

Revision of the African genus *Isomacrolobium* (Leguminosae, Caesalpinioideae)

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Background and aims – The African genus *Isomacrolobium* (Leguminosae, Caesalpinioideae) is poorly known. Its species are revised.

Methods – Normal practices of herbarium taxonomy have been applied to study all herbarium material available, mainly at BM, BR, COI, FHO, G, K, LBV, MA, MO, OXF, P, WAG, and YA.

Key results – Twelve species are recognised, including one new one: *I. brachyrhachis* from Gabon. All the species are confined to the Guineo-Congolian region. A full taxonomic treatment with key to the species is given. The new species is fully illustrated. The fruits, known of nine species, are illustrated as well. Distribution maps of all taxa are provided. *Macrolobium ernae*, a synonym of *I. obanense*, is neotypified. For *I. graciliflorum* and *I. leptorrhachis* a lectotype is designated.

Key words – *Isomacrolobium*, Caesalpinioideae, Leguminosae, taxonomy, one new species, tropical Africa.

INTRODUCTION

In the framework of the taxonomic study of the African Leguminosae, Caesalpinioideae, the revision of *Isomacrolobium*, here presented, follows that of *Anthonotha* (Breteler 2010). *Isomacrolobium* was described by Aubréville & Pellegrin in 1958 to accommodate eleven aberrant *Anthonotha* species that were classified by Léonard (1957) in three sections of that genus. A fourth section *Triplisomere*, also of Léonard, with three aberrant species, was simultaneously raised to generic rank by the same authors. Two species of *Isomacrolobium* were later transferred to *Englerodendron* (Breteler 2006). In a recent publication (Breteler 2008) the present author united the remaining species of *Isomacrolobium* with those of *Triplisomeris* under the former name and confirmed the generic status of *Isomacrolobium*, distinct from *Anthonotha*.

The revision of *Isomacrolobium* was, for several species, hampered by the small number of available specimens, inflicting incomplete species descriptions, e.g. by the lack of fruits, or descriptions that are based on a very restricted number of specimens. *Isomacrolobium brachyrhachis* and *I. lebrunii* are only known from the type, and *I. sargosii* from two collections only. *Isomacrolobium vignei* is in fact the only species that may be classified as well known.

RESULTS

Chorology

The twelve species of *Isomacrolobium* are confined to the Guineo-Congolian region (White 1979). *Isomacrolobium obanense* is the only species that occurs in all three subdivisions of this region, the other species are restricted to one or two subcentres. Lower Guinea is most diverse with the presence of nine species, six of which are endemic to this subdivision. Of these endemics three *Isomacrolobium brachyrhachis*, *I. hallei* and *I. triplisomere* are confined to Gabon. In Upper Guinea three species are present of which two are endemic, and in Congolia four including one endemic. The distribution of some species, e.g. *Isomacrolobium graciliflorum*, *I. nigericum*, and *I. obanense*, is very disjunct, which may reflect the actual state of insufficient exploration, or may be due to climatic conditions.

Morphology

The bracteole character that was used for the separation of *Anthonotha* species (Breteler 2010), whether with a hairy or with a (partly) glabrous edge, is not reliable for the distinction of species in *Isomacrolobium*. On the other hand the

Key to the species of *Isomacrolobium*

1. Leaf rachis winged, at least below the attachment of the leaflets; Cameroon.....7 *I. leptorrhachis*
1. Leaf rachis not winged, usually terete to somewhat grooved, rarely subquadrate in transverse section.....2
2. Leaves 1-jugate; Gabon.....4 *I. hallei*
2. Leaves 2–7-jugate, exceptionally 1-jugate, but then leaves with at least two pairs of leaflets present as well.....3
3. Leaves 5–7-jugate; D.R.Congo.....6 *I. lebrunii*
3. Leaves 2–4-jugate, exceptionally 1-jugate leaves may be present as well.....4
4. Flowers sessile or nearly so, the bracts (5–)6–9 mm long, $\pm$ as long as the full grown bracteoles (flower bud), $\pm$ persistent till anthesis; from Guinea to Ghana.....12 *I. vignei*
4. Flowers distinctly stalked, the bracts at most 2 mm long, much shorter than the full grown bracteoles (flower bud), early caducous or not.....5
5. Leaves 2-jugate; leaf rachis (5–)8–10(–18) mm long, petiole (1–)2–3(–4) mm long; leaflets of the upper pair 1.5–2(–2.5) times as long as the leaflets of the lower pair (fig. 4); Gabon.....1 *I. brachyrhachis*
5. Above leaf characters not associated, either the petiole and/or the rachis longer, or with more than 4 leaflets and/or apical leaflets relatively smaller.....6
6. Leaves 2-jugate, rarely 1-jugate or unifoliate but then 2-jugate leaves also present; sepals with ciliate apex; Gabon.....11 *I. triplisomere*
6. Leaves 2–4-jugate, sometimes 1-jugate leaves may be present as well, sepals glabrous.....7
7. Inflorescence up to 20 cm long, $\pm$ stiff, not pendulous; sepals and petals subequal in length, the petals equal in size and shape.....8
7. Inflorescence slender, pendulous, up to c. 1(–1.25) m long; petals unequal, the adaxial one(s) longest and/or largest.....9
8. Small to medium sized tree; branchlets glabrous; leaves glabrous; pedicel (1.5–)2–3(–4) mm long; petals and stamens glabrous; Cameroon, Equatorial Guinea, Gabon.....5 *I. isopetalum*
8. Small tree to 5 m tall; branchlets sparsely pubescent, glabrescent; leaves sparsely pubescent; pedicel 5 mm long; petals and stamens densely villous at base; SW Gabon, W Republic of the Congo.....10 *I. sargosii*
9. Leaves 2-jugate, leaflets with 12–15 pairs of main lateral nerves; Nigeria, D.R.Congo.....8 *I. nigericum*
9. Leaves (1–)2–4-jugate, leaflets with (4–)5–9(–11) pairs of main lateral nerves.....10
10. Bracteoles 8–10(–13) $\times$ 4–7 mm, firm, stiff, nerves not visible; from Sierra Leone to D.R.Congo.....9 *I. obanense*
10. Bracteoles (4–)5–6(–7) $\times$ 2–5 mm, thin, $\pm$ flexible, almost transparent, nerves visible.....11
11. Tree (4.5–)15–20(–33) m tall and up to 40(–60) cm dbh; petiole 1–4 cm long; petals 5 (rarely a small petal missing), 3 large, subequal, 6–8 $\times$ 3–5 mm, 2 small, ligulate to ovate-elliptic, 1–4 mm long; Guinea, Sierra Leone, Liberia.....2 *I. explicans*
11. Small tree to shrub, up to 10 m tall and 30 cm dbh; petiole (1–)2–4(–6) mm long; petals 2–5, narrowly spatulate, 3–3.5 mm long; from Cameroon to D.R.Congo.....3 *I. graciliflorum*

leaves offer some useful characters for the key to the species, such as the uni-jugate leaves in *Isomacrolobium hallei*, the 5–7-jugate leaves in *I. lebrunii*, the winged leaf rachis in *I. leptorrhachis* and the very short rachis in *I. brachyrhachis*. *Isomacrolobium vignei* can easily be distinguished by its almost sessile flowers with large bracts. Most inflorescences are narrow and pendulous, up to c.1(–1.25) m long, but in *Isomacrolobium isopetalum* and in *I. sargosii* they are short (up to 20 cm long) and $\pm$ stiff. Cauliflory is reported by Richards for a specimen (no 5114) of *Isomacrolobium obanense*.

The two adaxial sepals are completely united into a single sepal that is not or hardly distinguishable as being composed of two sepals. The corolla shows much variation as regards the presence and the number of large petals within one species or even within one specimen. In *Isomacrolobium obanense* the specimen Jongkind *et al.* 5649 shows in one flower

four large petals and in another only three. In *Isomacrolobium isopetalum* the adaxial petal is often missing. The variability as regards petals is most extreme in *Isomacrolobium vignei* where at most four petals are present which can occupy all the five positions, very rarely adaxially (Breteler 2008).

The pods of *Isomacrolobium* resemble very much those of *Anthonotha* (Breteler 2010). *Isomacrolobium isopetalum* has remarkable narrow, pustulate pods.

Taxonomic treatment

Isomacrolobium Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 497); Aubréville (1968: 188; 1970: 181); Breteler (2008: 137–144). – Type: *Isomacrolobium leptorrhachis* (Harms) Aubrév. & Pellegr.

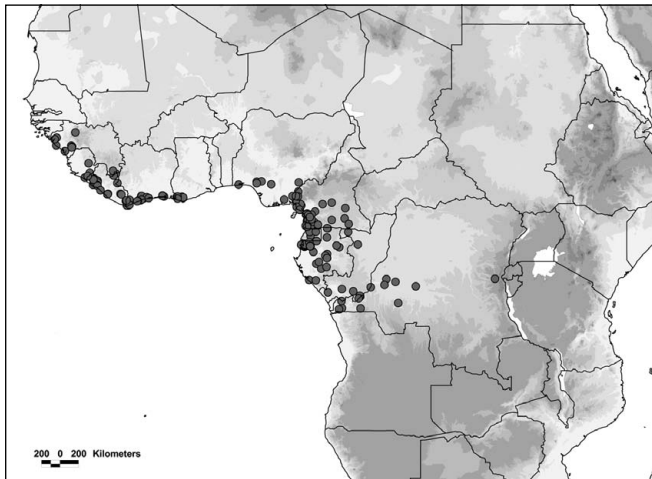


Figure 1 – Distribution of *Isomacrolobium* in Africa.

Triplisomeris Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 497); Aubréville (1968: 192; 1970: 184). – Type: *Triplisomeris explicans* (Baill.) Aubrév. & Pellegr. = *Isomacrolobium explicans* (Baill.) Breteler (Breteler 2008: 143).

Evergreen shrubs to small trees up to 15(–25) rarely 33 m tall and up to 40(–60) cm dbh. Stipules usually persistent in most species, ± free to shortly united at base. Leaves paripinnate sometimes with an odd terminal leaflet, 1–7-jugate; leaflets opposite to subopposite, glabrous to sparsely pubescent, glands on the lower surface only, usually few and small, mostly well dispersed, often crater-like. Inflorescence a panicle (compound raceme), mostly long (up to 1.25 m) and pendulous, terminal or axillary on the leafy branch, rarely also on the trunk. Bracts usually small, persistent or not. Bracteoles valvate, covering the flower in bud. Hypanthium 1–3(–5) mm long. Flowers 5-merous. Sepals 4, equal to slightly unequal. Petals basically 5, sometimes less (e.g. *I. graciliflorum*, *I. lebrunii*, *I. vignei*), or in part strongly reduced, usually very unequal in size and/or shape, when unequal the adaxial one(s) longest and/or largest. Stamens: 3 well developed of the outer whorl, the remaining stamens of the outer whorl and the four

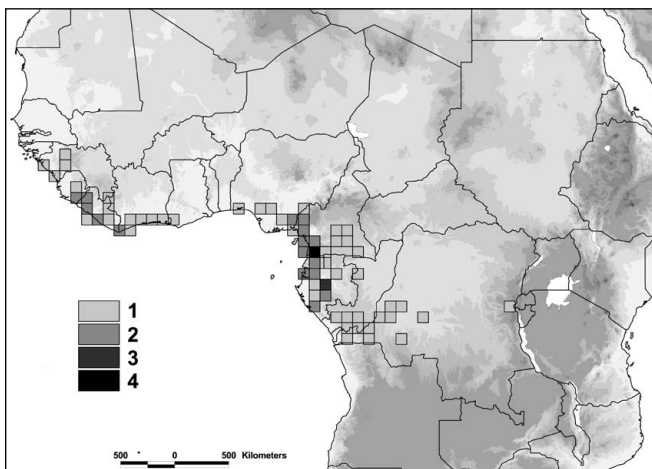


Figure 2– Species density of *Isomacrolobium* in Africa (number of species per grid cell).

(very rarely five) stamens of the inner whorl staminodial or absent. Ovary shortly stipitate or not, velutinous, 2–8-ovulate; style usually glabrous, stigma capitate. Pods up to 8-seeded, usually oblong in outline, rarely ± circular, straight to falcate, dehiscent on the tree or shrub or tardily on the forest floor, valves ± smooth to prominently veined, rarely pustulate, ± appressed short-hairy. Seeds irregular in shape, circular to elliptic to subquadrate to oblong in outline, seed coat brown, dull to somewhat glossy, brittle or not.

1. *Isomacrolobium brachyrhachis* Breteler, sp. nov.

Isomacrolobium triplisomeris (Pellegr.) Breteler affinis foliis 2-jugis sed ab eo differt petiolo et rachidi multo brevior, *Isomacrolobium graciliflori* (Harms) Aubrév. & Pellegr. affinis inflorescentia gracili longaque ab eo differt floribus 3 petala grandia et 2 parva habentibus. – Type: Gabon, 50 km SE of Achouka, 0°01'S 11°55'E, A.M. Louis, Breteler & de Bruijn 729 (holo-: WAG; iso-: BR, K, LBV, MA, MO, P, PRE not seen).

