

Novitates Gabonenses 46. A new *Chaetocarpus* (Euphorbiaceae) from Gabon

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KEY WORDS

Chaetocarpus,
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ABSTRACT

Chaetocarpus gabonensis is described and illustrated. It is the second species of this genus from continental Africa. The distribution of both species is mapped.

RÉSUMÉ

MOTS CLÉS

Chaetocarpus,
Euphorbiaceae,
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Novitates Gabonenses 46. Un nouveau *Chaetocarpus* (Euphorbiaceae) du Gabon. *Chaetocarpus gabonensis* est décrit et illustré. C'est la seconde espèce de ce genre d'Afrique continentale. La distribution des deux espèces est cartographiée.

Chaetocarpus is a small tropical genus recently considered to comprise 13 (RADCLIFFE-SMITH 2001) or 15 species (GOVAERTS et al. 2000). In fact, however, the number of species currently in this genus is 17: 11 in America (ALVES 1994), 4 in Asia (VAN WELZEN 1994, PHILCOX 1997) and 2 in Africa, namely *Chaetocarpus africanus* Pax (1894) in the mainland and *C. rabaraba* Capuron (1972) in Madagascar. *Chaetocarpus africanus* is confined to the southern hemisphere in Central Africa having its northwestern limit in central Gabon, South of the Ogooué River. North of this river and more to the West, a new species of *Chaetocarpus* was discovered, occupying more or

less similar habitats as quoted for *C. africanus*. The new species is described below.

Chaetocarpus gabonensis Breteler, sp. nov.

Chaetocarpo africano Pax *affinis sed stipulis majoribus basi latiore, sepalis interioribus staminibusque floris masculi plus numerosis, disco floris feminei profunde lobato et parietibus fructus crassioribus differt.*

TYPUS. — F.J. & B.J.M. Breteler 15570, Gabon, Moyen-Ogooué, 77 km La Lopé-Ndjolé road, ± 0°03'S, 11°10'E, 8 Aug. 2000, fr. (holo-, WAG; iso-, A, B, BR, E, FI, G, K, LBV, MA, MO, NY, P, PRE, S, US).

Shrub or tree up to at least 25 m tall and 30 cm d.b.h. Branches pubescent, appressedly so or not to \pm velutinous, glabrescent. Stipules foliaceous, \pm appressed, rather long persistent, narrowly ovate to subobovate-elliptic, usually slightly falcate, (6-) 8-12(-15) \times (2-)3.5(-6) mm, 1-2.5 mm wide at base, rounded to acute at apex, appressed-pubescent outside, inside sparsely so to almost glabrous. Leaves: petiole subterete, (2-)3-5(-7) mm long, pubescent, appressedly so or not, glabrescent; lamina subcoriaceous, elliptic to oblong-elliptic or ovate-elliptic, (2-)2.5-3 times as long as wide, (6-) 10-15(-20) \times (2-)4-7(-8) cm, rounded to slightly cuneate at base, acuminate at apex, the acumen mostly acute, 0.5-1.5(-2) cm long; midrib slightly prominent above, distinctly so beneath, the (6-) 9-11(-13) pairs of main lateral nerves \pm parallel, plane to very slightly raised above, prominent beneath; appressed-pubescent on both surfaces when young, more densely so beneath, rather soon glabrescent, more rapidly so above. Flowers axillary, fasciculate; basal bracts minute, concave, suborbicular, pubescent. Pedicel pubescent, up to 2 mm long and articulate in male flowers, up to 1.5 mm in female flowers, up to 3 mm long in fruit. Male flower: sepals 6-7 (see note), spreading, outer two opposite, cuculate, suborbicular, \pm 1.5 mm in diam.; inner 4 sepals slightly concave, \pm elliptic, 2.5-3 \times 1.5-2 mm, sparsely pubescent outside and with ciliate margin, glabrous inside, a fifth, smaller, more petaloid and glabrous inner sepal may be present. Stamens (12-)13(-14); filaments slender, variously united into an up to

3 mm long, pubescent column; free part of filaments \pm 2 mm long, pubescent; anthers c. 0.7 mm long; pistillode rudimentary, pubescent. Disc glands narrowly ellipsoid, c. 0.5 mm long, glabrous. Femelle flower: calyx more or less as in male flowers; ovary subglobose, 1-2 mm long, sessile; styles bifid, shortly united at base, \pm 3 mm long; disc \pm 0.7 mm long, deeply and narrowly lobed, glabrous. Fruit capsular, slightly depressed-subglobose, 8-9 mm in diam., tuberculate, the tubercles pyramidal, crowned by a needle-like hair of c. 1 mm long; valves woody, 2-2.5 mm thick. Seeds black, glossy, sublenticular, \pm 4 \times 2 mm. — Figs. 1-3.

