



Two new *Sabicea* (Rubiaceae) species from West Central Africa: *Sabicea bullata* and *Sabicea urniformis*

LISE A. ZEMAGHO^{1,2}, OLIVIER LACHENAUD³, STEVEN DESSEIN³, SIGRID LIEDE-SCHUMANN² & BONAVENTURE SONKE^{1,4,5}

¹Plant Systematic and Ecology Laboratory, Higher Teachers' Training College, University of Yaoundé I, P.O. Box 047, Yaoundé, Cameroon; Email: lisemez@yahoo.fr; bonaventuresonke@ens.cm

²Department of Plant Systematics, University of Bayreuth, 95440 Bayreuth, Germany; Email: sigrid.liede@uni-bayreuth.de

³Botanic Garden Meise, Domein van Bouchout, BE-1860 Meise, Belgium; Email: steven.dessein@br.fgov.be, olachena@ulb.ac.be

⁴Service Evolution Biologique et Ecologie, Université Libre de Bruxelles - ULB, 50 Av. F. Roosevelt, CP160/12, 1050 Bruxelles, Belgique

⁵Missouri Botanical Garden, Africa & Madagascar Department, P.O. Box 299, 63166–0299, Saint Louis, Missouri, USA

Abstract

Two distinctive new species of *Sabicea* (Rubiaceae) from the Lower Guinea region are described and illustrated. *Sabicea bullata* is easily recognized by its cordate leaves, which are strongly bullate above, and its sessile glomerulate inflorescences. It is restricted to the Rumpi Hills and Bakossi Mountains, in southwestern Cameroon. *Sabicea urniformis*, from southern Gabon and Congo-Brazzaville, is remarkable in having discoloured leaves and an urn-shaped involucre with bracts shortly connate at the base.

Detailed descriptions and botanical drawings are provided, conservation status assessed and taxonomic affinities discussed.

Key words: Conservation status, Lower Guinea, Rumpi Hills, IUCN Red List Categories

Introduction

Sabicea Aublet (1775: 192) is a large genus of the Rubiaceae family and includes ca. 145 species (Govaerts *et al.* 2013). The two main centers of diversity are tropical Africa (ca. 85 species) and South America (ca. 54 species) (Khan *et al.* 2008); the genus also occurs in Madagascar (6 spp.) (Razafimandimbison & Miller, 1999) and Sri Lanka (1 sp.) (Khan *et al.* 2008).

The delimitation of *Sabicea*, especially in Africa, has been controversial. Hallé (1963, 1966) regarded *Sabicea* to consist only of species with twining habit and 5-locular ovaries, and separated the genera *Stipularia* Palisot-Beauvois (1807: 26), *Ecpoma* Schumann (1896: 430) and *Pseudosabicea* N. Hallé (1963: 170), which have a non-twining habit and (except in *Stipularia*) 2-locular ovaries. Based on phylogenetic data, Khan *et al.* (2008) united these satellite genera with *Sabicea*. This largely follows the earlier treatments of Wernham (1914, who however kept *Stipularia* distinct) and Hepper (1958). *Sabicea* in the broad sense is easily characterized by the following combination of characters: absence of raphides, valvate corolla aestivation, axillary inflorescences and fleshy fruits with numerous small seeds (Dessein *et al.* 2001, Khan *et al.* 2008).

The genus *Sabicea* s.l. belongs to tribe Sabiceae. Based on nrITS and *trnT-F* sequence data, Khan *et al.* (2008) also included in this group the genera *Hekistocarpa* Hooker (1873: 1151), *Tamridaea* Bremer & Thulin (1998: 85) and *Virectaria* Bremekamp (1952: 21), although this broad circumscription of Sabiceae s.l. is not supported by any morphological synapomorphy. Dessein *et al.* (2001) treated these three genera as a separate tribe, Virectarieae, a position supported by *rps16* intron sequences.

In Africa, *Sabicea* s.l. is most diverse in the Lower and Upper Guinea Domains, with only few species in the Congolia Domain and in the other African phytoregions of White (1979). Although valuable regional treatments have been provided by Hepper & Keay (1963) for West Africa, Hallé (1966) for Gabon and Verdcourt & Bridson (1988)

