Adieu Adelosa Blume (Lamiaceae): Further Observations on Rotheca Raf. for Madagascar

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Source: Candollea, 68(2) : 316-320

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

URL: https://doi.org/10.15553/c2013v682a18

34. CALLMANDER, Martin W., Peter B. PHILLIPSON, James A. WEARN & Rogier P. J. de KOK: Adieu Adelosa Blume (Lamiaceae): Further observations on Rotheca Raf. for Madagascar

Introduction

The genus *Adelosa* Blume *(Lamiaceae)* and its single species, *Adelosa microphylla* Blume, were first described by BLUME (1850) based on a single gathering made by Auguste Pervillé in northern Madagascar. This plant has puzzled taxonomists for more than a century and a half. BAILLON (1891) in his *Histoire des Plantes* did not accept the genus and placed it in synonymy under *Clerodendrum* L., a conclusion followed by BRIQUET (1895). More recently, MOLDENKE (1981) resurrected *Adelosa*, placing it near *Premna* L. and *Clerodendrum*, but nevertheless expressed uncertainty about this. One of us (RPJK), re-examined the holotype *(Pervillé 629)* in Leiden Herbarium (L) in an attempt to resolve the problem. Careful dissection of the flower buds revealed the style to be attached between the four unilocular lobes of the ovary, a condition that is found in *Clerodendrum* (sensu lato) and it was concluded that *Adelosa microphylla* Blume belongs in this genus (DE KOK, 2001). However the specimen at L could not be identified to any known species of *Clerodendrum* from Madagascar with any confidence, due to its fragmentary condition.

Clerodendrum has generally been circumscribed to comprise c. 400-500 species native to tropical and warm temperate regions of the world with its centre of diversity in tropical regions of Africa and Asia (HARLEY & al., 2004), but recent molecular phylogenetic studies have revealed that it is polyphyletic (STEANE & al., 1997, 1999, 2004; YUAN & al., 2010), and several genera have been segregated from *Clerodendrum*, leaving it more narrowly circumscribed and limited to c. 180 described species (WEARN & MABBERLEY, 2011a, 2011b). In Madagascar, *Clerodendrum* sensu Wearn & Mabberley, as well as the segregate genera *Rotheca* Raf. and *Volkameria* L., are present (CALLMANDER & PHILLIPSON, 2012).

In the context of our review of the genus *Clerodendrum* and its segregates for the MADAGASCAR CATALOGUE (2013), we (MWC and PBP) examined the isotype material of *Adelosa microphylla* held at P. It comprises two separate sheets, each with several portions of Pervillé's collection, and in contrast with the holotype at L one of the sheets [P00091374] possesses a mature flower. The corolla, although not in a very good condition, was observed to be strongly zygomorphic, and to expand abruptly at the mouth of the tube, distinctive characteristics of the genus *Rotheca*, and we realized that *Adelosa microphylla* was none other than the widespread and variable *Rotheca incisa* (Klotzsch) Steane & Mabb., which is native to Madagascar and Africa (STEANE & MABBERLEY, 1998). However Blume's name predates *Clerodendrum incisum* Klotzsch, the basionym of *Rotheca incisa*, and we therefore make the required new combination *R. microphylla* (Blume) Callm. & Phillipson. We have reviewed the many names that have been treated as synonyms of this species, and its morphological variation across Madagascar and on the African continent, as well as other apparently closely related species.

During this study, additional material of the poorly-known *Clerodendrum mirabile* Baker was brought to light. This enabled us to ascertain that it also belongs to the genus *Rotheca* and to elucidate its geographic distribution, and we provide the necessary new combination: *R. mirabilis* (Baker) Callm. & Phillipson.

We have also re-examined the status of *Rotheca myricoides* (Hochst.) Steane & Mabb., which is treated as native to Madagascar in the *Flore de Madagascar et des Comores* (as *Clerodendrum myricoides* Hochst.), based on the collection *"Warbur 553"* [Warburg?] cited as from Madagascar without locality (MOLDENKE, 1956). The specimen of this gathering at P is

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ISSN: 0373-2967 – Online ISSN: 2235-3658 – *Candollea* 68(2): 316-320 (2013)

clearly marked as having been collected in a garden. We have found no evidence of the species occurring naturally in Madagascar, nor of this commonly cultivated ornamental plant having become in any way naturalized.