Treelet c. 6 m tall and 5 cm dbh. Branches shortly velutinous, the same indumentum present on petiole, leaf rachis and petiolules as well as on the midrib beneath and sparsely so on the remaining surface beneath. Stipules persistent, free or nearly so, narrowly triangular to linear, sickle-shaped or not, 2–4 mm long, sparsely velutinous outside, glabrous inside. Leaves: 2-jugate; petiole terete, (1–)2–3(–4) mm long; rachis terete to somewhat flattened, (5–)8–10(–18) mm long, with 1–1.5 mm long tip; leaflets opposite; petiolules terete 1–3 mm long; lamina obovate often narrowly so, 2–3.5 times as long as wide, (2.5–) 4–14 × (1–)2–4(–5) cm, the leaflets of the upper pair 1.5–2(–2.5) times as long as those of the lower pair, rounded to obtuse to (sub-)cordate at base, (3–)5–10 mm long acuminate at apex, glabrous above with impressed midrib and somewhat indistinct lateral nerves, beneath with prominent midrib and (6–)8–9(–11) pairs of main lateral nerves. Inflorescence axillary, slender, up to 50 cm long, pendulous, brown-velutinous to ± appressed short-hairy; peduncle c. 5 cm long; racemes 1–2 cm long; bracts ± long persistent, ovate, c. 1 mm long, rounded to acute at apex, sparsely short-brown-hairy outside, glabrous inside. Pedicel 3–4 mm long, appressed brown-short-hairy. Bracteoles broadly obovate-elliptic, 6–7 × 5–6 mm, outside hairy as pedicel, puberulous-tomentellous inside and on edge. Hypanthium 2 mm long, glabrous. Sepals 4, obovate, 5–7 mm long, glabrous, the adaxial one somewhat longer and wider. Petals 5, the adaxial one largest, obovate-oblongate, c. 11 mm long, tapering to a narrow base, c. 1 mm bilobed at apex; two adjacent petals narrowly obovate, 9–10 mm long, ± entire; remaining petals narrowly oblong-elliptic, 5–6 mm long. Large stamens 3, 15–20 mm long, glabrous; anthers 2.5 mm long; staminodes 5, filiform, 1–2 mm long, glabrous, with or without a strongly reduced anther. Pistil 15–20 mm long; ovary 4–5 mm long, subappressed velutinous, 7-ovulate; style with a few hairs in lower half. Pods unknown. Fig. 4.

Habitat and distribution – Primary rain forest in central Gabon. Only known from the type locality. Alt. c. 350 m. Fig. 5.

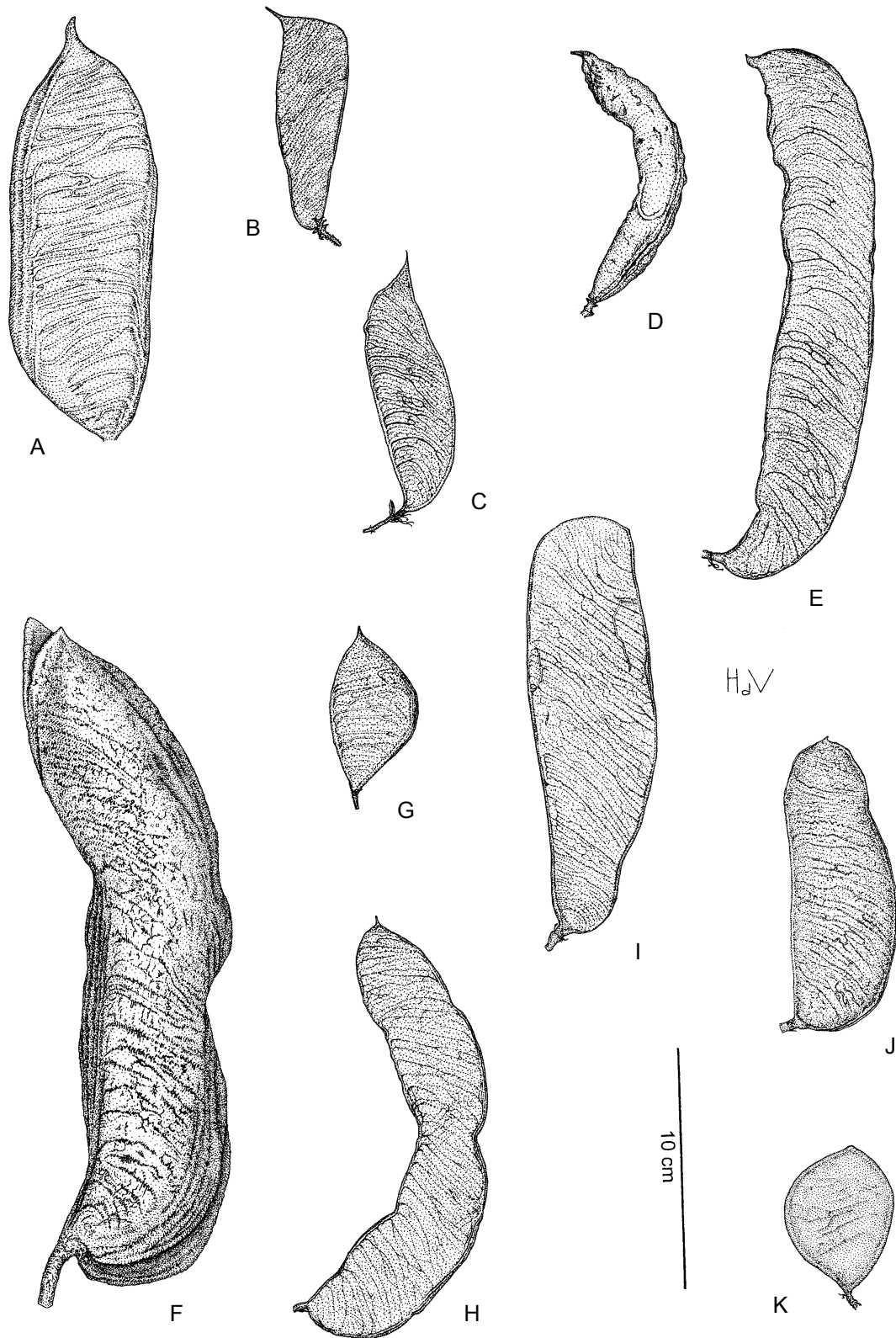


Figure 3 – Pods of *Isomacrolobium*: A, *Isomacrolobium explicans*; B, *Isomacrolobium graciliflorum*; C, *Isomacrolobium hallei*; D, *Isomacrolobium isopetalum*; E, *Isomacrolobium leptorrhachis*; F, *Isomacrolobium nigericum*; G–H, *Isomacrolobium obanense*; I, *Isomacrolobium sargosii*; J–K, *Isomacrolobium vignei*. (A, Voorhoeve 1299a; B, Lejoly 86/201; C, Leal 647; D, Sosef et al. 1937; E, Olorunfemi FHI 30737; F, D.W. Thomas 7634; G, Toussaint 2087; H, Jongkind et al. 5707; I, J.J. de Wilde c.s. 11275; J, de Koning 2653; K, de Koning 4769). Scale bar = 10 cm. Drawn by H. de Vries.

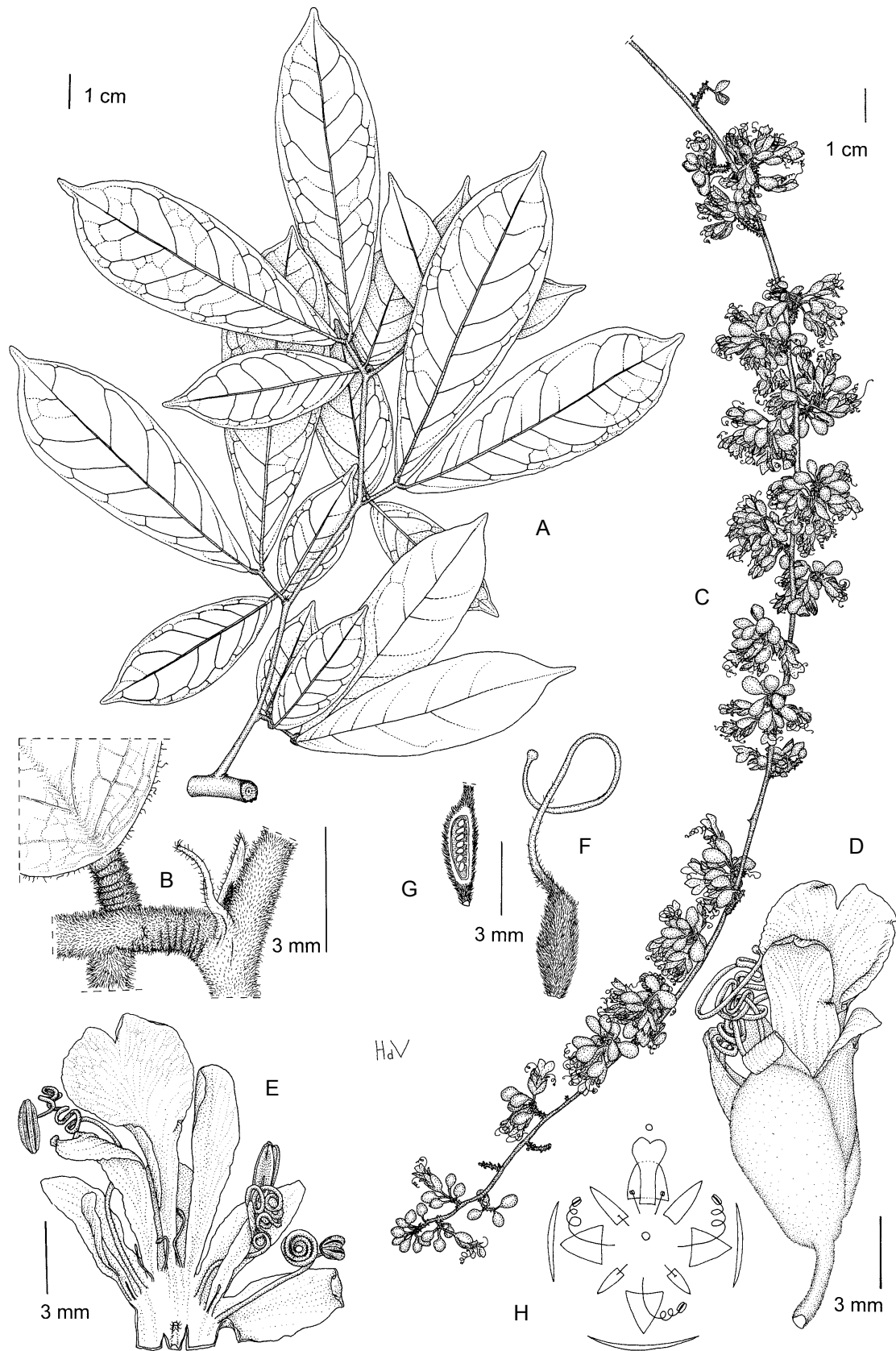


Figure 4 – *Isomacrolobium brachyrhachis*: A, leafy branch; B, stipules; C, inflorescence; D, flower; E, opened up flower; F, pistil; G, ovary cut lengthwise; H, flower diagram. (A–H, *A.M. Louis et al.* 729). Drawn by H. de Vries.

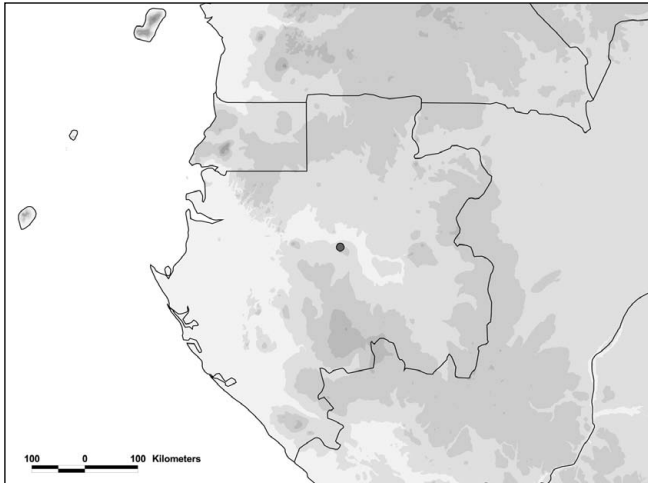


Figure 5 – Distribution of *Isomacrolobium brachyrhachis*.

2. *Isomacrolobium explicans* (Baill.) Breteler (Breteler 2008: 143). – *Vouapa explicans* Baill. (Baillon 1865: 181). – *Macrolobium explicans* (Baill.) Keay (Keay 1954: 490). – *Anthonotha explicans* (Baill.) J.Léonard (Léonard 1955: 202); Keay (1958: 473); Voorhoeve (1965: 142); Hawthorne & Jongkind (2006: 840). – *Triplisomeris explicans* (Baill.) Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 104); Aubréville (1959: 286). – Type: Guinea, Fouta Djallon, 1837, Heudelot 738 (holo-: P; iso-: BM, BR, K, OXF, WAG).

Anthonotha kwewonii Breteler, nomen (Breteler 2006: 840).

Macrolobium heudelotii Planch. ex Benth. (Bentham 1865: 308); Oliver (1871: 298); Hutchinson & Dalziel (1928: 347); Aubréville (1936: 224, 226). – Type: Guinea, Fouta Djallon, 1837, Heudelot 738 (holo-: K; iso-: BM, BR, P, OXF, WAG).

