

Three new species of *Tricalysia* (Rubiaceae) from Atlantic Central Africa

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Background and aims – The genus *Tricalysia* A.Rich. (Rubiaceae), regarded here in the strict sense (i.e., excluding *Empogona* Hook.f.), includes 77 species in tropical Africa, Madagascar and the Comoros. In the current paper, three new species from Atlantic Central Africa are described and illustrated; their conservation status is also assessed.

Material and methods – This paper is based on a study of herbarium collections from BR, BRLU, K, LBV, P, WAG and YA. Normal practices of herbarium taxonomy have been applied. The conservation status assessments follow the IUCN Red List criteria.

Results – *Tricalysia lophocarpa* O.Lachenaud & Sonké is endemic to Gabon and is best recognised by its fruits with 8–10 narrow longitudinal ribs. *Tricalysia obovata* O.Lachenaud & Sonké is endemic to Equatorial Guinea (Rio Muni) and may be recognised by its obovate leaves with rounded base, glabrous stems, and sessile flowers with included style and half-exserted anthers. *Tricalysia wilksii* O.Lachenaud & Sonké occurs in Gabon and southwestern Republic of Congo, and may be recognised by its glabrous stems and leaves, the latter with crypt domatia, its linear calyx teeth equalling or exceeding the tube in length, and its shortly pedicellate fruits. The three species are assessed respectively as Near-threatened (*T. lophocarpa*), Critically Endangered (*T. obovata*) and Vulnerable (*T. wilksii*).

Keywords – *Tricalysia*; Rubiaceae; Coffeaeae; new species; taxonomy; Central Africa; Gabon; Equatorial Guinea; Republic of Congo.

INTRODUCTION

The genus *Tricalysia* A.Rich. (Rubiaceae-Coffeaeae) occurs in tropical Africa, Madagascar and the Comoros, and currently includes 77 species (Govaerts et al. 2019), the majority of which are found in the Guineo-Congolian region (White 1979). The highest diversity of the genus occurs in Cameroon (26 species) followed by the Democratic Republic

of the Congo (22 species) and Gabon (21 species) (Govaerts et al. 2019). The African species of *Tricalysia* have been revised by Robbrecht (1979, 1982, 1983, 1987) who separated two subgenera: subg. *Tricalysia* and subg. *Empogona* (Hook.f) Brenan. The latter is now regarded as a separate genus, *Empogona* Hook.f., with 29 species (Tosh et al. 2009). The Malagasy species have been revised by Ranarivelo-Randriamboavonjy et al. (2007).

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The genus belongs to the tribe Coffeae s. lat. (Bridson & Verdcourt 2003) which is characterised by left-contorted corolla aestivation, usually paired and axillary inflorescences, bracteoles often fused into calyculi, bifid style, bilocular ovary, and fleshy fruits. Within this tribe, *Tricalysia* most closely resembles *Empogona*, but differs from the latter by having a well-developed calyx tube, a shortly and sparsely hairy corolla throat, the anthers not or hardly apiculate at apex, and the fruits green to brownish when immature and orange to red when mature. By contrast, *Empogona* has a very short calyx tube, a usually densely bearded corolla throat, anthers prolonged by a conspicuous sterile appendage, and fruits white to pale pink when young and purple-black when mature.

Tricalysia s. str. is recovered as monophyletic with strong support in recent molecular phylogenetic studies of the Coffeae (Davis et al. 2007; Tosh et al. 2009; Arriola et al. 2018) but its relationship to other genera of the tribe remains unclear: it appears either as sister to *Belonophora* Hook.f. (Davis et al. 2007; Tosh et al. 2009) or sister to a clade comprising *Sericanthe* Robbr., *Diplospora* DC. and *Empogona* (Arriola et al. 2018) but in either case the support is weak.

Five sections were hitherto recognized in *Tricalysia* s. str. (Robbrecht 1982, 1983, 1987; Ranarivelo-Randriamboavonjy et al. 2007) but this classification is in need of a revision. Most of these sections were based on few key characters: unisexual flowers in sect. *Androgyne* Robbr. which includes the Malagasy species, free bracteoles in sect. *Probletostemon* (K.Schum.) Robbr., anthers fully or partly included in sect. *Ephedranthera* Robbr., and calyx longitudinally split in sect. *Rosea* (Klotzsch) Robbr.; the last section, sect. *Tricalysia*, being essentially defined by the lack of all these features. In fact, some of these characters are not always reliable: for example in *T. pangolina* N.Hallé, placed in sect. *Tricalysia* by Robbrecht (1987), the bracteoles may be free or fused, sometimes on the same branch; while in *T. amplexicaulis* Robbr. and *T. obstetrix* N.Hallé, also of sect. *Tricalysia*, the calyx is often split longitudinally as in sect. *Rosea*. Some species are closely similar and presumably related despite being placed in different sections, e.g., *T. longituba* De Wild. (sect. *Ephedranthera*) and *T. potamogala* N.Hallé (sect. *Tricalysia*), or *T. ferorum* Robbr. (sect. *Probletostemon*) and *T. vadensis* Robbr. (sect. *Tricalysia*). A molecular study of the group (Tosh et al. 2009) suggested that most of the sections are not monophyletic, but the resolution and sampling were not sufficient to propose an alternative classification. Consequently, we have not considered any sections in the current paper.

The flowers of continental African *Tricalysia* are bisexual (contrary to those of Malagasy species) and usually isostylous, with both style and anthers exerted. However, some species have the anthers entirely or partly included, and may be either isostylous (e.g., *T. vanroechoudtii* (Lebrun ex van Roechoudt) Robbr.) or heterostylous (e.g., *T. longituba* De Wild., *T. acokantheroides* K.Schum.). These have been grouped in sect. *Ephedranthera* by Robbrecht (1982), but as discussed above, this section is probably artificial.

