



Revision of the African genus *Tessmannia* (Leguminosae – Detarioideae), including seven new species

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Summary. The genus *Tessmannia* Harms (Leguminosae – Detarioideae) consists of 24 species. The genus is morphologically clearly defined and uniform. Although the number of leaflets varies from 2 (– 4) up to 36 – 48 between the species, the flower structure of the 24 species is similar. The genera *Sindora* Miq. and *Sindoropsis* J. Léonard are closely related to the genus *Tessmannia*, but their leaflets and flowers are clearly different. All 24 *Tessmannia* species occur in tropical Africa; 18 species occur in one or more countries from Cameroon to Angola and western Tanzania; five species occur in central and eastern Tanzania; and a single species from Guinea to Ivory Coast. The species are canopy trees from rain forest, up to 53 m tall, woodland trees to 25 m tall, or woodland shrubs to 7 m tall. *Tessmannia* wood has been used for carpentry and railway sleepers and the resin has been burned to provide light. All 24 species are described here in detail. Seven species are described as new to science: *Tessmannia bambidiensis* Breteler & Burgt, *T. grandifoliola* Burgt, *T. media* Breteler & Burgt, *T. minutiflora* Burgt, *T. neglecta* Breteler & Burgt, *T. nervosa* Breteler & Burgt and *T. tanzaniensis* Burgt. Three existing varieties are raised to the rank of species. *Tessmannia anomala* (Micheli) Harms var. *flamigni* J. Léonard is named *T. microphylla* Burgt; *T. dewildemaniana* Harms var. *leucocalyx* Harms is named *T. macrantha* Breteler & Burgt; and *T. martiniana* Harms var. *pauloi* J. Léonard is named *T. pauloi* (J. Léonard) Burgt. *Tessmannia tanzaniensis* is described as new to science 133 years after the type specimen was collected; this type is probably the oldest herbarium collection ever made of a *Tessmannia* species. Black and white line drawings are presented of the seven newly described species and the three varieties raised to species level. A key to the species and a table listing the important morphological differences are included. All species are preliminarily assessed according to IUCN categories and criteria: one species is Critically Endangered, nine species are Endangered, seven species are Vulnerable, and seven species are Least Concern.

Key Words. Angola, Burundi, Caesalpinioideae, Cameroon, Congo (Brazzaville), Congo (Kinshasa), Detarieae, Fabaceae, Gabon, *Sindora*, *Sindoropsis*, Tanzania

Introduction

Tessmannia Harms is a genus of trees, occurring in tropical Africa. The genus *Tessmannia* is placed in the Leguminosae subfamily Detarioideae (LPWG 2017). *Tessmannia* is named after the German collector Günther Theodor Tessmann (1884 – 1969), the collector of the type specimen of the genus, collected on 25 April 1908 in present-day Equatorial Guinea. The genus *Tessmannia* was published by Hermann A. T. Harms in 1910, with *Tessmannia africana* Harms as its type species, followed in 1913 by a second species *T. parvifolia*. In 1915 Harms (1915a) transferred two species to the genus *Tessmannia*. These were published earlier in the genus *Baikiaea* Benth.: *T. anomala* (Micheli) Harms published as *B. anomala* Micheli in 1897 and *T. lescrauwaetii* (De Wild.) Harms published as *B. lescrauwaetii* De Wild. in 1907. Harms (1915b) published four new taxa in the genus *Tessmannia*: *T. densiflora* Harms, *T. dewildemaniana* Harms, *T. dewildemaniana* Harms var. *leucocalyx* Harms and *T. martiniana* Harms. In 1938, Harms published the new species *T. burtii* Harms; bringing the total number of taxa published by him to

nine. One of these nine species, *T. parvifolia*, was later synonymised under *T. anomala*. In 1925 and 1927 de Wildeman published the new species *T. claessensii* De Wild., later synonymised under *T. africana* Harms; and *T. moesikei* De Wild., later synonymised under *T. anomala*. *Tessmannia baikiaeoides* Hutch. & Dalziel was published in 1928 (Hutchinson & Dalziel 1928a, 1928b). In 1949 and 1957 J. J. G. Léonard published five new taxa in *Tessmannia*: *T. anomala* (Micheli) Harms var. *flamigni* J. Léonard, *T. copallifera* J. Léonard, *T. darwei* J. Léonard, *T. martiniana* Harms var. *pauloi* J. Léonard and *T. yangambiensis* Louis ex J. Léonard. In 1967 *T. camoneana* Torre was published, bringing the total number of names published in *Tessmannia* to 18 taxon names, currently representing 15 different taxa. Léonard (1949, 1957) divided the genus *Tessmannia* into two Sections: section *Tessmannia* which includes the type species of the genus (synonym *glandulososepalae* J. Léonard) and section *pilososepalae* J. Léonard.

For a period of 49 years after 1967, no new taxa were published, until *Tessmannia korupensis* Burgt (2016). Fifteen years earlier, in 2001, an unpublished report by

Issembe & Breteler (2001) named five new *Tessmannia* species but these were not validly published according to the International Code of Nomenclature (Turland *et al.* 2018). Apart from the fact that this report is not published, there were no citations of type specimens and no author names of the five species. Sosef *et al.* (2006) mention four of these five species, now with author names: *T. bambidiensis* Breteler ined., *T. macrantha* Breteler ined., *T. neglecta* Breteler ined. and *T. nervosa* Breteler ined. The fifth name from Issembe & Breteler (2001), *Tessmannia media* sp. nov. appears only on one of the sheets of the collection Breteler 14632 (WAG). These five species are published in the present publication, without changing the specific epithet but with a change in the author's names.

Tessmannia species are evergreen, and may be large trees from rain forest, or trees from gallery forest and woodland (Aubréville 1968, 1970; Brenan 1967; Brummitt *et al.* 2007; Léonard 1952). The genus is characterised by the paripinnate or imparipinnate leaves, leaflets alternate, sub-opposite, or rarely opposite, lateral nerves looped into a sub-marginal nerve, leaflets usually emarginate, with numerous translucent dots and a few glands on the lower leaflet surface, petiolules short; flowers with 2 small, caducous bracteoles that do not enclose the flower bud, 4 sepals of which one is composed of two fused sepals and wider than the others; in some species the sepals are covered in glands; 5 petals, 4 equal in size and one narrower, and 10 stamens, alternately short and long, 9 stamens are united at the base and one is free; ovary stipitate; and the fruits are flattened, indehiscent or dehiscent, smooth and often dotted with resin glands, containing 1 – 4 seeds (Aubréville 1968, 1970; Brenan 1967; Brummitt *et al.* 2007; Léonard 1952). This paper presents a revision of the genus *Tessmannia*, using morphological characteristics. The genus is morphologically compared with nearby genera. Results are presented in descriptions, a key, and tables; and illustrated with black and white line drawings and colour photographs.

Materials and Methods

The present revision was accomplished using all collections found and studied as herbarium sheets or as images of these sheets, in the herbaria B, BR, BRLU, COI, DSM, E, EA, EPU, FR, HBG, HNG, IEC, K, L, LBV, LISC, MA, MO, NHT, P, SCA, SL, WAG, YA. Herbarium acronyms follow Thiers (2023). Images were received from these herbaria on request, found on the websites of these herbaria, and on GBIF (2023). All cited material was seen, as an herbarium specimen and/or as an image. However, some isotypes collected by the authors themselves were only seen before distributing them to the destination herbaria; it is therefore not completely certain that these isotypes have arrived there. Herbarium collections without co-ordinates on their labels were georeferenced with

Google Earth (2023); those from Congo (Kinshasa) were georeferenced using Bamps (1982). Distribution maps were made with Simplemappr (Shorthouse 2010). A file with all studied herbarium collections and their co-ordinates is supplied as Electronic Supplementary Material.

The morphological terminology follows that of Beentje (2016). Measurements were taken from fertile and sterile specimens from mature trees. The maximum number of pairs of leaflets is given in brackets if the number of leaves counted having that many pairs of leaflets is less than 5% or found on only one of many collections. The minimum number of pairs of leaflets indicates that at least 5% of leaves have that number of leaflets. The number of leaflets per leaf, and the size of the leaflets of juvenile trees and saplings may be different from those of mature trees. Specimens made from juvenile trees and saplings were therefore not used in the descriptions, but they are still cited and appear in the distribution maps. Occasionally, a collection consisted of fertile material and sterile material mounted on a single sheet or on separate sheets. In this case the measurements were also only taken from the fertile parts. When stipules were visible on fertile specimens, the stipules are described as persistent. When stipules were visible on specimens of juvenile trees but not on specimens from mature trees, a description is given, and the stipules are described as caducous. The colours of the inflorescence axis, the different parts of the flowers, and the stipules, were taken from the field notes. The specimen citations provide the phenology of the specimen: fl. indicates in flower, fr. in fruit, and st. sterile.

The drawings were made from the holotype and the isotypes, and often other fertile collections were used as well. Drawings were made from dried herbarium material. Conserved flowers of *Tessmannia* species are brittle, both dried flowers and flowers on spirit, especially the petals, stamens, and style. These flower parts are therefore often partly missing in herbarium material but were added to the illustrations for clarity. *Tessmannia martiniana* is only known from the lost type collection; and therefore the drawing of the leaf was made from the 78-word long Latin description of the leaves in the protologue (Harms 1915b). To better understand this description, it was compared with the descriptions of the leaves of the other five *Tessmannia* species described by the same author (Harms 1910, 1913, 1915b, 1938) and their type specimens. The drawing of the flower bud of *T. martiniana* was also made in this way.

The IUCN extinction risk category of each species was preliminarily determined following IUCN criteria (2012, 2024). The extent of occurrence and the area of occupancy were estimated with GeoCAT (2023). The most used definition of generation length by the IUCN (2024: 30) was used: “generation length is the average age of parents in the current cohort”. An estimate of the generation length of each *Tessmannia* species was calculated using the available spreadsheet (IUCN 2024: 32). To estimate

generation length, *Tessmannia* species were divided into four categories: emergent, large, medium, and small trees.

Taxonomic Results

The genus *Tessmannia* consists of 24 species (Table 1). Seven species are here newly described: *Tessmannia bambidiensis* Breteler & Burgt, *T. grandifoliola* Burgt, *T. media* Breteler & Burgt, *T. minutiflora* Burgt, *T. neglecta* Breteler & Burgt, *T. nervosa* Breteler & Burgt and *T.*

tanzaniensis Burgt. Three existing varieties are raised to species level: *Tessmannia anomala* (Micheli) Harms var. *flamigni* J.Léonard is named *T. microphylla* Burgt; *T. dewildemaniana* Harms var. *leucocalyx* Harms is named *T. macrantha* Breteler & Burgt; and *T. martiniana* Harms var. *pauloi* J.Léonard is named *T. pauloi* (J.Léonard) Burgt.

All 24 species are described in detail. Table 1. lists the important morphological differences between the 24 species. A black and white line drawing presents 24 leaves, one leaf of each species, drawn to the same scale (Fig. 1).

Table 1. The main characters that distinguish the 24 species in the genus *Tessmannia*. The species are sorted in ascending order of average number of leaflets.

<i>Tessmannia</i> species	Leaves			Flowers		Fruits		Other distinctive characteristics
	Average leaflet number	Leaflet number	Leaflet size (cm)	Pedicel length (mm)	Sepal length (mm)	Pod size (cm)	Glands per valve	
<i>T. copallifera</i>	2.0	2 (or 4), even	6–13 × 2–4	4–7	8–10	4–6 × 2–3.5	0–50	Pedicel and sepals whitish hairy
<i>T. nervosa</i>	2.3	1–3	6–17 × 3–8	18–25	12–14	unknown	unknown	
<i>T. bambidiensis</i>	2.5	1–3	6–14 × 2–5	9–15	11–15	6–9 × 4–6	0–2	
<i>T. macrantha</i>	4.6	4–5	3–15 × 1.5–7	7–12	11–15	5–6 × 3.5–4	0–5	Pedicel and sepals whitish hairy
<i>T. korupensis</i>	4.7	4–6	6–18 × 3–9	18–38	15–17	6–11 × 3.5–7	0–10	Pod upper suture winged
<i>T. baikiaeoides</i>	5.0	4–6	2–9 × 1–4	12–20	14–17	4–6 × 2.5–3	100–200	
<i>T. dewildemaniana</i>	5.1	4–6	4–10 × 2–4	8–15	12–14	6–7 × 3–3.5	50–100	Pedicel short appressed hairy
<i>T. grandifoliola</i>	5.2	4–6	5–14 × 3–7	14–26	12–15	6 × 3.2 immature	100–150	Pedicel long erect hairy
<i>T. camoneana</i>	5.4	4 or 6, even	1.5–7 × 0.7–2.8	14–19	11–13	2.7–5 × 1.6–2.8	30–80	Pedicel and sepals glabrescent
<i>T. tanzaniensis</i>	5.5	4–6 (–7)	1.5–7 × 1–3	6–10	12–14	4.5–7 × 3–3.5	30–50	
<i>T. minutiflora</i>	6.4	5–7	4–12 × 2–5	6–9	7–9	2–3.5 × 1.5–2	0–20	Ovary glabrous, sutures hairy
<i>T. burtii</i>	7.2	5–9 (–10)	3–9 × 1–3	24–34	13–17	4–6 × 2–3	50–150	
<i>T. dawei</i>	8.0	6, 8 or 10, even	1.5–5 × 0.7–2	11–22	11–14	4–5.2 × 2.5–3	80–150	Sepals stalked glands
<i>T. africana</i>	8.4	7–10 (–11)	1.5–8 × 1–3.5	5–10	8–11	3–6 × 3–5	80–200, spiny	Sepals stalked capitate glands
<i>T. pauloi</i>	8.5	7–10	1.2–3.6 × 1–2.2	3–6	7–9	unknown	unknown	
<i>T. martiniana</i>	10.5	9–12	1–3 × 0.7–1.1	8–10	10	unknown	unknown	
<i>T. media</i>	10.9	9–12 (–13)	2–4.8 × 0.7–1.4	12–17	14–16	unknown	unknown	Stipules persistent
<i>T. yangambiensis</i>	14.0	12–16	2–6 × 1–2.5	4–7	8–9	4–8 × 3–4.5	50–150	
<i>T. lescrauwaetii</i>	14.3	12–17	1–6 × 0.5–1.7	6–12	10–12	4–8 × 2–3.5	100–200	Sepals stalked capitate glands
<i>T. anomala</i>	21.2	18–25	1–2.4 × 0.5–1	3–6	7–10	3–5 × 2–3	0–50	Leaflets faint venation above
<i>T. neglecta</i>	21.9	18–25 (–28)	1–2.6 × 0.5–1	5–6	8–10	3–4.5 × 2.8–4.1	100–250, spiny	Leaflets clear venation above
<i>T. densiflora</i>	24.1	18–28, even	0.9–1.8 × 0.3–0.7	2–3	9–11	3.3–4.8 × 2.5–3.5	100–200, spiny	Ovary glabrous
<i>T. microphylla</i>	27.2	22–30 (–37)	0.5–1.2 × 0.2–0.4	4–9	7–9	2.4–4.2 × 1.6–2.8	0–3	Pedicel and sepals glabrescent
<i>T. princeps</i>	42.0	36–48	1.1–1.3 × 0.3–0.4	6–7	5	4.5–4.9 × 3.0	0–1	Leaflets not emarginate

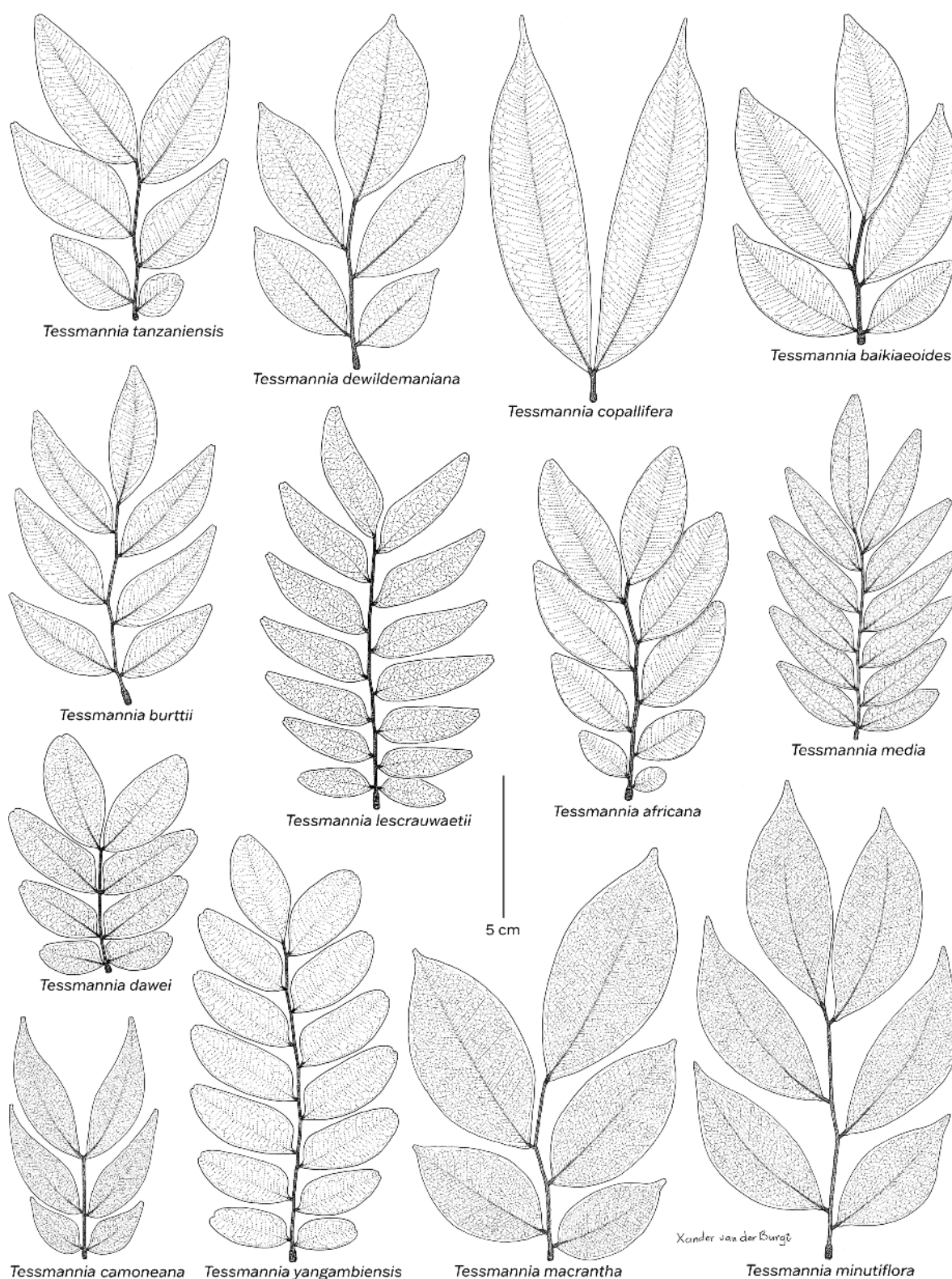


Fig. 1. A single leaf of each of the 24 species of *Tessmannia*. All leaves are illustrated on the same scale. A leaf was drawn with leaflet number equal to the nearest integer of the average number of leaflets, or the most common number of leaflets. All drawings except one were made from the type collections; often other fertile collections were used as well. The drawing of *Tessmannia martiniana* was made from the Latin description (see methods). DRAWN BY XANDER VAN DER BURGT.

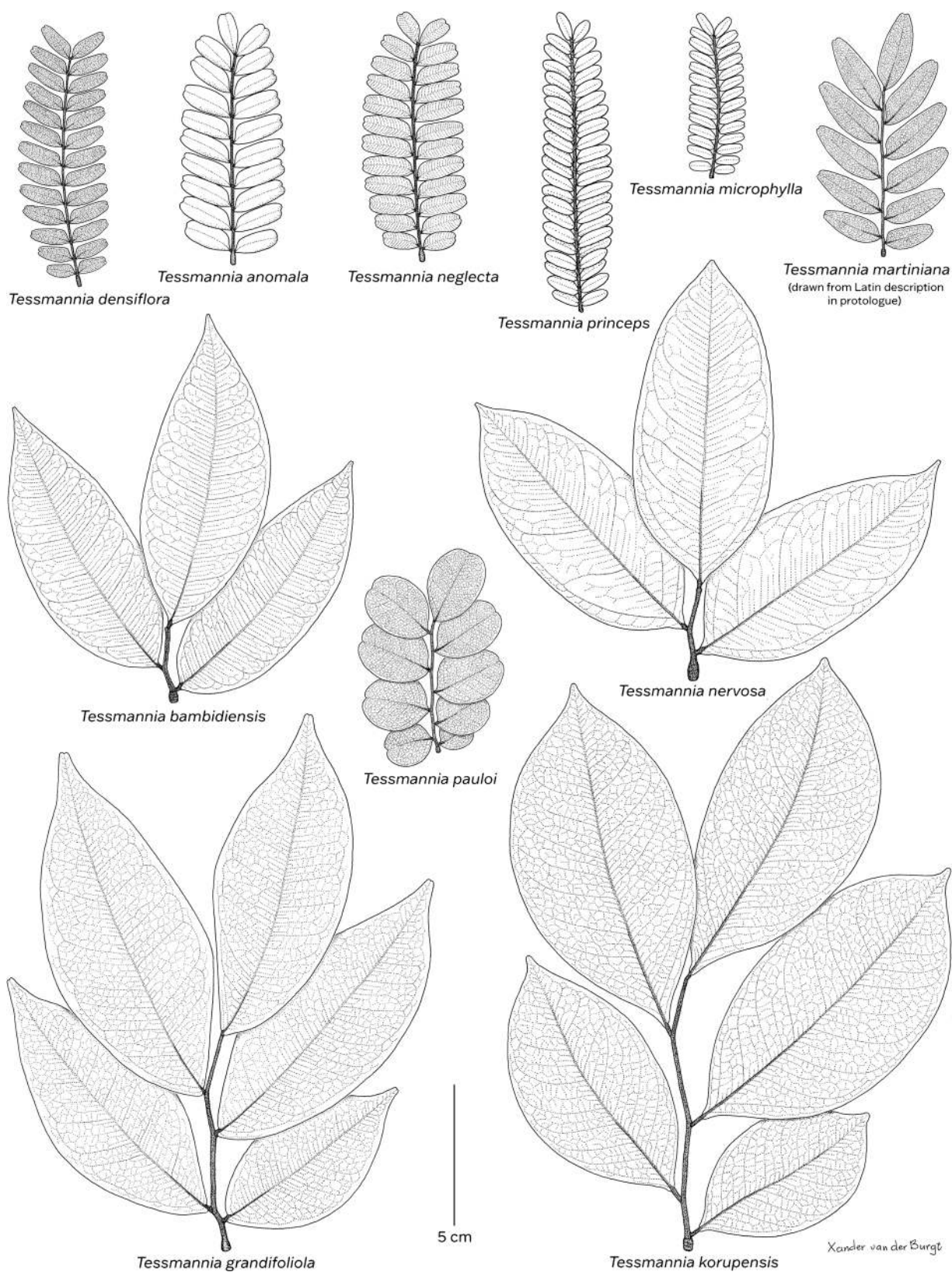


Fig. 1. (continued)

Another line drawing compares the flower buds of the 24 species, drawn to the same scale (Fig. 2). Line drawings are presented of the seven newly described species and the three varieties raised to species level.

Tessmannia Harms 1910: 295; Léonard 1949: 384 – 388; Léonard 1950: 35 – 55; Léonard 1952: 287 – 296; Léonard 1957: 66 – 72; Brenan 1967: 106 – 108; Aubréville 1968: 156 – 162; Aubréville 1970: 155 – 161; Hawthorne & Jongkind 2006: 822 – 823; Lewis *et al.* 2005: 83; Sosef *et al.* 2006: 228; Brummitt *et al.* 2007: 51 – 53. Type species: *Tessmannia africana* Harms.

Evergreen resiniferous trees, or occasionally shrubs. Rain forest canopy trees, up to 53 m tall and 180 (– 270) cm trunk diam., woodland trees to 25 m tall, or woodland shrubs to 7 m tall. Trunk cylindrical. Buttresses absent or small, to 1 m tall. Bark very hard, brownish-grey, with fine vertical fissures. Twigs hairy when young, hairs usually to 0.2 mm long, mature twigs glabrescent to glabrous. Stipules persistent or caducous, leafy, green, sparsely hairy to glabrous, linear, or ovate, midvein eccentric, distal side 2 – 6 × wider than proximal side, distal side auriculate to rounded at base, proximal side cuneate at base. Leaves alternate, pinnate; rachis canaliculate, sparsely hairy with erect hairs usually to 0.2 mm long, to glabrescent. Leaflets paripinnate or imparipinnate, even or uneven in number, opposite, sub-opposite or alternate; the lowest leaflet always points towards the apex of the twig; both sides somewhat glossy, both sides nearly identical in colour, or lower side lighter or sometimes darker in colour; primary vein above flattened, slightly impressed or slightly prominent, primary vein below prominent; secondary and tertiary venation prominent on both sides (except in *T. anomala* and *T. microphylla*). Leaflet blade with numerous translucent dots, 0.1 – 0.2 mm diam.; 0 – 12 glands on lower leaflet surface, 0.2 – 0.3 mm diam., usually placed near the petiolule. Leaflet base oblique, the length of the petiolule is shorter on the adaxial side compared to the abaxial side; leaflet apex usually emarginate. Inflorescence a raceme or compound raceme, axillary, 1 – 5 inflorescences per leaf axil. Flowers bisexual, bract caducous, triangular to ovate; bracteoles 2, caducous, triangular to ovate, not enclosing the flower bud, inserted alternately near the base of the pedicel; hypanthium short, obconical. Pedicel densely to sparsely hairy with brownish, sometimes whitish, short and long hairs, sometimes glabrescent. Sepals 4, green, narrowly imbricate, the adaxial sepal broadly elliptic, consisting of two fused sepals, the other 3 sepals narrowly elliptic, on the outer surface densely to sparsely hairy with

brownish, sometimes whitish, short and long hairs, sometimes glabrescent, in some species the sepals are covered in glands, sepals inside densely hairy with light-coloured, straight, appressed hairs 1 – 2 mm long, overlapping edges glabrous. Petals white or pink, sometimes lilac or violet, alternate to the sepals, oblanceolate, clawed, translucent-dotted, edge of lamina usually crispate; abaxial and lateral petals: claw hairy, lamina on the outer surface glabrous, or hairy on midvein, inside hairy on midvein, hairs 1 – 2 mm long; adaxial petal slightly shorter and narrower but with a wider claw, claw hairy near base, otherwise usually glabrous, midvein sometimes hairy inside (the adaxial petal could not be studied in all species). Stamens 10, alternately with long and short filaments, 5 with long filaments and 5 with short filaments, the adaxial stamen short and free, proximal part of the filaments of the other 9 stamens united into a sulcate tube, proximal part of all filaments hairy, upper part of filaments glabrous; all 10 anthers similar in size, dorsifixed, dehiscent by longitudinal slits, often a few long hairs at apex. Ovary stipitate, usually tomentose but sometimes only so on the stipe; ovules 4 – 10; style glabrous, stigma capitate. Fruit laterally compressed, woody, dehiscent, upper suture flat or occasionally winged, after dehiscence valves remain flat or curl a little inwards, on the outer surface hairy to glabrescent, with 0 – 250 raised resin glands on each valve (in some species, most pods have no glands and only some pods have resin glands), or with 80 – 250 stalked capitate resin glands on each valve; fruits contain 1 – 5 seeds. Seeds hard, blackish to dark brown, with a small whitish aril.

DISTRIBUTION. All 24 *Tessmannia* species occur in tropical Africa; 18 species occur in one or more of the following countries: Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo (Brazzaville), Congo (Kinshasa), Burundi, Angola, Zambia, and western Tanzania; five species occur in central and eastern Tanzania; and a single species in Guinea, Sierra Leone, Liberia, and Ivory Coast; Map 1.

HABITAT. The majority of *Tessmannia* species occur in rain forest on well-drained soil. The rain forest species of *Tessmannia* are confined to this habitat. Other species of *Tessmannia* are found in seasonally dry forest, forest on rocky slopes, at edges of inselbergs, forest along rivers and streams, forest on coastal or inland white sand, or woodland. *Tessmannia* species occur at 0 – 1500 m altitude.

SPECIMENS EXAMINED. In total 432 herbarium collections were studied for the present revision. A file with all studied collections and their co-ordinates is supplied as Electronic Supplementary Material. This file also contains 24 observations. Of these 432 collections,

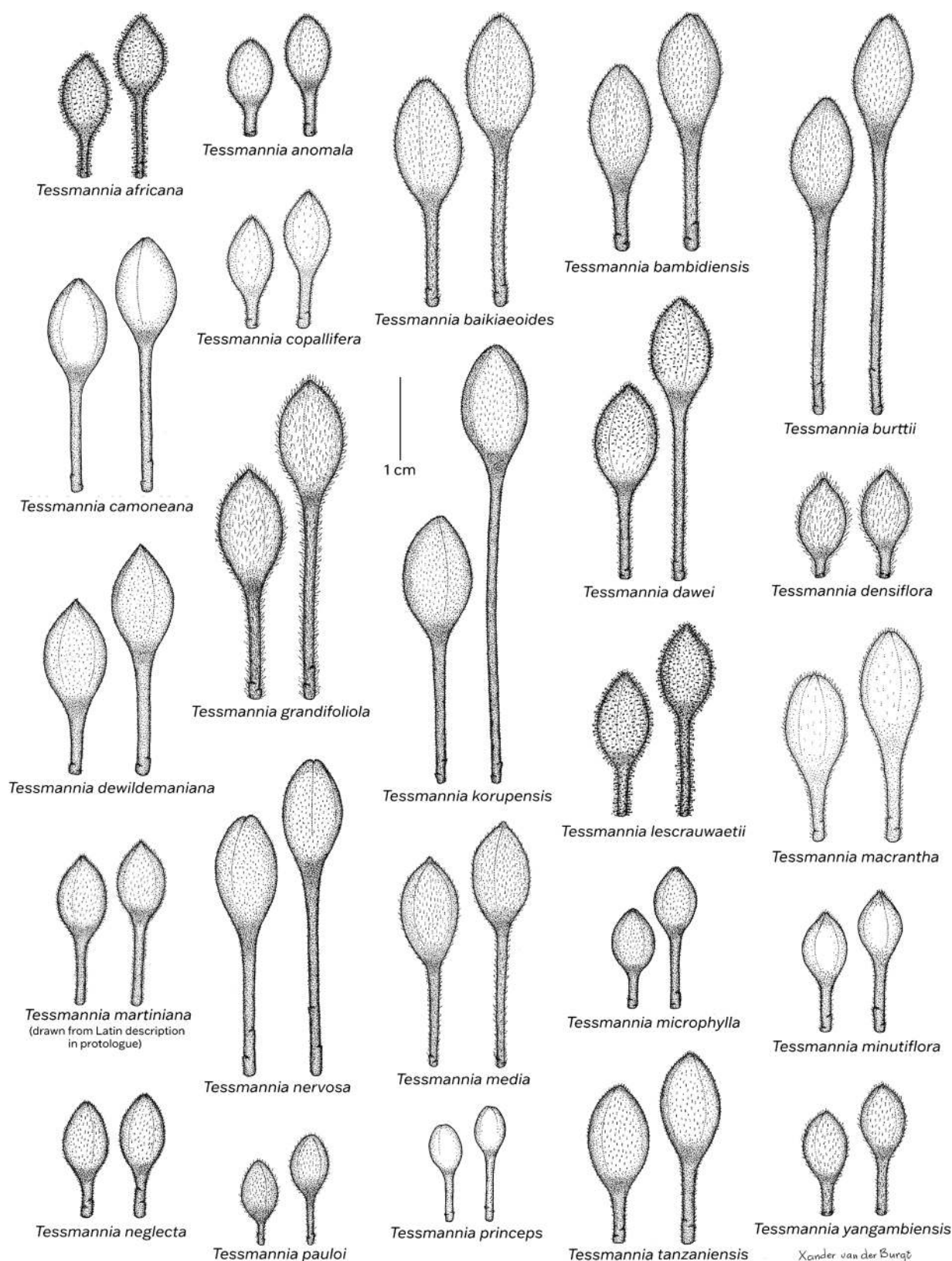


Fig. 2. Two mature flower buds of each of the 24 species of *Tessmannia*. All flower buds are illustrated on the same scale. Flower buds were drawn with shortest and longest recorded pedicel length. All drawings except one were made from the type collections; often other fertile collections were used as well. The drawing of *Tessmannia martiniana* was made from the Latin description (see methods). DRAWN BY XANDER VAN DER BURGT.

33 collections represent *Tessmannia*, but the species could not be determined. These were mostly sterile collections of *T. anomala* or *T. neglecta* from seedlings, saplings, or juvenile trees. Only a single flowering collection could not be identified and may represent an undescribed species: Gabon. Haut-Ogooué, route Franceville – Lekei, fl., Oct. 1957, *Gauchotte* 1885 (WAG). Only a single sheet was seen of this collection, for a description it is preferable to study at least a number of sheets of a single collection. All of the 33 collections determined to *Tessmannia* occur within the distribution area of the genus (Map 1).

