



A New Species of Operculicarya H. Perrier (Anacardiaceae) from Western Dry Forests of Madagascar

Authors: Armand, Randrianasolo, and Lowry, Porter P.

Source: Candollea, 70(1) : 57-60

Published By: The Conservatory and Botanical Garden of the City of Geneva (CJBG)

URL: <https://doi.org/10.15553/c2015v701a6>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

A new species of *Operculicarya* H. Perrier (Anacardiaceae) from western dry forests of Madagascar

Armand Randrianasolo & Porter P. Lowry II

Abstract

RANDRIANASOLO, A. & P. P. LOWRY II (2015). A new species of *Operculicarya* H. Perrier (Anacardiaceae) from western dry forest of Madagascar. *Candollea* 70: 57-60. In English, English and French abstracts. DOI: <http://dx.doi.org/10.15553/c2015v701a6>

A new species of *Operculicarya* H. Perrier (*Anacardiaceae*) is described from material collected in dry forest on karstic limestone in western Madagascar, bringing the total number of species in the genus to nine. *Operculicarya calcicola* Randrian. & Lowry is distinguished from the other members of the genus by the size and shape of its leaves and leaflets, the structure of its infructescence, and the size of its fruits. An illustration is provided along with a distribution map and preliminary assessment of its risk of extinction following the IUCN Red List criteria, which indicates a status of Least Concern.

Résumé

RANDRIANASOLO, A. & P. P. LOWRY II (2015). Une nouvelle espèce d'*Operculicarya* H. Perrier (Anacardiaceae) de la forêt sèche de l'ouest de Madagascar. *Candollea* 70: 57-60. En anglais, résumés anglais et français. DOI: <http://dx.doi.org/10.15553/c2015v701a6>

Une nouvelle espèce d'*Operculicarya* H. Perrier (*Anacardiaceae*) est décrite à partir de matériel récolté dans la forêt sèche sur calcaire de l'ouest de Madagascar, portant le nombre total des espèces reconnues dans le genre à neuf. *Operculicarya calcicola* Randrian. & Lowry se distingue des autres membres du genre par la taille et la forme de ses feuilles et de ses folioles, la structure de ses infrutescences et la taille de ses fruits. Une illustration de l'espèce est présentée ainsi qu'une carte de distribution et une évaluation préliminaire de son risque d'extinction selon les critères de la Liste Rouge de l'IUCN, indiquant un statut de Préoccupation Mineure.

Keywords

ANACARDIACEAE – *Operculicarya* – Conservation – Madagascar – New species – Taxonomy

Addresses of the authors:

AR: William L. Brown Center, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO, 63166-0299, U.S.A. E-mail: armand.randrianasolo@mobot.org

PPL: Africa and Madagascar Program, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO, 63166-0299, U.S.A. and Institut de Systématique, Évolution et Biodiversité (UMR 7205 – CNRS MNHN UPMC EPHE), Muséum national d'Histoire naturelle, rue Cuvier 57, C.P. 39, 75231 Paris CEDEX 05, France.

Submitted on February 16, 2015. Accepted on March 11, 2015.

Edited by M. W. Callmander

ISSN: 0373-2967 – Online ISSN: 2235-3658 – *Candollea* 70(1): 57-60 (2015)

