

Novitates Gabonenses 36. *Tetrorchidium* (Euphorbiaceae) in Africa with special reference to Gabon

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ABSTRACT

The African species of *Tetrorchidium* have been studied in order to investigate the report of a corolla present in the female flowers of *T. congolense*. The study revealed that *T. congolense* does not have a corolla but an involucre. The same holds for *T. gabonense* which is described for the first time. *Tetrorchidium tenuifolium* is lectotypified and treated as a synonym of *T. oppositifolium*, which is lectotypified as well. *Tetrorchidium ulugurense* is maintained as a distinct species. A key to the resulting five species is given and their distribution is mapped.

KEY WORDS

Tetrorchidium,
Euphorbiaceae,
involucre,
Gabon.

RÉSUMÉ

Novitates Gabonenses 36. Tetrorchidium (Euphorbiaceae) en Afrique et en particulier au Gabon.

Les espèces africaines du genre *Tetrorchidium* ont été étudiées afin de savoir si une corolle existe chez les fleurs femelles de *T. congolense*. L'étude a révélé que cette espèce n'est pas pourvue d'une corolle, mais d'un involucre, qui est aussi présent chez *T. gabonense*, décrit ici comme espèce nouvelle. *Tetrorchidium tenuifolium* est mis en synonymie de *T. oppositifolium*. Les deux noms sont lectotypifiés. *Tetrorchidium ulugurense* est maintenu comme espèce distincte. Une clé de détermination et des cartes de distribution des cinq espèces sont présentées.

MOTS CLÉS

Tetrorchidium,
Euphorbiaceae,
involucre,
Gabon.

The genus *Tetrorchidium* of the Euphorbiaceae-Crotonoideae has ca. 20 species, 15 in tropical America and 5 in tropical Africa (WEBSTER 1994). The African species are confined to the mainland. Initially the African species were treated as belonging to a different genus *Haskarlia* Baill. (PAX 1914), but were later (PAX & HOFFMANN 1919) transferred to *Tetrorchidium* Poepp. PAX & HOFFMANN recognized 4 species: the widespread *T. didymostemon* (Baill.) Pax & K. Hoffm., the West African *T. minus* (Prain) Pax & K. Hoffm. and *T. oppositifolium* (Pax) Pax & K. Hoffm., and *T. tenuifolium* (Pax & K. Hoffm.) Pax & K. Hoffm. from Cameroun. In 1957 VERDCOURT described *T. ulugurensis* from Tanzania and in 1959 J. LÉONARD added *T. congolense*, occurring in Congo-Brazzaville as well as in Congo-Kinshasa. LÉONARD described the female flowers of his *T. congolense* as having a corolla, a character hitherto not known from any species of the genus. This character was used by him (1962: 134) to separate the two species that occur in Congo-Kinshasa, viz. *T. congolense* and *T. didymostemon*.

The presence of female flowers with a corolla in one species of a genus in view of the lack of this element in all the other species of that genus is strange. A detailed study of *T. congolense* revealed the following. The female flower of *T. congolense* has, outside its inner envelope of 3 elements, the corolla of LÉONARD, a second envelope which is large and 4-8-lobed, the calyx of LÉONARD. In all other species of *Tetrorchidium* the outer envelope is missing and the inner envelope is described as a calyx and looks alike LÉONARD's corolla of *T. congolense*. The outer element, termed calyx by LÉONARD is in fact additional to the normal situation in the female flowers of *Tetrorchidium*. The discovery of a new species of *Tetrorchidium*, named *T. gabonense* and described in this paper, has helped to reveal the

identity of that additional floral element in *T. congolense*.

The female flowers in African *Tetrorchidium* are arranged in dichasia, which are well developed and bear (1-)3-5 flowers in *T. didymostemon*. In the other species, including the new species, *T. gabonense*, the inflorescence is usually single-flowered. From the latter (see Fig. 3: C,G-I) it can be seen that the additional floral envelope is very irregular in appearance. It may be two- to six-lobed and its lobes may be very unequal. It is also possible to conclude that basically this envelope is formed by two almost free lobes. It is not even restricted to the female dichasium as may be deduced from Fig. 3B where a young male catkin is depicted with 2 large bracts at its base.

In conclusion it may be stated that the additional floral envelope or calyx of *T. congolense* is in fact an enlargement of the dichasial bracts and bracteoles which together form an involucre around its single flower and fruit. This is more or less paralleled by the situation in *Carpinus betulus* L. (Corylaceae) where each fruit, 2 per dichasium, is provided with a 3-lobed involucre. This involucre is also formed by an enlargement of the bract and bracteoles of the dichasium. The female flowers of *T. congolense* are thus apetalous.

NOTES.—The leaves on flowering shoots may be opposite (*T. oppositifolium*, *T. ulugurensis*) or alternate (*T. congolense*, *T. didymostemon*, *T. gabonense*). The non-flowering orthotropic shoots are not always collected, but from the latter 3 species it is known that the leaves are, as a rule, opposite. An orthotropic shoot of *T. oppositifolium* (*de Wilde & Leeuwenberg 3593*, WAG) showed alternate leaves, but this may be exceptional.

Male and female flowers may be dioecious, but may also be produced by the same individual, either on the same branch or on different branches.