In this note we present preliminary threat assessments for *Rotheca microphylla* and *R. mirabilis* for Madagascar following IUCN Red List Categories and Criteria (IUCN, 2012), and an updated species key to the native Malagasy species of *Rotheca*. Lists of representative collections can be found in the MADAGASCAR CATALOGUE (2013).

Key to the Malagasy species of *Rotheca*

1. Inflorescence developing on old wood early in the season, generally produced on leafless stems before vegetative growth has commenced; corolla tube shorter than the corolla lobes ..... ***Rotheca nudiflora***

1a. Inflorescence developing on young growth during the growing season, at the same time or after the leaves, stems with leaves at time of anthesis; corolla tube many times longer than corolla lobes 2

2. Calyx 2-2.5 cm in length at anthesis ..... ***Rotheca mirabilis***

2a. Calyx 0.5-1 cm in length at anthesis ..... ***Rotheca microphylla***

Systematics

Rotheca microphylla (Blume) Callm. & Phillipson, **comb. nova.**

≡ *Adelosa microphylla* Blume, Mus. Bot. 1: 176. 1850.

Typus: MADAGASCAR. Prov. Antsiranana: Ambongo, croît au bord de la mer, 14.II.1841, fl., *Pervillé 626* (holo-: L [L0062225]!; iso-: P [P00091374, P00091375]!, NY [NY00103724] image seen).

= *Clerodendrum incisum* Klotzsch in Peters, Naturw. Reise Mossambique, Bot. 1: 257. 1861. ≡ *Rotheca incisa* (Klotzsch) Steane & Mabb. in Novon 8: 205. 1998. **Typus: MOZAMBIQUE:** Rios de Sena, Querimba & Boror, *Peters s.n.* (holo-: B; iso-: K [K000192940]!), **syn. nov.**

= *Clerodendrum macrosiphon* Hook f. in Curtis's Bot. Mag.: tab. 6695. 1883. ≡ *Clerodendrum incisum* var. *macrosiphon* (Hook. f.) Baker in Fries, Fl. Scan. 5: 307. 1900. **Typus: TANZANIA. Zanzibar:** Usaramo, Hort. Kew, 19.V.1882, *Kirk s.n.* (holo-: K [K000607526]!), **syn. nov.**

= *Clerodendrum lindemuthianum* Vatke in Linnea 4: 348. 1896. **Typus: MADAGASCAR. Prov. Antsiranana:** Vavatobé, II.1880, fl., *Hildebrandt 3332* (holo-: B; iso-: BM [BM000923603] image seen, K [K000192958]!; P [P00446638, P00446639]!), **syn. nov.**