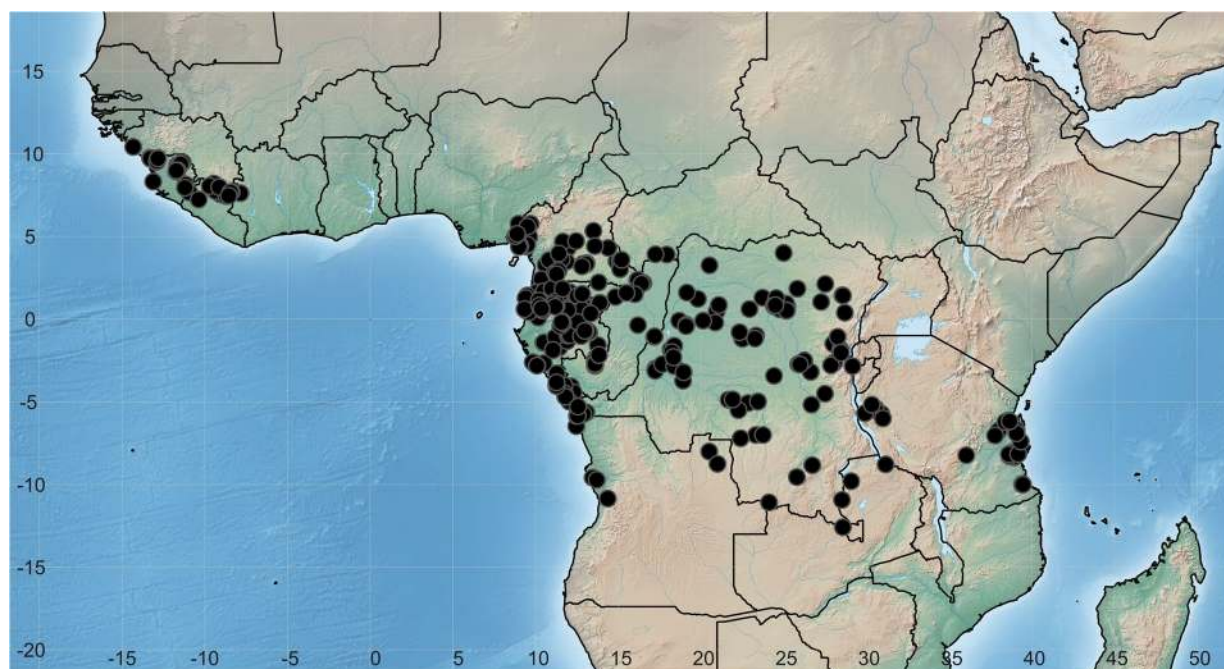
CONSERVATION STATUS. The conservation status categories and criteria of each *Tessmannia* species are assessed after each of the species' descriptions. The data is summarised in Table 2. The species are assessed to the following IUCN categories: one species is Critically Endangered, nine species are Endangered, seven species are Vulnerable, and seven species are Least Concern.

ECOLOGY. It is a common feature of *Tessmannia* species to grow clustered in some parts of a forest whilst being completely absent in other parts of the same forest: for example, *T. africana*, *T. anomala* and *T. korupensis* (Burgt 2016) have been found growing in groups in Cameroon, *T. baikiaeoides* in Guinea and Sierra Leone, and *T. dawei* in Congo (Brazzaville).

Several *Tessmannia* species are the host of the parasitic plant species *Chlamydoxylum aphyllum* Mildbr. (Balanophoraceae). The host could be *T. africana*, *T. anomala*, *T. dewildemaniana* var. *leucocalyx* (now *T. macrantha*) or *T. lescrauwaetii* (Hallé 1978).

USES. *Tessmannia* wood has been used for carpentry, railway sleepers, tool handles and posts (Lewis *et al.* 2005). The resin of various *Tessmannia* species has been burned to provide light. *Tessmannia* resin is thought to have been used by hunter-gatherers in Gabon, up to 5670 years ago. The resin was brought into caves, well beyond the limit of natural light, indicating resin torches were used as a source of light (Oslisly *et al.* 1994).

NOTES. The number of leaflets is an important taxonomic character in *Tessmannia*. Small variations in leaflet numbers such as 1 – 3 leaflets vs 3 – 5 leaflets may indicate difference at the species level. The number of leaflets of *Tessmannia* shows a large range of variation between the species, from 2 (– 4) leaflets in *T. copallifera*, to 36 – 48 leaflets in *T. princeps*. The size of the leaflets of the species of *Tessmannia* is inversely proportional to the number of leaflets. *Tessmannia microphylla* has the smallest leaflets, 0.5 – 1.2 × 0.2 – 0.4 cm; *T. korupensis* has the largest leaflets, 6 – 18 × 3 – 9 cm. Leaflets occur usually in even as well as uneven numbers on leaves on a single twig. Some species have leaflets only in even numbers: *T. camoneana* always has 4 or 6 leaflets; never 5; *T. dawei* always has 6, 8 or 10 (or 12) leaflets, never 7, 9 or 11; *T. copallifera* always has 2 (once 4) leaflets. *T. densiflora* usually has an even number of leaflets, but occasionally an uneven number. The leaflets of *Tessmannia* are oblique at the base; except the leaflets of *T. korupensis* which are hardly or not oblique. The leaflets of *Tessmannia* are usually emarginate at the apex; however, the leaflets of *T. copallifera*, *T. korupensis*, *T. minutiflora* and *T. princeps* are hardly or not emarginate.



Map 1. Distribution of the genus *Tessmannia*.

Table 2. The 24 species in the genus *Tessmannia*: data used in determining the IUCN conservation status category and criteria. IUCN categories: CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern.

<i>Tessmannia</i> species	Number of collections	Extent of occurrence (km ²)	Area of occupancy (km ²)	Maximum height (m)	Generation length (years)	IUCN category	IUCN criteria	Publication
<i>T. africana</i>	109	2,040,000	304	53	100	LC		Contu 2012
<i>T. anomala</i>	52	1,680,000	160	50	100	LC		BGCI & IUCN 2019
<i>T. baikiaeoides</i>	34	102,000	160	25	80	VU	B2ab(iii,v)	Williams & Cheek 2019
<i>T. bambidiensis</i>	3	1,850	12	30	80	EN	B1ab(iii,v)+2ab(iii,v)	–
<i>T. burtii</i>	18	118,000	52	12	60	VU	B2ab(iii)	Nsanzurwimo <i>et al.</i> 2021
<i>T. camoneana</i>	3	400	12	7	50	EN	B1ab(iii,v)+2ab(iii,v)	–
<i>T. copallifera</i>	8	218,000	32	35	80	VU	B2ab(i,ii,iii,iv,v)	Shutsha Ehata <i>et al.</i> 2021a
<i>T. dawei</i>	18	595,000	40	20	60	EN	A2c	–
<i>T. densiflora</i>	11	3,800	40	25	80	EN	B1ab(iii)+2ab(iii)	Gereau <i>et al.</i> 2020a
<i>T. devildemani-ana</i>	4	189,000	16		100	VU	B2ab(iii,v)	–
<i>T. grandifoliola</i>	4	63,700	16		80	VU	A2c	–
<i>T. korupensis</i>	6	840	24	39	100	EN	B1ab(i,iii)+2ab(i,iii)	Harvey-Brown 2020
<i>T. lescrauwaetii</i>	36	978,000	112	45	100	LC		IUCN & BGCI 2022
<i>T. macrantha</i>	31	193,000	96	18	60	LC		–
<i>T. martiniana</i>	1	4	4		60	CR	B1ab(iii,v)+2ab(iii,v)	–
<i>T. media</i>	1	4	4	10	60	EN	B1ab(iii,v)+2ab(iii,v)	–
<i>T. microphylla</i>	10	585,000	32	35	80	LC		–
<i>T. minutiflora</i>	6	157,000	20	30	80	LC		–
<i>T. neglecta</i>	17	615,000	56	40	100	LC		–
<i>T. nervosa</i>	2	4	4	30	80	EN	B1ab(iii,v)+2ab(iii,v)	–
<i>T. pauloi</i>	3	470	12	35	80	EN	A2c; B1ab(iii,v)+2ab(iii,v)	–
<i>T. princeps</i>	1	9.26	12	40	100	VU	D1	Bianchi <i>et al.</i> 2025
<i>T. tanzaniensis</i>	13	8,024	44	20	60	VU	A2c; B1ab(iii,v)+2ab(iii,v)	–
<i>T. yangambi-ensis</i>	8	51	16	48	100	EN	B1ab(i,ii,iii,iv,v) +2ab(i,ii,iii,iv,v)	Shutsha Ehata <i>et al.</i> 2021b

The inflorescences are axillary; up to 5 inflorescences occur in a single leaf axil. On some specimens, such as *Gossweiler* 14105 (K) and *Burgt* 2331 (K), it can be clearly seen that the inflorescences emerge separately from the twig.

Flowers of all 24 *Tessmannia* species are known. The flower structure of the 24 *Tessmannia* species is very similar; the flowers only differ in, for example, length of pedicel, size of sepals and petals and indumentum of sepals. The flowers of all *Tessmannia* species have 4 sepals (one of these sepals consists of two fused sepals), 5 petals, 10 stamens of which 5 are long and 5 shorter (Fig. 3), and the lower part of 9 of the 10 filaments are fused. Fig. 4G in Burgt (2016) and Fig. 1F in Bianchi *et al.* (2025) present

floral diagrams of *Tessmannia*; all 24 species of *Tessmannia* share this floral diagram. The drawing of *Tessmannia baikiaeoides* presents a dissected flower. The length of the pedicel is an important species characteristic. The interspecific variation in pedicel length is large; from 2–3 mm in *T. densiflora*, to 18–38 mm in *T. korupensis*. Within each species, the maximum length is about 2× the minimum length. The length of the pedicel was measured on open flowers. The pedicel grows during development of the flower and the pod; flower buds have a shorter pedicel than open flowers and pods may have a longer pedicel. The sepals' length varies from 5 mm in *T. princeps* to 14–17 mm in *T. baikiaeoides*. The sepals of three species have stalked glands on the outer surface: *T. africana*, *T. dawei*

and *T. lescrauwaetii*. Pollen of Leguminosae-Detarioideae, including *Tessmannia*, has been extensively studied by H. Banks, see for example Banks & Klitgaard (2000).

The fruits of four *Tessmannia* species are unknown: *T. nervosa*, *T. pauloi*, *T. martiniana* and *T. media* (Table 1). All species of which the fruits are known have glandular fruits. In some species, some pods may be without glands, but in these species, there are always some pods with glands. In at least four species the pod glands are stalked and look like spines: *T. africana*, *T. densiflora*, *T. lescrauwaetii* and *T. neglecta*. Two of these four species also have stalked glands on the sepals. However, the third species with stalked glands on the sepals, *T. dawei*, does not have stalked glands on the pod. The function of these glands might be to deter animals from opening the pod to eat the seeds inside. The fruits are always dehiscent, woody, and dry when ripe. In at least two species the pods are explosively dehiscent: *T. bambidiensis* and *T. korupensis*; in those species a dehiscing pod may disperse its seeds to a short distance from the edge of the crown of the parent tree. *Tessmannia korupensis* has the largest pods in the genus, to 11 × 7 cm, and is the only species with ridges

on the upper suture of the pod. The seeds of *Tessmannia* species have a small whitish aril, which may aid in their dispersal by animals. Other forms of longer-distance seed dispersal may also exist.

Tessmannia, *Sindora* and *Sindoropsis*

The phylogenetic placement of *Tessmannia* has been studied by Fougère-Danezan *et al.* (2007, 2010) and Estrella *et al.* (2018). Intergeneric relationships amongst *Tessmannia*, *Sindora* Miq., *Sindoropsis* J. Léonard, *Detarium* Juss. or *Copaifera* L. remain unresolved (Estrella *et al.* 2018: 6). In the protologue of the genus *Tessmannia*, Harms (1910) remarks that the genus is clearly connected to *Sindora*. The genus *Sindora* has c. 20 species, of which 19 occur in Southeast Asia, whilst a single species, *Sindora klaineana* Pierre ex Pellegr., occurs in Congo (Brazzaville), Equatorial Guinea and Gabon (GBIF 2023). *Sindoropsis* is a monotypic genus, with the species *Sindoropsis letestui* (Pellegr.) J. Léonard (Léonard 1957) occurring in Cameroon (Letouzey 12322 (P, YA)), Equatorial Guinea and Gabon. *Detarium* occurs in Tropical Africa with three species. *Copaifera* occurs in



Fig. 3. *Tessmannia baikiaeoides* Hutch. & Dalziel. Open flower with 5 long fertile stamens and 5 shorter fertile stamens. From Burt 2331. PHOTO: XANDER VAN DER BURGT.

South America with many species, in Tropical Africa with four species, and in Borneo with a single species.

While molecular studies are inconclusive, this study concludes that *Tessmannia* is morphologically a clearly defined and uniform genus. Although the number of leaflets per leaf, and the size of individual leaflets, varies substantially between the species of *Tessmannia* (Table 1), the flower structure of the 24 species of *Tessmannia* is similar. The genus *Tessmannia* is morphologically clearly distinct from the genera *Copaifera*, *Detarium*, *Sindora* and

Sindoropsis. The genera *Copaifera* and *Detarium* have very different flower and fruit morphologies from those of *Tessmannia* (Aubréville 1968, 1970). Although *Sindora* and *Sindoropsis* cannot be distinguished from *Tessmannia* by their stem and bark (as observed by the second author of this study), and the fruits of *Sindora* may also look like those of *Tessmannia*, there are several clear differences between the leaves and flowers of the three genera (Table 3).

Key to the 24 species of *Tessmannia*

This key can be used to identify flowering collections, fruiting collections, and sterile material collected from mature trees. Material collected from seedlings, saplings, juvenile trees, or stem shoots of mature trees may be difficult to identify. All species of *Tessmannia* have numerous translucent dots in the leaflets, the secondary veins are looping to form a vein near the edge of the leaflet, the base of the leaflet is oblique, and the leaflet apex is usually emarginate.

1. Leaves 18 – 48-foliolate, largest leaflets ≤ 2.6 cm long..... 2
 Leaves 1 – 17-foliolate, largest leaflets 3 – 18 cm long..... 6
2. Largest leaflets 1.3×0.4 cm..... 3
 Largest leaflets $1.8 - 2.6 \times 0.7 - 1$ cm..... 4
3. Leaves 36 – 48-foliolate. Leaflets not emarginate. East Africa..... **T. princeps**
 Leaves 22 – 30 (– 37)-foliolate. Leaflets emarginate. Central Africa..... **T. microphylla**
4. Leaflets opposite to alternate. Pedicel 3 – 6 mm. Ovary densely hairy. Central Africa..... 5
 Leaflets opposite or sub-opposite. Pedicel 2 – 3 mm. Ovary glabrous. East Africa..... **T. densiflora**
5. Pods with 0 – 50 resin glands on each valve; glands sessile, to 0.5 mm tall. Secondary and tertiary leaflet venation above obscure. Inflorescence to 5 cm long. Pedicel 3 – 6 mm long; the scar of the upper bracteole is 0.5 – 2 mm from the base of the pedicel..... **T. anomala**
 Pods with 100 – 250 resin glands on each valve; glands stalked, to 1 mm tall. Secondary and tertiary leaflet venation above clearly visible. Inflorescence to 13 cm long. Pedicel 5 – 6 mm long; the scar of the upper bracteole is 2 – 4 mm from the base of the pedicel..... **T. neglecta**
6. Leaves 1 – 3-foliolate, leaflets 6 – 17 cm long..... 7
 Leaves 4 – 17-foliolate, leaflets 1 – 18 cm long..... 9
7. Leaves with 2 opposite leaflets..... **T. copallifera**
 Leaves with 1 – 3 alternate leaflets..... 8
8. Leaflets to 5 cm wide, 12 – 14 pairs of secondary veins, leaf petiole 3 – 6 mm long, pedicel 9 – 15 mm long..... **T. bambidiensis**
 Leaflets to 8 cm wide, 8 – 11 pairs of secondary veins, leaf petiole 6 – 11 mm long, pedicel 18 – 25 mm long..... **T. nervosa**
9. Leaves 12 – 17-foliolate, average 14 leaflets..... 10
 Leaves 4 – 12 (– 13)-foliolate, average 4.6 – 11 leaflets..... 11
10. Inflorescence and pedicel not glandular, pedicel 4 – 7 mm long. Sepals 8 – 9 mm long. Leaflets to 2.5 cm wide..... **T. yangambiensis**
 Inflorescence and pedicel covered in capitate glands, pedicel 6 – 12 mm long. Sepals 10 – 12 mm long. Leaflets to 1.7 mm wide..... **T. lescrauwaetii**
11. Leaves 5 – 12 (– 13)-foliolate, average number of leaflets > 7 , usually some leaves with 8 leaflets or more.... 12
 Leaves 4 – 7-foliolate, average number of leaflets < 6.5 , usually some leaves with 6 leaflets or less..... 17
12. Leaflets opposite or subopposite, always an even number of 6, 8 or 10 leaflets. Sepals on the outer surface with many stalked glands..... **T. dawei**

- Leaflets opposite to alternate, usually some leaves with an odd number of leaflets. Sepals on the outer surface not glandular, or with many stalked glands..... **13**
13. Sepals on the outer surface with many stalked glands to 0.5 mm tall. Pod valve with 80–200 stalked resin glands, to 6 mm tall. Leaflets 1.5–8 × 1–3.5 cm, 1.5–2.5 × longer than wide. Leaves with 7–10 (–11) leaflets..... **T. africana**
- Sepals on the outer surface not glandular. Pod valve glandular with rounded glands to 1 mm tall; or pods unknown. Leaflets may be up to 9 × 3 cm, but then 3–4 × longer than wide..... **14**
14. Leaflets to 9 × 3 cm. Pedicel 24–34 mm long. Sepals 13–17 mm long. Leaves with 5–9 (–10) leaflets..... **T. burttii**
- Leaflets to 4.8 cm long, or to 2.2 cm wide. Pedicel 3–17 mm long. Sepals 7–16 mm long..... **15**
15. Pedicel 12–17 mm long. Sepals 14–16 mm long. Leaves with 9–12 (–13) leaflets. Leaflets 2–4.8 × 0.7–1.4 cm. Central Africa..... **T. media**
- Pedicel 3–10 mm long. Sepals 7–10 mm long. East Africa..... **16**
16. Leaves 7–10-foliolate. Leaflets 1.2–3.6 × 1–2.2 cm. Pedicel 3–6 mm long. Sepals 7–9 mm long.... **T. pauloi**
- Leaves 9–12-foliolate. Leaflets 1–3 × 0.7–1.1 cm. Pedicel 8–10 mm long. Sepals 10 mm long.... **T. martiniana**
17. Leaves 4 or 6-foliolate, never 5 leaflets. Leaflets opposite or sub-opposite. Leaflets 1.5–7 × 0.7–2.8 cm. Pedicel and sepals on the outer surface glabrescent..... **T. camoneana**
- Leaves 4–7-foliolate, often 5 leaflets. Leaflets opposite to alternate. Pedicel and sepals on the outer surface hairy... **18**
18. Pedicel 18–38 mm long. Pod valve with 0–10 glands, upper suture winged, wings 5–10 mm wide on each valve. Central Africa..... **T. korupensis**
- Pedicel 6–26 mm long. Pod valve with 0–200 glands, sutures not winged; or pods unknown. West, Central or East Africa..... **19**
19. Pedicel and sepals on the outer surface with whitish hairs. Pod valve with 0–5 glands. Leaves with 4–5 leaflets. Central Africa..... **T. macrantha**
- Pedicel and sepals on the outer surface with yellowish to brownish hairs. Pod valve with 0–200 glands. Leaves with 4–7 leaflets..... **20**
20. Sepals 7–9 mm long. Pedicel 6–9 mm long. Ovary glabrous or only the sutures hairy. Central Africa..... **T. minutiflora**
- Sepals 12–17 mm long. Pedicel 6–26 mm long. Ovary hairy..... **21**
21. Pedicel 6–10 mm long. Leaflets to 7 × 3 cm. East Africa..... **T. tanzaniensis**
- Pedicel 8–26 mm long. Leaflets to 14 × 7 cm..... **22**
22. Pedicel 14–26 mm long. Leaflets 5–14 × 3–7 cm. Central Africa..... **T. grandifoliola**
- Pedicel 8–20 mm long. Leaflets 2–10 × 1–4 cm..... **23**
23. Pedicel 8–15 mm long. Sepals 12–14 mm long. Central Africa..... **T. dewildemaniana**
- Pedicel 12–20 mm long. Sepals 14–17 mm long. West Africa..... **T. baikiaeoides**

Table 3. Comparison of morphological characteristics of *Sindora*, *Sindoropsis* and *Tessmannia*. Morphological characteristics in bold indicate differences between the genera.

Characteristic	<i>Sindora</i>	<i>Sindoropsis</i>	<i>Tessmannia</i>
Number of species	20	1	24
Distribution	SE Asia 19 sp., Africa 1 sp.	Cameroon, Gabon, Eq. Guinea	Tropical Africa
Petiolules length	2–6 mm	3–4 mm	0–3 (–4) mm
Leaflet arrangement	Normally opposite	Alternate	Normally alternate
Leaflet apex	Normally emarginate	Normally emarginate	Normally emarginate
Leaflet base	Not or faintly oblique	Not oblique	Oblique
Secondary veins	To leaflet edge	To leaflet edge	Uniting near leaflet edge
Leaflet glands	1, on leaflet apex	1, on edge of leaflet, near petiolule	Several, on leaflet blade, near petiolule
Inflorescence	Axillary or terminal	Axillary	Axillary
Sepals	4, one wider	4, one wider	4, one wider
Fully developed petals	1	1	5
Stamens	10: 2 large, 8 sterile	10: 5 large, 5 medium	10: 5 large, 5 medium
Pods	Glandular or spiny	Glandular	Glandular or spiny

Tessmannia africana Harms 1910: 295; Aubréville 1968: 159 – 160; Aubréville 1970: 158 – 159; Hutchinson & Dalziel 1958: 455 – 456; Léonard 1950: 35 – 55; Léonard 1952: 288 – 290; Saint Aubin 1963: 93; Sosef *et al.* 2006: 228; Velayos *et al.* 2010. Type: Equatorial Guinea, Nkolentangan, fl., 25 April 1908, *Tessmann* 377 (B†; K000417963).

Tessmannia claessensi De Wild. (De Wildeman 1925: 220). Type: Congo (Kinshasa), Boyulu, fl., March 1921, *Claessens* 353 (BR).

Tessmannia claessensii De Wild.; Aubréville 1968: 159; Aubréville 1970: 158; Léonard 1952: 288.

Tree, to 53 m tall, trunk to 180 cm diam. and 31 m long. Stipules linear, 5 – 8 × 1 mm, caducous. Leaves to 18 × 11 cm, petiole 4 – 18 mm long, 1 – 2 mm diam.; rachis 4 – 10 (– 17) cm long. Leaflets 7 – 10 (– 11) per leaf, alternate, ovate, somewhat falcate, 1.5 – 8 × 1 – 3.5 cm, glabrous, midvein sparsely hairy beneath; petiolules 0 – 3 mm long; leaflet base obtuse; secondary veins 10 – 15 pairs. Glands 0 – 3 per leaflet, placed near the petiolule. Inflorescence a raceme or compound raceme, axis to 16 cm long, 0 – 5 lateral branches to 11 cm long, to 32-flowered, 1 – 4 inflorescences per leaf axil, sometimes a few stalked capitate glands in the upper part, hairs to 0.5 mm long. Flowers: bract 3 – 4 mm long; bracteoles 2 – 3 mm long, inserted at 0 – 1 mm and 1 – 2 mm from base of pedicel. Pedicel 5 – 10 mm long, many stalked capitate glands 0.5 mm tall, hairs to 0.5 mm long; sepals 8 – 11 mm long, on the outer surface many stalked capitate glands 0.5 mm tall, hairs on the outer surface to 0.5 mm long; petals white to light pink, adaxial petal 15 – 18 × 3 – 4 mm, the other 4 petals 20 – 24 × 7 – 8 mm; stamens 10, 5 filaments 18 – 24 mm long, 5 filaments 10 – 15 mm long; anthers c. 3 × 1 mm; ovary 3 – 4 × 2 – 3 mm, glandular, densely hairy, hairs to 2 mm long, stipe 4 – 6 mm long; style 12 – 15 mm long. Infructescence axis to 16 cm long, 1 – 3 fruits per infructescence. Fruits woody, brown, orbicular, 3 – 6 × 3 – 5 cm, glandular, each valve with 80 – 200 stalked resin glands to 6 mm tall; stipe 4 – 7 mm long, beak 0 – 1 mm long, fruits hairy to glabrescent on the outer surface, hairs to 0.2 mm long, to 1 mm long on edge; fruits contain 1 – 4 seeds. Seeds dark brown to black, glossy, ovate, 16 – 19 × 12 – 16 × 6 – 8 mm. Figs 1, 2, 4.

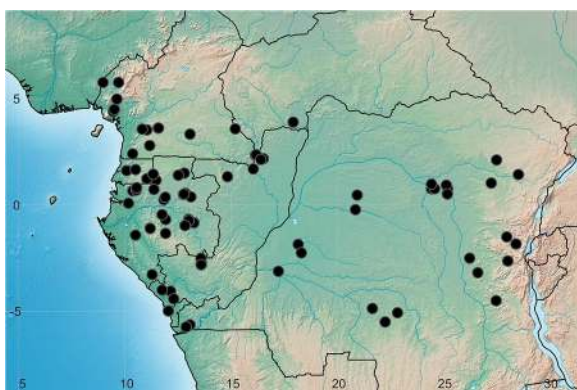
DISTRIBUTION. *Tessmannia africana* occurs in Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo (Brazzaville) and Congo (Kinshasa); Map 2.

SPECIMENS EXAMINED. CAMEROON. Ebianemeyong, fr., 6 March 2016, *Burgt* 1947 (B, BM, BR, EA, G, K, LISC, MA, MO, NY, P, PRE, SCA, SING, US, WAG, YA); Mefou N.P., st., 14 Oct. 2002, *Cheek* 11129 (K, MO, YA); Bakossi Mts, st., 20 March 2003, *Cheek* 11313 (K, YA); Southern Bakundu F.R., st., 5 April 1951, *Ejiofor*

FHI 29316 (K); Southern Bakundu F.R., fr., 11 Jan. 1951, *Keay* s.n. (K); Reserve forestière de Makak, fr., 31 Jan. 1950, *Letouzey* 1382 (P, YA); Forêt de Koumou, fl., 15 June 1950, *Letouzey* 1475 (YA); 15 – 20 km NW de Ngola, st., 4 April 1961, *Letouzey* 3721 (YA); Ndingé-Koungoulou, fl., fr., 16 April 1961, *Letouzey* 3863 (P, YA); Same loc., st., 16 April 1961, *Letouzey* 3864 (K, P, YA); Same loc., st., 16 April 1961, *Letouzey* 3873 (BR, K, P, WAG, YA); Makomol, 10 km SSE Eseka, fr., 30 Dec. 1973, *Letouzey* 12523 (YA); Lake Ejagham, 35 km W Mamfe, fr., 20 May 1975, *Letouzey* 13569 (BR, K, P, WAG, YA); Kendem, 40 km E Mamfe, st., 16 Aug. 1975, *Letouzey* 14315 (BR, K, P, YA); Mefou N.P., Ndanani I, fr., 22 Oct. 2002, *Mackinder* 503 (K, YA); Same loc, st., 22 Oct. 2002, *Mackinder* 504 (K, MO, P, SCA, WAG, YA); Lake Ejagham in Kembong F.R., st., 17 March 1951, *Onochie* FHI 30897 (K, P); N'Koladom, fl., 15 Nov. 1974, *Wilde* 7716 (BR, HBG, K, MA, MO, P, WAG, YA). **CENTRAL AFRICAN REPUBLIC.** Dzanga-Sangha Reserve, st., 27 Sept. 1988, *Harris* 1203 (MO); same loc., st., 4 Oct. 1988, *Harris* 1324 (MO); Boukoko, fl., 23 April 1951, *Tisserant* 2082 (BM, BR, P, WAG); Boukoko, fl., 8 May 1951, *Tisserant* 2100 (BM, BR, P, WAG); Boukoko, fr., 27 June 1951, *Tisserant* 2145 (BM, BR, P, WAG). **EQUATORIAL GUINEA.** Parc National de Nsork, fr., 6 July 1998, *Nguema* 230 (BRLU); village Asoc, 15 km from Mongomo, fr., 5 June 2002, *Parmen-tier* 3782 (BRLU); Parc National de Monte Alén, st., 9 Feb. 2002, *Senterre* 2186 (BRLU); Same loc., st., 10 Feb. 2002, *Senterre* 2207 (BRLU); Nkolentangan, fl., 25 April 1908, *Tessmann* 377 (type B†, K000417963). **GABON.** Djidji, Koumémayong, fr., 25 April 1988, *Breteler* 8988 (WAG); 30 km E of Lastoursville, fr., 7 May 1992, *Breteler* 11356 (WAG); Same loc., seedlings, 7 May 1992, *Breteler* 11357 (WAG); 55 km E of Lastoursville, st., 23 Nov. 1993, *Breteler* 12275 (LBV, WAG); 6 km E of Bambidie, fl., 16 Oct. 1994, *Breteler* 13322 (BR, K, MO, P, WAG); W of Yombi, Koumounabouali massif, fr., 18 Sept. 1997, *Breteler* 13968 (WAG); 65 km SSW of Booué, fr., 26 Feb. 1999, *Breteler* 15227 (BR, MO, WAG); station d'Ipasa, 20 km S de Makokou, st., 31 May 1977, *Florence* 475 (P); near Makokou on Ivindo R., st., 18 July 1981, *Gentry* 33389 (MO); Dicoua, fl., 1 Oct. 1926, *Le Testu* 6312 (BM, BR, MO, P); region de Lastoursville, Tsenda, fl., 1 Oct. 1929, *Le Testu* 7476 (BM, BR, MO, P); Ebé. Woleu-Ntem, fl., 12 Nov. 1933, *Le Testu* 9391 (B, BM, BR, HBG, K, MO, P, WAG); Forêt des Abeilles, E of Lopé Reserve, fr., 4 Dec. 1993, *McPherson* 16311 (BR, P, US, WAG); Minkébé, st., 4 Feb. 1990, *Minkébé* A64 (WAG); Minkébé, st., 17 March 1990, *Minkébé* A667 (WAG); Minkébé, st., 29 March 1990, *Minkébé* W78 (WAG); Crystal Mts, st., 9 Dec. 2000, *Nguema* 1558 (MO, WAG); Crystal Mts, st., 29 March 2001, *Nguema* 1786 (LBV, MO, WAG); Crystal Mts, st., 11 July 2001, *Nguema* 1936 (LBV, MO, WAG); Oveng, Mintsic, st., 7 Nov. 1986, *Reitsma* 2538 (LBV,



Fig. 4. *Tessimannia africana* Harms. **A** tree stem; **B** mature fruits; **C** mature fruit with resin drops. From *Burgt* 1947. PHOTOS: XAN-
DER VAN DER BURGT.



Map 2. Distribution of *Tessimannia africana*.

WAG); N'Koulounga, fr., 1 Nov. 1961, *Saint Aubin* 2088 (P); Ekobakoba, fl., 6 Nov. 2005, *Sosef* 2231 (LBV, WAG); Waka NP, st., 17 March 2007, *Sosef* 2396 (MO, WAG); Pélé Mts, fr., 5 April 2009, *Sosef* 2641 (WAG); Makokou, reserve of Ipassa, fr., 15 March 2001, *Tabak*

196 (WAG); 20 km N de Koumameyong, fr., 17 March 1987, *Wilks* 1414 (MO, WAG). **CONGO (BRAZZAVILLE).** Zanaga, near Mbouyi, st., 13 Oct. 2009, *Cheek* 15831 (IEC, K, WAG); Mayombe, near Niari R., st., 13 Oct. 2010, *Douhi* 155 (IEC, K, WAG); Odzala N.P., fr., 1 Oct. 1994, *Dowsett-Lemaire* 1802 (BR); Mayombe, haute Loukénéne, st., 9 Oct. 1954, *Groulez* 31 (P); Lefoutou, st., 24 May 2010, *Kami* 4943 (IEC); N of Lefoutou, st., 31 May 2010, *M'Boungou* 317 (IEC, K); N of Lefoutou, st., 1 June 2010, *M'Boungou* 373 (IEC); Bambama, st., 5 July 2011, *Mpandzou* 921 (IEC); 36 km ESE de Bomassa, fr., 13 Sept. 2006, *Ndolo Ebika* 15 (E); 25 km ESE de Bomassa, fl., 10 April 2011, *Ndolo Ebika* 569 (E, WAG); Lefoutou, st., 24 May 2010, *Nkouka* 1306 (IEC); Kouilou, fl., *Sargos* 6 (BM, P); Futa Kobi, fl., *Sargos* 212 (P). **CONGO (KINSHASA).** 23 km from Kisangani to Bengamisa, st., 30 March 1973, *Bokdam* 4052 (WAG); Asonga Hill, c. 75 km S of Isiro, st., 30 July 2011, *Bujo* 3135 (EPU); Boyulu, fl., 1 March 1921, *Claessens* 353 (BR); Bena Longo,

fr., 5 April 1957, *Declercq* 25 (BR); Befale. Distr. de la Tshuapa, fr., 1 Sept. 1934, *Dubois* 537 (BR); Boende, fl., 1935, *Dubois* 693 (BR, K); Bokala, st., April 1944, *Flamigni* 7104 (BR); Lombe, Loliba, st., 19 Feb. 2012, *Gereau* 7298 (MO); Bengamisa, fr., 1 Feb. 1938, *Gilbert* 934 (BR, P); Yangambi, fl., 1 June 1938, *Gilbert* 1190 (BR, K); Yangambi, fr., 1 July 1938, *Gilbert* 1305 (BR); Yangambi, fr., 1950, *Gilbert* 8886 (BR, K); Yangambi, fr., 1950, *Gilbert* 8985 (BM, BR); Mashala, fr., 5 Nov. 1934, *Gillard* 129 (BR); Yangambi, rivière Loweo, fr., 9 June 1954, *Gutzwiller* 394 (BR); Ituri Forest, fl., 29 March 1992, *Hart* 1364 (BR, K, MO); Luki, Mayumbe, fr., 16 Jan. 1954, *Hombert* 110 (BR); Luki, Mayumbe, fr., 6 Dec. 1956, *Hombert* 425 (BR, K); Luki, Mayumbe, fl., 1 Jan. 1959, *Hombert* 484 (BR); Demba, st., 2 July 1951, *Jacques* 34 (BM, BR, K); Yangambi, fr., 14 Sept. 1948, *Léonard* 1908 (BR); Yangambi, fl., 20 Aug. 1936, *Louis* 2471 (BR, K, MO); Yangambi, fl., 12 March 1937, *Louis* 3583 (B, BR, IFAN, MO); Yangambi, fl., 14 April 1937, *Louis* 3678 (BR); Yangambi, fr., 21 May 1937, *Louis* 3930 (BR); Yangambi, fr., 31 Dec. 1937, *Louis* 7352 (BR, K); Yangambi, fl., 5 May 1938, *Louis* 9230 (B, BR, K, MO, P, US); Yangambi, fl., 21 April 1939, *Louis* 14607 (BM, BR, K, P); Yangambi, fr., 9 Oct. 1939, *Louis* 16173 (BM, BR, K, MO, P, US); Yangambi, fr., 29 Aug. 1941, *Louis* 16480 (BR); Yangambi, fr., 1 July 1943, *Louis* 16901 (BR); Stanleyville, km 25, fr., 20 Jan. 1939, *Meiren* 17 (BR, K, US); Rives Luka, st., *Michelson* 259 (BR); Meshe, st., *Michelson* 295 (BR); Pangi, st., *Michelson* 369 (BR); no loc., st., *Michelson* 782 (BR); Nzibi, km 9 vers Belanzovi, st., 15 Jan. 1949, *Michelson* 859 (BR); Kaseka, fr., 1 March 1949, *Michelson* 923 (BR, K, US); Patambalu, fr., 19 June 1952, *Tailfer* 107 (BR, K); Maniema, st., *Tondeur* 943 (BR); INEAC Luki, Boma, fr., 18 Jan. 1953, *Wagemans* 471 (BR, K); Same loc., fr., 10 Dec. 1953, *Wagemans* 753 (BR).