Key to the species

1. Plants pubescent, at least sparsely so, on branchlets, petioles, and usually also on inflorescences; female inflorescence (unknown in *T. ulugurensis*) usually single-flowered, sessile or nearly so; stigma distinctly lobed 2
- 1'. Plants entirely glabrous (sepals excepted); female flowers usually in distinctly stalked, (1-)3-5-flowered dichasia; stigma cap-shaped, entire or lobulate ***T. didymostemon***

- 2. Female flowers and fruits subtended by enlarged bracts forming an 2-8-lobed involucre; leaves on flowering shoots usually alternate; seeds alveolate or tuberculate 3
- 2'. Female flowers and fruits (where known) not subtended by enlarged bracts; leaves on flowering shoots usually (sub) opposite; seeds (where known) alveolate 4
- 3. Rhachis of the male inflorescence glabrous; sepals of the female flower glabrous inside; seeds alveolate **T. gabonense**
- 3'. Rhachis of the male inflorescence hairy; sepals of the female flower hairy inside; seeds tuberculate **T. congolense**
- 4. Plant from West- and western Central Africa **T. oppositifolium**
- 4'. Plant from eastern Tanzania **T. ulugurense**

Tetrorchidium congolense J. Léonard

Bull. Rijksplantentuin Bruss. 29: 197 (1959); Fl. Congo & Rwanda-Burundi 8 (1): 138 (1962).—Type: *Claessens 675*, Congo (Kinshasa), Ikenge, ♂ (holo-, BR).—Fig. 1, see note.

SPECIMENS EXAMINED.—Var. *congolense*.—CONGO (Brazzaville): *Bouquet 1858*, Kingani, fr. Oct. (P); *Bouquet & Sita 2310*, Makaga, ♂ fr. Jan. (BR); *F. Hallé 1525*, Mayombe, ♀ Nov. (P); *Koechlin 5251*, between Mababana and Banza Dounga, ♂ ♀ Sep. (P); *Sita 2657*, Taba-Mandzakala Rd., ♂ Oct. (BR); *Sita 5352*, Mousengani, fr. Dec. (BR).—CONGO (Kinshasa): *Bequaert 6865*, Lubutu-Kirundu, ♂ Feb. (BR); *Callens 2732*, Kingundu, ♀ fr. Jan. (BR); *Callens 2851*, Zongo, ♂ Sep. (BR); *Callens 2971*,

Gombe Matadi, ♀ Jan. (BR); *Callens 4525*, Zongo, fr. Feb. (BR); *4526*, ♂ Feb. (BR); *Casier 450*, ♂ May (BR); *Claessens 291*, Kole, ♂ Oct. (BR); *Claessens 675*, Ikenge, ♂ (BR); *Devred 3571*, Kiyaka, ♂ Mar. (WAG); *Evrard 2866*, Emengeye, ♀ fr. Oct. (BR); *Evrard 4628*, Nkinki-Pomandjoku, ♂ Aug. (BR); *Evrard 5161*, Yalikungu-Yongo, ♂ ♀ fr. Nov. (BR); *Evrard 5658*, Bokota-Boseka, ♂ Feb. (BR); *5659*, ♀ fr. Feb. (BR); *Flamigny 6241*, Popompo, ♂ Oct. (BR); *Gillet s.n.*, Kinshasa, ♂ Aug. (BR); *Liben 3489*, Miao R., ♂ Aug. (BR); *A. Léonard 3754*, Bulumbu, ♂ Apr. (BR, WAG); *A. Léonard 3776bis*, ♂ Apr. (BR); *Louis 14175*, Opala ♂ Feb. (BR); *Pauwels 5854*, Manenga, ♂ Apr. (BR, WAG); *Pauwels 6060*, Zenge, fr. Dec. (BR); *Robin 8*, Brooke, ♀ May (BR); *Vanderyst 5545*, Sanda, ♂ June (BR); *Vanderyst 14688*, Kimayala, ♂ Apr. (BR).—GABON: *Breteler*