© CONSERVATOIRE ET JARDIN BOTANIQUES DE GENÈVE 2015

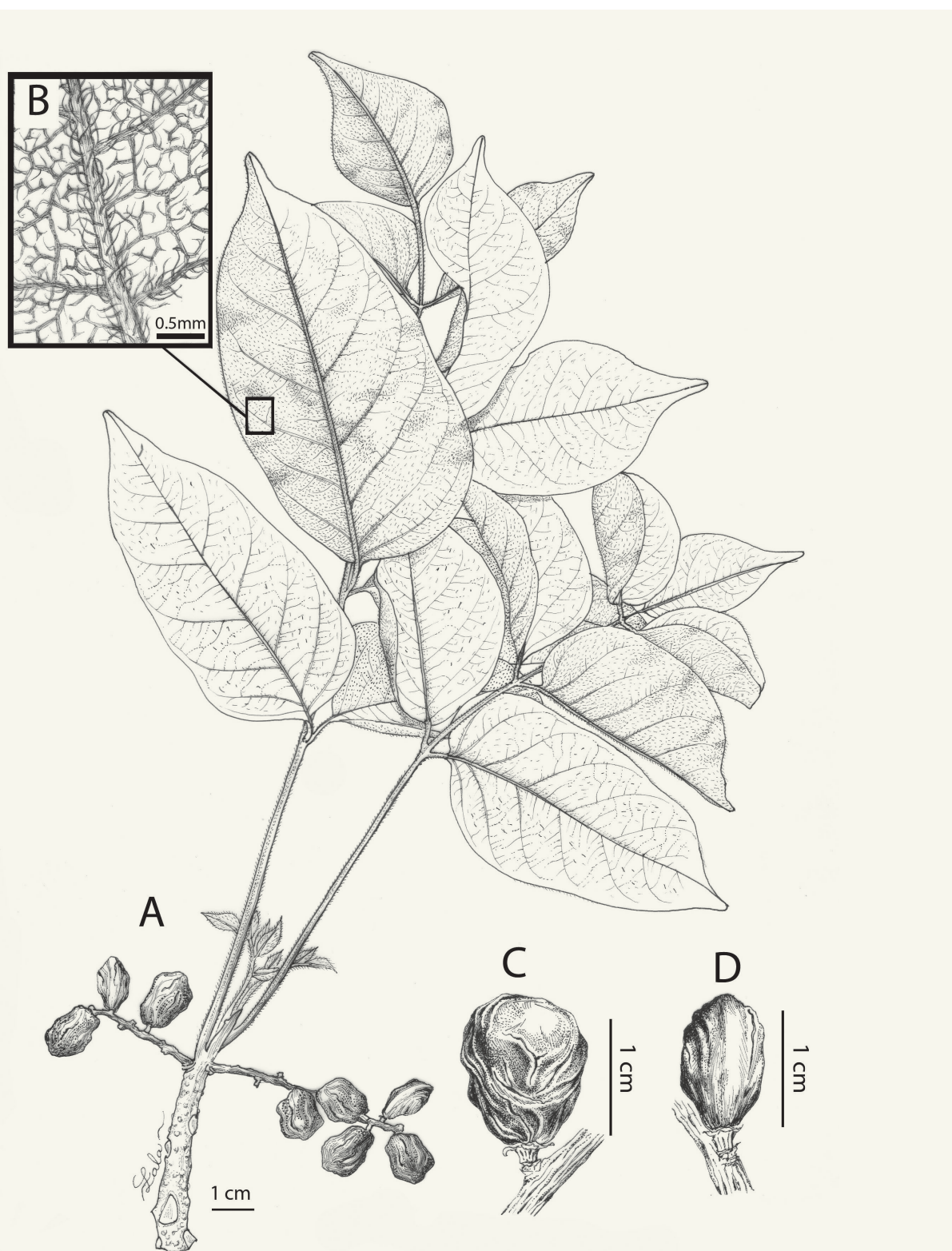


Fig. 1. – *Operculicarya calcicola* Randrian. & Lowry. A. Fruiting branch; B. Detail of indument on lower surface of leaflet; C. Fruit on pedicel (lateral view); D. Fruit on pedicel (dorsal view). [Rakotovao 6185, TAN] [Drawing: Roger Lala Andriamiarisoa]

Introduction

The genus *Operculicarya* H. Perrier (*Anacardiaceae*) has been the subject of a pair of taxonomic revisions during the last two decades, the first by EGGLE (1995), who recognized six species, including four he described as new, and the second by RANDRIANASOLO & LOWRY (2006), who re-examined species limits and described two additional novelties, bringing the total number of species to eight, all of which occur on Madagascar, with one, *O. gummifera* (Sprague) Capuron, also present in the Comoro Islands. As part of our ongoing study of Malagasy *Anacardiaceae*, we have systematically been examining newly collected herbarium material resulting from the extensive inventory work conducted throughout Madagascar by botanists from various institutions, which has regularly led to the discovery of new taxa. Here we describe a distinctive new species of *Operculicarya* restricted to areas of karstic limestone (referred to locally as “tsingy”), in western Madagascar, in particular in the Beanka forest (GAUTIER et al., 2013) where most of the specimens, including the type, were collected. This species was previously known only from one fertile and two fragmentary, unidentifiable specimens.

Systematics

Operculicarya calcicola Randrian. & Lowry, *spec. nova* (Fig. 1).

Typus: MADAGASCAR. **Prov. Mahajanga:** Région Melaky, Beanka, S de la Kimanambolo, 18°07'14"S, 44°33'34"E, 350 m, 25.XI.2014, fr., Gautier et al. 5829 (holo-: G [G00377897]!; iso-: BR, K, MO-6605509!, P [P00641020]!, TAN).

Operculicarya calcicola Randrian. & Lowry differs from its most similar congener, *O. gummifera* (Sprague) Capuron, by its larger leaflets [(2.5-) 6-11 × (1.3-)2.5-4.7 vs. (2)3-6.3 × (0.9)1-1.9 cm] and fruits [10-12 × 7-10 × 5-7 vs. 6-9 × 5-7 × 3-5 mm], as well as the thickness of its infructescence axis [0.9-1.3(-1.8) vs. 0.3-0.9(-1.3) mm].

