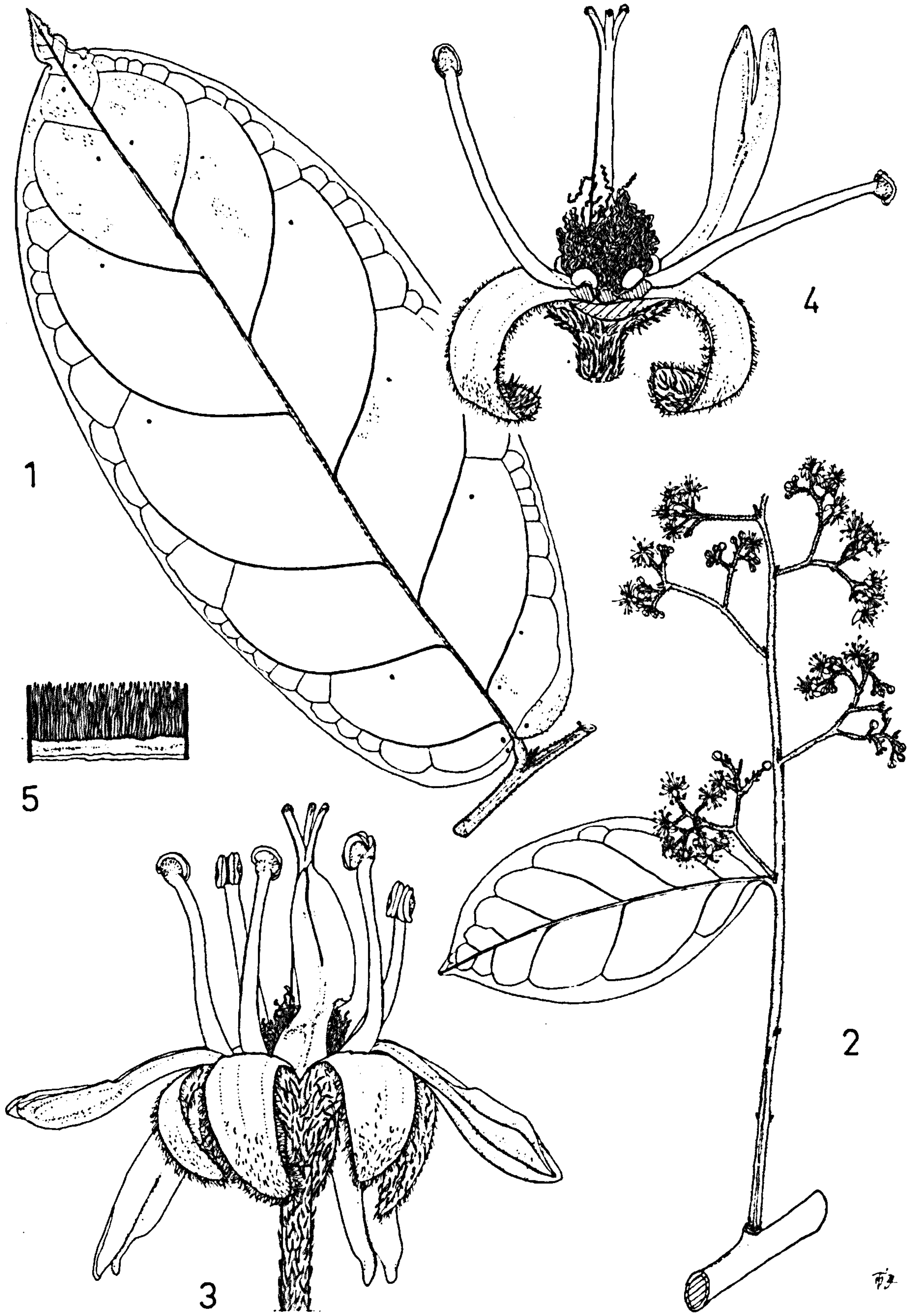


FIG. 13. *D. librevillense*: 1. leaf with stipules, $\frac{5}{6}\times$; 2. flowering branchlet, $\frac{5}{6}\times$; 3. flower, $10\times$; 4. flower partly, $10\times$; 5. detail of fruit indumentum, $20\times$. (1. *Breteler 5806*; 2–4. *Breteler 6840*; 5. *Klaine 99*).

shrub. *Stem* and *branches* often somewhat angular, the orthotropic, thicker ones with rather obscure rows of lenticels, the other sparsely lenticellate or not; *branchlets* shortly, subappressed red-hairy, glabrescent with age. Fresh bark and intruding phloem, especially so of stem and branches, exuding a usually reddish, sour, sticky slime, turning dark-brown to black when dry. *Stipules* narrowly triangular to subulate, 2–4 mm long, early caducous or not, hairy as the branchlets. *Leaves*: petiole 2–5(7) mm long, flat to somewhat grooved above, densely short-hairy, often somewhat paler than the branchlets; blade oblong to elliptic, sometimes obovate, (8)13–17(20) × 3.5–6(8) cm, truncate to subcordate or cordate, sometimes rounded or cuneate at base, abruptly or gradually short-acuminate at apex (the acumen up to 1.5 cm long, often irregular in shape, apparently caused by the glands), often entirely dark red-hairy when not full-grown, soon glabrescent, the full-grown leaves usually only hairy on the glandular leaf tip, on the prominent midrib above, and to a lesser extent on the prominent midrib and lateral nerves beneath, the latter (5)6–7 on each side; glands large, beneath only, more numerous towards base and top, especially so on the acumen, visible from above as dark spots. *Inflorescences* distinctly pedunculate, loosely and distinctly 3–4(5) times branched, often several together on a leafless axillary shoot or on the terminal leafless part of it, appressed red-brown hairy; peduncle slender, (2)7–15 mm long; bracts and bracteoles minute, triangular, up to 1 mm long, appressed. *Pedicel* (1)2–4.5 mm long, hairy as the inflorescence, the upper part up to 0.5 mm long. *Sepals* spreading to reflexed,

PHOT. 5. *D. librevillense*: flowering branchlet (*Breteler 6828*; phot. F. J. BRETELER).

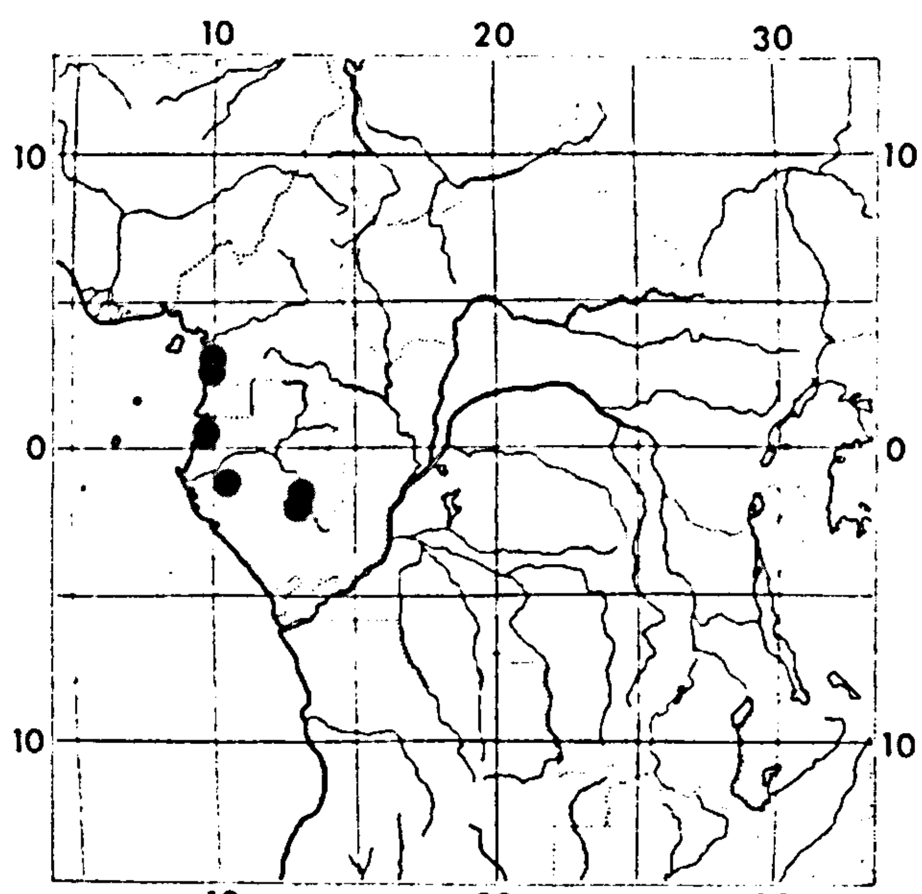
oblong-elliptic, 2.5–3 × 1 mm, appressed short red-hairy to tomentellous outside, puberulous to tomentellous mainly on upper part inside. *Petals* suberect, spreading, or reflexed, shortly adnate to filaments at base, narrowly obovate in outline, 3–4 mm long, 0.5–1.5 mm split, glabrous inside, outside glabrous or with a few to many long curled hairs mainly below split. *Stamens* suberect to spreading, 3.5–4.5 mm long, glabrous; anthers up to 0.5 mm long. *Staminodes* obovate, up to 0.5 × 0.5 mm, glabrous. *Pistil* 3(–4)-merous, 3.5–4.5 mm long; ovary 3(–4)-locular, densely lanate; style shortly 3(–4)-lobed, ca glabrous. *Fruit* 1–2(3?)-seeded, the aborted cells represented by a small lobe or ridge, very shortly stipitate, not or shortly apiculate, deeply lobed when more than 1-seeded, the lobes and 1-seeded fruits obovoid-ellipsoid, laterally compressed, up to 14 × 12 × 8 mm, with a very dense indumentum of short stiff hairs, like fine sandpaper to the touch; endocarp somewhat bony, finely striate and usually glabrous inside. *Seeds* subellipsoid, laterally compressed, up to ca 10 mm long; testa rather firm, brown.