The botanical exploration of Atlantic Central Africa in recent decades has led to the discovery of numerous new Rubiaceae species (e.g., Ntore et al. 2010; Lachenaud & Séné

2012; Zemagho et al. 2014, 2017, 2018; Lachenaud & Zemagho 2015; Sonké et al. 2015; Sonké & Lachenaud 2016; Taedoumg et al. 2017; Lachenaud 2019) but our knowledge of the family remains far from complete. While identifying unnamed material from this area, mostly collected after the completion of Robbrecht's abovementioned series of revisions, we came across three species of *Tricalysia* s. str. that we were unable to match to any described taxa (Keay 1958, 1963; Hallé 1970; Robbrecht 1979, 1982, 1983, 1987, 1988a; Sonké et al. 2002a, 2002b). These three new entities are here described and illustrated, and their conservation status is assessed.

MATERIAL AND METHODS

This paper is based on a study of herbarium collections from BR, BRLU, K, LBV, P, WAG and YA (herbarium acronyms according to Thiers continuously updated). The descriptions are based on herbarium specimens, spirit material and pictures when available, and data derived from field notes. Descriptive terminology follows Robbrecht (1988b). Phytogeographical considerations follow White (1979, 1983, 1993). All specimens cited have been seen, unless otherwise stated.

The conservation status of the new species was assessed according to IUCN Red List Categories and Criteria, version 3.1 (IUCN 2012; IUCN Standards and Petitions Subcommittee 2015). The extent of occurrence and the area of occupancy were estimated with GeoCAT (<http://geocat.kew.org>) with a grid size of 2 × 2 km.

TAXONOMIC TREATMENT

Tricalysia lophocarpa O.Lachenaud & Sonké, sp. nov.

Figs 1A, 2, 3

Diagnosis – Ramulis breviter pubescentibus, foliis ellipticis parvis, floribusque parvis et sessilibus *T. pallenti* Hiern similis, sed differt fructibus longitudinaliter 8–10-costatis (nec laevibus), calyci lobis 0.5–1 mm longis (nec 0.1–0.5 mm), stylo glabro (nec pubescente), foliisque domatiis cryptiformibus (nec foveolatis) munitis et subtus in sicco minute granulosis (nec laevibus).

Type – Gabon: Ivindo National Park, 0°15'S, 12°20'E, 10 Apr. 2004, fr., *Moungazi 1545* (holotype: BR [BR0000009456501]; isotypes: LBV, WAG [WAG0318084, WAG0122835]).

Description – **Shrub** 0.4–3.5 m high, branched. **Twigs** cylindrical, c.1 mm thick, densely pubescent with short patent hairs c. 0.15 mm long; older twigs with pale brown bark. **Stipules** 2–5.5 × 1–2 mm, with a short triangular base < 1 mm long and a filiform awn 1.5–4.5 mm long, puberulous, persistent. **Leaves** with petiole 0.1–0.4 cm, puberulous; lamina 3–11.3 × 1.3–3.8 cm, elliptic, acute or rarely obtuse at base, acuminate (usually shortly) at apex, coriaceous and minutely granulose below when dry, glabrous except the domatia and the underside of midrib with sparse appressed hairs, drying ashy green to pale olive-brown, paler below; midrib impressed above, prominent below; lateral veins 3–5(–6), ascending at c. 45° and forming very obscure loops 1–1.5 mm from the margin; tertiary veins hardly distinct, parallel

to reticulate; domatia present in the main vein axils, as dense hair tufts masking a crypt. **Inflorescences** axillary on young twigs, 1- to 3-flowered, sessile; bracts fused into a cup c. 1 mm long with two short teeth, appressed pubescent; bracteoles fused into a cup 1–1.5 mm long with two short teeth, densely appressed pubescent. **Flowers** 4- or 5-merous, sessile; calyx with tube 1–1.5 mm long and acute teeth 0.5–1 mm long, densely appressed-pubescent on both sides; corolla greenish white, tube almost cylindrical with slightly widened apex, 3.5–4 × 0.7 mm, glabrous outside and sparsely pubescent in upper half inside, lobes narrowly elliptic, 2.5 × 0.7–1 mm, acute at apex, shortly appressed-pubescent outside, glabrous inside; stamens fully exerted, filaments c. 0.5 mm long, anthers 1.7–2 × 0.3 mm, acute at apex, glabrous; ovary c. 0.7 mm long, glabrous; placentas with two collateral ovules each; style exerted, c. 5.5 mm long, bifid, glabrous. **Fruits** green when young, orange when mature, globose to shortly obovoid with 8–10 conspicuous ridges (both in life and in the dry state), 5.5–8 × 4–6 mm when dry, glabrous, crowned with persistent calyx, sessile; pericarp 0.3–0.5 mm thick. **Seed** 1(–3) per fruit, ellipsoid and slightly compressed, c. 4 × 3.2 × 2.5 mm, with a narrow ventral hilum for all its length; seed coat chestnut brown, minutely reticulate.

Distribution and ecology – Lower Guinea subcentre of endemism (White 1979). Only known from Gabon, where it is relatively widespread but uncommon in the centre and south of the country; to be expected in the Republic of Congo. The species occurs in primary and secondary forest, both on well-drained soils and in swampy areas near rivers, 350–835 m in altitude (fig. 3).

Phenology – Flowers collected in December, fruits from February to April.