HABITAT. *Tessmannia africana* occurs in rain forest on well-drained soil, at 0 – 800 m altitude.

CONSERVATION STATUS. *Tessmannia africana* is known from 109 collections made from 1908 to 2016. Since the species is common, most of the National Parks within the extent of occurrence are expected to contain populations of this species. Google Earth (2023) imagery shows large areas of natural vegetation present near the collecting localities, but also shows oil palm plantations, small-scale farming, and urban development, where few or no trees of the original forest remain. *Tessmannia africana* was assessed as Least Concern (Contu 2012). Utilising data from Table 2, this assessment is supported.

PHENOLOGY. *Tessmannia africana* has been collected in flower in nearly every month of the year (20 flowering collections), and in fruit in every month of the year (33 fruiting collections). The flowering and fruiting time does not seem to be clearly correlated with geographical position.

ETYMOLOGY. *Tessmannia africana* is named after the African continent.

VERNACULAR NAME. Nkaga, N’Kaga (*Breteler* 8988), Nkagha (*Wilks* 1414), Fang language and forestry name in Gabon (Saint Aubin 1963). Mbilombi, Lissongo language in Central African Republic (*Tisserant* 2082). Mondumba, Bambindjere language in Central African Republic (*Harris* 1203). Waka, Turumbu ethnic group in Congo (Kinshasa) (*Louis* 2471 etc.).

USES. The wood of *Tessmannia africana* is white, darkening on exposure, hard and fibrous. The wood has been used in Congo (Kinshasa) for carpentry and as railway-sleepers. People of the Turumbu ethnic group used the resin of the tree for light. Newly-delivered Turumbu women used crushed fresh fruit as perfume (*Burkill* 1995; *Léonard* 1950).

NOTES. *Tessmannia africana* is the largest and most widespread species of all species in the genus. It is an emergent rain forest tree of up to 53 m tall, with a trunk to 180 cm diam. The species is found all over the Central African rain forest. A group of 6 trees standing within 100 m distance to each other was recorded on the label of *Burgt* 1947. However, trees may also be found as single individuals.

Sterile leaf samples of *Tessmannia africana* can easily be recognised by the number of 7 – 10 (– 11) leaflets, which are usually alternate but may be opposite. The other species of *Tessmannia* have more or fewer leaflets, or the same number of leaflets but then of a very different shape (Fig. 1). *Tessmannia africana* can easily be recognised by the up to 6 mm long resin glands on the fruits. These glands bear resemblance to spines. *Tessmannia densiflora*, *T. lescrauwaetii* and *T. neglecta* also have resin glands resembling spines, but to only 1 mm long. The pedicel and sepals of *T. africana* have many stalked glands. Such glands are only present in two other species: *T. lescrauwaetii* has capitate glands, not only on the pedicel and sepals, but also on the inflorescence axis; *T. dawei* has stalked glands similar to those of *T. africana*.

Seeds were collected of *Tessmannia africana*. These seeds are stored at the Millennium Seed Bank of the Royal Botanic Gardens, Kew, and at the seed bank of YA herbarium in Cameroon.

***Tessmannia anomala* (Micheli) Harms 1915a:** 457; Aubréville 1968: 157 – 159; Aubréville 1970: 156 – 158; Léonard 1949: 384 – 385; Léonard 1950; Léonard 1952: 293 – 294; Sosef *et al.* 2006: 228; Sosef *et al.* (2021): 129. – *Baikiaea anomala* Micheli 1897: 72. Type: Congo (Kinshasa), Kasai, Lusambo, fl., Dec. 1895, *E. Laurent* s.n. (BR0846347).

Tessmannia anomala (Micheli) Harms var. *anomala* J.Léonard 1949: 384.

Tessmannia moesieki De Wild. (De Wildeman 1927: 122).

Type: Congo (Kinshasa), Distr. de la Lulonga, Basankusu, fr., 1925, *Moesieke* s.n. (BR0846204, BR0846237).

Tessmannia parvifolia Harms 1913: 423. Type: Cameroon, South Region, Ebolowa, Ekuk, 21 June 1911, *Mildbraed* 5648 (BR0846380, HBG519048, P03495940).

Tree, to 50 m tall, trunk to 120 cm diam. and 32 m long. Stipules linear, 7 – 10 × 1 – 2 mm, caducous, midvein eccentric. Leaves to 10 × 4 cm, petiole 2 – 4 mm long, 1 – 2 mm diam.; rachis 5 – 9 cm long. Leaflets 18 – 25 per leaf, sub-opposite to alternate, elliptic, asymmetric, 10 – 24 × 5 – 10 mm, glabrous; petiolules 0 – 0.5 mm long; leaflet base proximal side cuneate, distal side rounded; dull to weakly glossy on both sides; venation obscure above, prominent below, secondary veins 8 – 14 pairs. Glands 0 – 1 per leaflet, placed near the petiolule. Inflorescence a raceme or compound raceme, axis to 5 cm long, 0 – 3 lateral branches to 1 cm long, to 18-flowered, 1 – 4 inflorescences per leaf axil, hairs to 0.4 mm long. Flowers: bract 2 – 3 mm long; bracteoles 2 mm long, inserted at 0 – 0.5 mm and 0.5 – 2 mm from base of pedicel. Pedicel 3 – 6 mm long, hairs to 0.4 mm long; sepals 7 – 10 mm long, hairs on the outer surface to 0.4 mm long; petals white to light pink, adaxial petal 12 – 17 × 4 – 5 mm, the other 4 petals 16 – 24 × 6 – 8 mm; stamens 10, 5 filaments 18 – 23 mm long, 5 filaments 12 – 17 mm long; anthers c. 2 × 1 mm; ovary c. 4 × 2 mm, densely hairy, hairs to 1 mm long, stipe 2 – 3 mm long; style 10 – 16 mm long. Infructescence axis to 5 cm long, 1 – 2 fruits per infructescence. Fruits woody, brown, obovate to elliptic, 3 – 5 × 2 – 3 cm, glandular with 0 – 50 raised resin glands on each valve; stipe 2 – 4 mm long, beak 0 – 1 mm long, fruits densely hairy on the outer surface, old fruits glabrescent, hairs on sutures to 1 mm long; fruits contain 1 – 2 seeds. Seeds dark brown to black, glossy, ovate, 12 – 18 × 10 – 12 × 5 mm. Figs 1, 2, 5.

DISTRIBUTION. *Tessmannia anomala* occurs in Cameroon, Gabon and Congo (Kinshasa); Map 3. The species probably also occurs in Equatorial Guinea and Congo (Brazzaville); fertile specimens are needed for confirmation. The sterile specimen *Lejoly* 95T/L2.128 (BRLU) from Equatorial Guinea is cited as *T. anomala* in Velayos *et al.* (2010); this may be *T. anomala* or *T. neglecta*.

SPECIMENS EXAMINED. CAMEROON. Dja Reserve, fr., 6 Dec. 2018, *Burgt* 2228 (BR, G, K, MO, P, WAG, YA); Nanga Eboko, fl., 6 May 1959, *Letouzey* 1866 (BR, HBG, K, P, WAG, YA); Mbalam, Ngoila, st., 26 Feb. 1973, *Letouzey* 12052 (BR, HBG, P, WAG, YA); Ebolowa, 22 km E of Ekuk, fr., 21 June 1911, *Mildbraed* 5648 (BR0846380, HBG519048, P03495940); Dengdeng,

fl., 1 May 1914, *Mildbraed* 8766 (K); Nta Ali F.R., st., 12 March 1995, *Thomas* 10592 (K, WAG, YA). **GABON.** Maciya, fl., 10 Dec. 1930, *Le Testu* 8568 (B, BM, BR, K, MO, P, WAG); Oveng, st., 20 Sept. 1985, *Reitsma* 1478 (WAG); Oveng, st., 9 May 1986, *Reitsma* 2193 (WAG); Oveng, st., 11 March 1986, *Reitsma* 2235 (MO, WAG); Moukalaba Doudou NP, st., 17 Feb. 2004, *Valkenburg* 2790 (WAG); Same loc., st., 17 Feb. 2004, *Valkenburg* 2791 (WAG); Same loc., st., 17 Feb. 2004, *Valkenburg* 2792 (LBV, WAG); Forêt des Abeilles, fr., 30 July 1993, *Wilks* 2702 (MO, WAG); Crystal Mts, st., 3 May 2001, *Wilks* 3448 (WAG). **CONGO (KINSHASA).** Epulu, fl., 20 July 2000, *Amsini* 329 (BR, EPU, MO); Balanga, fr., *Bermejo* 86 (BR); Bomane, fl., 21 May 2010, *Boyekoli Ebale 2010 Expedition* 616 (BR, K, MO); Bena Longo, fl., 22 Dec. 1958, *Dechamps* 81 (BR, WAG); 20 km from Bokoli, fr., 1 Nov. 1980, *Dechamps* 8024 (BR); Yangambi, fr., 11 Oct. 1950, *Donis* 2909 (BR, K); Haut Lopoi, fr., 1 Jan. 1934, *Dubois* 568 (BR, K); Boyakoko, fr., 24 Aug. 1955, *Evrard* 1655 (BR); Simba – Yahuma, fr., 20 Feb. 1959, *Evrard* 5787 (BR, YBI); Yalokombe, fl., 12 May 1952, *Germain* 7322 (BR); Befale, st., Sept. 1927, *Ghesquière* 814 (BR); no loc, fr., *Gilbert* 988 (BR); no loc, fl., June 1938, *Gilbert* 1260 (BR); Bengamisa, fl., 28 May 1936, *Gilbert* 2338 (BR, K, P); Epulu, fl., 7 June 1981, *Hart* 92 (BR, EPU, K, MO); Epulu, fl., 19 June 1991, *Hart* 1160 (BR, EPU, K); Bokuna, fl., fr., 1 Sept. 1952, *Hulstaert* 1582 (BR, K); Bokote, st., 1936, *Jespersen* 12 (BR); Lusambo, fl., Dec 1895, *Laurent* s.n. (type BR0846347); Yangambi, st., 14 Sept. 1948, *Léonard* 1911 (BR); Arboretum Stanleyville, fr., Sept. 1942, *Liègeois* 13 (BR); Yangambi, fr., 9 Aug. 1936, *Louis* 2404 (B, BR, K, P, US); Yangambi – Stanleyville, fl., 12 Aug. 1936, *Louis* 2420 (B, BM, BR, K, MO, P); Yangambi, fl., 27 April 1937, *Louis* 3785 (BR, K, MO, YBI); Yangambi, fr., 8 July 1937, *Louis* 4360 (BR, K); Yangambi, fr., 11 Nov. 1937, *Louis* 6564 (BM, BR, K, P, YBI); Yangambi, fl., 15 June 1938, *Louis* 9790 (B, BM, BR, IFAN, K, MO, P); Yangambi, fl., 22 June 1938, *Louis* 9880 (BM, BR, K, P); 22 km N of Yangambi, fl., 25 June 1938, *Louis* 9943 (B, BR, K, MO); Yangambi, fl., 4 June 1957, *Maudoux* 1271 (BR); Stanleyville, st., 1 Feb. 1939, *Meiren* 17 bis (BR, K); R. Eke, st., *Michelson* 201 (BR); Biaboye, fl., *Michelson* 445 (BR); Basankusu, fr., 1925, *Moesieke* s.n. (BR0846204, BR0846237); Lwalimba, fr., 26 May 1959, *Pierlot* 2924 (BR); Makwe, st., 25 Nov. 1959, *Pierlot* 3277 (BR); Yambuya, st., 1906, *Solheid* 121 (BR).

HABITAT. *Tessmannia anomala* occurs in evergreen and semi-deciduous rain forest, on well-drained soil, at 0 – 900 m altitude.

CONSERVATION STATUS. *Tessmannia anomala* is known from 52 collections made from 1895 to 2018. This is a common species; most of the National Parks within the extent of occurrence are expected to contain populations of this species. Google Earth (2023) imagery shows areas of natural vegetation present near the



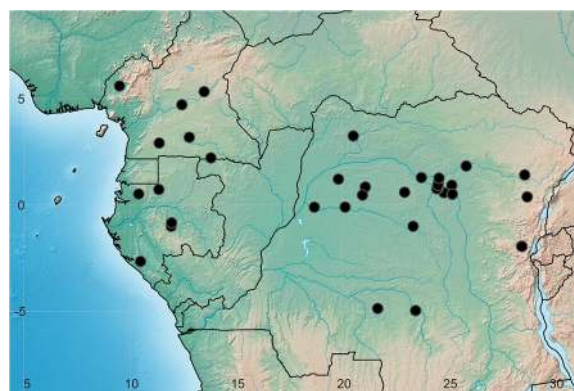
Fig. 5. *Tessmannia anomala* (Micheli) Harms. **A** tree stem; **B** tree crown. From *Burgt* 2228. PHOTOS: XANDER VAN DER BURGT.

collecting localities, but also shows oil palm plantations, small-scale farming, and urban development, where few or no trees of the original forest remain. *Tessmannia anomala* was assessed as Least Concern (BGCI & IUCN 2019). Some *T. anomala* specimens used in that assessment are here identified to *T. neglecta*, and some other *T. anomala* specimens could be identified to genus only by the present study. However, utilising data from Table 2, the assessment Least Concern for *T. anomala* is supported.

PHENOLOGY. *Tessmannia anomala* has been collected in flower in nearly every month. Of the 21 flowering collections, 13 were collected in May and June. The species has been collected in fruit also in nearly every month. Of the 16 fruiting collections, 4 were collected in August. The flowering and fruiting time does not seem to be clearly correlated with geographical position.

ETYMOLOGY. The species name of *Tessmannia anomala* means abnormal, diverging from the usual. The author of the species does not explain why this name was given; perhaps the name refers to the leaflets. These leaflets occur in larger numbers and smaller sizes than any other species of *Baikiaea*; the genus in which *T. anomala* was first published.

VERNACULAR NAME. Ebaka, Kibila language in Congo (Kinshasa) (*Amsini* 329). Tshiluba, Bangula language in



Map 3. Distribution of *Tessmannia anomala*.

Congo (Kinshasa) (*Dechamps* 81). Waka, Turumbu ethnic group in Congo (Kinshasa) (collections by *Louis*).

USES. The resin has been burned locally to provide light (*Louis* 2404). The wood may be used for carpentry and railway sleepers.

NOTES. *Tessmannia anomala* is here divided into two species; the new species *T. neglecta* is described from collections previously identified to *T. anomala*. The differences between the two species are listed in the recognition and notes of *T. neglecta*. *Tessmannia moesiekei*

and *T. parvifolia* are without doubt synonyms of *T. anomala* because the types *Moesieke* s.n. (BR) and *Mildbraed* 5648 (BR, HBG, P) have pods that have 0–50 glands that are not stalked, and leaflets without prominent venation above. Sterile material of *T. anomala* and *T. neglecta* is easily confused with several other species; see notes of *T. neglecta*.

***Tessmannia baikiaeoides* Hutch. & Dalziel** (Hutchinson & Dalziel 1928a: 336); Hutchinson & Dalziel 1928b: 382; Léonard 1950: 35–55; Hutchinson & Dalziel 1958: 456; Hawthorne & Jongkind 2006: 822–823. Type: Sierra Leone, York Pass, fl., 1 Dec. 1912, *G. Aylmer* 137 (K000043904).

Following Turland *et al.* 2018, article 60.10, the specific epithet is spelled *baikiaeoides* because the epithet is supposed to have been derived from the genus name *Baikiaea* Benth.

Tree, to 25 m tall, trunk to 80 cm diam. Stipules ovate, 7–10 × 4–6 mm, somewhat persistent, midvein eccentric. Leaves to 16 × 10 cm, petiole 5–11 mm long, 1–2 mm diam; rachis 2–6 cm long. Leaflets 4–6 per leaf, alternate, elliptic, somewhat falcate, 2–9 × 1–4 cm, glabrous, midvein of juvenile leaves sparsely hairy beneath; petiolules 1–2 mm long; leaflet base obtuse; secondary veins 13–16 pairs. Glands 2–6 per leaflet, placed near the petiolule. Inflorescence a raceme, axis to 13 cm long, to 30-flowered, 1–5 inflorescences per leaf axil, hairs to 0.3 mm long. Flowers: bract 2 mm long; bracteoles 2 mm long, inserted at 1–2 mm and 2–3 mm from base of pedicel. Pedicel 12–20 mm long, green, hairs to 0.7 mm long; sepals 14–17 mm long, hairs on the outer surface to 0.7 mm long; petals white, adaxial petal 26–32 × 8–10 mm, the other 4 petals 30–36 × 10–16 mm; stamens 10, filaments white, 5 filaments 35–40 mm long, 5 filaments 25–30 mm long; anthers orange-red, c. 5 × 2 mm; ovary 7–8 × 3–4 mm, densely hairy, hairs to 1 mm long, stipe 3 mm long; style 18–22 mm long, white, stigma white. Infructescence axis to 13 cm long, 1–3 fruits per infructescence. Fruits woody, brown, obovate, 4–6 × 2.5–3 cm, glandular with 100–200 raised resin glands on each valve, each gland topped with a droplet of resin, stipe 4–5 mm long, beak 1–2 mm long, fruits densely hairy on the outer surface, hairs on sutures to 1.5 mm long; fruits contain 1–2 seeds. Seeds dark brown to black, glossy, ovate, 11–18 × 9–13 × 5–7 mm. Fig 1, 2, 6, 7.

DISTRIBUTION. *Tessmannia baikiaeoides* occurs in Guinea, Sierra Leone, Liberia and Ivory Coast; Map 4.

SPECIMENS EXAMINED. GUINEA. Boffa, E of Kalekale, st., 18 Oct. 2016, *Bidault* 2430 (MO, P); Nimba Mts, st., 14

Oct. 2011, *Bilivogui* 124 (MO, P); SW of Kounounkan, Gbara, fr., 28 Sept. 2016, *Burgt* 2026 (BR, HNG, K, MO, P, WAG); Benna Plateau above Gombokori, fl., 31 Oct. 2019, *Burgt* 2331 (B, BR, G, HNG, K, MO, P, SERG, WAG); Kounounkan plateau, fr., 19 Jan. 2013, *Cheek* 16967 (HNG, K, P, WAG); same loc., st., 19 Jan. 2013, *Cheek* 16969 (HNG, K); Tombayah to Saliyah, st., 28 Sept. 2015, *Cheek* 18135 (HNG, K, WAG); Forêt Classée de Diécké, fr., 13 Nov. 2016, *Haba* 503 (HNG, K); R. Diani at Kpo, fr., 16 March 2017, *Haba* 786 (HNG, K); Nimba Mts, st., 9 July 2007, *Jongkind* 7916 (WAG); Nimba Mts, st., 21 Aug. 2008, *Jongkind* 8380 (WAG); Mt Yonon, st., 7 May 2011, *Jongkind* 10656 (WAG); Kaporro, fr., 8 April 2017, *Konomou* 247 (HNG, K, P, WAG); Benna Plateau above Gombokori, fr., 13 Feb. 2019, *Konomou* 660 (BR, HNG, K, MO, P, WAG); Kounounkan, fr., 13 Feb. 2017, *Molmou* 1550 (HNG, K); Nimba Mts, st., 23 Nov. 2007, *Nimba Team* 430 (WAG); Massif de Benna, st., May 1950, *Schnell* 5561 (P); same loc., st., May 1950, *Schnell* 5606 (P). SIERRA LEONE. York Pass, fl., 1 Dec. 1912, *Aylmer* 137 (K000043904); Sula Mts, fr., 4 March 2010, *Burgt* 1433 (BR, FBC, G, K, MO, P, SL, WAG); same loc., fl., 16 Nov. 2012, *Burgt* 1571 (B, BR, E, EA, FBC, G, HNG, K, LISC, MA, MO, NY, P, PRE, S, SING, SL, W, WAG, US); Gola National Park, fr., 19 Oct. 2013, *Burgt* 1602 (K, SL, WAG); Seli River near Yirafilaia, fr., 13 March 2017, *Burgt* 2079 (BR, K, MO, P, SL, WAG); Waterloo-York Pass road, fl., *Deighton* s.n. (K, SL); Seli R. between Sandia and Yara, fr., 6 April 2016, *Momoh* 135 (BR, K, MO, P, SL, WAG); Dodo Hills F.R., fr., 1 Jan. 1949, *Sawyer* 13576 (K, SL); Kambui F.R., fr., 25 May 1951, *Small* 53 (SL). LIBERIA. Nimba Mts, fr., 1 Feb. 1965, *Adam* 20809 (K, MO); Nimba Mts, fl., 22 Nov. 1964, *Adames* 781 (B, BR, K, P); North Lorma Nat. Forest, st., 19 Nov. 2005, *Jongkind* 6681 (WAG); Nimba Mts, st., 8 Dec. 2007, *Jongkind* 8177 (WAG); Gbarpolu, Kpelle Forest, st., 20 Dec. 2010, *Jongkind* 10279 (WAG); Nimba Mts, st., 1 Aug. 1962, *Voorhoeve* 1172 (BR, K, MO, WAG). IVORY COAST. Mt Dou, st., 13 March 1932, *Aubréville* 1046 (BR, P).

HABITAT. *Tessmannia baikiaeoides* occurs in forest along rivers and streams, forest on rocky slopes, sometimes in rain forest, on well-drained rocky soil, often with *Cryptosepalum tetraphyllum* (Detarioideae), at 200–900 m altitude.

CONSERVATION STATUS. *Tessmannia baikiaeoides* is known from 34 collections and 22 observations (see Electronic Supplementary Material) made from 1912 to 2023. Some collections were made in protected areas such as the Nimba Nature Reserves in Guinea and Liberia, the Gola National Park, and Western Area National Park in Sierra Leone. In and around the collecting localities are extensive areas of farmland where few or no trees of the original forest remain (Google Earth 2023). Disturbance by anthropogenic dry-season

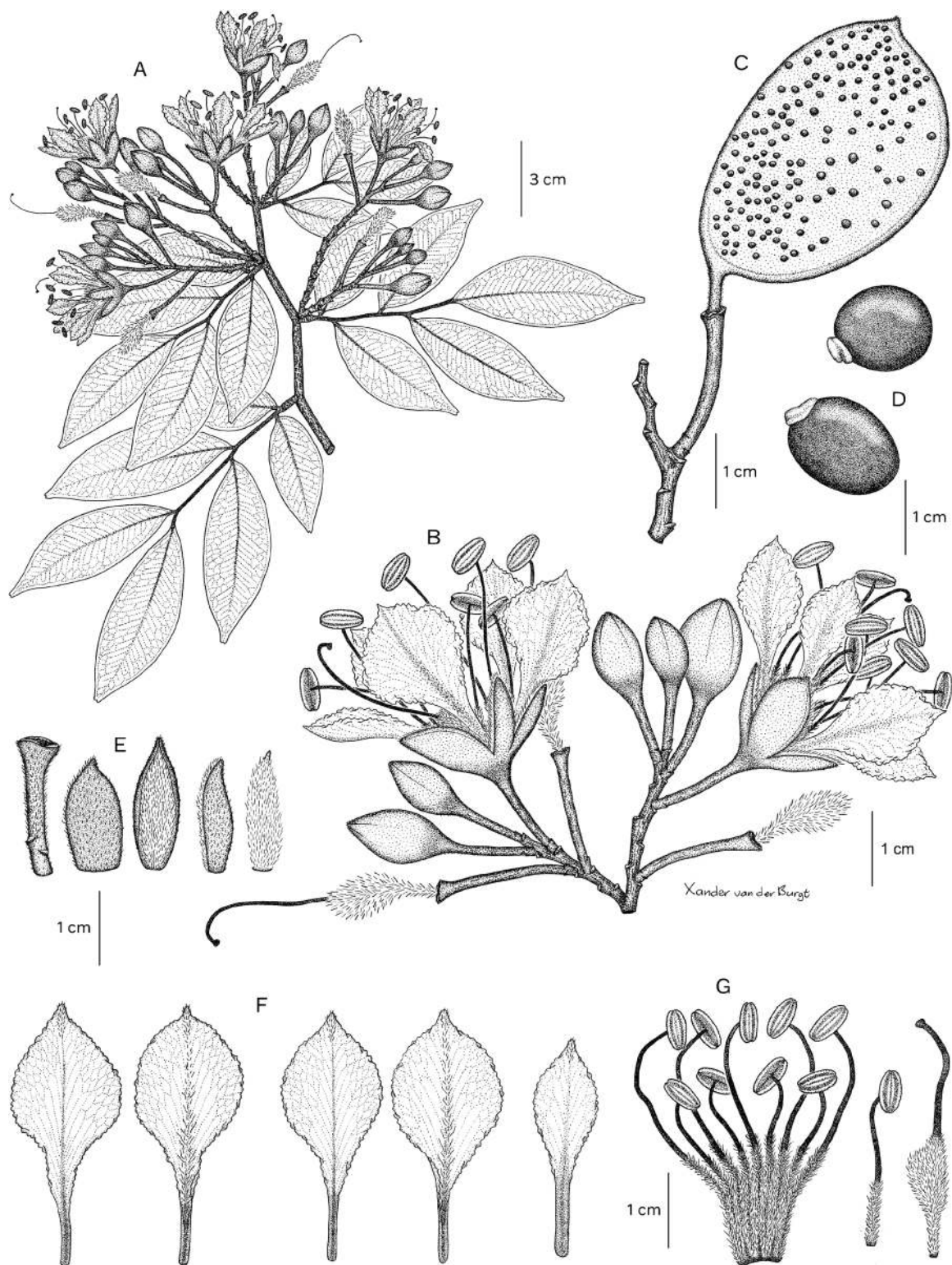
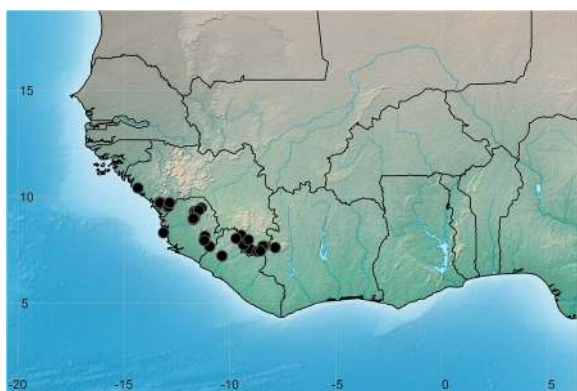


Fig. 6. *Tessmannia baikiaeoides* Hutch. & Dalziel. **A** twig with leaves, flower buds and open flowers; **B** inflorescence with flower buds, open flowers and young fruits; **C** fruit with resin drops; **D** seeds with aril; **E** pedicel, 4 sepals, outer surface of first and third sepal, inner surface of second and fourth sepal; **F** abaxial petals outer and inner surface, lateral petals outer and inner surface, adaxial petal outer surface; **G** 9 partially fused stamens of which 5 long and 4 short, one short free stamen, pistil. **A**, **B**, **E** – **G** from Burgt 2331; **C** from Burgt 1433; **D** from Burgt 2079. DRAWN BY XANDER VAN DER BURGT.



Fig. 7. *Tessmannia baikiaeoides* Hutch. & Dalziel. **A** flower with the slightly smaller adaxial petal on top left; **B** flower with 5 long fertile stamens and 5 shorter fertile stamens; **C** fruit with resin drops; **D** seeds with aril. **A**, **B** from *Burgt* 1571; **C** from *Burgt* 1433; **D** from *Burgt* 2079. PHOTOS: XANDER VAN DER BURGT.



Map 4. Distribution of *Tessmannia baikiaeoides*.

fires was observed in several collecting localities and is expected to occur in many localities. In some areas, the vegetation has been modified or has disappeared, due to open-pit ore mining, reservoir building and urban

development. *Tessmannia baikiaeoides* was assessed as Vulnerable B2ab(iii,v) (Williams & Cheek 2019). Utilising data from Table 2, the assessment is supported. **PHENOLOGY.** *Tessmannia baikiaeoides* flowers from October to December and fruits from January to April, and once in September.

ETYMOLOGY. The species name of *Tessmannia baikiaeoides* means looking like the species of the genus *Baikiaea* (Leguminosae - Detarioideae).

VERNACULAR NAME. Fulayindi (*Sawyer* 13576) or Matindi (*Deighton* s.n.), Mende language in Sierra Leone. Yinei, Mano Language in Guinea and Liberia (*Adames* 781).

USES. Flowering trees have evergreen foliage with beautiful large white flowers (Fig. 7); the species might be suitable to plant along streets and in urban parks. The wood is hard, good for tool handles (*Adames* 781) and used for veranda posts (*Sawyer* 13576; *Burkill* 1995).

NOTES. *Tessmannia baikiaeoides* looks somewhat similar to *T. burttii*, a species found at 4500 km distance. Both species are medium-sized trees and seem to occupy

similar habitat, although *T. burtii* is found at much higher altitudes. Despite superficial similarity there are clear differences in leaflet numbers and pedicel length, and the flowers of *T. baikiaeoides* are white, whilst those of *T. burtii* are pale pink. Seeds were collected of *T. baikiaeoides*. These seeds are stored at the Millennium Seed Bank of the Royal Botanic Gardens, Kew, and at the seed bank of HNG herbarium in Guinea.

***Tessmannia bambidiensis* Breteler & Burgt sp. nov.** Type: Gabon, Ogooué-Lolo, near Bambidié, c. 30 km E of Lastoursville, fl., 10 Oct. 1994, *F. J. Breteler* 13201 (holotype WAG0101122; isotypes WAG0101123, WAG0192355).

<http://www.ipni.org/urn:lsid:ipni.org:names:77364901-1>

Tessmannia bambidiensis Breteler ined.; Sosef *et al.* 2006: 228.

Tree, to 30 m tall, trunk to 70 cm in diam. Stipules caducous, not seen. Leaves to 17 × 13 cm, petiole 3–6 mm long, 2–3 mm diam; rachis 1–3 cm long. Leaflets 1–3 per leaf, alternate, elliptic, 6–14 × 2–5 cm, leaflets glabrous above, hairy below when young, hairs to 0.3 mm long, on and between the veins; petiolules 1–3 mm long; leaflet base obtuse, apex acuminate, to 7 mm long; secondary veins 12–14 pairs. Glands 5–10 per leaflet, placed near the petiolule and near the margin. Inflorescence a raceme or compound raceme, axis to 4 cm long, 0–3 lateral branches to 1 cm long, to 10-flowered, 1–2 inflorescences per leaf axil, hairs to 0.5 mm long. Flowers: bract 2–3 mm long; bracteoles 2 mm long, inserted at 1–2 mm and 2–3 mm from base of pedicel. Pedicel 9–15 mm long, hairs to 0.5 mm long; sepals 11–15 mm long, hairs on the outer surface to 0.5 mm long; petals pink, translucent dots, adaxial petal 20–23 × 7–8 mm, the other 4 petals 24–28 × 9–12 mm; stamens 10, 5 filaments 25–30 mm long, 5 filaments 20–25 mm long; anthers c. 4 × 1.5 mm; ovary 7–10 × 3–4 mm, densely hairy, hairs to 1 mm long, stipe 2 mm long; style 16–20 mm long. Infructescence axis to 4 cm long, 1–3 fruits per infructescence. Fruits woody, brown, obovate, 6–9 × 4–6 cm, glandular with 0–2 raised resin glands on each valve, densely hairy on the outer surface, short hairs mixed with hairs to 2 mm long, valves curl inwards after dehiscence, sutures not winged, stipe c. 5 mm long, beak 2–3 mm long; fruits contain 1–2 seeds. Seeds c. 22 × 15 × 5 mm, glossy, dark brown to black. Figs 1, 2, 8.