Distribution: South-West Cameroun, Gabon.
Ecology: Rain forest, semi-deciduous forest.

Specimens examined:

Cameroun. 7 km Kribi-Ebolowa, *Bos 4520* (WAG); Elephant Mt., S.E. of Kribi, *Bos 6552* (WAG); 7 km Kribi-Ebolowa, *Bos & Breteler 7255* (WAG); 15 km N. of Kribi, *Bos & Breteler 7266* (WAG); 45 km Kribi-Campo, *Bos & Breteler 7298* (WAG); *7326*(WAG).

Gabon. 50 km S.E. of Lambaréné, *Breteler 5695* (WAG); 42 km S.E. of Lambaréné, *Breteler 5806* (WAG); 7 km Moanda-Franceville, *Breteler 6383* (WAG); 11 km Moanda-Bakoumba, *Breteler 6828* (WAG); 17 km Moanda-Bakoumba, *Breteler 6840* (WAG); 60 km S.W. of Moanda, *Breteler 6972* (WAG); Libreville, *Klaine 99* (P); *1409* (P); *1970* (K, P); *2377* (P, WAG, type); *2401* (BM, K, P); *3037* (P, WAG).



MAP 13. *D. librevillense*

N o t e s. When treating *D. brazzae* (BRETELER, 1973: 110) it has been stated that this species is very closely related to *D. librevillense*. To distinguish between them a key was given, based on a few, rather weak characters as obtained from relatively few specimens, especially as regards *D. librevillense*. As additional characters may be mentioned the usually obtuse to subcordate leaves and the very short stiff-hairy fruits of *D. librevillense*.

Since 1973 no material of *D. librevillense* has become available. So a decision whether both taxa should be maintained at the specific level or be treated as one species remains difficult to take. The area of *D. librevillense* seems, at present, separated from that of *D. brazzae*, but the transitional zone is not very well explored.

The present author feels that under these circumstances a sound decision cannot be taken and prefers to retain both species, which were published simultaneously, awaiting more pertinent information.

D. linderi Hutch. & Dalz. = **D. heudelotii** (Planch. ex Oliv.)Baill. var. **heudelotii**

For details see p. 29.

D. lofense Bret., *sp.nov.* **Fig. 14 Map 14**

D. lofaense Breteler ex Punt, 1955: 16, nomen.

Liana vel frutex lianescens. Ramuli dense velutini usque tomentosi. Stipulae anguste triangulares usque oblongo-lineares, (2)3–6(10) mm longae. Folia elliptica usque oblonga, (6)10–15(22) × (3)4–7(11) cm, basi cordata usque rotundato-cuneata et saepe inaequalia, plerumque breviter acuminata, juvenilia hirsuto-velutina saepe mox glabrescentia costa supra impressa excepta. Inflorescentia glomerata, sessilis vel subsessilis, hirsuto-tomentosa. Sepala patentia usque reflexa, oblonga, 1.7–2.5 × 0.5–0.7 mm. Petala tenuea, 1.7–3 mm longa, 0.5–1 mm fissa, glabra. Stamina gracilia, 2–4 mm longa, glabra. Staminodia oblonga, intus et apice hirsuta. Pistillum 3–4 mm longum, hirsutum. Fructus subellipsoideus, velutinus.

Type: Liberia, Lofa County, 3 km Gbama-Lofa, *Van Meer 27* (holotype: WAG).

D i a g n o s t i c c h a r a c t e r s. Liana or lianescent shrub. Branchlets densely velutinous to tomentose. Stipules narrowly triangular to oblong-linear, (2)3–6(10) mm long. Leaves elliptic to oblong, (6)10–15(22) × (3)4–7(11) cm, cordate to rounded-cuneate and often unequal-sided at base, usually shortly acuminate, hirsute-velutinous when young, often soon glabrescent except for the impressed midrib above. Inflorescences glomerate, sessile or nearly so, hirsute-

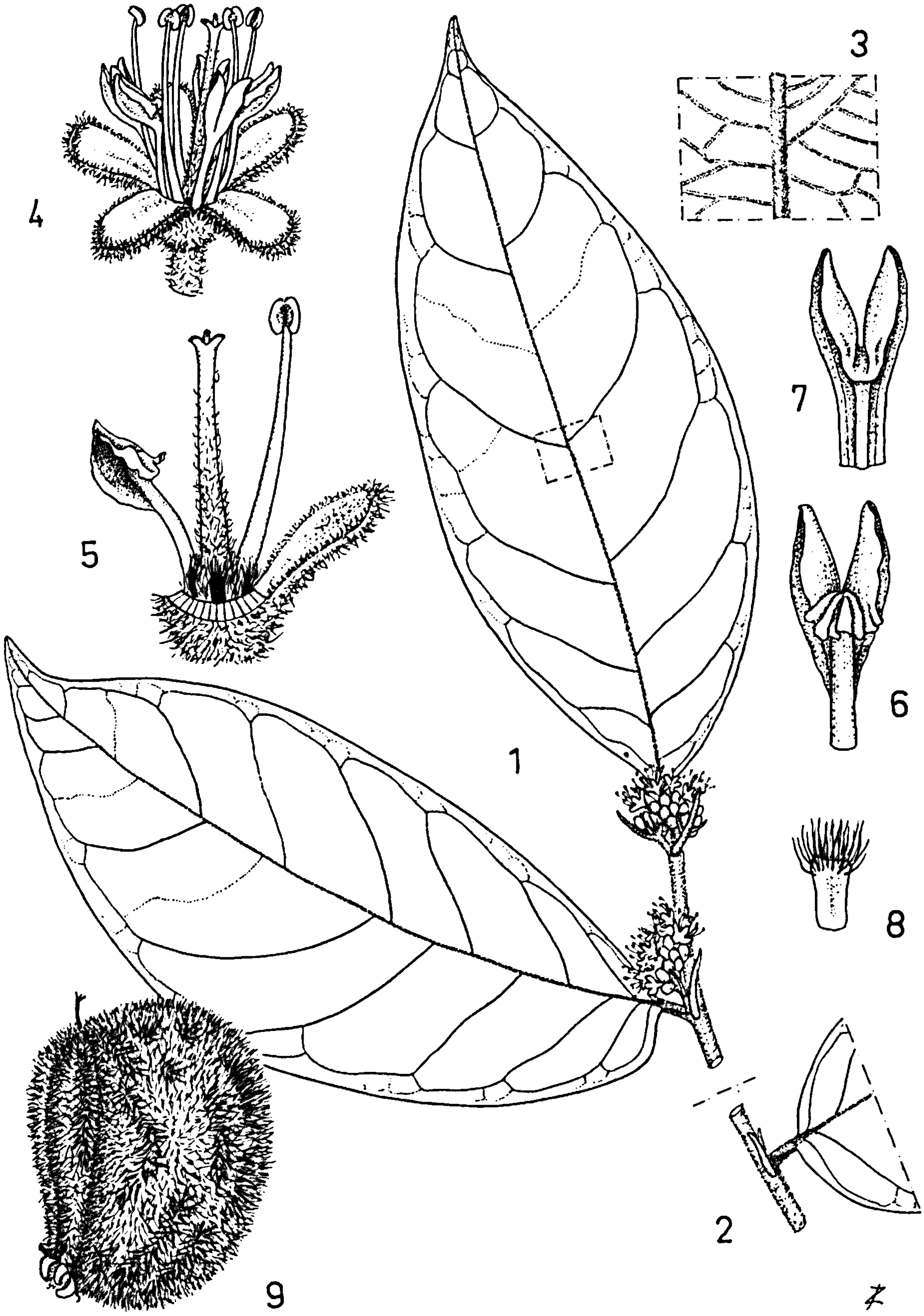
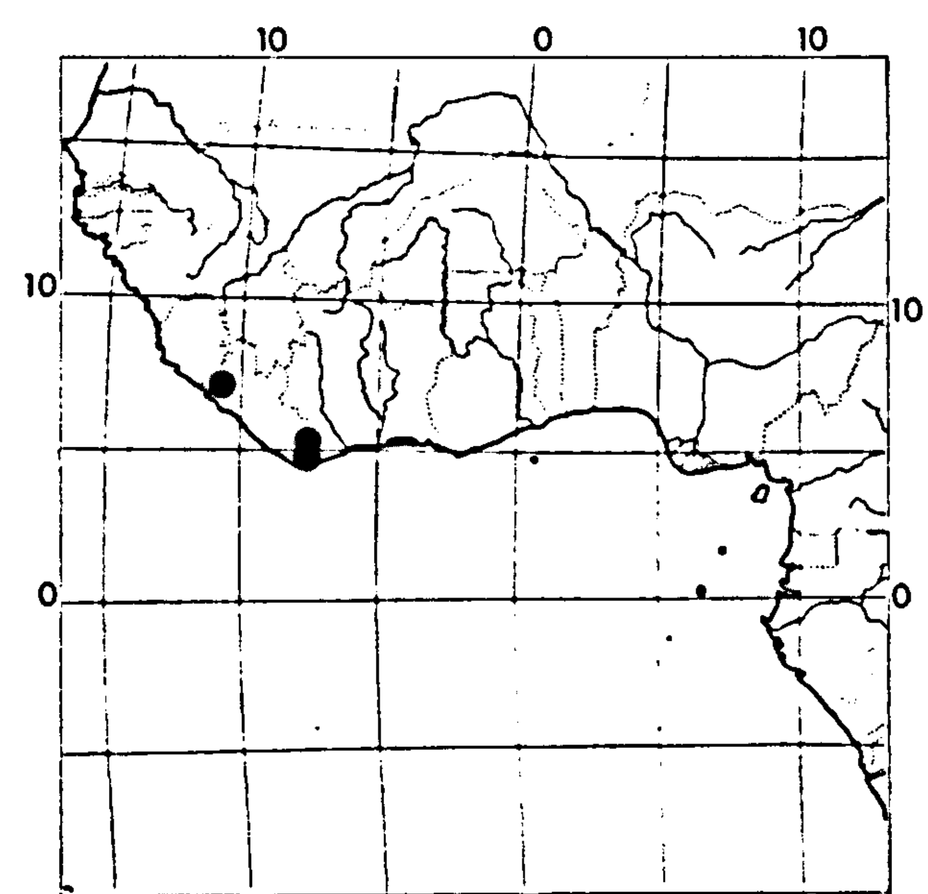


