

The genus *Idertia* (Ochnaceae)

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Background and aims – The genus *Idertia* belongs to the subfamily Ochnoideae, tribe Ochneae, subtribe Ouratinae. This paper aims at a full taxonomic revision and a critical evaluation of the taxonomic position of the genus along with its diagnostic characters.

Methods – All characters are studied using 73 herbarium collections of the following herbaria: B, BM, BR, BRLU, COI, EA, G, K, MO, P and WAG. Specimen data were managed using the BRAHMS herbarium management software.

Key results – *Idertia* is characterized by a gynobasic style, apocarpous fruits, ten stamens, persistent and accrescent sepals and intra-axillary fused stipules. It shares these features with its African relatives *Campylospermum* and *Rhabdophyllum*, but its axillary inflorescence, smooth anthers and straight cotyledons renders it distinct. The latter feature is reminiscent of the South American relative *Ouratea* which lacks the persistent sepals and has free lateral stipules. Other diagnostic characters of the wood, leaves, inflorescence, flowers and fruits are discussed. A key to the four genera of the subtribe Ouratinae is provided. The correct author combination for the name Ouratinae is (Engl.) Kanis. The variation amongst the four species of *Idertia* recognized by other authors was studied carefully and deemed continuous. Only a single, though variable species distributed from Guinea to Uganda is recognized. A full taxonomic treatment is provided and two lectotypes are designated.

Conclusions – *Idertia* is a well-defined and sufficiently distinct monotypic genus.

Key words – Africa, *Campylospermum*, *Idertia*, lectotype, morphology, Ochnaceae, Ochnoideae, *Ouratea*, Ouratinae, *Rhabdophyllum*, taxonomy.

INTRODUCTION

The genus *Idertia* was created by Farron (1963: 211–212) to accommodate three tropical African species previously treated as members of the genus *Ouratea* Aubl. s.l. Later, Farron (1968: 227; 1985: 60, 66) added a fourth species, based on a single specimen from Sao Tomé, but left it undescribed. Amaral & Bittrich (accepted) followed Farron in his concept of this genus.

Following the subdivision of the family by Kanis (1968), *Idertia* belongs to the subfamily Ochnoideae, tribe Ochneae, subtribe Ouratinae (Engl.) Kanis. This subtribe contains three other genera: *Rhabdophyllum* Tiegh. (Africa, eight species; Sosef 2008), *Ouratea* Aubl. (Neotropics, c. 140 species; Sastre 1988) and *Campylospermum* Tiegh. (some 55 species in Africa and Madagascar, and two in tropical Asia; Farron 1985, Kanis 1968). It is characterized by having 10 stamens with sessile or subsessile anthers and a gynobasic style in between a ring of almost free carpels. These develop into an apocarpous fruit with the mericarps sitting on a swollen re-

ceptacle. The interesting group of African Ouratinae are the subject of on-going research efforts at Wageningen, in cooperation with the Senckenberg Research Institute at Frankfurt. *Rhabdophyllum* has been revised some years ago (Sosef 2008) while the notoriously problematic *Campylospermum* is subject to a revision of the continental African species by Bissiengou (Bissiengou & Sosef 2008; Bissiengou et al. 2013). *Ouratea* has been studied by Sastre (1988). Although Farron (1963, 1985) and Bamps & Farron (1967) represent useful contributions, *Idertia* has never been subject to a thorough taxonomic revision, a situation we hope to improve now.

MATERIAL AND METHODS

We carefully studied the variation within dried material of the genus *Idertia* from the following herbaria: B, BM, BR, BRLU, COI, EA, G, K, MO, P, WAG. Standard herbarium techniques were used. In all, this material represents 73 different collections. Many of these (50) were collected after

Farron's 1985 paper or were never seen by him and hence we are now better equipped to make the right taxonomic decisions. All specimen data have been entered into the BRAHMS (Botanical Research and Herbarium Management System, <http://herbaria.plants.ox.ac.uk>) database of the National Herbarium of the Netherlands (now Naturalis Biodiversity Center) and will soon be available on-line through <http://vstbol.leidenuniv.nl> or upon request to the author.

Additional material from related genera was studied at WAG.

RESULTS

Diagnostic characters for *Idertia*

Farron (1963) provides several morphological characteristics for *Idertia* that make it stand out from the rest of the subtribe. He, as well as the earlier Ochnaceae specialist van Tieghem (1902a, 1902b, 1907), attributes great value to the shape and position of the embryo and cotyledons. For *Idertia*, Farron mentions a straight embryo accompanied by two straight cotyledons of similar size with the radicle in between them (cotyledons accumbent). Within the Ouratinae, this state is only encountered in the New World genus *Ouratea* from which *Idertia* sufficiently differs in having persistent and strongly accrescent sepals and intra-axillary and fused stipules. It shares the latter characters with the related *Campylospermum* and *Rhabdophyllum*. Moreover, the few-flowered and axillary inflorescence of *Idertia* also sets it apart from the vast majority of other Ouratinae species while the leaf margins carry unique long setae. Furthermore, Farron (1963) has observed a hypogeal germination (cotyledons below ground) in *Idertia morsonii* Hutch. & Dalz. while it is epigeal (cotyledons above ground) in two species of *Campylospermum*, but there are too few observations to give them some taxonomic weight. Finally, Farron (1963) states that the pollen of both *Idertia* species he studied differs from all other African and American Ouratinae. Unfortunately, he never published his palynological observations, and it seems worthwhile to perform such a study, the one of Amaral (1991) providing only limited data.