RECOGNITION. *Tessmannia bambidiensis* morphologically resembles *T. nervosa*. The pedicel is 9–15 mm in *T. bambidiensis*, and 18–25 mm long in *T. nervosa*. In *T. bambidiensis*, the two bracteoles are inserted at 1–2 and 2–3 mm from the base of the pedicel; in *T. nervosa*, at 2–4 and 5–9 mm. The leaflets of *T. nervosa*

are somewhat wider: the size of the leaflets of *T. bambidiensis* is 6–14 × 2–5 cm; of *T. nervosa* 6–17 × 3–8 cm. The leaflets of *T. bambidiensis* have 12–14 pairs of secondary veins; those of *T. nervosa* have 8–11 pairs of secondary veins. The petiole of *T. bambidiensis* is 3–6 mm long, the petiole of *T. nervosa* is 6–11 mm long.

DISTRIBUTION. *Tessmannia bambidiensis* is endemic to the Ogooué-Ivindo and Ogooué-Lolo Provinces in Gabon; Map 5.

SPECIMENS EXAMINED. GABON. Ogooué-Lolo, near Bambidié, c. 30 km E of Lastoursville, fl., 10 Oct. 1994, *Breteler* 13201 (holotype WAG0101122; isotypes WAG0101123, WAG0192355); Ogooué-Lolo, about 65 km SSW of Booué, Makande, fr., 25 Feb. 1999, *Breteler* 15201 (WAG); Ogooué-Ivindo, SE of Booué, fr., 23 Nov. 1993 *McPherson* 16256 (K, MO, P, US, WAG).

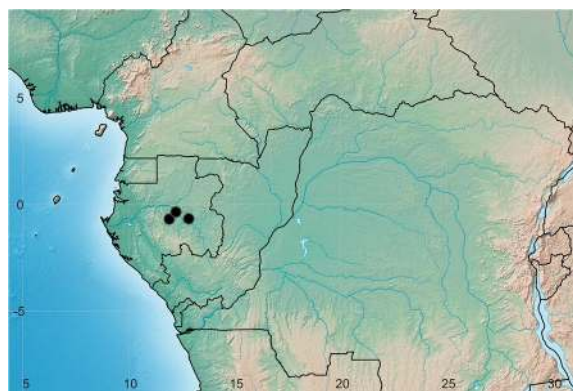
HABITAT. *Tessmannia bambidiensis* occurs in rain forest, at 300–400 m altitude.

CONSERVATION STATUS. *Tessmannia bambidiensis* is known from three collections at three localities, made in 1993, 1994 and 1999. Google Earth (2023) imagery shows large areas of forest present near the three collecting localities. The collections were made in logging concessions, near logging roads, in areas that are currently unprotected. The nearby Ivindo National Park and Lopé National Park have similar forest habitat and may contain populations of this species. Google Earth (2023) imagery shows some small-scale farming around the collecting locality, and much industrial logging activity. There has been decline in area and quality of habitat, and in number of mature individuals, and this is continuing. Utilising data from Table 2, *Tessmannia bambidiensis* is here preliminarily assessed to the IUCN (2012) Red List category Endangered B1ab(iii,v)+2ab(iii,v).

PHENOLOGY. *Tessmannia bambidiensis* flowers in October and fruits in February.

ETYMOLOGY. *Tessmannia bambidiensis* is named after the village Bambidié, a logging industry village near the area where the tree species is endemic.

VERNACULAR NAME. Not recorded.



Map 5. Distribution of *Tessmannia bambidiensis*.



Fig. 8. *Tessmannia bambidiensis* Breteler & Burgt. **A** twig with leaf and young fruit; **B** twig with leaves, flower buds and an open flower; **C** open flower; **D** seeds; **E** fruit with a single gland. **A** from McPherson 16256; **B**, **C** from Breteler 13201; **D**, **E** from Breteler 15201. DRAWN BY LUCY T. SMITH.

USES. Not recorded.

NOTES. The new species *Tessmannia bambidiensis* and *T. nervosa* are closely related; see the notes of *T. nervosa*. The pod valves of *T. bambidiensis* curl strongly inwards after dehiscence, indicating the presence of ballistic seed dispersal. It is therefore likely that trees of *T. bambidiensis* grow in groups, as do trees of *T. korupensis* and *T. nervosa*.

Tessmannia burtii Harms 1938: 110; Brenan 1967: 107; Brummitt *et al.* 2007: 52–53; Léonard 1950: 35–55; Meerts & Hasson 2016: 330; Sosef *et al.* 2021: 131. Type: Zambia, Northern Province, Lake Tanganyika Coast, in the gorge of the Lunzua river just above the falls, fl., 20 May 1936, *B. D. Burt* 6004 (lectotype K000417958, selected here; isolectotypes BM000842223, BR0892280, EA000000942, EA000000943, FT001362, K000417959, P00253031, S).

Tree, to 12 m tall, trunk to 58 cm diam. Stipules ovate, falcate, c. 15 × 10 mm, caducous, midvein eccentric. Leaves to 20 × 12 cm, petiole 6–10 mm long, 1–3 mm diam.; rachis 4–15 cm long. Leaflets 5–9 (–10) per leaf, alternate, elliptic, somewhat falcate, 3–9 × 1–3 cm, glabrous, midvein of juvenile leaves sparsely hairy beneath; petiolules 1–2 mm long; leaflet base obtuse; somewhat glossy above, dull below; secondary veins 11–17 pairs. Glands 2–6 per leaflet, placed near the petiolule. Inflorescence a raceme, axis to 6 cm long, to 13-flowered, 1–4 inflorescences per leaf axil, hairs to 0.2 mm long. Flowers: bract 2–3 mm long; bracteoles not seen, inserted at 1 mm and 2–5 mm from base of pedicel. Pedicel 24–34 mm long, hairs to 0.5 mm long; sepals 13–17 mm long, hairs on the outer surface to 0.5 mm long; petals pale pink, 25–35 × 8–12 mm; stamens 10, 5 filaments 32–36 mm long, 5 filaments 24–28 mm long; anthers c. 5 × 2 mm; ovary 8–10 × 2–3 mm, densely hairy, hairs to 1 mm long, stipe 2 mm long; style 20–25 mm long. Infructescence axis to 8 cm long, 1–3 fruits per infructescence. Fruits woody, warm brown, obovate, 4–6 × 2–3 cm, glandular with 50–150 raised resin glands on each valve, stipe 4–5 mm long, beak 1–3 mm long, fruits densely hairy on the outer surface, hairs on sutures to 2 mm long; fruits contain 1–2 seeds. Seeds dark brown to black, glossy, ovate, 12–15 × 9–11 × 5–6 mm. Figs 1, 2, 9.

DISTRIBUTION. *Tessmannia burtii* occurs in Congo (Kinshasa), Western Tanzania and Zambia; Map 6.

SPECIMENS EXAMINED. CONGO (KINSHASA). Katanga, Upemba National Park, fl., 24 June 1948, *De Witte* 4038 (BR, K); Kasenga, Lubemba village, fl., fr., 27 May 2012, *Meerts & Hasson* 100 (BRLU, P); route Lubumbashi to Sakania, st., 7 Aug. 1958, *Schmitz* 6143 (BR, WAG). TANZANIA. Rukwa Region: Mpanda Distr., Tongwe East F.R., st., 17 Dec. 2002, *Abeid* 1257 (MO, NHT); same loc., st.,

21 Dec. 2002, *Abeid* 1355 (MO, NHT); same loc., st., 21 Dec. 2002, *Abeid* 1356 (MO, NHT); same loc., st., 24 Dec. 2002, *Abeid* 1408 (MO); same loc., st., 24 Dec. 2002, *Abeid* 1410 (MO); Misanga Village, fr., 14 Sept. 2005, *Abeid* 2308 (MO); Tongwe East F.R., st., 26 Feb. 2014, *Abeid* 3722 (MO); Kigoma Region: Kasye Forest, st., 18 March 1994, *Bidgood* 2794 (DSM, K); same loc., fr., 21 March 1994, *Bidgood* 2887 (K); Mfyombosi Forest Reserve, fr., 1 Aug. 1995, *Mbago* 1368 (DSM, MO); Nyamnsi R., 25 miles N of Mpanda, fr., July 1962, *Procter* 2115 (EA, K). ZAMBIA. Northern Province, Lake Tanganyika Coast, in the gorge of the Lunzua R. just above the falls, fl., 20 May 1936, *Burt* 6004 (lectotype K000417958, selected here; isolectotypes BM000842223, BR0892280, EA000000942, EA000000943, FT001362, K000417959, P00253031, S); Luapula Province, Kawambwa, fr., 24 Aug. 1957, *Fanshawe* 3586 (BR, EA, K); North-Western Province: Mwinilunga Distr., 4 miles NW of Kalene Hill, fr., 20 Sept. 1952, *Holmes* 895 (BR, K); same loc., seedling, 19 June 1954, *Léonard* 18 (BR).

HABITAT. *Tessmannia burtii* occurs in riverine forest and woodland, on sandy and rocky soils, at 800–1500 m altitude.

CONSERVATION STATUS. *Tessmannia burtii* is known from 18 collections made from 1936 to 2014. The species is recorded to be locally very common but absent elsewhere. One of the collecting localities is in a protected area, the Upemba National Park in Congo (Kinshasa). Within the extent of occurrence there are protected areas such as the Mahale Mountain National Park in Tanzania, and the Mweru Wantipa and Sumbu National Parks in Zambia; *T. burtii* is likely to occur in these and other protected areas. Google Earth (2023) imagery shows areas of forest and woodland remaining around the collecting localities. In and around the collecting localities are areas of farmland where few or no trees of the original forest remain. *Tessmannia burtii* was assessed as Vulnerable B2ab(iii) (Nsanzurwimo *et al.* 2021). Utilising data from Table 2, this assessment is supported.

PHENOLOGY. *Tessmannia burtii* flowers in May and June and fruits from July to November. There exists also a fruiting collection from May.

ETYMOLOGY. *Tessmannia burtii* is named after the collector of the type specimen.

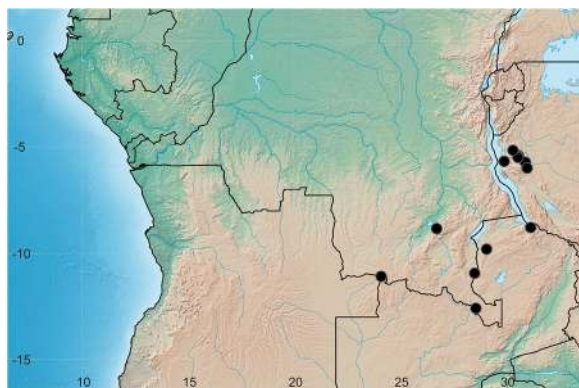
VERNACULAR NAME. Unknown.

USES. Flowering trees were noted to have evergreen foliage with masses of spectacular pink flowers (*Burt* 6004; Meerts & Hasson 2016); the species might be suitable to plant along streets and in urban parks.

NOTES. The collection *Meerts & Hasson* 100 (BRLU) consists of five sheets: three sheets of flowering branches and two sterile branches of juvenile trees. Thanks to this collection it is now known what juvenile material of *T. burtii* looks like. Several collections of juvenile trees from western Tanzania that were identified to *T. dewildemaniana* could



Fig. 9. *Tessmannia burtii* Harms. **A** twig with leaves, flowers, and young fruits; **B** inflorescence with open flowers and very young fruits. From Meerts & Hasson 100. PHOTOS: MICHEL HASSON.



Map 6. Distribution of *Tessmannia burtii*.

now be included in *T. burtii*. Several collections from coastal Tanzania that were identified to *T. burtii*, often with reservations, are here included in the new species *T. tanzaniensis*. Mligo *et al.* (2009) note that *T. burtii* is abundant in the Zaraninge Forest in Tanzania; this refers to the new species *T. tanzaniensis*.

***Tessmannia camoneana* Torre 1967:** 151. Type: Angola, Quicama National Park, 40 km from Cabo Ledo, 20 km after Galinda, fl., 10 June 1966, *J. B. Teixeira* 10532 (holotype LUA; isotypes BM000842224, BR0846169, COI00000941, LISC001619, LISC001621).

Shrub, to 7 m tall, multi-stemmed. Stipules caducous, not seen. Leaves to 9×7 cm, petiole 2–4 mm long, 1–2 mm diam.; rachis 1–3.5 cm long. Leaflets 4 or 6 per leaf, opposite or sub-opposite, asymmetrically elliptic, falcate, $1.5 - 7 \times 0.7 - 2.8$ cm, glabrous; petiolules to 1 mm long; leaflet base obtuse; secondary veins 12–14 pairs. Glands 0–2 per leaflet, placed near the petiolule.

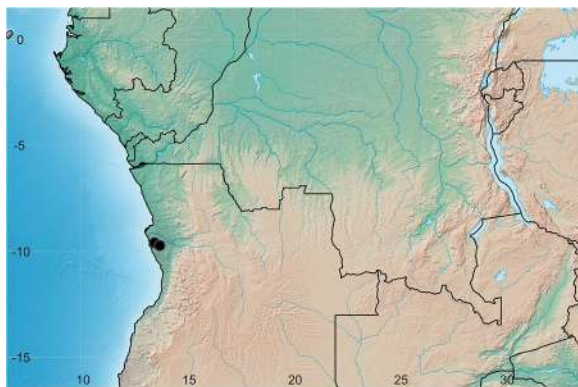
Inflorescence a raceme, axis to 3.5 cm long, to 7-flowered, one inflorescence per leaf axil, hairs to 0.2 mm long, to glabrescent. Flowers: bract 4–5 mm long; bracteoles 3 mm long, inserted at 1 mm and 2–4 mm from base of pedicel. Pedicel 14–19 mm long, glabrescent; sepals 11–13 mm long, on the outer surface glabrescent; petals pink lilac, adaxial petal $18 - 22 \times 5 - 6$ mm, the other 4 petals $21 - 29 \times 8 - 12$ mm; stamens 10, 5 filaments 29–33 mm long, 5 filaments 19–21 mm long; anthers c. 5×1.5 mm; ovary 5×3 mm, edges densely hairy, hairs to 1 mm long, stipe 4–6 mm long; style 17–22 mm long. Infructescence axis to 3.5 cm long, 1–2 fruits per infructescence. Fruits woody, brown, obovate, $2.7 - 5 \times 1.6 - 2.8$ cm, glandular with 30–80 raised resin glands on each valve, stipe 5–8 mm long, beak 1–3 mm long, fruits densely hairy on the outer surface, hairs to 0.5 mm long; fruits contain 1–2 seeds. Seeds dark brown to black, glossy, ovate, c. 13×8 mm. Figs 1, 2.

DISTRIBUTION. *Tessmannia camoneana* is endemic to the Bengo Province in Angola; Map 7.

SPECIMENS EXAMINED. ANGOLA. Quicama National Park, 8 Nov. 2015, fl. buds, *Catarino* 2156 (FR, photos); Quicama National Park, 40 km from Cabo Ledo, 20 km after Galinda, fl., 10 June 1966, *Teixeira* 10532 (holotype LUA; isotypes BM000842224, BR0846169, COI00000941, LISC001619, LISC001621); Quicama National Park, fr., 30 July 1966, *Teixeira* 10532 A (BM, BR, COI, LISC); 74 km from Pousada, to Cabo Ledo, near Calinda, fr., 30 May 1967, *Teixeira* 10636 (LISC).

HABITAT. *Tessmannia camoneana* occurs in “Mutolo” vegetation: riverine forest and broadleaved woodland, at 100–200 m altitude.

CONSERVATION STATUS. *Tessmannia camoneana* is known from three collections made in 1966 and 1967, and in 2015 observations were made of the species (GBIF 2023). The species was reported to be abundant at the



Map 7. Distribution of *Tessmannia camoneana*.

type locality. The species is endemic to the Quicama National Park, which is 9960 km² in size and is located close to the capital Luanda. Google Earth (2023) imagery shows that the vegetation inside the national park is largely intact, but that there are some areas of farmland where few or no trees of the original forest remain. Disturbance by annual anthropogenic dry-season fires is probably extensive within the range of the species, affecting the wooded grassland and the edges of the gallery forest. There has been some decline in area and quality of habitat, and in numbers of mature individuals, and this is continuing. The extent of occurrence is probably over 100 km² but below 5000 km². There may be just one location according to IUCN (2024). Utilising data from Table 2, *Tessmannia camoneana* is here preliminarily assessed to the IUCN (2012) Red List category Endangered B1ab(iii,v)+2ab(iii,v).

PHENOLOGY. *Tessmannia camoneana* flowers in June and fruits in July.

ETYMOLOGY. *Tessmannia camoneana* is named after Luís de Camões, the author of *Os Lusíadas* (The Lusíads), Portugal's national epic poem celebrating Portuguese history and achievements. The type collection was collected on 10 June, the National Day of Portugal, commemorating his death on 10 June 1580.

VERNACULAR NAME. Not recorded.

USES. Not recorded.

NOTES. *Tessmannia camoneana* has 4 or 6 leaflets, never 5, and these leaflets are opposite or sub-opposite. Only three other *Tessmannia* species have even numbers of opposite or sub-opposite leaflets: *T. copallifera* has 2 leaflets, *T. dawei* has 6, 8 or 10 leaflets and *T. densiflora* has 18–28 leaflets. *Tessmannia camoneana* is the only species of *Tessmannia* clearly recorded as a shrub, to 7 m tall and multi-stemmed. *Tessmannia dawei* may be multi-stemmed but this is the result of coppicing. Several collections made recently in Quicama National Park were re-identified to *Annea laxiflora* (Benth.) Mackinder & Wieringa. *Annea laxiflora* always has 4 leaflets (never 6 leaflets) and the leaflets do not have translucent dots.

Tessmannia copallifera J. Léonard 1957: 68; Sosef *et al.* 2021: 132. Type: Congo (Kinshasa), km 32 route Elila – Kailo, fr., 24 Feb. 1949, A. Michelson 918 (holotype BR0846280, isotype BR0846313).

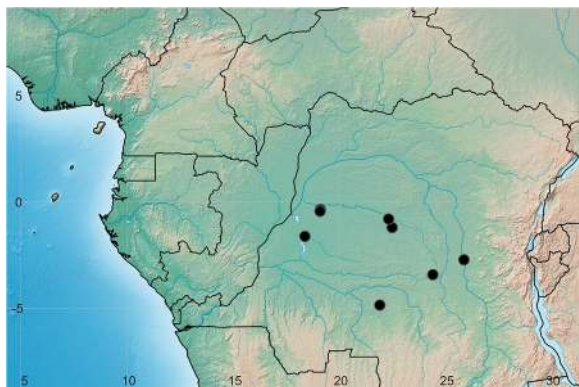
Tree, to 35 m tall, trunk to 110 cm in diam., cylindrical, straight, without buttresses. Stipules caducous, not seen. Leaves to 13 × 11 cm, petiole 3–10 mm long, 1–2 mm diam., canaliculate, glabrous. Leaflets 2 per leaf, a single leaf with 4 leaflets seen on the type, opposite, elliptic, falcate, 6–13 × 2–4 cm, glabrous; petiolules 0–1 mm long; leaflet base cuneate; apex acuminate, to 12 mm long; secondary veins 16–22 pairs. Glands 0–5 per leaflet, placed near the petiolule. Inflorescence a raceme, axis to 3 cm long, to 12-flowered, 1–3 inflorescences per leaf axil, whitish hairs to 0.3 mm long. Flowers: bract 3 mm long; bracteoles 2 mm long, inserted at 0–1 mm and 1–2 mm from base of pedicel. Pedicel 4–7 mm long, whitish hairs to 0.4 mm long; sepals 8–10 mm long, on the outer surface whitish hairs to 0.4 mm long; 5 petals, 20 × 8 mm; stamens 10, 5 filaments 20–24 mm long, 5 filaments 12–15 mm long; anthers c. 3 × 1 mm; ovary 4–5 × 2–3 mm, sides glabrous, edges densely hairy, hairs to 1.5 mm long, stipe 2 mm long; style 13–15 mm long. Infructescence axis to 4 cm long. Fruits woody, brown, obovate, 4–6 × 2–3.5 cm, glandular with 0–50 raised resin glands on each valve, upper suture somewhat thicker than lower suture but not winged, stipe 3–5 mm long, beak 1–3 mm long, fruits glabrous on the outer surface; fruits contain 1–2 seeds. Seeds not seen. Seedlings: hypocotyl 9–11 cm, epicotyl 2–3 cm long; first two leaves opposite, petiole 0.8–1.1 cm long, 1 pair of opposite leaflets 4–5 × 2–2.5 cm, petiolules 0–1 mm long. Figs 1, 2.

DISTRIBUTION. *Tessmannia copallifera* is endemic to Congo (Kinshasa); Map 8.

SPECIMENS EXAMINED. CONGO (KINSHASA). Kasai, Katoko Kombe, st., Jan. 1910, Claessens 342 (BR); Kasai, Mwaka, Kakenge, fl., 19 Nov. 1958, Dechamps 77 (BR, WAG); Bokungu, Bokota – Yalifafu, fr., 13 Feb. 1959, Evrard 5707 (BR); Inongo, Bolia, Lac Leopold II, fr., 16 April 1959, Evrard 6165 (BR, K); Bokungu, Bokota – Boende, st., 21 April 1959, Evrard 6220 (BR, K); Nseke, Flandria, st., 1949, Hulstaert 1526 (BR); Iambo, Flandria, st., Oct. – Nov. 1949, Hulstaert 1547 (BR); km 32 route Elila – Kailo, fr., 24 Feb. 1949, Michelson 918 (holotype BR0846280, BR0846313).

HABITAT. *Tessmannia copallifera* occurs in rain forest on well-drained soil and swampy soil, at 300–600 m altitude.

CONSERVATION STATUS. *Tessmannia copallifera* is known from eight collections made from 1910 to 1959. None of the collections were made in protected areas, but the National Park de la Salonga likely has populations



Map 8. Distribution of *Tessmannia copallifera*.

of this species. Google Earth (2023) imagery shows large areas of forest present within and near the extent of occurrence, but also some small-scale farming, large oil palm plantations and some urban development. *Tessmannia copallifera* was assessed as Vulnerable B2ab(i,ii,iii,iv,v) (Shutsha Ehata *et al.* 2021a). Utilising data from Table 2, this assessment is supported.

PHENOLOGY. *Tessmannia copallifera* flowers in November and fruits from January to February.

ETYMOLOGY. *Tessmannia copallifera* is named after the copal (resin) which the tree species produces.

VERNACULAR NAME. Manga, Batetela dialect. Ngare, Maniema dialect. Wengele, Lokundu dialect.

USES. The species produces resin (copal; *Evrard* 5707; *Hulstaert* 1526).

NOTES. *Tessmannia copallifera* was described from four fruiting or sterile specimens by Léonard (1957: 68). The first flowering specimen of *Tessmannia copallifera*, *Dechamps* 77, was collected one year later, in 1958. The sterile and fruiting specimens collected before 1958 have caused some confusion. De Wildeman (1916: 255) cited *Claessens* 342 as *Macrolobium diphyllum* Harms. Léonard (1950: 126–127, 134) cited this specimen and two others as *Amherstiae* sp. Two years later, after having read De Wildeman (1916), Léonard (1952: 427) cited all four specimens as *Macrolobium diphyllum* under the header “Doubtful species”. He remarked that a correct generic determination was not possible because of the absence of flowers, but he also remarked that the four specimens possibly represent a new species of *Tessmannia*. Five years later he solved the problem by describing the new species *T. copallifera* and citing all four specimens (Léonard 1957: 68).

Tessmannia dawei J.Léonard 1949: 386; Léonard 1950: 35–55. Type: Angola, Zaire Province, Lunuango, fr., 1921, *M. T. Dawe* 32 (lectotype K000417962, selected here; isoelectotype BR0846111).

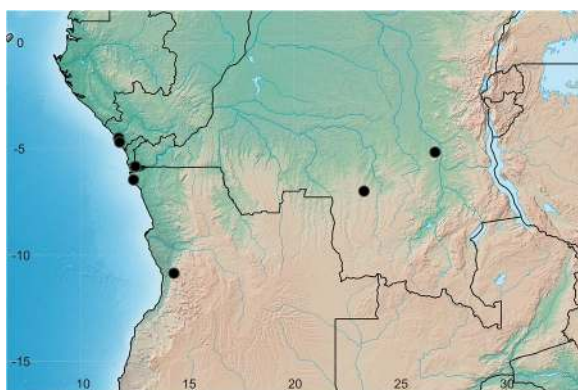
Tree, to 20 m tall, trunk to 40 cm diam. Stipules linear, to 13 mm long, caducous. Leaves to 9×6 cm, petiole 2–4 mm long, 1–2 mm diam.; rachis 2–5 cm long. Leaflets 6, 8 or 10 per leaf, sub-opposite, elliptic, asymmetric, $1.5–5 \times 0.7–2$ cm, glabrous, juvenile leaves sparsely hairy on edge and midvein beneath, hairs to 1 mm long; petiolules to 1 mm long; leaflet base cuneate; secondary veins 8–10 pairs. Glands 2–4 per leaflet, placed near the petiolule. Inflorescence a raceme or compound raceme, axis to 9 cm long, 0–3 lateral branches to 3 cm long, to 15-flowered, 1–2 inflorescences per leaf axil, covered in capitate glands (inland specimens only), hairs to 0.3 mm long. Flowers: bract 6 mm long; bracteoles 3–4 mm long, inserted at 0–1 mm and 1–2 mm from base of pedicel. Pedicel 11–22 mm long, many stalked glands 0.3 mm tall (inland specimens only), hairs to 0.5 mm long; sepals 11–14 mm long, on the outer surface many stalked glands 0.3 mm tall, hairs on the outer surface to 0.5 mm long; petals pink, adaxial petal $15–18 \times 5–8$ mm, the other 4 petals $20–22 \times 12–15$ mm; stamens 10, filaments pink, 5 filaments 25–30 mm long, 5 filaments 18–25 mm long; anthers orange-red, c. 3×1 mm; ovary $7–8 \times 2–3$ mm, densely hairy, hairs to 1 mm long, stipe 4 mm long; style 20–25 mm long, pink. Infructescence axis to 10 cm long, 1–2 fruits per infructescence. Fruits woody, brown, obovate, $4–5.2 \times 2.5–3$ cm, glandular with 80–150 raised resin glands on each valve, mostly near upper suture, stipe 4–6 mm long, beak 1–2 mm long, fruits densely hairy on the outer surface, hairs to 1 mm long; fruits contain 1–2 seeds. Seeds dark brown to black, glossy, ovate, $14–16 \times 7–9 \times 5–6$ mm. Figs 1, 2, 10.

DISTRIBUTION. *Tessmannia dawei* occurs in Angola, Congo (Brazzaville) and Congo (Kinshasa). The species occurs at sea level near the coast but also up to 1050 m altitude and up to 1600 km inland: Map 9.

SPECIMENS EXAMINED. ANGOLA. Zaire Province, Lunuango, fr., 1921, *Dawe* 32 (lectotype K000417962, selected here; isoelectotype BR0846111); Cuanza Sul, Gabela, fl., 30 April 1968, *Teixeira* 12481 (COI, LISC). **CONGO (BRAZZAVILLE).** Kouilou Plains, fl., 19 Jan. 1988, *Foresta* 1545 (P, PN); Kouilou, NNW of Pointe Noire, near Pointe Indienne, st., 24 Nov. 2011, *Kami* 1246 (BR, G, IEC, K, MO, P, WAG); Kouilou, Tchimpounga, 30 km NNW of Pointe Noire, fl., 3 Dec. 2011, *Kami* 1363 (BR, G, IEC, K, MO, P, PRE, US, WAG); same loc., st., 2 Nov. 2012, *Kami* 1413, (B, IEC, K, LISC, MA, S, WAG); same loc., st., 4 Nov. 2012, *Kami* 1453, (IEC); NNW of Pointe Noire, st., 9 July 2011, *Mpandzou* 1200 (IEC, K); same loc., st., 9 July 2011, *Mpandzou* 1234 (IEC, K); Tchimpounga, st., 5 Nov. 2012, *Mpandzou* 1635 (IEC); same loc., st., 6



Fig. 10. *Tessmannia dawei* J.Léonard. **A** tree stem; **B** twig with leaves and young inflorescences. From *Kami* 1363. PHOTOS: XANDER VAN DER BURGT.



Map 9. Distribution of *Tessmannia dawei*.

Nov. 2012, *Mpandzou* 1659 (IEC). **CONGO (KINSHASA).** Kasai-Oriental, Mwene Ditu, fr., May 1952, *Hardy* 36B41 1952 (BR); same loc., fl., 1 March 1951, *Hardy* 67B71 1951 (BR); Katanga, Lubunda, st., Aug. 1948, *Schmitz* 3216 (BR, K); Bas-Congo, Boma-Banane, fl., 2 Feb. 1957, *Wagemans* 1360 (BR, K, MO, WAG); same loc., fl., fr., 12 Feb. 1957, *Wagemans* 1412 (BM, BR); same loc., fr., 10 March 1958, *Wagemans* 1890 (BR, WAG).

HABITAT. *Tessmannia dawei* occurs in forest on coastal white sand, gallery forest and sub-montane forest, at 0 – 1050 m altitude.

CONSERVATION STATUS. *Tessmannia dawei* is known from 17 collections made from 1921 to 2012. All collections were made in areas that are currently unprotected, but some of the National Parks within the extent of occurrence may contain populations of this species. Google Earth (2023) imagery shows that the 1 × 3 km area of forest and grassland mosaic near Pointe Indienne, which was found to be very rich in *T. dawei* trees in 2011, is subject to extensive charcoal and firewood production, sand extraction, and urban development. About half of the over 10,000 trees of *T. dawei* recorded there in 2011 – 2012 have gone. If current trends continue, within a few decades, there will be few trees of the original forest left. The city of Pointe Noire is partly built on white sand, and it is anticipated that other patches of *T. dawei* forest have been completely destroyed already. Google Earth (2023) imagery shows some small-scale farming around the other collection localities, and some urban development. Areas of natural grassland around some of the collecting localities will be subject to anthropogenic dry-season fires that may damage forest edges.

There has been decline in area of occupancy and in extent and quality of habitat, and this is continuing. The population size reduction over three past generations is estimated to be over 50%. Utilising data from Table 2, *Tessmannia dawei* is here preliminarily assessed to the IUCN (2012) Red List category Endangered A2c.

PHENOLOGY. *Tessmannia dawei* flowers from December to April and fruits from March to May.

ETYMOLOGY. *Tessmannia dawei* is named after the collector of the type specimen.

VERNACULAR NAME. Musese, language: Tshiluba, spoken in central Congo (Kinshasa) (Hardy 67B71 1951).

USES. On the type specimen, the tree was recorded as producing resin. Near Pointe Noire, the first author observed the wood to be used for firewood and charcoal production.

NOTES. *Tessmannia dawei* was endemic in coastal white sand vegetation in Congo (Brazzaville), Congo (Kinshasa) and Angola. However, this study re-identified four collections from Congo (Kinshasa) and Angola, found under *T. lescrauwaetii*, to *T. cf. dawei* (Table 4). These four collections were all collected inland, at altitudes of 700 – 1050 m, from gallery forest in wooded grassland vegetation. These four collections match better with *T. dawei* collections from sea level, than with *T. lescrauwaetii* collections: they have an even number of 6, 8 or 10 opposite or sub-opposite leaflets, while *T. lescrauwaetii* has 12 – 17 sub-opposite or alternate leaflets (Table 4). The flowers of *T. lescrauwaetii* are smaller than those of *T. dawei* and the collections identified to *T. cf. dawei*. The glands on the inflorescence and the sepals of *T. lescrauwaetii* are different from those on the *T. dawei* and *T. cf. dawei* collections. However, on flowering *T. dawei* collections from sea level only the upper half of the sepals is glandular, while on inland flowering *T. cf. dawei* collections the sepals and pedicel are glandular,

as well as the upper inflorescence axis, or the whole inflorescence axis (Table 4).

In 2011 and 2012, several collectors from Congo (Brazzaville) noted that *Tessmannia dawei* was very common in the coastal white sand areas near Pointe Indienne, 10 km NNE of Pointe Noire, and at Tchimpounga, 30 km NNE of Pointe Noire, in a mosaic of forest and grassland vegetation. These two areas were about 1 × 3 km and 2 × 3 km in size. Patches of forest were dominated by hundreds of trees of *T. dawei*.

Tessmannia densiflora Harms 1915b: 462; Brenan 1967: 108; Léonard 1950: 35 – 55. Syntypes: Tanzania, Pwani Region, Utete Distr., Kichi Hills, Aug. 1913 & Jan 1913, *Brulz in Holtz* 100 & *Martin in Holtz* 3130 (syn.: B†). Tanzania, Pwani Region, Utete Distr., Nawanje, fl., 7 Aug. 1971, *Ludanga* 1319 (neotype: K001381349, selected here; isoneotype: DSM, EA).

Tree, to 25 m tall. Stipules linear, 11 × 0.5 mm, caducous. Leaves to 10 × 3.5 cm, petiole 3 – 4 mm long, 1 – 2 mm diam.; rachis 5 – 8 cm long. Leaflets 18, 20, 22, 24, 26 or 28 per leaf, usually an even number of leaflets, occasionally uneven, opposite to alternate, ovate to elliptic, asymmetric, 9 – 18 × 3 – 7 mm, glabrous; petiolules to 0.5 mm long; leaflet base proximal side cuneate, distal side rounded; secondary veins 7 – 11 pairs. Glands on leaflet not seen. Inflorescence a raceme, axis to 7 cm long, to 14-flowered, one inflorescence per leaf axil, hairs to 1 mm long. Flowers: bract 7 – 8 mm long; bracteoles not seen, inserted at 0 – 1 mm from base of pedicel. Pedicel 2 – 3 mm long, hairs to 1 mm long; sepals 9 – 11 mm long, hairs on the outer surface to 1 mm long; petals pink to red, size unknown; stamens 10, filaments length unknown; anthers c. 3 × 1 mm; ovary 5 × 3 mm, glabrous,

Table 4. Comparison of *Tessmannia dawei* sensu stricto, *T. lescrauwaetii*, and four collections that were previously named to *T. lescrauwaetii*. These four collections are morphologically closer to *T. dawei*.