FIG. 14. *D. lofense*: 1. flowering branchlet, $\frac{5}{6}\times$; 2. leaf axil with stipules, $\frac{5}{6}\times$; 3. detail leaf beneath, $2\frac{1}{2}\times$; 4. flower, $7\frac{1}{2}\times$; 5. flower partly, $10\times$; 6–7. upper part of petal inside, $15\times$; 8. staminode outside, $15\times$; 9. fruit, $2\frac{1}{2}\times$. (1–6, 8. *Van Meer 27*; 7, 9. *Beentje 814*).

tomentose. Sepals spreading-reflexed, oblong, 1.7–2.5 × 0.5–0.7 mm. Petals thin, 1.7–3 mm long, 0.5–1 mm split, glabrous. Stamens slender, 2–4 mm long, glabrous. Staminodes oblong, inside and apically hirsute. Pistil 3–4 mm long, hirsute. Fruit subellipsoid, velutinous.

Description. Liana or lianescent shrub. Main *stem* sparsely lenticellate, bark peeling off in small, thin flakes. *Branches* glabrous or glabrescent, sparsely lenticellate or not. *Branchlets* densely velutinous to tomentose. *Stipules* narrowly triangular to oblong-linear, (2)3–6(10) mm long, velutinous-tomentose, caducous. *Leaves*: petiole subterete, 2–6(10) mm long, velutinous-tomentose; blade elliptic to oblong, 2–3 times as long as wide, (6)10–15(22) × (3)4–7(11) cm, cordate-subcordate to rounded-cuneate and often unequal-sided at base, usually shortly acuminate, the acumen 0.5–1(2) cm long; young, immature leaves usually entirely hirsute-velutinous, full-grown leaves glabrous or glabrescent, above except for the impressed midrib, beneath the hairs longer persistent, at least on the midrib; main lateral nerves 6–9(12) pairs, obscure above, prominent beneath; glands small, both sides or beneath only, at least more numerous beneath, rather well dispersed. *Inflorescences* glomerate or very shortly peduncled (up to 3 mm), obscurely branched, up to ca 25-flowered, hirsute-tomentose; bracts and bracteoles ovate-triangular, 1–3 mm long, appressed, glabrous inside. *Pedicel* up to 3 mm long, tomentose, the upper part 0. *Sepals* spreading to reflexed, oblong, 1.7–2.5 × 0.5–0.7 mm, tomentose-velutinous outside and on top inside. *Petals* erect to slightly spreading, thin, narrowly obovate-spathulate in outline, 1.7–3 mm long, 0.5–1 mm split, glabrous; lobes concave, the two proximal lobe-margins sometimes basally united and irregularly folded (see fig. 14: 6). *Stamens* erect to slightly spreading, 2–4 mm long, glabrous; anthers at most 0.5 mm long. *Staminodes* flat, oblong, up to 0.5 mm long, inside and apically hirsute. *Pistil* 3–4 mm long, (2)3-merous; ovary and style hirsute, the latter shortly (2)3-lobed at apex. *Fruits* (only immature fruits seen) subellipsoid, up to ca 1.5 × 1 cm, velutinous.



MAP 14. *D. lofense*

Distribution: Liberia, Western Ivory Coast.
Ecology: Rain forest.

Specimens examined:

Liberia. Lofa County, 3 km Gbama-Lofa, *Van Meer 27* (WAG, type).
Ivory Coast. 20 km N.W. of Tabou, *Beentje 814* (WAG); *815* (WAG); 13 km N.W. of Tabou, *Breteler 7376* (WAG); 17 km N. of Grabo, *Breteler 7415* (WAG); Grabo, *Chevalier 19629* (K, P).

Note. *D. lofense* is related to *D. reticulatum* Engl. and *D. umbellatum* Chod. It differs from these species by its sessile or nearly sessile inflorescences and its smaller flowers with glabrous instead of hairy petals and with much shorter stamens.

D. lokanduense De Wild. = **D. heudelotii** (Planch. ex Oliv.)Baill. var. **heudelotii**

For details see p. 28.

D. lolo De Wild. & Th. Dur. = **D. heudelotii** (Planch. ex Oliv.)Baill. var. **heudelotii**

For details see p. 28.

D. longifolium De Wild. & Th. Dur. = **D. heudelotii** (Planch. ex Oliv.) Baill. var. **heudelotii**

For details see p. 28.

D. longipedicellatum De Wild. = **D. pedicellatum** Krause

D. longipedicellatum De Wildeman, 1919: B43. Type: Zaïre, Lemfu, Butaye in coll. *Gillet 2269* (lectotype: BR).

Note. HAUMAN (1958-a: 316) reduced *D. longipedicellatum* into synonymy of *D. pedicellatum*. His decision is fully supported.

D. longipilosum Engl. = **D. heudelotii** (Planch. ex Oliv.)Baill. var. **hispidum** (Oliv.)Bret.

For details see p. 33.

D. longitubulosum Engl. = **D. heudelotii** (Planch. ex Oliv.)Baill. var. **longitubulosum** (Engl.)Bret.

For details see p. 35.

D. lujae De Wild. & Th. Dur. **Fig. 15 Map 15–17**

For literature, synonyms, and typification see under the varieties.

Diagnostic characters. Liana, lianescent shrub, or shrub. Stipules palmately divided into 2–4(5) subulate, curved parts. Leaves shortly stalked to almost sessile, ovate-elliptic, usually obliquely cordate at base, acuminate, covered with a, usually soon deciduous, white web when young. Inflorescences usually stalked and usually distinctly branched, brown-hairy. Sepals and petals erect or nearly so. Ovary lanate. Fruits usually beaked, 1–3-seeded, velutinous.