HABITAT AND DISTRIBUTION. — Gallery forest, forest edge in forest-savannah mosaic in Central Gabon North of Ogooué River and West of Ngounié River.

PARATYPES. — GABON: *Aubréville* 65, région de Ndjolé, 1 Sep. 1945, fr. (P); *Breteler & Jongkind* 10523, 5-15 km NNW of Ndjolé, 16 Nov. 1991, ster. (LBV, WAG); *Breteler et al.* 10995, 5-30 km NW of Ndjolé, 22 Apr. 1992, ster. (WAG); *Breteler et al.* 13026, 27 Sep. 1994, δ fl.b. (LBV, MO, P, WAG); *Breteler* 13485, 8 km N of Ndjolé, 15 Mar. 1996, ster. (LBV, MO, P, WAG); *Breteler* 14329, 28 Apr. 1998, ster. (K, LBV, MO, WAG); *F.J. & B.J.M. Breteler* 15571, 77 km La Lopé-Ndjolé, 8 Aug. 2000, δ fl. (BR, G, K, LBV, MO, P, WAG); *N. Hallé* 2070, Lac Ezanga, 29 May 1963, δ fl.b. (P); *Louis et al.* 832, Kongo Boumba-Ayem road, 11 Nov. 1983, fr. (BR, K, LBV, MA, MO, P, PRE, WAG).

The two African species of *Chaetocarpus* may be distinguished as follows:

Stipules (6-)8-12(-15) \times (2-)3-5(-6) mm with 1-2.5 mm broad base, sparsely pubescent to \pm glabrous inside; leaves (sub)coriaceous, (6-)10-15(-20) \times (2-)4-7(-8) cm with (6-)9-11(-13) pairs of main lateral nerves; male flower with 4(-5) inner sepals and with (12-)13(-14) stamens; disc in female flower deeply and narrowly lobed; fruit depressed-subglobose, 8-9 mm in diam., wall 2-2.5 mm thick **C. gabonensis**

Stipules 3-9 \times (0.3-)0.5-1.2(-3) mm, constricted to a \geq 0.5 mm wide base, usually appressed-pubescent inside; leaves \pm papyraceous, 5-10(-15) \times (1.5-)2-4(-7) cm, with (5-)6 -8(-10) pairs of main lateral nerves; male flower with 2-3(-4) inner sepals and with 8-10(-12) stamens; disc in female flower with undulate margin; fruit ellipsoid-obovoid, 7-10 \times 6-7 mm, wall 1-1.5 mm thick **C. africanus**

Chaetocarpus africanus Pax

In Engl., Bot. Jahrb. Syst. 19: 113 (1894). — Types: *Pogge* 112, 1384, 1388, Congo (Kinshasa), Mussamba (no 112) and Mukenge (no 1384, 1388) (syn-, B, delet.); neotype (designated here): *Lisowski* 66707,

Congo (Kinshasa), Kasai, near Kanango, fr., fl.b. Nov. 1981 (holo-, BR; iso-, WAG), see note. — Figs. 1, 3, 4.

SPECIMENS EXAMINED (selection). — ANGOLA: *Cavaco* 1267, Lunda, fl. Oct.-Dec. (P, WAG); *Exell & Mendonça* 736, Lunda, fr. Apr. (BM); *Gossweiler*

