

Two New Species of *Oxyanthus* DC. (Rubiaceae) from Central Africa

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Two new species of *Oxyanthus* DC. (Rubiaceae) from Central Africa

Bonaventure Sonké & Olivier Lachenaud

Abstract

SONKÉ, B. & O. LACHENAUD (2016). Two new of *Oxyanthus* DC. (Rubiaceae) from Central Africa. *Candollea* 71: 173-180. In English, English and French abstracts. DOI: <http://dx.doi.org/10.15553/c2016v712a2>

Two new *Rubiaceae* species from Central Africa, *Oxyanthus doucetii* Sonké & O. Lachenaud and *Oxyanthus lewisii* Sonké & O. Lachenaud, are described and illustrated. *Oxyanthus doucetii* is endemic to Cameroon and is closely related to *Oxyanthus unilocularis* Hiern, from which it differs in the minute calyx teeth, the stems with glabrous internodes, the dorsally glabrous stipules, the flower buds with a shorter head, and the corolla lobes not or hardly acute at apex. *Oxyanthus lewisii* is sparsely distributed from Cameroon to eastern Democratic Republic of Congo, and is characterised by narrow fusiform fruits, glabrous stems, and leaves lacking domatia but sparsely pubescent on the nerves beneath. Both new species are assessed as “Vulnerable” according to IUCN Red List Categories and Criteria.

Résumé

SONKÉ, B. & O. LACHENAUD (2016). Deux nouvelles espèces d'*Oxyanthus* DC. (Rubiaceae) d'Afrique centrale. *Candollea* 71: 173-180. En anglais, résumés anglais et français. DOI: <http://dx.doi.org/10.15553/c2016v712a2>

Deux nouvelles espèces de Rubiaceae d'Afrique centrale, *Oxyanthus doucetii* Sonké & O. Lachenaud et *Oxyanthus lewisii* Sonké & O. Lachenaud, sont décrites et illustrées. *Oxyanthus doucetii* est endémique du Cameroun et très proche d'*Oxyanthus unilocularis* Hiern, dont il se distingue par les dents du calice très réduites, les rameaux à entrenœuds glabres, les stipules glabres à la face dorsale, les boutons floraux à tête moins allongée, et les lobes de la corolle non ou à peine aigus au sommet. *Oxyanthus lewisii* est distribué de façon éparse du Cameroun à l'est de la République Démocratique du Congo, et caractérisé par ses fruits étroitement fusiformes, ses rameaux glabres, et ses feuilles dépourvues de domaties et éparsément pubescentes sur la face inférieure des nervures. Les deux espèces nouvelles sont évaluées comme «Vulnérables» selon les Catégories et les Critères de la Liste Rouge de l'IUCN.

Keywords

RUBIACEAE – *Oxyanthus* – Cameroon – Gabon – Democratic Republic of Congo – New species

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Introduction

Oxyanthus DC. is a genus confined to tropical Africa, including about 35 species (SONKÉ, 1999; LACHENAUD & SONKÉ, 2015). The genus is characterised by a combination of the following characters: persistent stipules, pseudo-axillary inflorescences, 5-merous flowers with long and very narrow corolla tube, contorted corolla aestivation, exserted anthers and style (except *O. schumannianus* De Wild. & T. Durand, with half-exserted anthers), calyx truncate or with subulate lobes, fleshy fruits with numerous seeds, and striated seed-coat.

The genus was traditionally classified in the tribe *Gardenieae* (HALLÉ, 1970; ROBBRECHT, 1988) of subfamily *Ixoroideae*. The recent molecular phylogenetic study of the *Gardenieae* complex by MOULY et al. (2014) led to the description of the new tribe *Sherbournieae* (subfamily *Ixoroideae*), which includes four African genera: *Oxyanthus*, *Atractogyne* Pierre, *Mitriostigma* Hochst., and *Sherbournia* G. Don. The *Sherbournieae* differs from the *Gardenieae* s.s. (sensu MOULY et al., 2014) by having a striated rather than smooth seed-coat. Within this group, *Oxyanthus* differs from the other three genera by its very narrow corolla tube.

The centre of diversity of *Oxyanthus* is in Central Africa, where 18 species are known (SONKÉ, 1999; CHEEK & SONKÉ, 2000). Eight species are found in West Africa (LACHENAUD & SONKÉ, 2015) and eleven in East Africa (BRIDSON & VERDCOURT, 1988).