References

- Anonymous (1962) Systematics Association Committee for descriptive biological terminology II. Terminology of simple symmetrical plane shapes (chart 1a). *Taxon* 11: 145–156.
<http://dx.doi.org/10.2307/1216718>
- Aublet, J.B.C.F. (1775) *Histoire des plantes de la Guiane Française. Tome I*. Didot jeune, London and Paris, 621 pp.
- Bachman, S., Moat, J., Hill, A.W., De la Torre, J. & Scott, B. (2011) Supporting Red List Threat assessments with GeoCAT: geospatial conservation assessment tool. *Zookeys* 150: 117–126.
<http://dx.doi.org/10.3897/zookeys.150.2109>
- Bremekamp, C.E.B. (1952) *The African species of Oldenlandia L. sensu Hiern et K. Schumann*. Verhandelingen der Koninklijke Nederlandse Akademie van Wetenschappen. Afd. Natuurkunde, Tweende Reeks, LVIII, no 2, North-Holland Publishing Company, Amsterdam, 297 pp.
- Bremer, B. & Thulin, M. (1998) Collapse of Isertieae, re-establishment of Mussaendeae and a new genus of Sabiceae (Rubiaceae): phylogenetic relationships based on *rbcL* data. *Plant Systematics and Evolution* 211: 71–92.
- Cheek, M., Pollard, B.J., Darbyshire, I., Onana, J.-M. & Wild, C. (2004) *The plants of Kupe, Mwanenguba and the Bakossi Mountains, Cameroon: a conservation checklist*. Kew, Royal Botanic Gardens, 508 pp.
- Dessein, S., Andersson, L., Robbrecht, E. & Smets, E. (2001) *Hekistocarpa* (Rubiaceae): A member of an emended tribe Virectarieae. *Plant Systematics and Evolution* 229: 59–78.
<http://dx.doi.org/10.1007/s006060170018>
- Govaerts, R., Ruhsam, M., Andersson, L., Robbrecht, E., Bridson, D., Davis, A., Schanzer, I. & Sonké, B. (2013) *World Checklist of Rubiaceae, The Board of Trustees of the Royal Botanic Gardens, Kew*. Available from: <http://www.kew.org/wcsp/> (accessed: 16 November 2013).
- Hallé, N. (1963) Délimitation des genres *Sabicea* Aubl. et *Ecpoma* K.Schum. en regard d'un genre nouveau: *Pseudosabicea* (Mussaendeae-Rubiaceae). *Adansonia*, sér. 2, 3: 168–177.
- Hallé, N. (1964) Complément à l'étude du genre *Pseudosabicea* N.Hallé (Rubiaceae). *Bulletin Jardin Botanique État Bruxelles* 34: 397–402.
<http://dx.doi.org/10.2307/3667324>
- Hallé, N. (1966) *Flore du Gabon. Vol. 12. Rubiacées (1e partie)*. Muséum National d'Histoire Naturelle, Paris, 278 pp.
- Hepper, F.N. (1958) *Sabicea* Aubl. and *Stipularia* P. Beauv. (Rubiaceae-Mussaendeae) in Tropical Africa. *Kew Bulletin* 13: 289–294.
<http://dx.doi.org/10.2307/4109534>
- Hepper, F.N. & Keay, R.W.J. (1963) Rubiaceae. In: F. N. Hepper (Ed.) *Flora of Tropical Africa*. Vol. 2, Crown Agents for Oversea Governments and Administrations, Millbank, London, pp. 104–224.
- Hijmans, R.J., Guarino, L., Cruz, M. & Rojas, E. (2001) Computer tools for spatial analysis of plant genetic resources data: 1. DIVA-GIS. *Plant Genetics. Resources. Newsletter*. 127:15–19.
- Hooker, J.D. (1849) *Niger Flora*. London, 587 pp.
- Hooker, J.D. (1873) *Hekistocarpa minutiflora*. *Icones Planterum* 14: t. 1151.
- IUCN (2012) *IUCN Red List Categories*, Version 3.1. Second Edition. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK. Downloadable from: http://jr.iucnredlist.org/documents/redlist_cats_crit_en.pdf (accessed: 4 august 2013).
- IUCN Standards and Petitions Subcommittee (2013) *Guidelines for Using the IUCN Red List Categories and Criteria*. Version 10 (February 2013). Prepared by the Standards and Petitions Subcommittee. Downloadable from: <http://www.iucnredlist.org/documents/RedListGuidelines.pdf> (accessed: 04/08/2013).
- Khan, S.A., Razafimandimbison, S.G., Bremer, B. & Liede-Schumann, S. (2008) Sabiceae and Virectarieae (Rubiaceae, Ixoroideae): one or two tribes? New tribal and generic circumscriptions of Sabiceae and biogeography of *Sabicea* s.l. *Taxon* 57: 1–17.
- Krause, K. (1917) Beiträge zur Flora von Afrika XLVI, Rubiaceae africanae. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 54: 357
- Mildbraed, G.W.J. (1922) *Wissenschaftliche Ergebnisse der zweiten Deutschen Zentral-Africa-Expedition 1910–1911 unter Führung Adolf Friedrichs, Herzogs zu Mecklenburg. Band II*. Klinkhardt & Biermann, Leipzig, 202 pp.
- Palisot-Beauvois, A.M.F.J. (1810) [1807] *Stipulaire. Stipularia*, Fam. des Rubiacées. In: *Flore d'Oware et de Bénin en Afrique*. Imprimerie de Fain et compagnie, Paris, p. 26.
- Razafimandimbison, S.G. & Miller, J. (1999) New taxa and nomenclatural notes on the flora of the Marojejy Massif, Madagascar. III. Rubiaceae. A new species of *Sabicea*. *Adansonia* sér. 3. 21: 41–45.
- Robbrecht, E. (1988) Tropical woody Rubiaceae. Characteristics, features and progressions. Contribution to a new subfamilial classification.

Opera Botanica Belgica 1: 1–271.

- Schumann, K. (1896) [1897] Beiträge zur Flora von Afrika, XIII, Rubiaceae africanae. In: Engler A. (Ed.) *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 23. W. Engelmann, Leipzig, Germany, pp: 412–470.
- Thiers, B. (2010) Index Herbariorum: *A global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. Available from: <http://sweetgum.nybg.org/ih/> (accessed: 01/10/2010).
- Verdcourt, B. & Bridson, V. (1988) Rubiaceae (part II). In: Polhill R.M. (Ed.) *Flora of Tropical East Africa*. Balkema, Rotterdam, p 747.
- Wernham, H.F. (1914) *A monograph of the genus Sabicea*. London, British Museum (Natural History), 82 pp.
- White, F. (1979) The Guineo-Congolian Region and its relationships to other phytochoria. *Bulletin du Jardin Botanique National de Belgique* 49: 11–55.
<http://dx.doi.org/10.2307/3667815>