Wood anatomy – The wood anatomy of *Idertia* was studied by den Outer (1977) and den Outer & Schutz (1981). The observations place *Idertia* closest to *Campylospermum* with the main part of the axial system occupied by parenchyma cells with scattered sieve tubes that are almost rectangular in transverse section. *Idertia* differs from the three investigated *Campylospermum* species in having on average 4 cells per phloem-parenchyma strand, and phloem rays with long or short uniseriate tails and a maximum of 5 rows of cells. In *Idertia*, no crystals were observed, which are usually present in Ochnaceae.

Stipules – In *Idertia*, these are intra-axillary and fused, as in all African Ouratinae [except for *Campylospermum lecomtei* (Tiegh.) Farron, where they are linear and have secondarily become free again], and the structure regularly carries two apices. The American genus *Ouratea* stands out in the subtribe by having lateral and free stipules.

Leaves – The margin of *Idertia* leaves is undulate to bluntly serrate, with the actual margin consisting of a slightly thick-

ened rim similar to the situation in most species in *Campylospermum* and *Rhabdophyllum*. The most striking leaf feature are the long setae that protrude from this thickened rim (fig. 2B). Despite of what Farron (1963: 211) says (“sétules qui prolongent le plus souvent les nervures secondaires”), we observed that the setae actually arise in an irregular pattern, and are not associated with the secondary veins but rather with the undulations or blunt teeth.

Within the Ouratinae, the leaf venation patterns provide important characteristics (Farron 1968: 188). In *Idertia*, the main secondary veins protrude in a slightly oblique angle from the midrib to run straight or only with a slight curve to the margin. Just before the margin they curve up and fuse with it (figs 1 & 2B). As such, this venation type is intermediate between the camptodromous type (Ellis et al. 2009; main secondaries curving up to eventually run parallel to the margin, as in most *Campylospermum* species) and the craspedodromous type (main secondaries running straight to the margin, as in all *Rhabdophyllum* species). The main secondaries are fairly regularly and rather closely spaced (when compared with *Campylospermum*), but do not come near the very dense spacing found in *Rhabdophyllum*. Intersecondary veins (not reaching the margin) are present, 0–2(–3) in between each pair of main secondaries. The intercostal veins are scalariform, at least in the outer half of the leaf blade (fig. 2B), similar to the situation in most species of *Campylospermum*.

The stomata of the twenty species of African Ouratinae investigated by Farron (1963) are always present only at the lower leaf surface. While in *Rhabdophyllum* the stomata are of the paracytic type (subsidiary cells that flank the stomata parallel to the long axis of the guard cells), he observed stomata of the anomocytic type (no distinct flanking cells, surrounding cells irregular pattern) in both *Idertia* and *Campylospermum*.

Inflorescence – In *Idertia*, they are strictly axillary, a character shared with all species of *Rhabdophyllum*, a few species of *Campylospermum* and other genera of the tribe Ochnaceae like *Ochna*. They are composed of a single fascicle of only 1–2(–4) flowers, representing a strongly reduced cyme. Occasionally, the inflorescence may seem terminal, because several fascicles are positioned near the tip of a twig. However, upon closer inspection one can observe that these are all arising from the axil of a stipule-like scale and that growth continues apically. Such seemingly terminal inflorescences may occur when the apical growth has almost halted (during the dry season?). Later on, the twig starts growing again, producing leaves etc., and the fascicles are now more obviously in an axillary position. A similar phenomenon can be observed in *Rhabdophyllum*.

Previously, it was reported that *Rhabdophyllum* and *Campylospermum* would differ in having monochasial and dichasial fascicles (or cymules), respectively (Farron 1968: 192, Sosef 2008). However, new observations now revealed the presence of dichasial fascicles in at least two species of *Rhabdophyllum* [*R. arnoldianum* (De Wild. & T. Durand) Tiegh. and *R. calophyllum* (Hook.f.) Tiegh.], while in others the true nature of the fascicles was difficult to establish because of the low number of flowers per fascicle. For the

same reason, it could not be determined whether the fascicles in *Idertia* are dichasial or monochasial, and it seems best to refrain from using this character for a distinction at genus level.

Flower – In *Idertia*, the pedicel is articulated at or very close to the base and is accrescent in fruit. The sepals are quincuncial (two outside, two inside, one half outside, half inside). In fruit, they are persistent, turn red or pink and are strongly accrescent (fig. 2D), the ultimate size being matched only by species like *Campylospermum umbricolum* (Tiegh.) Farron or *Ochna staudtii* Engl. & Gilg. Sastre (1988) claims that the six species of *Ouratea* sect. *Persistens* Sastre also have persistent sepals. These do indeed remain attached during the first phase of the fruit development, but fall off before the fruits are fully mature and, moreover, are not accrescent and coloured. The latter feature is a clear element of the bird dispersal syndrome (see below) typical for the African Ouratinae. The sepals lack the character typical for *Rhabdophyllum* where most carry one or two dorsal strips that interlock with the margin of the adjacent sepal in bud (Sosef 2008: Fig. 3). The petals stretch to become narrowly elliptic, not unguiculate (figs 1, 2A & C). In bud, they are not curved inward to clasp an anther, and so the bud is not ‘partitioned’ [or “cloisonnée”, van Tieghem (1902b: 182)]. Hence, they are unlike those in the related genera of the Ouratinae. There are (9–) 10 stamens, the anthers of which sit on a short filament and open by apical pores, which is typical for the subtribe. The anthers are, however, smooth (fig. 2A) and linear, not transversely wrinkled and narrowly pear-shaped as in the other three Ouratinae genera. The gynoeceum has a singly gynobasic style and is composed of 5–6 almost free carpels which soon become entirely free in fruit.

