The LINNEAN SOCIETY of London BOTANICAL Journal of the Linnean Society

*Botanical Journal of the Linnean Society*, 2012, **169**, 530–554. With 13 figures

# A reconsideration of the Lower Guinean species of *Sericanthe* (Rubiaceae, Coffeeae), with four new species from Cameroon and Gabon

BONAVENTURE SONKÉ[1,2,3]*, HERMANN TAEDOUMG[1] and ELMAR ROBBRECHT[4]

[1]*Plant Systematic and Ecology Laboratory, Higher Teachers Training College, University of Yaounde I, PO Box 047, Yaounde, Cameroon*
[2]*Service d'Evolution Biologique et Ecologie, CP 160/12, Université Libre de Bruxelles, 50 Avenue F. Roosevelt, BE-1050 Bruxelles, Belgium*
[3]*Missouri Botanical Garden, Africa & Madagascar Department, PO Box 299, St. Louis, MO 63166-0299, USA*
[4]*National Botanic Garden of Belgium, Domein van Bouchout, BE-1860 Meise, Belgium*

*Received 26 September 2011; revised 16 November 2011; accepted for publication 23 February 2012*

The genus *Sericanthe* was established and its species were revised 30 years ago by one of the authors. Intensive recent botanical collecting in Lower Guinea (mainly southern Cameroon, Equatorial Guinea and Gabon) has made a reconsideration of species in this area necessary. Revision of the newly collected Lower Guinean herbarium specimens of *Sericanthe* (twice as many as were available at the time of the first revision) has brought four new species to light, namely ***S. gabonensis*** and ***S. mpassa*** from Gabon, ***S. lowryana*** from Cameroon and ***S. rabia*** from Cameroon and Gabon. Distributional data are much augmented, and distributional maps of all species from the area are provided. Four species were reported to be newly recorded for at least one country. The occurrence of the novelties in the main diversity centre of the genus is discussed in the context of the chorology of the entire genus *Sericanthe*. A first estimation of the conservation status for the new species is given. A synopsis of the genus *Sericanthe* in Lower Guinea with a taxonomic key is provided.  *Botanical Journal of the Linnean Society*, 2012, **169**, 530–554.

ADDITIONAL KEYWORDS: conservation status – Lower Guinean Domain.

## INTRODUCTION

*Sericanthe* Robbr. is restricted to the tropics of the African mainland (Robbrecht, 1978a, 1981a). On its recognition, it was placed in Coffeeae, a placement accepted today on molecular evidence (Davis *et al*., 2007; Tosh *et al*., 2009), despite *Sericanthe* and many other relatives of *Tricalysia* A.Rich ex DC. having been transferred to Gardenieae–Diplosporinae in the 1980s and 1990s (for a survey, see Robbrecht & Manen, 2006: 109 & table 2). The habit of a coffee shrub (plagiotropic lateral branches with sessile axillary inflorescences paired at the nodes) and contorted corolla aestivation make Coffeeae immediately recognizable. *Sericanthe* also exhibits the other morphological characteristics of Coffeeae (Davis *et al*., 2007: 321), namely sheathing stipules, bracteoles and bracts fused into calyx-like cup-shaped structures ('calyculi'), anthers exserted from the narrow corolla tube, style two-lobed and bilocular ovaries with axile placentation. *Sericanthe* is, however, easily distinguished from the other members of the tribe by the unique type of anther [(sub)sessile, basifixed and with a much widened and flattened connective] and the relatively large pleiomerous flowers covered with a silky hairiness. It further deviates from all other members of Coffeeae in having the embryo radicle in a lateral, rather than an inferior, position. In addition, many species have a peculiar type of calyx, completely covering the corolla in the late bud stage

*Corresponding author. E-mail: bsonke_1999@yahoo.com

and becoming longitudinally fissured by the force of the opening corollas. Furthermore, most *Sericanthe* spp. have bacterial galls in the leaf blades, a feature only known from two other genera of Rubiaceae: *Pavetta* L. (Pavetteae) and *Psychotria* L. (Psychotrieae).

The monophyly of *Sericanthe* as originally circumscribed (Robbrecht, 1978a) and its division into two subgenera *Sericanthe* and *Macrocarpus* (Robbrecht, 1981a) have been corroborated recently by molecular data (Davis *et al*., 2007; Lemaire *et al*., 2011). However, molecular sampling is limited to six species only, and the first branching position of an imperfectly known species in the 2011 study casts some doubt on the recognition of the subgenera.

*Sericanthe* was recognized and its species were revised 30 years ago by the third author of this article (Robbrecht, 1978a, 1981a, 1988). The treatment in *Flora Zambesiaca* (Bridson, 2003) is the only later and purely floristic publication on the genus; it recognized four additional informal taxa ('Nyanga taxon', etc.), mainly based on Zambezian specimens left in an uncertain position by Robbrecht. Since then, intensive botanical exploration has been undertaken in the Lower Guinea area, which is also the main centre of diversity for the genus. This was performed mainly by botanists working in the herbaria BR, BRLU, K, LBV, WAG and YA (Cheek *et al*., 2004; Droissart, Sonké & Stévart, 2006; Sonké *et al*., 2008a; Sonké, Djuikouo & Robbrecht, 2008b; Droissart *et al*., 2009a, b, 2011, 2012; Sonké, Simo & Dessein, 2009; Dessein, Lachenaud & Sonké, 2011). Routine identifications of material in *Sericanthe* proved to be difficult and often ended in uncertain identifications. However, many new distributional data were added. It was therefore decided to revise the species represented in Lower Guinea (mainly southern Cameroon, Equatorial Guinea and Gabon). As a result, four new species were discovered. They are here formally treated in the taxonomic part, which also includes a key for Lower Guinea and assembles any novel data obtained from this revision. Two other novelties represented by specimens insufficient for formal description are reported from Cameroon and Gabon; here, we include these species under the informal names *Sericanthe* 'Djidji' and *Sericanthe* 'Rumpi'.

## MATERIAL AND METHODS

Herbarium material of *Sericanthe* was consulted at BR, BRLU, K, P, WAG and YA (herbarium abbreviations according to Holmgren, Holmgren & Barnett, 1990). Specimen data were entered and exported from the BR database BG-BASE (ver. 6.8). Georeferencing and mapping of specimen data (Figs 1, 3, 4, 7, 8, 10, 11, 13) were performed using ESRI ArcMap 9.1 and ArcCatalog 9.1; the geographical coordinate system used was GCS Assumed Geographic 1 and a Datum of D North American 1927.

Measurements, colours and other details given in the descriptions are based on living material, spirit and herbarium specimens and data derived from field notes. The chorological part follows White (1979, 1983, 1993), but simplifies his chorological categories ['regional (sub)centre of endemism' and other] into region and domain. The conservation status was assessed by calculating the extent of occurrence or the area of occupancy using a GIS and applying the International Union for the Conservation of Nature (IUCN) Red List Category criteria (IUCN, 2001) and guidelines (IUCN, SSC, 2010).

### CHOROLOGY

Lower Guinean species are rare and were seen during our field work mostly as isolated shrubs or trees, the imperfectly known 'Rumpi' being an exception that was found as a population of many individuals. Zambezian and Sudanian taxa, in contrast, are more common. This rarity makes it unsurprising that we have, at present, a much better view of the distribution of the Lower Guinean taxa relative to the maps published earlier (Robbrecht, 1978b). For the 1978 monograph of the genus and the then prepared maps, only 41 Lower Guinean specimens were available; since then, 67 more specimens have been collected as a result of the intense exploration of this floristically richest part of tropical Africa.

Robbrecht's (1978a: 26) chorological characterization of the genus *Sericanthe* was written before White's phytogeographical framework for tropical Africa was fully elaborated (see White, 1993). It is therefore necessary to characterize *Sericanthe* here in view of the more recent phytogeographical knowledge. *Sericanthe* (Fig. 1, Table 1) is an Afrotropical genus. The genus is remarkable in consisting of species endemic in the sense of White (1993), i.e. restricted to a single phytochorion. There are no pluriregional species or linking elements *sensu* White, the sole exception being the Lower Guinean *S. testui* (N.Hallé) Robbr. recorded from a single outpost in the Congolian Domain.

Most species inhabit rain forests and are confined to the Guineo-Congolian (12 species) and Afromontane (eight species) Regions. The greatest species diversity of *Sericanthe* is in the Lower Guinean Domain of the Guineo-Congolian Region; here, 11 accepted species are recorded if we also count *S. raynaliorum* (N.Hallé) Robbr., which occurs in the transition zone between the Lower Guinean and Sudanian phytochoria.

In the Congolian Domain, the genus is absent from the lowermost part of the Congo Basin, i.e. the low-

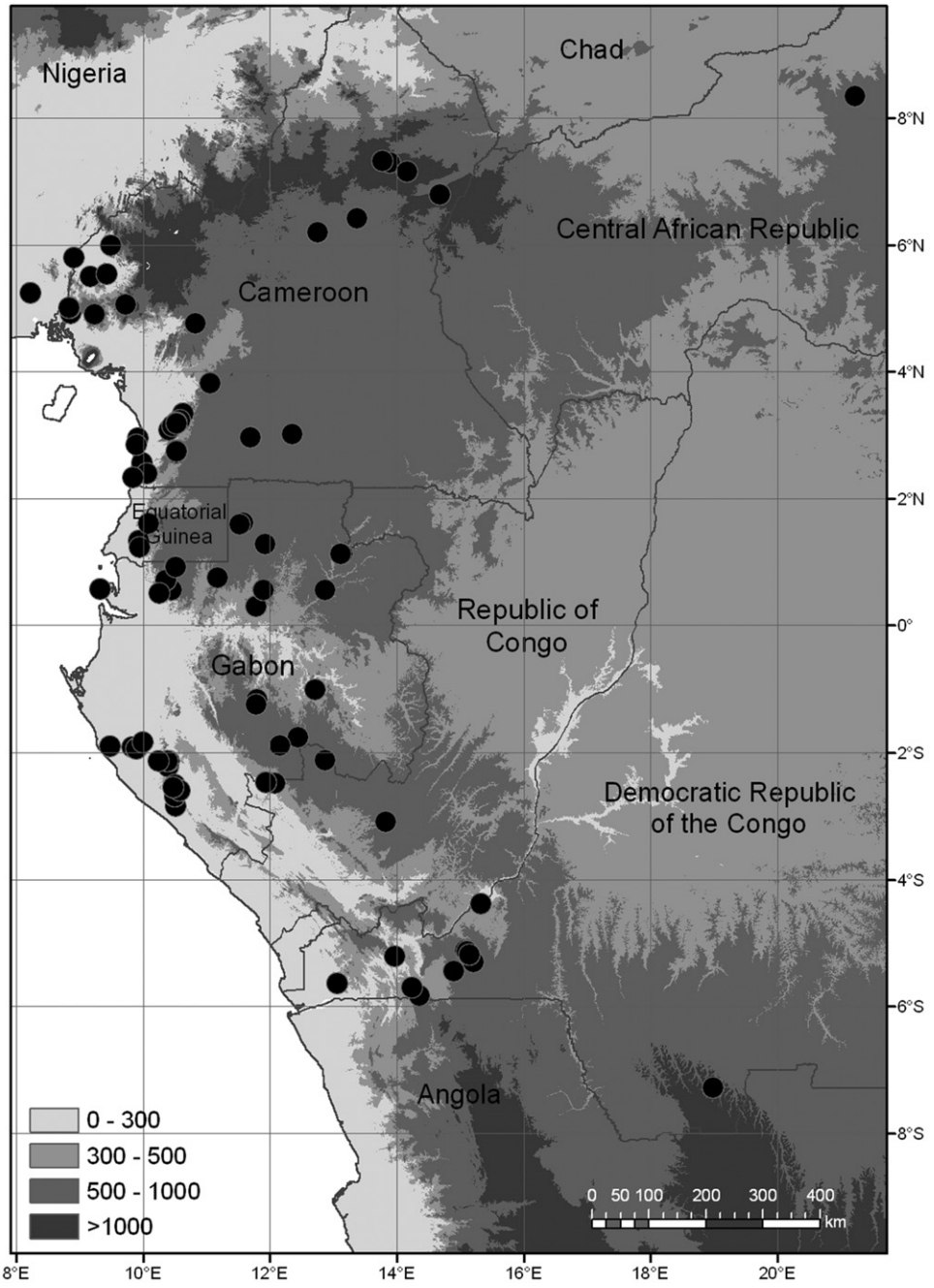


**Figure 1.** Distribution of *Sericanthe*, shown on an orographic map of the Lower Guinea Domain. The distant record in the southeast of the map (RD Congo record of *S. testui*) lies in the Congolian Domain.

lands (<50 m) bounded to the north by the Congo River. This chorological pattern is well known from many species, e.g. *Lindackeria poggei* (Gürke) Gilg. (Bamps, 1975), *Dichapetalum zenkeri* Engl. (Breteler, 1984) and *Pouzolzia guineensis* Benth. (Wilmot-Dear & Friis, 2006). At the generic level, such a 'pericongolian' distribution is apparently rare; the small genus *Parapentas* Bremek. (Rubiaceae; Robbrecht, 1981c) seems to be another case. This absence from lowland areas is also seen in the Lower Guinean Domain (Fig. 1). The genus mainly occurs at mid-altitudes and is almost absent from Nigeria [a single record of *S. auriculata* (Keay) Robbr. being located in the east of this country]. The lowland species

**Table 1.** Chorology of *Sericanthe*

| | | |
|---|---|---|
| Guineo-Congolian Region | Upper Guinea Domain | *S. toupetou* |
| | | *S. trilocularis* |
| | Lower Guinea Domain | *S. auriculata* |
| | | ***S. gabonensis*** |
| | | *S. jacfelicis* |
| | | ***S. lowryana*** |
| | | ***S. mpassa*** |
| | | *S. pellegrinii* |
| | | *S. petitii* |
| | | ***S. rabia*** |
| | | *S. raynaliorum** |
| | | *S. roseoides* |
| | | *S. testui* |
| | | ***S. 'Djidji'*** |
| | | ***S. 'Rumpi'*** |
| | Congolian Domain | An imperfectly known species (Yangambi) |
| Afromontane Region | West African Domain | *S. adamii* |
| | Kivu-Ruwenzori Domain | *S. burundensis* |
| | | *S. halleana* |
| | | *S. leonardii* |
| | Uluguru-Mlanje Domain | *S. odoratissima* |
| | Chimanimani Domain | Nyanga taxon† |
| | | Chimanimani taxon† |
| Sudanian Region | | *S. chevalieri* |
| Zambezian Region | | *S. andongensis* |
| | | *S. suffruticosa* |
| | | Chipinge taxon† |
| | | Zambesia taxon† |

Novelties recognized here given in bold.
*In transition zone between Guineo-Congolian and Sudanian Regions.
†Taxa provisionally recognized by Bridson (2003).

*S. gabonensis* Sonké & Robbr., sp. nov., is the main exception to this pattern.

The numbers of species in the drier parts of Africa are restricted. Four occur in the Zambezian Region, and only one occurs in the Sudanian Region.

## TAXONOMIC PART

The taxonomic part includes the treatment of the novelties recognized here. A short treatment of the other Lower Guinean species (including one species from the transition zone with the Sudanian Region) mainly reports changes in taxonomic or chorological knowledge since Robbrecht's (1978a, 1981a) revision. Specimens that were already cited in that revision are marked with an asterisk before the collector's name. The two Congos are distinguished as R Congo (République du Congo, 'Congo Brazzaville') and RD Congo (République Démocratique du Congo, 'Congo Kinshasa').

