A new Dichaetanthera (Melastomataceae: Melastomateae) from Masoala National Park in Madagascar

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A new Dichaetanthera (Melastomataceae: Melastomateae) from Masoala National Park in Madagascar

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Abstract

RANARIVELO, H. & F. ALMEDA (2019). A new Dichaetanthera (Melastomataceae: Melastomateae) from Masoala National Park in Madagascar. *Candollea* 74: 131–136. In English, English and French abstracts. DOI: http://dx.doi.org/10.15553/c2019v742a2

Dichaetanthera schatzii H. Ranariv. & Almeda, a new species from Masoala National Park in northeastern Madagascar, is described, illustrated, and compared with *Dichaetanthera arborea* Baker, its presumed closest relative. *Dichaetanthera schatzii* appears to be endemic to the lowland humid evergreen forest on the southwestern side of Masoala National Park in Madagascar.

Résumé

RANARIVELO, H. & F. ALMEDA (2019). Un Dichaetanthera (Melastomataceae: Melastomateae) nouveau du Parc National de Masoala à Madagascar. *Candollea* 74: 131–136. En anglais, résumés anglais et français. DOI: http://dx.doi.org/10.15553/c2019v742a2

Dichaetanthera schatzii H. Ranariv. & Almeda, une nouvelle espèce du Parc National de Masoala au Nord-Est de Madagascar, est décrite, illustrée, et comparée avec *Dichaetanthera arborea* Baker, supposée être son plus proche parent. *Dichaetanthera schatzii* semble endémique des forêts humides de basse altitude situées au sud-ouest du Parc National de Masoala à Madagascar.

Keywords

MELASTOMATACEAE – *Dichaetanthera* – Madagascar – New species – Taxonomy

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Introduction

Dichaetanthera Endl., a genus of paleotropical *Melastomataceae*, consists of 35 currently recognized species. Twenty seven of these are endemic to Madagascar (Perrier de la Bâthie, 1951; Almeda, 2003; Madagascar Catalogue, 2019). Eight other species grow in tropical Africa where most of the diversity is centered from Cameroon, Gabon, and the Democratic Republic of Congo to Angola, Zambia, and Tanzania (Wickens, 1975; Fernandes & Fernandes, 1978; Jacques-Félix, 1983a, 1983b; Figueiredo & Smith, 2008). The widespread *Dichaetanthera africana* (Hook. f.) Jacq.-Fél. also ranges to Equatorial Guinea, Nigeria, Ivory Coast, and Sierra Leone and *D. echinulata* (Hook. f.) Jacq.-Fél. is restricted to Sierra Leone and Guinea (Hutchinson et al., 1954; Wickens, 1975; Jacques-Felix, 1983a; Parmentier & Geerinck, 2003).

Dichaetanthera appears to be a monophyletic genus (Veranso-Libalah et al., 2017). It is readily recognized by the following combination of characters: 4-merous flowers, persistent truncate or well-developed calyx lobes that are uncontorted in bud to expose the petals, stamens slightly to markedly unequal in size in each flower with the connectives modified ventro-basally at the filament junction into yellow erect biaristate appendages, and seeds that are cochleate to ± cuneiform with a tuberculate testa on the antiraphal and chalazal sides (Perrier de la Bâthie, 1932).

The species described here was recognized as undescribed nearly twenty years ago when the second author was doing routine identifications of Malagasy *Melastomataceae* at CAS. The only known collection of this species was set aside in hopes that additional material would eventually turn up. Unfortunately, no additional material of this species has come to light since it was first collected in 1989. We therefore see no reason to delay its formal recognition. We have initiated a project focused on the systematics and phylogeny of *Dichaetanthera* since available taxonomic information for the Malagasy members of the genus dates back to the seminal study by Perrier de la Bâthie (1932) nearly 90 years ago.

Taxonomic treatment

Dichaetanthera schatzii H. Ranariv. & Almeda, **spec. nova** (Fig. 1, 2).

Holotypus: Madagascar. Reg. Analanjirofo [Prov. Toamasina]: Masoala Peninsula, c. 3 km NE of Antalavia, along Antalavia River, [15°47'S 50°02'E], 200–380 m, 13–16.XI.1989, *Schatz et al. 2806* (CAS!; iso-: K image seen, MO-3759746!, P, TAN image seen).