<i>Tessmannia</i> species or collection	Leaflets number	Inflorescence glands located on	Inflorescence glands	Pedicel length (mm)	Sepal length (mm)	Pod glands located on
<i>T. dawei</i> sensu stricto	6, 8 or 10	Upper half of sepals	Acuminate	11 – 22	11 – 14	Whole pod
Hardy 36B41 1952	8 or 10	Whole inflorescence	Acuminate	15 – 20	–	Upper half of pod
Hardy 67B71 1951	6 or 8	Whole inflorescence	Acuminate	11 – 13	14 – 16	–
Schmitz 3216	6 or 8	(Sterile collection)	–	–	–	–
Teixeira 12481	6 or 8	Sepals, pedicel, upper inflorescence	Acuminate	17 – 22	15 – 17	Whole pod
<i>T. lescrauwaetii</i>	12 – 17	Whole inflorescence	Capitate	6 – 12	10 – 12	Whole pod

stipe 3 mm long; style length unknown. Infructescence axis not seen. Fruits woody, brown, glabrous, obovate, $3.3–4.8 \times 2.5–3.5$ cm, each valve with 100–200 stalked resin glands to 2 mm tall, beak 0–1 mm long; number of seeds unknown. Seeds not seen. Figs 1, 2.

DISTRIBUTION. *Tessmannia densiflora* is endemic to Tanzania, southern Pwani Region and southern Lindi Region; Map 10.

SPECIMENS EXAMINED. TANZANIA. Pwani Region, Kichi Hills, fr., 27 April 2001, *Abeid* 899 (MO); Pwani Region, Matumbi Hills, st., 29 April 2001, *Abeid* 924 (MO); same loc., st., 25 Nov. 1989, *Coastal Forest Research Programme* 192 (K, MO, NHT); same loc., st., 18 Nov. 2006, *Couvreux* 47 (MO, WAG); Pwani Region, Utete Distr., Kichi Hills, Aug. 1913, *Brulz in Holtz* 100 (syntype B†); same loc., Jan 1913, *Martin in Holtz* 3130 (syntype B†); Pwani Region, Utete Distr., Nawanje, fl., 7 Aug. 1971, *Ludanga* 1319 (neotype: K001381349, selected here; isoneotype: DSM, EA); Pwani Region, Kichi Hills, fr., 27 April 2001, *Mbago* 2021 (DSM); Lindi Region, Chitoo Forest Reserve, st., 5 Dec. 2001, *Mbago* 2261 (K); Pwani Region, Kichi Hills, fl., 4 Aug 2006, *Mbago* 3410 (DSM 2x); same loc., st., 8 Sept. 1975, *Vollesen* 2701 (EA, K, WAG).

HABITAT. *Tessmannia densiflora* occurs in thicket, evergreen forest and legume dominated forest with *Guibourtia*, *Scorodophloeus fischeri* and *Hymenaea verrucosa*; on sandy and rocky ground, at 200–600 m altitude.

CONSERVATION STATUS. *Tessmannia densiflora* is known from eleven collections made from 1913 to 2006. Three collectors mention that the species is common at the collection site. Ten collections were made in Pwani Region: seven collections in the Kichi Hills and three collections about 35 km SE in the Matumbi Hills. A single collection was made 220 km further South in the Chitoo Forest Reserve in Lindi Region. Google Earth (2023) imagery shows forest areas of 30–400 km² remaining in these three areas. These forest areas are surrounded by small-scale farming. The

boundaries are reasonably clearly visible, indicating that the forests are being managed. Disturbance by anthropogenic dry-season fires and grazing by cattle may occur in all protected areas. In between the forest reserves are areas of farmland where few or no trees of the original forest remain. These farmland areas are much larger than the forest reserves. *Tessmannia densiflora* was assessed as Endangered Blab(iii)+2ab(iii) (Gereau *et al.* 2020a). Utilising data from Table 2, this assessment is supported.

PHENOLOGY. *Tessmannia densiflora* flowers in August and fruits in April.

ETYMOLOGY. *Tessmannia densiflora* is named after the flowers that appear densely clustered, because of the short pedicel, the shortest in the genus, and the large flower bract, the largest in the genus.

VERNACULAR NAME. Kikupa, language: Kimatumbi (*CFRP* 192); Muundei, language: Kindengereko (*Abeid* 899); Mvindeu, language: Ngindo (*Ludanga* 1319).

USES. Stem and root bark extracts of *Tessmannia densiflora* showed mosquito larvicidal activity, antibacterial and antifungal activity; indicating *Tessmannia* species to be potential sources of bioactive natural products (Kihampa *et al.* 2009a, 2009b).

NOTES. The syntypes of *Tessmannia densiflora*, collected in 1913, were lost in 1943, before any other collections were made of the species. The *Flora of Tropical East Africa* (Brenan 1967) still cites only the two syntypes. The leaves of *T. densiflora* are unmistakably different from those of the other species of *Tessmannia*; by comparing the detailed description of *T. densiflora* by Harms (1915b) with specimens recently collected in coastal Tanzania, nine specimens can be assigned to this species without any doubt. Two of these collections have flowers; one of these is here chosen as neotype.

Tessmannia dewildemaniana Harms 1915b: 463; Léonard 1950: 35–55; Léonard 1952: 292. Syntypes: Congo (Kinshasa), Equateur, Région des Bangala, fl., A. Dewevre 879 (lectotype BR0846335, selected here; isolectotype WAG0143395); Bandundu, Eiolo, 13 Oct. 1903, E. & M. Laurent s.n. (BR015741271).

Tree. Stipules ovate, $15–20 \times 6–9$ mm, persistent, midvein eccentric. Leaves to 15×8 cm, petiole 4–14 mm long, 2–3 mm diam.; rachis 4–7 cm long. Leaflets 4–6 per leaf, sub-opposite to alternate, elliptic, $4–10 \times 2–4$ cm, glabrous; petiolules 2–3 mm long; leaflet base cuneate; apex acuminate; somewhat glossy above, dull below; secondary veins 12–15 pairs. Glands 0–3 per leaflet, placed near the petiolule. Inflorescence a raceme, axis to 6 cm long, to 16-flowered, 1–4 inflorescences per leaf axil, hairs to 0.2 mm long. Flowers: bract 2 mm long; bracteoles 1–2 mm long, inserted at 0.5–1 mm and 1–2 mm from base of pedicel. Pedicel 8–15



Map 10. Distribution of *Tessmannia densiflora*.

mm long, hairs to 0.2 mm long; sepals 12–14 mm long, hairs on the outer surface to 0.2 mm long; petals white, 25–32 × 8–12 mm; stamens 10, filaments white, 20–30 mm long; anthers red, c. 4 × 2 mm; ovary 5 × 3 mm, densely hairy, hairs to 1 mm long, stipe 2 mm long; style c. 20 mm long. Infructescence axis to 6 cm long. Fruits woody, brown, obovate, 6–7 × 3–3.5 cm, glandular with 50–100 raised resin glands on each valve, stipe 7–10 mm long, beak 0–1 mm long, fruits shortly hairy on the outer surface; number of seeds unknown. Seeds not seen. Figs 1, 2.

DISTRIBUTION. *Tessmannia dewildemaniana* is endemic to Congo (Kinshasa); Map 11.

SPECIMENS EXAMINED. CONGO (KINSHASA). Bas-Uele, fr., 20 Oct. 1934, *De Wulf* 246 (BR); Equateur, Region des Bangala, fl., *Devèvre* 879 (syntypes BR0846335, WAG0143395); Bandundu, Eiolo, fl., 13 Oct. 1903, *Laurent* s.n. (syntype BR015741271); Léopoldville (Kinshasa), Lutendele, fr., 27 Oct. 1964, *Pauwels* 4748 (BR, IUK, MO, WAG).

HABITAT. *Tessmannia dewildemaniana* occurs in rain forest, at 300–600 m altitude.

CONSERVATION STATUS. *Tessmannia dewildemaniana* is known from four collections, the most recent made in 1964. The collections were made in areas that are currently unprotected, but the National Parks in central Congo (Kinshasa) include similar forest habitat and may contain populations of this species. Google Earth (2023) imagery shows large areas of forest present near the three localities for which co-ordinates can be estimated. There is some small-scale farming around the collection localities, and some urban development. There has been decline in extent and quality of habitat and in number of mature individuals, and this is continuing. *Tessmannia dewildemaniana* was assessed as Least Concern (Simo-Droissart *et al.* 2021). However, this assessment was made using 36 herbarium collections from six countries; 32 of which were re-identified to other species by the

present study. Utilising data from Table 2, *T. dewildemaniana* is here preliminarily assessed as Vulnerable B2ab(iii,v).

PHENOLOGY. *Tessmannia dewildemaniana* flowers and fruits in October.

ETYMOLOGY. *Tessmannia dewildemaniana* is named after Prof. E. A. J. de Wildeman, the director of the Brussels Herbarium at the time when the species was described. In the protologue, H. A. T. Harms expresses his gratitude to Prof. de Wildeman for showing him the two collections that would become the syntypes of *T. dewildemaniana*.

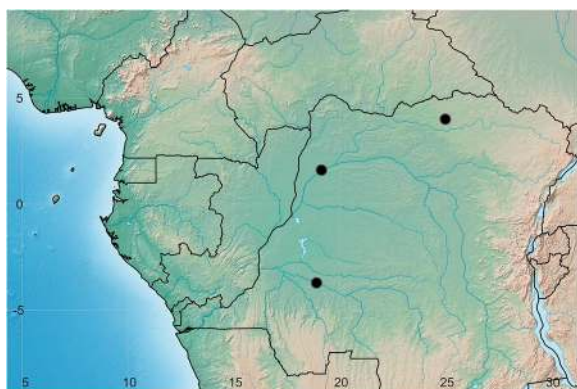
VERNACULAR NAME. Not recorded.

USES. The wood has been used to make furniture. The seed contains a flammable substance, which has been used locally as a source of light (*De Wulf* 246).

NOTES. The two syntypes of *Tessmannia dewildemaniana* are together known from three herbarium sheets, and these three sheets consist mostly of loose material kept in envelopes on the sheets. Consequently, it is somewhat difficult to identify specimens by comparing with the types. The present study re-identified about 30 collections that were identified to *T. dewildemaniana*, to three species, of which two are newly described (Table 5). Several collections from Eastern Tanzania were re-identified to *T. burtii*, see the notes of that species. Four collections from Angola and south Congo are here described as *T. grandifoliola*, and six collections from east and south Congo as *T. minutiflora*; see the notes of these species.

***Tessmannia grandifoliola* Burgt sp. nov.** Type: Angola, Lunda Norte, Chicapa R. at Marhura, fl., fr., 17 June 1948, *Gossweiler* 14105 (holotype K001091916; isotypes B100003074, B100003075, BM, BR018703030, BRLU0032169, COI00000942, COI00067272, K001091917, K000508628, LISC010526, LISC010527, LISC010528, LISC010529, P03481105, US00764962, US00764963).

<http://www.ipni.org/urn:lsid:ipni.org:names:77364902-1>



Map 11. Distribution of *Tessmannia dewildemaniana*.

Tree, trunk to 40 cm in diam. Stipules ovate, falcate, 10–25 × 4–13 mm, persistent, midvein eccentric. Leaves to 23 × 16 cm, petiole 6–15 mm long, 2–3 mm diam.; rachis 4–10 cm long. Leaflets 4–6 per leaf, alternate, elliptic, 5–14 × 3–7 cm, glabrous; petiolules 1–3 mm long; leaflet base cuneate; apex acuminate; glossy above, dull below; secondary veins 11–14 pairs. Glands 0–5 per leaflet, placed near the petiolule. Inflorescence a raceme or compound raceme, axis to 11 cm long, 0–5 lateral branches to 4 cm long, to 40-flowered, 1–3 inflorescences per leaf axil, hairs to 0.5 mm long. Flowers: bract not seen;

Table 5. Comparison of *Tessmannia dewildemaniana* with three other *Tessmannia* species. Most collections previously identified to *T. dewildemaniana* were re-identified to these three other *Tessmannia* species.

<i>Tessmannia</i>	Leaf axis length	Stipules	Leaflets	Leaflet size	Pedicle length	Hairs on pedicle	Sepal length	Habitat
<i>T. burtii</i>	4–15 cm	Caducous	5–9 (–10)	3–9 × 1–3 cm	24–34 mm	To 0.3 mm	13–17 mm	Woodland
<i>T. dewildemaniana</i>	4–7 cm	Persistent	4–6	4–10 × 2–4 cm	8–15 mm	To 0.2 mm	12–14 mm	Forest
<i>T. grandifoliola</i>	4–15 cm	Persistent	4–6	5–14 × 3–7 cm	14–26 mm	To 0.7 mm	12–15 mm	Woodland
<i>T. minutiflora</i>	6–15 cm	Caducous	5–7	4–12 × 2–5 cm	6–9 mm	To 0.2 mm	7–9 mm	Forest

bracteoles not seen, inserted at 1–2 mm and 2–4 mm from base of pedicel. Pedicel 14–26 mm long, to 32 mm long in fruit, hairs to 1 mm long; sepals 12–15 mm long, hairs on the outer surface to 1 mm long; petals white, 24–26 × 8–10 mm; stamens 10, 5 filaments 27–30 mm long, 5 filaments 20–24 mm long; anthers c. 4 × 2 mm; ovary 5 × 3 mm, densely hairy, hairs to 2 mm long, stipe 2–3 mm long; style 18–22 mm long. Inflorescence axis to 11 cm long, 1–3 fruits per inflorescence. Fruits woody, warm brown, obovate, largest juvenile pod 6 × 3.2 cm, glandular with 100–150 raised resin glands on each valve, stipe 8–10 mm long, beak 1–2 mm long, fruits hairy on the outer surface, hairs to 0.5 mm long; number of seeds unknown. Seeds not seen. Figs 1, 2, 11.

RECOGNITION. *Tessmannia grandifoliola* morphologically resembles *T. dewildemaniana*. The leaflets of the new species are to 14 × 7 cm, while *T. dewildemaniana* has leaflets to 10 × 4 cm. The inflorescence of *T. grandifoliola* is a raceme or compound raceme, to 11 cm long, with 0–5 lateral branches to 4 cm long; the inflorescence of *T. dewildemaniana* is a simple raceme, to 6 cm long. The pedicel of *T. grandifoliola* is 14–26 mm long; the pedicel of *T. dewildemaniana* is 8–15 mm long. The hairs on the pedicel and sepals of *T. grandifoliola* are to 1 mm long, while these hairs on *T. dewildemaniana* are to 0.2 mm long.

DISTRIBUTION. *Tessmannia grandifoliola* occurs in Angola and Congo (Kinshasa); Map 12.

SPECIMENS EXAMINED. ANGOLA. Lunda, Chicapa R. at Marhura, fl., fr., 17 June 1948, *Gossweiler* 14105 (holotype K001091916; isotypes B, BM, BR, BRLU, COI, K001091917, K000508628, LISC, P, US); Lunda, Sombo, Rio Luachimo, fr., 9 Aug. 1965, *Santos* 1583 (LISC). **CONGO (KINSHASA).** Kasai, Territoire Luisa, river Lulusa, fl., fr., 11 July 1957, *Liben* 3291 (BR, K); Katanga, 12 km ESE of Mukulakulu, near Luena, st., 6 Nov. 1958, *Schmitz* 6355 (BR).

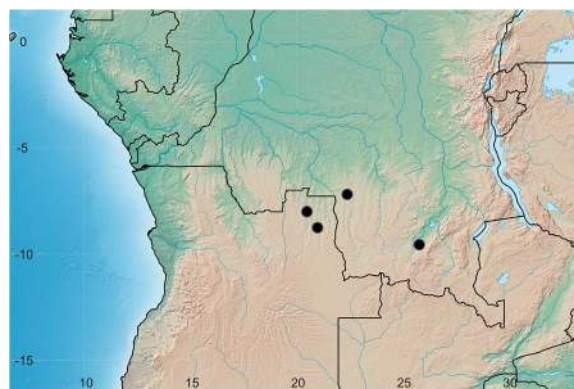
HABITAT. *Tessmannia grandifoliola* occurs in gallery forest on sandy and rocky soils, and in Muhulu forest vegetation, at 700–900 m altitude.

CONSERVATION STATUS. *Tessmannia grandifoliola* is known from four collections made from 1948 to 1965. The species was recorded on *Gossweiler* 14105 as “not frequent and never seen elsewhere”. Google Earth (2023) imagery shows gallery forest and some larger areas of forest present near collecting localities. The collections were made in areas that are currently unprotected, but one of the collections was made near the Upemba National Park in Congo (Kinshasa). Google Earth (2023) imagery shows some small-scale farming, some mining activities especially near rivers, and some urban development. Disturbance by annual anthropogenic dry-season fires is extensive, affecting the wooded grassland, but also the edges of the gallery forest. There has probably been some decline in extent and quality of habitat and in numbers of mature individuals, and this is continuing. The population size reduction over three generations may be over 30%. Utilising data from Table 2, *Tessmannia grandifoliola* is here preliminarily assessed to the IUCN (2012) Red List category Vulnerable A2c.

PHENOLOGY. *Tessmannia grandifoliola* flowers in June.

ETYMOLOGY. *Tessmannia grandifoliola* is named after its large leaflets. Several species of *Tessmannia* have even larger leaflets, but these occur in rain forest.

VERNACULAR NAME. Not recorded.

**Map 12.** Distribution of *Tessmannia grandifoliola*.

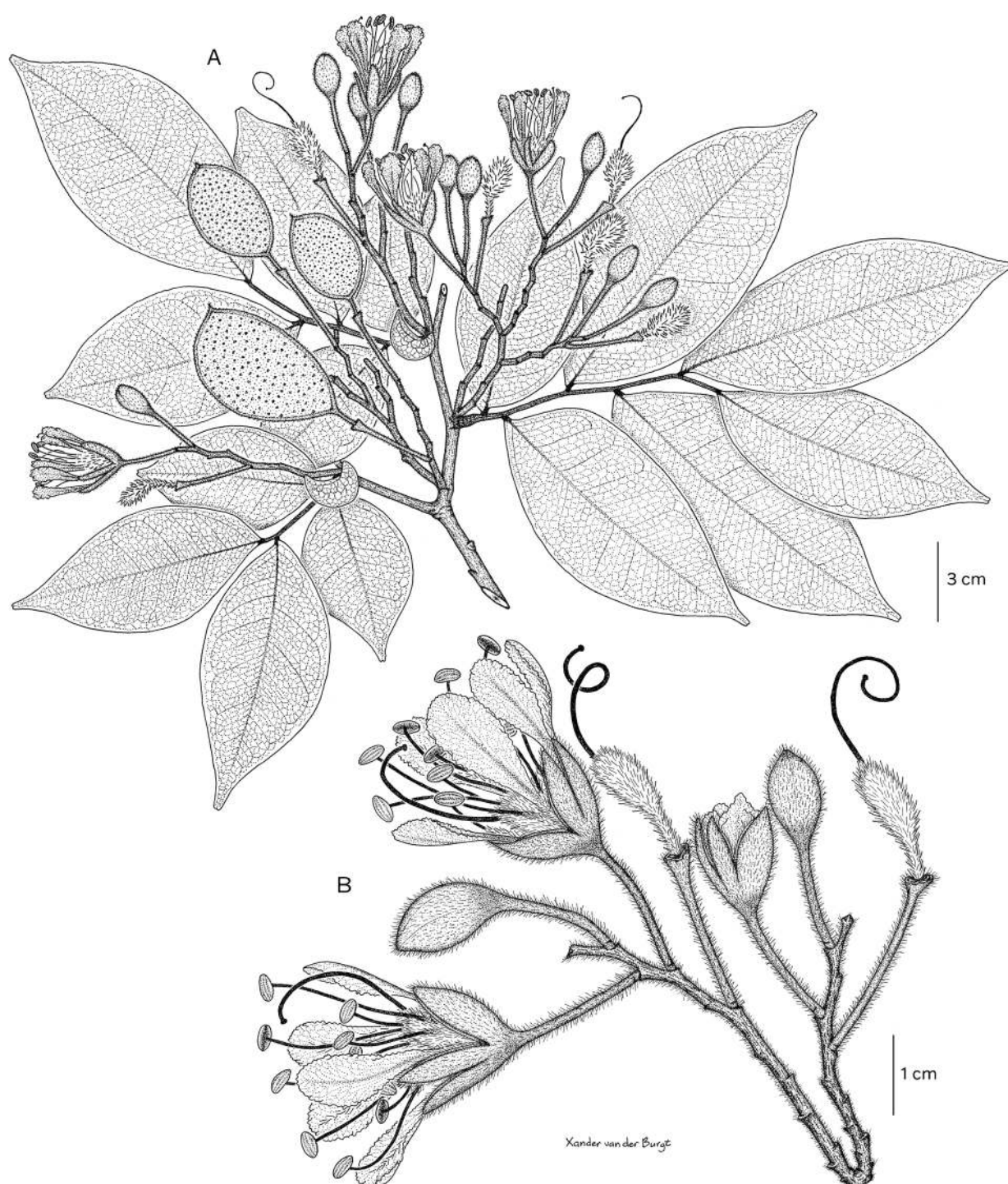


Fig. 11. *Tessmannia grandifoliola* Burgt. **A** twig with leaves, flower buds, open flowers, and immature fruits; **B** inflorescence with flower buds, open flowers and immature fruits. From Gossweiler 14105. DRAWN BY XANDER VAN DER BURGT.

USES. Not recorded.

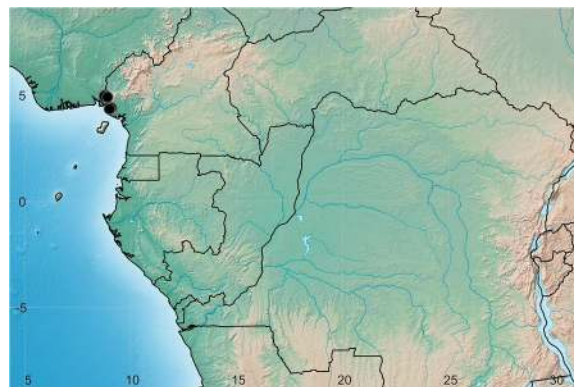
NOTES. *Tessmannia grandifoliola* is here described from four collections previously identified to *T. dewildemaniana*. The habitat of *T. grandifoliola* is gallery forest and Muhulu forest vegetation, while the syntypes of *T. dewildemaniana* were collected in rain forest. A second new species described here, *T. minutiflora*, is also described from collections previously identified to *T. dewildemaniana*. These species are compared in Table 5, in the notes section of *T. dewildemaniana*.

***Tessmannia korupensis* Burgt 2016:** 55. Type: Cameroon, Korup National Park, near P transect, subplot 26ON, fr., 22 Feb. 2008, X. M. van der Burgt 1128 (holotype K001061190 (herbarium sheet), K001061191 (carpological collection); isotypes BR026775289V, G, MO, P04022556, SCA, WAG, YA).

Tree, to 39 m tall, trunk to 105 cm in diam., straight, cylindrical. Stipules ovate, 7–11 × 4–7 mm, caducous, midvein eccentric. Leaves to 28 cm by 22 cm, glabrous; petiole 3–7 mm long, 2–3 mm diam.; rachis 5–11 cm long. Leaflets 4–6 per leaf, alternate, elliptic, 6–18 × 3–9 cm; petiolules 2–4 mm long; leaflet base obtuse, apex acuminate, to 10 mm long; secondary veins 8–12 pairs. Glands 5–12 per leaflet, placed near the petiolule and near the margin. Inflorescence not seen. Flowers: bract not seen; bracteoles not seen, inserted at 0–1 mm and 2–4 mm from the base of the pedicel. Pedicel 18–38 mm long, hairs to 0.3 mm long; sepals 15–17 mm long, hairs on the outer surface to 0.3 mm long; petals pink, adaxial petal c. 25 mm by 10 mm, the other 4 petals 35–40 × 15–20 mm; stamens 10, filaments pink, 5 filaments 32–40 mm long, 5 filaments 25–30 mm long; anthers orange, c. 6–7 × 3 mm; ovary c. 12 × 5 mm, densely hairy with hairs to 1 mm long; stipe 2 mm long; style pink, 22–28 mm long. Infructescence not seen. Fruits woody, brown, obovate, 6–11 × 3.5–7 cm, glandular with 0–10 raised resin glands on each valve, puberulent, erect hairs to 0.3 mm long, valves curl inwards after dehiscence, upper suture winged, 5–10 mm wide on each valve, stipe 6–8 mm long, beak 2–4 mm long; fruits contain 1–2 seeds. Seedlings: hypocotyl 10–15 cm, epicotyl 4.5–8 cm long; first two leaves opposite, petiole 0.8–2 cm long, 1 pair of opposite leaflets 6–9 × 2.5–3.5 cm, petiolules 1–2 mm long. Figs 1, 2.

DISTRIBUTION. *Tessmannia korupensis* is endemic to the Southwest Region in Cameroon; Map 13.

SPECIMENS EXAMINED. CAMEROON. Korup National Park, fr., 7 Sept. 2004, Burgt 707 (BR, G, K, MO, P, SCA, WAG, YA); Korup N.P., fl., 25 May 2007, Burgt 943 (K, MO, WAG, YA); Korup N.P., st. and seedlings, 19 Feb. 2008, Burgt 1123 (BR, G, K, MO, P, SCA, WAG,



Map 13. Distribution of *Tessmannia korupensis*.

YA); Korup N.P., fr., 22 Feb. 2008, Burgt 1128 (holotype K001061190 (herbarium sheet), K001061191 (carpological collection); isotypes BR026775289V, G, MO, P04022556, SCA, WAG, YA); Ndian, Bonjari, st., 2 May 1994, Ndam 1158 (K, SCA); Likenge, st., 18 March 1993, Tchouto Mbatchou 515 (K, SCA, YA).

HABITAT. *Tessmannia korupensis* occurs in rain forest on well-drained sandy and rocky soil, at 100–300 m altitude.

CONSERVATION STATUS. *Tessmannia korupensis* is known from six collections and two observations (see Electronic Supplementary Material) made from 1993 to 2008. Four collections were made in Korup National Park and two collections in or near the Mokoko River Forest Reserve. Google Earth (2023) imagery shows no forest loss in Korup National Park, but the Mokoko Forest Reserve is being invaded by small-scale farming. Within and near the extent of occurrence there are other forest areas where *T. korupensis* is likely to occur, but these are invaded by commercial plantations, small-scale farming, and some urban development. *Tessmannia korupensis* was assessed as Endangered B1ab(i,iii)+2ab(i,iii) (Harvey-Brown 2020). Utilising data from Table 2, this assessment is supported.

PHENOLOGY. *Tessmannia korupensis* flowers in May and fruits in February and September.

ETYMOLOGY. *Tessmannia korupensis* is named after the Korup National Park where the type specimen was collected.

VERNACULAR NAME. Not recorded.

USES. Not recorded.

NOTES. *Tessmannia korupensis* has the largest pods in the genus, to 11 × 7 cm, and is the only species of which the pods have winged upper sutures. These pods curl strongly inwards after dehiscence, indicating that the seed dispersal is ballistic. The seeds may be dispersed to an estimated 10–20 m from the pod, horizontally measured. Trees always occur in groups; seven such groups of trees have been recorded in southern Korup, at distances of 0.3–6.4 km from each other. One of these groups was mapped and found to contain 43 individuals

over 10 cm stem diam., in an area of less than 1 ha (Burgt 2016, Fig. 6). In two other groups the trees were counted: 9 trees and 33 trees over 10 cm stem diam. In total about 200 trees were recorded in Korup National Park, during several years of research fieldwork.

Tessmannia lescrauwaetii (De Wild.) Harms 1915a: 457; Léonard 1950: 35 – 55; Sosef *et al.* 2006: 228. *Baikiaea lescrauwaetii* De Wild. (De Wildeman 1907: 141). Type: Congo (Kinshasa), fl., 10 Feb. 1905, *E. L. L. M. Lescrauwaet* 415 (BR0846286).

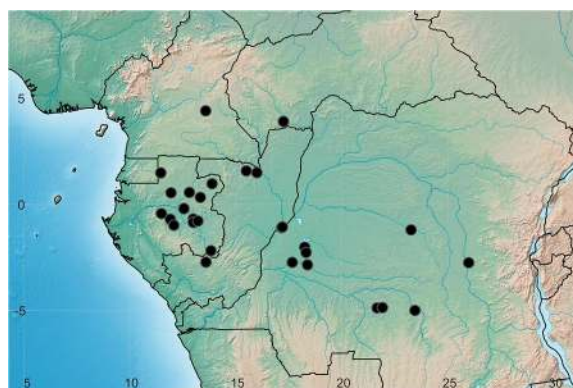
Tree, to 45 m tall, trunk to 150 cm diam. Stipules linear, falcate, 15 – 20 × 2 – 3 mm, caducous, base auriculate. Leaves to 18 × 8 cm, petiole 3 – 6 mm long, 1 – 2 mm diam.; rachis 5 – 12 cm long. Leaflets 12 – 17 per leaf, alternate, ovate, falcate, 1 – 6 × 0.5 – 1.7 cm, glabrous, young leaflets sparsely hairy on edge and midvein beneath; petiolules 0 – 1 mm long; leaflet base proximal side cuneate, distal side obtuse; secondary veins 8 – 14 pairs. Glands 0 – 4 per leaflet, placed near the petiolule and sometimes on the midrib near the apex. Inflorescence a raceme, axis to 13 cm long, to 20-flowered, 1 – 3 inflorescences per leaf axil, covered in capitate glands, hairs to 0.5 mm long. Flowers: bract 6 – 7 mm long; bracteoles 3 – 5 mm long, inserted at 0 – 1 mm from base of pedicel. Pedicel 6 – 12 mm long, many stalked capitate glands 0.5 mm tall, hairs to 0.5 mm long; sepals 10 – 12 mm long, on the outer surface many stalked capitate glands 0.5 mm tall, hairs on the outer surface to 0.5 mm long; petals white to light pink, petals 16 – 24 × 6 – 8 mm; stamens 10, filaments 15 – 32 mm long; anthers c. 3 × 1 mm; ovary 4 – 6 × 2 – 3 mm, glandular, densely hairy, hairs to 1 mm long, stipe 2 mm long; style 16 – 18 mm long. Infructescence axis to 13 cm long, 1 – 3 fruits per infructescence. Fruits woody, brown, elliptic, 4 – 8 × 2 – 3.5 cm, each valve with 100 – 200 resin glands to 1 mm tall, stipe 2 mm long, beak 0 – 2 mm long, fruits hairy on the outer surface, persistent hairs to 0.2 mm long mixed with sparse caducous hairs to 1 mm long; fruits contain 1 – 5 seeds. Seeds dark brown to black, glossy, ovate, 14 – 17 × 10 – 12 × 5 – 6 mm. Figs 1, 2.

DISTRIBUTION. *Tessmannia lescrauwaetii* occurs in Cameroon, Central African Republic, Gabon, Congo (Brazzaville) and Congo (Kinshasa); Map 14.

SPECIMENS EXAMINED. CAMEROON. East Region, Nika near Bertoua, st., 28 Jan. 1960, *Letouzey* 2848 (P, YA). **CENTRAL AFRICAN REPUBLIC.** Lobaye, Forêt de Ngoto, st., 30 Dec. 1962, *Guigonis* 2551 (P). **GABON.** Ogooué-Lolo, c. 30 km E of Lastoursville, st., 19 Nov. 1991, *Breteler* 10591 (MO, WAG); Ogooué-Lolo, Bambidie, c. 30 km E of Lastoursville, seedlings and fr., 5 Dec. 1993, *Breteler* 12522 (K, MO, WAG); Ogooué-Lolo, road from Lastoursville to Okondja, 3 – 5 km E of Ndambi, st., 11 Oct. 1994, *Breteler* 13215 (BR, K, MO, WAG); Ogooué-Lolo, c. 65 km

SSW of Booué. Makande, fr., 9 Feb. 1999, *Breteler* 14966 (BR, K, MO, WAG); Ogooué-Ivindo, Makokou, st., 5 July 1981, *Gentry* 33186 (MO); Ogooué-Lolo, Region Lastoursville, Lissacho, fl., 9 Dec. 1930, *Le Testu* 8562 (B, BM, BR, HBG, K, MO, P, WAG); Ogooué-Ivindo, Réserve de la Lopé, S of Ayem, st., 11 March 1989, *McPherson* 13756 (MO); P.N. de l'Ivindo, st., 16 March 2004, *Ngok Banak* 1994 (LBV, WAG); Plateaux Batéké NP, st., 7 June 2005, *Niangadouna* 574 (MO); Ogooué-Ivindo, road Mékambo to Makokou, 3 km W of Mbela-Baya, st., 1 Jan. 2001, *Wieringa* 3797 (WAG); Woleu-Ntem, Akom Essando, st., 14 Nov. 2015, *Wieringa* 8364 (WAG); Same loc., fr., 14 Nov. 2015, *Wieringa* 8365 (LBV, WAG); Same loc., fr., 14 Nov. 2015, *Wieringa* 8371 (WAG); Ogooué-Ivindo, 40 km NNE de Koumameyong, st., 25 March 1987, *Wilks* 1464 (WAG); Ogooué-Ivindo, near village Ekobakoba, road Makokou-Okondja, fr., 21 May 1987, *Wilks* 1552 (MO, WAG). **CONGO (BRAZZAVILLE).** Sangha, Ouesso, st., 15 March 1970, *Allanie* 46 (P); Lékoumou, near Zanaga, st., 30 March 2009, *Douhi* 12 (IEC); Ouesso, st., 28 May 1971, *Grisson* 155 (P); Lékoumou, near Zanaga, st., 28 Jan. 2009, *Kami* 4104 (IEC, K, WAG, P); Sangha, 54 km E of Ouesso, st., 29 March 1970, *Le Dreau* 57 (P). **CONGO (KINSHASA).** Equateur, Ikela, village Balanga, road Lokofe-Ikumaloki, fr., *Bernejo* 87 (BR); Motitu monene, Lac Léopold II, st., 20 May 1950, *Cauwe* 32 (BR); Patambalu, Lac Léopold II, st., 13 July 1953, *Cauwe* 3020 (BM, BR, K, P); Kasai. Mwaka. Bena Longo, fl., 5 Jan. 1958, *Dechamps* 14 (BR); same loc., fl., 1 Aug. 1957, *Declercq* 21 (BR); same loc., fl., 5 Jan. 1958, *Declercq* 27 (BR, K); Bandundu, Kutu, Nioki, fr., Dec. 1941, *Flamigni* 9521 (BR, K, US); Kakenge, Territoire de Bakuba, fl., 1 Nov. 1937, *Gillard* 285 (BR, K, P); Bandundu, Bokoro, fr., 27 Jan. 50, *Jans* 870 (BR); Kasai. Ikoka, fl., 10 Feb. 1905, *Lescrauwaet* 415 (type BR0846286); Kivu, Kindu, Lonioma, near confluence with Elila, st., Oct. 1945, *Michelson* 663 (BR, K, US); Patambalu, fr., 7 May 1958, *Tailfer* 72 (BR, K); Lukolela, st., 11 May 1959, *Toka* 61 (BR); Lukolela, fr., 23 July 1959, *Toka* 216 (BR).