### *SERICANTHE* ROBBR.

*Description:* Shrubs or small trees (one geofrutescent species outside Lower Guinea). Leaves often with domatia as small tufts of hairs without excavation; bacterial galls often present on the underside of the blade, either along the midrib and down to the petiole, or scattered on the secondary and intersecondary veins; stipules sheathing, overtopped by two or four awns, with silky hairs and colleters inside. Inflorescences axillary and paired at the nodes, pauciflorous. Flowers (penta) hepta–octo (–nono)-merous, subtended by bracts and bracteoles fused into two to four cupular, unequally awned calyculi. Calyx ellipsoidal in bud, either open at tip and truncate or closed and completely covering the corolla bud, then deeply splitting at anthesis. Corolla white, salver-shaped, usually with silky indumentum outside; lobes spreading, contorted to the left. Stamens inserted at the throat; anthers (sub-)sessile, basifixed with broadly flattened connective. Ovary inferior, bilocular, crowned by an annular disc; locules each with a pendulous placenta attached at the top of the septum. Style two-lobed, exserted. Fruits mostly orange, sometimes red, bilocular, endocarp papery. Seeds one to four per chamber; seed coat striate, brown; hilar scar apical-adaxial, with a diameter of about half of the seed height; endosperm horny, entire; embryo attaining half the diameter of the seed, with radicle in lateral or rarely (*S. gabonensis*) almost superior position.

## SURVEY OF LOWER GUINEAN SPECIES

### SUBGENUS *SERICANTHE*

*Description:* Stipules shortly sheathing, with triangular limb overtopped by two awns. Leaf blades cuneate, rarely rounded, tertiary veins reticulate or, more rarely, parallel to one another, then only a low number of veins between two secondary veins. Placentas with (one) two ovules. Fruits almost spherical, 1–2 cm in diameter. Seeds with a large elliptic hilar scar, lying free or rarely partly covered by an arilloidal outgrowth of the placenta, either one per locule, hemispherical or two per locule and shaped like a quarter of a sphere.

*1.* ***Sericanthe gabonensis*** *Sonké & Robbr.,* ***sp. nov.*** *(Fig. 2)*

*Type:* Gabon, at logging site of CBG, *c*. 5 km beyond checkpoint Divangui (01°50′S, 10°00′E), 29.xi.1990, *van Nek* 145 (holotype: WAG 014440).

KEY TO SPECIES

1. Base of leaf blades cuneate or rarely rounded; fruits with one or two seeds in each locule (subgenus *Sericanthe*)....2
1*. Base of leaf blades cordate; fruits with three to five seeds in each locule (subgenus *Macrocarpus*) (Nigeria, Cameroon, Equatorial Guinea, Gabon)....11. *S. auriculata*
2. Intersecondary veins very apparent, forming a dense pattern of parallel veinlets perpendicular to the midvein (Cameroon)....13. *S.* 'Rumpi'
2*. Intersecondary veins, if parallel to one another, then not very obvious, with a maximum of ten veinlets in between two secondary veins....3
3. Bacterial galls numerous, situated on the intersecondary veins....4
3*. Bacterial galls few and along the midvein, or difficult to observe or absent....7
4. Bacterial galls linear and often branched; young twigs glabrous; fruit diameter < 10 mm (RD Congo)..9. *S. roseoides*
4*. Bacterial galls punctiform; young twigs pubescent; fruit diameter > 10 mm....5
5. Leaf blades velutinous beneath, i.e. the hair covering of the intersecondary areas dense, each hair being touched by another (Gabon)....12. *S.* 'Djidji'
5*. Leaf blades underneath with hairs concentrated on the mid- and secondary veins, the intersecondary areas only sparsely covered....6
6. Leaf blade covered with long erect hairs on both sides (Cameroon)....3. *S. lowryana*
6*. Leaf blade covered with shorter appressed to rarely erect hairs, above only on the mid- and secondary veins (Gabon)....6. *S. petitii*
7. Leaf blades velutinous underneath (Cameroon, R Congo, RD Congo)....*5. S. pellegrinii*
7*. Leaf blades glabrous or more inconspicuously hairy underneath....8
8. Domatia present....9
8*. Domatia absent....10
9. Petiole > 7 mm long; inflorescences with two to five flowers; total length of flowers 12–14 mm; calyx in bud stage 'open' (±truncate; showing the tip of the corolla bud); style glabrous (Cameroon, Central African Republic)....8. *S. raynaliorum*
9*. Petiole < 7 mm long; inflorescences one- or two-flowered; total length of flowers 9–11 mm; calyx in bud stage 'closed' (±ellipsoidal; surrounding and hiding the tip of the corolla bud); style pubescent (Cameroon, Gabon, RD Congo)....10. *S. testui*
10. Leaf blades small, 7–12(–15) × 2.2–6.0 cm, with petioles 8–12 mm long....11
10*. Leaf blades large, (11–)13–27 × 3.5–10.0 cm, with petioles 9–30 mm long....12
11. Young twigs and leaf veins below pubescent, the pubescence extending to the blade below in the young stage; calycular appendages triangular; style hairy; leaf blades with (five) seven to nine lateral veins on each side of the midrib (Cameroon, Gabon)....7. *S. rabia*
11*. Young twigs and leaf veins below glabrous (but margin and veins below hairy at very young stages); calycular appendages filiform; style glabrous; leaf blades with four to six lateral veins on each side of the midrib (Gabon)....4. *S. mpassa*
12. Leaf blades obovate or elliptic, 2.2–2.7(–2.9) times longer than wide, with five to seven secondary veins on each side of midrib; acumen 9–10 mm; style glabrous (Cameroon, Equatorial Guinea, Gabon, R Congo)....2. *S. jacfelicis*
12*. Leaf blades narrowly obovate, more rarely narrowly elliptic, (2.4–)3.0–4.1 times longer than wide, with seven to ten secondary nerves on each side of midrib; acumen 13–20 mm long; style hairy (Gabon)....1. *S. gabonensis*

*Diagnosis: Quoad partes vegetativas et fructus magnos* Sericanthae jacfelicis *similis sed foliorum laminis angustioribus et florum stylis pubescentibus differt; quoad fructuum fabricam* Sericanthae pellegrinii *affinis, sed ab illa partibis vegetativis omnino glabris differt; praeterea foliorum laminis usque ad 26 cm longis anguste obovatis ellipticisve, nervis secundariis prominentibus praeditis, bene distinguitur.*

*Description:* Shrub or treelet 2–5 m high; young twigs glabrous. Stipular sheath *c.* 2 mm long, glabrous, overtopped by awns 1–2 mm long. Leaves: petiole 9–17 mm long, glabrous; blades obovate or, more rarely, elliptic, 10.8–26.3 × 3.4–7.1 cm, acuminate (acumen 13–20 mm long) and cuneate, glabrous; secondary veins prominent, seven to ten on each side of the midrib; tertiary veins reticulate; bacterial galls

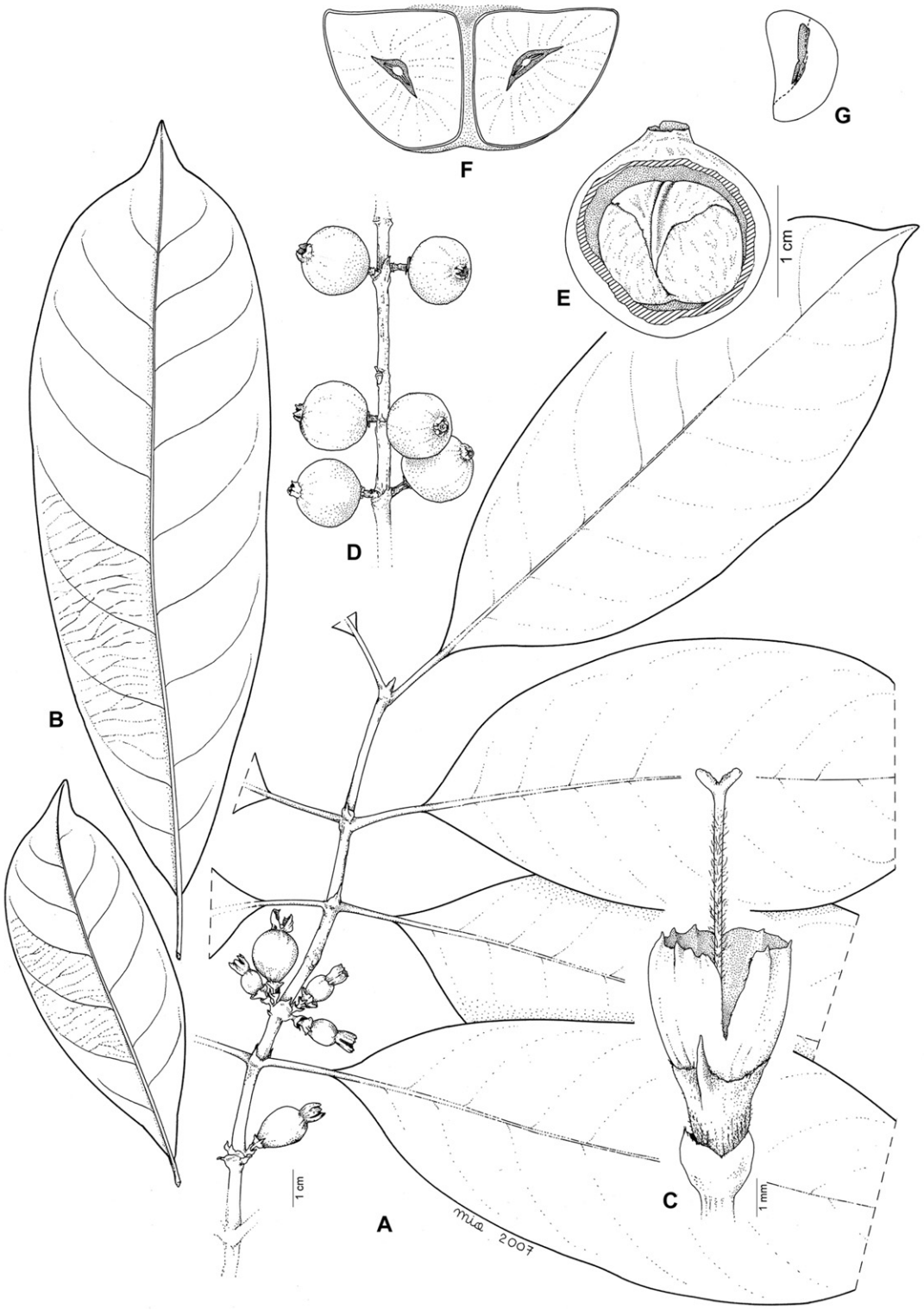


**Figure 2.** ***Sericanthe gabonensis*** Sonké & Robbr. A, Branch with young fruits. B, Leaves showing venation pattern above (scale as A). C, Flower parts, from base to top: two calyculi (surrounding the ovary), calyx with artificial split, style. D, Mature fruits (scale as A). E, Fenestrated fruit showing two seeds surrounded at the base by an arilloid outgrowth of the placenta. F, Median cross-section of two seeds and their arilloid (in the centre embryonal cavity and embryo). G, Diagrammatic longitudinal section of a seed, showing embryo position. Drawn by Mia Scheerlinck from *Sosef 1908* (A), *van Nek 145* (B, C), *Haegens & van der Burght 265* (D) and *Breteler 10112* (E–G).

absent; domatia absent. Inflorescences one- (two-) flowered, subsessile; calyculi two per flower; two-awned; lower calyculus *c*. 1 mm, upper calyculus *c*. 2 mm long. Flowers only known from material in young bud stage or with fallen corollas. Calyx truncate, *c*. 4 mm long, shortly dentate, pubescent, not covering the corolla in bud. Corollas not collected, unknown except greenish to white colour noted by collectors. Style pubescent, *c*. 8 mm long with lobes *c*. 1 mm long. Ovary with a biovulate placenta in each locule. Fruits globose to subglobose, light green turning bright red at maturity, glabrous, 12–20 mm in diameter. Seeds two per locule, with the shape of a quarter of a sphere, sometimes one of them ± aborted; placental tissue covering the top of the seeds; embryo radicle almost superior.

*Notes:* The new species has the closest morphological affinity with *Sericanthe jacfelicis*. The two species share glabrous vegetative parts, large leaves with long petioles and spaced secondary veins, and the largest fruits seen in *Sericanthe* subgenus *Sericanthe*. Flowering material is readily distinguished by the pubescent style (glabrous in *S. jacfelicis*), but most specimens hitherto collected are in fruit and hence can be distinguished with difficulty. Vegetatively, they differ in the leaf blades, more narrow and with more lateral veins and somewhat longer acumen in *S. gabonensis*. The two species are sympatric, but *S. gabonensis* has a narrower distribution, restricted to Gabon.

*Sericanthe gabonensis* has the top of the seeds covered by an outgrowth of the placenta (Fig. 2E), a feature only recorded from *S. pellegrinii* (Robbrecht, 1978a: fig. 7B, E). In *S. jacfelicis*, this feature is even more strongly expressed, the outgrowth surrounding the entire vertical circumference of the seed (Robbrecht, 1978a: fig. 7C, F).

The lateral (not inferior) embryo radicle position characteristic of *Sericanthe* is extreme in *S. gabonensis*, with the radicle almost fully upwardly directed (Fig. 2G). The rare placental outgrowth and the unique embryo radical position confirm that we have a new species, described here despite the fact that complete flowers remain unavailable.

*Habitat and distribution:* The species is restricted to the understorey of several types of rain forest in Gabon (Fig. 3) and was also encountered in logged-over forest. Rabi, where most specimens were collected, lies at *c*. 40 m altitude; Woleu Ntem lies at 500 m altitude.

*Chorology:* Element of the Lower Guinean Domain (White, 1979) of the Guineo-Congolian Region; local endemic only reported from the central coastal lowlands of Gabon.

*Etymology:* Named after the distribution, restricted to Gabon.

*Conservation status:* IUCN Red List Category. **Endangered** [B2ab(i, ii, iii, iv)]. The extent of occurrence is estimated at 44 502.47 km$^2$, the area of occupancy at 69.9 km$^2$ (cell size set at 3.16 km). B2, total area of occupancy <500 km$^2$ (69.9 km$^2$ for *Sericanthe gabonensis*); B2a, known to exist at no more than five locations (three for *S. gabonensis*); B2a(i, ii, iii), the expansion of Libreville into Mondah forest, deforestation and forest exploitation will negatively influence the area of occupancy and the quality of habitat; B2a(i, ii, iii, iv), *S. gabonensis* is known from only three locations. On the basis of these threats, a continuing decline in the extent of occurrence, area of occupancy, area, extent and/or quality of the habitat and number of locations can be projected.