In his revision of the Central African species, SONKÉ (1999) reported significant variation in the widespread species *O. unilocularis* Hiern, particularly in the size of the calyx teeth. A reexamination of the available material shows that this character is correlated with two others (the indumentum of the twigs and stipules, and the shape of the corolla lobes), and leads to the conclusion that two different species should be recognized. The form with short calyx teeth is here described as a new species, *O. doucetii* Sonké & O. Lachenaud, endemic to Cameroon, while *O. unilocularis* remains a widespread and common Guineo-Congolian species, occurring from Sierra Leone to Uganda.

SONKÉ (1999) also studied a collection from Cameroon (*Letouzey* 4585) and another from eastern Democratic Republic of Congo (*A. Léonard* 3872). He recognised them as different from all species described so far in the genus, and gave them the provisional names of *Oxyanthus* sp. B and *Oxyanthus* sp. C, respectively. A reexamination of these specimens shows that they belong to the same taxon, which is also represented by three collections from Gabon, discovered since. Although mature flowers of this taxon are still unknown, the shape of the flower buds and the striated seed coat clearly place it in *Oxyanthus*. It is also quite distinct from other *Oxyanthus* species, particularly in the unusual shape of its fruits. Accordingly, we here describe this plant as a new species, *O. lewisii* Sonké & O. Lachenaud.

Material and methods

Herbarium material of *Oxyanthus* was consulted at BR, BRLU, P, WAG and YA. Measurements, colours and other details given in the descriptions are based on herbarium specimens and data derived from field notes. The distribution map was done using georeferenced specimen data derived from labels or available literature. Phytogeographical considerations follow WHITE (1979) although we simplify his “subcentres of endemism” into Domains. The conservation status was assessed by calculating the extent of occurrence (EOO) and the area of occupancy (AOO) using the GeoCAT tool (BACHMAN et al., 2011) and applying the IUCN Red List Categories and Criteria (IUCN, 2012; IUCN SPS, 2015).