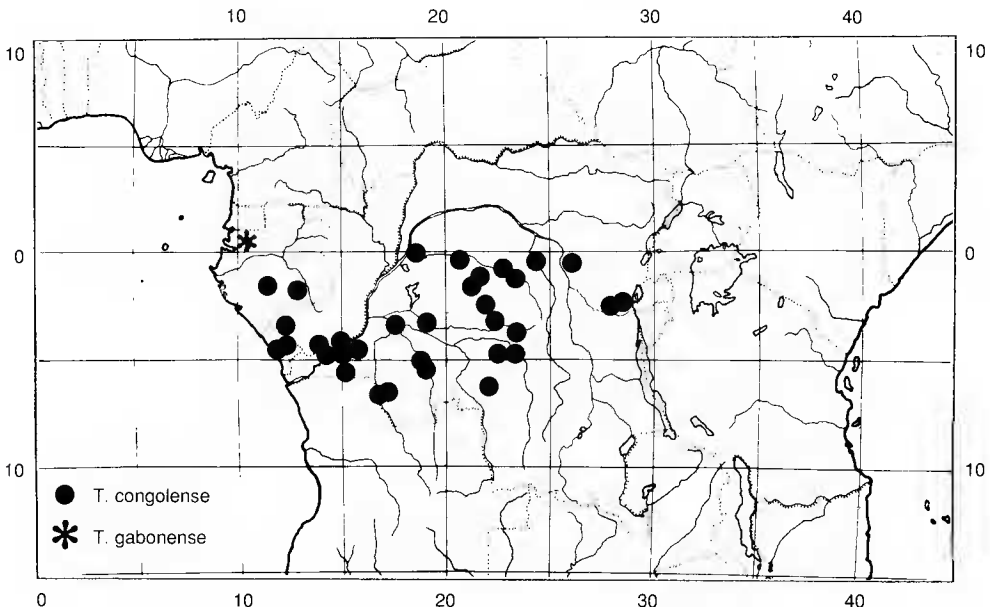


Fig. 1.—Distribution of *Tetrorchidium congolense* J. Léonard and *T. gabonense* Breteler.

6734, km 30 Moanda-Bakoumba, ♂ fr. Oct. (WAG); *N. Hallé & Cours* 6147, Mimongo, ♂ May (P); *Louis* 1640, km 8 Moanda-Mounana, ♀ fr. Nov. (WAG).—Var. *lenifolium* J. Léonard.—CONGO (Brazzaville): *de Foresta* 987, Dimonika, ♂ May (P); *Sita* 1071, Dzeba, ♂ ♀ Sep. (BR, P).—CONGO (Kinshasa): *Callens* 3551, Pelende, ♂ Feb. (BR); *Devred* 2594, Kiyaka, ♂ Sep. (BR); 2855, ♀ Mar. (BR); 3571, ♂ Mar. (BR); *Evrard* 2797, Isandja, ♂ Oct. (BR); *Evrard* 5161bis, Yalikunga-Yongo, ♀ Nov. (BR); *Evrard* 5314, Ikela, ♂ Dec. (BR); *Germain* 7550, Okota, ♂ June (BR); *Gorbatoff* 164, Boende, ♂ Oct. (BR); *Hulstaert* 1308, Ikela, ♂ June (BR); *Jans* 1079, Taketa, ♂ Sep. (BR); *E. & M. Laurent s.n.*, Kondue, ♂ Nov. (BR); *A. Léonard* 3776, Nyangoma, ♂ Apr. (BR); *A. Léonard* 5150, Nzovu, ♂ fr. juv. (BR, WAG); *Renier* 45B, Kikwit, ♂ May (BR).

NOTE.—The two varieties created by LÉONARD have been maintained, at least as far as "Specimens examined" is concerned. They have not been mapped as distinct entities for two reasons. The first is that both varieties have rather often been collected in the same locality and sometimes even under the same number, which made splitting necessary: *Evrard* 5161 var. *congolense*, 5161bis var. *lenifolium*; *A. Léonard* 3776 var. *lenifolium*, 3776bis var. *congolense*. The second is that more collections and/or detailed field studies will most probably reveal interme-

diates between these two varieties. The following collections, identified by LÉONARD as var. *lenifolium* already demonstrate in my opinion the weakness of this separation: *Callens* 3551, *Devred* 3571, *Evrard* 5314, and *Renier* 45B.

***Tetrorchidium didymostemon* (Baill.) Pax & K. Hoffm.**

In Engl., *Pflanzenr.* IV, 147, XIV, Euph. addit. VI: 53 (1919); Keay in Hutch. & Dalz., *Fl. W. Trop. Afr.*, ed. 2, I, 2: 414 (1958); Léonard, *Fl. Congo & Rwanda-Burundi* 8 (1): 134 (1962); Radcliffe-Smith, *Fl. Trop. E. Afr.*, Euphorb.: 374 (1987).—*Hasskarlia didymostemon* Baill., *Adansonia* 1: 52 (1860).—Type: *Heudelot* 835, Guinea, Fouta Djallon, ♂ ♀ Apr.-May (holo-, P).

T. minus (Prain) Pax & K. Hoffm., *Engl. Pflanzenr.* IV, 147, XIV, Euph. addit. VI: 53 (1919); Keay in Hutch. & Dalz., *Fl. W. Trop. Afr.*, ed. 2, I (2): 414 (1958).—*Hasskarlia minor* Prain, *Kew Bull.* 1912: 234 (1912).—Type: *Scott Elliot* 5680, Sierra Leone, Limba, near Bendembu, ♂ Apr. (holo-, K).

SPECIMENS EXAMINED (selection).—ANGOLA: *Gossweiler* 6602, Buco Zau, ♀ Aug. (BM); *Welwitsch* 357, Golungo Alto, fr. Feb. (BM, P).—CAMEROUN: *Adebusuyi* FHI 44042, Kumba, ♀ fr. May (K, WAG); *Bos* 4531, 9 km N of Kribi, ♂ May (BR, K, P, WAG); *Breteler* 1518, Yokadouma, fr. June (BR, K, P, WAG); *Breteler* 1884, 40 km W of Bertoua, ♂