Distinguished from all other species of Dichaetanthera Endl. in Madagascar and Africa by the combination of large (15–19.7 × 7–7.5 cm) entire lanceolate leaf blades that are sparsely beset abaxially mostly on the prominently elevated veins with a mixture of appressed papillose trichomes and minute brownish glandlike trichomes; small (6–7 × 2–4 mm) pink elliptic-ovate to elliptic-lanceolate petals with ciliate margins that are acute to obtuse at the apex and unguiculate at the base; and markedly dimorphic androecium.

Tree to 4 m tall. Distal branches rounded-quadrangular, the internodes sparsely to copiously covered with a mixture of small (0.25–0.5 mm long) knob-like papillose trichomes and longer (0.75–1 mm) subulate trichomes that are also inconspicuously papillose for most of their length; nodes somewhat swollen with an elevated ridge-like interpetiolar line beset with a few subulate trichomes 1.5–3.5 mm long that are inconspicuously papillose at least along the basal swollen third of their length. *Leaves* opposite and decussate, isomorphic in size and shape in each pair, widely spreading when fresh; petioles 22–43 mm long, subterete to somewhat laterally compressed, copiously covered with appressed subulate trichomes 0.25–1.5(–3) mm long that are papillose for most of their length; blades 14–20 × 5.3–7.5 cm, subcoriaceous when dry, lanceolate, the base rounded, the apex acute to attenuate, the margin entire with non-overlapping subulate trichomes 0.5–1.5 mm long like those on the petioles, 5–7-nerved, the primary and secondary veins elevated and diverging from one another at the blade base abaxially; abaxial surface sparsely beset mostly on elevated primary and secondary veins with a mixture of appressed subulate papillose trichomes 0.25–2 mm long and minute inconspicuous brownish glandlike trichomes mostly less than 0.25 mm long that are also copious on higher order veins; adaxial surface inconspicuously beset with scattered appressed conic trichomes 0.5 mm long that are pustulate at the base and minutely papillate to barbellate for a portion of their length, these accompanied by one or two inconspicuous brownish sessile glands at the trichome base. *Inflorescence* a terminal pyramidal panicle 18–20 cm long, subsessile or on a solitary peduncle 6–7 cm long, the primary and higher order axes copiously covered with trichomes 0.3–1 mm long like those of the distal internodes; pedicels 0.5–2 mm long with indumentum like that of the inflorescence axes; floral bracts caducous at anthesis and not seen; bracteoles also typically caducous at anthesis, sessile, 2 × 0.75 mm, ± ensiform, base truncate, apex acute, abaxial surface pustulate with a row of papillose conic trichomes ± restricted to the median vein, adaxial surface glabrous, the margin entire and ciliate. *Hypanthium* (at anthesis) 2–3 mm long to the torus and 2.5 mm in diameter, subcylindric to suburceolate, beset with appressed barbellate trichomes mostly 0.5–1 mm long that do not conceal the surface; calyx tube ca. 0.75 mm long; calyx lobes persistent, 1 × 1.5–2 mm, shorter than the hypanthium, triangular to rounded-triangular, indumentum like that of the hypanthium, the margin entire and minutely ciliolate. *Petals* 4,

Fig. 1. – *Dichaetanthera schatzii* H. Ranariv. & Almeda. **A.** Habit; **B.** Enlargement of inflorescence node; **C.** Representative leaf (abaxial surface); **D.** Detail of indumentum on elevated primary vein; **E.** Petal (adaxial surface); **F–G.** Antepetalous (small) stamens (profile view); **H–I.** Antesepalous (large) stamens (profile view); **J.** Hypanthium and calyx lobes enveloping capsule (profile view); **K.** Ovary, style and stigma (profile view). [*Schatz et al. 2806*, CAS] [Drawings: A. Chou]

Fig. 2. – *Dichaetanthera schatzii* H. Ranariv. & Almeda, showing leaves and the terminal paniculate inflorescence. [Photo: D. J. DuPuy]