Fruit – In *Idertia*, the receptacle, and to a lesser extent also the pedicel, becomes inflated and whitish to pinkish or reddish in fruit, contrasting with the black mericarps (fig. 2D)

and probably favouring bird dispersal (van der Pijl 1982, Steentoft 1988). In *Ouratea*, which lacks the accrescent sepals in fruit, the swelling of the receptacle and pedicel is often much more pronounced. *Idertia* seeds have a straight embryo and straight accumbent cotyledons (see above).

In all, *Idertia* seems to be a clear member of the Ouratinae (fused intra-axillary stipules, 10 stamens on short filaments, persistent and accrescent sepals), but seems to hold an intermediate position between *Campylospermum* and *Rhabdophyllum* on the one hand and *Ouratea* on the other. Moreover, some features, such as the smooth and linear anthers and axillary inflorescences, may form a bridge to other members of the tribe Ochneae outside of the subtribe. Preliminary results of a molecular phylogenetic analysis of the Ochnaceae (Bissiengou, Wageningen University, The Netherlands & CENAREST, Gabon, pers. comm.) show *Idertia* as sister to *Ouratea* and *Rhabdophyllum* with *Campylospermum* and *Ochna* s.l. being sister to that, but resolution as well as support for this tree are both still low. In conclusion, there are ample reasons to regard *Idertia* as being a well-defined and distinct genus of the Ouratinae; the key below providing the most prominent morphological differences between the four genera of this subtribe.

Nomenclatural note on the name Ouratinae

Kanis (1968) used the author combination (Tiegh.) Kanis for this subtribe and added “stat. nov.” to it, clearly implying he was lowering van Tieghem’s tribe name Ourateae to a new taxonomic level. However, Engler (1874) is to be regarded as the author of the name at the tribe level (see also Gilg 1903, 1925). Further, one could argue that van Tieghem (1902b: 188 & 189, 1902c: 36, 1902d: 204) had already provided two subtribal names for the group concerned, *Orthospermées* and *Campylospermées*. Thus, one of these would have

Key to the genera of Ouratinae

1. Sepals persistent, strongly accrescent and red to pinkish in fruit; stipules intra-axillary, fused (except in *C. lecomtei* which has linear stipules); cotyledons curved or straight; Old World tropics.....2
 - Sepals caducous, not or only slightly accrescent, greenish to brownish; stipules lateral, free; cotyledons straight; New World tropics.....*Ouratea*
 2. Secondary veins slightly to distinctly curved up, less dense or rarely very dense (in *C. lecomtei*) but then inflorescence terminal; stomata anomocytic (no distinct flanking cells, surrounding cells in irregular pattern); sepals without dorsal strips.....3
 - Secondary veins straight, parallel and very dense (at least 4 per cm, often many more); stomata paracytical (subsidiary cells that flank the stomata parallel to the long axis of the guard cells); inflorescence axillary; most sepals carrying one or two dorsal strips that interlock with the margin of the adjacent sepal in bud.....*Rhabdophyllum*
 3. Main secondary veins slightly curving up just before they fuse to the thickened margin; leaf margin often with irregularly distributed setae; inflorescence axillary with only 1–2(–4) flowers; petals not clasping the anthers in bud; anthers smooth, linear; cotyledons similar in size, straight.....*Idertia*
 - Main secondary veins distinctly curved up to run parallel to the margin, rarely with a pattern of dense, straight secondaries but then inflorescence terminal; inflorescence terminal or less often axillary, multi-flowered; leaf margin smooth to sharply dentate but never with setae; petals clasping the anthers in bud; anthers wrinkled, narrowly pear-shaped; cotyledons similar to dissimilar in size, curved.....*Campylospermum*
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priority over the name Ouratinae. However, Art. 19.7 of the ICN (McNeill et al. 2012) states that names published with a non-Latin termination, which is the case here, are not validly published. Subsequently, Gilg (1925: 65) reproduces van Tieghem's subdivision of the family, including the two subtribal names, with proper Latin endings, Orthosperminae and Campylosperminae respectively, and provides diagnostic characters. It seems that he herewith validated the names. However, from his preceding text (in German), it is obvious that Gilg does not accept van Tieghem's ideas about the subdivision of the family, but provides the schema to show the contrasts with his own, preferred, subdivision. This renders the names, again, not validly published (ICN Art. 36.1a; McNeill et al. 2012). In conclusion, the correct author combination for the name Ouratinae is (Engl.) Kanis.

How many species?

As said above, Farron (1968, 1985) recognized four species within *Idertia*, one of which remained undescribed. His species are clearly geographically separated: *I. morsonii* (Hutch. & Dalz.) Farron in the Upper Guinean phytochorion (Guinea to Ghana; White 1979, Linder et al. 2005), *I. axillaris* (Oliv.) Farron in Lower Guinea (Nigeria to Gabon), *I. mildbraedii* (Gilg) Farron in Congolia (Democratic Republic of the Congo and Uganda), and his undescribed species on the island of Sao Tomé. In his 1985 publication, Farron gives a key to all four species, providing the characters he uses to distinguish them: leaf consistency, leaf measurements and shape, acumen length, relative abundance of setae.