Conservation status – IUCN Red List Category: **Near-threatened [NT]**. The extent of occurrence (EOO) of *Tricalysia lophocarpa* is calculated to be 35,007 km² (exceeding the limit for Vulnerable status under criterion B1) and its area of occupancy (AOO) is estimated to be 52 km², within

the limit for Endangered status under criterion B2. The species is endemic to Gabon and occurs in various types of evergreen rainforest. It is known from 13 specimens representing 12 subpopulations. Four of these occur in three protected areas (Ivindo, Lopé and Waka National Parks). One subpopulation, in the Mayombe range, is at risk from a mining project, and another occurs in a forestry concession, where some level of habitat degradation may be expected. The 12 subpopulations represent therefore 11 locations in the sense of IUCN, just above the limit for Vulnerable status; at least one of them being under threat, the Near-threatened category seems appropriate.

Etymology – The name *lophocarpa* refers to the ribbed fruits, the most diagnostic character of the species (see below).

Notes – This species was already recognised as new by Hallé (1970: 320–322) as *Tricalysia* sp. C, and later by Robbrecht (1987: 204) as *Tricalysia* sp. (n° 98) but was not described due to the absence of flowers. New collections allowed giving here a complete description. We have not seen the specimen *N. Hallé & Cours 6116*, cited by Hallé (1970: 322) and coming from the same locality as *N. Hallé & Cours 5999*.

In the fruiting stage, *Tricalysia lophocarpa* is immediately recognised by the 8–10 narrow longitudinal ribs of the fruits. Except for *T. trachycarpa* Robbr., which has much larger and irregularly wrinkled fruits, other species of *Tricalysia* have smooth fruits – Robbrecht (1987) described the fruits of *T. vadensis* Robbr. as “costatae”, but they are at most slightly angular, without definite ridges.

In the flowering stage, *T. lophocarpa* is very similar to the much more widespread and common *T. pallens* Hiern, but the latter has shorter calyx teeth (0.1–0.5 mm long), a pubescent style, domatia of the pit type, and the lower leaf surface smooth in the dry state, while that of *T. lophocarpa* is minutely granulose. A flowering collection from Gabon (*Louis et al. 1243*) has the glabrous style of *T. lophocarpa*



Figure 1 – Photographs of *Tricalysia* species described in the present paper. **A.** *Tricalysia lophocarpa* (from Texier *et al.* 1351). **B.** *Tricalysia wilksii* (from Texier *et al.* 1112). © Nicolas Texier/Missouri Botanical Garden. These photographs are distributed under the Creative Commons License CC BY NC ND 3.0 (<https://creativecommons.org/licenses/by-nc-nd/3.0/>).