Small to medium trees ca. 5-10 m tall, trunk ca. 11-20 cm in diam. with smooth bark; twigs short-lanate. Leaves imparipinnate, alternate and usually well-spaced on long shoots, more closely clustered on lateral short shoots, (14-)19-28.5 cm long; petiole 5-8.5 cm long, short-lanate; rachis not winged, terete, short-lanate; leaflets (9-)11-13, lateral ones opposite, petiolules 2-5 mm long, short-lanate, blade membranaceous to chartaceous, ovate, (2.5-)6-11 × (1.3-)2.5-4.7 cm, median ones largest, discolorous, dark greenish brown to dark green above when dried, paler green beneath, densely lanate on both surfaces when young, with longer and somewhat denser trichomes along the midvein and secondary veins, glabrescent on upper surface except along midvein and secondary veins, venation craspedodromous, tertiary venation

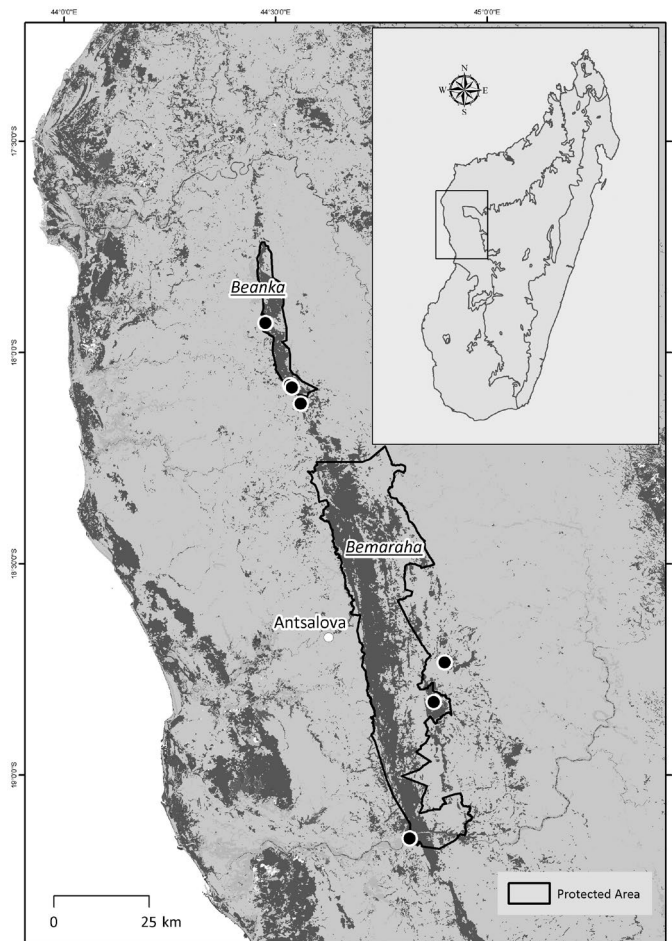


Fig. 2. – Geographic distribution of *Operculicarya calcicola* Randrian. & Lowry; darker areas indicate remaining natural vegetation (insert map shows the bioclimatic zones of Madagascar (after CORNET, 1974; see SCHATZ, 2000).

visible, more so on lower surface, base oblique to subcordate, asymmetric in lateral leaflets, margin entire, apex acuminate, the acumens rounded. Flowers unknown. Infructescence axes 2-7.5(-17) cm long, 0.9-1.3(-1.8) mm in diam. at base; pedicel ca. 1-3 mm long, glabrous. Fruits 6-8(-16) per infructescence, ellipsoid, slightly compressed laterally, 10-12 × 7-10 × 5-7 mm; endocarp bony, with a single operculum.

Distribution and ecology. – *Operculicarya calcicola* is only known from dry, deciduous forest on karstic limestone (“tsingy”) in western Madagascar (Fig. 2), at elevations between 50 and 600 m. The flowers of this species are as yet unknown, but fruiting material has been collected in November and December.

Conservation status. – *Operculicarya calcicola* has an extent of occurrence (EOO) of 1,426 km² and would thus qualify as Endangered under the Criterion B1 of the IUCN Red

List (IUCN, 2012) if other qualifying conditions were met. However, as *O. calcicola* is restricted to karstic limestone areas, one of the few natural habitats in Madagascar that does not appear to be subjected to noticeable human-caused destruction or alteration, it may well be under little if any threat, and should thus be assigned a preliminary status of Least Concern [LC].

Notes. – Using the key provided by RANDRIANASOLO & LOWRY (2006), material of this new species would be identified as *O. gummifera* (Sprague) Capuron. It can, however, be distinguished by several features, as summarized in Table 1.

Table 1. – Morphological features distinguishing *Operculicarya calcicola* Randrian. & Lowry from *O. gummifera* (Sprague) Capuron.