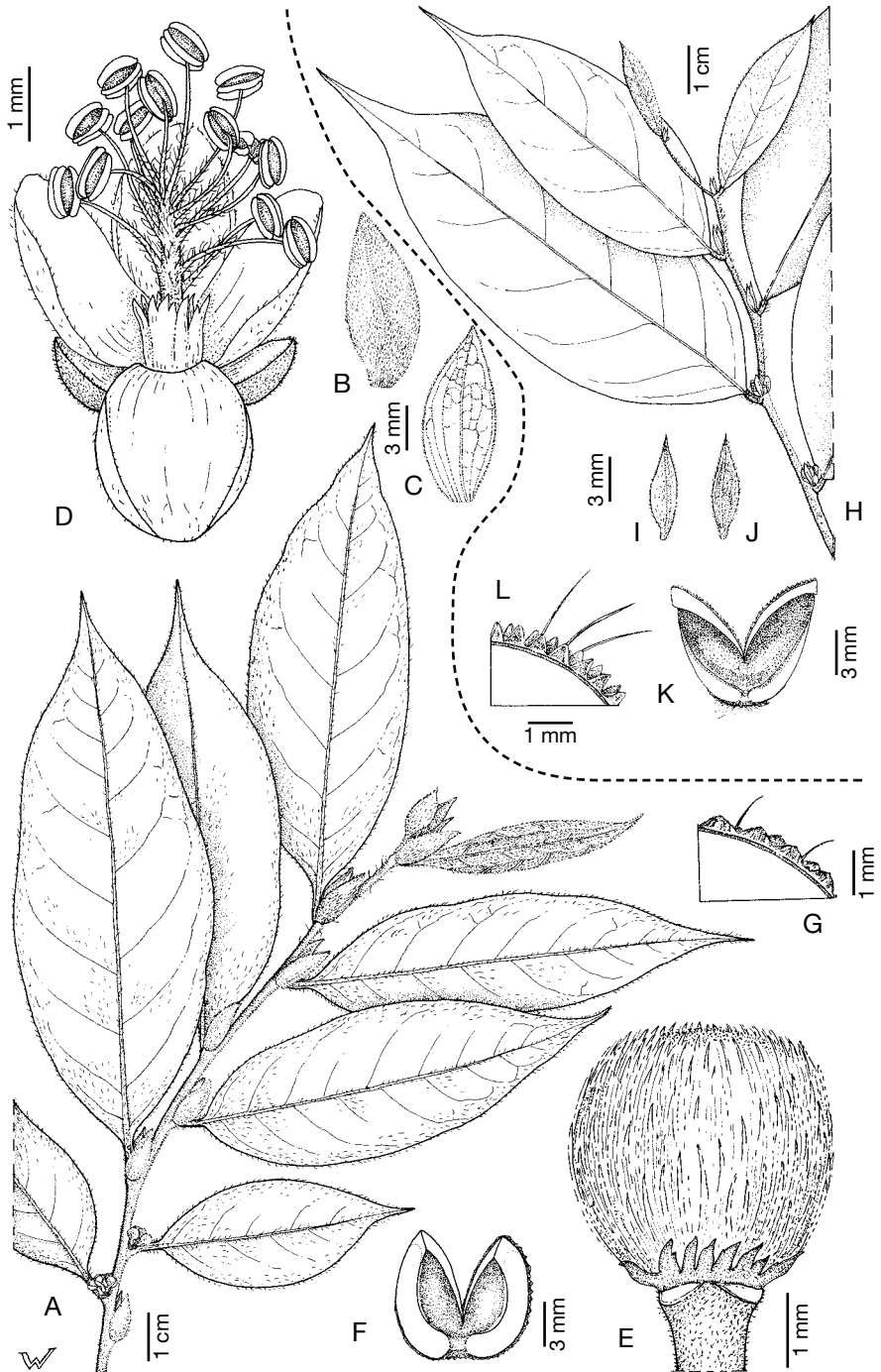


Fig. 1. — *Chaetocarpus gabonensis* Breteler: **A**, branchlet with stipules and flowerbuds; **B,C**, stipule, outside and inside respectively; **D**, ♂ flower; **E**, young fruit; **F**, part of fruit; **G**, detail of fruit wall. — *Chaetocarpus africanus* Pax: **H**, branchlet with stipules and flowerbuds; **I,J**, stipule, outside and inside respectively; **K**, part of fruit; **L**, detail of fruit wall. (A-C, *Breteler c.s. 13026*; D, *Breteler c.s. 15571*; E, *Breteler c.s. 15570*; F-G, *Louis et al. 832*; H-J, *Breteler c.s. 12447*; K-L, *Breteler 6235*). Drawing by W. WESSEL-BRAND.



Fig. 2. — *Chaetocarpus gabonensis* Breteler: fruiting branch of the tree from which the type specimen has been collected. Photograph by F.J. BRETELER.