The main difference between Farron's *I. morsonii* and his undescribed species from Sao Tomé on one side and the other two is the leaf size. Although at first glance, the variation in leaf size is striking (those in Upper Guinea regularly being as small as 5 × 2 cm, those in Lower Guinea not seldom as large as 23 × 7 cm), we observed a clear continuum of variation within the material at hand. There is only a tendency of larger-leaved specimens occurring in Lower Guinea and Congolia and smaller-leaved ones in Upper Guinea. In fact, the same is true for the length of the acumen: in smaller-sized leaves the acumen is generally shorter or even absent, in larger leaves the acumen is generally longer, but we were unable to establish a clear correlation between acumen length and any of the other characters. While *I. mildbraedii* would stand out because of its chartaceous, instead of papyraceous, leaves, various recent collections from eastern D.R.Congo clearly have less firm leaves. The undescribed species from Sao Tomé (based on the specimen *G. Watt* 7118) would be distinguished based on its narrowly elliptic leaves, but, again, a continuous variation from leaves with a length/width ratio of as low as 2 to as high as 4.5 could be observed in the large amount of material at hand. The Sao Tomé specimen itself also shows high variation in this respect, the length/width ratio of its leaves being 2.3–4. Similarly, leaves of *I. axillaris* would be, according to Farron's key, always obovate, which could not be confirmed with the present material. Especially the many specimens collected in 2010 by Ms P. Bissiengou in SW Cameroon proved very useful in understanding the natural variability in leaf shape. Finally, Farron used the relative abundance of the setae along

the leaf margin as a diagnostic character. He claimed that *I. mildbraedii* would have few or no setae, but based this statement on just two specimens from D.R.Congo and one from Uganda (Bamps & Farron 1967: 23). We have several recent collections from eastern D.R.Congo showing abundant setae along the margin.

In conclusion, we recognize a single, though variable, species within *Idertia*. We studied other characters as well, to see if no infraspecific taxa could be recognized. The variation turning out to be truly continuous, we concluded that even that was not possible. An adjusted species description, synonymy, etc. is given below.

TAXONOMIC TREATMENT

Idertia Farron (Farron 1963: 212); Bamps & Farron (1967: 22); Farron (1968: 179–185, 213–215, 227, 1985: 60); Amaral (1991); Amaral & Bittrich (accepted). – Type species: *I. axillaris* (Oliv.) Farron.

Shrubs or small trees; bark scaly, greenish to grey or chestnut; slash and wood red; branches horizontal to ascending. **Stipules** intra-axillary, fused. **Leaves**: blade with thickened margin from which setae protrude at irregular intervals; main secondary veins slightly curved just before and terminating in the thickened margin, intercostal veins scalariform. **Inflorescence** axillary, composed of a single, 1–4-flowered, strongly condensed cyme; pairwise scales present, often numerous. **Flowers** actinomorphic, 5-merous; pedicel articulated at or very close to the base; sepals quincuncial in bud, persistent and strongly enlarged in fruit; petals contorted, yellow; stamens (9–)10, on short filaments, anthers smooth, opening by apical pores; carpels 5(–6), almost free in flower, each with 1 ovule; style 1, gynobasic, stigma capitate. **Fruits** apocarpous, with accrescent and red to pink pedicel and sepals; receptacle swollen; mericarps ellipsoid, black. **Seeds**: cotyledons equal in size, straight, accumbent; embryo straight.

Idertia axillaris (Oliv.) Farron (Farron 1963: 212, 1985: 63, 66); Sita & Moutsamboté (1988: 112); Cable & Cheek (1998: 93); Sosef et al. (2006: 294). – *Gomphia axillaris* Oliv. (Oliver 1868: 322). – *Ouratea axillaris* (Oliv.) Engl. (in Gilg 1903: 260); Hutchinson et al. (1954: 228). – *Exomicrum axillare* (Oliv.) Tiegh. (van Tieghem 1902b: 341). – Type: Gabon, Mount John, River Kongui, Aug. & Sep. 1862, *Mann* 1787 (lecto-: K, **designated here**)

Ouratea mildbraedii Gilg (in Mildbraed 1913: 558, t. 75); Farron (1963: 211). – *Idertia mildbraedii* (Gilg) Farron (Farron 1963: 212); Bamps & Farron (1967: 23); Farron (1985: 63, 66). – *Gomphia mildbraedii* (Gilg) Lye (Lye 1998: 92); Verdcourt (2005: 53). – Type: Tafel LXXV in Gilg (lecto-: in Mildbraed 1913: 559, **designated here**), **synon. nov.**

Ouratea morsonii Hutch. & Dalz. (Hutchinson & Dalziel 1927: 217, 1928: 193); Farron (1963: 207, 211); Eggeling & Dale (1951: 282); Hutchinson et al. (1954: 228); Aubréville (1959: 324, pl. 247B). – *Idertia morsonii* (Hutch. & Dalz.) Farron (Farron 1963: 212); den Outer & Schutz (1981); Farron (1985: 63, 66); Hawthorne & Jongkind (2006: 174). – Type: Sierra Leone, s.d., *Morson* s.n. (K), **synon. nov.**