Tree (4.5–)15–20(–33) m tall and up to 40(–60) cm dbh. Branches glabrous to very short-hairy, glabrescent with age. **Stipules** ± free, ovate-triangular, 1–1.5(–7) mm long, appressed-puberulous to glabrous outside, glabrous inside. **Leaves**: 2–4-jugate; petiole subterete, 1–4 cm long, glabrous to appressed-puberulous, soon glabrescent; rachis subterete, 5–12(–20) cm long, hairy as petiole; leaflets opposite to sub-opposite, petiolules 2–6 mm long; lamina ± coriaceous, elliptic, rarely ovate or obovate, (1–)2–2.5(–3) times as long as wide, (5–)8–15(–20) × 3–6(–9) cm, rounded to obtuse at base, shortly (up to 10 mm) acuminate, sometimes acute to rounded at apex, glossy to dull and glabrous above usually with impressed midrib and ± plane, obscure, 5–8 pairs of main lateral nerves, beneath ± glabrous to sparsely appressed-puberulous on the prominent midrib and the main lateral nerves often also on the surface in between, often minutely brown-punctate. **Inflorescence** pendulous, up to 40(–70) cm long, axillary to terminal, or below the leaves, densely to sparsely appressed short-hairy; lateral racemes many flowered, up to c. 4(–5) cm long; bracts early caducous, ovate, < 1 mm long, glabrous inside. **Flowers** fragrant, pale yellow. **Pedicel** (3–)5–10(–12) mm long, pale-brown to silverish, appressed short-hairy. Bracteoles elliptic to obovate, ± thin, 5–6(–7) × 3.5–5 mm, outside hairy as pedicel, inside tomentellous. **Hypanthium**

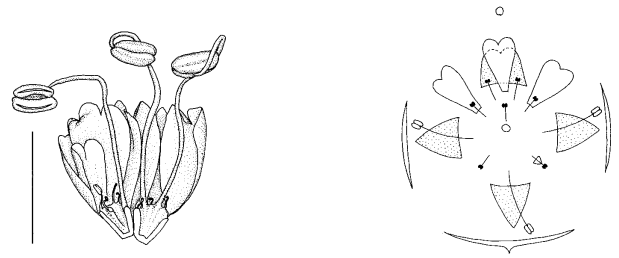


Figure 6 – Opened up flower and diagram of *Isomacrolobium explicans* (Chevalier 13088). Scale bar = 5 cm. Drawn by H. de Vries.

1–2(–3.5) mm long, glabrous. **Sepals** thin, ovate-elliptic to oblong, (4–)5–7 × 1.5–2.5 mm, apex acute, glabrous. **Petals** 5: 3 large, subequal, obovate, 6–8 × 3–5 mm, usually shortly clawed, up to 2 mm bilobed to notched at apex, glabrous; small petals ligulate to ovate-elliptic (0.5–)1–4 mm long, glabrous. **Large stamens** 10–17 mm long, glabrous; anthers 1.5–2.5 mm long; staminodes 6(–7), with or without a small closed anther, glabrous, 2 of the outer whorl 1 mm long, rarely almost as long as the fertile ones, those of the inner whorl usually smaller, up to 1 mm long. **Pistil** 15–17 mm long; ovary 2–4 mm long, subappressed-velutinous, 2–4-ovulate, style glabrous. **Pods** oblong, tapering at both ends, 13–16 × 5–6 cm, shortly brown-velutinous, slightly prominently, transversely veined, up to 4-seeded. Figs 3A, 6.

Habitat and distribution – Savanna woodland, semi-deciduous forest in Upper Guinea: Guinea, Sierra Leone, Liberia. Alt. 0–500 m. Fig. 7.

Additional specimens studied – **Guinea**: Koutouya, vers km 36, 22 Mar. 1993, *Aké Assi* 18831 (MO); Kindia, 4–10 Mar. 1905, *Chevalier* 12747 (P); *ibid.*, *Chevalier* 13088 (P, WAG); *ibid.*, *Chevalier* 13094 (P); *ibid.*, *Chevalier* 13218 (P); *ibid.*, *Chevalier* 13219 (P); *ibid.*, *Chevalier* 13361 (P); Kindia, 1929, *Jacques-Félix* 27 (P); Baf-fa region, 5 Feb. 1979, *Lisowski* 51455 (BR, K); 20 km Kindia-Te-limele Rd., 13 Feb. 1979, *Lisowski* 51534 (BR); Boké-Toubou, Apr. 1909, *Pobéguin* 2156 (P); Rio Nunez, 1848, *Whitfield* s.n. (BM).

Sierra Leone: s.l., *Afzelius* s.n. (BM); Blama, near Juring, 3 Dec. 1926, *Deighton* 309 (K), see note.

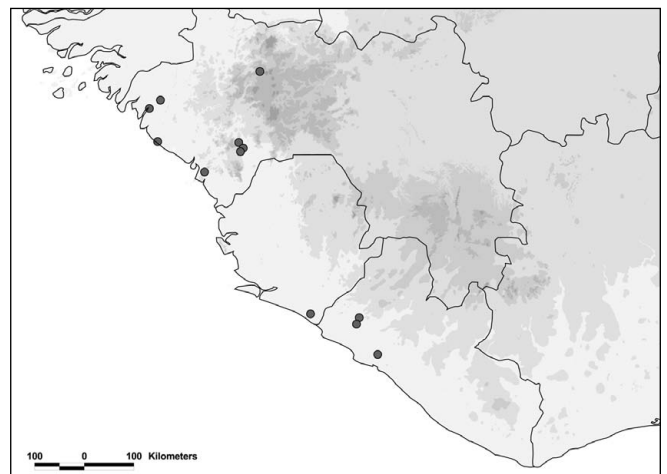


Figure 7 – Distribution of *Isomacrolobium explicans*.



Figure 8 – *Isomacrolobium graciliflorum*: A, flowering branchlet; B, raceme; C, open flower with bracteoles; D, opened up flower without pistil; E, pistil, ovary cut lengthwise; F, pod; G, seed; H, flower diagram. (A–E, H, *Bitsindou* 409; F–G, *Asonganyi* 678). Drawn by H. de Vries.

Liberia: Dukwai R., near Monrovia, 27 Oct. 1928, *Cooper* 100 (BM, FHO, K); Bomi Hills, 23 Nov. 1960, *Voorhoeve* 136 (WAG); *ibid.*, Dec. 1962, *Voorhoeve* 1299 (BR, WAG); *ibid.*, Dec. 1962, *Voorhoeve* 1299a (WAG).

Notes – It is with some doubt that I refer *Deighton* 309 (K) to this species. The stipules are glabrous and much longer than average, the bracts are twice as long and not early caducous, the flowers have a long tubular hypanthium of 2–3.5 mm long, longer than average, and somewhat longer large petals that are longer clawed. Some of these aspects as a longer hypanthium and larger, longer clawed petals, point to *Isomacrolobium obanense*, but the length of its bracteoles and the early deciduous bracts of the latter do not.

Hawthorne (2006) noted that some specimens from Guinea (e.g. *Pobéguin* 2156) have up to seven pairs of leaflets. The specimen cited has been investigated and more than four pairs have not been found in this specimen nor in other specimens of *Isomacrolobium explicans*.

3. *Isomacrolobium graciliflorum* (Harms) Aubrév. & Pellegrin (Aubréville & Pellegrin 1958: 498); Breteler (2008: 143). – *Macrolobium graciliflorum* Harms (Harms 1910: 302); Pellegrin (1948: 45, quoad nomen, the specimens cited belong to *Englerodendron gabunense* (J. Léonard) Breteler); Léonard (1952: 416). – *Anthonotha graciliflora* (Harms) J.Léonard (Léonard 1955: 202). – Type: Equatorial Guinea, 'Fanggebiet', Nkolentangan, Dec. 1907, *Tessmann* B.57 (holo-: B†; lecto-: K, **designated here**).

Small tree to forest undershrub, up to 10 m tall and 30 cm dbh. **Branches** glabrous to puberulous, often mixed with longer hairs, glabrescent, the same for the stipules, petiole, leaf rachis, petiolules, the lower leaf surface especially the midrib and the main lateral nerves, and inflorescence. **Stipules** narrowly triangular, usually $\pm$ sickle-shaped, 2–5 $\times$ 0.5–1 mm, united at base. **Leaves** 2–4-jugate; petiole subterete, (1–)2–4(–6) mm long; rachis terete to somewhat angled, (0.6–)2–5(–7.5) cm long; **leaflets**: petiolule 2–5 mm long; lamina elliptic, that of the lowest pair usually ovate, (1–)2–3(–4) times as long as wide, (1.5–)4–12(–17) $\times$ (1–)2.5–4(–6) cm, rounded at base, 1–2.5 cm long acuminate at apex, the acumens rounded to emarginate at top, glabrous above, the midrib and the (4–)6–7(–10) pairs of main lateral nerves plane to slightly impressed above, prominent beneath. **Inflorescence** terminal, slender, $\pm$ pendulous, up to 60 cm long; lateral racemes 1–2 cm long; bracts broadly ovate, c. 1 mm long. **Flowers** $\pm$ red. **Pedicel** 2–3 mm long, puberulous. **Bracteoles** elliptic to obovate, 4–5 $\times$ 2–2.5 mm, puberulous outside, glabrous to sparsely pubescent inside. **Hypanthium** 2–3 mm long, glabrous. **Sepals** subequal in size and shape, 2–3 mm long, glabrous. **Petals** 2–5, glabrous, narrowly oblanceolate, 3–4 mm long, the adaxial petal sometimes bilobed at apex. **Large stamens** 4–5 mm long, anthers c. 1.5 mm long; filaments glabrous or with some hairs in the middle on the inner side; staminodes 0–2(–5), two of the outer whorl and sometimes 3 of the inner, $\pm$ thread-like, c. 1 mm long. **Pistil** 5–7 mm long; ovary 2 mm long, velutinous, 4(–5)-ovulate; style pubescent in the basal part. **Pods** oblong to oblanceolate in outline, 8–10 $\times$ 2.3–3 cm, c. 5 mm beaked, shortly brown-velutinous, $\pm$ smooth, finely prominently veined when young, up to 4–5-seeded. Seeds circular to elliptic to subquadrate to

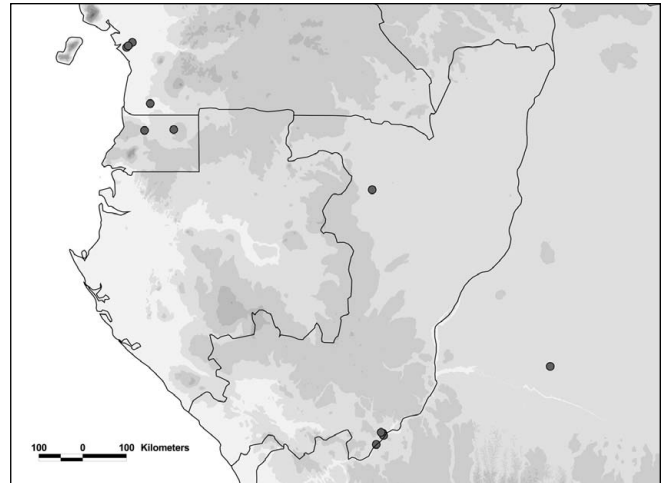


Figure 9 – Distribution of *Isomacrolobium graciliflorum*.

oblong in outline, 16–20 $\times$ 13–17 $\times$ 5–8 mm, brown, dull to slightly glossy. Figs 3B, 8.

Habitat and distribution – Rain forest to semi-deciduous forest, often riverine, in Cameroon, Equatorial Guinea, Republic of the Congo and D.R.Congo. Not yet collected in Gabon. Alt. 300–400 m. Fig. 9.

Additional specimens studied – **Cameroon:** Tisongo Lake, 16 km ESE of Mouanko, 16 Sep. 1983, *Asonganyi* 678 (P, YA); Lombe in Douala/Edea Res., 3 Aug. 1975, *Gartlan* s.n. (K); Tisongo, 18 Jul. 1976, *McKey & Gartlan* 121 (K); Ebianemeyong, 15 Apr. 2001, *van Andel et al.* 3320 (WAG).

Equatorial Guinea: Wele-Nzas, 16 Jun. 2000, *Pérez Viso* 3197 (MA, WAG).

Republic of the Congo: Forêt de la Djoumouna, 25 Sep. 1976, *Bitsindou* 409 (P); Odzala, 13 Jan. 1995, *Champluvier* 5267 (BR, MO, P, WAG); Odzala Nat. Park, Lekoli R., 2 Sep. 1994, *Dowsett-Lemaire & Bitsindou* 1779 (BR); forêt de la Djoumouna, 5 Jan. 1967, *Farron* 5296 (P); Loukanga II, at 25 km from Brazzaville to Pointe Noire, 16 Nov. 1986, *Lejoly* 86/203 (BR); Djoumouna forest, 3 Dec. 1969, *Makany* 1129 (P, WAG); Foulakari forest, 3 Oct. 1968, *Sita* 2589 (K, P, WAG).

D.R.Congo: Buna-Kutu, *Flamigni* 6269 (BR).

4 *Isomacrolobium hallei* Aubrév. (Aubréville 1968: 362); Breteler (2008: 143). – *Anthonotha hallei* (Aubrév.) J.Léonard (Léonard 1996: 446). – Type: Gabon, Abanga, chantier C.E.F.A., Lano R., 3 Jun. 1963, *N. Hallé* 2195 (holo-: P).