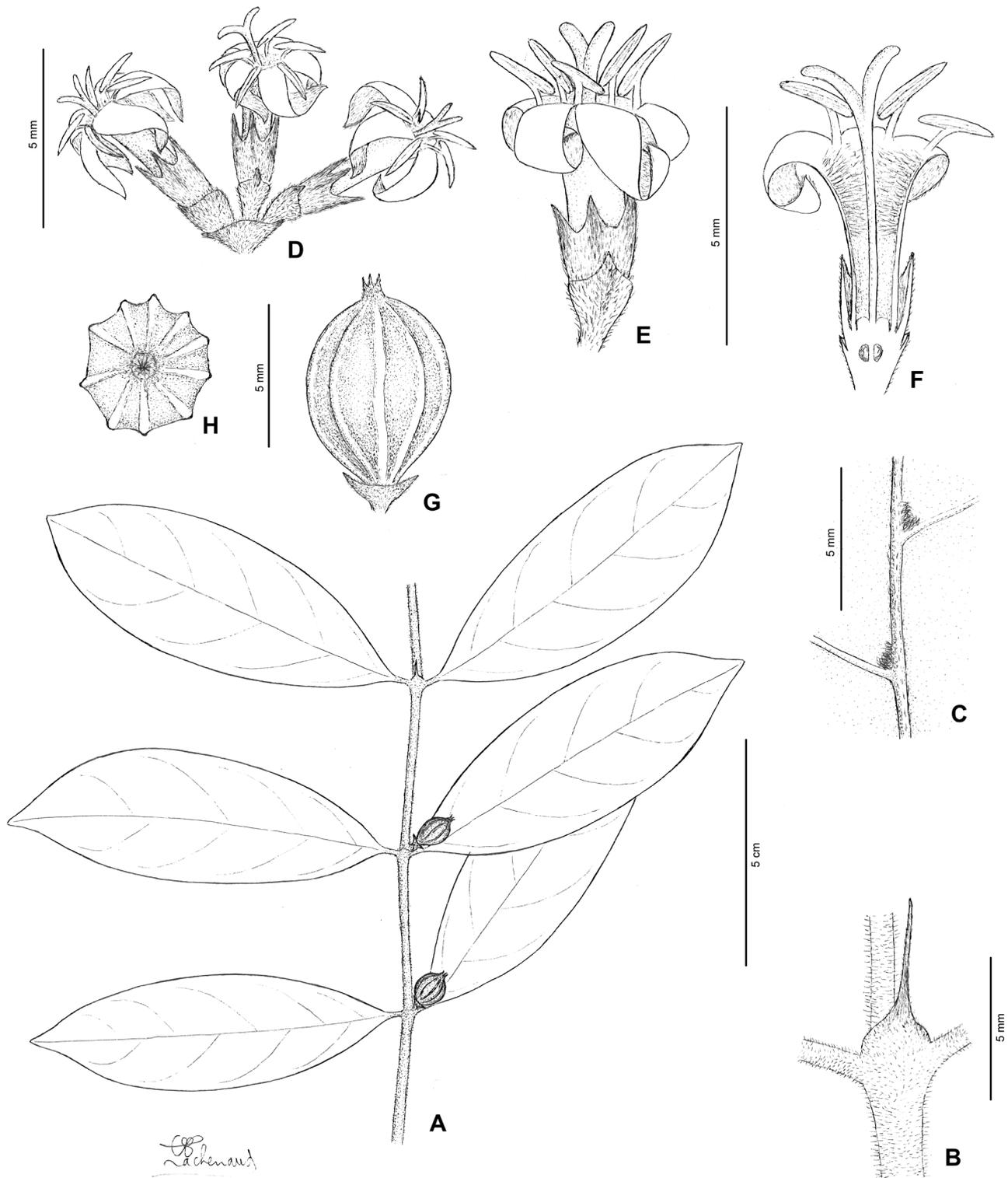


Figure 2 – *Tricalysia lophocarpa*. **A.** Fruiting stem. **B.** Stipule. **C.** Detail of the domatia. **D.** Inflorescence. **E.** Flower. **F.** Longitudinal section of flower. **G.** Fruit, side view. **H.** Fruit, viewed from above. A–C, G–H from *Moungazi 1545*; D–F from *J.J. de Wilde & de Wilde-Bakhuizen 11799*. Drawn by O. Lachenaud.

but the short calyx lobes of *T. pallens*, and the rufous-brown drying colour of its leaves is unusual for either species; it might represent another new taxon.

Although only one flowering specimen has been seen, the flowers are probably isostylous, in view of their morphology (stamens and style both exserted).

Additional specimens examined – **Gabon**: 5–10 km E Saint Germain, E of Okano river, 0°38'N, 11°38'E, 19 Apr. 1988, fr., *Breteler et al.* 8839 (WAG); Makandé, about 65 km SSW of Booué, 0°41'S, 11°55'E, 24 Feb. 1999, fr., *Breteler et al.* 15197 (WAG); Lopé reserve, forest exploitation N.S.G, S of Mitendi, 0°39.9'S, 11°48.3'E, 23 Dec. 1996, fl., *J.J.F.E. de Wilde* 11799 (BR, LBV, WAG); est de Moumba, 18 May 1963, fr., *N. Hallé & Cours* 5999 (P); Ngounie, Waka (1°09'16"S, 11°5'19"E), 27 Apr. 2005, fr., *Leal et al.* 567 (BR); Massif du Chaillu, east side of Balendi Hills, 1°09'28"S, 11°19'50"E, 26 Mar. 2007, fr., *Leal et al.* 1569 (LBV); Nyanga, summit, 3°17'02"S, 11°07'04"E, 5 Apr. 2009, fr., *Leal* 2409 (LBV); Ivindo National Park, Massouna 2000, 0°08'90"S, 12°27'10"E, 4 Apr. 2004, *D. Nguema* 570 (LBV); Ndjolé area, concession Bordamur, SW Ndjolé, between Waka and Lopé, 26 Feb. 2009, fr., *Stévant et al.* 3081 (BR, MO); Ivindo N.P., 0°06'00"S, 12°30'36"E, 12 Apr. 2017, fr. imm., *Texier et al.* 1351 (MO, LBV n.v.); Lopé, WW-Tr-1620 m, 10 Apr. 1991, fr., *L.J.T. White* 433 (LBV); Ngounié, 13.5 km on the road Moukabou to Mbigou, 1°40.39'S, 11°45.18'E, 13 Mar. 2013, fr., *Wieringa et al.* 7387 (WAG).

***Tricalysia obovata* O.Lachenaud & Sonké, sp. nov.**

Figs 3, 4

Diagnosis – Foliis obovatis basi rotundatis et ut caulibus glaberrimis, floribusque parvis et sessilibus *T. amplexicauli* Robbr. et *T. pedunculosa* (N.Hallé) Robbr. var. *walkeriana* (N.Hallé) Robbr. similis, sed ab ambabus conspicue differt foliis minoribus 8.5–10.7 cm longis (nec 14–35 cm) et subtus in sicco laevibus (nec granulosis), floribusque stylo in-

cluso (nec exserto) et antheris pro parte inclusis (nec omnino exsertis).

Type (and only material known) – Equatorial Guinea (Rio Muni): Bata – Niefang, margenes del Río Comaya, 18 Aug. 1994, fl., *Carvalho* 5647 (holotype: WAG [WAG0143107]; isotypes: MA n.v. [MA-598569], MO).

Description – **Undershrub** 0.5 m high, probably single-stemmed. **Stem** cylindrical, 1.2–2 mm thick, glabrous, soon covered with a pale grey bark. **Stipules** 2.3 × 1.3 mm, with a short triangular base c. 0.5 mm long and a linear awn c. 1.8 mm long, glabrous, soon caducous. **Leaves** with petiole 0.1–0.2 cm, glabrous; lamina 8.5–10.7 × 3.5–4.4 cm, obovate to oblanceolate, rounded at base, obtusely acuminate at apex, papyraceous and smooth below in the dry state, entirely glabrous, drying olive green; midrib impressed above, prominent below; lateral veins 4–7 pairs, strongly ascending and forming loops 3–4 mm from the margin; tertiary veins ± parallel, lax and inconspicuous; domatia absent. **Inflorescences** axillary on young stems, 3- to 6-flowered, sessile; bracts fused into a cup c. 1 mm long, with short and sparse appressed hairs; bracteoles similar to the bracts in shape and indumentum. **Flowers** 4-merous, sessile; calyx with tube 1–1.3 mm long and acute teeth 0.3–0.5 mm long, sparsely and shortly appressed-pubescent outside, more densely so inside; corolla white, in bud conical and very acute, open corolla with tube narrowly infundibuliform, c. 6 mm long × 0.7–1.2 mm wide at base and 1–2 mm at apex, glabrous outside and sparsely pubescent inside in the upper 2/3, lobes narrowly ovate, 2.5–3 × 1.2–1.5 mm, acute at apex and recurved outwards, glabrous outside, shortly and sparsely pubescent inside towards the base; stamens exserted for 1/2 or 2/3 of their length, sessile, inserted in the corolla throat, anthers c. 2 × 0.4 mm, obtuse at apex, glabrous; ovary c. 1 mm, glabrous; placentas with two collateral ovules each; style included, 6 mm long, just reaching throat, bifid for c. 1 mm and pubescent in the upper half. **Fruits** not known.