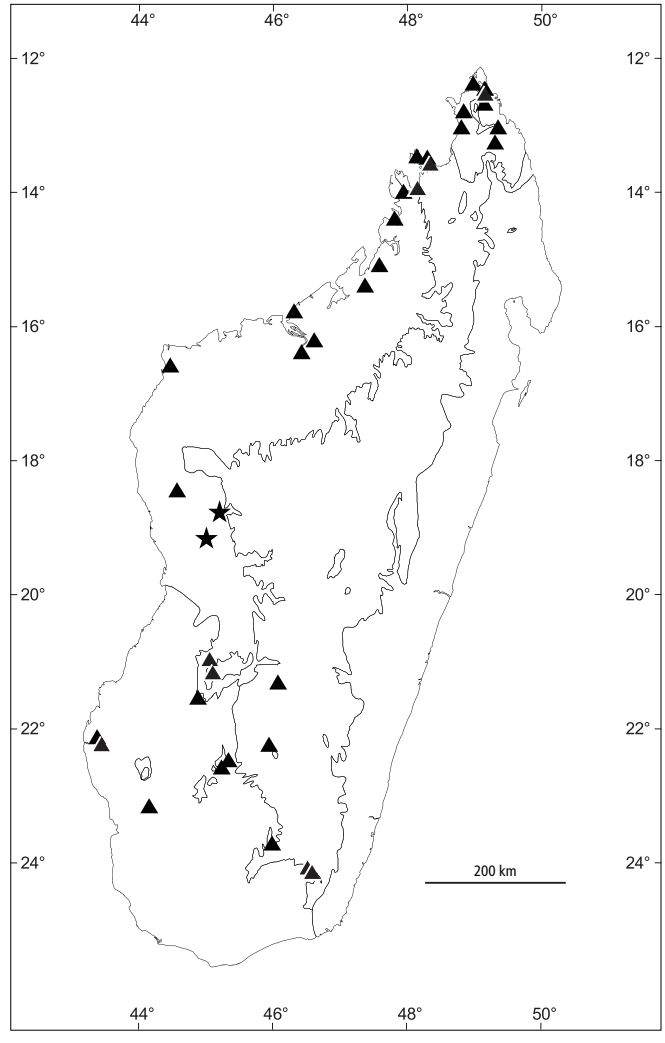

Fig. 1. – Distribution of *Rotheca microphylla* (Blume) Callm. & Phillipson (triangles) and *Rotheca mirabilis* (Baker) Callm. & Phillipson (stars) in Madagascar mapped on the biogeographic zones of CORNET (1974).

= *Clerodendrum bernieri* Briq. in Bull. Herb. Boissier 4: 348. 1896. **Typus: MADAGASCAR. Prov. Antsiranana:** sur les rochers calcaire de Lingvatou, [12°26'S 49°30'E], 1835, fl., *Bernier 169 (2e envoi)* (holo-: G [G00366 312]!; iso-: P [P00446637, P02865951, P02865955]!), **syn. nov.**

= *Clerodendrum pusillum* Gürke in Bot. Jahrb. Syst. 30: 390. 1901. **Typus: TANZANIA. MBEYA DISTR.:** Unyika, Nsangamales, s.d., *Goetze 1393* (holo-: B), **syn. nov.**

= *Clerodendrum incisum* var. *vinosum* Chiov., Fl. Somala 2: 364. 1932. **Typus: SOMALIA:** Licchitore, 22.VII. 1929, fl., *Senni 542* (holo-: FT [FT002833] image seen), **syn. nov.**

= *Clerodendrum incisum* var. *longepedunculatum* B. Thomas in Bot. Jahrb. Syst. 68: 78. 1936. **Typus: Kenya:** coast opposite Lamu, s.d, *Hildebrandt 1911* (holo-: B), **syn. nov.**

= *Clerodendrum incisum* var. *parvifolium* Moldenke in Phytologia 3: 407. 1951. **Typus: Madagascar. Prov. Antsiranana:** Vallée moyenne du Mandrare, près d'Andadabolava, Mont Vohitrosy, 800-850 m, XII. 1933, fl., *Humbert 12741* (holo-: P [P00446640]!; iso-: NY [NY001377354] image seen, P [P00446641]!), **syn. nov.**

= *Clerodendrum incisum* var. *afzelii* Moldenke in Amer. J. Bot. 38: 325. 1951. **Typus: Madagascar. Prov. Tulear:** Manasoa Tanosy, 13.I.1913, fl., *Afzelius s.n.* (holo-: K [K000607527]!; iso-: NY image seen), **syn. nov.**

= *Clerodendrum dalei* Moldenke in Phytologia 4: 287. 1953. **Typus: Kenya:** near Marjoreni, S. Digo, IX. 1937, fl., *Dale 3811* (holo-: BR [BR0000008715517] image seen; iso-: EA [EA000001136, EA000001137] images seen, K [K000192876]!, NY [NY00137334] image seen), **syn. nov.**