Small tree to 7 m tall. Branches $\pm$ sparsely appressed-puberulous, glabrescent. **Stipules** shortly united at base, narrowly triangular, (1–)2–4 mm long, glabrous to sparsely puberulous, ciliate or not. **Leaves** 1-jugate; petiole terete, (5–)10–15(–20) mm long, hairy as branchlet. **Leaflets**: petiolule (3–)5–6(–8) mm long, $\pm$ glabrous; lamina $\pm$ papery, elliptic, (2–)2.5–3 times as long as wide, 8–14(–20) $\times$ 4–5(–6) cm, glabrous, midrib and the 4–5(–7) pairs of main lateral nerves plane to slightly impressed above, prominent beneath, the lateral nerves usually long-looped, $\pm$ rounded at base, 1–3 cm long acuminate at apex. **Inflorescence** slender, pendulous, up to 1.20 m long, axillary or terminal, appressed-puberulous, the lateral racemes at most 1 cm long, usually much shorter; bracts ovate, c. 1 mm long, glabrous inside, usually

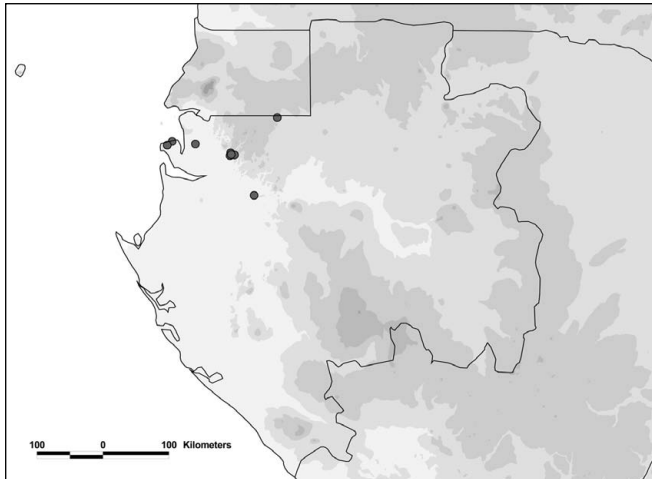


Figure 10 – Distribution of *Isomacrolobium hallei*.

ciliate. Pedicel 5–9 mm long, $\pm$ densely appressed-puberulous. Bracteoles obovate in outline, 7–9 $\times$ 3–4 mm, $\pm$ densely appressed-puberulous both sides. Hypanthium 2–3 mm long, glabrous. Sepals 4, $\pm$ equal in size and shape, ovate-elliptic, 5–7 $\times$ 2.5–3 mm, glabrous or with a few hairs on the margin. Petals 5, narrowly obovate-spathulate, 7–10 $\times$ 1–2.5 mm, the two abaxial petals slightly shorter or not, rounded to obtuse at apex, the adaxial petal usually bilobed apically. Large stamens c. 20 mm long, glabrous, anthers 2.5–3 mm long; staminodes usually 6 present, filiform, up to 3 mm long, glabrous, with or without a very much reduced anther. Pistil 8–10 mm long; ovary 2–2.5 mm long, velutinous, 5-ovulate; style pubescent near base. Pod (only immature pods seen) oblong in outline, 11 $\times$ 3 cm, 5 mm long beaked, shortly brown-velutinous, finely reticulately to transversely, prominently veined, up to 5-seeded. Fig. 3C.

Habitat and distribution – Tropical rain forest in NW Gabon. Alt. 0–500 m. Fig. 10.

Additional specimens studied – **Gabon**: Moka creek, E of Mondah R., 24 Jul. 1985, *Bos et al.* 10788 (BR, LBV, MO, P, WAG); Mbe Nat. Park, S of Mbilan Mt., 13 Feb. 2005, *Leal et al.* 271 (WAG); Crystal Mts., Mbe Nat. Park, 11 Apr. 2005, *Leal et al.* 548 (WAG); Mbilan Mt., 26 Oct. 2005, *Leal et al.* 647 (WAG); Crystal Mts., 28 May 2001, *Nguema Miyono* 1874 (LBV, WAG).

5. *Isomacrolobium isopetalum* (Harms) Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 498) Aubréville (1968: 190; 1970: 183). – *Macrolobium isopetalum* Harms (Harms 1907: 25); Pellegrin (1948: 44). – *Anthonotha isopetala* (Harms) J.Léonard (Léonard 1955: 202; 1957: 224). – Type: Cameroon, Bipindi, 1905, *Zenker* 3384 (lecto-: BR, designated by J. Léonard, see notes; iso-: BM, G, K, MO, P).

Isomacrolobium isopetalum (Harms) Aubrév. & Pellegr. var. *isopetalum* Breteler (Breteler 2008: 143).

Small to medium-sized tree, up to 13(–25) m tall and to 30(–50) cm dbh. Branchlets smooth, glabrous. Stipules early caducous, narrowly elliptic-ob lanceolate, slightly sickle-shaped, 10–17 $\times$ 1.5–3 mm, glabrous. Leaves glabrous, (2–)3(–4)-jugate; petiole $\pm$ terete, (0.8–)2–4.5 cm long; rachis $\pm$ terete, (2–)4–10(–17) cm long; leaflets $\pm$ opposite; petiolule, (2–)3–5(–6) mm long; lamina $\pm$ papery, elliptic,



Figure 11 – Open flower, opened up flower, and diagram of *Isomacrolobium isopetalum* (Letouzey 11704). Scale bar = 5 mm. Drawn by H. de Vries.

(1.5–)2–2.5(–3.5) times as long as wide, (5–)8–14(–16.5) $\times$ (2.5–)3–4(–5) cm, rounded to cuneate at base, 0.5–1.5(–2.5) cm long acuminate at apex; midrib impressed above, prominent beneath, the (4–)5–6(–8) pairs of main lateral nerves $\pm$ plane above, prominent beneath. Inflorescence axillary or terminating short shoots, often lowly branched as if there are more than one inflorescence per axil, up to 20 cm long, appressed brown-short-hairy, the individual racemes up to 6 cm long; bracts early caducous, ovate, concave, at most 1 mm long, glabrous inside. Flowers white. Pedicel (1.5–)2–3(–4) mm long, hairy as inflorescence. Bracteoles elliptic, 6–8 $\times$ 3–4 mm, outside hairy as pedicel, tomentellous inside. Hypanthium 1–2.5 mm long, glabrous. Sepals equal or slightly unequal in length, oblong-elliptic to oblanceolate-spathulate, 5–7(–9) $\times$ 2–3.5 mm, glabrous. Petals 4–5, oblanceolate-spathulate, c. as long as the sepals, claw at most 1 mm long, the adaxial petal sometimes notched to shortly bilobed at apex, often missing. Large stamens 17–18(–20) mm long, glabrous; anthers 2–2.5 mm long; staminodes 4–6, thread-like, up to 5 mm long, with or without a very much reduced anther. Pistil up to 20 mm long; ovary 3–4 mm long, velutinous, 4–6-ovulate; style glabrous. Pod oblong in outline, somewhat falcate, 8–18 $\times$ 2–2.5 cm, rounded to cuneate at base, 0.5–1 cm beaked; valves densely, shortly velutinous, obscurely nerved to irregularly wrinkled to somewhat pustulate, 1–3-seeded. Seeds oblong-elliptic in outline, laterally

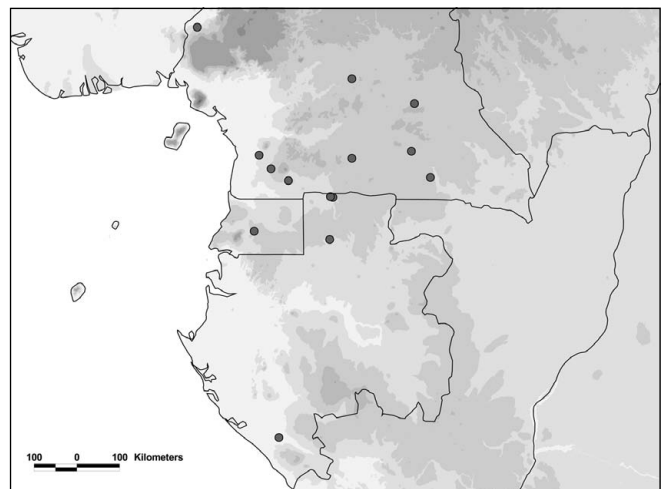


Figure 12 – Distribution of *Isomacrolobium isopetalum*.

compressed, $2.5\text{--}4.5 \times 1.5\text{--}2 \times 1\text{--}1.5$ cm; seed coat thin brittle, smooth, slightly glossy. Figs 3D, 11.

Habitat and distribution – Tropical rain forest in Cameroon, Equatorial Guinea and Gabon. Alt. up to 800 m. Fig. 12.

Additional specimens studied – **Cameroon**: Bitye, 1922, *Bates* 1724 (FHO, K, P); *ibid.*, *Bates* 1884 (FHO, K, P); Nanga-Eboko, 17 Feb. 1960, *Endingle* 114 (BR, K, P); Biboumane, 11 Jan. 1956, *Letouzey* 541 (P); S. of Dongo, 29 Jan. 1960, *Letouzey* 2863 (BR, G, K, P, WAG); near Lomie, 30 Mar. 1961, *Letouzey* 3647 (P); near Ngoila, 21 Dec. 1972, *Letouzey* 11699 (P); *ibid.*, 21 Dec. 1972, *Letouzey* 11704 (BR, G, K, P, WAG); 20 km W of Mamfe, 4 Jun. 1975, *Letouzey* 13278 (YA); Ebolowa-Yaoundé, Jan. 1914, *Mildbraed* 7752 (K); Bipindi, Dec. 1913, *Zenker* 455 (BR, G, P, WAG); *ibid.*, Dec. 1905, *Zenker* 3385 (BM, BR, G, K, P).

Equatorial Guinea: SE of Monte Alen Nat. Park, 2 Dec. 2002, *Senterre & Obiang* 3589 (WAG); s.l., 1908–1909, *Tessmann* 815 (K).

Gabon: Biloukou, 2 Sep. 1907, *Le Testu* 1142 (BM, BR, P, WAG); Acourenzorc, 29 Dec. 1933, *Le Testu* 9443 (BM, BR, MO, P, WAG); Assoc (Ekorite), 18 Apr. 1934, *Le Testu* 9552 (BM, BR, FHO, K, P, WAG); Minko Mt., c. 70 km NE of Mitzi, 8 Feb. 2003, *Sosef et al.* 1937 (WAG).

Notes – The original material, two syntypes collected by Zenker, no 3384 & 3385, was destroyed at Berlin. Harms (1907) noted that these specimens were collected in December 1905, but the duplicates bear the year 1907. This is most probably a mistake, because Harm's publication dates from May 1907.

Léonard (1957) selected the BR duplicate of *Zenker* 3384 as the lectotype which was followed by Aubréville & Pellegrin (1958) when they noted: "type *Zenker* 3384, Brux.". In 1968 & 1970, however, Aubréville mentioned the P duplicate of *Zenker* 3384 as the lectotype, which is incorrect.

6. *Isomacrolobium lebrunii* (J.Léonard) Aubrév. & Pellegr. ex Breteler (Breteler 2008: 143). – *Macrolobium lebrunii* J.Léonard (Léonard 1952a: 186; 1952b: 414). – *Anthonotha lebrunii* (J.Léonard) J.Léonard (Léonard 1957: 226). – Type: D.R.Congo, between Dekese and Bumbuli, Oct. 1932, *Lebrun* 6497 (holo-: BR; iso-: K).

Small tree c. 15 m tall. **Branches** stipules, petioles, rachis, petiolules, and midrib of leaflets beneath $\pm$ sparsely appressed-puberulous, glabrescent. **Stipules**: the free apical part early caducous, not seen, the united basal part persistent, c. 3 mm long. **Leaves** 5–7-jugate; petiole subterete, 6–10 mm long; rachis subterete, 5–15 cm long; leaflets $\pm$ opposite; petiolule 3–4 mm long; lamina ovate-elliptic to lanceolate, (2–)3(–3.5) times as long as wide, (4.5–)5–12.5 $\times$ (1.5–)2.5–4 cm, rounded to obtuse at base, 0.5–1(–2) cm long acuminate at apex, midrib $\pm$ impressed above, prominent beneath, the 7–10 pairs of thin, main lateral nerves slightly prominent both sides. **Inflorescence** up to 4 together, up to 40 cm long, axillary to subterminal, $\pm$ densely-appressed, brown-short-hairy; racemes up to 1(–1.5) cm long; bracts early caducous, ovate-triangular, 1–2 mm long, glabrous inside. **Pedicel** 3–6 mm long. **Bracteoles** elliptic to obovate in outline, concave, 5–6 $\times$ 3 mm, sparsely puberulous inside. **Flowers** white. **Hypanthium** c. 2 mm long, glabrous. **Sepals** thin, almost hyaline, distinctly veined, $\pm$ ovate-triangular, (4–)5–6.5 $\times$ 3–4 mm, glabrous. **Petals** up to 5 present, very unequal in length, spatulate, 1–5(–6) mm long, c. 1 mm wide or less, glabrous.

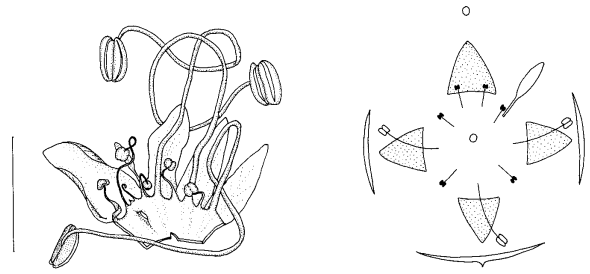


Figure 13 – Opened up flower and diagram of *Isomacrolobium lebrunii* (Lebrun 6497). Scale bar = 5 mm. Drawn by H.de Vries.

Large stamens c. 2 cm long, glabrous; anthers subellipsoid, c. 2 mm long; staminodes up to 6 present, 1–3(–4) mm long, often with a small, much reduced anther. **Pistil** c. 2 cm long; ovary c. 5 mm long, velutinous, 4–5-ovulate, style glabrous. **Fruits** unknown. Fig. 13.

Habitat and distribution – Tropical lowland rain forest in Kasai in D.R.Congo. Only known from the type. Fig. 14.

Note – The number of petals present is variable. In fig. 13, a flower is depicted with one large petal only.

7. *Isomacrolobium leptorrhachis* (Harms) Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 498); Aubréville (1970: 182); Breteler (2008: 143). – *Macrolobium leptorrhachis* Harms (Harms 1902: 157); Pellegrin (1948: 45). – *Anthonotha leptorrhachis* (Harms) J.Léonard (Léonard 1955: 202; 1957: 224). – Type: Cameroon, Bipindi, Sep. 1901, *Zenker* 2445 (holo-: B†; lecto-: P, **designated here**; iso-: BR, G, K, MO, WAG).