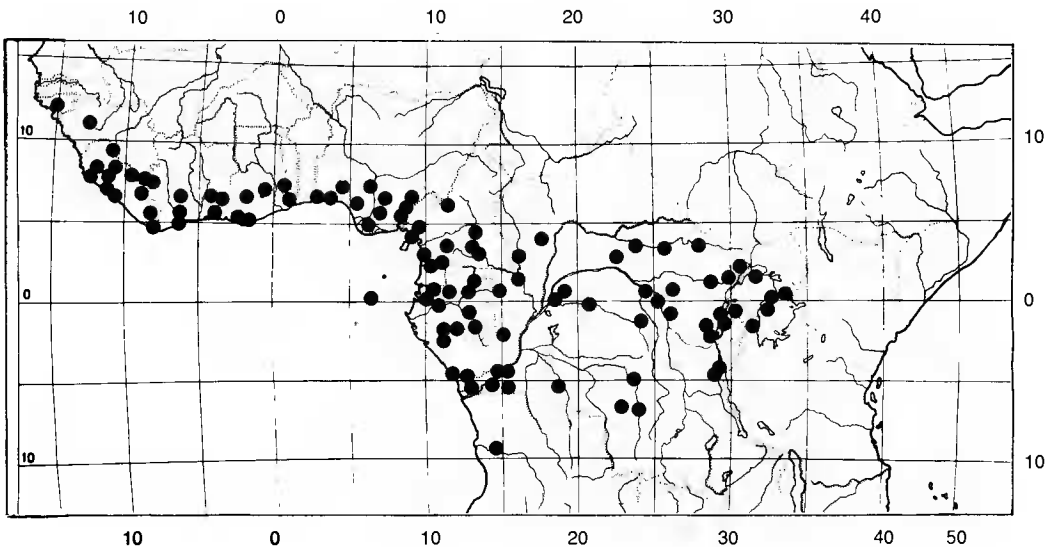


Fig. 2.—Distribution of *Tetrorchidium didymostemon* (Baill.) Pax & K. Hoffm.

Sep. (BR, K, P, WAG); *J.J. de Wilde* 7582, Nkoemvone, ♂ Sep. (BR, K, WAG); *W. de Wilde* 1887, 5 km S of Mbalmayo, fr. Feb. (BR, K, P, WAG); *Fleury in Chevalier* 33316, Douala, fr. June (P); *Letouzey* 8767, Kimi-Bankim, fr. July (BR, P); *Lowe* 3151, 22 km E of Lomie, fr. Feb. (K); *Maitland* 140, Victoria (=Limbe), ♀ Apr. (K); *Nkongmeneck* 434, Nyabessan, fr. Dec. (P).—CENTRAL AFRICAN REPUBLIC: *Harris* 2296, E of Banyanga, May (K); *Equipe Tisserant* 1791, Boukoko, fr. June (BM, BR, P); *Tisserant* 3678, Bozoum, ♀ Feb. (P).—CONGO (Brazzaville): *Bouquet* 396, Mbamou, ♂ Aug. (P); *Bouquet* 935, Komono, fr. Jan. (P); *Descoings* 7030, Alima-Lefini, ♂ June (P); *Dowsett-Lemaire* 1761, Odzala, fr. Aug. (BR); *de Foresta* 852, Diosso, ster. Mar. (P); *Grison RC* 913, Ouesso, ster. May (P).—CONGO (Kinshasa): *Amsini* 45, Epulu, fr. Nov. (BR); *Bamps* 659, Yangambi, ♀ Aug. (BR, WAG); *Billet & Jardin* 4065, fr. Feb. (BR); *Bredo* 1004, ♂ Apr. (BR); *Claessens* 281, ♀ Mar. (BR); *Corbisier Baland* 1342, ♂ (BR, K, P, WAG); *Devillé* 433, ♂ June (BR, K); *Devred* 2743, ♂ Oct. (BR, K, WAG); *Devred* 3122, Luki, ♀ Feb. (BR, K); *Dubois* 427, Thsuapa, ♂ June (BR); *Evrard* 6666, Kimuenza, ♀ Dec. (BR); *Gillardin* 426, Mumba, ♂ (BR, K, P); *Gillardin* 445, Sangala, ♂ (BR, K); *Gutzwiller* 2496, Bunyakiri, ♀ fr. Jan. (BR, K); *Lejoly* 1276, km 58 Kisangani-Ubundu, ♂ Apr. (BR); *Lejoly* 81/587, km 176 Kisangani-Lubutu, fr. Dec. (BR); *J. Léonard* 530, Mondjo, ♂ Sep. (BR, WAG); *Liben* 2326, Dibaya, ♀ Jan. (BR, K, WAG); *Lisowski* 41387, Mt. Hoyoy, fr. Aug. (BR); *Lisowski* 43267, Lifera, ♂ Nov. (K); *Michelson* 608, Lolemba-Ngoma, fr. May (BR); *Mortehan* 737, Dundusana, ♂ Nov. (BR, P); *Pierlot* 966, 215 km Kavumu-Walikale, ♂ Aug. (BR); *Pierlot* 3018, Kisharo, ♂ June (BR, K, WAG); *Risopoulos* 699, Gandajika, ♂ Feb. (BR); *Steyaert* 79, Dingba, ♀ fr. (BR); *Van de Brande* 561, La Kulu, ♂ (BR); *Vanderyst* 13869, Lemfu, fr. Nov. (BR).—CÔTE D'IVOIRE: *Aubréville* 2087, Danané, fr. Dec. (P); *Bernardi* 8705, Yapo Nord, ♀ Mar. (K, P, WAG); *Breteler* 5896, km 83 Gagnoa-Sassandra, ♂ Nov. (BR, WAG); *Chevalier* 15321, Bingerville, fr. (BM, BR, K, P); *W. de Wilde* 238, 16 km NW Sassandra, ♂ June (BR, K, P, WAG); *Leeuwenberg* 2414, 64 km N of Sassandra, fr. Jan. (BR, K, WAG).—GABON: *Aubréville* 158, Mouila, Sep. (P); *Breteler* 6291, km 6 Moanda-Franceville, fr. Sep. (BR, WAG); *Breteler & Lemmens* 8270, 20 km N of Kango, ♂ Sep. (BR, P, WAG); *Breteler et al.* 8804, E of Saint Germain, ♀ Apr. (WAG); *Breteler & Jongkind* 10648, 30 km E of Lastoursville, ♀ Nov. (WAG); *J.J. de Wilde et al.* 352, Mouyanama, fr. Feb. (BR, P, WAG); *J.J. de Wilde et al.* 10145, km 15 Tchimbélé-Assok, ♀ fr. Jan. (WAG); *Florence* 1457, Ipassa, fr. June (P); *Gentry* 33572, Bélinga, fr. July (WAG); *N. Hallé* 1934, 10 km SW Ndjolé, ♂ Apr. (P); *Louis & Wagner* 1929, Ebomame, ♂ Oct. (WAG).—GHANA: *Beveridge* 106, Kwahu Tafo, ♂ Apr. (BM); *Darko* 728, Kwadaso, ♂