	<i>O. calcicola</i>	<i>O. gummifera</i>
Size of largest leaflet [cm]	(2.5-)6-11 × (1.3-)2.5-4.7	(2-)3-6.3 × (0.9-)1-1.9
Inflorescence axis [mm in diam.]	Robust, 0.9-1.3(-1.8)	Filiform, 0.3-0.9(-1.3)
Fruit size [mm]	Large, 10-12 × 7-10 × 5-7	Small, 6-9 × 5-7 × 3-5

All but three of the known collections of *O. calcicola* were made since RANDRIANASOLO & LOWRY (2006) completed their review of the genus. The two oldest gatherings (*Leandri 2017* and *Service Forestier 6778*) were not cited by them because they are fragmentary and could not be assigned with confidence to any of the eight species they recognized, whereas the most recent one (*Jongkind et al. 3228*) was regarded as a somewhat atypical individual of *O. gummifera*.

Paratypes. – MADAGASCAR. Prov. Mahajanga: Region Melaky, Tsingy de Bemaraha, S of the Manambolo River, 19°09'S 44°09'E, 50 m, 26.XI.1996, fr., *Jongkind et al. 3228* (G [G00404134], MO-5968354, P [P04800703], TAN, WAG); env. de Tsiandro (Ouest), forêt de Behandrao, [18°49'37"S 44°52'25"E], 500-600 m, 25.XI-3.XII.1952, fr., *Leandri 2017* (P [P00633854, P00633857]); aux env. de Tsiandro, [18°49'37"S 44°52'25"E], 4.XII.1952, fr., *Service Forestier 6778* (P [P00120510, P06242028, P06633856]); Beanka, partie centrale, Ambinda Nord, 17°55'48"S 44°28'34"E, 223 m, 16.XI.2011, fr., *Gautier et al. 5625* (G [G00376040], MO-6605511, TAN); forêt d'Amboloando, Tsingy de Beanka, 18°04'35"S 44°32'02"E, 269 m, 12.XI.2012, fr., *Rakotovoao et al. 6185* (G [G00377809], MO-6605512, TAN); *ibid. loc.*, 18°04'56"S 44°32'20"E, 269 m, 13.XI.2012, fr., *Rakotovoao et al. 6213* (G [G00377810], MO-6605510, TAN).

Acknowledgements

We wish to thank Roger Lala Andriamiarisoa for the fine illustration, Martin Callmänder for assistance with obtaining loans, scans and bar codes of specimens from G, George Schatz for valuable help with the risk of extinction assessment, Tantely Raminosoa for preparing the species distribution map, and the staffs of the Herbar National in Paris (P) and the Botanical and Zoological Park of Tsimbazaza herbarium in Antananarivo (TAN) for providing access to their collections. We gratefully acknowledge courtesies extended by the Government of Madagascar (Ministère de l'Environnement, de l'Écologie, de la Mer et des Forêts (MEEMF)). Finally we thank Laurent Gautier and Roy Gereau for helpful comments on an earlier version of this manuscript that led to its improvement.

References

- CORNET, A. (1974). *Essai de cartographie bioclimatique à Madagascar. Notice Explicative No. 55.* ORSTOM, Paris.
- EGLI, U. (1995). A synoptical revision of *Operculicarya* (Anacardiaceae). *Bull. Mus. Natl. Hist. Nat., sect. B, Adansonia* 17: 149-158.
- GAUTIER, L., R. BOLLIGER, M. W. CALLMANDER, M. R. HANITRARIVO, I. LUINO, L. NUSBAUMER, P. B. PHILLIPSON, L. RANAIVARISOA, P. RANIRISON, B. F. L. RAKOTOZAFY, N. RASOLOFO & J. A. TAHINARIVONY (2013). Inventaire des plantes vasculaires de la région de Beanka, Région Melaky, Ouest de Madagascar. In: GOODMAN, S. M., L. GAUTIER & M. J. RAHERILALAO (ed.), *La forêt de Beanka, Région Melaky, Ouest de Madagascar. Malagasy Nat.* 7: 127-160.
- IUCN (2012). *IUCN Red List Categories and Criteria: Version 3.1. 2nd Edition.* IUCN Species Survival Commission, Gland & Cambridge.
- RANDRIANASOLO, A. & P. P. LOWRY II (2006). *Operculicarya* (Anacardiaceae) revisited: an updated taxonomic treatment for Madagascar and the Comoro Islands, with descriptions of two species. *Adansonia* ser. 3, 28: 359-371.
- SCHATZ, G. E. (2000). Endemism in the Malagasy tree flora. In: LOURENÇO, W. R. & S. M. GOODMAN (ed.), *Diversity and endemism in Madagascar: 1-9.* Mémoires de la Société de Biogéographie, Paris.