Shrub to small tree up to 15 m tall and 30 cm dbh. Branches $\pm$ densely puberulous to shortly velutinous, usually more sparsely so on petiole & leaf rachis, glabrescent. **Stipules** united at base, narrowly triangular, 2–10 mm long, puberulous outside, glabrous inside. **Leaves** (1–)2–5-jugate; petiole $\pm$ terete, (2–)5–10(–15) mm long; **rachis** winged, narrowly so just above a pair of leaflets, widest, up to 8 mm, just below, (0–)6–20(–29) cm long; leaflets usually (sub-)opposite, rarely some alternate; petiolule $\pm$ terete, 2–5 mm long, densely to

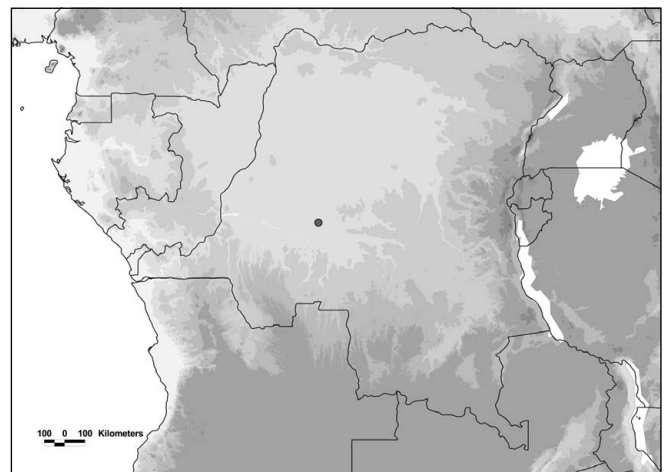


Figure 14 – Distribution of *Isomacrolobium lebrunii*.

mentose to puberulous, glabrescent; lamina obovate-elliptic, sometimes ovate or oblong, (2–)2.5–3.5(–5) times as long as wide, (5–)13–25(–40) × 4–6(–13) cm, rounded to cuneate or tapering to a cordiculate base, (0.5–)1–2(–3.5) cm long acuminate at apex, glabrescent above with a slightly prominent midrib and (7–)10–12(–13) pairs of main lateral nerves, these more prominent and sparsely pubescent to glabrous beneath, sometimes also pubescent between the nerves. **Inflorescence** born on older branches or axillary to (sub-)terminal, pendulous, up to 1.25 m long, brown-tomentellous to shortly brown-velutinous; racemes up to 1(–1.5) cm long; **bracts** ± persistent, concave, ovate, 1–1.5 mm long, glabrous inside. **Pedicel** (6–)8–10(–13) mm long, brown-tomentellous. **Bracteoles** obovate-elliptic in outline, 8–11 × 4–5 mm, brown-tomentellous outside, sparsely tomentellous inside. **Hypanthium** 2–4 mm long, glabrous. **Sepals** faintly pinkish cream to whitish, ± narrowly oblong, (7–)8–10 × 1–3 mm, glabrous, the adaxial sepal largest. **Petals** 5, cream to pink, subequal in length or 4 large and one lateral much reduced (2–3 mm long), obovate-spathulate, 10–15 × 4–7 mm, the adaxial one usually largest, shortly bilobed at apex or not, claw c. 6 mm long, glabrous. **Large stamens** 15–25 mm long; filaments red, glabrous or pubescent in lower part, mainly inside; anthers 3–3.5 mm long, yellow; staminodes usually 6 present, filiform, 2–4 mm long, with or without a rudimentary anther. **Pistil** 15–25 mm long; ovary velutinous, 4–6 mm long, 6–8-ovulate; style pubescent in lower part. **Fruit** (only one immature pod seen) narrowly oblong, 20 × 4 cm, reticulately to transversely, ± prominently veined, shortly brown-velutinous, 6–8-seeded. Figs 3E, 15.

Habitat and distribution – Tropical rain forest in Cameroon. Alt. up to c. 200 m. Fig. 16.

Additional specimens studied – **Cameroon**: Bipindi–Dihani Rd., 24–28 Jun. 1918 *Annet* 428 (P); Dihani, 28–30 Jun. 1918, *Annet* 478 (P); 10 km Kribi–Ebolowa Rd., 14 Nov. 1968 *Bos* 3290 (WAG); 12 km Kribi–Ebolowa Rd., 14 Nov. 1968, *Bos* 3290 (WAG); 12 km Kribi–Lolodorf Rd., 19 May 1969, *Bos* 4571 (BR, WAG); 20 km Kribi–Lolodorf Rd., 30 May 1969, *Bos* 4668 (WAG); c. 65 km SSW of Eséka, 16 Jul. 1964, *W.J. de Wilde c.s.* 2839 (BR, WAG); 29 km N of Eséka, 30 Jun. 1965, *Leeuwenberg* 6023 (BR, K, WAG); near Barombi Koto village, 25–28 Jun. 1986, *Mambo & Thomas* 82 (BR, K, MO, P, WAG); southern Bakundu F.R., 24 Aug. 1951, *Olorunfemi* FHI 30737 (K); between Bulu and Dibunda, *D.W. Thomas* 4158 (MO); Idenao, Onge R., 7 Nov. 1993, *D.W. Thomas* 9779 (K); Limbe, Mabeta-Moliwe reserve, 1 Feb. 1994, *Wieringa* 2080 (WAG); E slope of Elephant Mt., 7 Feb. 1994, *Wieringa & Haegens* 2140 (WAG); Bipindi, 1913, *Zenker* 4644 (BR, G, K, MO).

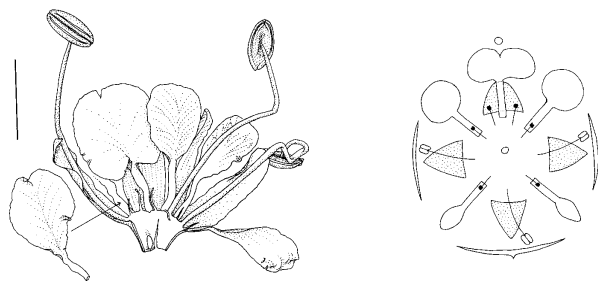


Figure 15 – Opened up flower and diagram of *Isomacrolobium leptorrhachis* (*Bos* 3290). Scale bar = 5 mm. Drawn by H. de Vries.

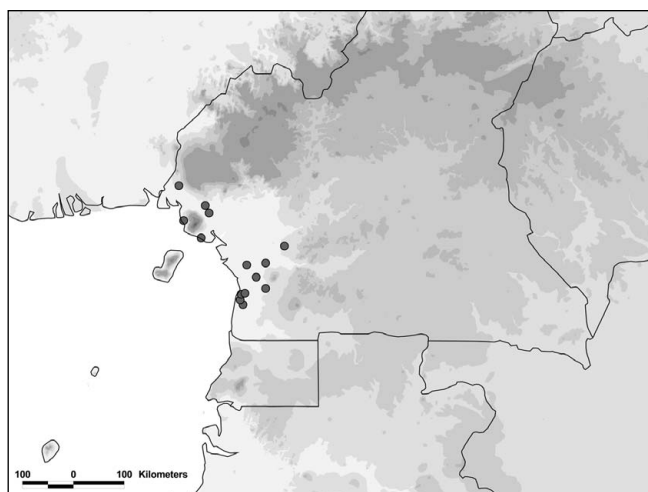


Figure 16 – Distribution of *Isomacrolobium leptorrhachis*.

8. *Isomacrolobium nigericum* (Baker f.) Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 498); Breteler (2008: 143). – *Macrolobium leptorrhachis* Harms var. *nigericum* Baker f. (as var. *nigerica*) (Baker 1913: 29). – *Macrolobium nigericum* (Baker f.) J. Léonard (Léonard 1952b: 416). – *Anthonotha nigerica* (Baker f.) J. Léonard (Léonard 1955: 202; 1957: 225); Keay (1958: 473). – Type: Nigeria, Oban, 1911, *Talbot* 582 (holo-: BM; iso-: K).

Macrolobium obanense Auct. non Baker f. (Hutchinson & Dalziel 1928: 347) p.p. quoad *Talbot* 582.

Tree. **Branches** densely tomentose. **Stipules** not seen. **Leaves** 2-jugate; petiole firm, c. 8 mm long, densely tomentose; rachis 3.5 cm long; leaflets opposite; petiolule firm, densely tomentose, 2–3 mm long; lamina elliptic to obovate, 2.5–3 times as long as wide, 11.5–18 × 4–6 cm (see note), rounded to cuneate at base, c. 5 mm long acuminate at apex, midrib slightly impressed above, prominent beneath, the 12–15 pairs of main lateral nerves ± plane above, prominent beneath, the reticulate nervation slightly prominent both sides, glabrous above, puberulous beneath, especially so on midrib and the main laterals. **Inflorescence** slender, pendulous, up to c. 1 m long, densely, shortly brown-velutinous; racemes up to c. 2 cm long; **bracts** ± persistent, ovate-triangular, up to c. 1 mm long, glabrous inside. **Pedicel** (5–)6–8(–9) mm long, hairy as the inflorescence. **Bracteoles** elliptic, 6–7 × 4 mm, outside hairy as pedicel, sparsely puberulous-tomentellous inside. **Hypanthium** 1.5–2 mm long, glabrous. **Sepals** oblong-lanceolate, (4–)5–7(–8.5) × 1.5–2 mm, glabrous. **Petals** 5, glabrous, very unequal in size, distinctly clawed, the large adaxial petal c. 10 mm long, 4–5 mm long slender-clawed, lamina bilobed, 6 × 4 mm, the other petals 3–8 mm long with shorter claw and smaller lamina. **Large stamens** 12–14 mm long, filaments glabrous, c. 2 mm long; staminodes 2–4, up to 3 mm long. **Pistil** up to 15 mm long; ovary c. 5 mm long, 5–6-ovulate, velutinous, style glabrous. **Pod** (see note) oblong, 28 × 6 × 4–5 cm (field description : c. 30 × 8 × 7 cm), rounded at base, acute at apex, 5-seeded; valves dull, greyish, prominently, reticulately to ± transversely veined. **Seeds** dark-brown, rectangular in outline (pillow-shaped), up to 6 × 3.5 × 2.5 cm, with a brittle, thin seed coat and firm, thick cotyledons. Figs 3F, 17.

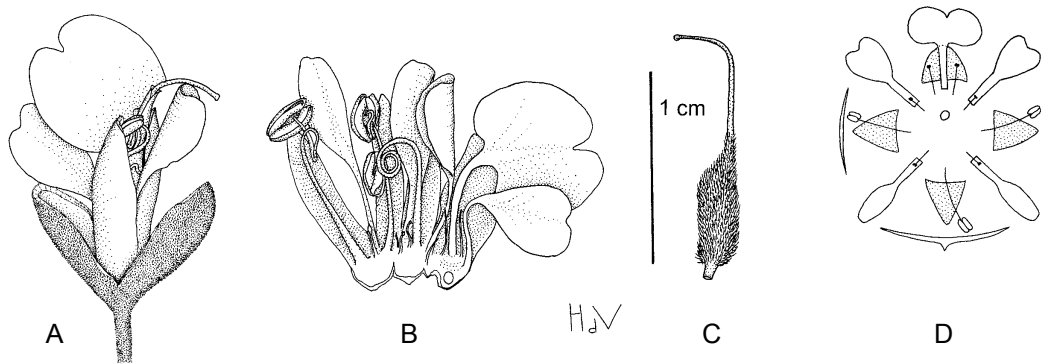


Figure 17 – *Isomacrolobium nigericum*: A, flower with bracteoles ; B, opened up flower; C, pistil; D, diagram (A–D, Talbot 582). Drawn by H. de Vries.

Habitat and distribution – Tropical rain forest in SE Nigeria and most probably also in the adjacent part of Cameroon (see note). Its presence in D.R.Congo needs confirmation on the basis of good flowering and fruiting material. Alt. 0–200 m. Fig. 18.

Additional specimens studied – **Cameroon**: Korup Nat. Park, 6 km Ikenge–Esukutang, 3 Apr. 1988, *D.W. Thomas et al.* 7634 (MO).

D.R.Congo: Nioki, Jan. 1947, *Flamigni* 8159 (BR, K); Kimbidi, near Shiloango R., Oct. 1951, *Flamigni* 10330 (BR); Dima, *Sapin* s.n. (BR); Kunzulu, Feb. 1915, *Vanderyst* 5172 (BR).

Notes – The description of this species, except for the fruit, is based on the holotype at BM and the isotype at K, together bearing three leaflets only. Baker (1913) in his original diagnosis described the leaflets as large as 20–25 × 8–8.5 cm, which size agrees well with the large-leaved specimens from D.R.Congo that were assigned to Baker's taxon by Léonard in 1952 (see below). Because of the large gap between Nigeria and D.R.Congo it may be that the specimens from the latter area belong to a different, undescribed species. The fruit description is after a loose fruit collected by *D. W. Thomas et al.* (no 7634) in the Korup National Park in West Cameroon, close to the type locality of *Isomacrolobium nigericum* in East Nigeria. This fruit resembles the fruit collected by Sapin

in D.R.Congo, but is at least twice as large. Its assignment to *Isomacrolobium nigericum* is tentative.

9. *Isomacrolobium obanense* (Baker f.) Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 498); Breteler (2008: 143). – *Macrolobium obanense* Baker f. (Baker 1913: 28); Hutchinson & Dalziel (1928: 347); Baker (1930: 670); Aubréville (1936: 224, p.p., quoad nomen, the illustration is *Isomacrolobium vignei*). – *Anthonothea obanensis* (Baker f.) J.Léonard (Léonard 1955: 203 & 1957: 225); Keay (1958: 473). – Type: Nigeria, Oban, 1911–1912, *Mr. & Mrs. Talbot* 1428 (holo-: BM; iso-: K).