*Specimens examined:* **GABON**. Rabi-Kounga, 25.xi.1991, *F. Breteler & C.C.H. Jongkind 10112* (WAG); Rabi, in rainforest near camp, 24.iii.1990, *F. Breteler, C.C.H. Jongkind, J.J. Wieringa & Moussavou 9445* (WAG); Rabi-Kounga, near Rabi 9, 28.i.1994, *R.M.A.P. Haegens & X.M. Van der Burgt 265* (WAG); forest Mondah, along stream, 11.iv.2006, *M. E. Leal, D. Nguema, E. Mounoumoulossi, & P. Bissiemou 1020* (BR); Rabi-Kounga, E of Rabi, 7.xii.1991, *J. Schoenmaker 282* (BR, WAG); forestry concession Bordamur, *c*. 70 km NE of Mitzic, 7.ii.2003, *M. Sosef 1908* (WAG); Rabi-Kounga, *c*. 4 km N of Shell-camp, 19.ix.992, *J.J. Wieringa & J.B. Epoma 1615A* (WAG).

*2. Sericanthe jacfelicis (N.Hallé) Robbr., Bull. Jard. Bot. Nat. Belg. 48: 46 (1978) & Distr. Pl. Afr. 13: map 415 (1978)*

*Basionym: Neorosea jacfelicis* N.Hallé, Adansonia sér. 2, 12: 199 (1972). *Type*: Gabon, Ndiki, xi.1938, **H. Jacques-Félix 2552* (holotype: P).

*Notes:* In the earlier revision (Robbrecht, 1978a), there were only two reported specimens from Cameroon and one from R Congo. The gap in between these is now filled by discoveries in several places in Gabon; only two of the Gabonese specimens cited here are in the Gabon checklist (Sosef *et al*., 2006).

Prior to this, this species was not known from Equatorial Guinea. The above specimen (*B. Senterre & N. Nguema 3077*) is the first record for the country.

*Habitat and distribution:* The species occurs in rain forests from Cameroon to R Congo (Fig. 4) and is reported from primary and secondary forest.

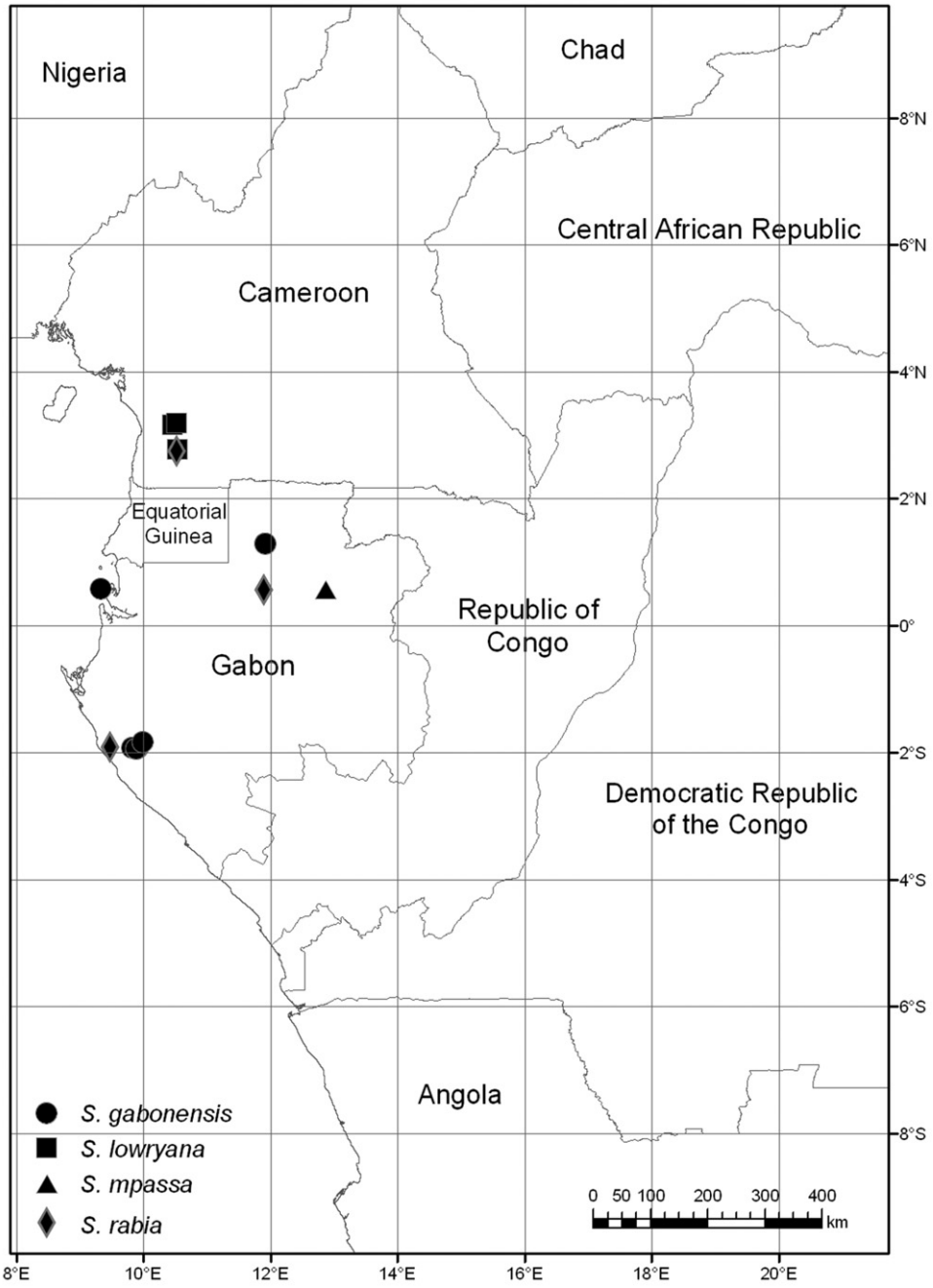


**Figure 3.** Distribution map of the new species described in this article.

*Chorology:* A widespread element of the Lower Guinea Domain (White, 1979) of the Guineo-Congolian Region.

*Specimens examined:* **CAMEROON**. Mvini, 35 km Campo, *J. Hoshino 317* (YA); Kumbeng hill, 8 km SSE of Matomb, **R.Letouzey 11577* (K, P, YA); Réserve de faune de Campo, 28.iii.1983, *B.A. Nkongmeneck 490* (BR, YA); Campo Ma'an area, Nkoelon, path to Nkoelon Cave, 22.viii.2002, *P. Tchouto 3413* (SCA not seen, WAG). **EQUATORIAL GUINEA**. SW Monté Alen National Park, 26.vi.2002, *B. Senterre & N. Nguema 3077* (BRLU). **GABON**. forest about 15 km NE of Asok, Cristal Mountains, 17.viii.1978, *F. Breteler & J.J.F.E. de Wilde 75* (BR, WAG); Monts de Cristal, inselberg Milobo, 10 km N Mbé Akélayong, 50 km W Medouneu, 29.xi.2001, *J. Degreef 171* (BR); Monts de Cristal, Mbe National Park, Mt. Mbilan Plateau, 30.x.2005, *M. E. Leal, D. Nguema, E. Mounoumoulossi & P. Bissiemou 661* (BR, WAG);

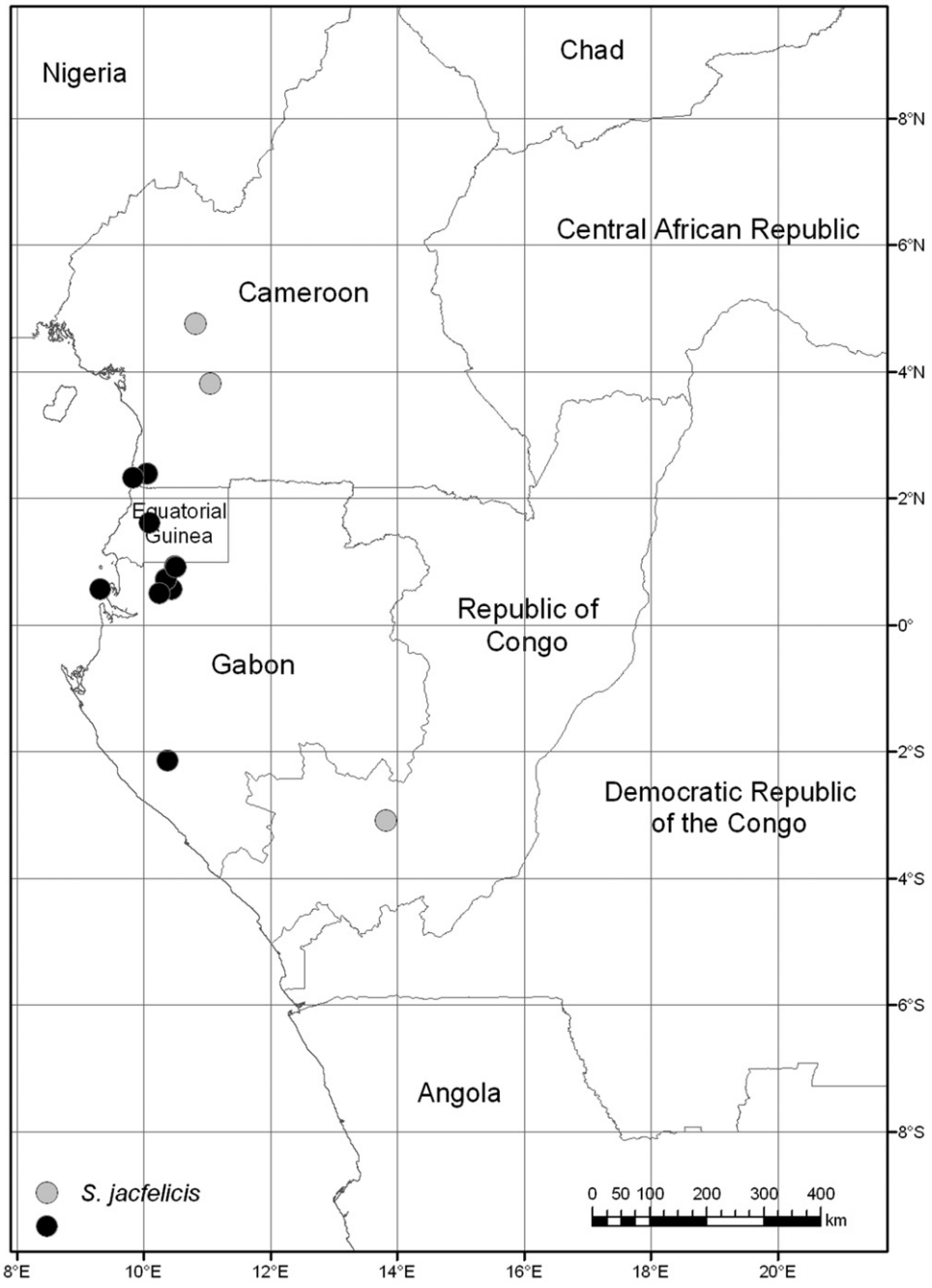


**Figure 4.** Distribution map of *Sericanthe jacfelicis* (grey symbols, localities cited in Robbrecht, 1978a; black symbols, new records).

Mondah forest, 6.iii.2011, *O. Lachenaud et al*. 1202 (BR, LBV, MO); estuaire, Crystal Mountains, *N.S. Nguema Miyono 1380* (WAG); Milobo, 21.ix.2001, *L. Ngok Banak* & *A. Moungazi 183* (BRLU); Doudou Mountains National Parc, *c*. 50 km from Mandji, 17.xi.2005, *M. Sosef 2355* (WAG). **R CONGO**. Bouyala-Kimboto, Djoueli river, **P. Sita 3302* (P).

*3.* ***Sericanthe lowryana*** *Sonké & Robbr.* ***sp. nov.*** *(Fig. 5)*

*Type:* Cameroon, 3.5 km WNW of Bidjouka (03°09′N, 10°28′E), 17.iv.2006 (fl. & fr.), *B. Sonké & H. Taedoumg 4517* (holotype: BR 503234; isotypes: BR 503244 & 674486, BRLU, K, MO, P, WAG, YA).

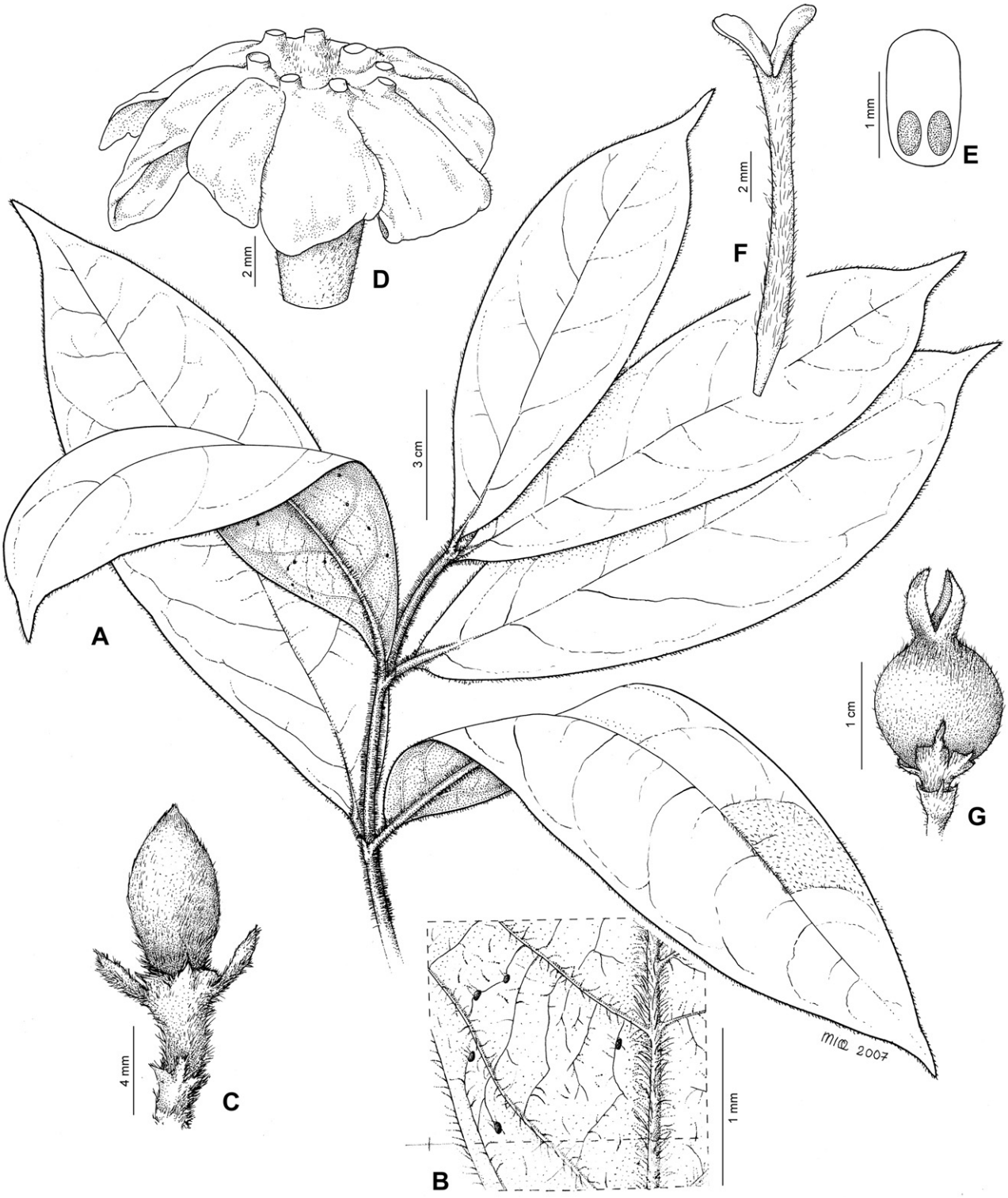


**Figure 5.** ***Sericanthe lowryana*** Sonké & Robbr. A, Top of branch. B, Leaf blade underneath, showing hairiness and bacterial galls on tertiary veins. C, Flower bud. D, Opened corolla (anthers removed). E, Placenta with two ovules. F, Style. G, Fruit. Drawn by Mia Scheerlinck from *Sonké & Taedoumg 4517*.