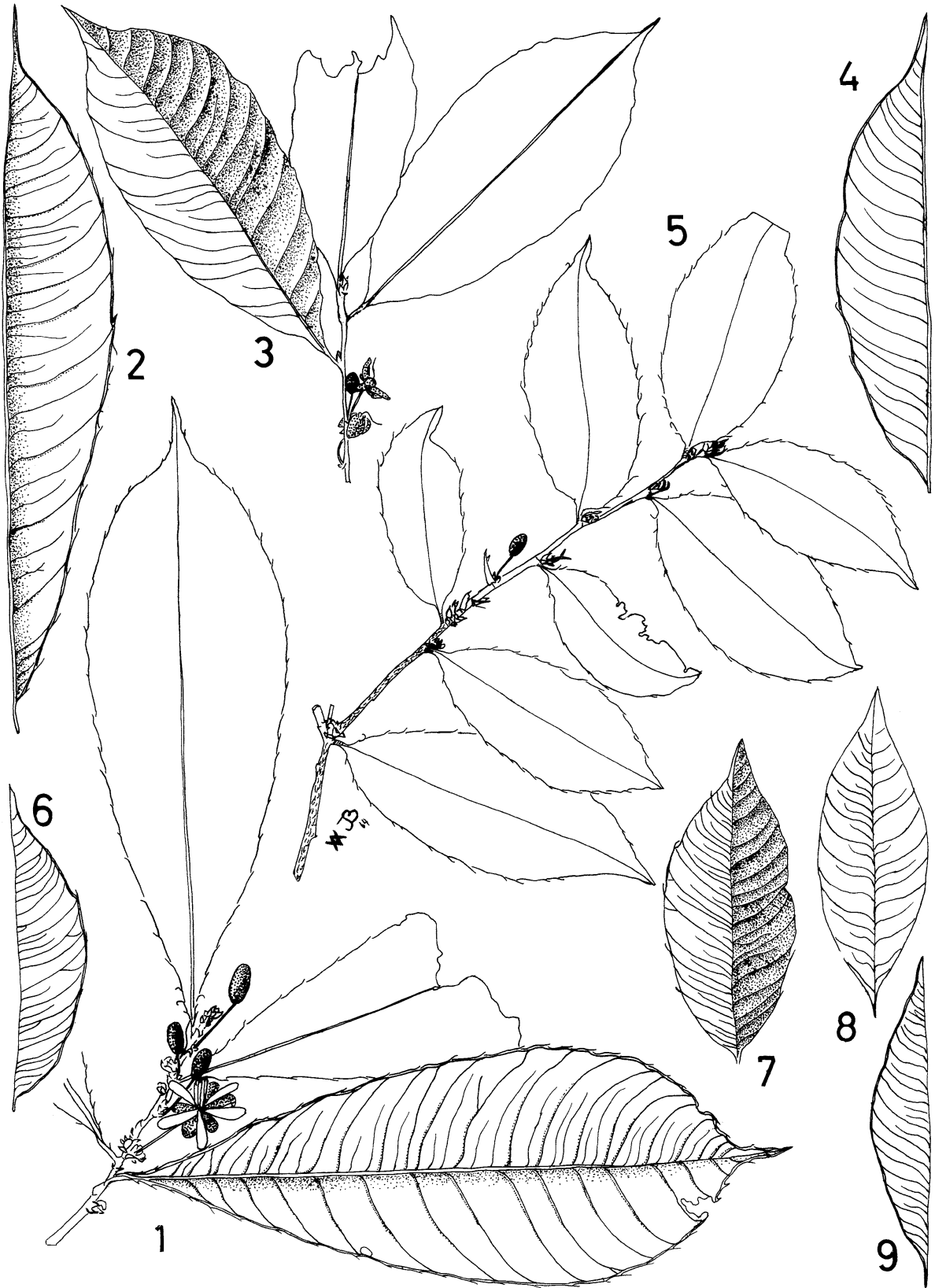


Figure 1 – *Idertia axillaris*: 1, flowering twig; 2, lower leaf surface; 3, twig with old flower; 4, upper leaf surface; 5, twig with flower buds; 6–9, (parts of) leaves. Drawn by Sabine Bousaniat Neuchatel, reproduced with permission.