Distribution and ecology – Lower Guinea subcentre of endemism (White 1979). Apparently endemic to continental

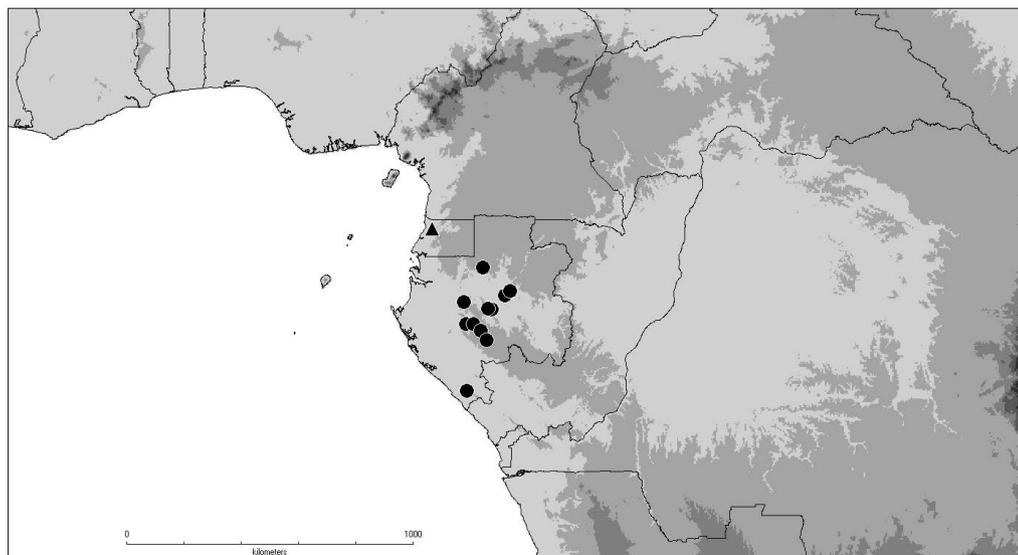


Figure 3 – Distribution of *Tricalysia lophocarpa* (circle) and *T. obovata* (triangle).