HABITAT. *Tessmannia lescrauwaetii* occurs in rain forest on well-drained soil, at 200 – 700 m altitude.



Map 14. Distribution of *Tessmannia lescrauwaetii*.

CONSERVATION STATUS. *Tessmannia lescrauwaetii* is known from 36 collections made from 1905 to 2015. Some collections were made in National Parks. Google Earth (2023) imagery shows large areas of natural vegetation present near the collecting localities, but also shows oil palm plantations, small-scale farming, and urban development, where few or no trees of the original forest remain. The species was reported to be very common by a collector (Michelson 663). *Tessmannia lescrauwaetii* was assessed as Least Concern (IUCN & BGCI 2022). Utilising data from Table 2, this assessment is supported.

PHENOLOGY. *Tessmannia lescrauwaetii* flowers from November to February and fruits from February to April.

ETYMOLOGY. *Tessmannia lescrauwaetii* is named after the collector of the type specimen.

VERNACULAR NAME. Ndebilombi; Sangho language, spoken in Central African Republic. Mangolo, Nakogonok; Bekwil language, spoken in Congo (Brazzaville). Bangula; Tshiluba language, spoken in central Congo (Kinshasa). Kasasesase; Luba-Kasai language, spoken in central Congo (Kinshasa).

USES. In Congo (Kinshasa) the wood has been used for joinery and boxes. It is suitable for heavy construction, heavy flooring, mine props, railway sleepers, ship building, sporting goods and turnery. The tree produces a copal resin, which is possibly used locally (Lemmens 2012).

NOTES. *Tessmannia lescrauwaetii* is a species from closed forest. Four collections from gallery forest in wooded grassland vegetation in Congo (Kinshasa) and Angola, previously identified to *T. lescrauwaetii*, are here re-identified to *T. dawei*. See the notes of *T. dawei*. This species may also be confused with *T. media*; see the recognition of that species. The pods of *T. lescrauwaetii* and *T. africana* look similar. Both have raised resin glands which represent spines; to 1 mm long in *T. lescrauwaetii* and to 6 mm long in *T. africana*. The size and shape of the pods is somewhat different; *T. lescrauwaetii*: elliptic, 4–8 × 2–3.5 cm, to 2.8× longer than wide; *T. africana*: orbicular, 3–6 × 3–5 cm, to 1.4× longer than wide. *Tessmannia densiflora* and *T. neglecta* also have pods with stalked resin glands.

***Tessmannia macrantha* Breteler & Burgt sp. nov.** Type: Gabon, Ogooué-Maritime, Gamba area, near Vembo, fl., 9 Nov. 1998, F. J. Breteler 14618 (holotype WAG0090448, isotypes BM, BR, BRLU, C, E, G, K000745735, LBG0038921, MA, MO6732823, NY, PR, S, US001234565, WAG0090446, WAG0090447, WAG0090449, WAG0090450). Lewis *et al.* 2005: 83; Sosef *et al.* 2006: 228.

<http://www.ipni.org/urn:lsid:ipni.org:names:77364903-1>

Tessmannia dewildemaniana Harms var. *leucocalyx* Harms 1915b: 463. Type: Congo (Kinshasa), Bas-Congo, Cabra 26 (BR0846393).

Tessmannia macrantha Breteler ined.; Sosef *et al.* 2006: 228.

Tree, to 18 m tall. Stipules ovate, 10–25 × 5–15 mm, persistent, midvein eccentric. Leaves to 20 × 17 cm, petiole 3–10 mm long, 2–3 mm diam.; rachis 3–9 cm long. Leaflets 4–5 per leaf, alternate, elliptic, 3–15 × 1.5–7 cm, glabrous; petiolules 1–3 mm long; leaflet base obtuse; apex acuminate, to 10 mm long; secondary veins 10–15 pairs. Glands 5–10 per leaflet, placed near the petiolule and near the margin. Inflorescence a raceme, axis to 8 cm long, 0–3 lateral branches to 3 cm long, to 25-flowered, 1–4 inflorescences per leaf axil, whitish hairs to 0.5 mm long. Flowers: bract 6–7 mm long; bracteoles 5–9 mm long, inserted at 1–2 mm and 2–3 mm from base of pedicel. Pedicel 7–12 mm long, whitish hairs to 0.7 mm long; sepals 11–15 mm long, on the outer surface whitish hairs to 0.7 mm long; petals pink to lilac, translucent dots, 30–38 × 9–18 mm; stamens 10, filaments pink, 5 filaments 35–40 mm long, 5 filaments 25–30 mm long; anthers c. 4 × 2 mm; ovary 8–11 × 3–4 mm, densely hairy, hairs to 1 mm long, stipe 2 mm long; style 25–30 mm long, pink. Infructescence axis to 8 cm long, 1–3 fruits per infructescence. Fruits woody, orange-brown, obovate, 5–6 × 3.5–4 cm, glandular with 0–5 raised resin glands on each valve, stipe 5–6 mm long, beak 2–6 mm long, fruits densely hairy on the outer surface, hairs to 1 mm long; fruits contain 1–3 seeds. Seeds not seen. Seedlings: hypocotyl 4.5–6 cm, epicotyl c. 2 cm long; first two leaves opposite with 2 pairs of leaflets, petiole 7–11 mm long, rachis 11–18 mm, leaflets opposite, 28–43 mm by 12–18 mm, petiolules c. 1 mm long. Figs 1, 2, 12, Lewis *et al.* 2005: 83.

RECOGNITION. *Tessmannia macrantha* morphologically resembles *T. dewildemaniana*. The new species has 4–5 leaflets, both sides glossy, while *T. dewildemaniana* has 4–6 leaflets, glossy above but dull below. The pedicel and calyx of *T. macrantha* are densely hairy with whitish hairs to 0.7 mm long; the pedicel and calyx of *T. dewildemaniana* are hairy with appressed, dark brown hairs to 0.2 mm long. The flower bracts of *T. macrantha* are 6–7 mm long and the bracteoles are 5–9 mm long; the flower bracts of *T. dewildemaniana* are 2 mm long and the bracteoles are 1–1.5 mm long. The fruits of *T. macrantha* are glandular with 0–5 raised resin glands on each valve; the fruits of *T. dewildemaniana* are glandular with 50–100 raised resin glands on each valve.

DISTRIBUTION. *Tessmannia macrantha* occurs in Cameroon, Equatorial Guinea, Gabon, Congo (Brazzaville) and Congo (Kinshasa); Map 15.

SPECIMENS EXAMINED. CAMEROON. Inselberg d'Akookas, à 38 km au SE Ebolowa, st., 15 March 2001, Parmentier 1924 (WAG); 1 km NW Nouma, Mt Miviami-Zibi, st., 4 March 2007, Wieringa 5826 (BR, MO, WAG). **EQUATORIAL GUINEA.** Ndote Sud, Espigon, 1°25'N, 9°30'E, st., 7 Sept. 1997, Lisowski 570 (BRLU); Ndote Sud, environs

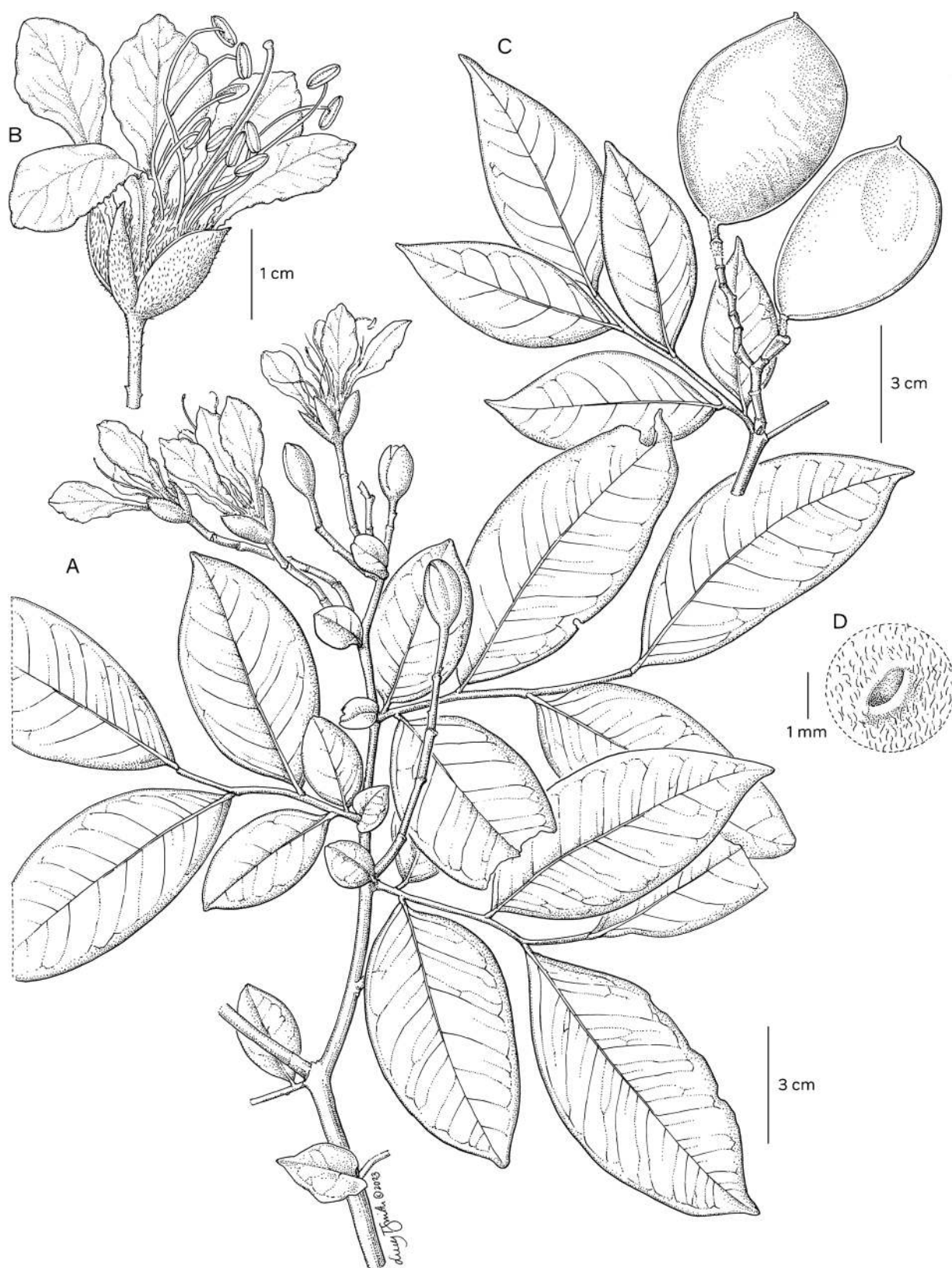
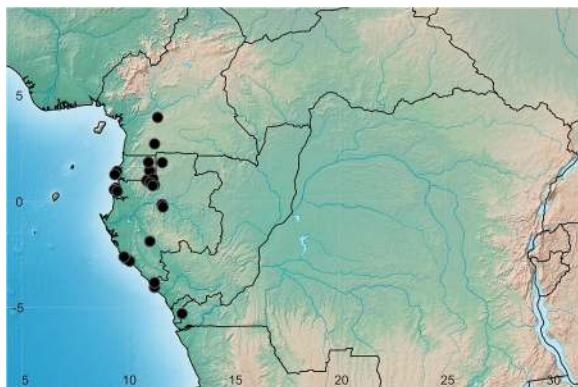


Fig. 12 *Tessmannia macrantha* Breteler & Burgt. **A** twig with leaves, flower buds and open flowers; **B** open flower; **C** twig with mature fruits; **D** fruit gland. **A, B** from de Wilde 11379; **C, D** from Wieringa 5489. DRAWN BY LUCY T. SMITH.



Map 15. Distribution of *Tessmannia macrantha*.

d'Etembue, 1°16'N, 9°24'E, st., 7 Sept. 1997, *Lisowski* 1071 (BRLU); Acoaseng, Aconibe, Afaanam, 1°27'N, 11°02'E, st., 27 May 1999, *Parmentier* 16 (BRLU); village Mfuin, 15 km from Nsok Nsomo, 1°51'N, 10°59'E, st., 17 June 1999, *Parmentier* 132 (BRLU); Akoak Ebanga, 10 km from Nsork, st., 7 Aug. 1999, *Parmentier* 199 (BRLU, WAG); same loc., st., 31 May 2002, *Parmentier* 3525 (BRLU, WAG). **GABON.** Gamba, near Vembo, fl., 9 Nov. 1998, *Breteler* 14618 (holotype WAG0090448, isotypes BM, BR, BRLU, C, E, G, K000745735, LBV0038921, MA, MO6732823, NY, PR, S, US001234565, WAG0090446, WAG0090447, WAG0090449, WAG0090450); Oveng, N of Libreville, st., 30 July 2000, *Breteler* 15531 (K, MO, WAG); same loc., fl., 15 Oct. 2000, *Breteler* 15656 (K, MO, WAG); Gamba, seedlings, 27 Jan. 1999, *Houten* s.n. (WAG); Fôret de la Mondah, Malibe, fl., 21 Dec. 1993, *Jongkind* 1332 (BR, P, WAG); Débarcadère d'Oveng, E of Libreville, fl., fr., 22 Dec. 2022, *Lachenaud* 4284 (BRLU, MO); Lopé Forest Reserve, st., 10 Dec. 1998, *Leal* 166 (WAG); Woleu-Ntem, chantier Oveng, st., 2 May 1986, *Louis* 2094 (MO, WAG); Road Pény-Mouila, fl., 10 Nov. 2011, *Maas* 10196 (WAG); 9 km ESE Medouneu, Efot, st., 21 Dec. 2002, *Ngok Banak* 1084 (LBV, WAG); same loc., st., 26 Dec. 2002, *Ngok Banak* 1273 (WAG); Mont Miwa, 3 km from Kumassi, st., 15 April 2002, *Parmentier* 2347 (WAG); Inselberg, c. 25 km ESE of Medouneu, st., 4 Feb. 1986, *Reitsma* 1840 (K, LBV, MO, WAG); Woleu-Ntem, 15 km NW Oveng, fr., 8 Feb. 1987, *Reitsma* 2930 (K, MA, MO, P, WAG); Lopé Reserve, fl., 6 Dec. 1992, *White* 629 (MO); Lopé Reserve, fl., 6 Dec. 1992, *White* 630 (MO); NE of Libreville, Oveng, fl., 21 Nov. 2004, *Wieringa* 5476 (K, LBV, MO, P, WAG); same loc., fr., 9 Jan. 2005, *Wieringa* 5489 (K, MO, WAG); Setté Cama to Gamba, fl., 11 Dec. 1994, *Wilde* 11379 (K, MO, WAG). **CONGO (BRAZZAVILLE).** Konkouati – Douli, st., 11 Dec. 2012, *Mpandzou* 1856 (IEC, K); Mvandji, Tchিনিmi, st., 14 April 2013, *Nkondi* 585 (IEC, K); Louvandzi to N'Dindi, st., 7 Feb. 1974, *Sita* 3678 (P). **CONGO (KINSHASA).** Bas Congo, fl., *Cabra* 26 (BR0846393); Bas-Congo, fl., 9 Jan. 1960, *Jans* 1096 (BR).

HABITAT. Edges of low forest on inselbergs, coastal forest on white sand, forest on rocks at the edge of mangrove, forest along rivers; on sandy soil, limestone, or granite, at 0 – 1100 m altitude.

CONSERVATION STATUS. *Tessmannia macrantha* is known from 32 collections. A few collections were made in National Parks. *Tessmannia macrantha* was most often collected in low forest on inselbergs; nine collections were made in this habitat. Trees in this habitat are often subject to annual anthropogenic dry season fires, which are usually ignited at the height of the dry season when natural fires would not normally occur. These fires result in the destruction of the open inselberg vegetation and of the low-stature forest surrounding it. Another habitat where *T. macrantha* occurs, is coastal forest on white sand, where eight collections were made. The forest and grassland mosaic in this habitat is also subject to annual fires resulting in the destruction of forest edges. There has probably been some decline in extent and quality of habitat and in numbers of mature individuals, and this is continuing. The species occurs in more than 10 locations. The population size reduction over three generations is estimated to be less than 30%. Utilising data from Table 2, *Tessmannia macrantha* is here preliminarily assessed to the IUCN (2012) Red List category Least Concern.

PHENOLOGY. *Tessmannia macrantha* flowers from October to December and fruits from January to February.

ETYMOLOGY. The species name of *Tessmannia macrantha* translates to large-flowered.

VERNACULAR NAME. Not recorded.

USES. Not recorded.

NOTES. *Tessmannia macrantha* is here described from 31 collections, most of which were previously identified to *T. dewildemaniana* var. *leucocalyx*. *Tessmannia macrantha* is very different from *T. dewildemaniana* and the variety taxon is therefore raised to species level. The collection *Cabra* 26 (BR) from Congo (Kinshasa) is the type of *Tessmannia dewildemaniana* var. *leucocalyx* and is here included in *T. macrantha*. The name *leucocalyx* is not preserved, although Turland *et al.* (2018), in article 24B.2, recommend to retain the name of an infraspecific taxon when it is raised to the rank of species. The name *leucocalyx* is not preserved because the type is somewhat poor, consists of a single sheet only, and has no clear locality. The flowers of *Cabra* 26 (BR) match well with those on the flowering collections of *T. macrantha* but the two leaves have 6 leaflets or possibly 7 leaflets. The leaves on fertile collections of *T. macrantha* have 4 – 5 leaflets. The single sheet of *Cabra* 26 has no locality other than Bas-Congo, but many other specimens from that collector were collected in Lemba; which is in Mayombe.

Tessmannia martiniana Harms 1915b: 463; Brenan 1967: 107; Léonard 1950: 35 – 55. Type: Tanzania, Pwani Region, Mohoro, fl., Dec. 1912, *Martin in Holtz* 3131 (type B†).

Tree. Stipules unknown. Leaves: petiole 1 – 5 mm long; rachis 4 – 7 cm long. Leaflets 9 – 12 per leaf, alternate, oblong to obovate-suborbicular, 1 – 3 × 0.7 – 1.1 cm, glabrous, sessile; leaflet apex obtuse; primary vein eccentric near base of leaflet (nearer to the abaxial leaflet margin), upper primary vein sub-central. Inflorescence a raceme, to 4.5 cm long, to 8-flowered, 1 – 3 inflorescences per leaf axil, hairy. Flowers: bract and bracteoles unknown. Pedicel 8 – 10 mm long, hairy; sepals c. 10 mm long, on the outer surface hairy, unequal, lanceolate to ovate, apex acute or obtuse; 5 petals, c. 20 mm long, claw long, narrow and sparse hairy, blade sub-glabrous; stamens 10; ovary and stipe 9 – 10 mm long after flowering, stipe densely hairy; style glabrous, stigma capitate. Infructescence and fruits unknown. Figs 1, 2.

DISTRIBUTION. *Tessmannia martiniana* is endemic to Tanzania, Pwani Region; Map 16. The species is known from a single herbarium sheet, collected in 1912 and destroyed in 1943.

SPECIMENS EXAMINED. No specimens of *Tessmannia martiniana* were examined for the present study. The Latin protologue in Harms (1915b) cites a single specimen: **TANZANIA.** Pwani Region, Mohoro, fl., Dec. 1912, *Martin in Holtz* 3131 (type B†).

HABITAT. *Tessmannia martiniana* probably occurs, or occurred, in forest near sea level.

CONSERVATION STATUS. *Tessmannia martiniana* is known from a single collection from 1912. Six collections of other *Tessmannia* species were made within c. 50 km of the type locality. Frank Mbago, curator of DSM herbarium in Tanzania, made thousands of collections in the country and collected the other four species of *Tessmannia* from Tanzania, but he never collected *T.*

martiniana. The type of *T. martiniana* was collected in or near Mohoro, a small town near the Mohoro Forest Reserve. The type locality is in a rural area of coastal Tanzania, where areas of forest and wooded grassland remain. Google Earth (2023) imagery shows much small-scale farming and some urban development in the area, but also some forest areas, the largest of which is about 2 km² in size. Disturbance by farming, anthropogenic dry-season fires and grazing by cattle may occur. *Tessmannia martiniana* was assessed as Endangered B2ab(iii) (Gereau *et al.* 2020b) assuming there were 5 localities, representing 3 locations. Utilising data from Table 2, and assuming there is a single location, this assessment is here preliminarily updated to Critically Endangered B1ab(iii,v)+2ab(iii,v). Exhaustive surveys in the sense of IUCN (2024: 83), specifically targeting *T. martiniana*, have not yet been undertaken. There exists a reasonable chance that the species still occurs in the area, because large amounts of forest trees and wooded grassland trees remain in the area. Therefore, the IUCN tag “Possibly Extinct” (IUCN 2024) cannot be applied. **PHENOLOGY.** *Tessmannia martiniana* flowers in December.

ETYMOLOGY. *Tessmannia martiniana* is named after the collector of the type specimen.

VERNACULAR NAME. Mzalawange (Harms 1915b).

USES. Not recorded. Kihampa *et al.* (2009b, 2010) studied chemical compounds found in tissue of *Tessmannia martiniana* var. *martiniana* and *Tessmannia martiniana* var. *pauloi*. Their results relate to the newly described species *T. tanzaniensis*; see the uses section of that species.

NOTES. *Tessmannia martiniana* was described by Harms (1915b); providing a detailed description and citing only a single specimen, *Martin in Holtz* 3131 (B†). This type, collected in 1912, was lost in 1943. The *Flora of Tropical East Africa* (Brenan 1967) cites only the type. No specimens have been located that comply with the description of *T. martiniana* by Harms (1915b). It is most probably a valid species; this can be concluded from a comparison with the other four *Tessmannia* species from East Africa. *T. martiniana* is not conspecific with *T. densiflora*. The two species were described in the same paper. Harms (1915b) counted c. 9 – 12 leaflets on the leaves of *T. martiniana* and 16 – 26 leaflets on the leaves of *T. densiflora*. The maximum size of the leaflets of *T. martiniana*, 3 × 1.1 cm, is much less than in *T. burtlii* (leaflets to 9 × 3 cm), and *T. tanzaniensis* (leaflets to 7 × 3 cm). *Tessmannia martiniana* is not conspecific with *T. pauloi*, for reasons specified in the notes section of the description of that species. The leaflet width of 0.7 – 1.1 cm has not been found in any of the existing specimens of *Tessmannia* from East Africa: *T. densiflora* has leaflets 0.3 – 0.7 cm wide, *T. burtlii* 1 – 3 cm, *T. pauloi* 1 – 2.2 cm, and *T. tanzaniensis* 1 – 3 cm. *Tessmannia martiniana* has apparently never been collected apart from the type.



Map 16. Distribution of *Tessmannia martiniana*.

***Tessmannia media* Breteler & Burgt sp. nov.** Type: Gabon, Ogooué-Maritime, near Gamba, road from Yenzi to Vembo, fl., 10 Nov. 1998, *F. J. Breteler* 14632 (holotype WAG0192357; isotypes BM, BR015741356, BRLU, C, E, G, K000745734, LBV, MA, MO6700143, NY, P00905069, PR, S, US01234564, WAG0266495, WAG0266496).

<http://www.ipni.org/urn:lsid:ipni.org:names:77364904-1>

Tree, c. 10 m tall, trunk c. 20 cm diam. Stipules ovate, 8–12 × 3–4 mm, persistent, midvein eccentric. Leaves to 13 × 6 cm, petiole 3–5 mm long, 1 mm diam.; rachis 4–8 cm long. Leaflets 9–12 (–13) per leaf, sub-opposite to alternate, ovate to lanceolate, falcate, 2–4.8 × 0.7–1.4 cm, glabrous; petiolules 0–1 mm long; leaflet base proximal side cuneate, distal side obtuse; secondary veins 8–10 pairs. Glands 0–1 per leaflet, placed on proximal side near petiolule. Inflorescence a raceme, axis to 4.5 cm long, to 10-flowered, 1–3 inflorescences per leaf axil, hairs to 0.5 mm long. Flowers: bract not seen; bracteoles not seen, inserted at 1–2 mm from base of pedicel. Pedicel 12–17 mm long, hairs to 0.5 mm long; sepals 14–16 mm long, hairs on the outer surface to 0.5 mm long; petals pink, adaxial petal c. 26 × 7 mm, the other 4 petals c. 29 × 11 mm; stamens 10, filaments pink, 5 filaments 32–34 mm long, 5 filaments 19–21 mm long; anthers orange, c. 3 × 1 mm; ovary 6–7 × 3–4 mm, densely hairy, hairs to 1 mm long, stipe 2 mm long; style 21–23 mm long, pink, stigma cream-coloured. Infructescence, fruits and seeds not seen. Figs 1, 2, 13.

RECOGNITION. *Tessmannia media* morphologically resembles *T. lescrauwaetii*. The new species has 9–12 (–13) leaflets, while *T. lescrauwaetii* has 12–17 leaflets. The rachis is 4–8 cm long, not 5–12 cm long. In *T. media*, the inflorescence axis, the pedicel and the sepals are not glandular, while in *T. lescrauwaetii* these are covered in capitate glands. The pedicel of *T. media* is 12–17 mm long; the pedicel of *T. lescrauwaetii* is 6–12 mm long.

DISTRIBUTION. *Tessmannia media* is endemic to Gabon, known from a single locality near the coast in Ogooué-Maritime; Map 17.

SPECIMENS EXAMINED. GABON. Ogooué-Maritime near Gamba, road from Yenzi to Vembo, fl., 10 Nov. 1998, *Breteler* 14632 (holotype WAG0192357; isotypes BM, BR015741356, BRLU, C, E, G, K000745734, LBV, MA, MO6700143, NY, P00905069, PR, S, US01234564, WAG0266495, WAG0266496).

HABITAT. Forest patch in mosaic of forest and grassland, on white sand, at c. 2.5 km from the seashore, at 5 m altitude.

CONSERVATION STATUS. *Tessmannia media* is known from a single collection from 1998. The area around

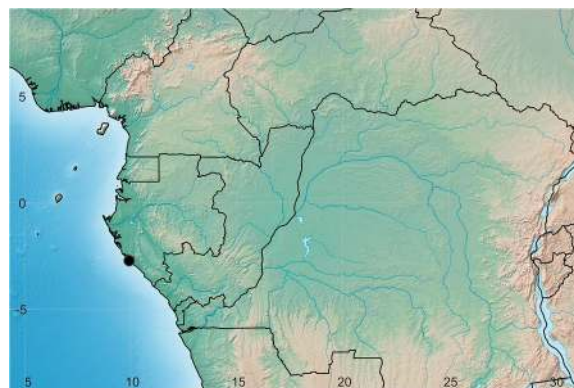
the type locality has been visited by many botanists who made numerous botanical collections. Five collections of two other *Tessmannia* species were made within c. 20 km of the type locality. The new species is a small tree that flowers abundantly with large pink flowers; it would not easily be overlooked when flowering. The new species is therefore probably rare in the area around the type locality. The type of *T. media* was collected in a relatively sparsely inhabited area of coastal Gabon. The area does not have any protected status. Google Earth (2023) imagery shows that the vegetation of the coastal white sand around the type locality is a forest and grassland mosaic. Urban development in the area is ongoing, there are crude oil transport facilities and an airport, but farming hardly occurs. The grassland is also affected by off-road driving and annual anthropogenic dry-season grassland fires. These grassland fires affect forest edges, increasing the area of grassland and decreasing the area of forest and the number of forest trees. There probably has been decline in extent and quality of habitat and numbers of mature individuals, and this is continuing. The coastal white sand area is about 450 km² in size, of which c. 120 km² are forest patches. The number of locations is one. Utilising data from Table 2, *Tessmannia media* is here preliminarily assessed to the IUCN (2012) Red List category Endangered B1ab(iii,v)+2ab(iii,v).

PHENOLOGY. *Tessmannia media* flowers in November; fruiting period unknown.

ETYMOLOGY. *Tessmannia media* is so named because morphologically it is positioned in the middle between *T. lescrauwaetii* and *T. dawei*. In addition, the species is of medium height, while most other species in the genus *Tessmannia* are large trees.

VERNACULAR NAME. Not recorded.

USES. Trees have attractive foliage and abundant pink flowers when in flower; the species might be suitable to plant along streets and in urban parks.



Map 17. Distribution of *Tessmannia media*.



Fig. 13. *Tessmannia media* Breteler & Burgt. **A** twig with leaves, flower buds and open flowers; **B** open flower; **C** leaflet. From Breteler 14632. DRAWN BY LUCY T. SMITH.

NOTES. The habitat of *Tessmannia media* is coastal white sand vegetation; it is not known if the species is restricted to this habitat. Three other species of *Tessmannia* have been collected in coastal white sand habitat but occur also in other habitats: *Tessmannia dawei*, *T. macrantha* and *T. microphylla*. *Tessmannia media* looks similar to *T. lescrauwaetii*; the differences between the two species are given in the recognition. Another species with morphological similarities is *T. dawei*. This species always has an even number of sub-opposite leaflets (never alternate), and the sepals with many stalked glands on the outer surface.

***Tessmannia microphylla* Burgt sp. nov.** Type: Gabon, Ogooué-Maritime. Gamba area, near Vembo, fl., 11 Nov. 1998, F. J. Breteler 14638 (holotype WAG0192353; isotypes B, BM, BR015740991, BRLU, C, E, G, K000745733, LBV0038928, MA879668, MO, MPU, NY, P00905064, PR, S, US01234563, W, WAG0266515, Z).

<http://www.ipni.org/urn:lsid:ipni.org:names:77364905-1>

Tessmannia anomala (Micheli) Harms var. *flamigni*
J. Léonard 1949: 384; Sosef *et al.* 2006: 228;
Sosef *et al.* 2021: 131. Type: Congo (Kinshasa),
Popompo – Lukenie, Oct. 1942, *Flamigni* 8077
(BR0846194, BR0846304, YBII66150339).

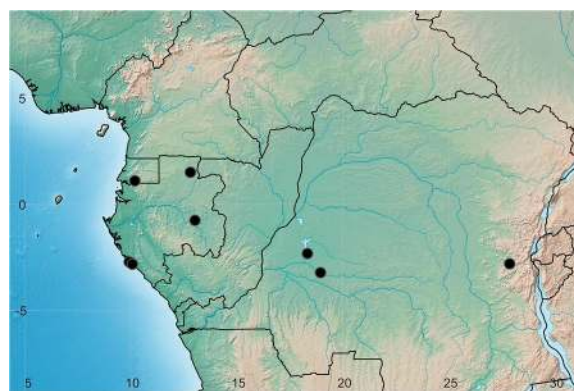
Tree, to 35 m tall, trunk to 90 cm diam. Stipules linear, 3 – 6 × 0.5 mm, caducous, midvein eccentric. Leaves to 6.5 × 2.5 cm, petiole 2 – 3 mm long, 1 mm diam.; rachis 3 – 6 cm long. Leaflets 22 – 30 (– 37) per leaf, sub-opposite to alternate, elliptic, 5 – 12 × 2 – 4 mm, glabrous; petiolules 0 – 0.3 mm long; leaflet base proximal side cuneate, distal side rounded; somewhat glossy above, dull below; venation obscure on both sides, secondary veins 7 – 9 pairs. Glands 0 – 1 per leaflet, placed on distal side near the petiolule. Inflorescence a raceme, axis to 2 cm long, to 12-flowered, 1 – 2 inflorescences per leaf axil, hairs to 0.2 mm long. Flowers: bract not seen; bracteoles 1 mm long, inserted at 0.2 – 0.5 mm and 1 – 2 mm from base of pedicel. Pedicel 4 – 9 mm long, sparse hairs to 0.3 mm long; sepals 7 – 9 mm long, glabrous to sparse hairy on the outer surface, hairs to 0.2 mm long; petals pale pink, adaxial petal 10 – 14 × 4 – 5 mm, the other 4 petals 15 – 18 × 6 – 7 mm; stamens 10, filaments pink, 5 filaments 20 – 23 mm long, 5 filaments 14 – 17 mm long; anthers c. 2 × 1 mm; ovary c. 4 × 2 mm, densely hairy, hairs to 1 mm long, stipe 2 – 3 mm long; style pink, 12 – 15 mm long. Infructescence axis to 2 cm long. Fruits woody, brown, elliptic, 2.4 – 4.2 × 1.6 – 2.8 cm, glandular with 0 – 3 raised resin glands on each valve, stipe 2 – 3 mm long, beak 0 – 1 mm long, fruits densely hairy on the outer surface, old fruits glabrescent; fruits contain 1 – 3 seeds. Seeds dark brown to black, glossy, ovate, 12 – 14 × 8 – 10 × 5 – 6 mm. Figs 1, 2, 14.