10577, Sacandica, fr. Dec. (BM); *Gossweiler* 11565, Lunda, fr. Apr. (K); *Gossweiler* 13675, Dundo, fl. Oct. (BM, K, P); *Gossweiler* 13885, Dundo, fl. Nov. (BM, K, P); *Gossweiler* 14056B, Dundo, fl. Mar. (BM, K, P); *Gossweiler* 14056C, Dundo, fr. (BM); *Lynes* 340, Missão, fl. Dec. (BR); *Milne-Redhead* 4242, Moxico, fr. Jan. (BM, BR, K); *Raimundo et al.* 897, Huambo, fl. Aug. (BR); *Soares in Cavaco* 52, Dundo, fl. Dec. (P). — CONGO (Brazzaville): *Charvet* 123, Brazzaville, fr. Feb. (P); *Chevalier* 4041, Brazzaville, fr. July (P); *Chevalier* 5022, between Nigoua and Ngantchou, fl. Aug. (P); *J. de Brazza* 179, piste du Diélé, fr. Oct.-Nov. (P, WAG); *de Neré* 430, Boko, fr. Aug. (P); *Deschamps* 13066, Kouilou, fr. June (BR); *Descoings* 7056, Gaboma, fl.b. June (P); *Descoings* 7468, Makoua, ster. June (P); *Descoings* 9631, 20 km Brazzaville-Foulakari, fl. Feb. (P); *Descoings* 9831, falaises de Douvres, fr. Nov. (P); *Dowsett-Lemaire* 1403, Tchissanga, fl. Dec. (BR); *Farron* 4031, Moutampa, ster. Mar. (P); *Koechlin* 5634, Hinda, ster. Dec. (P); *Sita* 440, forêt de la Patte d'Oie, fr. Oct. (P, WAG); *Thollon* 513, Brazzaville, fr. Nov. (P, WAG); *Thollon* 1281, Loango, fl. Oct. (P); *Vermoesen* 2440, Ngandu-Sedek, fr. June (BR, K, P, WAG). — CONGO (Kinshasa): *Bamps & Malaisse* 8195, Kyamascumba-Kolwezi, fr. Jan. (BR, K); *Bequaert* 826, Kinshasa, fr. Oct. (BR, P); *Breyne* 103, Kimuenza, fr. Mar. (BR, WAG); *Breyne* 4061, Wombe, fl.b. Dec. (BR); *Callens* 1899, Dembo, fr. Nov. (BR); *Callens* 1964bis, Mpese, fl. Dec. (BR); *Claessens* 294, Kole, fr. (BR); *Claessens*

328, Katoko Kombe, fr. Jan. (BR); *Claessens s.n.*, Boma, fr. (BR, P); *Compère* 1359, Kimaza, fl. Jan. (BR); *Dechamps* 10, Kakenge, fr. Feb. (BR, K); *Delvaux* 63, Masondoye, ster. Feb. (BR); *Desenfans* 1813, Sapeza, fr. Feb. (BR); *Devred* 582, Mvuazi, fr. July (BR, WAG); *Devred* 2077, Tono-Feshi-Kwango, fr. June (BR, K, WAG); *Dumont* 128, Mikope, fl., fr. May (BR); *Dumont* 222, Ilebo, fl. May (BR, K, WAG); *Evrard* 4623, Nkinki-Pomandjoku, fr. Aug. (BR, WAG); *Evrard* 4655, piste Yongo-Yenge, fr. Aug. (BR, K); *Flamigni* 6174, Nioki, fr. Feb. (BR); *Flamigni* 6397, Bokebene, fl. Oct. (BR); *Galliez* 179, Elundu, fr. Dec. (BR, K); *Germain* 7627, Katoko Kombe, fr. June (BR, K); *Germain* 7946, Mwene Ditu, fl.b. July (BR, K); *Gilbert* 14582, Ipeke, fl. July (BR, K, WAG); *Gillardin* 215, Bilala, ster. Feb. (BR); *Huart* 80, Malondo, ster. June (BR); *Jans* 809, Bokoro, fl. Oct. (BR, WAG); *Jespersen s.n.*, Watsi, fl.b. Nov. (BR); *E. & M. Laurent s.n.*, Kapinga, fr. Nov. (BR); *Lebrun* 6090, between Kindu and Katoko Kombe, fl. July (BR, K); *Lebrun* 6721, between Mushie and Bolobo, fl. Dec. (BR, K); *Lebrun* 6757 Bolobo, fl.b. Dec. (BR, WAG); *Lejoly* 82/896, Bankana, fl. Dec. (BR); *A. Leonard* 5500, Kitoko, fl.b. Aug. (BR); *Liben* 1763, Badibanga, fr. Oct. (BR); *Liben* 1956, Miabi, fl.b. Nov. (BR); *Liben* 2195, Tshondo, fr. Jan. (BR); *Lisowski* 66707, Kananga, fr. Nov. (BR, WAG), neotype; *Nelis s.n.*, Bokala, fr. June (BR); *Pauwels* 274, Kimvulu, fr. Oct. (BR); *Sapin s.n.*, Tshibangu, fr. Jan. (BR); *Schlechter* 12554, Stanley