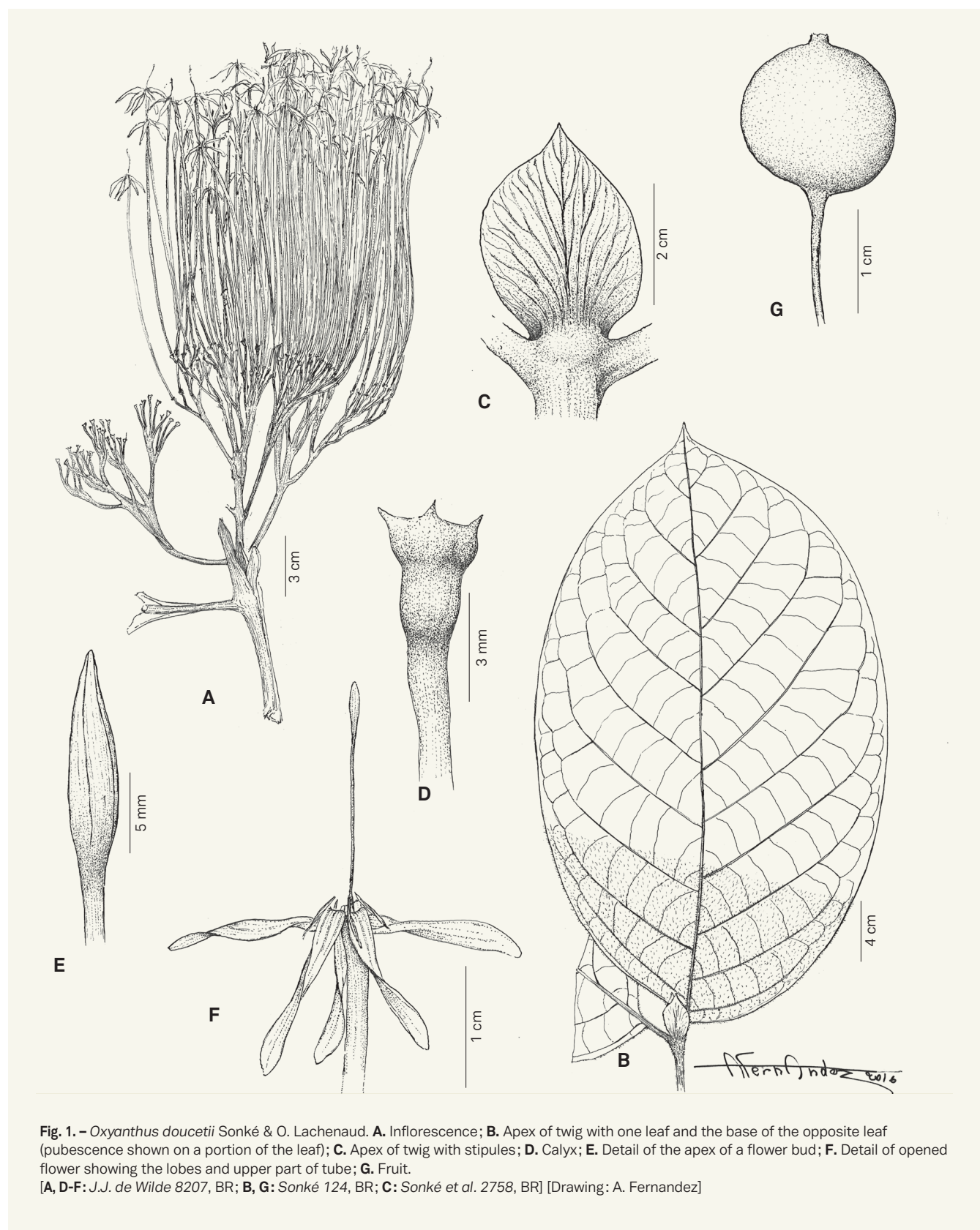
Taxonomic treatment

Oxyanthus doucetii Sonké & O. Lachenaud, **spec. nova** (Fig. 1).

Typus: CAMEROON. **South Region:** 16 km on the road from Ebolowa to Minkok, 2°58'N 11°17'E, 28.IV.1975, fl., *De Wilde* 8207 (holo-: BR!; iso-: P [P04006788]!, WAG [WAG.1228575, WAG.1228576, WAG.1228577]!, YA!).

Oxyanthus doucetii Sonké & O. Lachenaud closely resembles *O. unilocularis* Hiern in the large and broad asymmetrical leaves with sparsely pilose lower surface, and the many-flowered inflorescences with long corollas. The species differs from *O. unilocularis* in the minute calyx teeth (<0.3 mm long), the stems with glabrous internodes, the stipules glabrous except sometimes on their margin, the flower buds with a shorter head 8.5–11 mm long, and the corolla lobes not or hardly acute at apex; by contrast, *O. unilocularis* has well-developed subulate calyx teeth 1.5–10(–14) mm long, densely puberulous stems and stipules, the head of the flower buds 12–25 mm long, and the corolla lobes sharply acute at apex.

Shrub or small tree, 2–10 m tall, with horizontal branches; stems hollow, 7–14 mm thick, glabrous or with short sparse hairs at the nodes only. *Stipules* 23–48 × 16–25 mm, broadly mitriform with ± acute apex, glabrous or sparsely ciliate, persistent (except at flowering nodes, where often caducous). *Leaves* with petiole 0.5–1.5 cm, glabrous or with short sparse hairs, and leaf blades 34–60 × 18–30 cm, very broadly elliptic, strongly asymmetrical at base with proximal side rounded to cordate and distal side acute to obtuse inserted 5–12 mm higher, acute or shortly acuminate at apex, glabrous above, sparsely pilose below with ± scabrid erect hairs 0.7–1 mm long; lateral nerves 12–13 pairs, strongly ascending (except the lower ones) and forming loops well away from the margin; tertiary veins laxly reticulate; domatia absent. *Inflorescences* pseudo-axillary, one per branch and per season, corymbiform, glabrous, with several hundred flowers but usually producing