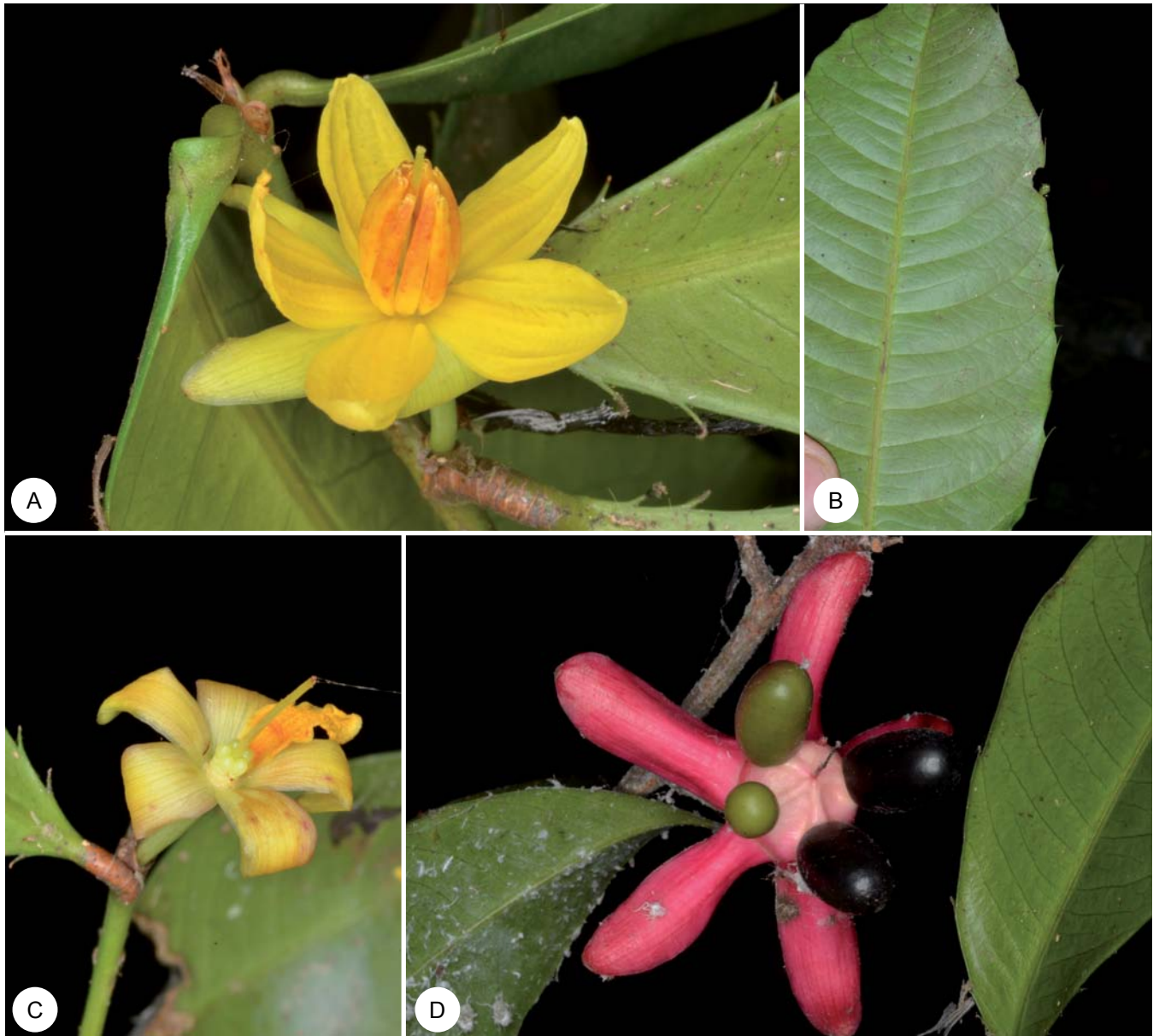


Figure 2 – *Idertia axillaris*: A, flower just after anthesis; B, leaf showing main secondary veins, intersecondary veins, intercostal veins and marginal setae; C, flower after anthesis with most petals fallen; D, infructescence with unripe (green) and ripe (black) mericarps; one mericarp not developed (A, C, D: coll. E. Bidault 297 from Guinea; B: E. Bidault 1064 from Gabon). Photographed by E. Bidault, reproduced with permission.

Idertia sp., Farron (1968: 227); Farron (1985: 60, 66); based on specimen *G. Watt* 7118, **synon. nov.**

Shrub or small tree up to 8 m tall; bole straight, up to 10 cm dbh; twigs slightly angular and striate in the distal part. **Stipules** triangular, often two-tipped, 3–10 mm long, firm. **Leaves**: petiole 3–8 mm long, transversely wrinkled, canaliculate above; blade narrowly elliptic to obovate or broadly elliptic-obovate, (4.5–)5.5–23(–26) × 2–7(–9) cm, l/w ratio 1.7–4.6, base broadly to narrowly cuneate, apex blunt to caudate with an acumen of up to 25(–40) mm, papery to leathery, medium to dark green and flat to slightly bullate above, lighter green below; midrib prominent and rounded to flat above, prominent below, main secondary

veins 15–20 on each side of the midrib, prominent on both sides, intersecondary veins 0–2(–3) between each pair of main secondaries, tertiary venation distinct. **Flowers**: pedicel 6–12 mm long, in fruit thickened and up to 15 mm long; sepals elliptic, 6–7 × 2–3 mm, green outside, pale green inside; petals elliptic but soon stretching to narrowly elliptic, 6 × 3 to 11 × 2 mm; stamens with c. 1 mm long filaments, anthers linear, 4–5 mm long; ovary c. 1 mm high, pale green; style 4–7 mm, in fruit up to 9 mm. **Fruit**: sepals indurated, patent, up to 25 × 11 mm, pink to purple or reddish; receptacle carrying 1–4 mericarps, whitish to pink or reddish; mericarps 13–14 × 7–8 mm, green turning black and shiny when mature. **Chromosomes**: 2n = 12. Figs 1 & 2.