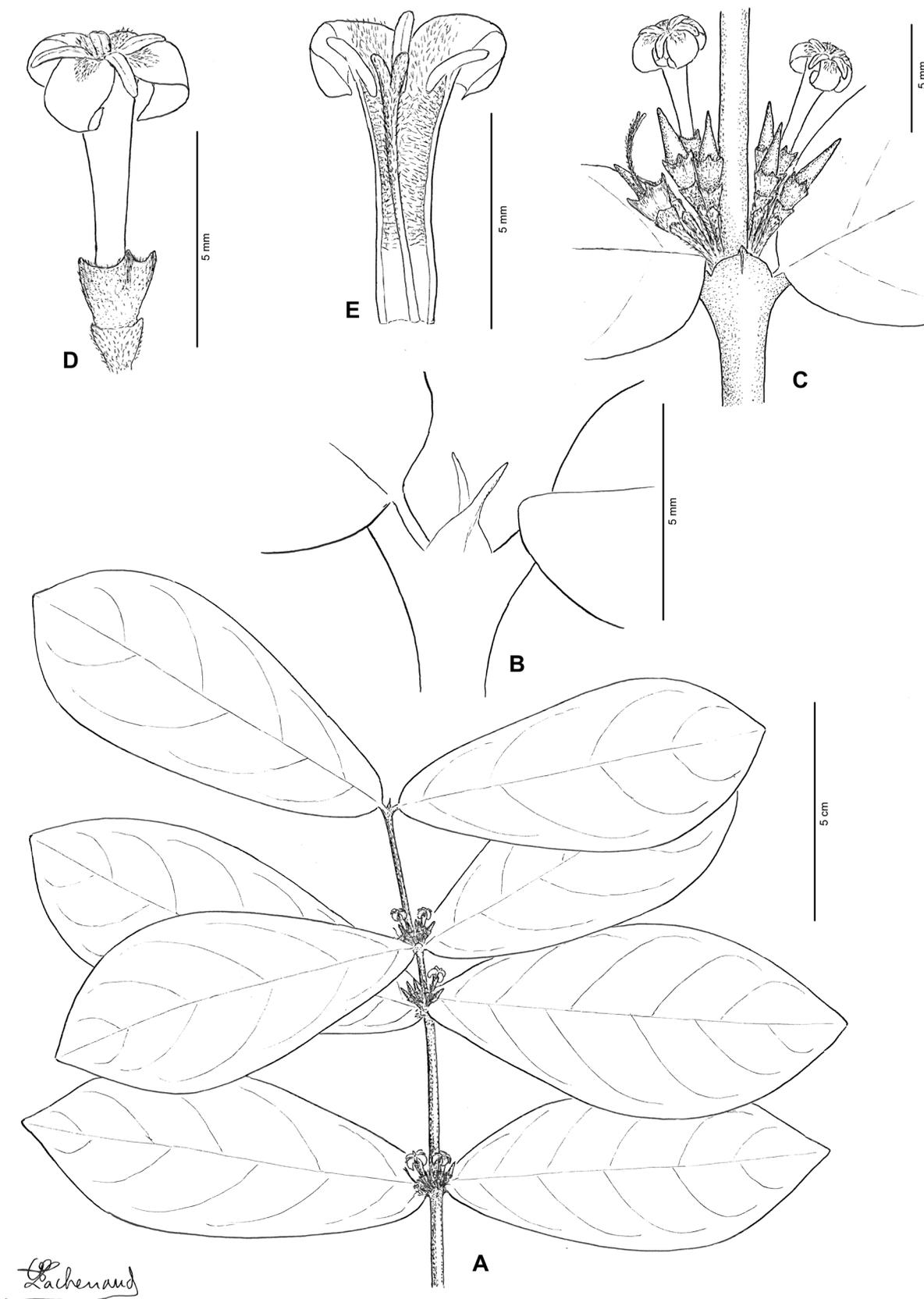


Figure 4 – *Tricalysia obovata*. A. Flowering stem. B. Stipule. C. Node with paired inflorescences. D. Flower. E. Longitudinal section of corolla. From Carvalho 5647. Drawn by O. Lachenaud.

Equatorial Guinea; only known from the type. The species was found in a shady, wet and rocky place in forest, at unknown elevation (fig. 3).

Phenology – Flowers in August.

Conservation status – IUCN Red List Category: Critically Endangered [CR B2ab(iii)]. *Tricalysia obovata* is endemic to the continental part of Equatorial Guinea, and is known from a single collection. Its extent of occurrence is therefore not calculable, and its area of occupancy is estimated to be 4 km², within the limit for Critically Endangered under criterion B2. The species was found in a wet rocky place in evergreen rainforest. The only known site is situated close to a road, in an area that has no official protection status and is exposed to deforestation for agriculture (already apparent on satellite images). A decline in the extent and quality of habitat may, therefore, be inferred, and the species qualifies for Critically Endangered status under the conditions B2ab(iii).

Etymology – The species name refers to the obovate leaves.

Notes – Although known from a single collection, this species is distinctive enough to be described. In general habit, e.g., obovate leaves with rounded base (which are highly unusual in the genus), stems and leaves glabrous, and small sessile flowers, *T. obovata* resembles both *T. amplexicaulis* Robbr. and *T. pedunculosa* (N.Hallé) Robbr. var. *walkeriana* (N.Hallé) Robbr. However, these two species have flowers with exerted style and fully exerted anthers, and larger leaves with the lower surface minutely granulose when dry, while it is smooth in *T. obovata*.

In the absence of further material, it is not known whether *T. obovata* is heterostylous; the fact that the style is included suggests this might be the case (as explained in the introduction, most *Tricalysia* species are isostylous with both style and anthers exerted).

Tricalysia wilksii O.Lachenaud & Sonké, **sp. nov.**

Figs 1B, 5, 6

Diagnosis – Foliis ellipticis basi acutis et glabris domatiis exceptis, calycisque lobis linearibus tubo aequantibus vel excedentibus *T. obstetrici* N.Hallé similis, sed differt fructibus pedicellatis pericarpio tenue (nec sessilibus pericarpio incrassato), ovario dense pubescente (nec glabro), bracteolis in cupula breviora (0.8–1.3 mm, nec 1.5–2 mm) connatis, stipulis glabris (nec pubescentibus), foliisque nitidis et subtus in sicco laevibus (nec opacis et in sicco granulosis).

Type – Gabon: About 30 km NE Lastoursville, 0°45'S, 12°55'E, 14 Apr. 1990, fl., *Breteler et al.* 9963 (holotype: BR [BR0000024875639]; isotypes: WAG [WAG0231876], LBV).

Description – **Shrub** 0.6–3 m high, branched. **Twigs** cylindrical, 1–1.5 mm thick, glabrous; older twigs with medium brown to dark brown bark. **Stipules** 1–4.5 × 1.3–2 mm, with a triangular base 1–2 mm long and a linear awn 1–2.5 mm long, glabrous, persistent. **Leaves** with petiole 0.1–0.6 cm, glabrous; lamina (3.8–)5–15 × 1.6–4.7 cm, elliptic, acute to obtuse at base, acuminate at apex, coriaceous and smooth below when dry, glabrous (except the domatia), drying olive brown to blackish; midrib impressed above, prominent

below; lateral veins 6–8, weakly ascending, rather inconspicuous and forming very obscure loops 0.5–3 mm from the margin; tertiary veins parallel, not or hardly distinct on young leaves, slightly more prominent on older leaves; domatia present as pubescent crypts in the main vein axils. **Inflorescences** axillary on young twigs, 1- to 3-flowered, sessile or with peduncle < 0.1 cm; bracts fused into a cup c. 0.5 mm long with two short teeth c. 0.5 mm, with short and very sparse appressed hairs; bracteoles fused into a cup 0.8–1.3 mm long with two short teeth 0.4–1 mm long, with same indumentum as the bracts. **Flowers** 5-merous, sessile or almost so; calyx with tube 1.2–1.7 mm long and narrowly acute teeth 1.2–2 mm long, with short and very sparse appressed hairs on both sides; corolla white, in bud shorter than the calyx, conical and very acute at apex, open corolla with almost cylindrical tube slightly widening at apex, 3.5–4 × 1–1.2 mm, glabrous outside and with 5 rows of sparse hairs in upper half inside, lobes narrowly elliptic, 2–2.5 × 1–1.2 mm, acute at apex, minutely appressed-pubescent outside, glabrous inside; stamens fully exerted, filaments c. 0.5 mm long, anthers 2–2.2 × 0.5 mm, obtuse at apex, glabrous; ovary c. 1 mm long, densely and shortly appressed-pubescent; placentas with a single ovule each; style exerted, c. 5.5 mm long, bifid or trifid, glabrous. **Fruits** green when young, red when mature, ellipsoid to slightly obovoid, smooth, 6–8 × 5–7 mm when dry, shortly and sparsely appressed-pubescent, crowned with persistent calyx; pedicel 1–2 mm long; pericarp soft and very thin. **Seeds** 2 per fruit, semi-ellipsoid, c. 5 × 4.5 × 2–3.5 mm, with a narrow lateral hilum for all their length; seed coat dark brown, minutely reticulate.