*Diagnosis: Quoad bacteriocecidia punctiformia in laminis dispersa* Sericanthae petitii *affinis, sed propter petiolos longiores, foliorum laminas longiores supra subtusque pilis longis erectis munitas atque flores majores bene differt*.

*Description:* Small tree *c*. 10 m high, stem *c*. 15 cm in diameter; young twigs pubescent. Stipular sheaths *c*. 2 mm long, pubescent, overtopped by awns up to 6 mm long. Leaves: petiole (5–)8–11 mm long, densely covered with erect hairs; blades elliptic, 13.2–17 × 4.2–5.5 cm, acuminate [acumen (5–)10–20 mm long] and cuneate, pubescent above and below, margin with erect and dense hairs (1.2–2.0 mm long); secondary veins prominent, seven or eight on each side of the midrib; tertiary veins reticulate; bacterial galls dot-like, 0.5–0.8 mm in diameter, scattered in the leaf blade but located on secondary and tertiary veins; domatia absent. Inflorescences placed slightly above the axil, one- or two-flowered; pedicels 8.5–10.0 mm long, pubescent; calyculi two or three per flower, four-lobed, pubescent; basal (first) calyculus 1.0–1.5 mm, second calyculus 3–5 mm, upper (third) calyculus 5–7 mm long. Flowers octomerous. Calyx pubescent, 4.0–4.5 mm in diameter and 5–7 mm long, in late bud stage ovoidal and closed at top, completely covering the corolla bud, at anthesis showing two or three deep longitudinal fissures. Corolla white, pubescent outside; corolla tube *c*. 9 mm long; lobes glabrous inside except hairs at throat, 6–7 × 2 mm long. Stamens subsessile; anthers 4–5 mm long, with broad connective. Ovary pubescent, with (one) two ovules in each chamber; style glabrous at base, upper part with scattered hairs, up to 10 mm long; stigma lobes *c*. 3 mm long. Fruits globose to subglobose, sparsely covered with hairs, 13–15 mm in diameter. Seeds (one) two or three (four), the shape depending on the available space, spherical, hemispherical or a quarter of a sphere.

*Notes: Sericanthe petitii*, another endemic of the Lower Guinea Domain, restricted to the Haute Ngounyé (Gabon), is obviously the most closely related species. The two species have the same type of bacterial leaf galls, i.e. small dot-like structures located on the secondary and tertiary veins. Bacteriocecidia are common in *Sericanthe*, but are either linear and placed along the midvein, or ramified when located on the lateral veins. *Sericanthe lowryana* differs from *S. petitii* in being more robust in all aspects. The hair covering of the leaf blades of *S. lowryana* differs in being present on both sides, and in consisting of more erect and longer hairs. In *S. petitii*, the hairs are shorter, appressed and restricted to the underside of the blade and the veins above.

*Habitat and distribution:* Restricted to rain forest in Cameroon (Fig. 3). The area from which *S. lowryana* is known supports a closed-canopy evergreen forest with many epiphytes and a rich herb layer, classified by Letouzey (1985) as Biafran evergreen forest, rich in Fabaceae (Caesalpinioideae). The area lies at 500–600 m above sea level.

*Chorology:* Element of the Lower Guinean Domain (White, 1979) of the Guineo-Congolian Region. Local endemic restricted to south Cameroon (Fig. 3). Reported from an area with a high degree of local endemism (e.g. Nguembou *et al*., 2006; Sonké, Nguembou & Davis, 2006; Droissart *et al*., 2009a, b).

*Phenology:* Flowering and fruiting in March and June.

*Etymology:* We dedicate the new species to Dr Porter P. Lowry II, head of the Africa and Madagascar programmes of the Missouri Botanical Garden, who has always advised and encouraged the first author.

*Conservation status:* IUCN Red List Category. **Endangered** (EN B1ab(iii) + B2ab(iii)). The extent of occurrence is estimated at 169.63 km$^2$ and the area of occupancy at 29.96 km$^2$ (cell size set at 3.16 km). B1, extent of occurrence estimated to be < 5000 km$^2$ (169 km$^2$ for *S. lowryana*); B1a, known to exist at no more than five locations (three for *S. lowryana*); B1b(iii), continuing decline inferred in area, extent and quality of habitat; B2, total area of occupancy less than 500 km$^2$ (29.9 km$^2$ for *S. lowryana*); B2ab as for B1ab. The main threat for the species is logging, which negatively influences the quality of its habitat. Only one collection has been made inside the boundaries of a protected area. On the basis of these threats, a continuing decline in the area, extent and/or quality of the habitat can be projected.

*Specimens examined:* **CAMEROON**. Near Mbikiliki village, from basecamp to hill WNW from basecamp, 11.iii.2007, *S. Dessein & B. Sonké 1512* (BR); Efoulan, 9.v.2009, *O. Lachenaud et al. 658* (BR, MO, YA).

*4.* ***Sericanthe mpassa*** *Sonké & Robbr.,* ***sp. nov.*** *(Fig. 6)*

*Type:* Gabon. M'Passa, about 7 km SW of Makokou, I.R.E.T. Station, border of Ivindo River, 14.xi.1979 (fl. & young fr.), *F. Breteler* 7649 (holotype: WAG 0114446; isotype: in spirit WAG 0107249).

*Diagnosis: Propter folias sine bacteriocecidiis domatiisque affinis* Sericanthae gabonensi *et* S. jacfelicis *affinis, sed ab illis foliorum laminis multo minoribus et nervis primariis subtus in sicco pallescentibus differt*.

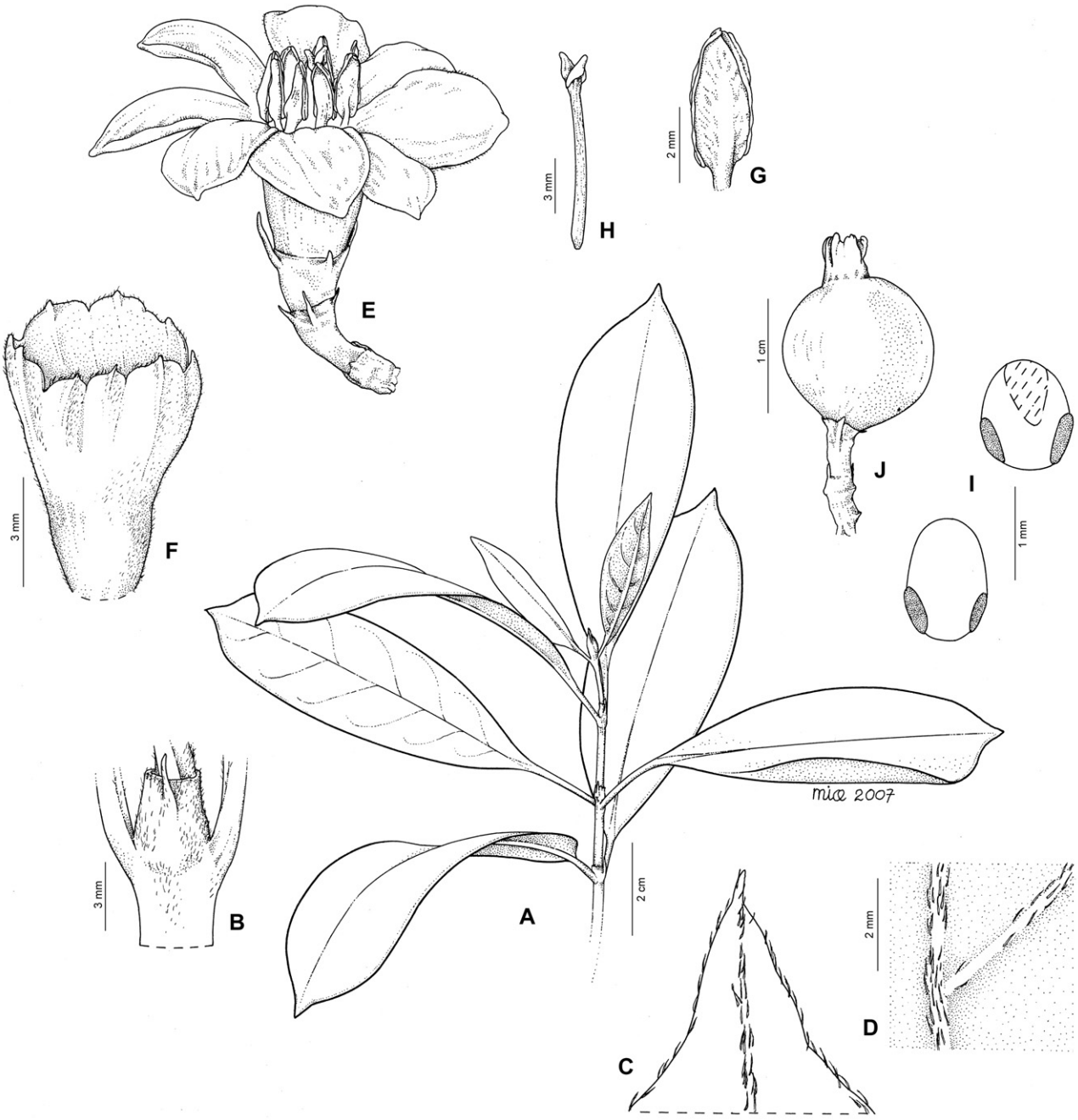


**Figure 6.** ***Sericanthe mpassa*** Sonké & Robbr. A, Top of branch. B, Internode showing stipules. C, Hairiness on leaf blade tip above in very young stage. D, Hairiness on leaf veins underneath in very young stage. E, Flower and its pedicel with three calyculi. F, Ovary and calyx. G, Stamen. H, Style. I, Ad- and abaxial views of a placenta with two ovules. J, Young fruit. Drawn by Mia Scheerlinck from *Breteler 7649*.

*Description:* Small tree, height unknown; vegetative parts glabrous, but long appressed hairs present on stems, stipules, leaf margins and veins below when very young. Stipular sheaths 2.5 mm long, overtopped by awns *c*. 1 mm long. Leaves: petiole 6–12 mm long; blades obovate, 6.5–11.5 × 2.4–4.2 cm, acuminate (acumen 3–5 mm long) and cuneate; secondary veins prominent, four to six on each side of the midrib; tertiary veins almost invisible; bacterial galls absent; domatia absent. Inflorescences one- to three-flowered; pedicels up to 5 mm long; calyculi three per flower, with filiform appendages; basal (first) calyculus and

second calyculus *c*. 1 mm, upper (third) calyculus *c*. 2 mm. Flowers octomerous. Calyx 4 mm long, finely pubescent, truncate and shortly lobed, the lobes shortly apiculate. Corollas white, the tube 5 mm long and hardly exserted from the calyx, the lobes $8.5 \times 5.0$ mm with ± rounded tip. Stamens with short filament; anthers 4 mm long with 2 mm broad connective. Ovary with a biovulate placenta in each locule; style glabrous, 9 mm long, with lobes *c*. 2 mm long. Fruits globose, only known immature. Seeds two per locule.

*Notes:* This new species is known from the type only. This fine collection (including flowers in spirit) is very complete. It contains flowers and young fruits, so that the affinity of the species can be established. It is apparently related to two other species without domatia and bacterial galls, *S. gabonensis* and *S. jacfelicis*, but the much smaller leaf blades with midveins below drying pale (vs. dark brown in the other two species) make it easily distinguishable. The collection locality of *S. mpassa* is situated within the recently created Ivindo National Park.

*Habitat and distribution:* The species is restricted to rain forest in Gabon (Fig. 3). The single collection was collected at *c*. 300 m altitude.

*Chorology:* Element of the Lower Guinean Domain (White, 1979) of the Guineo-Congolian Region. Local endemic only reported from the northeastern part of the Ogooué Basin in Gabon.

*Phenology:* The single collection was collected in November.

*Etymology:* Named after the type locality.

*Conservation status:* IUCN Red List Category. **Vulnerable** (D2). *Sericanthe mpassa* is only known from one collection, possibly just outside the Ivindo National Park in Gabon. This is despite the fact that many collectors have made several lengthy visits to this part of Gabon over recent years to collect herbarium specimens. This might indicate that the species is rare. Outside Ivindo National Park, logging and the progressing agricultural front might threaten the species. On the basis of the area of occupancy that is $< 20$ km$^2$ and the clear threat that can be identified, we propose to classify the species as Vulnerable: D2.

*5. Sericanthe pellegrinii (N.Hallé) Robbr., Bull. Jard. Bot. Nat. Belg. 48: 55 (1978) & Distr. Pl. Afr. 13: map 420 (1978)*
*Basionym: Neorosea pellegrinii* N.Hallé, Fl. Gabon 17: 276 (1970). *Type*: Gabon. Mt Iboundji, 26.xii.1930, **G. Le Testu 8622* (holotype: P; isotypes: BM, BR, LISC).

*Notes:* This species remains poorly known, and was reported by Robbrecht (1978a) only from two specimens from Gabon and two specimens from RD Congo (Mayumbe district of Bamps, 1982; i.e. the southwestern part of the country situated in the Lower Guinean Domain). Now, an additional first record for R Congo fills the gap between these specimens. Based on an historical *Dinklage* specimen hitherto unidentified, the species is also newly recorded here from Cameroon. The records for Gabon were already included in the Gabon checklist (Sosef *et al*., 2006: 369).

*Habitat and distribution:* The species occurs in rain forests from Cameroon to RD Congo (Fig. 7) and is reported up to 1000 m altitude.

*Chorology:* Restricted to the central part of the Lower Guinean Domain (White, 1979) of the Guineo-Congolian Region.

*Specimens examined:* **CAMEROON**. Grand-Batanga, 24.i.1891, *M. Dinklage 1098* (HBG). **GABON**. 35 km SW of Doussala, 18.v.1985, *F. Breteler & A. M. Louis 1029* (WAG); Doudou mountains, Chantier SNF-Bakker, 1.xii.2003, *C.C.H. Jongkind 5855* (WAG); Ngoma, **G. Le Testu 7773* (BM); 40 km NW of Doussala, around camp II, 7.iv.2000, *M. Sosef et al. 1136* (BRLU, WAG). **R CONGO**. Forest between Moutsoumoukoudi and Kuyi, 3.ii.1975, *P. Sita 3871* (BR). **RD CONGO**. INEAC-Luki, N of Zanza Putu forest reserve, **J. Wagemans 1611* (BR, K, WAG); Luki, 3.xii.1948, **C. Donis 2209* (BR, K).

*6. Sericanthe petitii (N.Hallé) Robbr., Bull. Jard. Bot. Nat. Belg. 48: 56 (1978) & Distr. Pl. Afr. 13: map 421 (1978)*
*Basionym: Neorosea pellegrinii* N.Hallé, Fl. Gabon 17: 274 (1970). *Type*: Gabon. Pounga, 26.ii.1925, **G. Le Testu 5245* (holotype: P; isotypes; BM, BR, MO).