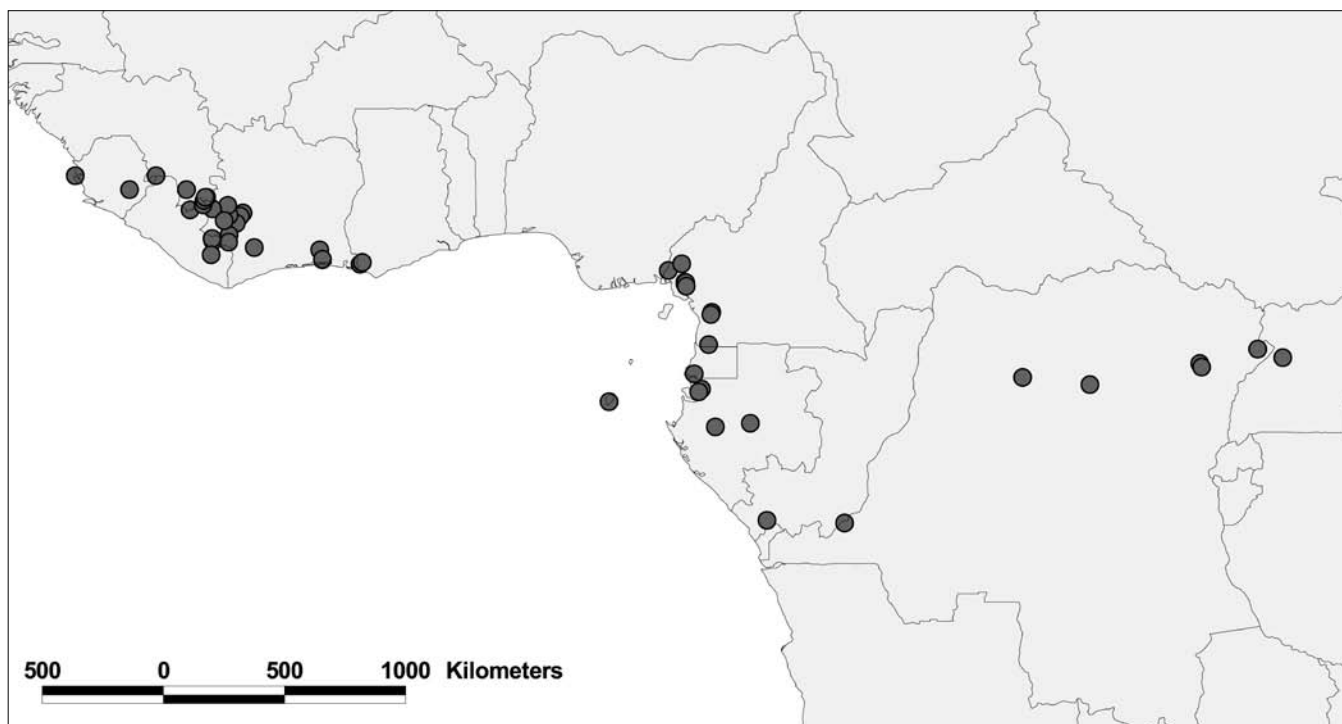


Figure 3 – Distribution of *Idertia axillaris* based on herbarium specimens examined.

Distribution – Guinea, Sierra Leone, Liberia, Ivory Coast, south-western Ghana, Cameroon, Equatorial Guinea (Rio Muni), Sao Tomé & Príncipe (Sao Tomé), Gabon, Republic of the Congo, Democratic Republic of the Congo and Uganda (fig. 3).

Habitat – Primary and secondary forest, on dry land to seasonally inundated places, in hill forest and forest on river banks, on clayey to sandy or rocky soil; at 50–800 m altitude.

Uses – In Liberia, the wood is used to make axe handles (Voorhoeve 2209). In Ivory Coast, the stems are used for roof construction of rural houses (Tra Bi 1997).

IUCN conservation assessment – Least Concern. Due to its comparatively large AOO (area of occupancy, 3,027,350 km²) and EOO (extent of occurrence, 2,818,436 km²), and the fact that the species is hardly used and not commercially exploited, it is best accommodated in the IUCN Red List category of Least Concern.

Nomenclatorial notes – *Gomphia axillaris* was described by Oliver (1868) with two syntypes: *Mann* 1787 from Gabon and *Morson* s.n. from Sierra Leone. The latter was taken as the type of *Ouratea morsonii* by Hutchinson & Dalziel (1927). Therefore, the most obvious choice of a lectotype for *G. axillaris* is the remaining *Mann* 1787 syntype, but this was never effected.

Ouratea mildbraedii was described with two syntypes, *Mildbraed* 2918 and 2932, and an accompanying plate. Both *Mildbraed* specimens were lost in Berlin and despite a very wide search in all relevant herbaria no duplicate was encountered, neither by us nor by Farron (from a remark in his specimen card system). Therefore, the plate, being the only remaining part of the original material (McNeill 2012: Art. 9.3), has to be chosen as lectotype.

Specimens studied – **Guinea**: Nzérékoré, Lola, Monts Nimba, concession minière SMFG, base de la vallée du Gba, 14 Feb. 2012, *Bidault* 297 (WAG); Nzérékoré, Nimba Mountains, Forêt de Cavally (Diougou), 18 Dec. 2008, *Haba, O.-O.* 29 (WAG); Nzérékoré, Nimba Mountains, Gba River valley, 5 Dec. 2006, *Jongkind* 7495 (P, WAG); Nzérékoré, Nimba Mountains, Cavally River, 2 Aug. 2008, *Jongkind* 8295 (WAG); Nzérékoré, Forêt Classée de Mt Yonon, not far from the Diane River, 11 May 2011, *Jongkind* 10749 (BR, WAG); Nzérékoré, Nimba Mountains, Zié Valley, 21 Sep. 2011, *Jongkind* 11161 (WAG); Nzérékoré, Mount Nimba, Jun. 1945, *Schnell* 2889 (P); *ibid.*, Feb. 1950, *Schnell* 4405 (K, P); *ibid.*, Apr. 1950, *Schnell* 5015 (P); *ibid.*, Apr. 1950, *Schnell* 5099 (P).

Sierra Leone: Eastern Province, Nimini South F.R., Kangama chiefdom, 13 May 1965, *Fox* 68a (K); Eastern Province, Nongowa Chiefdom, Kambui F.R., 21 May 1955, *Jordan* 2092 (B); Western Area, York Pass, Peninsula, 21 Jun. 1964, *Morton* SL 1370 (K, WAG); Eastern Province, Upper Neaboi Valley, Kambui Hills F.R., Block 10, 17 Apr. 1967, *Samai* 519 (K).

Liberia: Nimba, Mt Tokadeh, 9 Jun. 1965, *Adam* 21454 (K); Nimba, Ganta, 21 May 1939, *Harley* 1183 (K, WAG); Grand Gedeh, close to Geeblo Town, along recently finished OTC road going east-west and passing along Jaudee, 5 Jun. 2005, *Jongkind* 6618 (WAG); Nimba, East of the Nimba Mountains, 12 Apr. 2010, *Jongkind* 9625 (BR, G, K, P, WAG); Grand Gedeh, Chien, 4 Oct. 1969, *Versteegh* 798 (BR, WAG); Grand Gedeh, Cavally Research Project, 1981, *Voorhoeve* 2209 (WAG).