Oct. (BR, K); *Deaw Sp* 460, Prestea, ♂ ♀ fr. Dec. (WAG); *Hall* 1689, Elmina, ♀ Dec. (K); *Harder et al.* 2925, Argumatsa, ♀ fr. June (BR).—GUINEA: *Heudelot* 835, Fouta Djallon, ♂ ♀ Apr.-May (P).—GUINEA-BISSAU: *Espirito Santo* 2237, Empada, fr. Dec. (BR, P).—LIBERIA: *Adam* 20469, Nimba, fr. Jan. (K); *Bos* 1839, Duport, ♂ ♀ Mar. (BR, WAG); *Bos* 2124, Zorzor, ♂ July (BR, WAG); *Bos* 2639, Tapeta, ♂ Jan. (BR, K, WAG); *Jansen* 1766, Robertsport, ♀ fr. Jan. (BR, WAG); *Jansen* 2394, Harper, fr. July (BR, WAG).—NIGERIA: *Bimuyo FHI* 45433, Oban Group F.R., fr. Nov. (K, P); *Brenan* 8400, Okumu F.R., ♀ Dec. (BM, K, P); *Emwiogbon & Amyandiegwu FHI* 72906, Awka, ♂ Mar. (K, WAG); *Irvine* 3613, Enugu, fr. Mar. (K); *Jones & Onochie FHI* 14714, Okeigbo, Feb. (BM, K); *Onochie FHI* 40278, Ejirinrin, ♂ Oct. (K); *Talbot* 3795, Degema (K); *van Meer* 827, Shasha F.R., ♀ July (BR, WAG); *van Meer* 1689, Cross R. North F.R., fr. May (WAG).—SAO TOMÉ: *Espirito Santo* 99, Roça Amelia, ♂ Jan. (BM, BR).—SIERRA LEONE: *Dalziel* 960, Freetown, ♂ Mar. (K, P); *Deighton* 383, Zimmi, ♂ Nov. (BM, K); *Deighton* 634, Njala (BM, K); *Deighton* 3205, Bwedu, ♀ Apr. (K); *Jaeger* 9020, Loma Mt., fr. May (BR, K).—TANZANIA: *Bancroft* 180, Bukoba, May (K).—TOGO: *Hakki et al.* 601, 7 km N of Badou, fr. Apr. (K); *Hiepko & Schultze-Motel* 135, Klouto, fr. Sep. (K, P).—UGANDA: *Bagshawe* 661, Buvuma I., ♂ Mar. (BM); *Chandler* 1560, Kitabe, ♂ Jan. (BR); *Dawkins* 872, Nkose I., ♀ Jan. (BM); *Osmaton* 2774, Igaro, Jan. (K); *Sheil* 1735, Budongo Forest (K).

Tetrorchidium gabonense Breteler, sp. nov.

T. congolense J. Léonard *affinis*, *axibus inflorescentiis* ♂ *glabris*, *sepalis intibus glabris*, *semen alveolatum*, *differt*.

TYPUS.—*Breteler*, *Nzabi & Wieringa* 12904, Gabon, Tchimbélé, ♂ ♀ Sep. (holo-, WAG; iso-, BR, K, MO, P).