Isomacrolobium elongatum (Hutch.) Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 498); Aké Assi (2001: 296); Breteler (2008: 143), **syn. nov.** – *Macrolobium elongatum* Hutch. (Hutchinson 1916: 229); Hutchinson & Dalziel (1928: 357); Baker (1930: 670). – *Anthonothea elongata* (Hutch.) J.Léonard (Léonard 1955: 202 & 1957: 223); Keay (1958: 473); Hawthorne & Jongkind (2006: 840). – Type: Sierra Leone, Pujehun, 16 Feb. 1914, *Lane-Poole* 161 (holo-: K).

Macrolobium ernae Dinkl. (Dinklage 1937: 157). – *Anthonothea ernae* (Dinkl.) J.Léonard (Léonard 1955: 202); Keay (1958: 473); Voorhoeve (1965: 5); Hawthorne & Jongkind (2006: 840). – *Triplisomeris ernae* (Dinkl.) Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 497); Breteler (2008: 143, in synonymy of *Isomacrolobium elongatum*). – Type: Liberia, Monrovia, 5 Feb. 1922, *Dinklage* 2805 (holo-: B†); **neotype, here designated**, Liberia, Cestos-Sanguin area, S E of River Cess Town, 7 Dec. 2002, *Jongkind et al* 5706 (WAG; isoneo-: K, P, not seen).

Anthonothea isopetala (Harms) J.Léonard var. *macrantha* (J.Léonard) J.Léonard (Léonard 1957: 224) **syn. nov.** – *Macrolobium isopetalum* Harms var. *macranthum* J.Léonard (Léonard 1952a: 186). – Type: D.R.Congo, Luki, 11 Oct. 1948, *Donis* 2045 (holo-: BR), see note.

Small tree or shrub up to 20 m tall and 45 cm dbh. Branches glabrous to appressed short-hairy, glabrescent, the same for petioles, rachis, and petiolules. **Stipules** usually early caducous, often foliaceous, to 4 mm long united at base, oblong-elliptic, somewhat falcate or not, (4–)7–9(–30) × 2.5–4(–15)mm, glabrous to sparsely appressed-puberulous

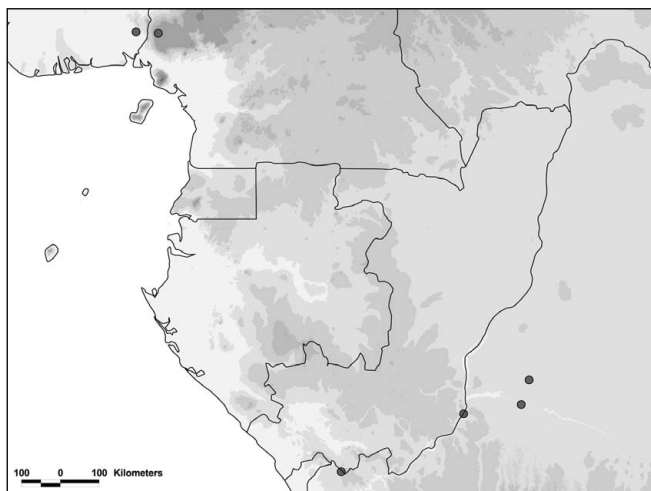


Figure 18 – Distribution of *Isomacrolobium nigericum*.

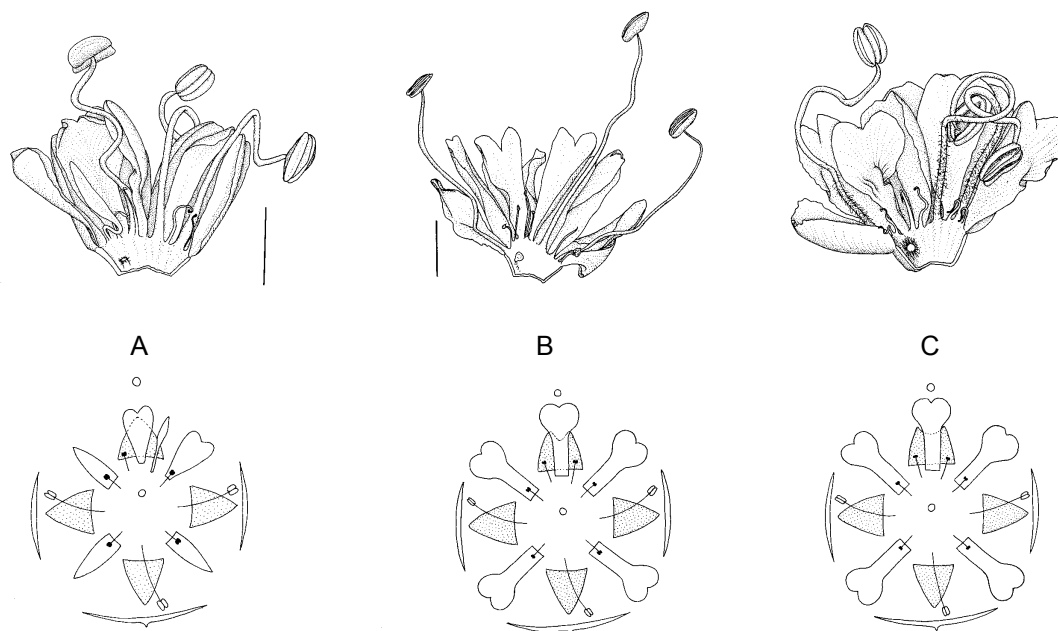


Figure 19 – Opened up flowers and diagrams of *Isomacrolobium obanense* (A, *Brenan* 8669; B, *Donis* 2045; C, *Koechlin* 4021). Scale bar = 5 mm. Drawn by H. de Vries.

outside, usually prominently nerved. **Leaves** (1–)2–3(–4)-jugate; petiole $\pm$ terete, (3–)5–20(–35) mm long; rachis subterete, rarely somewhat angled, 2–13(–20) cm long; **leaflets**: opposite or nearly so; petiolules 2–8(–9) mm long; lamina papery to coriaceous, elliptic to obovate, (1.5–)2–3(–5) times as long as wide, (5–)9–16(–26) $\times$ 3–7(–13) cm, rounded to cuneate at base, emarginate to obtuse to rounded to 0.5–1(–2) cm long acuminate at apex, glabrous above, beneath glabrous or sparsely appressed-puberulous especially so on the midrib, glabrescent; main lateral nerves (5–)6–9(–11) pairs, plane to very slightly prominent above, prominent beneath, the midrib plane to slightly impressed above, prominent beneath. **Inflorescence** subterminal or axillary, rarely cauliflorous, pendulous, rusty, appressed short-hairy, up to 50(–107) cm long; lateral branches up to 5(–12) cm long; **bracts** early caducous or not, concave, ovate-deltoid in outline, c. 2 mm in diam., outside hairy as inflorescence, glossy and glabrous inside. **Pedicel** (3–)6–10 mm long, hairy as inflorescence. **Bracteoles** elliptic to obovate, 8–10(–13) $\times$ 4–7 mm, outside hairy as pedicel, inside tomentellous. **Hypanthium** 2–3(–5) mm long, glabrous. **Sepals** glabrous, subequal in length, oblong, (7–)8–13(–17) $\times$ (2.5–)3–5 mm, the adaxial one largest. Petals glabrous, usually unequal, largest adaxially, 3–4(–5) large, narrowly obovate to spatulate, 13–15(–19) $\times$ (3–)5–10 mm, notched or up to 3 mm bilobed at apex, claw 4–5 (–6) mm long, the often two, smaller, abaxially petals narrowly obovate-oblongate, (4–)5–11 $\times$ 1–2 mm, entire. **Large stamens** up to 25 mm long, glabrous (but see note), anthers 3–5 mm long; staminodes usually all present, slender, up to 6 mm long, often with a strongly reduced anther. **Pistil** 20–25 mm long; ovary 4–7 mm long, velutinous, (4–)5–8-ovulate; style glabrous. **Pod** 1–4-seeded, oblong to elliptic (1-seeded), (7.5–)13–18 $\times$ 3.5–4.5 cm, c. 5 mm long beaked; valves shortly

brown-velutinous, $\pm$ transversely to somewhat reticulately, slightly prominently veined; ventral suture c. 5 mm thick. **Seed** ellipsoid, laterally compressed, 4.5 $\times$ 3 $\times$ 1.5 cm; seed coat brown, dull. Figs 3 G–H, 19.

Habitat and distribution – Rain forest in Upper and Lower Guinea, from Liberia to D.R.Congo. Alt. up to 700 m. Fig. 20.

Additional specimens studied – **Liberia**: Grand Bassa, Cestos-Sanguin area, 6 Dec. 2002, *Jongkind et al.* 5649 (WAG); *ibid.*, 7 Dec. 2002, *Jongkind et al.* 5707 (WAG).

Côte d’Ivoire: Tabou, 2 Feb. 1957, *Aubréville* 4065 (K, P).

Nigeria: Idanre, 2 Jan. 1948, *Brenan et al.* 8669 (BR, FHO, K, P); upper Cross R., Kedan, 1935, *Catterall* 76 (K); Ogbesse-Owo Rd., 7 Feb. 1969, *Gbile et al.* FHI 20583 (K); Obeyon, 18 Jan. 1900, *Holland* 244 (K); Abete, Dec. 1892, *Millen* 74 (K); Idanre, Orusun Park, 4 Mar. 1955, *Richards* 5114 (K, P); Utanga, 24 Dec. 1948 *Savory & Keay* FHI 25143 (K); Oban District, 1911–1912, *Mr. & Mrs. Talbot* 1468 (K); Uburubu, 28 miles NW of Onitsha, 30 Jan. 1913, *N.W. Thomas* 2260 (K), *ibid.*, *N.W. Thomas* 2262 (K).

Cameroon: Campo Ma’an area, Kom, 11 Dec. 2001, *Elad et al.* 1495 (WAG); Akak, 20 km E of Campo, 16 May 1989, *Onana* 368 (WAG, YA); Mabeta, Cameroon Mt., 3 Nov. 1997, *Tchouto et al.* 1764 a (MO).

Gabon: M’Passa, 20 Jul. 1981, *Gentry* 33448 (MO); Ipoungou, 14 Nov. 1925, *Le Testu* 5740 [BM (on 23 Apr. 2008 identified as *I. isopetalum*), BR, WAG]; Akok–Mvoum, 22 Nov. 1982 *A.M. Louis* 134 (LBV, WAG); Inselberg Milobo, 30 Oct. 2001, *Ngok Banak et al.* 268 (LBV, WAG); *ibid.*, 1 Dec. 2001, *Ngok Banak et al.* 328 (LBV, WAG); Crystal Mts., 24 Feb. 2001, *Nguema Miyono* 1701 (LBV, WAG).

Republic of the Congo: Forêt de Bangou, Nov.–Dec. 1956, *Koechlin* 4021 (P), see note.

D.R.Congo: Kinganga, 23 Oct. 1952, *Devred* 1152 (BR, FHO); Luki, 6 Jan. 1947, *Toussaint* 2087 (BR, K); N’kula valley, 15 Oct.

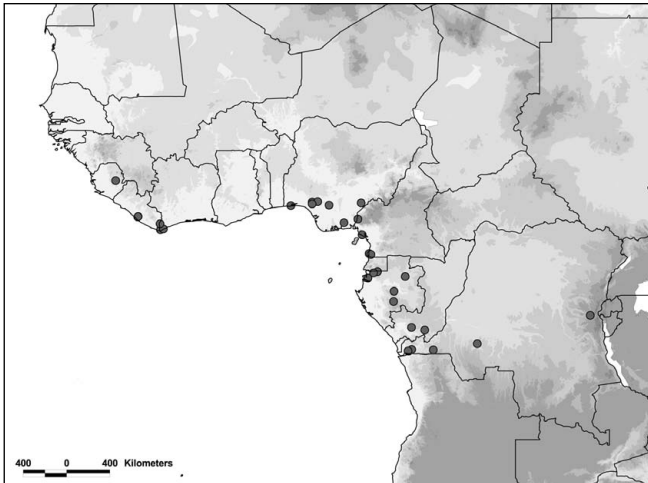


Figure 20 – Distribution of *Isomacrobium obanense*.

1947, Toussaint 2491 (BR, K, MO, WAG); Gimbi, 11 Nov. 1953, Wagemans 711 (BR, WAG).

Notes – The corolla of *Isomacrobium obanense* shows great variation in the number of large petals from three till five. This variation occurs throughout its area. A certain number of large petals is not restricted to specimens of a particular area, not even to single specimens, as the variation also occurs between flowers of e.g. Jongkind *et al.* 5649. This variation in the number of large petals has probably misled Léonard (1952) when he placed his var. *macrantha* under *Macrobium isopetalum*, and the present author when he placed this variety under *Isomacrobium sargosii* (Breteler 2008).

The large stamens have glabrous filaments except for Koechlin 4021 from Republic of the Congo with hairy filaments (fig. 19). This aberrant feature is not found to be correlated with any other character by which this specimen might be placed separately.

The description of the pod is based on three specimens only, Jongkind *et al.* 5707 from Liberia with immature fruits, Aubréville 4065 from Côte d'Ivoire with $\pm$ mature, 4-seeded pods, and Toussaint 2087 from Congo-Kinshasa with immature 1-seeded pods (see fig. 3 G–H).

The type of *Macrobium ernae*, a Dinklage collection, has not been cited by number in the protologue, but Mildbraed (1937) mentioned Dinklage 2805 in connection with the name *M. ernae* in an article that appeared a year earlier in the same periodical. This original material has been lost at Berlin and a duplicate has not been traced. Jongkind *et al.* 5706, collected in the coastal area c. 150 km SE of Monrovia has been designated neotype.