only few fruits; peduncle 0.6–1.5 cm long, rhachis 5–10.5 cm long, lateral branches 1.5–4 cm long. *Bracts* minutely triangular, < 1(–1.5) mm, glabrous. *Flowers* 5-merous; pedicels 2–8 mm long, glabrous. *Ovary* 1.5–2 mm long, glabrous. *Calyx* with tube 0.7–1 mm long and minute, acutely triangular teeth 0.2–0.3 mm long, entirely glabrous. *Corolla* tube pale green, very narrowly cylindrical, 12.2–13.7 cm long \times c. 0.2 cm wide, glabrous; corolla lobes white, lanceolate, obtuse or only faintly acute at apex, 1.2–1.7 cm long \times 0.25–0.3 cm wide, glabrous outside, shortly papillose inside. *Anthers* exserted, \pm patent, inserted at the corolla throat, linear, 3–5 \times 0.5 mm including a sterile apical appendage 0.5–1 mm long, glabrous. *Style* exserted, exceeding corolla throat by 1.5–2 cm, glabrous, with slightly swollen elongated stigma. *Fruits* green, smooth, ovoid to globose, 1.3–2.7 \times 1.4–2 cm when dry, glabrous, with pedicel not markedly accrescent and calyx persistent. *Seeds* numerous, irregularly polygonal and compressed, c. 9 \times 5 mm, the surface folded into numerous closely parallel ridges.

Etymology. – The species name honours Prof. Jean-Louis Doucet, specialist in tropical forestry (Université de Liège, Gembloux Agro-Bio Tech, Belgium), to whom the first author is particularly indebted for his constant support.

Distribution and ecology. – *Oxyanthus doucetii* is endemic to Cameroon in the Lower Guinea Domain (Fig. 2), and is found mostly in the Central Region around Yaoundé, more rarely in the southwest (Mt. Cameroon) and South Regions (around Bipindi and Ebolowa). The species occurs in primary and secondary forests between 480 and 760 m.

Phenology. – Flower buds in October–November, mature flowers in April; fruits in March, June–July (immature) and from September to December.

Conservation status. – The EOO is estimated as c. 35,435 km² and AOO as 44 km². The species is known from nine locations. None of these locations are protected, and

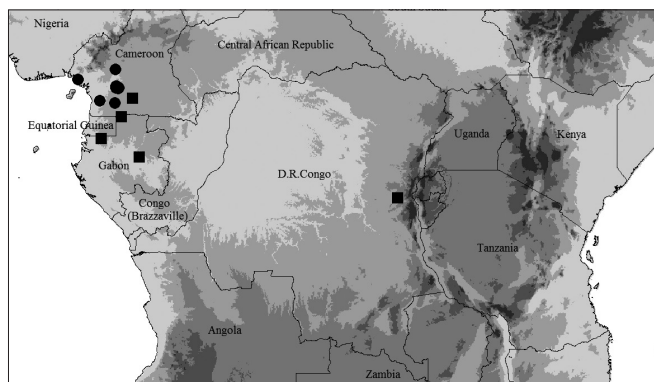


Fig. 2. – Distribution of *Oxyanthus doucetii* Sonké & O. Lachenaud (circles) and *O. lewisii* Sonké & O. Lachenaud (squares).

deforestation for agriculture (and also for urban extension in the periphery of Yaoundé) represents a clear threat to the species. A decline in AOO, extent and quality of habitat, number of locations and number of individuals is therefore expected, and *O. doucetii* is assigned a preliminary conservation status of “Vulnerable” [VU B2ab(i,ii,iii,iv)].

Notes. – As mentioned above, *O. doucetii* has previously been confused with the morphologically similar, and presumably closely related, *O. unilocularis*. It differs from the latter in having minute calyx teeth (<0.3 mm long), the stems with glabrous internodes, the stipules glabrous except sometimes on their margin, the flower buds with a shorter head 8.5–11 mm long, and the corolla lobes not or hardly acute at apex (compare Fig. 1 and 3). Additionally, *O. doucetii* tends to have larger and broader stipules (23–48 \times 16–25 mm) than *O. unilocularis* (7–35 \times 4–22 mm), but this character shows significant overlap between the two species. The stipules of *O. doucetii* are the largest in the genus.

Two sterile collections from Mt Kolodom near Yaoundé, *Sonké 120* & *121* (BR), are intermediate between *O. doucetii* and *O. unilocularis* in vegetative characters. The internodes are very sparsely pubescent, often only towards the apex, and the stipules are pubescent only at the base and margins. In the absence of fertile material, these collections cannot be referred with certainty to either species; they may represent hybrids, since both species are found in the region.