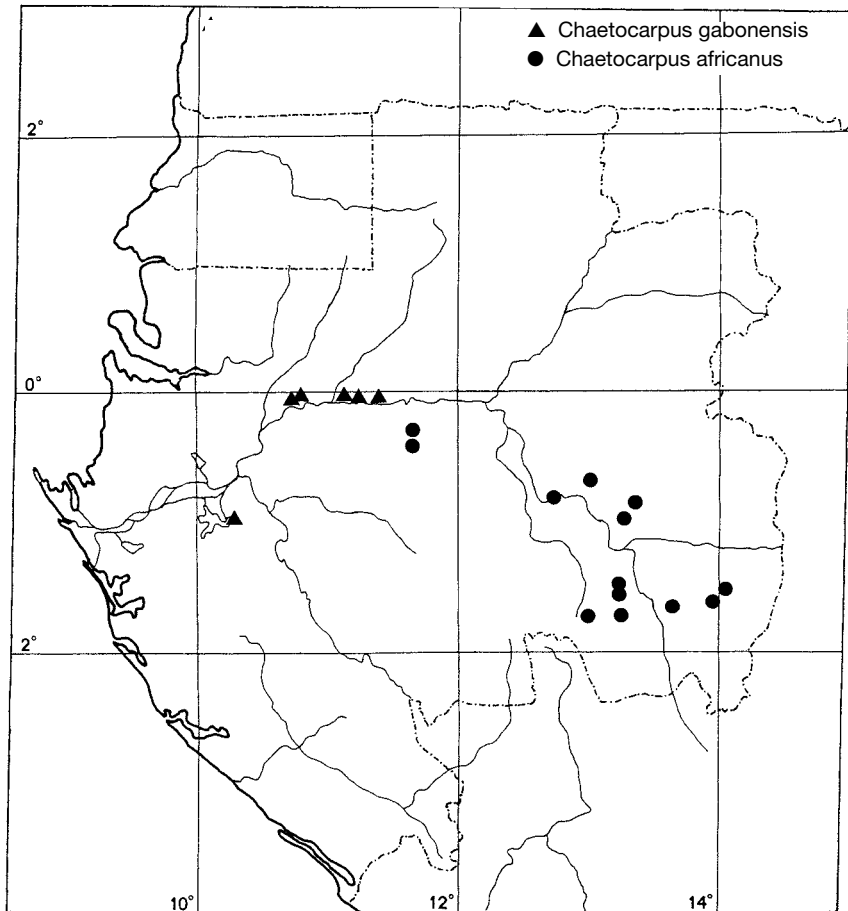


Fig. 3. — Distribution of *Chaetocarpus* in Gabon.

Pool, fl. June (BM, BR, K, P, WAG); *Schmitz* 2649, Dilolo, fr. Jan. (BR); *Toka* 59, Lukolela, ster. May (BR); *Vanderyst* 3094, Kikwit, fl. Jan. (BR); *Vanderyst* 5533, Sanda, fl. June (BR); *Vanderyst* 8578, Ipamu, fr. Jan. (BR); *Vanderyst* 10157, Mpio-Mpio, fr. Aug. (BR); *Vanderyst* 11175, Kamtsha, ster. Nov. (BR, K); *Vanderyst* 16365, Mbau, fl. (BR); *Wagemans* 1441, Boma-Banana, fr. Oct. (BR, K); *Wellens* 249, Kizu, fl. Mar. (BR). — GABON: *Breteler* 6235, km 6 Moanda-Franceville, fr. Sep. (BR, C, K, LBV, MO, P, PRE, SRGH, WAG); *Breteler* 6328, km 5 Moanda-Franceville, fl. Sep. (AAU, B, BR, C, K, LBV, MA, MO, P, PRE, SRGH, WAG); *Breteler & Jongkind* 10709, 30 km E of Lastoursville, fr. Nov. (K, LBV, MO, P, PRE, WAG); *F.J. & B.J.M. Breteler* 12394, 70 km E of Lastoursville, fr. Nov. (G, K, LBV, MA, MO, P, PRE, WAG); *F.J. & B.J.M. Breteler* 12444, 10 km Moanda-Franceville, fl. Dec. (BR, G, K, LBV,