*Notes:* In the earlier revision (Robbrecht, 1978a), this species was only known from the type specimen from Gabon. It has since been collected from numerous other localities, all from that country (seven additional specimens cited in the Gabon checklist; Sosef *et al*., 2006). The many available collections confirm the diagnostic features (chestnut brown colour in the dried state; pubescent young twigs and petioles; leaf blades with rounded base and numerous dot-shaped domatia), but indicate that the leaf blades may be much larger than described before (up to $16.0 \times 5.5$ cm).

*Habitat and distribution:* The species is restricted to rain forests in Gabon (Fig. 8) and is reported up to 1000 m altitude.

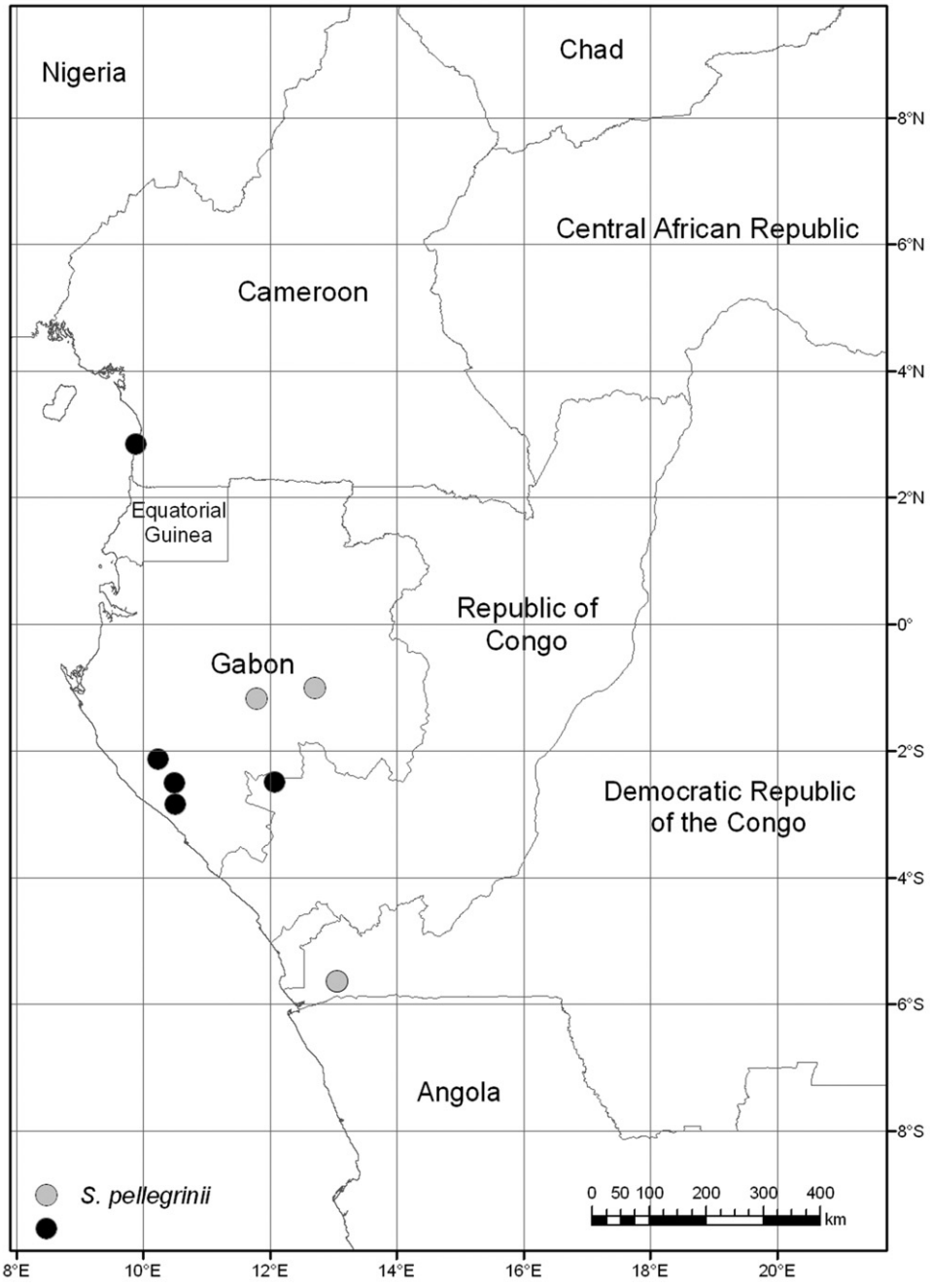


**Figure 7.** Distribution map of *Sericanthe pellegrinii* (grey symbols, localities cited in Robbrecht, 1978a; black symbols, new records).

*Chorology:* Restricted to the central part of the Lower Guinean Domain (White, 1979) of the Guineo-Congolian Region.

*Specimens examined:* **GABON**. About 40 km NNW of Doussala, 24.iii.1988, *J.J.F.E. de Wilde & C.C.H. Jongkind 9556* (BR, WAG); 32 km N of Igotchi–Mouenda road, Bakker timber concession, 12.vi.1997, *G. McPherson 16952* (WAG); 32 km N of Igotchi–Mouenda road; Bakker forestry concession, 15.vi.1997, *G. McPherson 17003* (WAG); primary forest in Doudou mountains, *c*. 45 km SW of Doussala, 22.ii.1986, *J.M. Reitsma & B. Reitsma 1945* (BR, WAG); *c*. 15 km NW of forestry camp Oveng, 8.ii.1987, *J.M. Reitsma & B.*

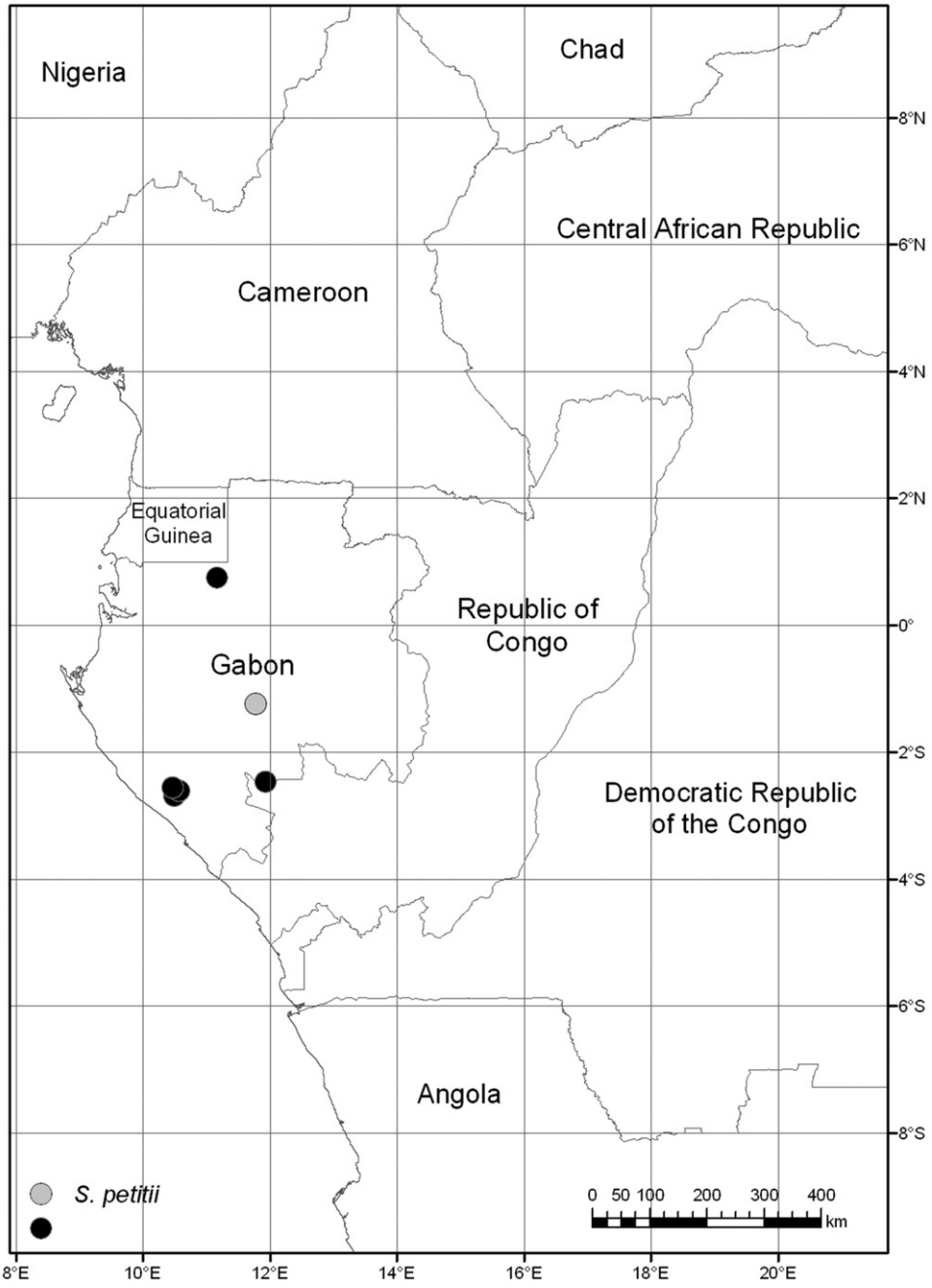


**Figure 8.** Distribution map of *Sericanthe petitii* (grey symbols, localities cited in Robbrecht, 1978a; black symbols, new records).

*Reitsma 2932* (WAG); *c*. 50 km SSW of Doussala, 13.iv. 1987, *J.M. Reitsma, B. Reitsma & C.Wilks 3217* (WAG).

*7.* ***Sericanthe rabia*** *Sonké & Robbr.* ***sp. nov.***
*(Fig. 9)*
*Type:* Gabon, Rabi 12, more or less primary dryland forest, altitude ± 70 m, small tree in riverbed or on the bank, 30.xi.1989, *J.J.F.E. de Wilde, J.C. Arends, A.M. Louis & J.J. Wieringa 9890* (holotype: WAG 114442; isotypes: LBV not seen, WAG 114443).

*Diagnosis: Inter generis* Sericanthes *cum calycibus in alabastro apertis atque foliorum laminis sine bacteriocecidiis domatiisque praeditas facile distinguitur propter ramos novellos et foliorum laminas subtus pubescentes ut praecipue in foliis juvenilibus videtur*.

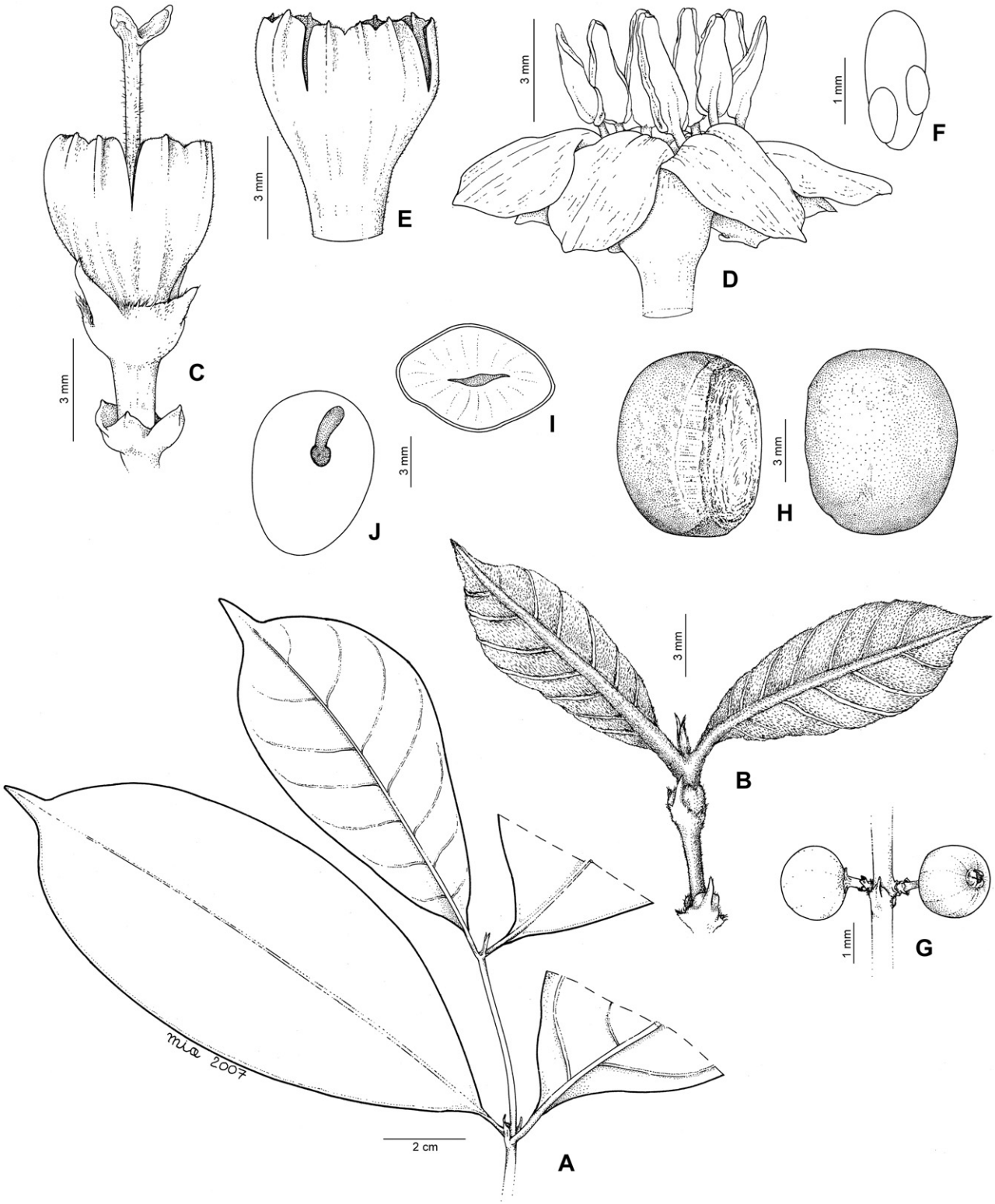


**Figure 9.** ***Sericanthe rabia*** Sonké & Robbr. A, Top of branch. B, Juvenile branch tip showing hairy twig, stipules and leaves. C, Flower and its pedicel with two calyculi, corolla removed to show style. D, Corolla and anthers. E, Ovary and calyx. F, Abaxial view of a placenta with two ovules. G, Fruits. H, Two views of a seed. I, Cross-section of a seed showing embryonal cavity. J, Schematic representation of embryo position in seed. Drawn by Mia Scheerlinck from *Wilks 1433* (B, G) and *De Wilde et al. 9890* (other drawings).

*Description:* Shrub or small tree *c*. 5 m high; vegetative parts pubescent, but hairiness on the leaves falling off when maturing. Stipular sheaths *c*. 2 mm long, overtopped by awns of the same length. Leaves: petiole 8–12 mm long; blades elliptic, 12.2–14.5 × 5–6 cm, acuminate (acumen 13–17 mm long) and cuneate; secondary veins prominent (five) seven to nine on each side of the midrib; tertiary veins reticulate; bacterial galls absent; domatia absent. Inflorescences one- or two-flowered; pedicels *c*. 3 mm long; calyculi two per flower; basal calyculus *c*. 1 mm, upper calyculus *c*. 3 mm long. Flowers octomerous. Calyx *c*. 2 mm long, with truncate but slightly toothed margin, showing several lengthwise fissures at anthesis. Corolla greenish to white, tube and lobes 4–5 mm long equalling one another in length. Stamens with very short filament; anthers 4 mm long with 2 mm broad connective. Ovary densely pubescent, with two ovules on each placenta; style sparsely covered with erect hairs, *c*. 8 mm long, with lobes *c*. 1.5 mm long. Fruits globose to subglobose, red at maturity, glabrous, up to about 2 cm in diameter. Seeds one or two per locule, their shape dependent on available space (hemispherical in fruits with only two seeds).