Shrub up to 2 m tall. Branchlets sparsely hairy, glabrescent, with a colourless, slimy exudate. Stipules often glandular or gland-like, subdeltoïd, ≤ 1 mm long, appressed-hairy. Leaves on flowering shoots alternate, opposite on the orthotropic non-flowering shoots; petiole ± semiterete, (2-)4-10(-12) mm long, appressed-puberulous beneath, glabrescent or not; lamina herbaceous to coriaceous (papery when dry), narrowly elliptic, 2.5-4(-6) times as long as wide, (9)10-16(-20) × 2-6(-7) cm, cuneate at base, abruptly or gradually acutely acuminate at apex,

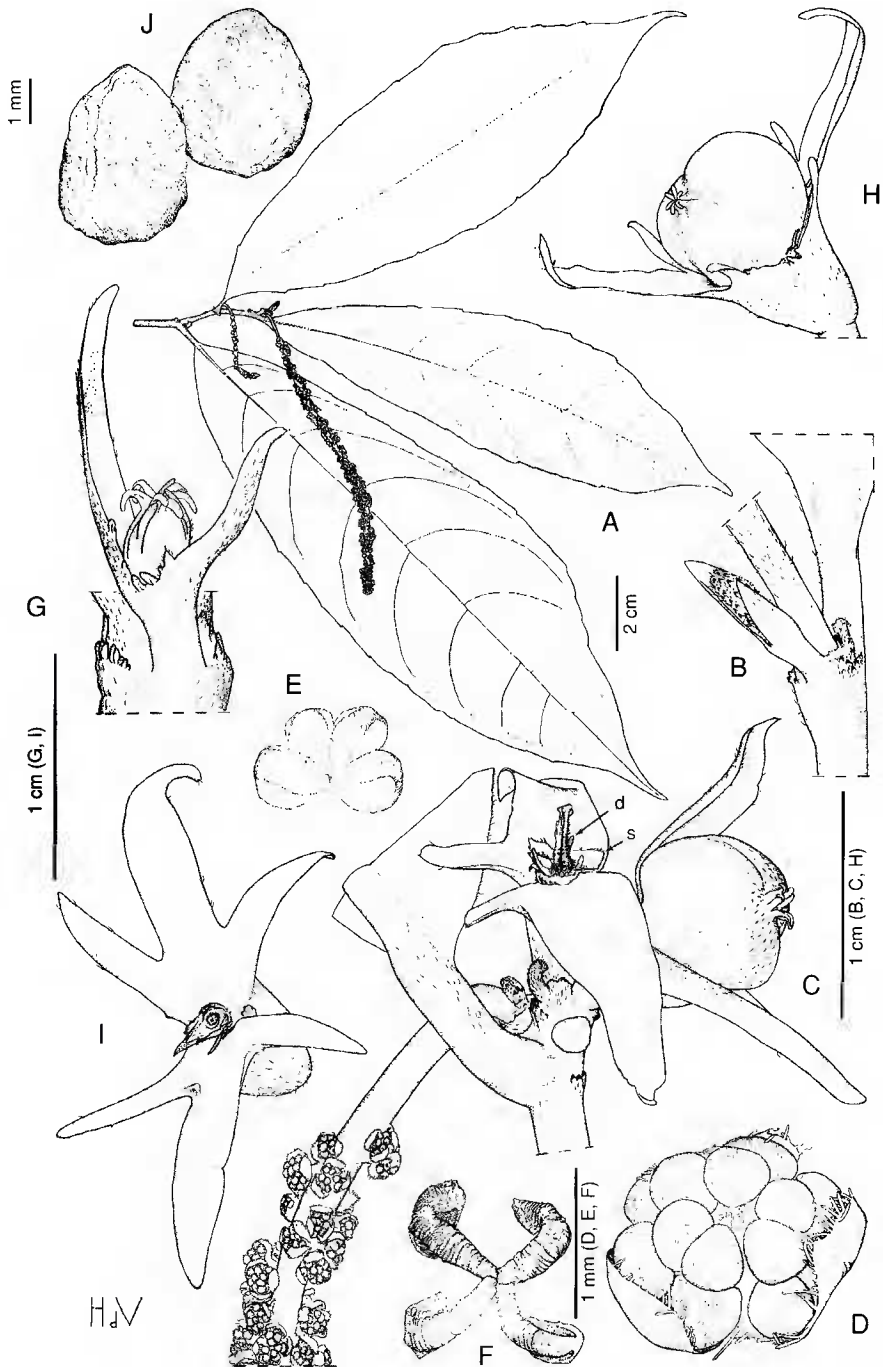


Fig. 3.—*Tetrorchidium gabonense* Breteler: **A**, branchlet with male inflorescences; **B**, leaf axil with young male catkin with 2 bracts at its base; **C**, 3-noded apical part of branchlet with male inflorescence, young fruit, and fruit remnant (columella), (s = sepal, d = disc lobe); **D**, male flower with closed anthers; **E**, closed anther; **F**, open anther; **G**, female flower with involucre; **H**, fruit with involucre; **I**, involucre without fruit; **J**, seeds. (A-I, Breteler et al. 12904; J, Breteler & de Wilde 378). Drawing by H. DE VRIES.