Ivory Coast: Man, Mar. 1932, *Aubréville* SF 1088 (P); Danané, Mar. 1932, *Aubréville* SF 1114 (BR, P); Guiglo, relevé l' proche Djiloubaye FDH, 2 May 2002, *Bakayoko* 137 (G, WAG); Guiglo, Zagné-Guiglo Km 10, 19 Feb. 1970, *Bamps* 2456 (BR, K, WAG); Agboville, forêt du Yapou, 19 Nov. 1991, *Chatelain* 812 (G); Soubré, Moyenne Sassandra, Guideko, May 1907, *Chevalier* 16383 (P); Abidjan, Banco, Dec. 1971, *Frédoux* 328 (G); Vavoua, F.C. du Haut-Sassandra, Centre, relevé FNK14, 13 Apr. 1995, *Kouamé* 1488 (G); 43 km N of Duékoué, along the road to Man, 10 Apr. 1962, *Leeuwenberg* 3841 (WAG); 8 km E of Duékoué, 12 Apr. 1962, *Leeuwenberg* 3893 (WAG); Man, F.C. Scio, Pinhou, Lobykro

à 5 km, Bloc 31, parcelle 450 de la Sodefor, 1 Jul. 2001, *Nusbaumer* 316 (BR, G, WAG); idem, parcelle 151 de la Sodefor, 1 Sep. 2001, *Nusbaumer* 683 (G); Agboville, Forêt du Yapo, 10 Oct. 1991, *Téré* 1924 (G); Daloa, F.C. du Haut-Sassandra, Centre, 5 Feb. 1996, *Téré* 2593 (G, WAG); Abidjan, Banco Arboretum near Abidjan, 29 Oct. 1961, *Wilde, J.J.F.E. de* 3129 (WAG).

Ghana: Western Region, N boundary of Ankasa F.R., 5 Apr. 1968, *Hall, J.B.* GC 38438 (K); Western Region, Ankasa River Forest Reserve, 15 Apr. 1978, *Hall, J.B.* GC 46693 (WAG); Western Region, Ankasa Game Reserve following footpath right just after entrance going parallel with Ankasa R., 19 Mar. 1995, *Jongkind* 2150 (G, WAG).

Cameroon: South-West Province, ancienne réserve du South Bakundu, 15 km Ouest du village Small Ekomba, 2 Apr. 2010, *Bissiengou* 1268 (WAG); *ibid.*, *Bissiengou* 1271 (WAG); *ibid.*, *Bissiengou* 1275 (WAG); *ibid.*, *Bissiengou* 1278 (WAG); *ibid.*, 3 Apr. 2010, *Bissiengou* 1280 (WAG); *ibid.*, *Bissiengou* 1283 (WAG); *ibid.*, *Bissiengou* 1284 (WAG); *ibid.*, *Bissiengou* 1285 (WAG); *ibid.*, *Bissiengou* 1286 (WAG); *ibid.*, *Bissiengou* 1287 (WAG); South-West Province, village Mafoko-Kindongi, 8 km Ouest du village Small Ekomba, 4 Apr. 2010, *Bissiengou* 1291 (WAG); *ibid.*, *Bissiengou* 1292 (WAG); South-West Province, Kumba Div., Banga, S. Bakundu F.R., 10 Mar. 1948, *Brenan* 9259 (K); South-West Province, south Bakundu F.R. Kendongi, 14 May 1970, *Farron* 7293 (P); South-West Province, Korup National Park, ca. 13 km NNW of Ikassa Last Bush and 8 km SE of Akpasang River on trail to Akpasang, 6 Apr. 1994, *Gereau* 5500 (MO, P); Central Province, 60 km SW of Eséka, S. of Nyong R., 12 km W. of Songbong, 9 Mar. 1965, *Leeuwenberg* 5036 (B, BR, EA, K, P, WAG); Central Province, Nyong, Kellé & Kribi FR., 13 Mar. 1977, *Lowe, J.* 3326 (K); South Province, Campo-Ma'an area, Bibambivoto, 1000 m along transect T4 in the Campo area, 23 Aug. 2000, *Tchouto Mbatchou* 2981 (WAG); South-West Province, footpath between Baro Village and Manyemen, 29 Mar. 1984, *Thomas, D.W.* 3386 (K, MO).

Equatorial Guinea: Rio Muni, Mt. John, Kongui river, Sep. 1862, *Mann, G.* 1787 (K).

Sao Tomé & Príncipe: Sao Tomé Island, Ribeira Peixe, Dep. de Monte Carmo, 6 Oct. 1956, *Espirito Santo* 3874 (COI); San Thomé, San Thelmo, 23 Oct. 1912, *G. Watt* 7118 (BM).

Gabon: Estuaire, SBM-Kougouleu, 6 Dec. 1952, *Bernard, F.* SRF 1009 (LBV); Moyen-Ogooué, Mabounié, à 45 km au sud-ouest de Lambaréné, rive nord de la rivière Ngounié, 5 Feb. 2013, *Bidault* 1064 (WAG); Ogooué-Ivindo, Forêt des Abeilles, 1990, *Dibata* 685 (WAG); Estuaire, près de Mviadi, Chantier SOFOR, 23 Sep. 1983, *Floret* 1409 (WAG).

Republic of the Congo: Kouilou, route Pounga-Dimonika, source "Paris Sangha", 25 Nov. 1978, *Cusset* 563 (P).

Democratic Republic of the Congo: Orientale, près de la rivière Egoro, 7 Nov. 1996, *Amsini* 34 (BR, WAG); Orientale, Epulu, 19 Feb. 1988, *Hart, T.B.* 831 (BR); Orientale, Yangambi, 29 Jan. 1963, *Bombali* 1919 (BR); Equateur, Yaliemba de Likote (N. de Befale), 17 May 1937, *Collart* 36 (BR); Binza, 5 Nov. 1981, *Lejoly, J.* 81/249 (BR); Orientale, Ituri, Lodjo Camp, pt 095 to pt 096, 28 Oct. 2010, *Luke, W.R.Q.* 14749 (BR); Orientale, Yangambi, réserve forestière de l'Inongo, 17 Jan. 1963, *Yafunga* 220 (BR, P).

Uganda: Western Province, Budongo Forest, Apr. 1940, *Eggeling* 4255 (BR, K).

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