Description. Liana, lianescent shrub, or shrub. Woodcylinder 5-lobed to 5-partite; lenticels distinct and large when present. *Branches* glabrous or glabrescent, hollow or not. *Branchlets* hollow or not, hispid mixed with a short-hairy indumentum (velutinous) or only velutinous, or covered by an, often soon deciduous, white web, which may be mixed with brown erect hairs; the hispid and velutinous indumentum extending on stipules, petioles, the midrib both sides, the margin, and the main lateral nerves beneath or even the entire lower surface, as well as on the inflorescences; the white web on the leafblade both sides, rather loose and soon deciduous above, soon deciduous or more appressed and persistent beneath, the more dense the web the less dense the hispid-velutinous indumentum beneath (when with a rather dense hispid-velutinous indumentum the white web may be very inconspicuous and reduced to some sparse, curled, white hairs). *Stipules* usually palmately divided into 2–4(5) subulate, (2)5–10(14) mm long, curved parts, sometimes entire on the lower side of plagiotropic branches. *Leaves*: petiole subterete, 1–5 mm long; blade ovate-elliptic to obovate or oblong, (1.5)2–3(3.5) times as long as wide, (3)6–17(22) × (1.5)3–6(9) cm, usually obliquely cordate at base, short- to long-acuminate, the acumen acute or mucronate, 0.5–2(2.5) cm long; midrib and the (4)6–9(13) pairs of main lateral nerves often impressed above, always prominent beneath; glands usually present, beneath only, small, hidden by the persistent web or not, rather well-dispersed, sometimes more numerous towards base and top. *Inflorescences* axillary, sometimes grouped on leafless axillary branches or on leafless apical parts of branches, usually pedunculate, usually 1–3 times distinctly branched, branching short or long, up to ca 50-flowered; peduncle (0)0.5–2.5(3.5) cm long; bracts and bracteoles subulate, curved or not, up to 8 mm long, appressed-hairy to hispid, often with a mixture of long and short hairs. *Pedicel* up to 6 mm long, the upper part at most 0.5 mm long, more or less hairy as the bracts and bracteoles. *Sepals* suberect, sometimes a few reflexed, ovate to obovate-elliptic to narrowly oblong, 2–4.5 × 0.7–2.5 mm, lanate-tomentose to appressed-pubescent-strigose and with or without hispid hairs outside, appressed-puberulous inside. *Petals* erect or nearly so, at base shortly united with filaments, narrowly obovate-spathulate to almost linear in outline, 3.5–5.5 mm long, 0.7–2.5 mm split, glabrous or with a few appressed hairs below split outside, lobes concave, rounded at top. *Stamens* erect, 2.5–5(6) mm long, glabrous, connective prominent. *Staminodes* subquadrate-subobovate-oblong, up to 0.5 × 0.5 mm, glabrous or with a few curled hairs inside. *Pistil* 3-merous, 2–5(7) mm long; ovary and lower part of style densely lanate, upper part of style glabrous, shortly 3-lobed at top. *Fruits* yellow to orange at maturity, 1–3-seeded, distinctly lobed when more than one-seeded, the aborted cells present by a distinct ridge; 1-seeded fruits: subellipsoid, up to 4.5 cm long and 1.5–2 cm diam., rounded at base, often shortly stipitate, with an up to 2 cm long, beak; exocarp velutinous; mesocarp juicy; endocarp bony, at most 0.5 mm thick, glabrous inside. *Seeds* subellipsoid to ovoid, up to ca 2 cm long and 1 cm diam., with brown to black seedcoat.

Distribution: Central Africa.
Ecology: Rain forest, semi-deciduous forest.

Key to the varieties

1a. Stamens 2.5–3 mm long, pistil 2–2.5 mm long; white indumentum persistent on leaves beneath. . . . . var. **letestui**
b. Stamens (3.5)4–5(6) mm long, pistil (3.5)4–5(7) mm long; white indumentum persistent or not on leaves beneath. 2
2a. Sepals subequal in length, narrowly oblong, (3)4–4.5 × 0.7–1.5 mm; white indumentum persistent on leaves beneath. . . . . var. **gillardinii**
b. Sepals usually distinctly unequal in length, the outer 0.5–1 mm shorter than the inner, relatively broader, 2–3.5(4.5) × 1–1.5(2.5) mm; white indumentum of leaves usually soon deciduous both sides. . . . . . . var. **lujae**

D. lujae De Wild. & Th. Dur. var. **lujae** **Fig. 15: 1–6 Map 15**

D. lujaei De Wildeman & Th. Durand, 1900-a: 55; 1900-b: 8; De Wildeman, 1906: 273; 1907: 41; 1909: 109; Th. & H. Durand, 1909: 94; Engler, 1912-a: 571; De Wildeman, 1914: 144; 1919: B45; Hauman, 1958-a: 342 (as *D. lujae*); Breteler, 1973: 20, 75, 76, XVII (as *D. lujaei*); Punt, 1975: 19 (as *D. lujaei*); Breteler, 1978: 7, 54 (as *D. lujaei*).

Type: Zaïre, Stanley Pool, *Luja 5* (holotype: BR).

D. lujae De Wildeman & Th. Durand var. *brevipile* Hauman, 1955: 349; 1958-a: 344. Type: Zaïre, Kapanga, *Overlaet 1176* (holotype: BR).

D. lujae De Wildeman & Th. Durand var. *leucosepalum* (Ruhland) Hauman, 1958-a: 345. Basionym: *D. leucosepalum* Ruhland, 1902: 81; Th. & H. Durand,

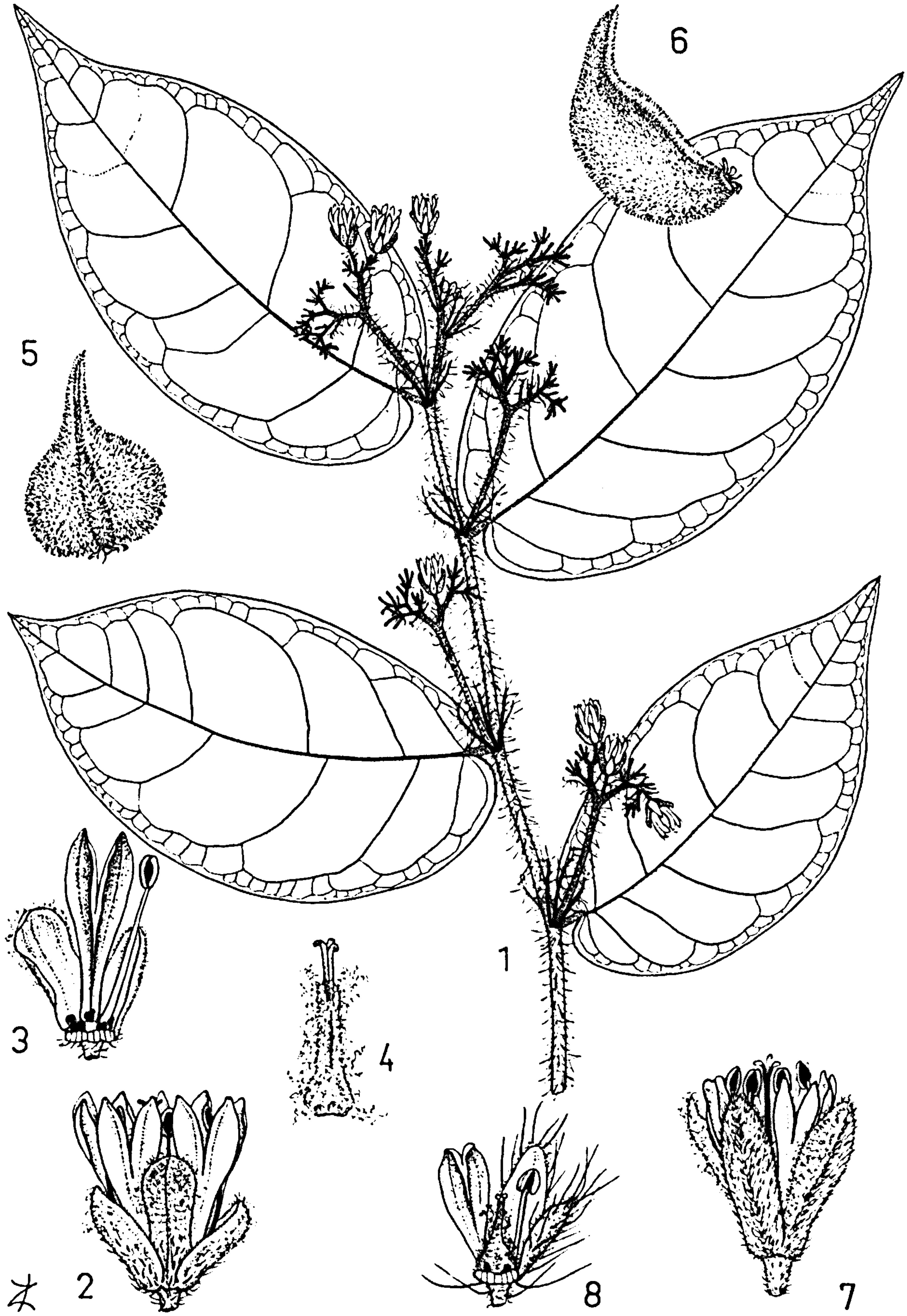


FIG. 15. *D. lujae* var. *lujae*: 1. flowering branch, $\frac{5}{6}\times$; 2. flower, $5\times$; 3. flower partly, $5\times$; 4. pistil, $5\times$; 5. 2-seeded fruit, $\frac{5}{6}\times$; 6. 1-seeded fruit, $\frac{5}{6}\times$. (1–5. *Descoings 5525*; 6. *Gossweiler 13956*).

D. lujae var. *gillardinii*: 7. flower, $5\times$. (7. *Vanderyst 9524*).

D. lujae var. *letestui*: 8. flower partly, $5\times$. (8. *Le Testu 2004*).

1909: 94; De Wildeman, 1909: 109; 1911-a: 225 (as *D. glaucosepalum*); Engler, 1912-a: 570; De Wildeman, 1919: B39; Breteler, 1973: XVII (in synonymy of *D. lujaei*). Type: Zaïre, sin. loc., *Dewèvre 1048* (= *10048*) (holotype: BR).