*Notes:* This is another new species without domatia and bacterial galls in the leaf blades. It seems closer to *S. mpassa* than to *S. gabonensis* and *S. jacfelicis*, two species with much larger leaf blades. *Sericanthe rabia* differs from *S. mpassa* by its stronger pubescence on the vegetative parts, a hairy style and a greater number of lateral veins.

*Habitat and distribution:* The species occurs in rain forest in Cameroon and Gabon (Fig. 3), up to 900 m altitude.

*Chorology:* Restricted to the central part of the Lower Guinean Domain (White, 1979) of the Guineo-Congolian Region.

*Etymology:* Named after one of the collecting localities.

*Conservation status:* IUCN Red List Category. **Near Threatened** (NT). The extent of occurrence is estimated at 53 441.52 km$^2$ and the area of occupancy at 29.96 km$^2$ (cell size set at 3.16 km). Two collections were made in or nearby national parks; one collection comes from outside protected areas, but in an area that is not immediately under known threats, although logging could become a problem in the future. Because the species is known from three collections only (representing three locations) and, in the future, might classify for one of the IUCN categories, we consider the species as Near Threatened (NT).

*Specimens examined:* **CAMEROON**. Océan, Akom II, Efoulan, 24.vi.2008, *B. Sonké, H. Taedoumg & M. Simo 4871* (BR, K, MO, P, WAG, YA). **GABON**. 40 km de Koumameyong, 8.iii.1987, *C.M. Wilks 1433* (BR, WAG).

*8. Sericanthe raynaliorum (N.Hallé) Robbr., Bull. Jard. Bot. Nat. Belg. 48: 58 (1978) & Distr. Pl. Afr. 13: map 422 (1978)*

*Basionym: Neorosea raynaliorum* N.Hallé, Adansonia sér. 2, 12: 199 (1972). *Type*: Cameroon. Sadolkoulay (36 km E Ngaoundéré), 5.xii.1964, **J. Raynal & A.M. Raynal 12230* (holotype: P; isotype: YA).

= *Neorosea* sp. D., N. Hallé, Fl. Gabon 17: 271 (1970) & Adansonia, ser. 2, 12:203 (1972).

*Notes:* When Robbrecht (1978a) revised the species of the genus, four specimens were known, all from a restricted area in central Cameroon at about 6–8°N. They were interpreted as representing a taxon from submontane forests, reported from altitudes up to 1200 m. The discovery of a fifth specimen at Myéré, in the same area, by one of us (B.S.) allowed a more correct interpretation of the ecology. There, a population was observed in a gallery forest at the contact zone between forest and savanna. *Sericanthe raynaliorum* is therefore better considered as an element from the transition zone between the Sudanian and Guineo-Congolian Regions.

This is in line with our other finding that '*Neorosea* sp. D' from the north of the Central African Republic also belongs here. Hallé based sp. D on *Chevalier* 7328 from the eastern Chari, left with the unnamed specimens by Robbrecht (1978a). We were unable to locate *Chevalier 7328* exactly, too many homonyms being reported for the Gounda river (Office of Geography, 1962). It obviously comes from an area situated 18–20°E and 8–10°N, i.e. far away from the reported occurrence of the species in Cameroon. The poor condition of *Chevalier 7328* could cast doubt on our identification, but we traced a modern and good specimen from the same area, *Fay* 6644.

Both *Sonké 4580* and *Fay 6644* have the habit reported (Robbrecht, 1978a) as characteristic for the species (flowering twigs with short internodes, leaves crowded at the top and flowers on the leafless, lower parts).

It remains puzzling why Hallé (1970) separated sp. B (later described as *Neorosea raynaliorum*; Hallé, 1972) from his sp. D. In his key, the distinction is based on the hairiness of the lower surfaces of the leaf blades, glabrous between the secondary veins (sp. B) vs. pubescent between the secondary veins (sp. D). Our observation of *Chevalier 7328* revealed that the blades were glabrous between the secondary veins.

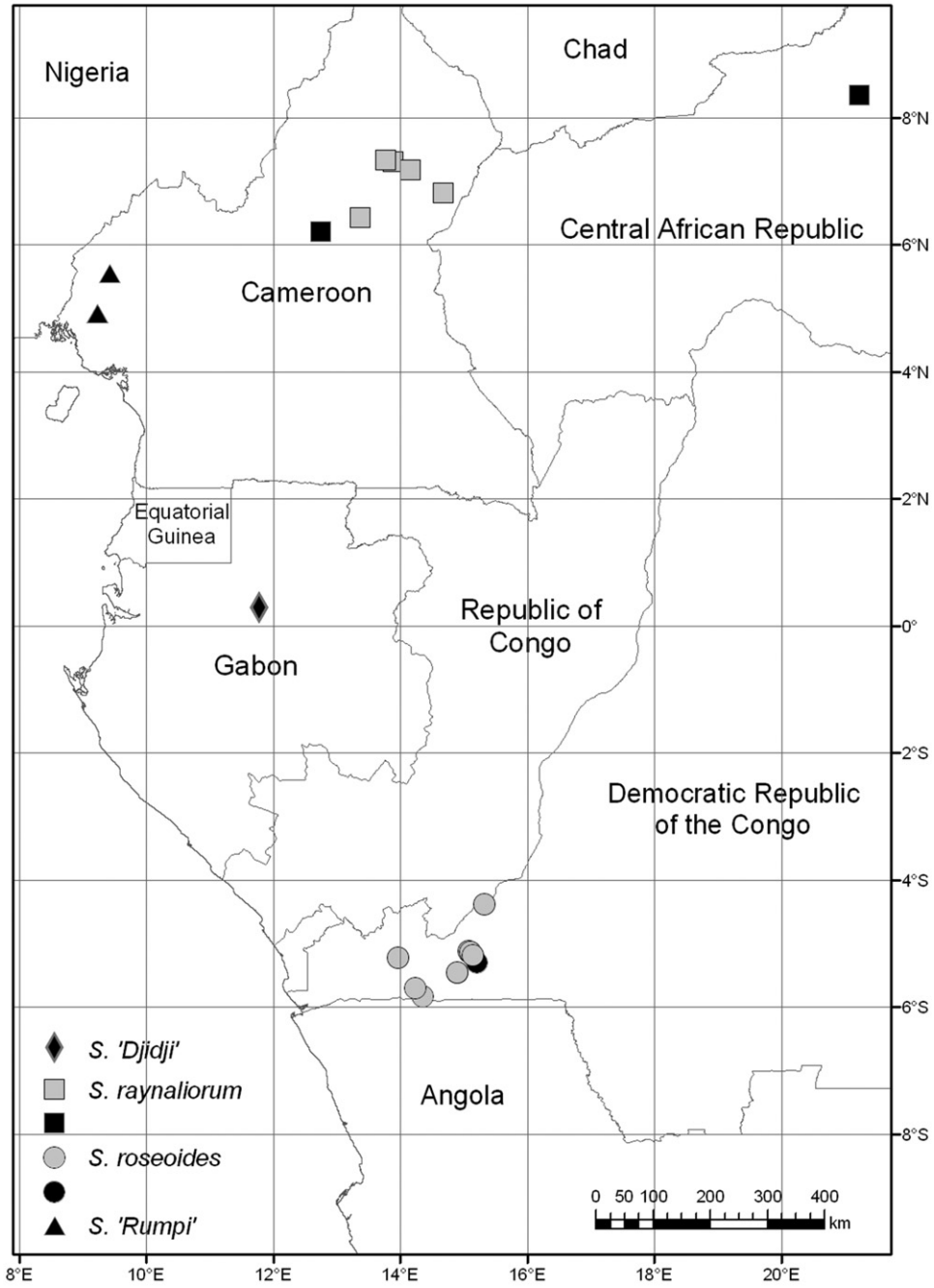


**Figure 10.** Distribution map of *Sericanthe raynaliorum* and *S. roseoides* (grey symbols, localities cited in Robbrecht, 1978a; black symbols, new records). Location of specimens representing imperfectly known taxa from Gabon and Cameroon.

*Habitat and distribution:* The species occurs in gallery forest in the north of Cameroon and the Central African Republic (Fig. 10).

*Chorology:* Local element of the transition zone between the Lower Guinean and Sudanian phytochoria.

*Specimens examined:* **CAMEROON**. Telolo River, about 47 km E of Ngaoundéré, 27.xi.1964, **W.J.J.O. de Wilde 4281* (BR, WAG); Soa-Djom, 20 km E Ngaoundéré, *G. Fotius 2975* (P); between Meiganga and Yarbang, 16.ix.1967, **M.Jaques-Felix 8138* (BR, P, YA); 10 km W Bagodo, Ngaou Ndal, 28.ii.1966, **R.*

*Letouzey 7564* (BR, YA); Myéré, 29.ix.2007, *B. Sonké 4580* (BR, K, MO, P, WAG, YA). **CENTRAL AFRICAN REPUBLIC**. Gallery forest of Gounda, 21.x.1903, *A. Chevalier 7328* (BR, K); 9.3 km S of Koumbale Pende confluence on Pende Creek, 15.v.1984, *J.M. Fay 6644* (K, MO).

*9. Sericanthe roseoides (De Wild. & T.Durand) Robbr., Bull. Jard. Bot. Nat. Belg. 48: 59 (1978) & Distr. Pl. Afr. 13: map 423 (1978)*
*Basionym: Tricalysia roseoides* De Wild. & T.Durand, Bull. Herb. Boiss., ser. 2, 1:825 (1901). Type: RD Congo. Kisantu, ix.1900, **J Gillet 1349* (lectotype: BR).

*Note:* This species is only reported from westernmost parts of RD Congo ('district Bas-Congo' of Bamps, 1982), i.e. the southern extreme of the Lower Guinean Domain. Its taxonomic and chorological knowledge has not changed since Robbrecht's (1978a) revision (only some additional specimens are reported here from the same area).

*Habitat and distribution:* The species occurs in the understorey of semi-deciduous forests in the west of RD Congo (Fig. 10) and has also been reported from secondary forest.

*Chorology:* Local endemic of the southern extreme of the Lower Guinean Domain (White, 1979) of the Guineo-Congolian Region.

*Specimens examined:* **RD CONGO**. M'vuazi, 17.iv.1976, **H. Breyne 2968* (BR); Songa, 26.ii.1959, **P. Compère 889* (BR, K); Vunda, 18.xii.1959, **P. Compère 1073* (BR); M'vuazi – forest of Mansiesie, 18.ix.1951, **R. Devred 679* (BR, WAG); M'vuazi, bank side Ntava river, 3.iii.1952, **Devred R. 1110* (BR, K); M'vuazi – forest of Kikola, 24.ix.1952, **R.Devred 1235* (BR, K); forest of Matete, 9.vii.1954, **J. Dubois 37* (BR, C, P, UPS, WAG); Kisantu, 1900, **J. Gillet 454* (BR); Kisantu, 1900, **J. Gillet 923* (BR); Kimbaambu (env. Lemfu), bank side of Kiela river, 8.ii.1979, *L.Pauwels 6172* (BR); Nyanga river, Kisantu, iv.1932, **H.Vanderyst 29135* (BR); Kikonka, Kisantu, vii.1932, **H.Vanderyst 32253* (BR); Kikonka, Kisantu, vii.1932, *H. Vanderyst 32254* (BR); Mayidi, viii.1932, **H.Vanderyst 33622* (BR); Kwilu, v.1913, **R. Verschueren 483* (BR).

*10.1 Sericanthe testui (N.Hallé) Robbr. var testui, Bull. Jard. Bot. Nat. Belg. 48: 63 (1978) & Distr. Pl. Afr. 13: map 425 (1978)*
*Basionym: Neorosea testui* N.Hallé, Fl. Gabon 17: 272 (1970). *Type*: Gabon. Lebagny, **G. Le Testu 6463* (holotype: P; isotypes: BM, LISC).

*Notes:* The new specimens corroborate the taxonomic and chorological knowledge given in Robbrecht (1978a). In two of the cited specimens (*Etuge & Thomas 328*; *Achoundong 1232*), the domatia are weakly developed; this material can be confused with *S. rabia*, a species in which stems and leaf veins are covered with hairs that are longer and more sparse than in *S. testui*.

The distant RD Congo collection from Kasai (Congolian Domain of the Guineo-Congolian Region; White, 1979) might represent a taxon to be segregated, but is too poor (young fruits and one wilted flower only) to be well understood. The larger leaves and thinner stipules, calyculi and calyces might be diagnostic differences.

*Habitat and distribution:* The species is restricted to rain forest in Cameroon and Gabon; the outpost in RD Congo remains poorly understood (Fig. 11).

*Chorology:* Widespread element of the Lower Guinean Domain (White, 1979) of the Guineo-Congolian Region.

*Specimens examined:* **CAMEROON**. Nta-Ali sud-est Mamfe, 10.vi.1985, *Achoundong 1232* (BR); Bitye, near the river Dja 'Ya', 21.i.1921, **G.L. Bates 1704* (FHO, K, P); ibid., 9.iv.1921, *G.L. Bates 1835* (FHO, K, P); path NW Elumseh-Mejelet Bakossi, Bangem, 6.x.1986, *M. Etuge & D.W. Thomas 328* (BR, P, WAG); near Evelessi, 30 km W Sangmelima, 10.iii.1970, **R. Letouzey 10142* (BR, P, YA). **GABON**. *c*. 70 km SSW of Moanda, 15.x.1970, *F. Breteler 6923* (BR); Belinga, 22.xii.1964, *N. Hallé 3569* (P); Moucombo, 14.v.1931, **G. Le Testu 8816* (BR, BM, K, LISC, P); Oyem, are between Ogooué and Cameroon, 20.ix.1933, **G. Le Testu 9296* (BM, BR, P, WAG). **RD CONGO**. Kahemba-Kwango, 21.vii.1955, **R. Devred 2265* (BR, B, K).

*10.2 Sericanthe testui (N.Hallé) Robbr. var. pseudosalacia (N.Hallé) Robbr., Bull. Jard. Bot. Nat. Belg. 48: 65 (1978) & Distr. Pl. Afr. 13: map 426 (1978)*
*Basionym: Neorosea testui* N.Hallé var. *pseudosalacia* N.Hallé, Fl. Gabon 17: 273 (1970). *Type:* Gabon. Bélinga, 9.xii.1964, **N. Hallé 3448* (holotype: P; isotypes: BR, K).

*Note:* Remains as poorly known as in Robbrecht (1978a) (only the type specimen from Gabon, also cited by Sosef *et al*., 2006).