RECOGNITION. *Tessmannia microphylla* morphologically resembles *T. anomala*. The new species has 22 – 30 (– 37) leaflets, up to 5 – 12 × 2 – 4 mm in size, *T. anomala* has 18 – 25 leaflets, 10 – 24 × 5 – 10 mm in size. The pedicel and the outer surface of the sepals of *T. microphylla* are glabrous to sparsely hairy, while the pedicel and the outer surface of the sepals of *T. anomala* are densely hairy. The pods of *T. microphylla* have 0 – 3 resin glands; the pods of *T. anomala* have 0 – 50 resin glands on each valve.

DISTRIBUTION. *Tessmannia microphylla* occurs in Equatorial Guinea, Gabon and Congo (Kinshasa); Map 18. **SPECIMENS EXAMINED. EQUATORIAL GUINEA.** Monts de Cristal, fr., 25 Aug. 1988, Wilks 1824 (WAG). **GABON.** Bambidie, fr., 17 Oct. 1994, Breteler 13343 (WAG); Gamba, Yenzi to Vembo, st., 10 Nov. 1998, Breteler 14633 (LBV, MO, WAG); Gamba, near Vembo, fl., 11 Nov. 1998, Breteler 14638 (holotype WAG0192353; isotypes B, BM, BR015740991, BRLU, C, E, G, K000745733, LBV0038928, MA879668, MO, MPU, NY, P00905064, PR, S, US01234563, W, WAG0266515, Z); Gamba, seedlings, 31 Jan. 2002, Houten s.n. (WAG); Minkébé, Sing Valley, fr., 23 Feb. 1990, Minkébé B 35 (WAG); Gamba, st., 29 March 1994, Wieringa 2598 (WAG). **CONGO (KINSHASA).** Bokebene, Lac Léopold II, fr., Jan. 1941, *Flamigni* 8026 (BR); Popompo – Lukenie, fl., 1 Oct. 1942, *Flamigni* 8077 (BR, YBI); Niangoma, fl., 19 Jan. 1949, *Michelson* 865 (BR, K).

HABITAT. *Tessmannia microphylla* occurs in forest on coastal white sand, and in inland forest, also on sandy soil, at 0 – 700 m altitude. The species was reported to be very common on sandy soil in forest along rivers (*Flamigni* 8077).

CONSERVATION STATUS. *Tessmannia microphylla* is known from 10 collections made from 1942 to 2002. All collections were made in areas that are currently unprotected, but some of the National Parks within the extent of occurrence may contain populations of this species. Google Earth (2023) imagery shows large areas of natural vegetation present near the collecting localities. It is likely that there are unrecorded occurrences, and that the area of occupancy is an underestimation. Google Earth (2023) imagery shows



Map 18. Distribution of *Tessmannia microphylla*.

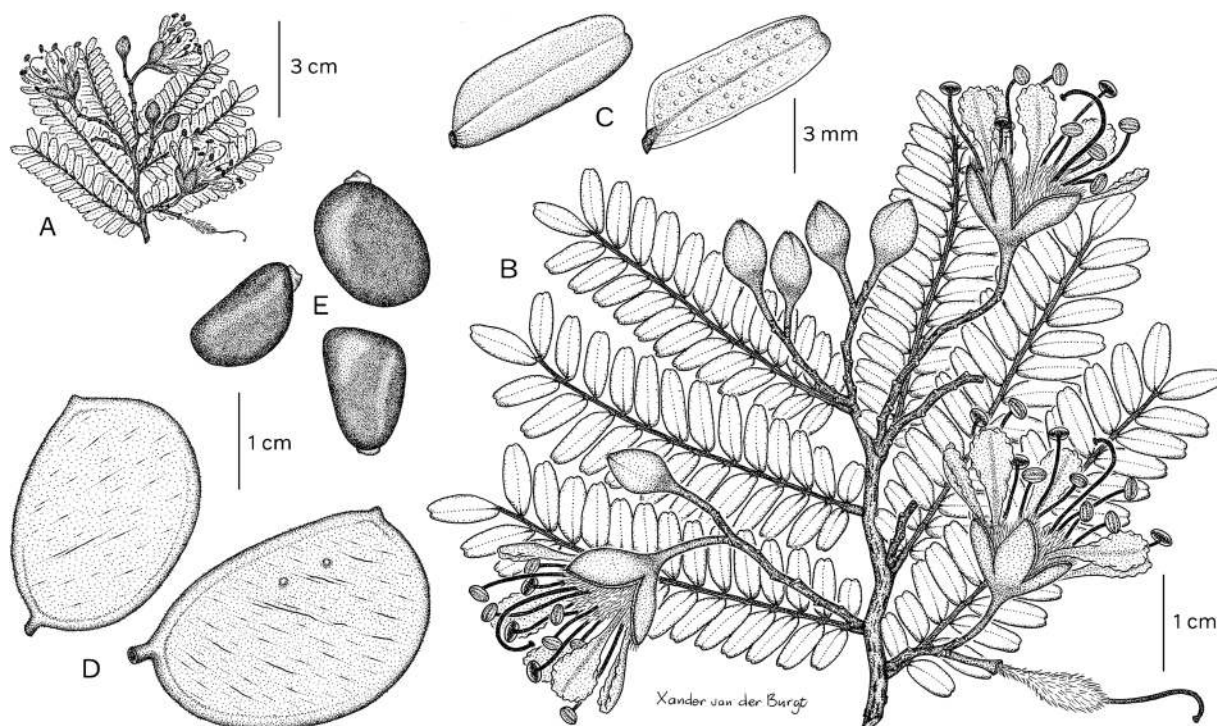


Fig. 14. *Tessmannia microphylla* Burgt. **A, B** twig with leaves, flower buds and open flowers; **C** leaflet upper surface, leaflet lower surface with translucent dots; **D** mature fruits, one of the fruits has two glands; **E** seeds. **A – C** from *Breteler* 14638; **C, D** from *Breteler* 13343. DRAWN BY XANDER VAN DER BURGT.

some small-scale farming around the collection localities, and some urban development. Areas of natural grassland around some of the collecting localities will be subject to anthropogenic dry-season fires that may damage forest edges. There has been decline in extent and quality of habitat and in numbers of mature individuals, and this is continuing. The population size reduction over three generations is estimated to be less than 30%. Utilising data from Table 2, *Tessmannia microphylla* is here preliminarily assessed to the IUCN (2012) Red List category Least Concern.

PHENOLOGY. *Tessmannia microphylla* flowers and fruits from October to January.

ETYMOLOGY. *Tessmannia microphylla* is named after its small leaves.

VERNACULAR NAME. Not recorded.

USES. Not recorded.

NOTES. The leaflets of *Tessmannia microphylla* are much smaller than those of *T. anomala*; there is hardly any overlap. *Tessmannia microphylla* is here described from ten collections. All collections previously identified to *T. anomala* var. *flamigni* are here included in *T. microphylla*. The name *flamigni* is not preserved, although Turland *et al.* (2018), in article 24B.2, recommend to retain the name of an infraspecific taxon when it is raised to the rank of species. The name *flamigni* is synonymised because the name *T. microphylla* refers to an

important characteristic of the species and because the type, *Flamigni* 8077 (BR, YBI) consists of three sheets in two herbaria only, while the type of *T. microphylla* is present in 20 herbaria.

There exist two fruiting collections of *Tessmannia microphylla*. The fruits on these collections are the same size but are otherwise very different. *Breteler* 13343 has fruits that remain flat when mature, like the majority of *Tessmannia* species, but *Flamigni* 8026 has fruits with strongly inrolled valves when mature. These fruits are more strongly inrolled than any other species of *Tessmannia*. Without doubt, the leaves, fruits, and seeds of *Flamigni* 8026 originate from a single tree, because the fruit pedicels are visible on the twigs, the seeds are *Tessmannia* seeds, and one of the seeds is attached to a fruit. The leaves, pods and seeds of *Breteler* 13343 were collected on the forest floor, under a 28 m tall tree. These two fruiting collections may represent two different *Tessmannia* species.

***Tessmannia minutiflora* Burgt sp. nov.** Type: Congo (Kinshasa), Orientale, Zone de Mambasa, Ituri, Epulu, fl., 29 May 1981, *Hart* 90 (holotype K001381117; isotypes BR0846283, EPU124812810).

<http://www.ipni.org/urn:lsid:ipni.org:names:77364906-1>

Tree, to 30 m tall, trunk to 60 cm in diam. Stipules caducous, not seen. Leaves to 22 × 11 cm, petiole 8–13 mm long, 2–3 mm diam.; rachis 6–15 cm long. Leaflets 5–7 per leaf, alternate, elliptic, 4–12 × 2–5 cm, glabrous; petiolules 2–4 mm long; leaflet base cuneate; apex acuminate; secondary veins 12–14 pairs. Glands 0–2 per leaflet, placed near the petiolule. Inflorescence a raceme, axis to 4 cm long, to 15-flowered, 1–4 inflorescences per leaf axil, hairs to 0.2 mm long. Flowers: bract 3 × 2 mm; bracteoles 1.5 mm long, inserted at 0–1 mm and 2–3 mm from base of pedicel. Pedicel 6–9 mm long, hairs to 0.5 mm long; sepals 7–9 mm long, hairs on the outer surface to 0.5 mm long; petals white, 15–20 × 6–8 mm, edge of lamina not crisped; stamens 10, 5 filaments 14–16 mm long, 5 filaments 8–10 mm long; anthers c. 2.5 × 1.5 mm; ovary 4 × 2 mm, glabrous or sutures hairy, stipe 2 mm long; style 8–10 mm long. Infructescence not seen. Fruits woody, brown, elliptic, 2–3.5 × 1.5–2 cm, glandular with 0–20 raised resin glands on each valve, stipe 2–3 mm long, beak 0–1 mm long, old fruits glabrescent; fruits contain 1–2 seeds. Seeds not seen. Figs 1, 2, 15.

RECOGNITION. *Tessmannia minutiflora* morphologically resembles *T. dewildemaniana*. The new species has 5–7 leaflets, while *T. dewildemaniana* has 4–6 leaflets. The rachis of *T. minutiflora* is 6–15 cm long; the rachis of *T. dewildemaniana* is 4–7 cm long. The stipules of *T. minutiflora* are caducous; those of *T. dewildemaniana* are persistent. *Tessmannia minutiflora* has small flowers with a pedicel 6–9 mm long, sepals 7–9 mm long and petals 15–20 mm long; while *T. dewildemaniana* has larger flowers with a pedicel 8–15 mm long, sepals 12–14 mm long and petals 30 mm long.

DISTRIBUTION. *Tessmannia minutiflora* occurs in Burundi and eastern Congo (Kinshasa); Map 19.

SPECIMENS EXAMINED. **BURUNDI.** Kiofi Mosso, st., 29 Aug. 1952, Michel 3793 (BR); **CONGO (KINSHASA).** Kasai, Territoire Kanda Kanda, Mwene Ditu, Vallée Bondoie, Lutete R., fl., 4 April 1949, Hardy 36B41 1949 (BR, K); same loc., fr., 11 July 1950, Hardy 36B41 1950 (BR); Orientale, Zone de Mambasa, Ituri, Epulu, fl., 29 May 1981, Hart 90 (holotype K001381117; isotypes BR0846283, EPU124812810); North Kivu, Terr. Walikale, Umpi, fl., 22 June 1959, Léonard, A. 4686 (BR, MO, P, WAG); South Kivu, km 82 road Kavumu-Walikale, R. Luhoho, Nyamiro, fl., 30 Sept. 1955, Pierlot 902 (BR).

HABITAT. *Tessmannia minutiflora* occurs in rain forest, at 700–1000 m altitude.

CONSERVATION STATUS. *Tessmannia minutiflora* is known from six collections made from 1949 to 1981. Google Earth (2023) imagery shows large areas of forest present within and near three of the six collection localities. All collections were made in areas that are currently unprotected, but the nearby Kahuzi-Biega and Maiko National Parks and the Okapi Faunal Reserve may contain populations of this species. The distances

between the six collecting localities are quite large and the area has been relatively infrequently visited by botanists. It is therefore likely that there are many unrecorded occurrences. Google Earth (2023) imagery shows much small-scale farming around three of the six collection localities, and some urban development. There are areas of farmland where few or no trees of the original forest remain. There has been some decline in extent and quality of habitat and in numbers of mature individuals, and this is continuing. The population size reduction over three generations is estimated to be less than 30%. Utilising data from Table 2, *Tessmannia minutiflora* is here preliminarily assessed to the IUCN (2012) Red List category Least Concern.

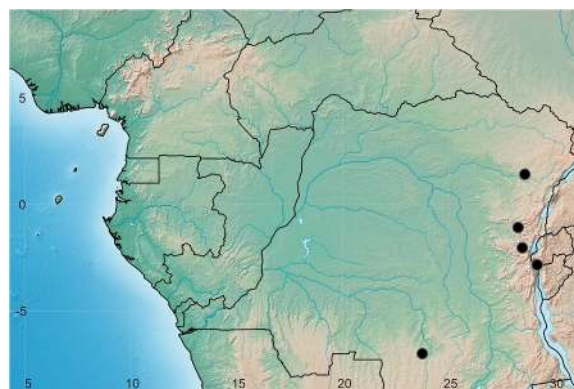
PHENOLOGY. *Tessmannia minutiflora* flowers in May, June, and September; the fruiting period is unknown.

ETYMOLOGY. *Tessmannia minutiflora* is named after its small flowers. Several other *Tessmannia* species have equally small flowers, but these species have smaller leaflets than *T. minutiflora*.

VERNACULAR NAME. Ngale; Kitembo language (Pierlot 902).

USES. Not recorded.

NOTES. *Tessmannia minutiflora* is here described from six collections, all of which were previously identified to *T. dewildemaniana*. A second new species described here, *T. grandifoliola*, is also described from collections previously identified to *T. dewildemaniana*. These species are compared in Table 5, in the notes section of *T. dewildemaniana*. The sterile collection Michel 3793 from Burundi is included in *T. minutiflora* but may also be *T. burtii*. The two collections Hardy 36B41 1949 and Hardy 36B41 1950 are included in *T. minutiflora* but may represent a different taxon. The flowers of Hardy 36B41 1949 match well with the type. The leaves of these two collections have 6–8 leaflets, 1.5–3 cm wide, while *T. minutiflora* has 5–7 leaflets, 2–5 cm wide. The habitat of these two collections is probably gallery forest and forest patches in wooded grassland (Google Earth 2023), while the type of *T. minutiflora* was collected in closed



Map 19. Distribution of *Tessmannia minutiflora*.

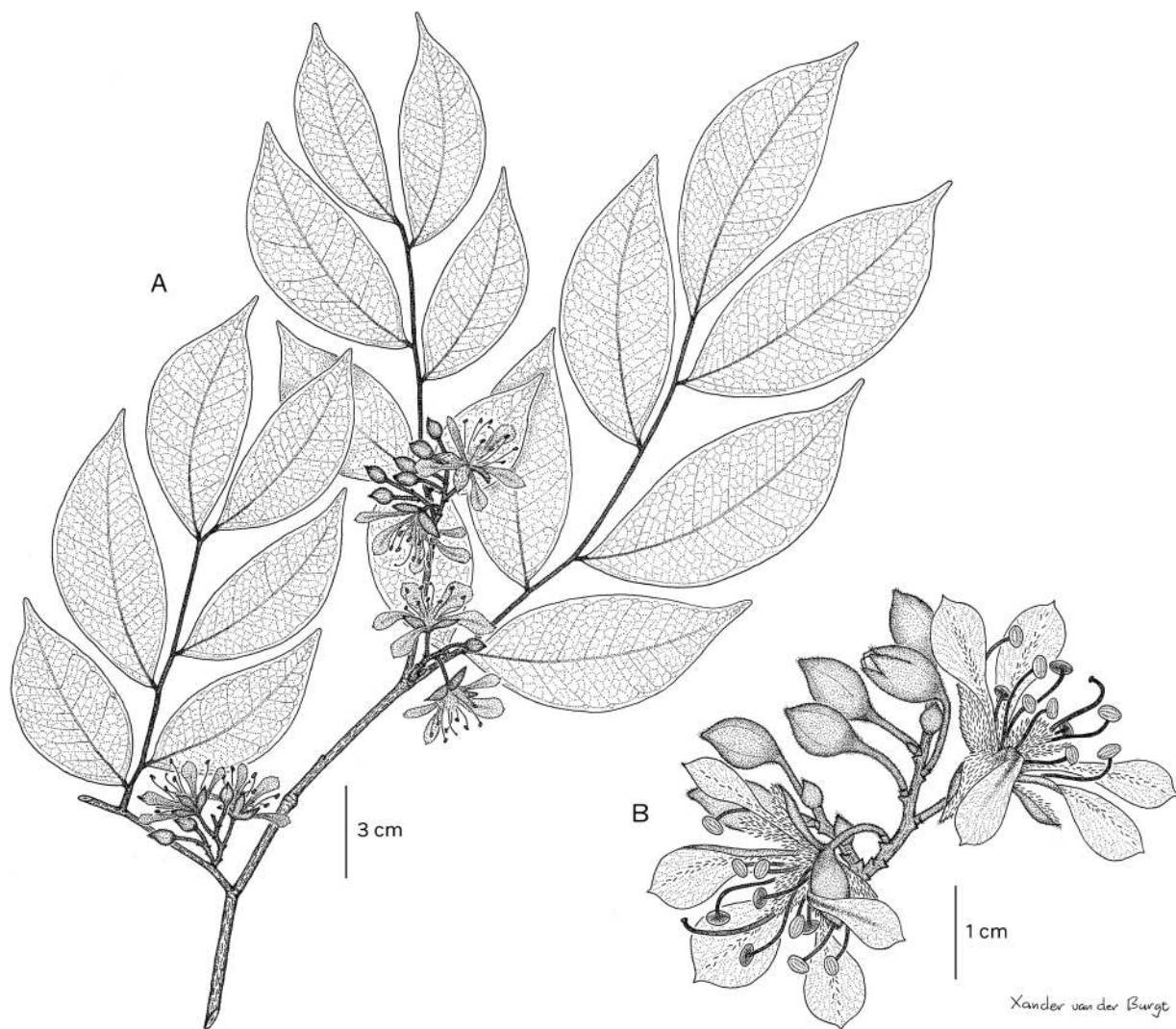


Fig. 15. *Tessmannia minutiflora* Burgt. **A** twig with leaves, flower buds and open flowers; **B** inflorescence with open flowers and flower buds. From Hart 90. DRAWN BY XANDER VAN DER BURGT.

forest. The fruit description was made with *Hardy* 36B41 1950 (BR); the envelope contains a few old fruit parts. If correct, these would be the smallest fruits in the genus.

***Tessmannia neglecta* Breteler & Burgt sp. nov.** Type: Gabon, Lastoursville region, Sacamicanda, fl., 9 Dec. 1929, *Le Testu* 7753 (holotype BR015740403; isotypes B100003012, BM, BR015740397, HBG527169, K001381363, MO2215660, P03495911, P03495927, WAG0100247).

<http://www.ipni.org/urn:lsid:ipni.org:names:77364907-1>

Tessmannia neglecta Breteler ined.; Sosef *et al.* 2006: 228.

Tree, to 40 m tall, trunk to 90 cm diam. Stipules linear, 5–11 × 1–2 mm, caducous, midvein eccentric. Leaves to 15 × 5 cm, petiole 2–4 mm long, 1–2 mm diam.; rachis 7–10 cm long. Leaflets 18–25 (–28) per leaf, sub-opposite to alternate, elliptic, asymmetric, 10–26 × 5–10 mm, glabrous; petiolules 0–0.5 mm long; leaflet base proximal side cuneate, distal side rounded; somewhat glossy above, dull below; secondary veins 11–20 pairs. Glands 0–2 per leaflet, placed near the petiolule. Inflorescence a raceme or compound raceme, axis to 13 cm long, 0–7 lateral branches to 4 cm long, to 50-flowered, 1–3 inflorescences per leaf axil, hairs to 0.2 mm long. Flowers: bract not seen; bracteoles not seen, inserted at 1–2 mm and 2–4 mm from base of

pedicel. Pedicel 5–6 mm long, hairs to 0.3 mm long; sepals 8–10 mm long, hairs on the outer surface to 0.3 mm long; petals white to light pink, adaxial petal probably smallest, the other 4 petals 20–26 × 8–10 mm; stamens 10, 5 filaments 16–20 mm long, 5 filaments 12–15 mm long; anthers c. 2 × 1 mm; ovary c. 4 × 2 mm, densely hairy, hairs to 1 mm long, stipe 2 mm long; style 9–14 mm long. Infructescence axis to 15 cm long, 1–2 (probably more) fruits per infructescence. Fruits woody, brown, orbicular to slightly elliptic, 3–4.5 × 2.8–4.1 cm, glandular, each valve with 100–250 stalked resin glands to 1 mm tall; stipe 2–5 mm long, beak 0–2 mm long, fruits densely hairy on the outer surface, hairs to 0.5 mm long, old fruits glabrescent; fruits contain 1–2 seeds. Seeds dark brown to black, glossy, ovate, 14–18 × 10–15 × 5–6 mm. Figs 1, 2, 16.

RECOGNITION. *Tessmannia neglecta* morphologically resembles *T. anomala*. Leaflets from mature trees of *T. neglecta* are glossy above and have prominent venation above; leaflets of mature trees of *T. anomala* are less glossy above and the venation is less prominent or obscure above. The inflorescence of *T. neglecta* is to 13 cm long, while the inflorescence of *T. anomala* is to 5 cm long. In *T. neglecta*, the scar of the upper bracteole is placed 2–4 mm from the base of the pedicel (up to the middle of the pedicel); in *T. anomala*, the scar of the upper bracteole is 0.5–2 mm from the base of the pedicel. The pods of *T. neglecta* are orbicular to slightly elliptic, each valve with 100–250 stalked resin glands 1 mm tall, these glands often occur also on the edges of the valve; the pods of *T. anomala* are obovate to elliptic, each valve with 0–50 raised resin glands, these glands occur only on the flat surface of the valve, not on the edges.

DISTRIBUTION. *Tessmannia neglecta* occurs in Cameroon, Gabon, Congo (Brazzaville) and Congo (Kinshasa); Map 20.

SPECIMENS EXAMINED. CAMEROON. Korup National Park, fr., 14 Jan. 2005, *Burgt* 730-B (WAG, YA); Korup National Park, Ekundu Kundu, fr., 8 Jan. 1998, *Mackinder* 110 (K). **GABON.** Ogooué-Lolo, Bambidie, fr., 29 April 1992, *Breteler* 11170 (WAG); cultivated seedlings of *Breteler* 11170, 13 May 1993, *Breteler* 12139 (WAG); region Libreville, fr., 16 Nov. 1936, *Heitz* 33 (P, WAG); Ogooué-Lolo, Sacamicanda, fl., 9 Dec. 1929, *Le Testu* 7753 (holotype BR015740403; isotypes B100003012, BM, BR015740397, HBG527169, K001381363, MO2215660, P03495911, P03495927, WAG0100247); Ogooué-Ivindo, Lopé Forest Reserve, st., 16 Nov. 1998, *Leal* 147 (BR, MO, K, WAG); Minkébé, st., 23 Feb. 1990, *Minkébé* E124 (WAG); Minkébé, st., 1 March 1990, *Minkébé* E183 (WAG); Estuaire, Cap-Estérias, st., 1 July 1951, *Morel* 196 (P); Crystal Mts, fr., 28 Jan. 2001, *Nguema* 1668 (WAG); cultivated seedlings of *Breteler* 11170, 6 Jan. 1993, *Veldhuizen* 1420 (WAG); Crystal Mts, st., 15 Nov. 2004, *Wieringa* 5442 (LBV, WAG). **CONGO (KINSHASA).** Befale, fr., 1

Aug. 1927, *Ghesquière* 787 (BR); Arboretum Stanleyville, fr., Sept. 1942, *Liégeois* 11 (BR); Stanleyville, st., 3 March 1939, *Meiren* 66 (BR, K). **CONGO (BRAZZAVILLE).** Cuvette, near Ossango, fr., 5 Sept. 2025, *Burgt* 2508 (BR, K).

HABITAT. *Tessmannia neglecta* occurs in rain forest on well-drained soil, and peat swamp forest, at 0–600 m altitude.

CONSERVATION STATUS. *Tessmannia neglecta* is known from 17 collections made from 1929 to 2025. The species occurs in several protected areas: Korup National Park in Cameroon; Crystal Mountains National Park, the Lopé Reserve and Minkébé National Park in Gabon. Google Earth (2023) imagery shows 100% forest cover in these protected areas, as well as in some of the unprotected areas where the species has been collected. Within the extent of occurrence there are other protected areas where *T. neglecta* is likely to occur. In between the protected areas are areas of farmland such as oil palm plantations, where few or no trees of the original forest remain. There has probably been some decline in extent and quality of habitat and in numbers of mature individuals, and this is continuing. The population size reduction over three generations is estimated to be less than 30%. If the current rate of deforestation in Cameroon continues, the population reduction in the future may exceed 30%. The species occurs in more than 10 locations. Utilising data from Table 2, *Tessmannia neglecta* is here preliminarily assessed to the IUCN (2012) Red List category Least Concern.

PHENOLOGY. *Tessmannia neglecta* flowers in May (Cameroon) and December (Gabon) and fruits in August (Congo (Kinshasa), December (Cameroon) and April or November (Gabon).

ETYMOLOGY. *Tessmannia neglecta* is so named because the species has been overlooked and neglected for a long time. The type of *T. neglecta* was collected in 1929.

VERNACULAR NAME. Dikingui in Baka (*Burgt* 2508).

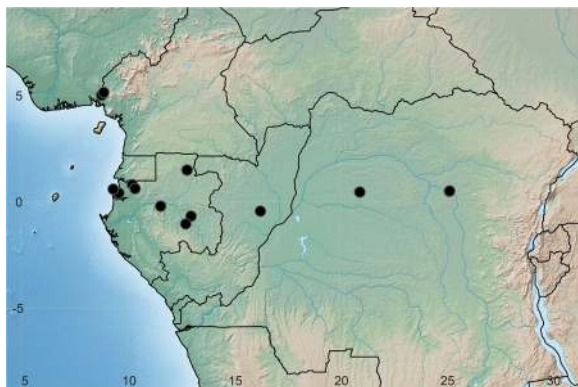
USES. Not recorded.

NOTES. *Tessmannia neglecta* resembles *T. anomala*. The differences between the two species are listed in the recognition section above. Fruiting material of these two species can be identified without any doubt. Flowering material and sterile material from mature trees may be identified to species, but sterile material from seedlings, saplings and juvenile trees is morphologically indistinguishable. The seedlings of *Valkenburg* 2791, collected under a mature tree of *T. anomala* (*Valkenburg* 2790), have leaflets of similar size, shape, and venation to seedlings of *Breteler* 12139 and *Veldhuizen* 1420, cultivated from seeds of *T. neglecta* (*Breteler* 11170).

The drawing of *Tessmannia anomala* in the *Flore du Cameroun* (Aubréville 1970: 157) and *Flore du Gabon* (Aubréville 1968: 157) shows material of both species. In September 1942, P. Liégeois made fruiting collections of both species, presumably in the Arboretum



Fig. 16. *Tessmannia neglecta* Breteler & Burgt. **A** twig with leaves and inflorescences; **B** open flower; **C** mature fruit; **D** detail of mature fruits with glands; **E** seeds; **F** leaflet upper surface. **A**, **B**, **F** from *Le Testu* 7753; **C** – **E** from *Breteler* 11170. DRAWN BY LUCY T. SMITH.



Map 20. Distribution of *Tessmannia neglecta*.

Stanleyville; the handwriting on the labels is not clear. *Liégeois* 11 is *T. neglecta* and *Liégeois* 13 is *T. anomala*. Both collections have different vernacular names.

Sterile material of *Tessmannia anomala* and *T. neglecta* is easily confused with *Copaifera mildbraedii* Harms (Detarioideae): both species have similar numbers of leaflets, with the same size, glossy above, apex emarginate, and with translucent dots. The distinguishing difference is this: the secondary veins of the leaflets of *C. mildbraedii* reach a clear vein at the edge of the leaflet, while the secondary veins of *T. neglecta* are looping to form a vein near the edge of the leaflet. *Gilletiodendron glandulosum* and *G. mildbraedii* might also be confused with *T. anomala* and *T. neglecta*, but in *Gilletiodendron* the secondary veins also reach a clear vein at the edge of the leaflet. A few sterile collections from Cameroon, previously identified to *T. anomala*, represent *Haplocoelum aurantium* Burgt, Ngansop & Tchiengué (Sapindaceae). The leaflets of *Haplocoelum* do not have translucent dots.

***Tessmannia nervosa* Breteler & Burgt sp. nov.** Type: Gabon, Ogooué-Lolo. 29 km ENE of Lastoursville, 3 km on CEB road, fl., 17 Nov. 1994, *J. J. Wieringa* 3224 (holotype WAG0090394; isotypes A, B, BP, BR15741554, BRLU, C, EA, FR, IAGB, K000745603, LBV, LUA, M0215203, MA866987, MO6731816, MPU, NY, POZG, PRE, RSA, SEV, STR, TI, UC, US01187690, W, WAG0090393, WAG0090395, WAG0090396, WRSL, YA).

<http://www.ipni.org/urn:lsid:ipni.org:names:7364908-1>

Tessmannia nervosa Breteler ined.; Sosef *et al.* 2006: 228.

Tree, to 30 m tall, trunk to 40 cm diam. Stipules caducous, not seen. Leaves to 16 × 14 cm, petiole 6–11 mm long, 2–3 mm diam.; rachis 1–5 cm long. Leaflets 1–3 per leaf, alternate, elliptic, 6–17 × 3–8 cm, glabrous above, below sparsely hairy mainly on midrib, becoming

glabrous; petiolules 1–3 mm long; leaflet base obtuse; apex acuminate, to 5 mm long; secondary veins 8–11 pairs. Glands 3–10 per leaflet, placed near the petiolule and near the apex. Inflorescence a raceme or compound raceme, axis to 5 cm long, 0–3 lateral branches to 2 cm long, to 12-flowered, 1–3 inflorescences per leaf axil, hairs to 0.5 mm long. Flowers: bract 3 mm long; bracteoles 2–3 mm long, inserted at 2–4 mm and 5–9 mm from base of pedicel. Pedicel 18–25 mm long, hairs to 0.3 mm long; sepals 12–14 mm long, hairs on the outer surface to 0.3 mm long; petals pink, translucent dots, 25–30 × 7–10 mm; stamens 10, filaments pink to dark pink, filamentous tube creamy white, 5 filaments 30–35 mm long, 5 filaments 24–28 mm long; anthers yellow, c. 5 × 2 mm; ovary 8–11 × 3–4 mm, densely hairy, hairs to 1 mm long, stipe 2 mm long; style 18–20 mm long, white at base, upper part pink. Infructescence, fruits and seeds unknown. Figs 1, 2, 17.

RECOGNITION. *Tessmannia nervosa* morphologically resembles *T. korupensis*. The new species has 1–3 leaflets, while *T. korupensis* has 4–6 leaflets. The rachis of *T. nervosa* is 1–5 cm long; the rachis of *T. korupensis* is 5–11 cm long.

DISTRIBUTION. *Tessmannia nervosa* is endemic to the Ogooué-Lolo Province in Gabon; Map 21.

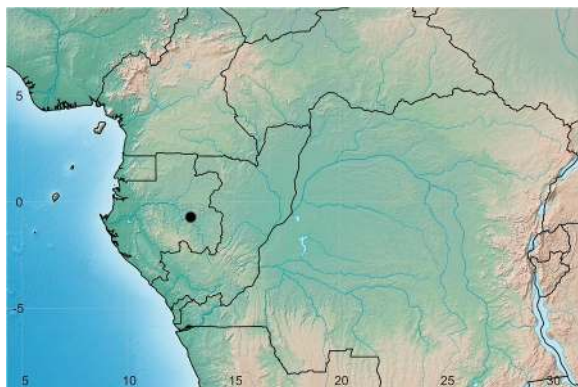
SPECIMENS EXAMINED. GABON. Ogooué-Lolo, c. 25 km E of Lastoursville, 3 km N of Bambidie, fl., 30 Oct. 2005, *Sosef* 2100 (BR, K, MO, WAG); same loc., fl., 17 Nov. 1994, *Wieringa* 3224 (holotype WAG0090394; isotypes A, B, BP, BR15741554, BRLU, C, EA, FR, IAGB, K000745603, LBV, LUA, M0215203, MA866987, MO6731816, MPU, NY, POZG, PRE, RSA, SEV, STR, TI, UC, US01187690, W, WAG0090393, WAG0090395, WAG0090396, WRSL, YA).

HABITAT. *Tessmannia nervosa* occurs in rain forest, at c. 300 m altitude.

CONSERVATION STATUS. *Tessmannia nervosa* is known from two collections made in 1994 and 2005. The two collections have the same co-ordinates; the second collector returned to the tree of the first collection, to collect additional material; about 10 trees were found (M. S. M. Sosef, pers. comm.). Google Earth (2023) imagery shows large areas of forest present near the single collecting locality. The collection was made along a logging road, in an area that is currently unprotected. The Ivindo National Park, 100 km to the North, and the Lopé National Park, 150 km to the West, has similar forest habitat and may contain populations of this species. Google Earth (2023) imagery shows some small-scale farming around the collecting locality, and much industrial logging activity. There has been decline in area and quality of habitat, and in number of mature individuals, and this is continuing. The extent of occurrence and area of occupancy are probably larger than the single known locality suggests. Utilising data from Table 2, *Tessmannia nervosa* is here preliminarily



Fig. 17. *Tessmannia nervosa* Breteler & Burgt. **A** twig with leaves, flower buds and open flowers; **B** open flower; **C** leaf with 3 leaflets. From Sosef 2100. DRAWN BY LUCY T. SMITH.