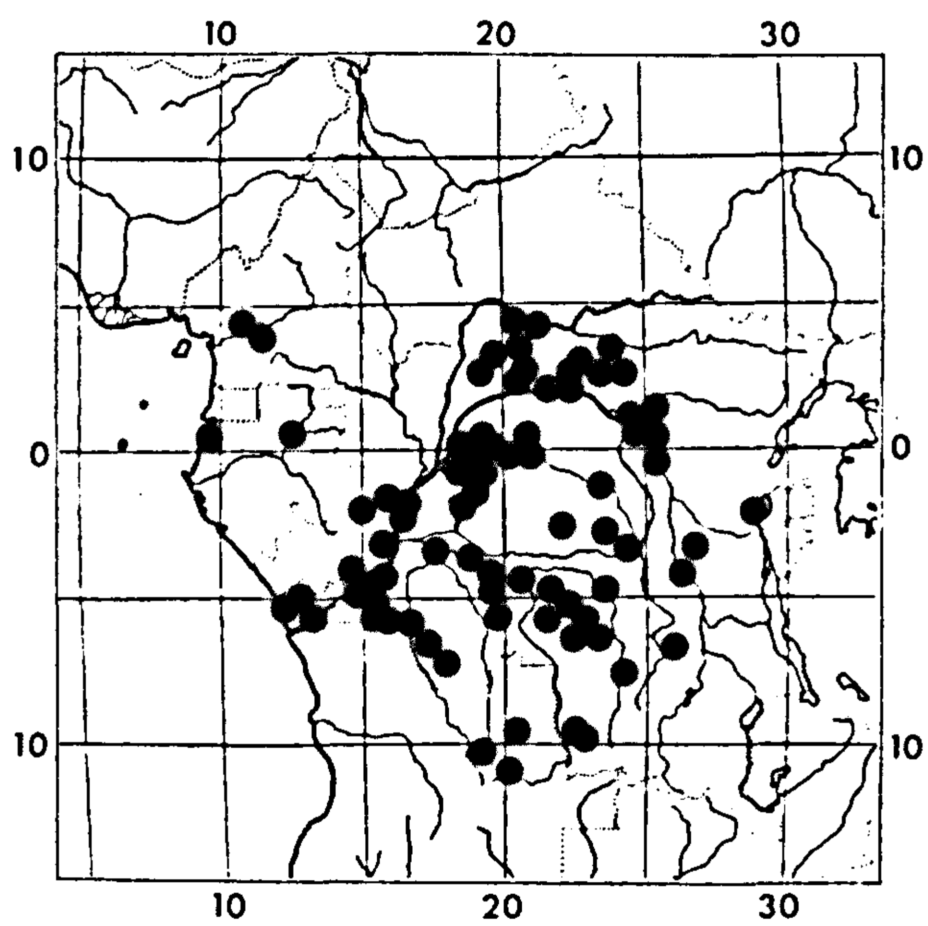
Specimens examined:

Cameroun. 7 km W. of Yaoundé, *Breteler, De Wilde & Leeuwenberg 2245* (WAG); 25 km S.S.W. of Ndikiniméki, *Letouzey 10820* (P, WAG); 12 km N.N.E. of Ngambé, *Letouzey 11063* (K, P, WAG).

Gabon. Libreville, *Baudon 211* (BR); 50 km S.W. of Makokou, *N. Hallé 2702* (P).

Congo. Sin. loc., *Bouquet 421* (P); near Brazzaville, *Chevalier 4164* (P); *11236* (P); *11394* (P, WAG); *27595* (P); *De Brazza 33* (P); *Descoings 5525* (IEC, MPU, P, WAG); Kimpanzou, *Descoings 5845* (IEC, MPU, P); Gamboma, *Descoings 7064* (MPU); *7068* (MPU, P); *7116* (IEC, MPU, WAG); 45 km Brazzaville-Foulakari, *Descoings 9579* (IEC, MPU); Kibossi, *Descoings 9791* (IEC, MPU); near Brazzaville, *Descoings 11430* (MPU); *Koechlin 14* (IEC); *404* (IEC); Inoni Forest, *Koechlin 710* (IEC); Mutampa, *Koechlin 1299* (IEC, P); Brazzaville, *Koechlin 2368* (IEC); sin. loc., *Makany 216* (P); Brazzaville, *Pobéguin 162* (P); M'Bamou I., *Sita 1711* (WAG); *1726* (WAG); Brazzaville, *Thollon 512* (K, P, WAG); Kinkala, *Trochain 9422* (IEC).

Zaïre. Kinshasa, *Achten 255A* (BR); *255B* (BR); *Baldwin jr. 14166* (K); *Bequet 956* (BR); Landana, *Bequaert 609* (BR); Luali, *Bequaert 624* (BR); Kinshasa, *Bequaert 843* (BR, K, WAG); Bolobo, *Bequaert 861* (BR); Yambuya, *Bequaert 1248* (BR); *1332* (BR); Banalia, *Bequaert 1470* (BR); Kinshasa, *Bequaert 7183* (BR); *7397* (BR); *7702* (BR); 76 km Kisangani-Bunia, *Bokdam 3110* (WAG); 20 km Kisangani-Buta, *Bokdam 3651* (WAG); Bengamisa, *Bokdam 4067* (WAG); Yangambi, *Bolema 151* (BR, P); *400* (BR); Ikelemba R., *Bonnivair 41* (BR, P, Z); Yangambi, *Boutique 24* (BR, M); Kimuenza, *Breyne 219* (BR); Eala, *Broun s.n.* (BR); Lisala, *Bruneel s.n.* (BR); between Dembo and Kwango R., *Butaye s.n.* (BR); Dembo, *Callens 1856B* (BR); Sefi, *Callens 2525* (BR); Pelende, *Callens 4292* (BR); Kimuenza, *Carlier 151* (BR); *Carrington 132* (BR); Mistandungu, *Chevalier 27865* (P); Eala-Bamania, *Chevalier 28157* (P); *28237* (P); sin. loc., *Claessens 41* (BR); Bofowabod, *Claessens 317* (BR); Kinganga, *Compère 673* (BR, K); Sanda, *Compère 1961* (BR); Eala, *Corbisier-Baland 1255* (BR); *1914* (BR); *Couteaux 327* (BR, EA); Binza, *Couteaux 1093* (BR); Boma, *Dacremont 133* (BR); Sanda, *De Brouwer in Gillet 3116* (BR); Dundusana, *De Giorgi 1047* (BR); Musa, *De Giorgi 1237* (BR, P, Z); Dobo, *De Giorgi 1443* (BR); Tendey, *Delvaux 428* (BR); Bokondji, *De Wanckel 120* (BR, K); Mbandaka, *Dewèvre 576* (BR); Wabundu, *Dewèvre 1143C* (BR); Piani Lombé-Nyangwe, *Dewèvre 1048* (= *10048*) (BR, type of *D. leucosepalum*); Bas Uele, *Dewulf 302* (BR); Kundu, *Dubois 325* (BR); Bobutu, *Evrard 441* (BR, LISC); Gemena, *Evrard 1382*