Distribution and ecology – Lower Guinea subcentre of endemism (White 1979). This species occurs in east-central Gabon and south-western of Republic of Congo, and grows in lowland primary and secondary forest on well-drained soils, occasionally on white sands, 280–760 m in altitude (fig. 6).

Phenology – Flowers collected in April and August; fruits in November (immature) and from January to April (mature).

Conservation status – IUCN Red List Category: Vulnerable [VU B2ab(iii)]. The extent of occurrence (EOO) of *Tricalysia wilksii* is estimated to be 24,353 km² (exceeding the limit for Vulnerable status under criterion B1) and its area of occupancy (AOO) to be 36 km², within the limit for Endangered under criterion B2. The species is restricted to Atlantic Central Africa and is known from ten specimens representing seven subpopulations. One of these occurs in a protected area, the Ivindo National Park in Gabon. The other subpopulations are unprotected, and three of them occur in forestry concessions, where a decline in habitat extent and quality due to selective logging may be inferred. The seven subpopulations represent seven locations in the sense of IUCN, and the species qualifies for Vulnerable status under the conditions B2ab(iii). However, considering that most of its range is not well prospected, the species is likely to be more widespread than records suggest, and this assessment may have to be revised in the future.

Etymology – The species name commemorates the British botanist Christopher Morris Wilks (13 July 1947–2 November 2008), a specialist of Central African trees, and one of the collectors of this plant.