Map 21. Distribution of *Tessmannia nervosa*.

assessed to the IUCN (2012) Red List category Endangered B1ab(iii,v)+2ab(iii,v).

PHENOLOGY. *Tessmannia nervosa* flowers in October and November; the fruiting period is unknown.

ETYMOLOGY. *Tessmannia nervosa* is so named because the leaflets have fewer secondary veins than the other species of *Tessmannia* with large leaflets.

VERNACULAR NAME. Not recorded.

USES. Not recorded.

NOTES. *Tessmannia nervosa* is closely related to *T. bambidiensis*. The two species occur in central Gabon. The differences between the species are given in the recognition section of *T. bambidiensis*. These two species are also morphologically close to *T. korupensis* from Cameroon. *Tessmannia korupensis* has 4–6 leaflets, while *T. bambidiensis* and *T. nervosa* have 1–3 leaflets with a shape and venation that is different from the leaflets of *T. korupensis*. These three species are rain forest canopy trees, with large leaflets and large pink flowers with a long pedicel. The pods of *T. nervosa* are not known. About ten trees of *T. nervosa* were seen at the single known site of the species (M. S. M. Sosef, pers. comm.). Detarioideae tree species that grow in groups usually have pods with valves that curl strongly inwards after dehiscence, with seeds dispersed by ballistic seed dispersal.

***Tessmannia pauloi* (J.Léonard) Burgt stat. nov.** Type: Tanzania, Kisware Distr., Kisiju, fl., Sept. 1953, *S. Paulo* 152 (holotype BR0892313, isotypes EA, K000417960, WAG0004530).

<http://www.ipni.org/urn:lsid:ipni.org:names:77364910-1>

Tessmannia martiniana Harms var. *pauloi* J.Léonard, *Mém. Cl. Sci. Acad. Roy. Sci. Belgique*. [8vo] 30 (2): 68 (1957); Brenan 1967: 108.

Tree, to 35 m tall. Stipules ovate, 4–6 × 2 mm, persistent, midvein eccentric. Leaves to 8.5 × 5.5 cm, petiole 2 mm long, 1–2 mm diam.; rachis 2.5–5 cm long, densely hairy with hairs to 0.5 mm long. Leaflets 7–10 per leaf, alternate, ovate, 1.2–3.6 × 1–2.2 cm, glabrous, midvein of juvenile leaves sparsely hairy beneath; petiolules 0–1 mm long; leaflet base proximal side cuneate, distal side rounded; apex rounded; secondary veins 6–8 pairs. Glands 0–4 per leaflet, placed near the petiolule. Inflorescence a raceme, axis to 1.5 cm long, to 6-flowered, one inflorescence per leaf axil, hairs to 0.2 mm long. Flowers: bract not seen; bracteoles not seen, inserted at 0–1 mm and 1–2 mm from base of pedicel. Pedicel 3–6 mm long, hairs to 0.5 mm long; sepals 7–9 mm long, hairs on the outer surface to 0.5 mm long; 5 petals, 13–15 × 5–6 mm; stamens 10, 5 filaments 20–24 mm long, 5 filaments 14–22 mm long; anthers c. 2.5 × 1 mm; ovary 4–5 × 2–3 mm, densely hairy, hairs to 1 mm long, stipe 2–3 mm long; style 12–14 mm long. Infructescence, fruits and seeds not seen. Figs 1, 2, 18.

RECOGNITION. *Tessmannia pauloi* morphologically resembles *T. martiniana*. The new species has 7–10 leaflets, while *T. martiniana* has 9–12 leaflets. The largest leaflets of *T. pauloi* are 3.6 × 2.2 cm, while the largest leaflets of *T. martiniana* are 3 × 1.1 cm. The inflorescence of *T. pauloi* is up to 1.5 cm long and the flower pedicel is 3–6 mm long; while the inflorescence of *T. martiniana* is up to 4.5 cm long and the flower pedicel is 8–10 mm long.

DISTRIBUTION. *Tessmannia pauloi* is endemic to Tanzania, Pwani Region and southern Lindi Region; Map 22. **SPECIMENS EXAMINED. TANZANIA.** Lindi Region: Chitoa Forest, st., 4 Sept. 2001, *Mbago* 2179 (DSM, K); same loc., st., 6 Dec. 2001, *Mbago* 2270 (K, WAG); Kisiju, fl., Sept. 1953, *Paulo* 152 (holotype BR0892313, isotypes EA, K000417960, WAG0004530).

HABITAT. *Tessmannia pauloi* occurs in lowland semi-deciduous and evergreen forest, Legume-dominated forest with *Guibourtia*, *Tessmannia*, *Scorodophloeus* and *Hymenaea*, and on seashore, at 0–400 m altitude.

CONSERVATION STATUS. *Tessmannia pauloi* is known from three collections made in 1953 and 2001. Two of these three collections were made in the Chitoa Forest Reserve. Google Earth (2023) imagery shows a forest area of at least 200 km² remaining in this forest reserve. The reserve is surrounded by small-scale farming. Disturbance by anthropogenic dry-season fires and grazing by cattle may occur. Within and near the extent of occurrence there are other forest reserves where *T. pauloi* might well occur. Inbetween the forest reserves are areas of farmland where few or no trees of the original forest remain. These farmland areas are much larger than the forest reserves. There has been decline in extent and quality of habitat and in numbers of mature individuals, and this is continuing. The population size reduction over three generations is estimated to be over 50%. The species occurs in 2

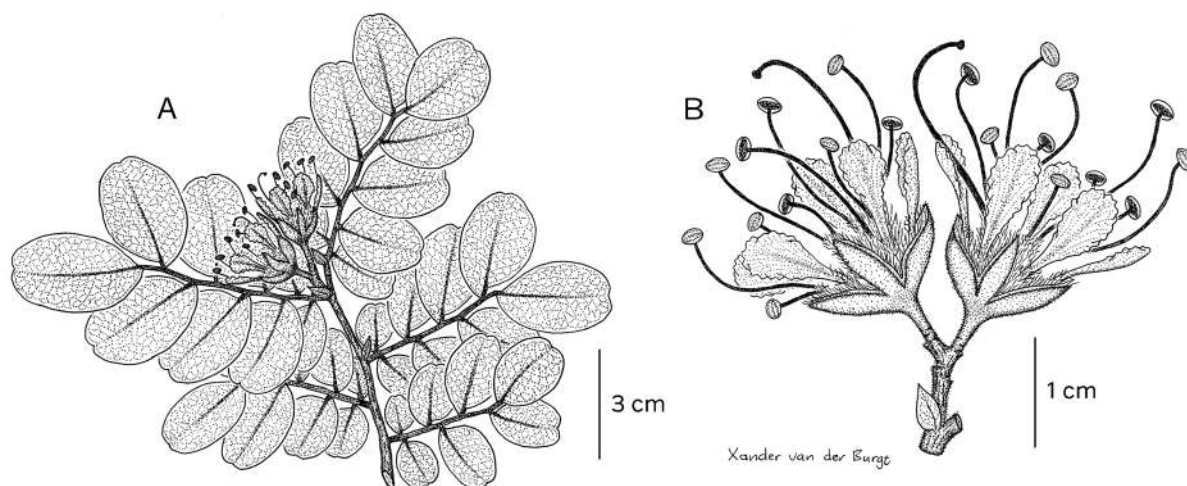


Fig. 18. *Tessmannia pauloi* (J.Léonard) Burgt. **A** twig with leaves, flower buds and open flowers; **B** open flowers. From *Paulo* 152. DRAWN BY XANDER VAN DER BURGT.



Map 22. Distribution of *Tessmannia pauloi*.

locations. Utilising data from Table 2, *Tessmannia pauloi* is here preliminarily assessed to the IUCN (2012) Red List category Endangered A2c; B1ab(iii,v)+2ab(iii,v).

PHENOLOGY. *Tessmannia pauloi* flowers in September; fruiting period unknown.

ETYMOLOGY. *Tessmannia pauloi* is named after the collector of the type specimen.

VERNACULAR NAME. Not recorded.

USES. Not recorded. Kihampa *et al.* (2009b, 2010) studied chemical compounds found in tissue of *Tessmannia martiniana* var. *martiniana* and *Tessmannia martiniana* var. *pauloi*. Their results relate to the newly described species *T. tanzaniensis*; see the uses section of that species.

NOTES. Léonard (1957) described *Tessmannia martiniana* var. *pauloi*, citing a single collection, *Paulo* 152. Léonard cannot have seen the type of *T. martiniana*, *Martin* in *Holtz* 3131 (B†), because this was lost in 1943. He

probably did not see any material at all of *T. martiniana* since the *Flora of Tropical East Africa* (Brenan 1967) still cites only the type. No specimens have been located that comply with the description of *T. martiniana* by Harms (1915b); see the notes at that species. Comparing the description of *T. martiniana* by Harms (1915b) with *Paulo* 152, the type of *T. martiniana* var. *pauloi* (Table 6), it is concluded that these two taxa differ in at least 5 characteristics and therefore represent two different species rather than varieties. The difference in maximum leaflet width, 1.1 cm for *T. martiniana* and 2.2 cm for *T. pauloi* (Table 6), is remarkably large.

Tessmannia princeps A.Bianchi, Tomasi, Mwakisoma, Barbieri & Q.Luke. Type: Tanzania. Boma la Mzingu Village Land Forest Reserve, Udzungwa Mts, –8.19900°S 36.08371°E, 1416 m, fl., fr., 6 Dec. 2019. *Bianchi & Mwakisoma* 153 (holotype NHT; isotypes EA, K).

Tree, to (35 –) 40 m tall, trunk to 270 cm diam. Stipules linear, 8 × 1 mm, early caducous. Leaves to 10 × 2.5 cm, petiole 1 – 3 mm long, rachis 6.8 – 9.4 cm long. Leaflets 36 – 48 per leaf, opposite to alternate, sub-rectangular/oblong, 11 – 13 × 3 – 4 mm; venation visible on both sides, secondary veins 7 – 9 pairs. Glands 2 – 7 per leaflet. Inflorescence a raceme, axis short, to 20-flowered, 1 – 4 inflorescences per leaf axil, hairs short. Flowers: bract small; bracteoles small, inserted near base of pedicel. Pedicel 6 – 7 mm long; sepals 5 mm long, glabrous on both surfaces; petals white, 5 × 1 – 1.5 mm; stamens 10, filaments white, 5 filaments 10 mm long, 5 filaments 5 mm long; anthers 0.8 × 0.5 mm; ovary 2 × 1 mm, glabrous, stipe short; style white, 3 mm long, glabrous.

Table 6. Comparison of the description of *Tessmannia martiniana* by Harms (1915b) with *Paulo* 152 (BR, EA, K, WAG), the type specimen of *T. pauloi*.

Character	<i>Tessmannia martiniana</i> (Harms 1915b)	<i>Tessmannia pauloi</i> (Paulo 152: BR, EA, K, WAG)
Leaflets number	9 – 12	7 – 10
Leaflets size	1 – 3 × 0.7 – 1.1 cm	1.2 – 3.6 × 1.0 – 2.2 cm
Rachis	glabrous	densely hairy
Inflorescence length	2 – 4.5 cm	to 1.5 cm (axis)
Pedicle length	8 – 10 mm, incl. hypanthium	3 – 6 mm

Infructescence axis short. Fruits woody, dark beige/tan, obovate, 4.5 – 4.9 × 3.0 cm, glandular with 0 – 1 raised resin glands on each valve, stipe short, beak 1 – 2 mm long, fruits glabrous; fruits contain 1 – 2 (– 3) seeds. Seeds dark glossy brown, tending towards olive, pure brown close to aril, glossy, elliptic to sub-rectangular, 16 – 19 × 9 – 12 × 2 – 3 mm. *Seedlings* with permanent cotyledons, first two leaves opposite. Figs 1, 2.

DISTRIBUTION. *Tessmannia princeps* is endemic to the Udzungwa Mountains in Tanzania (Bianchi *et al.* 2025); Map 23.

SPECIMENS EXAMINED. TANZANIA. Boma la Mzinga Village Land Forest Reserve, Udzungwa Mts, –8.19900°S 36.08371°E, 1416 m, fl., fr., 6 Dec. 2019, Bianchi & Mwakisoma 153 (holotype NHT; isotypes EA, K).

HABITAT. *Tessmannia princeps* occurs in afro-montane rain-forest at 1300 – 1500 m altitude. (Bianchi *et al.* 2025).

CONSERVATION STATUS. *Tessmannia princeps* is known from a single collection made in 2019, and from detailed observations (Bianchi *et al.* 2025). The species is found in two subpopulations that are very close, and fall within the same location; a larger one in Boma La Mzinga Village Land Forest Reserve and a smaller in Uluti Village Land Forest Reserve. A single individual has been recorded in a small patch of riverine forest (100 m × 20 m) close to Boma La Mzinga. Extensive and systematic research (transects and permanent plots) in the neighbouring Udzungwa Scarp Nature Forest Reserve and Mwanihana

Forest (a forest c. 150 km to the north with strong floristic affinities to the research area) have failed to locate it. This species may be a narrow endemic restricted to the two adjacent valleys (Bianchi *et al.* 2025). The extent of occurrence is 9.26 km², and the area of occupancy is 12 km², based on the three localities where the species was collected (Andrea Bianchi pers. comm.). The extent of occurrence should be changed to make it equal to the area of occupancy (IUCN 2024: 52). Both subpopulations occur within the Udzungwa Corridor, a 75 km² forest restoration project, which has a payment for ecosystem services scheme and protects remaining patches of forest. If the project were to cease, *T. princeps* would be immediately threatened with habitat loss and would then need to be assessed as Critically Endangered. A thorough survey of the forest patches indicated 101 mature individuals. The population size is estimated to number fewer than 1000 mature individuals. *Tessmannia princeps* is provisionally assessed to the IUCN (2012) Red List category Vulnerable D1 (Bianchi *et al.* 2025).

PHENOLOGY. *Tessmannia princeps* was found in flower in December; seeds were dispersed in October – November (Bianchi *et al.* 2025).

ETYMOLOGY. *Tessmannia princeps* is named after the canopy emergent habit of the species. The specific epithet is from the Latin ‘princeps’ for ‘the first, the foremost, the most eminent’ (Bianchi *et al.* 2025).

VERNACULAR NAME. Not recorded.

USES. A curious fact is that *Tessmannia princeps* is not felled in village land forest reserves (Bianchi *et al.* 2025).

NOTES. *Tessmannia princeps* has the smallest flowers as well as the largest number of leaflets of all 24 species in the genus. The leaflets are not emarginate. Nearly all species of *Tessmannia* have emarginate leaflets. The trunk of the largest tree was 270 cm diam.; much larger than measured at any other *Tessmannia* species. The second largest measured trunk was of *T. africana* with 180 cm diam.

***Tessmannia tanzaniensis* Burgt sp. nov.** Type: Tanzania, Madera, fl., May – June 1892, *Sacleux* 1896 (holotype P03481102, isotypes P03481103, P03495920, WAG0192356).



Map 23. Distribution of *Tessmannia princeps*.

<http://www.ipni.org/urn:lsid:ipni.org:names:77364911-1>

Tree, to 20 m tall. Stipules ovate, falcate, c. 7×3 mm, caducous, midvein eccentric. Leaves to 13×10 cm, petiole 2–4 mm long, 1–2 mm diam.; rachis 3–7 cm long. Leaflets 4–6 (–7) per leaf, alternate, ovate to elliptic, somewhat falcate, $1.5–7 \times 1–3$ cm, glabrous; petiolules 0–1 mm long; leaflet base obtuse; apex acute to attenuate; secondary veins 10–16 pairs. Glands 0–5 per leaflet, placed near the petiolule. Inflorescence a raceme, axis to 4 cm long, to 10-flowered, 1–3 inflorescences per leaf axil, hairs to 0.3 mm long. Flowers: bract 3 mm long; bracteoles 2 mm long, inserted at 1–2 mm and 2–3 mm from base of pedicel. Pedicel 6–10 mm long, hairs to 0.5 mm long; sepals 12–14 mm long, hairs on the outer surface to 0.5 mm long; petals violet or pinkish white, $24–30 \times 8–10$ mm; stamens 10, 5 filaments 27–32 mm long, 5 filaments 22–26 mm long; anthers 4×1.5 mm; ovary $4–5 \times 2–3$ mm, densely hairy, hairs to 1 mm long, style 4–5 mm long; style 21–24 mm long. Infructescence axis to 4 cm long, 1–2 fruits per infructescence. Fruits woody, brown, obovate, $4.5–7 \times 3–3.5$ cm, glandular with 30–50 raised resin glands on each valve, stipe 5 mm long, beak 1–2 mm long, fruits densely hairy on the outer surface; fruits contain 1–3 seeds. Seeds not seen. Figs 1, 2, 19.

RECOGNITION. *Tessmannia tanzaniensis* morphologically resembles *T. burtii*. The new species has 4–6 (–7) leaflets, while *T. burtii* has 5–9 (–10) leaflets. The petiole is 2–4 mm long and the rachis is 3–7 cm long; in *T. burtii* the petiole is 6–10 mm long and the rachis is 4–15 cm long. The lowest leaflet of *T. tanzaniensis* is ovate: 1.5×1 cm; while the lowest leaflet of *T. burtii* is lanceolate: 3×1 cm. The pedicel of *T. tanzaniensis* is 6–10 mm long; the pedicel of *T. burtii* is 24–34 mm long.

DISTRIBUTION. *Tessmannia tanzaniensis* is endemic to Tanzania, Morogoro and Pwani Regions; Map 24.

SPECIMENS EXAMINED. **TANZANIA.** Pwani Region, Zaraninge F.R., fr., 11 April 2000, Abeid 800 (MO); Morogoro Region, Pugu, Uluguru Mts, st., 1956, *Chemical Laboratory* s.n. (K); Pwani Region: Pande F.R., st., 19 Aug. 1982, Harthorne 1468 (DSM); Pwani Region, Zaraninge F.R., st., 7 Nov. 2008, Luke 12742 (EA, K); same loc., fl., 11 July 1994, Mbago 1321 (DSM); same loc., st., 23 Dec. 2000, Mbago 1898 (DSM); Morogoro Region, Pugu F.R., st., 16 Feb. 2006, Mbago 3374 (DSM); Morogoro Region, Kimboza F.R., road to Matombo, fr., 1 July 1983, Mwasumbi 2499 (K); Morogoro Region, Pugu F.R., st., 6 Jan. 1995, Ndangalasil 1 (DSM); Pwani Region, Kiono F.R., st., 21 Aug. 1989, Rulangaranga 188 (MO, NHT); Pwani Region, Mandera, fl., May–June 1892, Sacleux 1896 (holotype P03481102, isotypes P03481103, P03495920, WAG0192356); Pwani Region, Zaraninge F.R., st., 12 Jan. 2008, Suleiman 37 (DSM); same loc., fr., 26 Nov. 1975, Wingfield 3230 (DSM).

HABITAT. *Tessmannia tanzaniensis* occurs in coastal lowland evergreen and semi-deciduous forest, at 100–300 m altitude.

CONSERVATION STATUS. *Tessmannia tanzaniensis* is known from 13 collections made from 1892 to 2008. The species was recorded to be common in the Zaraninge Forest Reserve (Mligo *et al.* 2009; as *T. burtii*), but some collectors recorded only a few trees, or a single tree. Some of the 13 collections were made in protected areas: the Kimboza, Kiono, Pande, Pugu and Zaraninge Forest Reserves. Google Earth (2023) imagery shows forest remaining in these protected areas. The Forest Reserves are surrounded by small-scale farming and urban development. Disturbance by anthropogenic dry-season fires and grazing by cattle may occur in these protected areas. In between the forest reserves are areas of farmland and urban areas where few or no trees of the original forest remain. These areas are much larger than the forest reserves. There has probably been much decline in extent and quality of habitat and in numbers of mature individuals, and this is continuing. The species occurs in about 8 locations. The population size reduction over three generations is estimated to be over 30%. Utilising data from Table 2, *Tessmannia tanzaniensis* is here preliminarily assessed to the IUCN (2012) Red List category Vulnerable A2c; B1ab(iii,v)+2ab(iii,v).

PHENOLOGY. *Tessmannia tanzaniensis* flowers from May to July and fruits in July and November.

ETYMOLOGY. *Tessmannia tanzaniensis* is named after Tanzania, the country where it is endemic.

VERNACULAR NAME. Mdemo, language: Kizigua (*Mbago* 1321); Msakazi, language: Kiluguru (*Chemical Laboratory Tanzania* s.n.).

USES. The bark is tapped for gum copal (*Mbago* 1321, 3374). This resin was noted to be used locally as incense in churches (*Mwasumbi* 2499). Some of the chemical compounds found in tissue of *Tessmannia* exhibited significant antimosquito, antifungal and antibacterial activities (Kihampa *et al.* 2009b, 2010). These results relate to *T. tanzaniensis* because their samples came from the Pugu and Zaraninge Forest Reserves where *T. tanzaniensis* occurs commonly; it is the only species of *Tessmannia* found in these two forest reserves.

NOTES. The type of *Tessmannia tanzaniensis*, Sacleux 1896 (P 3 sheets, WAG), was collected in the year 1892; 18 years before the genus *Tessmannia* was described. This type is probably the oldest herbarium collection ever made of a *Tessmannia* species. *Tessmannia tanzaniensis* is described as new to science, 133 years after the type specimen was collected. Charles Sacleux was a French missionary who spent 19 years in East Africa, mostly in a mission at Mandera, NE of Bagamoyo, in present-day Tanzania. In addition to his missionary work, he collected 2636 herbarium specimens in present-day Tanzania and Kenya, which are stored in the P herbarium (Polhill

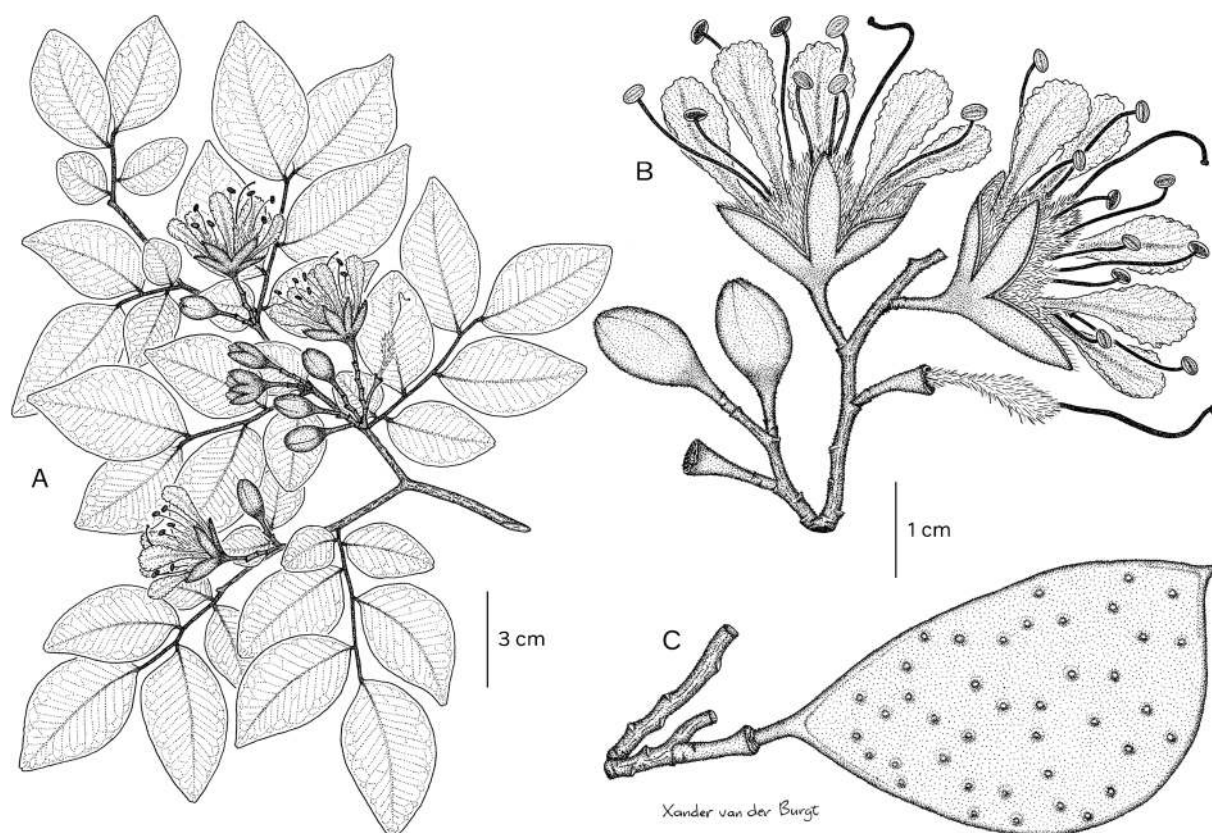


Fig. 19. *Tessmannia tanzaniensis* Burgt. **A** twig with leaves, flower buds and open flowers; **B** inflorescence with flower buds, open flowers and immature fruits; **C** mature fruit. **A, B** from *Sacleux* 1896; **C** from *Mwasumbi* 2499 & *Wingfield* 3230. DRAWN BY XANDER VAN DER BURGT.



Map 24. Distribution of *Tessmannia tanzaniensis*.

& Polhill 2015). Images of three herbarium sheets of *Sacleux* 1896 were found by the authors on the website of the P herbarium. An image of a fourth sheet, of an herbarium sheet stored in the WAG herbarium, was found by the authors on GBIF (2023). The three sheets at P are not annotated by J. Léonard.

The collection is not cited in the *Flora of Tropical East Africa* (Brenan 1967). The only other flowering specimen, *Mbago* 1321, is known from two sheets at DSM. Several taxonomists had annotated *Mbago* 1321 and some other specimens, as possibly representing new species: R. E. Gereau, G. P. Lewis, W. R. Q. Luke, B. A. Mackinder and K. Vollesen. However, none of the four sheets of *Sacleux* 1896 had been annotated as possibly representing new species.

The three collections *Hawthorne* 1468, *Mbago* 3374 and *Ndangalasi* 1 have broadly emarginate leaflets, while the other collections have narrowly emarginate leaflets. These three collections were collected near Dar es Salaam, at 70 km or more from the other collections. They are included in *Tessmannia tanzaniensis* because the collection *Luke* 12742 (K) has both broadly emarginate and narrowly emarginate leaflets.

Tessmannia tanzaniensis occurs in coastal Tanzania, with three other species of *Tessmannia*: *T. densiflora*, *T. martiniana* and *T. pauloi*, which have leaves different from those of *T. tanzaniensis*. The maximum length of the leaflets of these three species is 1.8 cm, 3.0 cm, and

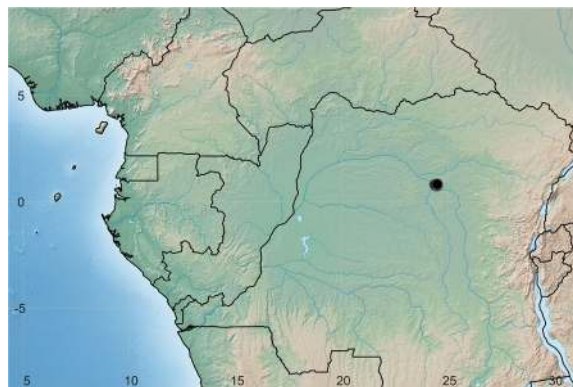
3.6 cm respectively, while the leaflets of *T. tanzaniensis* are up to 7 cm long. The average number of leaflets of these three species is 24.1, 10.5 and 8.5 leaflets respectively; in *T. tanzaniensis* the average number is 5.5 leaflets.

Tessmannia yangambiensis *Louis ex J. Léonard* 1949: 385; Léonard 1950: 35 – 55; Léonard 1952: 294; Sosef *et al.* 2021: 133. Type: Congo (Kinshasa), 28 June 1938, *J. Louis* 10111 (lectotype BR0892284, selected here; isolectotypes B100003072, BR0892346, BR0892379, GENT9003185, K000417961, MO1644953, P00253024, P03481577, US00230195, WAG0143394).

Tree, to 48 m tall, trunk to 135 cm diam. and 29 m long. Stipules caducous, not seen. Leaves to 20 × 8 cm, petiole 3 – 8 mm long, 1 – 2 mm diam.; rachis 5 – 14 cm long. Leaflets 12 – 16 per leaf, alternate, ovate, somewhat falcate, 2 – 6 × 1 – 2.5 cm, glabrous, mid-vein sparsely hairy beneath; petiolules 0 – 2 mm long; leaflet base proximal side cuneate, distal side obtuse; secondary veins 9 – 14 pairs. Glands 0 – 3 per leaflet, placed near the petiolule. Inflorescence a raceme or compound raceme, axis to 9 cm long, 0 – 8 lateral branches to 5 cm long, to 70-flowered, 1 – 4 inflorescences per leaf axil, hairs to 0.5 mm long. Flowers: bract 3 mm long; bracteoles 2 mm long, inserted at c. 0.2 mm and 1 mm from base of pedicel. Pedicel 4 – 7 mm long, hairs to 0.5 mm long; sepals 8 – 9 mm long, hairs on the outer surface to 0.5 mm long; petals pink, adaxial petal 15 – 20 × 7 – 8 mm, the other 4 petals 20 – 26 × 7 – 10 mm; stamens 10, 5 filaments 20 – 26 mm long, 5 filaments 15 – 20 mm long; anthers c. 3 × 1 mm; ovary 5 – 7 × 2 – 3 mm, densely hairy, hairs to 1 mm long, stipe 2 mm long; style 14 – 17 mm long. Infructescence axis to 9 cm long, 1 – 3 fruits per infructescence. Fruits woody, brown, obovate, 4 – 8 × 3 – 4.5 cm, glandular with 50 – 150 raised resin glands on each valve, stipe 3 – 4 mm long, beak 0 – 2 mm long, fruits hairy on the outer surface, persistent hairs to 0.2 mm long mixed with caducous hairs to 1 mm long; fruits contain 1 – 3 seeds. Seeds dark brown to black, glossy, ovate, 12 – 18 × 10 – 14 × 5 – 6 mm. Figs 1, 2.

DISTRIBUTION. *Tessmannia yangambiensis* is endemic to Congo (Kinshasa) and has only been collected near the town of Yangambi; Map 25.

SPECIMENS EXAMINED. CONGO (KINSHASA). Orientale, Yangambi, st., 1948, *Gilbert* 8765 (BR); Yangambi, fr., 1948, *Gilbert* 9170 (BR); Yangambi, R. Isalowe, fr., 17 Sept. 1948, *Léonard* 1916 (BR); Yangambi, 100 m from mouth of Isalowe, fl., 3 Dec. 1936, *Louis* 2908 (B, BM, BR, IFAN, K, MA, MO, P, WAG); 7 km E of Yangambi, Isalowe valley, fl., 16 April 1937, *Louis* 3684 (B, BM, BR, K, MO, P, WAG); Yangambi, fl., 7 June 1938, *Louis* 9719 (BM,



Map 25. Distribution of *Tessmannia yangambiensis*.

BR, K); Yangambi, Luweo plateau, fl., 28 June 1938, *Louis* 10111 (lectotype BR0892284, selected here; isolectotypes B100003072, BR0892346, BR0892379, GENT9003185, K000417961, MO1644953, P00253024, P03481577, US00230195, WAG0143394); Yangambi, Bohonde plateau, fr., 24 Sept. 1938, *Louis* 11334 (BR, K, MO).

HABITAT. *Tessmannia yangambiensis* occurs in rain forest on well-drained soil, at 380 – 500 m altitude.

CONSERVATION STATUS. *Tessmannia yangambiensis* is known from eight collections made from 1936 to 1948. All collections were made in the Yangambi Biosphere Reserve, designated in 1976. Google Earth (2023) imagery shows large areas of forest present within and near the extent of occurrence, but also much small-scale farming and some urban development. Oil palm and rubber plantations are also visible. There are large areas within the reserve where few or no trees of the original forest remain. *Tessmannia yangambiensis* was assessed as Endangered B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v) (Shutsha Ehata *et al.* 2021b). Utilising data from Table 2, this assessment is supported.

PHENOLOGY. *Tessmannia yangambiensis* flowers in December, April and June and fruits in September.

ETYMOLOGY. *Tessmannia yangambiensis* is named after the town near the area where it is endemic.

VERNACULAR NAME. Waka, language Turumbu (collections by *Louis*).

USES. The species produces copal (*Louis* 3684). People of the Turumbu ethnic group used the resin of the tree for light (Léonard 1950).

NOTES. Three species of *Tessmannia* are common in the forests around Yangambi: *T. africana*, *T. anomala* and *T. yangambiensis*. All are emergent rain forest trees, measured by their collector J. L. P. Louis in Yangambi to grow to 53 m, 50 m and 48 m height respectively. *Tessmannia yangambiensis* has only been collected within 8 km from Yangambi and the Yangambi herbarium. It is remarkable that a rain forest tree species is endemic to the surroundings of the most important rain forest research station of a country. These three tree

species can easily be separated from each other by the number and size of their leaflets (Table 1). *Tessmannia yangambiensis* might be confused with *T. lescrauwaetii*, a species of which the closest locality is 250 km South of Yangambi. In *T. lescrauwaetii*, the inflorescence, pedicel and sepals are glandular; in *T. yangambiensis* they are not. The leaflets of the two species are less easy to separate; both species have leaflets in similar numbers, with a similar size, and an emarginate apex. The leaflets of *T. lescrauwaetii* have an obtuse apex, while those of *T. yangambiensis* have a narrower, more attenuate apex.

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Declarations

Conflict of Interest The authors declare that they have no conflict of interest.

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