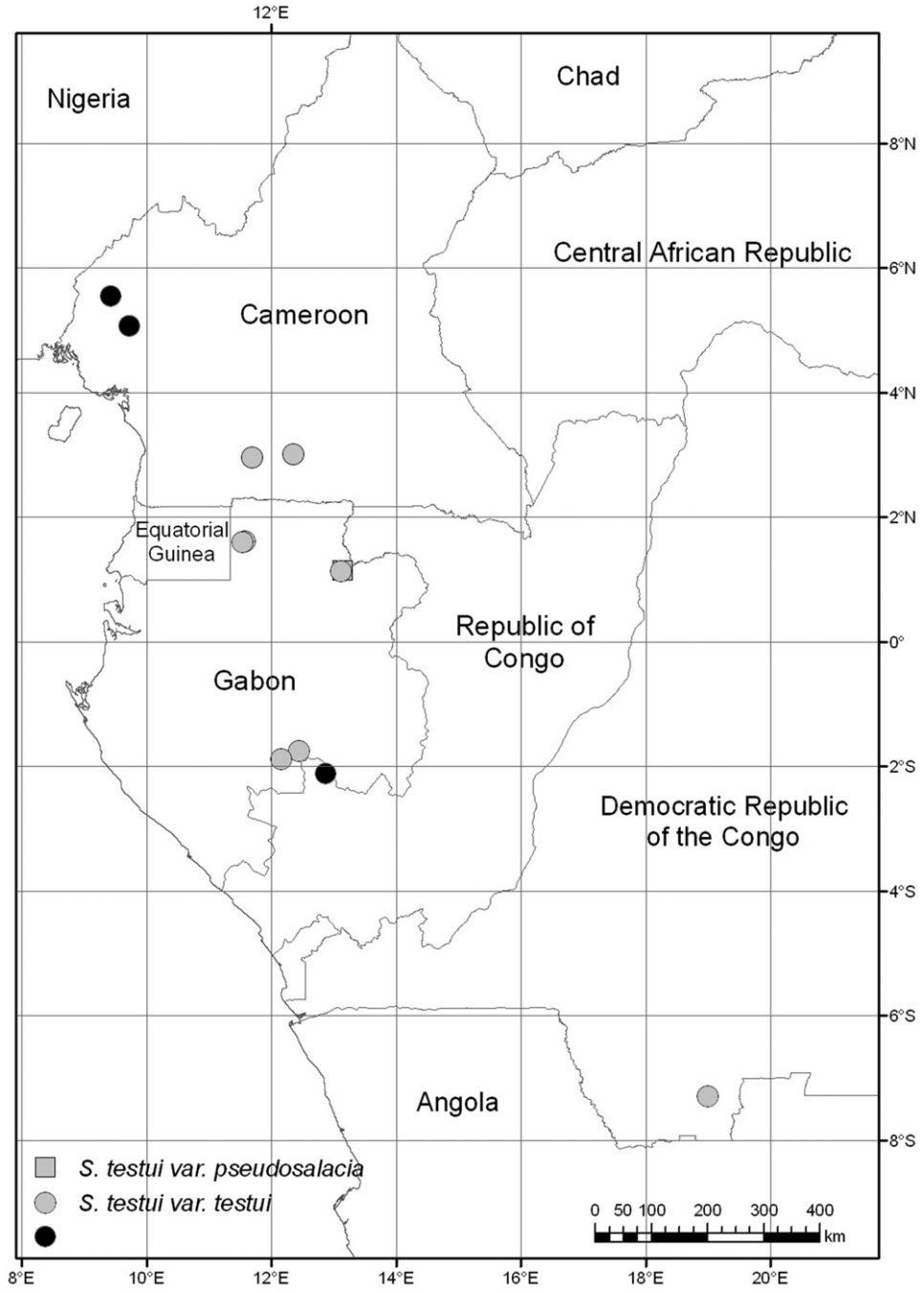


**Figure 11.** Distribution map of *Sericanthe testui* (grey symbols, localities cited in Robbrecht, 1978a; black symbols, new records).

*Habitat and distribution:* The variety is reported from rain forest at 800–850 m altitude in Gabon (Fig. 11).

### SUBGENUS *MACROCARPUS* ROBBR.

*Description:* Stipules triangular, not fused. Leaf blades cordate, rarely rounded; tertiary veins parallel to one another and perpendicular to the midvein, very dense (up to *c*. 25 tertiary veins between two secondary veins). Placentas with (two) three to five ovules. Fruits spherical or ellipsoidal, 3–6 cm long. Seeds (two) three to five in each chamber, angular, almost entirely covered by an arilloidal outgrowth of the placenta.

In the revision (Robbrecht, 1978a), *Tricalysia auriculata* Keay and the Upper Guinean *Neorosea*

*adamii* N.Hallé were left *incertae sedis*. A few years later, additional material allowed a complete description and understanding of these species and their placement in a separate subgenus *Macrocarpus* in *Sericanthe* (Robbrecht, 1981a). The subgenus was confirmed in molecular phylogenetic studies (Davis *et al*., 2007; Tosh *et al*., 2009), in which *S. auriculata* (as *Sericanthe* sp.) was found to be sister to the other sampled *Sericanthe* spp. In a recent molecular investigation (Lemaire *et al*., 2011), however, *S.* 'Rumpi' (see below) was also included (as *Sericanthe* sp. nov.) and found to be sister to the rest of the genus. The branching of the latter phylogenetic tree was well supported, but not fully resolved, despite being based on six plastid markers. These, however, have a low number of variable sites. Expanding the sampling of species might result in a tree in which only subgenus *Sericanthe* is monophyletic; subgenus *Macrocarpus* might be paraphyletic, representing a grade at the base of the nominate subgenus.

*11. Sericanthe auriculata (Keay) Robbr., Bull. Jard. Bot. Nat. Belg. 51: 172 (1981) & Distr. Pl. Afr. 21: map 709 (1981) (Fig. 12)*

*Basionym: Neorosea auriculata* (Keay) N.Hallé, Fl. Gabon 17: 270 (1970); Robbrecht, Bull. Jard. Bot. Nat. Belg. 48: 72 (1978), as species of uncertain generic position. *Type*: Nigeria. Calabar Province, Budeng-Ewen, **D.R. Rosevear 34* (holotype: K).

*Notes:* Many new specimens of *S. auriculata*, including flowering ones, have now become available. This allows the presentation here of a complete illustration (Fig. 12). The species is newly reported from Equatorial Guinea and Gabon. It was not included in the checklist for the latter country (Sosef *et al*., 2006).

*Habitat and distribution:* Occurring in rain forest from the southeast of Nigeria to Gabon (Fig. 13).

*Chorology:* The most widespread element of the Lower Guinean Domain (White, 1979) of the Guineo-Congolian Region.

*Specimens examined:* **NIGERIA**. Calabar Province, Budeng-Ewen, **D.R. Rosevear 33* (K). **CAMEROON**. Near Mbikiliki village, from basecamp to top of hill, 10.iii.2007, *S. Dessein & B. Sonké 1467* (BR); near Mbikiliki village, from basecamp to hill WNW from basecamp, 11.iii.2007, *S. Dessein & B. Sonké 1516* (BR); between Abat and Bayib Ossing, 20 km WNW Nguti,12.vi.1975, **R. Letouzey 13805* (BR, P, YA); path Akwaya–Mamfe, between Atolo (Boka)–Basho II, 25 km S Akwaya, 27.vii.1975, **R. Letouzey 14123* (BR, P, YA); Nndian–Dibonda–Ekumbako road, 24.xi.1986, *J. Nemba & D.W. Thomas 386* (BR, MO, YA); *c*. 5 km on the road Eyumojock–Ekok, 23.ix.1984, *J.M. Onana 34* (BR, YA); Massif des Mamelles, 40 km S Kribi, 11.xii.1979, **B. Satabié 523* (BR, P, YA); Engon, S Efoulan, 7.iii.2004, *B. Sonké & D. Beina 3371* (BR, K, MO, YA); Mvilé (Ngovayang), 25.xi.2005, *B. Sonké & M.N. Djuikouo K.4057* (BR, BRLU, K, MO, WAG, YA); ibid., 30.xi.2005, *B. Sonké & M.N. Djuikouo K. 4177* (BR, BRLU, K, MO, WAG, YA); ibid., 30.xi.2005, *B. Sonké & M.N. Djuikouo K. 4197* (BR, K, MO, YA); 3 km NW Mbikiliki, 20.i.2006, *B. Sonké & M.N. Djuikouo K. 4311* (BR, BRLU, K, MO, WAG, YA); Mingli II, 15.i.2005, *B. Sonké, C. Nguembou K. & P. Esono* 3668 (BRLU); Bibondi, 25.i.2005, *B. Sonké & C. Nguembou K. 3798* (BR, BRLU, K, MO, WAG, YA); ibid., 25.i.2005, *B. Sonké & C. Nguembou K. 3799* (BR, BRLU, K, MO, WAG, YA); mature rain forest in the Korup National Park, collected between the Ndian River at Pamol field and 2.5 km on transect 'P', iv.1985, *D.W. Thomas 4764* (BR, MO, WAG, YA); old-growth forest along transect P, southern end of Korup National Park, ii.1986, *D.W. Thomas 5591* (BR, MO, YA); Bipindi, 1909, **G. Zenker 3860* (BM, BR, K). **EQUATORIAL GUINEA**. 8 km N Mitong, 13.xii.2003, *B. Sonké & P. Esono 3170* (BATA, BR, MO); 17,5 km de Mitong, 14.xii.2003, *B. Sonké & P. Esono 3183* (BATA, BR, BRLU, K, MO, YA). **GABON**. *c*. 40 km NW of Doussala, around camp II, 10.iv.2000, *M. Sosef 1189* (WAG); old logging road leading southward from chantier CBG Peni. Old skidder track at end of practicable road, 22.iv.2005, *J.L.C.H. Van Valkenburg, J. Degreef, Y. Azizet Issembé & J.-N. Boussiengui 3160* (BR).

## Imperfectly known species

*12. Sericanthe 'Djidji'*

A specimen (flower buds and immature fruits only) of subgenus *Sericanthe* from the southern part of the Cristal Mountains in Gabon appears to represent an undescribed species. It shares a feature, otherwise unique in the genus, with *S. pellegrinii*, namely the velutinous hair covering on the lower surfaces of the leaf blades. It differs from that species in the rounded or even somewhat cordate bases of the leaf blades, the absence of linear bacterial galls along the midvein and the 'closed' calyx in bud stage. The specimen was included in *S. petitii* in the *Checklist of Gabonese Vascular Plants* (Sosef *et al*., 2006: 370) and has two diagnostic features in common with that species: the rounded leaf blade bases and punctiform bacterial galls situated on the intersecondary veins. *Sericanthe petitii* and the related *S. lowryana* differ, however, in having the vegetative organs covered by much coarser and more erect hairs.

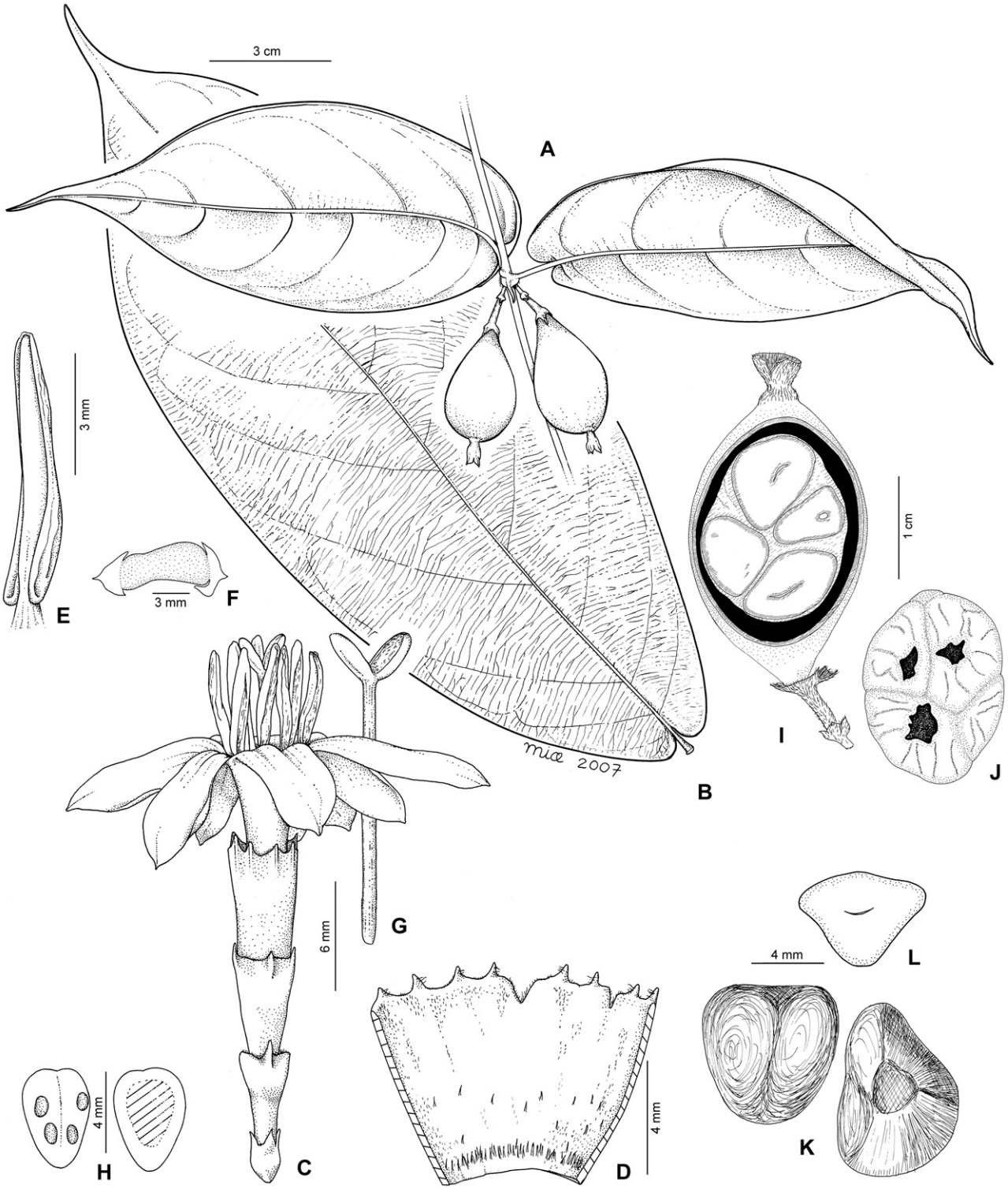


**Figure 12.** *Sericanthe auriculata* (Keay) Robbr. A, Part of fruiting branch. B, Leaf seen from above. C, Flower and its pedicel with three calyculi. D, Calyx laid open, showing colleters, especially at base. E, Stamen, its cross-section in F. G, Style. H, Ad- and abaxial views of a placenta with four ovules. I, Fruit cut tangentially showing four seeds surrounded by placental tissue. J, Abaxial view of four seeds held together by placental tissue. K, Two views of a seed. L, Cross-section of seed. A–H, drawn by Mia Scheerlinck from *Onana 34* (A), Sonké & Esono 3183 (B) and Nemba & Thomas 386 (C–H); I–L reproduced from Robbrecht (1981a: fig. 2).