6–7 × 2–4 mm, elliptic-ovate to elliptic-lanceolate, apex acute to obtuse, base unguiculate, pink, entire and ciliate. *Stamens* 8, dimorphic and fertile; antesepalous stamen filaments 5 mm long, white to pale pink, glabrous; anther thecae 4 mm long and 1 mm in diameter, linear-subulate and ventrally undulate, pale pink, apical pore ventrally inclined; pedoconnective 6 mm long, modified ventro-basally into a yellow biaristate ± erect appendage 6 mm long, the lobes fused basally for c. 2 mm; antepetalous stamen filaments 5 mm long, white to pale pink, glabrous; anther thecae 3–3.5 mm long and ca. 0.5 mm in diameter, linear-oblong, yellow, ventrally somewhat undulate, apical pore truncate to somewhat dorsally inclined; pedoconnective 1 mm long, modified ventro-basally into a yellow biaristate appendage 6 mm long, the lobes fused basally for 1 mm. *Ovary* (at anthesis) 3 mm long and 2 mm in diameter, ovoid to elliptic-ovoid, glabrous for most of its length but covered with a crown of erect and somewhat flattened basally fused distinctly barbellate trichomes 0.5–0.75 mm long intermixed with minute barbellate trichomes 0.25–0.5 mm long at the summit surrounding the base of the style, superior, 4-locular; style 7.5–8 mm long and 0.5 mm in diameter, white to pale pink, glabrous, somewhat declinate, terete and swollen distally just below the punctiform stigma. Mature capsules and seeds not seen.

Etymology. – We take pleasure in naming this species for George E. Schatz (1953–), collector of the type. George has been a long-time student of the Malagasy flora (Schatz, 2001) who has made many significant contributions to our knowledge of this unique and highly endemic biodiversity hotspot.

Distribution and habitat. – *Dichaetanthera schatzii* is known only from low-elevation rainforest on the Masoala Peninsula of northeastern Madagascar where it was collected along the Antalavia river at 200–380 m elevation (Fig. 3).

Phenology. – The type and only known collection of *Dichaetanthera schatzii*, which was made in the middle of November, is in flower.

Conservation status. – *Dichaetanthera schatzii* appears to be endemic to the lowland humid evergreen forest on the southwestern side of Masoala National Park as it is currently delimited. This national park, which encompasses 230,000 hectares, was established by the Madagascar government (decree no. 97-141) in February 1997. It is Madagascar's largest protected area and makes up about 50% of the total lowland humid evergreen forest that currently has protected status in Madagascar (Kremen, 2003). The Masoala peninsula has long been recognized as an area of high plant diversity and endemism (Perrier de la Bâthie, 1921; Dransfield & Beentje, 1995; Kremen, 2003; Scherberich & Duruisseau, 2016, 2019; Baker et al., 2016). *Dichaetanthera schatzii* appears to be afforded some protection because of its occurrence within a vast protected area. We have no information on whether the major habitat threats on the peninsula such as deforestation, habitat conversion and fragmentation, and overcollecting of forest products have affected the local environment where *D. schatzii* grows. The type, locality, which is quite remote, is 3 km inland and up the Antalavia river where it is unlikely that there are any of the above mentioned threats (G. Schatz, pers. comm.). Although we also lack information on the population size of this species, we recommend a conservation status of "Least Concern" [LC] based on IUCN (2012, 2017) guidelines and criteria. This recommendation is made with the caveat that this status is dependent on ongoing effective management of the protected area.

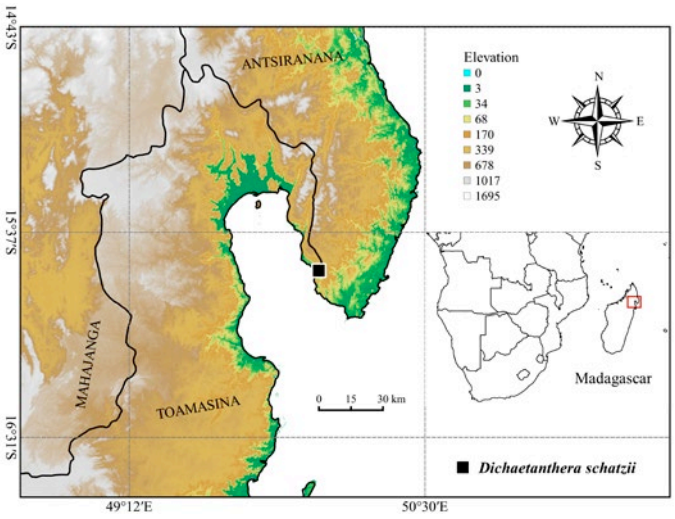

Fig. 3. – Map showing the distribution of *Dichaetanthera schatzii* H. Ranariv. & Almeda.