MA, MO, P, PRE, WAG); *F.J. & B.J.M. Breteler* 12447, 15 km Moanda-Franceville, fr. Dec. (G, K, LBV, MO, P, PRE, WAG); *F.J. & B.J.M. Breteler* 12480, near Bakoumba, fl. Dec. (BR, K, LBV, MA, MO, P, WAG); *Breteler* 15826, Ndambi, fl. Apr. (WAG); *J.J. de Wilde et al.* 9920, 7 km SE of Franceville, fr. Dec. (BR, G, K, LBV, MA, MO, P, PRE, WAG); *J.J. de Wilde et al.* 9965, 37 km E of Franceville, fl. Dec. (K, LBV, MO, P, WAG); *J.J. de Wilde et al.* 9970, 37 km E of Franceville, fr. Dec. (LBV, MA, MO, P, WAG); *Dibata* 1109, SSE of Moanda, fr. Aug. (WAG); *Le Testu* 7127, Lastoursville, fl. Apr. (P, WAG); *Le Testu* 7847, Lastoursville, fl. Jan. (BR, P); *Le Testu* 7931, Lastoursville, fl. Feb. (BR, P); *Le Testu* 8539, Lastoursville, fl. Nov. (BR, P, WAG); *A.M. Louis* 1644, km 8 Moanda-Mounana, fr. Nov. (WAG); *A.M. Louis* 3102, 60 km Franceville-Leconi, fl. June

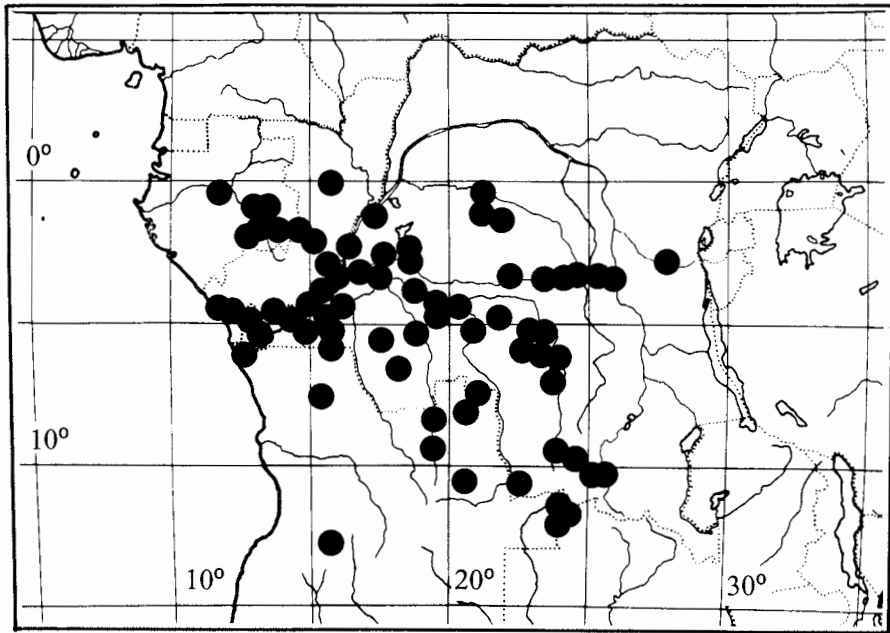


Fig. 4. — Distribution of *Chaetocarpus africanus* Pax.

(LBV); *L. White 1319*, Lopé-Okanda Res., fr. Jan. (WAG); *L. White 1338*, Lopé-Okanda Res., fr. Feb. (LBV). — ZAMBIA: *Angus 510A*, Kalene Mission, fl.b. Sep. (K); *Mutimushi 3154*, Chinyazzi R., fl. May (P); *Mutimushi 3156*, Mwinilunga, fr. May (K); *Richards 16961*, Mujileshi R., fr. Nov. (K); *Robinson 5946*, 6 km N of Kalene Hill, fr. Dec. (K); *Robinson 5951*, 6 km N of Kalene Hill, fl. Dec. (K); *F. White 3322*, N of Kalene Hill Mission, ster. Sep. (K).