Paratypes. – **CAMEROON. Central Region:** Yaoundé, NE, 1939, fl. buds, *Jacques-Félix 4799* (BR); Nkolakié, 3°57'N 11°21'E, VII.2010, fr. imm., *Kayo 1* (BR); *ibid. loc.*, 4.V.2003, fl. (fallen), *Nguembou & Djuikouo 665* (BRLU); *ibid. loc.*, 8.VI.2003, fl., *Nguembou & Djuikouo 796* (BR, BRLU); Mont Kala, 3°53'N 11°30'E, 5.V.2004, fl. buds, *Nguembou et al. 1202* (BR, BRLU); Mont Ngoa Ekele [3°51'N 11°24'E], 4.XII.1986, fr., *Sonké 43* (BR, YA); Mt Akon-doué [3°50'N 11°29'E], 23.IV.1987, fl. buds, *Sonké 95* (BR, K, YA); *ibid. loc.*, 29.IX.1987, fr., *Sonké 116* (BR, WAG); *ibid. loc.*, 31.X.1987, fl. buds & fr., *Sonké 117* (BR); Mt Kala, 14.XI.1987, fr., *Sonké 123* (BR, YA); *ibid. loc.*, same date, *Sonké 124* (BR, YA); Mt Kolodom, [3°51'N 11°22'E], 23.IV.1988, fl., *Sonké 141* (BR, YA); Nkolfép, Massif du Mbaminkom, 3°58'N 11°23'E, 3.III.2002, fr., *Sonké, Nguembou & Djuikouo 2758* (BR, BRLU); Ndjamtchourou (Ngoro), 4°57'N 11°20'E, 20.VII.2009, fr. imm., *Sonké & Simo 5297* (BR). **South Region:** Bipindi, 3°5'N 10°24'E, 26.XI.2004, fl. buds & fr., *Sonké & Nguembou 3598* (BR). **Southwest Region:** env. du village Efolofo, pentes septentrionales du Mt Cameroun, 4°21'N 9°7'E, 1.VI.1976, fr. imm., *Satabié 300* (BR, P, YA).

***Oxyanthus lewisii* Sonké & O. Lachenaud, spec. nova** (Fig. 4, 5).

– *Oxyanthus* sp. B, sp. C in SONKÉ (1999: 97, 98).

Typus: CAMEROON. **East Region:** près Mekomo, 8 km SW confluent Dja et Lobo, [3°14'N 12°22'E], 19.III.1962, fl. buds & fruits, *Letouzey 4585* (holo- : BR [BR880499]!; iso- : BR [BR880466, BR880508]!, P [P03907844]!, YA!).