Isomacrobium obanense is difficult to distinguish from *I. isopetalum*, especially so when open flowers are missing. The latter species differs in its petals which are all of the same length, c. as long as the sepals, without the adaxial petal(s) being the most conspicuous. On the contrary the adaxial petal is quite often missing in *I. isopetalum*.

The distribution of *Isomacrobium obanense* is disjunct, which is often seen in species that occur throughout the Guineo-Congolian region but are restricted to relatively wet habitats.

10. *Isomacrobium sargosii* (Pellegr.) Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 498); Breteler (2008: 143) partly, excluding *Anthonotha isopetala* (Harms) J.Léonard var. *macrantha* (J. Léonard) J.Léonard which is a synonym of *Isomacrobium obanense*. – *Englerodendron sargosii* Pellegr. (Pellegrin 1921: 11) – *Macrobium sargosii* (Pellegr.) Pellegr. (Pellegrin 1930: 666; 1948: 44). – *Anthonotha sargosii* (Pellegr.) J.Léonard (Léonard 1957: 225). – Type: Republic of the Congo, lower Kouilou R., Sargos 101 (holo-: P: iso-: BR, WAG).

Small tree to c. 5 m tall. Branches, petiole, leaf rachis, petiolule and midrib of leaflets beneath sparsely pubescent, glabrescent. **Stipules** early caducous, not seen. **Leaves** (1–) 2–3-jugate; petiole terete, 7–13 mm long; rachis $\pm$ terete, (0–) 1–4(–6) cm long; leaflets: petiolule 3–5 mm long; lamina papery, ovate-elliptic, (1.5–) 2–2.5 times as long as wide, 3.5–8.5 $\times$ 2–3.5 cm, rounded to broadly cuneate at base, 7–17 (–20) mm long acuminate at apex, glabrous above, $\pm$ appressed-pubescent beneath, midrib and the 5–7 pairs of main lateral nerves $\pm$ plane to slightly prominent above, more prominent beneath. **Inflorescence** axillary or terminating short, lateral shoots, up to c. 3 cm long, $\pm$ appressed, brown-velutinous; racemes up to c. 1 cm long; **bracts** early caducous, not seen. **Pedicel** c. 5 mm long, velutinous. **Bracteoles** ovate-elliptic, 9–10 $\times$ 5 mm, appressed short-hairy outside, tomentellous inside. **Hypanthium** 2–3 mm long, glabrous. **Sepals** oblong-lanceolate, 6–7 $\times$ 2.5–4 mm, the adaxial one largest, emarginate at apex, glabrous. **Petals** 5, subequal, narrowly obovate-spathulate, long clawed, 6–7 $\times$ 2–3 mm, top $\pm$ obtuse, claw densely villous at base. **Large stamens** exserted; filaments villous at base, anthers 1.5–2 mm long; staminodes 4–6, c. 0.8 mm long, without reduced anther. **Pistil** shortly stipitate, ovary 6–8-ovulate, villous; style villous in basal part. **Fruit** (pods immature, but most probably full grown in size) 12–17 $\times$ 3.5–5 cm, c. 4-seeded; valves $\pm$ densely, $\pm$ obliquely, prominently veined, shortly brown-velutinous. Fig. 3I.

Habitat and distribution – Rain forest or gallery forest in SW Gabon and W Republic of the Congo. Alt. 0–300 m. Fig. 21.

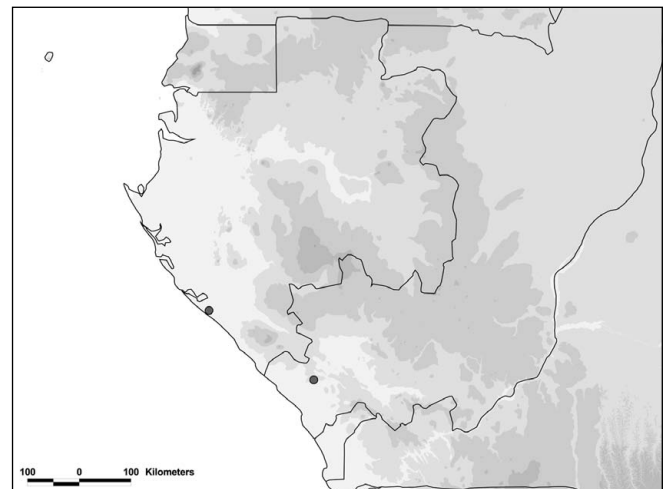


Figure 21 – Distribution of *Isomacrobium sargosii*.

Additional specimen studied – Gabon: Gamba, Bonda Rd., 1 Dec. 1994, J.J. de Wilde c.s. 11275 (P, WAG).

11. *Isomacrolobium triplisomere* (Pellegr.) Breteler (Breteler 2008: 143). – *Macrolobium triplisomere* Pellegr. (Pellegrin 1941: 508); Pellegrin (1948: 53). – *Anthonotha triplisomeris* (Pellegr.) J.Léonard (Léonard 1957: 226). – *Triplisomeris triplisomeris* (Pellegr.) Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 497); Aubréville (1968: 192), illegitimate name (tautonym). – Type: Gabon, Nyanga Mt., between l'Onoij and Mouila, 26 Nov. 1925, *Le Testu* 5792 (holo-: P; iso-: BM, WAG).

Small tree up to 9 m tall and 7 cm dbh. Branchlet, stipules, petiole, leaf rachis, petiolule and leaflets beneath glabrous to appressed-puberulous, glabrescent. **Stipules** ± persistent, narrowly triangular, 2–5 mm long, united at base. **Leaves** 2-jugate, sometimes reduced to a single pair of leaflets, exceptionally to a single leaflet; petiole subterete to somewhat angular, (0.5–)1–2(–2.5) cm long; rachis subterete to somewhat angular to shallowly grooved, (0–)1.7–6.5(–8) cm long; leaflets: petiolule (4–)5–8(–12) mm long; lamina obovate-elliptic, 1.5–2.5 times as long as wide, (5.5–)9–15(–26) × (2.5–)4–8(–12.5) cm, rounded to cuneate at base, 0.5–1.5 cm long acuminate at apex (see note), glabrous above with impressed midrib, the midrib and the (6–)7–8(–10) pairs of main lateral nerves prominent beneath. **Inflorescence** axillary or terminal, up to c. 60 cm long, appressed-puberulous to tomentellous; racemes up to 1 cm long; **bracts** ovate-triangular, concave, c. 1 mm long, glabrous inside. **Pedicel** 6–9 mm long, densely, appressed short-hairy. **Bracteoles** obovate, 8–9 × 5 mm, outside hairy as pedicel, tomentellous inside. **Hypanthium** 2–3 mm long, glabrous. **Sepals** oblong-elliptic, 6–7 × 2–3 mm, the adaxial sepal broadest, glabrous except for the sparsely ciliate apex. **Petals** glabrous, 3 large, sub-equal, obovate to broadly spatulate, 10–12(–15?, see note) mm long, the apical part c. 6–7 × 4–5 mm with a undulate-lobulate margin, the claw c. 5 mm long, the two small, abaxial petals narrowly oblong, 3 × 0.5 mm. **Large stamens** up to c. 15 mm long, glabrous, anthers 3 mm long; staminodes 3–5, filiform, c. 1 mm long, glabrous, without a reduced anther. **Pistil** up to c. 15 mm long; ovary 4 mm long, densely, ± appressed short-hairy, 8–9-ovulate; style glabrous or hairy at base. **Fruits** unknown. Fig. 22.

Habitat and distribution – Rain forest in Central Gabon. Alt. 200–500 m. Fig. 23.

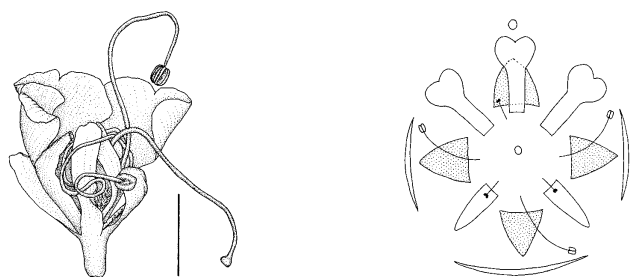


Figure 22 – Opened up flowers and diagram of *Isomacrolobium triplisomere* (A.M. Louis et al. 1317). Scale bar = 5 mm. Drawn by H. de Vries.

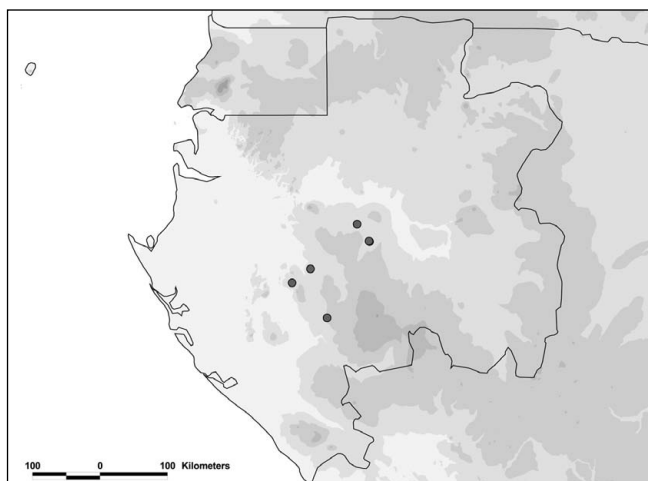


Figure 23 – Distribution of *Isomacrolobium triplisomere*.

Additional specimens studied – Gabon: Makandé, c. 65 km SSW of Booué, 2 Mar. 1999, *Breteler et al.* 15279 (LBV, WAG); 5 Nov. 1996, *Doucet* 457 (BR, WAG); Waka, 32 km SE of Sindara, 12 Dec. 1983, *Louis et al.* 1317 (BR, K, LBV, MA, P, WAG); E of Lopé Nat. Park, 4 Dec. 1993, *Mc Pherson & Flores* 16310 (BR, LBV, MO, WAG); Ikobey–Bakongue Rd., just after Oumba bridge, 27 Nov. 2001, *Wieringa et al.* 4439 (LBV, WAG).

Note – Pellegrin (1941) described his *Macrolobium triplisomere* with leaflets ‘longe caudata (acumine 1.5–2 cm longo)’, but I have only seen leaflets with an up to 1.5 cm long acumen. The large petals were described by him as 15 mm long and 6 mm wide, which is longer than seen for the description given above.

12. *Isomacrolobium vignei* (Hoyle) Aubrév. & Pellegr. (Aubréville & Pellegrin 1958: 498); Aubréville (1959: 293); Aké Assi (2001: 296); Breteler (2008: 144). – *Macrolobium vignei* Hoyle (Hoyle & Dunkley 1933: 171). – *Anthonotha vignei* (Hoyle) J.Léonard (Léonard 1955: 203); Keay (1958: 473); Voorhoeve (1965: 142); De Koning (1983: 194); Hawthorne & Jongkind (2006: 840). – Type: Ghana, Dompim, May 1930, *Vigne* 1968 (holo-: K; iso-: FHO, n.v.).

Tree up to 25 m tall and 40 cm dbh, sometimes a shrub. Branches lenticellate. **Branchlets**, petiole, rachis, petiolule, and lower surface of leaflet densely to sparsely puberulous, ± appressed or not, glabrescent. **Stipules** very early caducous, narrowly triangular to oblong, 4–5 × 1 mm, appressed-puberulous outside, glabrous inside. **Leaves** 1–3-jugate; petiole subterete (2–)6–10(–25) mm long; rachis ± terete to somewhat grooved or angular, 1–10(–14) cm long; leaflets: petiolule (2–)3–6(–8) mm long; lamina papery to coriaceous, obovate-elliptic, (1–)2–3(–3.5) times as long as wide, (2.5–)5–15(–23) × 2.5–6(–15) cm, rounded to cuneate at base, (0.5–)1–2(–4) cm long acuminate at apex, the acumen acute to mucronate, glabrous above, midrib impressed above, prominent beneath, main lateral nerves (4–)6–9(–11) pairs, plane above, prominent beneath. **Inflorescence** terminal or terminating short, axillary shoots, ± erect, widely branched, up to 12 cm long, tomentellous to velvety; racemes up to 5 cm long; **bracts** ± persistent till anthesis, elliptic, concave, (5–)6–9 × 4–5 mm, tomentellous outside, sparsely so inside. **Pedicel**

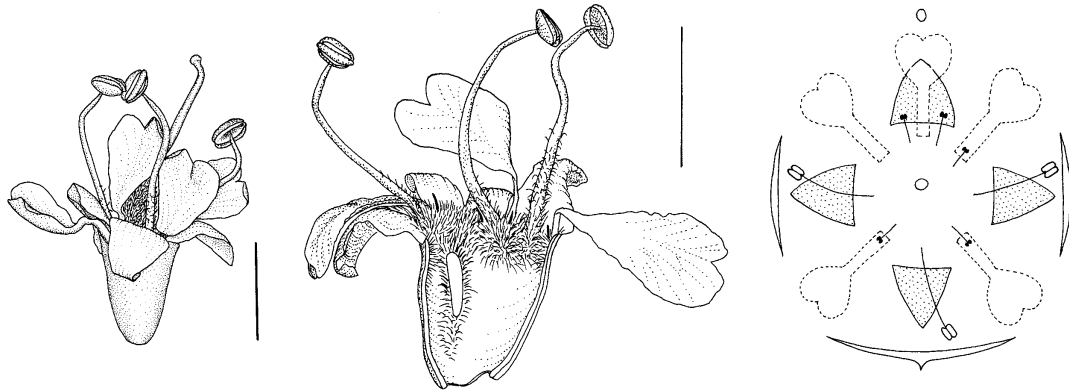


Figure 24 – Opened up flower, flower cut lengthwise and diagram of *Isomacrolobium vignei* (Leeuwenberg 3060). Scale bar = 5 mm. Drawn by H. de Vries.