Map 15. *D. lujae* var. *lujae*

(BR); Balomba, *Evrard 2753* (BR, EA); Befale, *Evrard 3132* (BR); Bumba, *Evrard 3429* (BR, LISC, SRGH); Ikela, *Evrard 5306* (BR); *5486* (BR, WAG); Ingende, *Evrard 6107* (BR, LISC); Bola, *Evrard 6163* (BR); Kinshasa, *Evrard 6364* (BR); *6526* (BR); Mpese, *Germain 2115* (BM, BR, K); Lodja, *Germain 7573* (BR, SRGH); *7609* (BR); Eala, *Germain 8411* (BR, EA); Yangambi, *Germain 8494* (BR); *8575* (BR, UPS); *8578* (BR); *8582* (BR); sin. loc., *Ghesquière 16* (BR); Eala, *Ghesquière s.n.* (BR); Likimi, *Gilbert 1628* (BR); Sangaie, *Gillardin 621* (BR); *625* (BR); Kisantu, *Gillet s.n.* (BR); Kimuenza, *Gillet s.n.* (BR); Bikoro, *Goossens 1518* (BR); *2365* (BR); sin. loc., *Goossens 2658* (BR); *2697* (BR); *2727* (BR); Ingende, *Goossens 6025* (BR); *6157* (BR); Kiri, *Goossens 6219* (BR); Boende, *Gorbatoff 48* (BR); *225* (BR); Bolima, *Hulstaert 485* (BR); Ikenge, *Huyghe s.n.* (BR); Lutendele, *Jans 81* (BR); Eala, *Laurent 744* (BR); Yumbi, *Laurent s.n.* (BR); Umangi, *Em. & M. Laurent s.n.* (BR); Eala, *Lebrun 548* (BR); *679* (BR); *1189* (BR); Mbandaka, *Lebrun 1213* (BR, W); Bokuma, *Lebrun 1289* (BR, M); *1306* (BR); Banzyville, *Lebrun 2099* (BR, LISU); Buta, *Lebrun 2606* (BR, W); Katako Kombe, *Lebrun 6108* (BR); Kole, *Lebrun 6314* (BR, LISU); Kinshasa, *Lebrun 6485* (BR, WAG); Mbandaka-Eala, *Leemans 143* (BR, M); *213* (BR, C, LISC, P, SRGH); Eala, *Leemans 492* (BR); Mobwasa, *Lemaire 235* (BR); Yangambi, *A. Léonard 933* (BR, K, SRGH); Eala, *J. Léonard 150* (BR, COI, FI, U, Z); Bikoro, *J. Léonard 571* (BR, C, L, LISC, PRE, U, W); Tshimbao, *Liben 2320* (BR); Bena Longo, *Liben 2772* (BR, SRGH); Musoko, *Liben 3513* (BR); Sandoa, *Liben 3793* (BR); Yangambi, *Lisowski 15024* (K); Mbandaka, *Louis 187* (BR, M, SRGH); Yangambi, *Louis 481* (BR); 21 km Yangambi-Ngazi, *Louis 1298* (BR, EA, LISU); Yangambi, *Louis 1452* (BR, LISC); Eala, *Louis 2084* (BR, C, L, W); Yangambi, *Louis 2284* (BR, EA); *2828* (BR, Z); *3643* (BR); *4050* (BR); *4081* (BM, BR, K, LISU); *5920* (BR, FI); *6369* (BR, COI); *7247* (BR, U, W); *8767* (BR, C, M, SRGH); *8823* (BM, BR, LISC, P); *8895* (BR, L, LD, PRE); *9196* (BR, COI, FI); *9416* (BR); *9520* (BR, Z); *10169* (BR); *10562* (BR, EA); *10883* (BR); *11581* (BR); *12774* (BR); *13109* (BR, SRGH); *13396* (BR, WAG); *13636* (BR, UPS); Kinshasa, *Luja 5* (BR, type); Sankuru, *Luja 50* (BR); Pangi, *Michelson 156* (BR); Kimuenza, *Mildbraed 3544* (HBG); *3691* (HBG); Yambata, *Montchal 132* (BR, Z); *172* (BR); Dundusana, *Mortehan 306* (BR); *1030* (BR); Bikoro, *Moureau-Cheuvrard 99* (BR); Kaniama, *Mullenders 1239* (BR); *1709* (BR); Sanda, *Oddon in Gillet 3568* (BR); Kapanga, *Overlaet 820* (BR); *821* (BR); *822* (BR); *1176* (BR, type of *D. lujae* var. *brevipile*); Kimvula, *Pauwels 1519* (BR); Kimwenza, *Pauwels 3395* (BR); Kipindi, *Pauwels 3753* (BR, WAG); Popokabaka, *Pauwels 3916* (BR); Ndjili, *Pauwels 5236* (BR); Eala, *Pynaert 159* (BR); *708* (BR); *1469* (BR); *1730* (BR); Kinshasa, *Reiniers 107A* (BR); Dundusana, *Reygaert 60* (BR); *98* (BR); *242* (BR); Mobwasa, *Reygaert 1242* (BR); Eala, *Robijns 603* (BR); *811* (BR, UPS, WAG); Madjalanga, *Robijns 1023* (BR); Lisala, *Robijns 1095* (BR, C, LISC, LISU, P); Booke, *Robin 119* (BR); Kivulu, *Sapin s.n.* (BR); Bienge, *Sapin s.n.* (BR); Stanley Pool, *Schlechter 12582* (BM, BR, G, K, LE, Z); Eala, *Seret 822* (BR); sin. loc., *Smith s.n.* (BM, K); Miao, *Sparano 28* (BR); Eala, *Staner 1278* (BR); *1507* (BR); Bikoro, *Thonet 99* (BR); *239* (BR); Mombongo, *Thonner 148Bis* (BR); 180 km Kavumu-Walikale, *Troupin 6282* (BR, EA); sin. loc., *Vanden Brande 135* (BR); La Kulu, *Vanden Brande 280* (BR); *614* (BR); Wumbali, *Vanderyst 1862* (BR); Kimpako, *Vanderyst 5420* (BR); Kinshasa, *Vanderyst 8115* (BR); Idiofa, *Vanderyst 8662Bis* (BR); Ipamu, *Vanderyst 8850* (BR); *8872* (BR); *8878* (BR); Ipamu-Pangu, *Vanderyst 9528* (BR); *9555* (BR); *9632* (BR); *9636* (BR); *9904* (BR); Mpio Mpio, *Vanderyst 10145* (BR); Ipamu, *Vanderyst 10315* (BR); *10364* (BR); *10710* (BR); *10753* (BR, WAG); *11113* (BR); Kamtsha, *Vanderyst 11253* (BR); *11338* (BR); *11351* (BR); Idiofa, *Vanderyst 12643* (BR); Kisantu, *Vanderyst 13892* (BR); Sanda, *Vanderyst 14726* (BR); Panzi, *Vanderyst 16065* (BR); Merode, *Vanderyst 23521* (BR); *23522* (BR); Hemptinne, *Vanderyst 23965* (BR); Chenal, *Vanderyst 24465* (BR); Kinshasa, *Vanderyst 25078* (BR, COI); Sanga, *Vanderyst 25379* (BR); Merode, *Vanderyst 23546* (BR); Yokola, *Vanderyst 34893* (BR); Kisasi, *Vanderyst 40430* (BR); Kinshasa, *Vanderyst s.n.* (BR); Sanda, *Vermeulen in Gillet 3408* (BR); Gombe, *Vermoesen 2067* (BR, EA, WAG); Eala, *Vermoesen 2184* (BR).

Angola. Henrique de Carvalho, *Exell & Mendonça 600* (BM, COI, LISC, M); Cacongo, *Gossweiler 6073* (BM, COI, K, LISJC, LISU); sin. loc., *Gossweiler 6255* (LISJC); Cacongo, *Gossweiler 8060* (BM, BR, COI, K, LISU); Chiluango, *Gossweiler 8101* (K); Dala, *Gossweiler 11585* (COI); Henrique de Carvalho, *Gossweiler 11735* (BM); Lunda, Tras-os-Montes, *Gossweiler 13956* (B, BM, K); Henrique de Carvalho, *Young 678* (BM, BR, COI, LISC).

Notes. DE WILDEMAN and TH. DURAND named this species *D. lujaei*. In accordance with article 73 of the Code (International Code of Botanical Nomenclature) (Utrecht 1956), HAUMAN (1958-a) changed the epithet into '*lujae*'. In the Seattle Code as well as in the previous ones, there is, in my opinion, some doubt whether this correction had to be made, and I did not do so. The Leningrad Code (1978), however, is more precise. Dealing with this matter in article 73.10 it states that orthographic errors mentioned in Recommendation 73 C1 are 'to be corrected'. Therefore I have now adopted the orthography '*lujae*' instead of '*lujaei*'. To me the question remains, whether '*lujaei*' is against Article 73 and 'cannot be maintained', or is against Recommendation 73C and 'cannot, on that account, be rejected' (citations from the preamble of the Leningrad Code).

HAUMAN (1958-a) divided his *D. lujae* into 3 varieties, each of them based on a different indumentum on their adult branchlets: var. *lujae* with persistent, 2–3 mm long erect hairs, var. *brevipile* with at most 1 mm long persistent hairs, and var. *leucosepalum* with glabrescent branchlets, having at first been covered by an arachnoid indumentum. These indumentum types do indeed exist, but mixtures are very common. There are even specimens of which the basal part of the branchlet is arachnoid-hairy and becomes glabrous, and of which the apical part or lateral shoots show a mixture of an arachnoid, dehiscent indumentum and a short or long erect-hairy persistent indumentum in varying degrees of density (e.g. *Evrard 2753, 3429, Robijns 1095, Young 678*). Even the type of var. *leucosepalum* shows some persistent erect hairs. Therefore these varieties have been reduced to one: *D. lujae* var. *lujae*.

With *D. gillardinii* now being reduced to a variety of *D. lujae*, the distinction between this species and *D. bangii* (F. Didr.)Engl. (see BRETELER, 1973: 76) can no longer be based on the relative length of the petals. Separation is still easy by the arachnoid indumentum on the leaves above, which is lacking in *D. bangii*.