Observations. – *Rotheca microphylla* is a highly variable species that occurs throughout much of western, southern and northern Madagascar (Fig. 1), where it is largely confined to the Dry Bioclimatic Region (Cornet, 1974), and the western slopes of the central plateau. It is also native to eastern and southern parts of Africa in Angola, Kenya, Malawi, Mozambique, Somalia, Tanzania (including Zanzibar) and Zambia. It occurs in dry forest and woodland, mostly from sea level to about 800 m elevation, but occasionally higher, where it forms a lianescent shrub typically scrambling up to c. 3 m high or more in the under-storey and on the forest margins, but sometimes even higher. It also grows in open areas of degraded forest, bush and secondary anthropogenic grassland, where it tends to develop a low-growing spreading growth-form. It appears to be somewhat tolerant of grazing, trampling and burning and can become locally abundant in disturbed habitats with a somewhat weedy tendency. With its prolific flowers, distinctive erect crochet-like buds, and conspicuous long white corolla tube and spreading lobes (see Fig. 2), it is a decorative plant that has been introduced into cultivation as an ornamental in tropical and sub-tropical gardens in various parts of the world, sometimes marketed in North America as the "Musical-note Plant".

In addition to its variable habit, the diversity in *Rotheca microphylla* is most marked with respect to leaf shape and size. In Madagascar leaves vary from lanceolate and no more than 25 × 8 mm and almost entire with at most a few shallow marginal teeth, to elliptic and as much as 100 × 50 with coarsely serrate margins. To some extent this variation is also correlated with habitat and locality, the small-leaved specimens occurring in exposed arid places such as Isalo National Park, and the large-leaved specimens from more humid forest locations such as Manongarivo Special Reserve, but floral characteristics appear to be quite constant. In Africa most collections have large leaves, and the marginal teeth tend to be fewer and more deeply incised, but again the floral morphology is not distinguishable from the Malagasy plants. It is tempting to separate the Malagasy and African plants as different species, but after careful examinations of specimen held at G, K, P and MO, we believe that the differences in leaf margins are not clear-cut. In the absence of a better understanding of the causes of the variation, we conclude that it is currently impossible to recognize meaningful separate taxa even at infraspecific rank, and we maintain the existing broad concept of the species.

Conservation status. – With an "Extent of Occurrence" (EOO) of 436,663 km^2, and an "Area of Occupancy" (AOO) of 315 km^2, and 29 known subpopulations, seven of which are within protected areas (Ankarafantsika, Ankarana, Bemaraha, Isalo, Loky Manambato, Manongarivo and Forêt de Mikea). It is thus assigned a preliminary status of "Least Concern" [LC].

Rotheca mirabilis (Baker) Callm. & Phillipson, **comb. nova.**

≡ *Clerodendrum mirabile* Baker in J. Linn. Soc., Bot. 22: 513. 1887.

Typus: Madagascar: Central, s.d., fl., *Baron 4755* (holo-: K [K000192959]!; iso-: BM [BM000923602] image seen, NY [NY00137366] image seen, P [P00446657]!).

Observations. – The type collection has no indication of origin other than "Central Madagascar", but in the *Flore de Madagascar et des Comores* (Moldenke, 1956), a second collection was cited for the species – *Baron 6889* (K [K000607528]), collected at "Ankavandra" a small town in the Manambolo River valley in the Menabe Region of Toliara Province. The discovery of a third specimen, *Du Puy MB733* (MO-3846948, P [P00075324]), collected recently and with precise locality just 40 km SW of Ankavandra, helps to confirm the species as a likely highly-restricted endemic, possibly confined to the area just to the east of the Bemaraha protected area (Fig. 1).

Conservation status. – With only three collections known (AOO of 27 km^2), two of which dating back to a century and only one recent, all of them falling outside the Protected Area network, *Rotheca mirabilis* can be assessed as "Critically Endangered" [CR 2ab(i,ii,iii,iv)] following the IUCN Red List Categories and Criteria (IUCN, 2012) (calculation following Callmander & al., 2007).

Fig. 2. – Living plant of *Rotheca microphylla* (Blume) Callm. & Phillipson.

[Photo: J. Bosser]

Acknowledgements

The authors are grateful to the curators of the herbaria in Geneva (G), Kew (K), Paris (P) and Saint-Louis (MO) for allowing access to specimens. We thank Jean Bosser, formally at MNHN, for providing the photo of *R. microphylla* (Fig. 2). Financial support was provided by Andrew W. Mellon Foundation.

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