1–2(–3) mm long, brown-velutinous to brown-tomentellous. Bracteoles elliptic to obovate, concave, 6–7(–8) × 3–4 mm, outside hairy as pedicel, ± glabrous inside. Hypanthium 3–6 mm long, glabrous outside, hairy on apical part inside. Sepals: the adaxial and the abaxial one ± reflexed, the lateral ones erect to spreading, ovate-oblong, 3–5 × 2–3 mm, glabrous. Petals 1–4 (see note), obovate-spathulate, 5–6 × 2.5–3 mm, claw c. 1 mm long, emarginate to shortly bilobed at apex, glabrous. Large stamens 6–8 mm long, glabrous; anthers 1.5–2 mm long; staminodes 1–5 present, minute, ≤ 1 mm long, with or without a very much reduced anther. Pistil 7–13 mm long; ovary 2–4 mm long, 2–4-ovulate, velutinous; style often sharply bent at base. Fruit very variable in size, shortly ellipsoid to oblongoid, laterally compressed, 5–12 × 1.5–4.5 cm, 1–3(–4)-seeded, velvety, ± smooth or sometimes warty, indistinctly nerved. Seed subquadrate in outline, 25–30 × 20–25 × 12–15 mm; seed coat ± dull, brittle, distinctly impressed-nerved. Seedling: hypocotyle 0; epicotyle 0; first leaves alternate, 2-jugate. Figs 3J–K, 24.

Habitat and distribution – Rain forest or gallery forest in Guinea, Sierra Leone, Liberia, Côte d'Ivoire, and Ghana. Alt. 0–750 m. Fig. 25.

Additional specimens studied – **Guinea**: Bélémou, 25 Feb. 1949, *Adam* 3858 (MO).

Sierra Leone: Kambui Hills F.R., 19 Apr. 1967, *Samai* 530 (K); Gola Forest, 28 Apr. 1952, *Small* 624 (K); *ibid.*, *Small* 626 (K); *ibid.*, *Small* 628 (K, P); *ibid.*, *Small* 635 (BR, K, MO, P).

Liberia: Saniquellie, Kitouma, Mar. 1959, *Adam* 16736 (MO, WAG); Sarbo, 6 Jul. 1947, *Baldwin* 6384 (K, MO); Suen, 21 Nov. 1947, *Baldwin* 10450 (K, MO, WAG); Brewerville, 31 Dec. 1947, *Baldwin* 10948 (K, MO); Lakrata, 22 Apr. 1944, *J.C. Bequaert* 187 (K, MO); 10 km N of Kanweake, 27 Mar. 1962, *J.J. de Wilde & Voorhoeve* 3664 (BR, K, MO, P, WAG); Gola Nat. Forest, 16 Apr. 1962, *J.J. de Wilde & Voorhoeve* 3818 (BR, K, MO, P, WAG); 32 km N of Kakata, 21 Apr. 1962, *J.J. de Wilde & Voorhoeve* 3861 (BR, K, P, WAG); Grand Bassa, *Dinklage* 1972 (FHO); 4 miles S of Kakata, 7 Nov. 1968, *Jansen* 1020 (BR, K, P, WAG); 19 miles Bomi Hills–Bopulu, 13 Feb. 1969, *Jansen* 1548 (BR, WAG); Grand Bassa, 7 Dec. 2002, *Jongkind et al.* 5684 (WAG); 32 km N of Kakata, 11 Aug. 1962, *Leeuwenberg & Voorhoeve* 4922 (K, WAG); Du R., *Linder* 189 (K, WAG); Nimba Range, 20 Jan. 1966, *van Meer* 299 (WAG); between Bomi Hills and Mano R., 5 Feb. 1966, *van Meer* 372 (WAG); 19 km S of Penoken, 22 Feb. 1966, *van Meer* 492

(WAG); Bassa County, *Voorhoeve* 62 (WAG); Bomi Hills, 31 May 1962, *Voorhoeve* 1112 (BR, WAG).

Côte d'Ivoire: Between Port-Gauthier and Ebonou, 26 Jun. 1966, *Aké Assi* 8990 (G); Sassandra, 16 Jul. 1969, *Aké Assi* 10694 (BR, G); Abidjan, 3 Jan. 1929, *Aubréville* 65 (BR, P); *ibid.*, 7 May 1929, *Aubréville* 89 (BR, P, WAG); Banco, 4 Jan. 1931, *Aubréville* 412 (P); *ibid.*, Dec. 1931, *Aubréville* 631 (P); Toulepleu, 9 Apr. 1932, *Aubréville* 1190 (P); Tabou, Dec. 1932, *Aubréville* 1685 (BR, P); 8 km SW of Kpata, 9 May 1975, *Beentje* 100 (WAG); Abidjan, Botanic Garden, 8 May 1995, *Breteler* 13412 (WAG); between Sassandra and Gagnoa, 7 Apr. 1973, *de Koning* 1471 (WAG); Sassandra, San Pedro Rd., 13 Apr. 1973, *de Koning* 1471 (WAG); N of Sassandra, 11 Nov. 1973, *de Koning* 2653 (WAG); Banco, 15 Nov. 1974, *de Koning* 4769 (WAG); Adiopodoumé, 19 Dec. 1974, *de Koning* 5042 (WAG); *ibid.*, 13 Jan. 1975, *de Koning* 5139 (WAG); Banco, 6 Feb. 1975, *de Koning* 5339 (WAG); Adiopodoumé, 6 Mar. 1975, *de Koning* 5476 (WAG); *ibid.*, 23 Apr. 1975, *de Koning* 5719 (WAG); Banco, 3 Jun. 1976, *de Koning* 6957 (WAG); 64 km N of Sassandra, 18 Jun. 1963 *W. de Wilde c.s.* 273 (BR, K, P, WAG); 64 km N of Sassandra, 30 Jun. 1963, *Fuyt in W. de Wilde* 399 (BR, K, P, WAG); between Port-Gauthier and Ebonou, 26 Jun. 1966, *Guillaumet* 1935 (BR); Bouboule, 18 Aug. 1975, *Hall & Abbiw* GC46552 (FHO, MO); Tabou, Forêt Classée Haute Dodo, 5 May 1999, *Jongkind et al.* 4509 (WAG); San Pedro, 24 Mar. 2000, *Jongkind et al.* 4720 (FHO, WAG); Abouabou Forest, 8 Jan. 1959, *Leeuwenberg* 2400 (BR, K, P, WAG); 55 km ENE Sassandra, 12 km N of Fresco, 12 Mar. 1959, *Leeuwenberg*

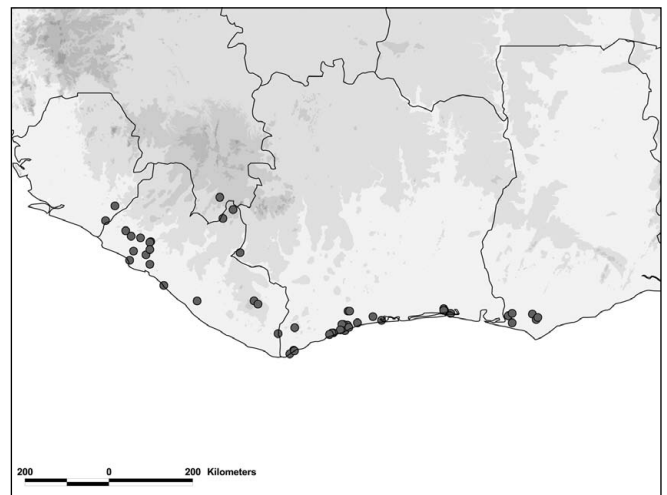


Figure 25 – Distribution of *Isomacrolobium vignei*.

3060 (BR, COI, FHO, K, P, WAG); 5 km NE of Monogaga, 29 Apr. 1962, *Leeuwenberg* 4061 (K, P, WAG); 10 km N of Sassandra, 10 May 1975, *van der Burg* 274 (WAG); 20 km NE of Tabou, 1 Sep. 1975, *van der Burg* 858 (WAG); 25 km NW of Sassandra, 6 Jun. 1969, *Versteegh & Den Outer* 206 (WAG); Banco, 1 Sep. 2001, *Wieringa* 4303 (WAG).

Ghana: Bonsasu, 26 May 1981, *Abbiw* 151 (MO, WAG); Ankasa F.R., 6 Oct. 1973, *Enti & Anonah* R1087 (BR, MO); Bonsasu, 26 May 1977, *Hall & Naboo* GC46641 (FHO, K, MO); Ankasa F.R., 22 km E of Elubo, 15 May 1995, *Merello et al.* 1287 (MO, WAG); Bonsa R., Axim District, Nov. 1928, *Vigne* 1397 (BR, FHO, K); *ibid.*, May 1930, *Vigne* 1997 (FHO, K).

Note—The number of petals and their position is very variable in *Isomacrolobium vignei*. In the diagram of figure 24 this has been visualized by a dotted line for the petals. At most four petals are present, the minimum is one. In the adaxial position the petal is usually missing. The variation in the number and the position of the petals can sometimes be seen in different flowers of a single specimen (e.g. *Breteler* 13142).

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Appendix – Index of taxa in the revisions of *Anthonotha* (this journal, volume 143: 70–99) and *Isomacrolobium* (this paper)

Numbers are page numbers in *Plant Ecology and Evolution* 143 (printed in 2010) & 144.

- Anthonotha* 143: 70, 71, 97; 144: 64, 65
Anthonotha section *Anthonotha* 143: 70, 71, 80
Anthonotha section *Triplisomere* 144: 64
acuminata 143: 70, 72–74, 76, 86
brieyi 143: 72, 74, 76, 77, 86, 93, 95
cladantha 143: 70, 72, 74, 77, 78, 81, 97
crassifolia 143: 70, 71, 73, 74, 78, 79, 84, 86, 89
elongata 144: 75
ernae 144: 75
explicans 144: 69
ferruginea 143: 70–72, 74, 80, 81
fragrans 143: 71, 73, 74, 81
gilletii 143: 72, 74, 82, 83, 86
graciliflora 144: 71
hallei 144: 71
isopetala 144: 72
isopetala var. *macrantha* 144: 75, 77
kwewonii 144: 69
lamprophylla 143: 70–72, 74, 83, 84
lebrunii 144: 73
leptorrhachis 144: 73
macrophylla 143: 70–74, 78, 80, 84–86, 91
macrophylla var. *heudelotiana* 143: 86
mouandzae 143: 70, 72, 75, 86, 87, 88
nigerica 144: 74
noldeae 143: 70, 72, 75, 88, 89
obanensis 144: 75
pellegrinii 143: 72, 75, 89, 90
pynaertii 143: 70–73, 75, 76, 84, 86, 90, 91
sargosii 144: 77
sassandraensis 143: 78, 80
stipulacea 143: 71, 72, 75, 91, 92
triplisomeris 144: 78
trunciflora 143: 70–72, 75, 92, 93
vignei 144: 78
wijmacampensis 143: 70, 72, 75, 93, 94
xanderi 143: 70, 72, 75, 95, 96, 97
Dalbergia 143: 80
- Englerodendron* 144: 64
gabunense 144: 71
sargosii 144: 77
Eurypetalum 143: 71
Gilbertiodendron 143: 70
Isomacrolobium 143: 70; 144: 64, 65, 67
brachyrhachis 144: 64–66, 68
elongatum 144: 75
explicans 144: 65–67, 69
graciliflorum 144: 64–67, 70, 71
hallei 144: 64, 65, 67, 71
isopetalum 144: 65, 67, 72, 77
isopetalum var. *isopetalum* 144: 72
lebrunii 144: 64–66, 73
leptorrhachis 144: 64, 65, 67, 73, 74
nigericum 144: 64, 65, 67, 74, 75
obanense 144: 64, 65, 67, 71, 75–77
sargosii 144: 64, 65, 67, 77
triplisomere 144: 64–66, 77, 78
vignei 144: 64–67, 75, 78–80
Macrolobium 143: 70, 80
acuminatum 143: 73
bipindense 143: 78
bonnivairi 143: 90
brieyi 143: 76
chrysophylloides 143: 81, 82
cladanthum 143: 77
crassifolium 143: 78, 80
elongatum 144: 75
ernae 144: 64, 75, 77
explicans 144: 69
ferrugineum 143: 80
fragrans 143: 81
gilletii 143: 82
graciliflorum 144: 71
heudelotianum 143: 78
heudelotii 144: 69
isopetalum 144: 72, 77
isopetalum var. *macranthum* 144: 75
lamprophyllum 143: 83
lebrunii 144: 73
leptorrhachis 144: 73
leptorrhachis var. *nigericum* 144: 74
macrophyllum 143: 70, 78, 84
macrophyllum var. *heudelotianum* 143: 78
malchairii 143: 90
nigericum 144: 74
noldeae 143: 88
obanense 144: 74, 75
palisotii 143: 70, 84, 90
palisotii var. *heudelotianum* 143: 78
pynaertii 143: 90
sargosii 144: 77
stipulaceum 143: 91
triplisomere 144: 78
trunciflorum 143: 92
vignei 144: 78
Oddoniodendron 143: 71
Paramacrolobium 143: 70
Pellegrineodendron 143: 70
Triplisomeris 144: 64, 66
ernae 144: 75
explicans 144: 66, 69
triplisomeris 144: 78
Vouapa 143: 70, 71, 80
autraniana 143: 91
crassifolia 143: 78
crassifolia var. *heudelotiana* 143: 78, 80
explicans 144: 69
macrophylla 143: 71, 84
macrophylla var. *heudelotiana* 143: 84
stipulacea 143: 71, 91