D. lujae De Wild. & Th. Dur. var. **gillardinii** (Haum.)Bret., *comb. & stat. nov.*
Fig. 15: 7 Map 16

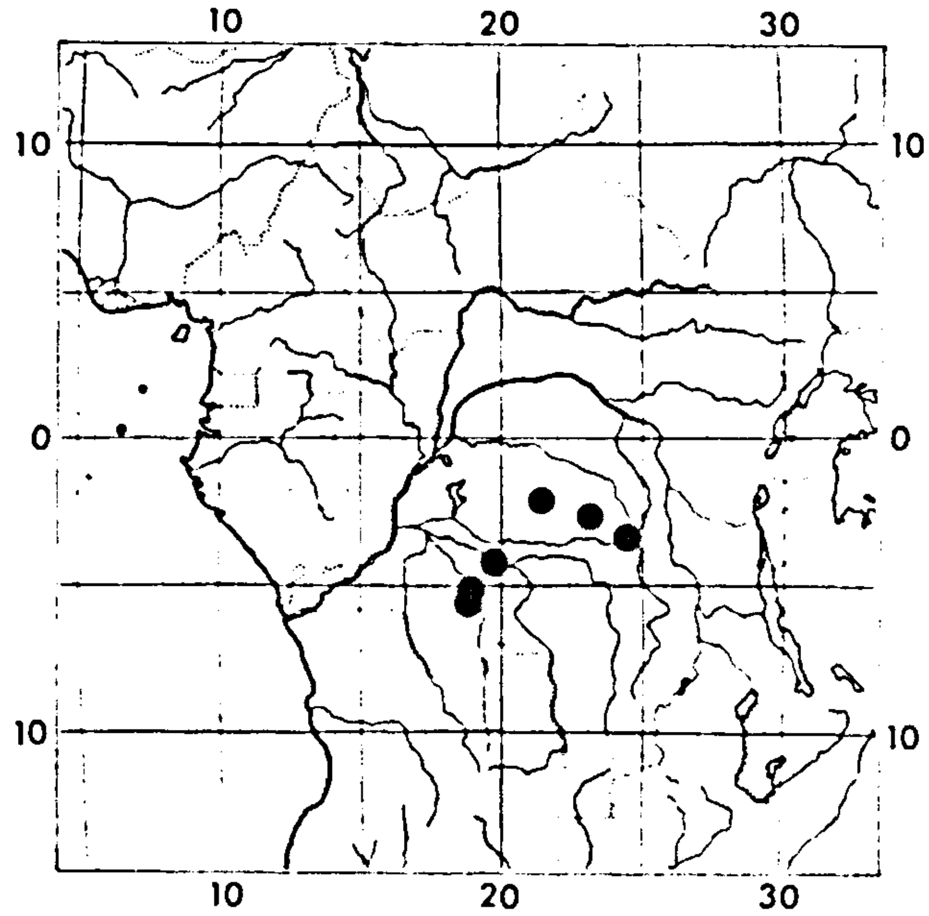
Basionym: *D. gillardinii* Hauman, 1955: 344; 1958-a: 345; Breteler, 1973: XVII; Punt, 1975: 19.

Type: Zaïre, Kasai, Katako Kombe, *Gillardin 232* (holotype: BR).

Specimens examined:

Zaïre. Kiyaka-Kwango, Kikwit terr., *Devred 2188* (BR, K, PRE, WAG); Kiyaka, *Devred 2402* (BR, K); Iwama, *Evrard 2828* (BR, K); Katako Kombe, *Gillardin 232* (BR, type); Mukumari, *Gillardin 598* (BR); between Ipamu and Pangu, *Vanderyst 9524* (BR).

Note. It was not possible to maintain this taxon at the specific level. Characters of sepals used to separate it from var. *lujae* are not well applicable to a few specimens. *Breteler c.s. 2245* and *Letouzey 11063* from Cameroun, identified as belonging to var. *lujae*, have subequal rather narrowly oblong sepals, but a non-



MAP 16. *D. lujae* var. *gillardinii*

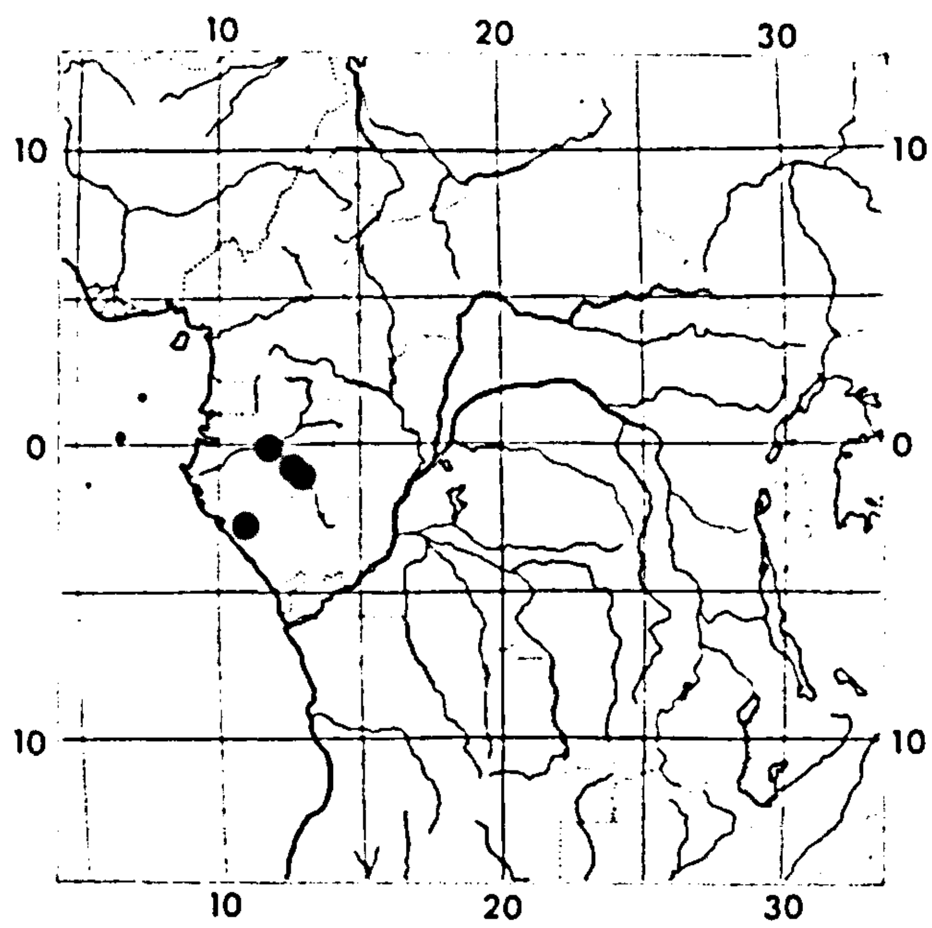
persistent white web on the leaves beneath. Additional material may prove, that even varietal rank is not tenable.

D. lujae De Wild. & Th. Dur. var. **letestui** (Pellegr.)Bret., *comb. & stat. nov.*
Fig. 15: 8 Map 17

Basionym: *D. letestui* Pellegrin, 1922: 89 (as '*le testui*'); 1924: 56 (as '*le testui*'); Breteler, 1973: XVII (in synonymy of *D. lujaei*).
Type: Gabon, Tchibanga, *Le Testu 2004* (holotype: P; isotypes: BM, K, WAG).

Specimens examined:

Gabon. Bank of Ogooué R., 4 km S.W. of Lastoursville, *Breteler 6554* (WAG); 16 km Lastoursville-Moanda, *Breteler & J. J. de Wilde 760* (WAG); Booué, *N. Hallé & Le Thomas 223* (P);



MAP 17. *D. lujae* var. *letestui*

Tchibanga, *Le Testu 1449* (BM, P); *2004* (BM, K, P, WAG, type); Lastoursville, *Le Testu 7055* (BM); *7250* (BM, BR, P, WAG).

Note. This variety is separated from the other two varieties by its smaller stamens and pistil. Such small-flowered varieties have also been distinguished within *D. crassifolium* Chod. and *D. dewevrei* De Wild. & Th. Dur. (BRETELER 1978: 31 & 55), as well as in *D. heudelotii* (see p.23 etc.).

The following specimens lack the necessary elements to identify them as belonging to one of the three varieties.

Congo. 35 km E.S.E. of Sibiti, *Farron 4553* (P).
Zaïre. Lodja Terr., *Germain 8623* (BR); Djuma valley, *Gillet s.n.* (BR); Sanga, *Vanderyst 25379* (BR).

D. luki nomen = **D. barteri** Engl.

D. luki nomen in Punt, 1975: 21.

Note. This name has been used by me for the material from Western Zaïre (mainly from Luki) which I kept separate from *D. barteri* (see BRETELER, 1973: 86). A further detailed study of *D. barteri* in relation with *D. stuhlmannii* Engl. (syn. *D. lebrunii*) from Eastern Zaïre and East Africa, revealed that both species are very closely related and can be distinguished from each other by their flower size. The entity '*D. luki*' from Western Zaïre belongs to the large-flowered West-African *D. barteri*. This species complex will be dealt with more detailed when treating *D. stuhlmannii*.

D. lukolelaense De Wild. = **D. heudelotii** (Planch. ex Oliv.)Baill. var **ndongense** (Engl.)Bret.

For details see p. 38.

D. luteiflorum De Wild. = **D. staudtii** Engl.

D. luteiflorum De Wildeman, 1919: B47; Breteler, 1973: XX (in synonymy to *D. staudtii*). Type: Zaïre, Nala, *Seret 781* (holotype: BR).
D. mombongense De Wildeman var. *luteiflorum* (De Wildeman)Hauman, 1958-a: 318. Type: see above.

REFERENCES

AUBRÉVILLE, A. 1936. La Flore Forestière de la Côte d'Ivoire **2**: 3-6.

AUBRÉVILLE, A. 1959. La Flore Forestière de la Côte d'Ivoire 2nd. ed. **2**: 9-12.

BAILLON, H. 1874. Histoire des Plantes **5**: 139-142.

BAILLON, H. 1892. Histoire Naturelle des Plantes. In: A. GRANDIDIER, Histoire physique, naturelle et politique de Madagascar: t. 205-207.