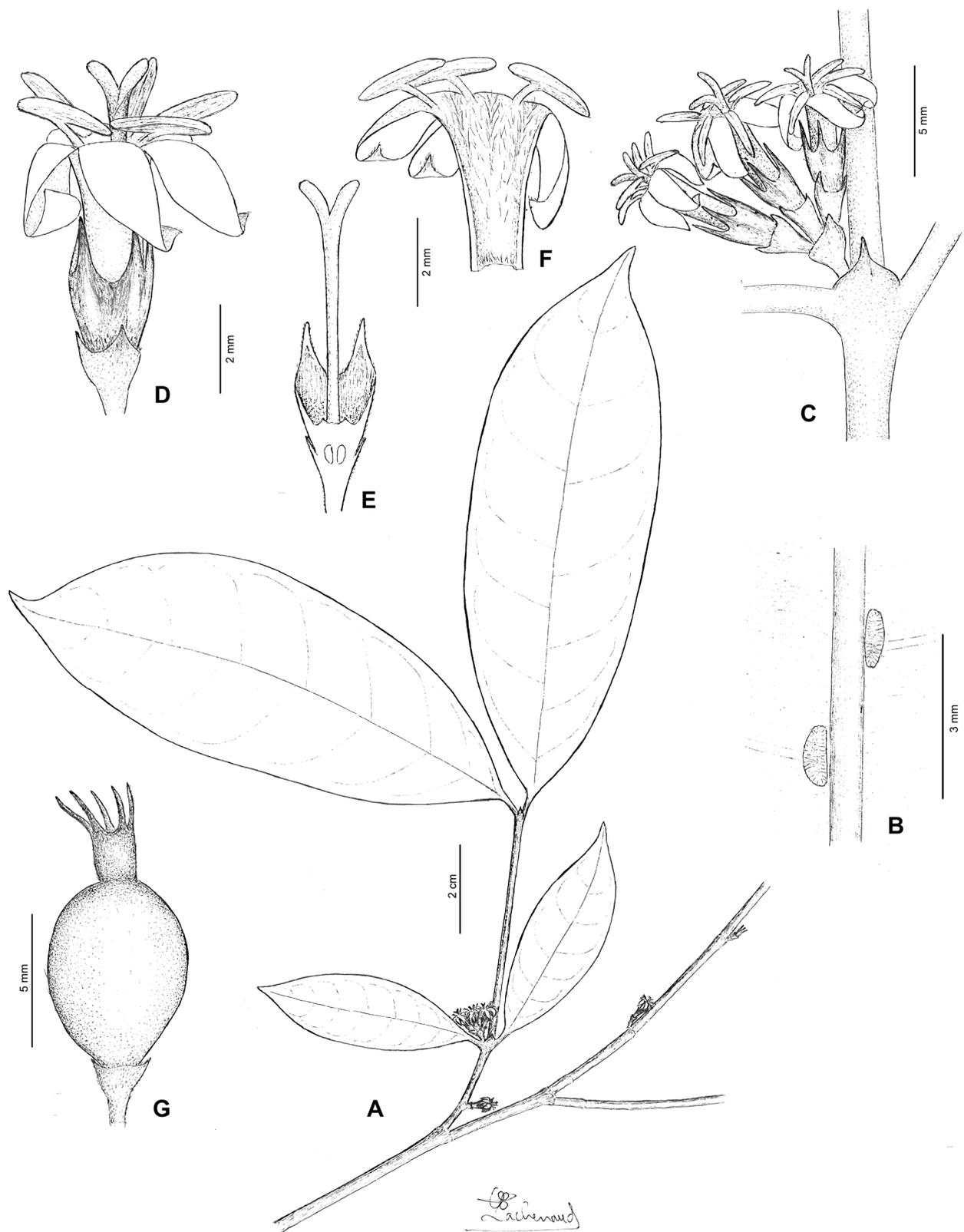


Figure 5 – *Tricalysia wilksii*. **A.** Flowering stem. **B.** Detail of the domatia. **C.** Node with inflorescence. **D.** Flower. **E.** Longitudinal section of calyx and style. **F.** Longitudinal section of corolla. **G.** Fruit. A–F from *Wilks 2727*; G from *Moungazi 1540*. Drawn by O. Lachenaud.

Notes – This species is rather distinctive by the combination of linear calyx teeth equalling or exceeding the tube in length, leaves with crypt-domatia, and otherwise glabrous vegetative parts. Its calyx resembles that of *T. obstetrix* N.Hallé, but that species has sessile fruits with thickened pericarp, longer bracteolar cups (1.5–2 mm), a glabrous ovary, pubescent stipules, and the leaf surface dull and granulose when dry. In general appearance, *T. wilksii* also somewhat resembles *T. micrantha* Hiern, but the latter has calyx teeth shorter than the tube, more or less pubescent twigs (sometimes only when very young), and longer stamen filaments (1–2.5 mm).

The inflorescences are usually paired at nodes, as usual in the genus, but sometimes only one inflorescence develops per node, as illustrated in fig. 5.

Although only two flowering collections have been seen, the flowers are presumably isostylous in view of their morphology (stamens and style both exerted). Some flowers of *Wilks 2727* have a trifid style, which is exceptional in the genus; others have a bifid style as usual.

Additional specimens examined – **Gabon**: Concession de CEB, nord de la zone de Milolé, sud du Parc National de l'Ivindo, 0°14'38"S, 12°44'40"E, 14 Feb. 2010, fr., *Dauby et al. 2384* (BRLU, LBV n.v., MO n.v.); *ibid.*, 0°14'02"S, 12°43'35"E, 15 Feb. 2010, fr. imm., *Dauby et al. 2419* (BRLU, LBV n.v., MO n.v.); *ibid.*, 0°14'10"S, 12°43'38"E, 15 Feb. 2010, fr., *Dauby et al. 2424* (BRLU, LBV n.v., MO n.v.); Lastoursville, concession forestière de la Compagnie Equatoriale du Bois, 0.800833°S, 13.508787°E, 29 Nov. 2012, fr. imm., *Ikabanga & Haurez 334* (BRLU, LBV n.v., MO n.v.); Ivindo National Park, route Langoué, 0°15'S, 12°15'E, 8 Apr. 2004, fr., *Moungazi 1540* (BR, LBV, WAG); Ivindo National Park, 0°10'23"S, 12°31'49"E, 4 Apr. 2017, fr., *Texier et al. 1112* (BRLU, LBV n.v., MO, P n.v., WAG n.v.); *ibid.*, 0°06'24"S, 12°30'14"E, 11 Apr. 2017, fr. imm., *Texier et al. 1331* (BRLU, LBV n.v., MO, P n.v., WAG n.v.); Forêt des Abeilles, 40 km SSW confluence Ogooué-Ivindo (0°30'S, 12°2'E), 8 Aug. 1993, fl., *Wilks 2727* (BR, MO, WAG).

Republic of the Congo: 10 km de Mouolo, vers Divenié, 31 Jan. 1975, fr., *Sita 3865* (BR).

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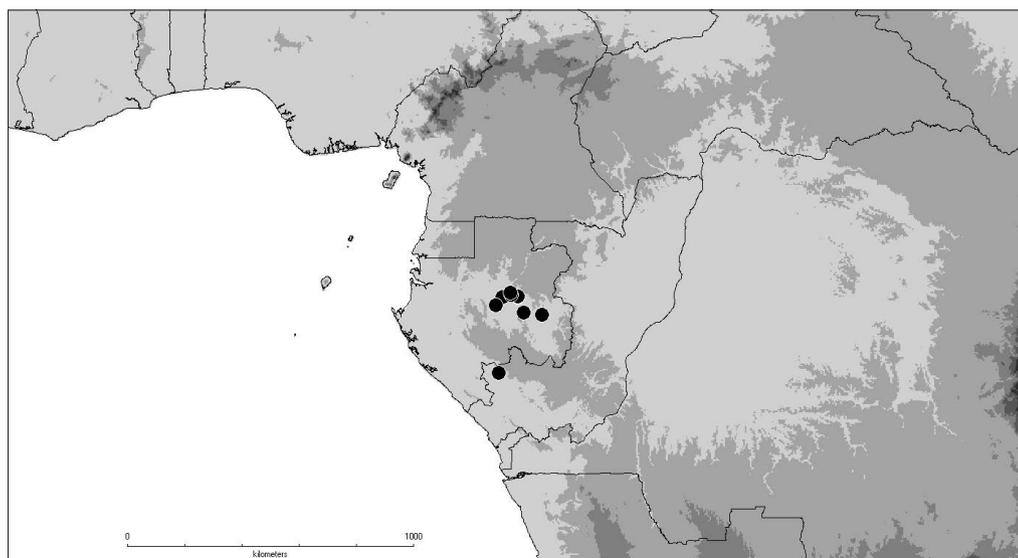


Figure 6 – Distribution of *Tricalysia wilksii*.

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