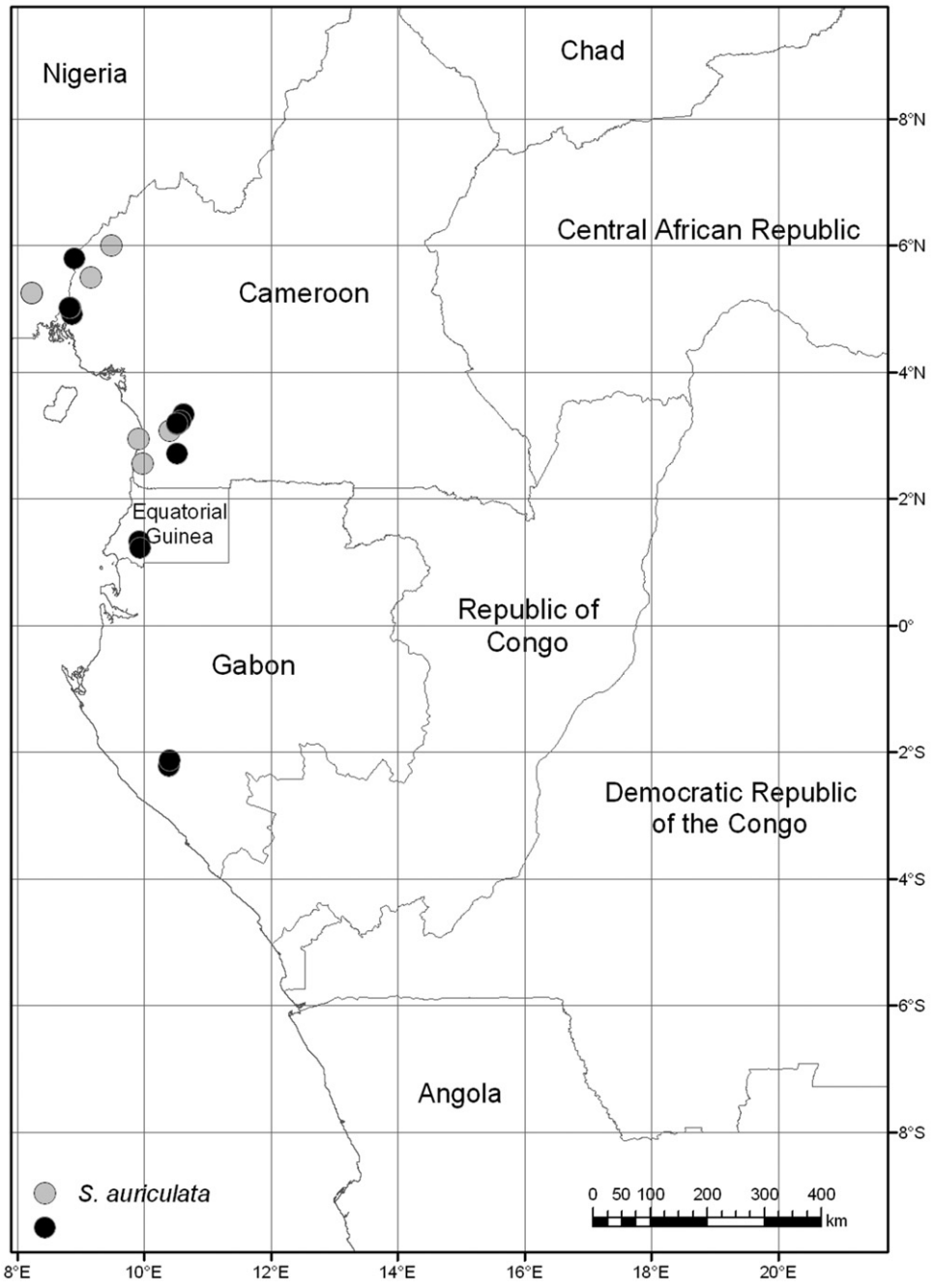


**Figure 13.** Distribution map of *Sericanthe auriculata* (grey symbols, localities cited in Robbrecht, 1981b; black symbols, new records).

The area in which the specimen was collected is well known for its high degree of endemism (Sosef *et al*., 2006: fig. 8).

**GABON**. Cristal Mountains, 10 km N of Djidji, 17.vi.1987, *J.M. Reitsma 3419* (WAG).

*13. Sericanthe 'Rumpi'*

Two specimens (given below) from the submontane to montane Rumpi Hills in the southwest of Cameroon probably represent a new species. The minor differences between the two specimens (as described below) have presumably no taxonomic value. The specimens have characteristic glossy leaf blades with dense parallel intersecondary veins, a feature easily visible in the field and on dried material; in the field, the intersecondaries are apparent because they are dark compared with the rest of the blade. This pattern suggests that a third species of subgenus *Macrocar-*

*pus* is at hand. The specimens also have a very apparent pubescence on the young twigs and undersides of young leaves (restricted to mid- and secondary veins and leaf margin) in common.

The two collections are in fruit only and do not permit a final decision to be made. Collection 2608 was made in a dense population of small trees, so that it should not be difficult to collect flowers during a following field trip.

**CAMEROON**. Nta Ali, 1200 m, 13.iv.1985, *Achoundong 1182* (BR S.P.510524). Leaf blades subcoriaceous, ovate or elliptic, up to $11.0 \times 4.5$ cm, with *c*. 15 parallel intersecondaries between the veins.

**CAMEROON**. Rumpi hills, near Dikume Balue (04°54′38.7″N, 09°14′19.8″E), 1585 m; 19.iv.2009, *S. Dessein et al*. *2608* (BR). Leaf blades papery, ovate or elliptic, up to $16 \times 8$ cm, with very dense pattern of parallel intersecondaries (> 20 parallel intersecondaries between two lateral veins).

## ACKNOWLEDGEMENTS

The National Geographic Society, through its Committee for Research and Exploration (grant N°7711-04), and the Sud Expert Plantes (project #375) project, under the French Ministry of Foreign Affairs, supported our field work in Cameroon. BS's visits to Belgium in 2006, 2007 and 2010, during which this article was drafted, were partly funded by the Université Libre de Bruxelles and the F.R.S.-F.N.R.S. (National Fund for Scientific Research), Brussels. Thanks are due to Dr Olivier Hardy (Laboratoire d'Eco-éthologie évolutive, Université Libre de Bruxelles) and Dr Tariq Stévart (Herbarium et Bibliothèque de Botanique africaine, Université Libre de Bruxelles) for their assistance. We are deeply grateful to Marie-Noël Djuikouo, Dr Vincent Droissart, Dr Charlemagne Nguembou, Murielle Simo, Lise Zemagho (University of Yaounde I) for help with the collection of plant material during field work in Cameroon. BS is grateful to the Missouri Botanical Garden for assistance. The National Botanic Garden (Belgium) staff are acknowledged for preparing the line drawings (Mia Scheerlinck), encoding the specimens (Natacha Beau), management of the specimen database and preparation of the distribution maps (Dr Henry Engledow) and help with the IUCN assessments (Dr Steven Dessein). Two anonymous reviewers gave helpful comments to an earlier version of the article. We thank Philip Oswald for help with the Latin diagnoses.

## REFERENCES

**Bamps P. 1975.** [Distribution map of *Lindackeria poggei*.]. Distributiones Plantarum Africanarum **9**: map 275.

**Bamps P. 1982.** *Flore d'Afrique centrale (Zaïre–Rwanda–Burundi). Repertoire des lieux de récolte*. Meise: Jardin Botanique National de Belgique.

**Breteler FJ. 1984.** [Distribution map of *Dichapetalum zenkeri*.]. Distributiones Plantarum Africanarum **25**: map 860.

**Bridson DM. 2003.** *Sericanthe*. In: Pope GV, ed. *Flora zambesiaca*. Volume **5**, part 3. Kew: Royal Botanic Gardens, 505–516.

**Cheek M, Pollard BJ, Darbyshire I, Onana JM, Wild C. 2004.** *The plants of Kupe, Mwanenguba and the Bakossi Mts, Cameroon. A conservation checklist*. Kew: Royal Botanic Gardens.

**Davis AP, Chester M, Maurin O, Fay MF. 2007.** Searching for the relatives of *Coffea* (Rubiaceae, Ixoroideae): the circumscription and phylogeny of Coffeeae based on plastid sequence data and morphology. *American Journal of Botany* **94:** 313–329.

**Dessein S, Lachenaud O, Sonké B. 2011.** *Colletoecema gabonensis*, a third species of an unusual African genus of Rubiaceae. *Brittonia* **63:** 215–219.

**Droissart V, Hardy O, Sonké B, Dahdouh-Guebas F, Stévart T. 2012.** Subsampling herbarium collections to assess geographic diversity gradients: a case-study with endemic Orchidaceae and Rubiaceae in Cameroon. *Biotropica* **44:** 44–52.

**Droissart V, Sonké B, Hardy OJ, Simo M, Taedoumg H, Nguembou KC, Stévart T. 2011.** Do plant families with contrasting functional traits show similar patterns of endemism? A case study with Central African Orchidaceae and Rubiaceae. *Biodiversity and Conservation* **20:** 1507–1531.

**Droissart V, Sonké B, Nguembou KC, Djuikouo KM-N, Parmentier I, Stévart T. 2009a.** Synopsis of the genus *Chamaeangis* (Orchidaceae) including two new taxa. *Systematic Botany* **34:** 285–296.

**Droissart V, Sonké B, Simo M, Stévart T. 2009b.** New orchid records from Atlantic Central Africa. *Edinburgh Journal of Botany* **66:** 115–132.

**Droissart V, Sonké B, Stévart T. 2006.** Checklist des Orchidaceae endémiques d'Afrique centrale atlantique présentes au Cameroun. *Systematics and Geography of Plants* **76:** 3–84.

**Hallé N. 1970.** Famille des Rubiacées (2e partie). In: Aubréville A, Leroy JF, eds. *Flore du Gabon* **17**. Paris: Muséum National d'Histoire Naturelle, 268–277.

**Hallé N. 1972.** Quatre espèces nouvelles du genre *Neorosea* N. Hallé (Rubiacées africaines). *Adansonia* **12:** 197–203.

**Holmgren PK, Holmgren NH, Barnett LC. 1990.** Index herbariorum. Part I. The herbaria of the world. *Regnum Vegetabile* **120:** 1–693.

**IUCN. 2001.** *2001 IUCN Red List categories and criteria: version 3.1*. IUCN Species Survival Commission. Gland and Cambridge: IUCN. Available at: http://www.iucnredlist.org/info/categories_criteria2001 [accessed 24 September 2011].

**IUCN, SSC. 2010.** *Guidelines for using the IUCN Red List categories and criteria*. Version 8.1. Gland and Cambridge: IUCN. Available at: http://app.iucn.org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf [accessed 28 March 2012].

**Lemaire B, Robbrecht E, van Wyk B, Van Oevelen S, Verstraete B, Prinsen E, Smets E Dessein S. 2011.** Identification, origin and evolution of leaf nodulating symbionts of *Sericanthe*. *Journal of Microbiology* **49:** 935–941.

**Letouzey R. 1985.** Notice de la carte phytogéographique du Cameroun au 1 : 500000: 4. Domaine de la forêt dense humide toujours verte. Toulouse: Institut de la Carte Internationale de la Végétation, 63–142.

**Nguembou KC, Esono P, Onana JM, Sonké B. 2006.** Un *Bertiera* (*Rubiaceae*) nouveau et hétérophylle du Cameroun et du Gabon. *Systematics and Geography of Plants* **76:** 211–216.

**Office of Geography. 1962.** *Central African Republic. Official standard names approved by the U.S. Board on geographic names*. Washington, DC: Department of the Interior.

**Robbrecht E. 1978a.** *Sericanthe*, a new genus of Rubiaceae (Coffeeae). *Bulletin du Jardin Botanique National de Belgique* **48:** 3–78.

**Robbrecht E. 1978b.** Rubiaceae. Distributiones Plantarum Africanarum **13**: maps 407–429.

**Robbrecht E. 1981a.** Studies in African Rubiaceae (I). 2 The position of '*Tricalysia auriculata*' and '*Neorosea adamii*'. *Bulletin du Jardin Botanique National de Belgique* **51:** 167–173.

**Robbrecht E. 1981b.** [Distribution map of *Sericanthe auriculata* and *S. adamii*]. Distributiones Plantarum Africanarum **21**: map 709–710.

**Robbrecht E. 1981c.** [Distribution map of *Parapentas*]. Distributiones Plantarum Africanarum **21**: map 717.

**Robbrecht E. 1988.** 71. *Sericanthe*. In: Bridson DM, Verdcourt B, eds. *Flora of tropical East Africa, Rubiaceae* (part 2). Rotterdam: A.A. Balkema, 566–569.

**Robbrecht E. & Manen J.-F. 2006.** The major evolutionary lineages of coffee family (Rubiaceae, angiosperms). Combined analysis (nDNA and cpDNA) to infer the position of *Coptosapelta* and *Luculia*, and supertree construction based on *rbcL, rps16, trnL-trnF* and *atpB-rbcL* data. New classification in two subfamilies, Cinchonoideae and Rubioideae. *Systematics and Geogrraphy of Plants* **76:** 85–146.

**Sonké B, Dessein D, Taedoumg H, Groeninckx I, Robbrecht E. 2008a.** A new species of *Colletoecema* (Rubiaceae) from southern Cameroon with a discussion of relationships among basal Rubioideae. *Blumea* **53:** 533–547.

**Sonké B, Djuikouo KM-N, Robbrecht E. 2008b.** A new species of *Calycosiphonia* (afrotropical Rubiaceae) from the 'Lower Guinea' area. *Nordic Journal of Botany* **25:** 275–280.

**Sonké B, Nguembou KC, Davis AP. 2006.** A new dwarf *Coffea* (Rubiaceae) from southern Cameroon. *Botanical Journal of the Linnean Society* **151:** 425–430.

**Sonké B, Simo M, Dessein S. 2009.** Synopsis of the genus *Mitriostigma* (Rubiaceae) with a new monocaulous species from southern Cameroon. *Nordic Journal of Botany* **27:** 305–312.

**Sosef MSM, Wieringa JJ, Jongkind CCH, Achoundong G, Isembé AY, Bedigian D, van den Berg RG, Breteler FJ, Cheek M, Degreef J, Faden RB, Goldblatt P, van der Maesen LJG, Ngok BL, Niangadouma R, Nzabi T, Nziengui B, Rogers ZS, Stévart S, van Valkenburg JLCH, Walters G, de Wilde JJFE. 2006.** Check-list des plantes vasculaires du Gabon. *Scripta Botanica Belgica* **35:** 369–370.

**Tosh J, Davis AP, Dessein S, De Block P, Huysmans S, Fay MF, Smets E, Robbrecht E. 2009.** Phylogeny of *Tricalysia* (Rubiaceae) and its relationships with allied genera based on plastid DNA data: resurrection of the genus *Empogona*. *Annals of the Missouri Botanical Garden* **96:** 194–213.

**White F. 1979.** The Guineo-Congolian Region and its relationship to other phytochoria. *Bulletin du Jardin Botanique National de Belgique* **49:** 11–55.

**White F. 1983.** *The vegetation of Africa. A descriptive memoir to accompany the UNESCO/AETFAT/UNSO, vegetation map of Africa*. Natural Resources Research 20. Paris: UNESCO.

**White F. 1993.** The AETFAT chorological classification of Africa: history, methods and applications. *Bulletin du Jardin Botanique National de Belgique* **62:** 225–281.

**Wilmot-Dear CM, Friis I. 2006.** The Old World species of *Pouzolzia* (Urticaceae, tribus Boehmerieae). A taxonomic revision. *Nordic Journal of Botany* **24:** 5–116.