BAKER, E. G. 1913. *Chailletiaceae* in: A. B. RENDLE, Catalogue of Talbot's Nigerian Plants: 19, 124.

BAKER, J. G. 1883. Contributions to the flora of Madagascar. Journ. Linn. Soc. **20**: 119.

BAKER, J. G. 1889. On the flora of Madagascar. Journ. Linn. Soc. **25**: 306.

BARTH, F. 1896. Anatomie comparée de la tige et de la feuille des *Trigoniacées* et des *Chailletiacées* (*Dichapetalées*). Bull. Herb. Boiss. **4**: 481-520.

BRETELER, F. J. 1969. The African *Dichapetalaceae* I. Acta Bot. Neerl. **18**(2): 375-376.

BRETELER, F. J. 1970. The African *Dichapetalaceae* II. Three new species from West Africa. Acta Bot. Neerl. **19**(1): 7-15.

BRETELER, F. J. 1973. The African *Dichapetalaceae* (III). A taxonomical revision. Species a-b. Meded. Landbouwhogeschool Wag. **73-13**.

BRETELER, F. J. 1978. The African *Dichapetalaceae* IV. A taxonomical revision. Species c-f. Meded. Landbouwhogeschool Wag. **78-10**.

CHEVALIER, A. 1920. Exploration Botanique de l'Afrique Occidentale Française **1**: 119-121.

CHODAT, R. 1895. *Dichapetala* nova Africana. Bull. Herb. Boiss. **3**: 671-672.

DE CANDOLLE, A. P. 1825. Prodromus **2**: 29-30; 57-58.

DESCOINGS, B. 1960. Révision de *Dichapetalum* de Madagascar. Mém. Inst. Sci. Madag. **B.9**: 63-120.

DESCOINGS, B. 1961. *Dichapetalacées*. Flore de Madagascar et des Comores: 110e famille.

DESCOINGS, B. 1962. Note complémentaire sur les *Dichapetalum* Malgaches. Nat. Malg. **13**: 47-51.

DESCOINGS, B. 1973. Note sur les *Dichapetalum* (*Dichapétalacées*) de Madagascar et description du *D. alaotrense* sp.nov. Bull. Soc. Bot. Fr. 1972, **119**: 509-520.

DE WILDEMAN, E. 1906. Etudes sur la Flore du Bas- & Moyen Congo. Ann. Mus. Congo Bot., sér. **5. 1**: 213-346.

DE WILDEMAN, E. 1907. Etudes sur la Flore du Bas- & Moyen Congo. Ann. Mus. Congo Bot., sér. **5. 2**: 1-84.

DE WILDEMAN, E. 1909. Etudes sur la Flore du Bas- & Moyen Congo. Ann. Mus. Congo Bot., sér. **5. 3**: 1-147.

DE WILDEMAN, E. 1911-a. Etudes de Flore de Bangala et Ubangi: 221-225, t. 7-9.

DE WILDEMAN, E. 1911-b. Decades novarum specierum Florae congolensis. Bull. Jard. Bot. Brux. **3**: 269-271.

DE WILDEMAN, E. 1912. Etudes sur la Flore du Bas- & Moyen-Congo. Ann. Mus. Congo Bot., sér. **5.3**: 419-422.

DE WILDEMAN, E. 1914. Additions à la Flore du Congo. Bull. Jard. Bot. Brux. **4**: 1-241.

DE WILDEMAN, E. 1919. Notes sur les espèces Africaines du genre *Dichapetalum* Thou. Rev. Zool. Afr. **4**(2), suppl. Bot.: 1-75.

DE WILDEMAN, E. & TH. DURAND. 1900-a. Matériaux pour la Flore du Congo 8. Bull. Soc. Roy. Bot. Belg. **39**: 55-57.

DE WILDEMAN, E. & TH. DURAND. 1900-b. Plantae Gilletianae Congolenses. Bull. Herb. Boiss. **1** (sér. 2): 1-64.

DE WILDEMAN, E. & TH. DURAND. 1901. Reliquiae Dewevreanae. Ann. Mus. Congo Bot., sér. **3.1**: 41-42.

DE WILDEMAN, E. & TH. DURAND. 1902. Illustrations de la flore du Congo. Ann. Mus. Congo Bot., sér. **1.1**: 179-180, t. 90.

DURAND, TH. & H. 1909. Sylloge Florae Congolanae: 94-95.

ENGLER, A. 1896-a. *Dichapetalaceae* in: E. & P., Nat. Pflanzenfam. **3**(4): 345-351.

ENGLER, A. 1896-b. *Dichapetalaceae* africanae. ENGLER, Bot. Jahrb. **23**: 133-142.

ENGLER, A. 1902. See: ENGLER, A. & W. RUHLAND. 1902.

ENGLER, A. 1912-a. *Dichapetalaceae* africanae III. ENGLER, Bot. Jahrb. **46**: 562–597.

ENGLER, A. 1912-b. *Dichapetalaceae* in: J. MILDBRAED, Wiss. Ergebn. Deutsch. Zentr. Afr. Exp. 1907/08. **2**: 438–445, t. 49–53.

ENGLER, A. 1915. Die Pflanzenwelt Afrikas **3(1)**: 840–849.

ENGLER, A. & K. KRAUSE. 1931. *Dichapetalaceae* in: E. & P., Nat. Pflanzenfam. 2e Aufl. **19c**: 1–11.

ENGLER, A. & W. RUHLAND. 1902. *Dichapetalaceae* africanae II. ENGLER, Bot. Jahrb. **33**: 76–91.

EXELL, A. W. 1927. Gossweiler's Portuguese West African Plants: *Dichapetalaceae*. Journ. Bot. 65, suppl. **1**: 65–70.

EXELL, A. W. & F. A. MENDONÇA. 1951-a. Novidades da flora de Angola. Bol. Soc. Brot. **25**: 108–109.

EXELL, A. W. & F. A. MENDONÇA. 1951-b. Conspectus Florae Angolensis **1**(2): 320–330.

HAUMAN, L. 1955. Notes sur le genre *Dichapetalum* Thou. en Afrique Centrale. Bull. Jard. Bot. Brux. **25**: 339–351.

HAUMAN, L. 1958-a. *Dichapetalaceae* in: Flore du Congo Belge et du Ruanda-Urundi **7**: 287–348.

HUTCHINSON, J. & E. A. BRUCE. 1931. In: Tropical African Plants: 8. Kew Bull. **5**: 270–271.

HUTCHINSON, J. & J. M. DALZIEL. 1928-a. Flora of West Tropical Africa **1**(2): 321–325.

HUTCHINSON, J. & J. M. DALZIEL. 1928-b. In: Tropical African Plants: 5. Kew Bull. **1928**: 380–381.

KEAY, R. W. J. 1955. Revision of the 'Flora of West Tropical Africa' – 7. Kew Bull. **1955**: 137–138.

KEAY, R. W. J. 1958. Flora of West Tropical Africa. 2nd. ed. **1**(2): 433–439.

KEAY, R. W. J., C. F. A. ONOCHIE & D. P. STANFIELD. 1960. Nigerian Trees **1**: 322–327.

KRAUSE, K. 1912. *Dichapetalaceae* africanae IV. ENGLER, Bot. Jahrb. **48**: 507–511.

MOSS, M. B. 1928. The genus *Dichapetalum* in East, South Tropical, and Subtropical Africa. Kew Bull. **1928**: 115–130.

OLIVER, D. 1868. Flora of Tropical Africa **1**: 339–344.

PELLEGRIN, F. 1912. *Dichapetalum* nouveaux de l'Afrique orientale. Not. Syst. **2**: 270–277.

PELLEGRIN, F. 1913. Contribution à l'étude de la flore de l'Afrique occidentale: *Dichapetalacées*. Bull. Soc. Bot. France **59**: 578–585, 640–648.

PELLEGRIN, F. 1922. Plantae Letestuanae novae 4. Bull. Mus. Hist. Nat. **28**: 89–92.

PELLEGRIN, F. 1924. Flore Mayombé 1. Mém. Soc. Linn. Norm. **26**(2): 55–60.

PUNT, W. 1975. Pollen morphology of the *Dichapetalaceae* with special reference to evolutionary trends and mutual relationships of pollen types. Review of Palaeobot. & Palyn. **19**: 1–97.

ROEMER, J. J. & J. A. SCHULTES. 1819. Systema Vegetabilium **5**: 324.

RUHLAND, W. 1902. See: ENGLER, A. & W. RUHLAND. 1902.

SPRENGEL, C. 1825. Systema Vegetabilium **1**: 931.

TORRE, A. R. 1962. New and little-known species from the Flora Zambesiaca Area 13. Bol. Soc. Brot., 2e ser. **36**: 67–70, t. 1–3.

TORRE, A. R. 1963. *Dichapetalaceae* in: Fl. Zamb. **2**(1): 319–328.

TULASNE, L. R. 1857. Florae madagascariensis, *Chailletiaceae*. Ann. Sci. Nat., Sér. **4.8**: 82–90.

VERDCOURT, B. & E. C. TRUMP. 1970. Common poisonous plants of East Africa: 62–71.

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