NOTES. — The three syntypes on which PAX based his *Chaetocarpus africanus* were lost at Berlin. Duplicate material has not been found, neither at BR nor at K or P. The neotype designated originates from the same area where Pogge collected the numbers 1384 and 1388.

The number of sepals in *Chaetocarpus* is very variable. This variation not only pertains to the differences between male and female flowers of the same species, but is also related to the continent from where the material originates. Based on the number of sepals and continental origin PAX & HOFFMANN (1912) subdivided the genus into three sections, one for the Asiatic species with 4 sepals, one for the American species with 5 sepals, and one for the single African species with

4 sepals in the male and 6-8 in the female flower. Although there is also variation in sepal number in Asia (see below) and America, the greatest variation and the highest number of sepals (9) is found in Africa. VAN WELZEN (1994) considered the, sometimes present, fifth and (rarely) sixth inner sepal in the Asian species to be petal remnants. These inner perianth elements, however, only show a small difference in shape and texture when compared to the most inner of the outer sepals, quite unlike the differences seen between sepals and petals in the related genus *Trigonopleura* (WEBSTER 1994). If VAN WELZEN is followed, the female flower of *C. rabaraba* Capuron from Madagascar with 9 perianth elements, and of *C. africanus* and *C. gabonensis* with 6-8 elements would have to be described as "petals present". In these flowers, however, there is no difference between the perianth elements that justifies a subdivision into sepals and petals. In the two continental African species of *Chaetocarpus*, however, there is a marked difference between the outer two sepals and the other ones, so that LÉONARD (1962) described this phe-

nomenon as “sépalés bisériés, inégaux”. These outer two sepals are considerably smaller (see Fig. 1D and LÉONARD 1962, fig. 8A) and look like two bracteoles. This distinction is not seen in the calyx of the Asian and American species, with 4, respectively with 5 sepals. Are the outer two sepals in these extra-african species homologous with the two bracteole-like sepals in Africa? I suppose so. If these are true bracteoles as well, the *Chaetocarpus* calyx has undergone a considerable reduction in the number of sepals. The higher number of sepals in the female elements of *C. africanus* and *C. gabonensis* may indicate a slower process of sepal loss than is observed in the male elements of the same species. The presence of a fifth and a sixth sepal in *Chaetocarpus castanocarpus* (Roxb.) Thwaites has then little to do with the loss of petals, but with that of sepals.

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REFERENCES

- ALVES M.V. DA SILVA. 1994. — Novas informações sobre *Chaetocarpus* Thwaites (Euphorbiaceae). *Anales Jard. Bot. Madrid* 51: 302-304.
- CAPURON R. 1972. — Sur la présence à Madagascar du *Chaetocarpus* Thw. *Adansonia*, sér. 2, 12: 209-211.
- GOVAERTS R., FRODIN D.G. & RADCLIFFE-SMITH A. 2000. — World checklist and bibliography of Euphorbiaceae 1: 314.
- LÉONARD J. 1962. — Euphorbiaceae: 127, in *Flore du Congo et du Rwanda-Burundi*, VIII, 1. I.N.É.A.C., Bruxelles.
- PAX F. 1894. — Euphorbiaceae Africanae II, in ENGLER A., *Bot. Jahrb. Syst.* 19: 76-127.
- PAX F. & HOFFMANN K. 1912. — Euphorbiaceae-Gelonieae: 7, in ENGLER A., *Das Pflanzenreich* IV. 147. IV, Engelmann, Leipzig.
- PHILCOX D. 1997. — Euphorbiaceae: 177-182, in DASSANAYAKE M.D. & CLAYTON W.D., *Revised Handbook to the Flora of Ceylon* XI. Balkema, Rotterdam.
- RADCLIFFE-SMITH A. 2001. — *Genera Euphorbiacearum*: 116-117. Royal Botanic Gardens, Kew.
- WEBSTER G.L. 1994. — Synopsis of the genera and suprageneric taxa of the Euphorbiaceae. *Ann. Missouri Bot. Gard.* 81: 33-144.
- WELZEN P.C. VAN 1994. — A taxonomic revision of S.E. Asian *Chaetocarpus* Thwaites (Euphorbiaceae). *Rheedea* 4: 93-101.

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