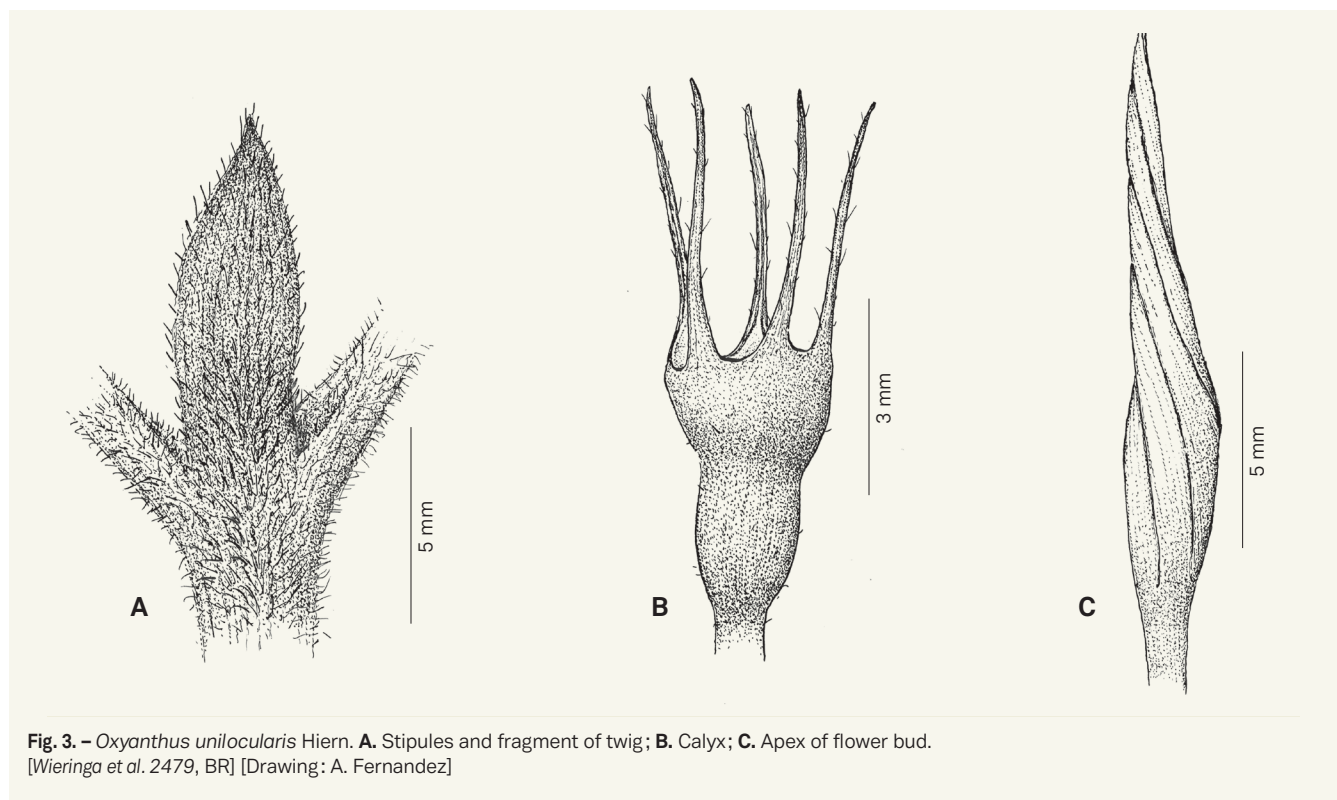


Fig. 3. – *Oxyanthus unilocularis* Hiern. **A.** Stipules and fragment of twig; **B.** Calyx; **C.** Apex of flower bud. [Wieringa et al. 2479, BR] [Drawing: A. Fernandez]

Oxyanthus lewisii Sonké & *O. Lachenaud* has fusiform fruits, resembling those of *O. robbrechtianus* Sonké, *O. dubius* De Wild. and *O. speciosus* DC. subsp. *stenocarpus* (K.Schum.) Bridson, but more narrowly pointed at apex than in these species. It further differs from *O. dubius* by the shorter calyx teeth (0.4–0.6 mm, not 3–4 mm) and bracts (1.5–2 mm, not 5–8 mm), from *O. speciosus* subsp. *stenocarpus* by the shorter and few-flowered inflorescences, and from both by the nerves sparsely hairy beneath and lacking domatia in their axils. From *O. robbrechtianus*, it also differs in the glabrous twigs and outside of corolla, the leaves symmetrical at base, and the orange (not red) fruits without longitudinal ridges.

Shrub 1–2 m tall, with horizontal branches; stems glabrous. *Stipules* 4.5–12 × 2.5–7 mm, narrowly ovate with acute apex, glabrous, persistent. *Leaves* with petiole 0.4–1.2 cm long, glabrous to sparsely pubescent, and leaf blade 9–18.5 × 1.9–8.5 cm, elliptic or elliptic-oblong; cuneate at base, acuminate at apex, glabrous above, sparsely and shortly pubescent on the midrib and lateral nerves beneath; lateral nerves 5–9 pairs, moderately to strongly ascending; tertiary veins rather densely reticulate; domatia absent. *Inflorescences* pseudo-axillary, one per branch and per season, very shortly paniculate, < 1.3 cm long, glabrous, with 5–14 flowers (usually producing 1–3

fruits); peduncle absent or very short (to 0.2 cm), rachis < 1.1 cm. *Bracts* subulate, 1.5–2 mm long, ciliate. *Flowers* 5-merous; pedicels 1–2 mm long, glabrous. *Ovary* 1–1.3 mm long, glabrous. *Calyx* with tube c. 1 mm long and short subulate teeth 0.4–0.6 mm, entirely glabrous. *Corolla* only known in very young bud stage, c. 0.65 cm long; tube cylindrical, glabrous, c. 0.15 cm long; lobes narrowly lanceolate, c. 0.5 cm long × 0.1 cm wide, glabrous on both sides. *Anthers* smooth, linear, 3.6–4 × 0.1 mm, including a sterile apical appendage ± 1 mm long. *Style* ± 6 mm long, with a slightly swollen elongated stigma ± 2 mm long. *Fruits* orange, fusiform, smooth or slightly rugose but without longitudinal ridges, 3.8–6.5(–8) × 0.5–1.5 cm, gradually pointing into a narrow beak (0.2–0.4 cm wide at apex), glabrous, with accrescent pedicel 0.5–1 cm long and calyx usually deciduous. *Seeds* numerous, compressed, irregularly ellipsoid, 6–7 × 3–5 mm, the surface folded into numerous closely parallel ridges.