the acumen 0.5-2 cm long, the margin shallowly lobate-undulate to remotely dentate, glabrous to more or less appressed-puberulous beneath and on the margin, glabrescent; midrib prominent both sides, the (5-)6-8(-12) main laterals often indistinct, plane or slightly prominent. Male inflorescence leaf-opposed, often drooping catkin, up to 10 cm long, the peduncle up to 10 mm long, bracteate or not, sparsely appressed puberulous, the rhachis glabrous; bracts subtriangular, ≤ 1 mm long, with hairy margin and often hairy outside. Male flowers sessile, 1-5 together; sepals largely ovate to broadly elliptic, concave, up to ca. 1 mm across, margin and usually outside hairy, inside glabrous; stamens subsessile; pistillode distinctly shorter than the full-grown stamens, lobed, glabrous. Female flowers single, sessile, subtended by an involucre; sepals broadly ovate to deltoid, appressed, ± 1.5 mm long, with lobulate-ciliate margin, glabrous inside; disc 3-lobed, lobes narrowly triangular, \pm as long as ovary; pistil sessile, ovary 2 mm long, sparsely appressed-puberulous, shallowly 3-lobed, stigma sessile, 6-lobed, up to 1 mm long. Involucre basically 2 lobed, up to 1.5 cm long in fruit, shorter in flower, with up to 3 mm long stipe, the 2 lobes entire or variously lobed, sparsely hairy outside, glabrous inside. Fruit sub-

globose in outline, 3-lobed, 5-7 mm diam., sparsely subappressed-hairy to glabrous, dehiscent. Seed subellipsoid, alveolate, $3.5-4 \times$ ca. 3 mm, glossy glabrous.—Figs. 1, 3.

HABITAT.—Primary rain forest, alt. ca. 600 m.

PARATYPES.—GABON: *Breteler & de Wilde 378*, 13 km Assok-Tchimbélé Rd., δ η fr. Aug. (BR, K, P, WAG); *J.J. de Wilde et al. 10028*, Tchimbélé, δ Dec. (BR, LBV, MO, P, WAG); *N. Hallé & Villiers 14436*, chutes de Kinguélé, δ η fr. Jan. (P); *Wieringa 333*, Tchimbélé, δ Dec. (WAG); *Wieringa 746*, 1 km S of Tchimbélé, δ η Apr. (BR, K, MO, P, WAG).

***Tetrorchidium oppositifolium* (Pax) Pax & K. Hoffm.**

In Engl., *Pflanzenr.* IV, 147, XIV, *Euph. addit.* VI: 53 (1919); Keay in Hutch. & Dalz., *Fl. W. Trop. Afr.*, ed. 2: 414 (1958).—*Hasskarlia oppositifolia* Pax, *Bot. Jahrb. Syst.* 43: 81 (1909).—Type: *Dinklage 2213*, Liberia, Monrovia, δ May (holo-, B \dagger). Neotype (chosen here): *Voorhoeve 464*, Liberia, Monrovia, δ Sep. (WAG).—Fig. 4.
Tetrorchidium tenuifolium (Pax & K. Hoffm.) Pax & K. Hoffm., in Engl., *Pflanzenr.* IV, 147, XIV, *Euph. addit.* VI: 53 (1919).—*Hasskarlia tenuifolia* Pax & K. Hoffm., *Bot. Jahrb. Syst.* 45: 238 (1910).—Type: *Ledermann 1068*, Cameroun, near Yabassi, δ η Nov. (holo-, B \dagger). Neotype (chosen here):

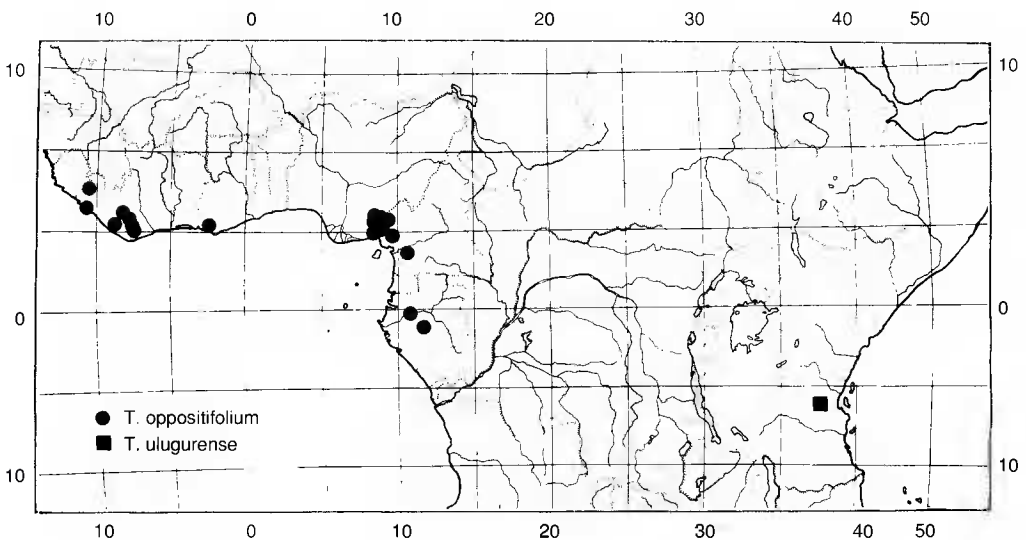


Fig. 4.—Distribution of *Tetrorchidium oppositifolium* (Pax) Pax & K. Hoffm. and *T. ulugurense* Verdc.

Leeuwenberg 9900, Cameroun, km 11 Loum-Solé, ♂ ♀ May (WAG; iso-, BR, MO, P, PRE, UPS, YA).

SPECIMENS EXAMINED.—CAMEROUN: *Leeuwenberg* 9900, km 11 Loum-Solé, ♂ ♀ May (BR, P, WAG); *Letouzey* 11179, 20 km SW Nkondjok, ♂ Feb. (K, P, WAG); *Letouzey* 13535, 35 km W Mamfé, ♂ May (BR, K, P, WAG); *Manning* 994, 10 km SE Mundembe, ♂ Nov. (K, WAG); *Onochie FHI 32051*, Mamfé, Kembong F.R. Mar. (K); *Thomas 2167A*, 2167B, Mana (Ndian) R., ♂ fr. June (P); *Thomas 2664*, Mana (Ndian) R., ♂ Dec. (K, P); *Thomas 3256*, between Bulu and Dibunda, ♂ Mar. (BR, K, P); *Thomas 9975*, Korup Nat. Park, ♂ Feb. (BR); *Thomas et al. 7511*, Korup Nat. Park, ♂ Apr. (BR, K, WAG).—CÔTE D'IVOIRE: *Breteler 13381*, Mt. Kopé, ♂ Apr. (WAG); *Chevalier 19695*, Mt. Kopé, ♂ Jul. (P); *de Wilde & Leeuwenberg 3593*, 109 km N of Tabou, ♂ Mar. (BR, K, P, WAG); *Guillaumet 1836*, Mt. Kopé, ♂ Apr. (BR).—GABON: *Louis et al. 587*, Achouka, ♂ Nov. (BR, WAG); *Thollon 714*, Ile de Ndjolé, ♂ Jan. (BR, P).—GHANA: *Hall & Enti GC 36232*, Ankassa F.R., ♂ Dec. (K).—LIBERIA: *Baldwin 6108*, Webo, ♂ Jun. (K); *Baldwin 11450*, Jaurazon, ♂ Apr. (K); *Bos 2871*, Tchien, ♀ Jan. (BR, K, P, WAG); *Jansen 1293*, 16 km Tchien-Cape Palmas, ♂ Jan. (BR, WAG); *Jansen 1294*, 16 km Tchien-Cape Palmas, fr. Jan. (WAG); *Jansen 2256*, 8 km N Bomi Hills, ♂ Nov. (WAG); *Linder 1377*, Moala, ♂ Nov. (K); *Voorhoeve 464*, Monrovia, ♂ Sep. (WAG); *Whyte s.n.*, Sinoe Basin, ♂ (K).—NIGERIA: *Brenan 9233*, Kwa Falls, ♂ Mar. (BM, BR, K, P); *Darter FHI 44352*, Calabar R., Oct. (K); *Latilo FHI 40904*, Calabar R., Mar. (K); *Talbot 617*, Oban, ♂ (BM); *Talbot 640*, Oban, ♂ (BM, K); *Talbot 664*, Oban, ♂ (BM, K); *Talbot s.n.*, Oban, ♂ (BM, K, P); *van Meer 1707*, Cross R. North F.R., ♂ May (WAG); *van Meer 1708*, Cross R. North F.R., fr. May (WAG).

NOTES.—The original material of both names *H. oppositifolia* and *H. tenuifolia* has been lost at Berlin and duplicate material has not been found. The neotypes have been selected taking into account the collecting locality as well as the quality (♂, ♀) of the original material.

The original description of *H. tenuifolia* fits *T. oppositifolium* in all essential details. All material collected in the area where *H. tenuifolia* was collected is easily recognized as belonging to *T. oppositifolium* or to *T. didymostemon*.

***Tetrorchidium ulugurense* Verdc.**

Kew Bull. 12: 347 (1957); Radcliffe-Smith, Fl.

Trop. E. Afr., Euph.: 376 (1987).—Type: *Semsei 1435*, Tanzania, Mtibwa F.R., ♂ Nov. (holo-, EA, n.v.; iso-, BR, K).—Fig. 4.

SPECIMENS EXAMINED.—TANZANIA: *Paulo 199*, Turiani, ♂ Nov. (BR, K); *Semsei 1424*, Turiani, ♂ Nov. (BR, K); *Semsei 1435*, Mtibwa F.R., ♂ Nov. (BR, K).

NOTE.—RADCLIFFE-SMITH (l.c.) stated that *T. ulugurense* comes very close to *T. tenuifolium* which, in this paper, is treated as a synonym of *T. oppositifolium*. Although both species are indeed very close, it is preferred to maintain *T. ulugurense* distinct from *T. oppositifolium* at least as long as the female flowers and fruits of the former are unknown, especially as there is a wide distribution gap between these two species.

Note on the geography of African *Tetrorchidium*

Tetrorchidium didymostemon is widespread in tropical Africa from Guinea eastwards to western Tanzania and South to Angola. The species is found in secondary vegetation and is rather well collected. Second in area of distribution, but very disjunct, comes *T. oppositifolium* ranging from Liberia to Gabon. Its distribution resembles that of *Keayodendron bridelioides* Léandri (BRETILER 1993) with one main difference, that this species occurs in semi-deciduous forest whereas *T. oppositifolium* seems to prefer the wetter, evergreen forest. The distribution of *T. congolense* has its northwestern limit in Gabon and *T. gabonense* is confined to this country. With 4 out of 5 species present, Gabon is, once more, the most species-diverse of all African countries.

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