Etymology. – This species is named after Prof. Simon Lewis, internationally renowned British ecologist (Chair in Global Change Science, Department of Geography, University College London) who made several expeditions in Cameroon with the first author, and constantly supported his research.



Fig. 4. – *Oxyanthus lewisii* Sonké & O. Lachenaud. **A.** Fruiting branch; **B.** Stipules and young inflorescence; **C.** Detail of lower leaf surface; **D.** Fruit; **E.** Seed.

[**A:** Dauby et al. 2293, BRLU; **B-E:** Letouzey 4585, BR] [Drawing: A. Fernandez]



Fig. 5. – Fruiting stem of *Oxyanthus lewisii* Sonké & O. Lachenaud.
[Photo: Gilles Dauby]

Distribution and ecology. – *Oxyanthus lewisii* is sparsely distributed in southern Cameroon, northern Gabon, and eastern D.R. Congo in the Lower Guinea and Congolian Domains (Fig. 2). It appears to have a widely disjunct range, with a gap of over 1,000 km between the D.R. Congo locality and the rest of the range; similar disjunctions are known in other species, e.g. in *Chassalia pleuroneura* (K. Schum.) O. Lachenaud (LACHENAUD & JONGKIND, 2010). The species is apparently rare; it occurs in lowland forest between 380 and 750 m, at least sometimes in riverine or periodically inundated formations.

Phenology. – Flower buds in March; fruits from December to April.

Conservation status. – The EOO is estimated at c. 371,433 km² and the AOO as 20 km². The species is known from five locations, none of which are protected. Logging activities and deforestation for agriculture (and also for mining in the eastern part of its range) represent potential threats to the species. A decline in AOO, extent and quality of habitat, number of locations and number of individuals may therefore be expected, and *Oxyanthus lewisii* is assigned a preliminary conservation status of “Vulnerable” [VU B2ab(ii,iii,iv,v)].

Notes. – *Oxyanthus lewisii* is remarkable by the long fusiform fruits, which are somewhat variable in shape, being particularly narrow in *Letouzey* 4585 and *Le Testu* 9033,

but distinctly broadened in the middle in *Dauby et al.* 2293. The only other taxa with fruits approaching in shape those of *O. lewisii*, although not so pointed at apex, are *O. robbrechtianus* Sonké, *O. dubius* De Wild. and *O. speciosus* subsp. *stenocarpus* (K. Schum.) Bridson. *Oxyanthus lewisii* differs from *O. dubius* by the shorter calyx teeth and bracts, from *O. speciosus* subsp. *stenocarpus* by the shorter and few-flowered inflorescences, and from *O. robbrechtianus*, it also differs in the glabrous twigs and outside of corolla, the symmetrical leaf base, and the fruits lacking longitudinal ridges. *Oxyanthus speciosus* subsp. *stenocarpus* also has a different habitat (submontane forests, 1000–2000 m).

In the absence of fruits, *O. lewisii* might be confused with *O. gracilis* K. Schum., *O. pallidus* Hiern and *O. subpunctatus* (Hiern) Keay, all of which have the leaves fairly similar in size and shape, but either entirely glabrous beneath (*O. pallidus*) or pubescent only on the nerve axils (*O. gracilis* and *O. subpunctatus*).

Paratypes. – **GABON. Estuaire:** Parc des Mts de Cristal, région d’Akoga, 0°51’50”N 10°29’53”E, 13.XII.2015, fr., *Boupoya* & *Issembé* 1211 (BRLU). **Ogooué-Ivindo:** Concession CEB, N de la Zone de Milolé, 2°14’55”S 12°44’19”E, 12.II.2010, fr., *Dauby et al.* 2293 (BRLU). **Woleu-Ntem:** Aloum [2°09’N 11°42’E], 14.III.1933, fr., *Le Testu* 9033 (BR). **D.R. CONGO. South Kivu:** Kingulube [2°39’S 28°02’E], fr., 15.IV.1959, *A. Léonard* 3872 (BR).

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