Notes. – Of the four sections of *Dichaetanthera* recognized by Perrier de la Bâthie (1951), *D. schatzii* can be assigned to *Dichaetanthera* sect. *Dichaetanthera* based on its dimorphic stamens in which the larger (antesepalous) ones exceed 4 mm in length, the calyx lobes are sparsely beset with short appressed trichomes that do not conceal the epidermis, and the ovary is covered with trichomes for at least the upper quarter of its length. Of the 13 species comprising sect. *Dichaetanthera* this new species keys closely to *D. arborea* Baker, a species that appears to be most similar based on overall morphology; however, the latter differs consistently from *D. schatzii* in a number of important characters. It has smaller (6–12 × 1.2–4 cm) leaf blades that are 5-plinerved with the secondary (inner pair) of veins diverging from the primary vein 3–5 mm from the blade base with the formation of pocules (acarodomatia?) on each side of the primary vein [v. 5–7-nerved blades that are larger (15–19.7 × 7–7.5 cm) with all elevated abaxial veins diverging from the blade base and pocules absent]. In *D. arborea* the indumentum on distal internodes consists solely of entire or irregularly lacerate flattened scales 0.3–1 mm long (vs. a mixture of small knoblike papillose trichomes 0.25–0.5 mm long and longer subulate trichomes 0.75–1 mm long that are also inconspicuously papillose for most of their length). The nodal indumentum of *D. arborea* consists of subulate flattened scales 0.5–3.2 mm long (vs. subulate trichomes 1.5–3.5 mm long that are minutely papillose for at least the basal swollen third of their length).

Dichaetanthera schatzii and *D. arborea* also differ consistently in details of the foliar indumentum. The abaxial foliar surfaces (between the elevated veins) of *D. arborea* are beset with lacerate flattened scales 0.5–1 mm long with pustulate bases that adhere to the epidermis. The elevated abaxial foliar veins of this species are also beset with flattened subulate scales that become slightly longer (0.5–1.5 mm) but glandlike trichomes are lacking altogether. In *D. schatzii,* the abaxial foliar surface is covered mostly on the elevated primary and secondary veins with a mixture of appressed subulate papillose trichomes 0.25–2 mm long and minute brownish glandlike trichomes mostly less than 0.25 mm long; the latter trichomes are also copious on higher order veins abaxially.

Dichaetanthera schatzii and its closest relative also differ in hypanthial indumentum and in petal details. The hypanthia and calyx lobes of *D. arborea* are sparsely covered with appressed entire or lacerate scales 0.25–0.5 mm long (vs. appressed conic barbellate trichomes 0.5–1 mm long). *Dichaetanthera schatzii* and *D. arborea* have comparatively small flowers with petals of similar size (6–7 × 2–4 mm in *D. schatzii* and 8–9 × 5 mm in *D. arborea*); the petals of both species are unguiculate at the base and have ciliate margins. In the former the petals are pink, elliptic-ovate to elliptic-lanceolate with an acute to obtuse apex whereas the latter has magenta petals that are widely obovate to obcordate or nearly orbicular in shape with an obliquely rounded or shallowly emarginate apex.

Both *D. schatzii* and *D. arborea* are reportedly forest trees. We still have too little information to determine whether they attain different heights at maturity. The collection label on *D. schatzii* gives plant height as 4 m whereas published descriptions for *D. arborea* give its height as 7–10 m (Perrier de la Bâthie, 1932, 1951). These two species also appear to be allopatric. Our new species is known only from the Masoala Peninsula at 200–380 m whereas *D. arborea* is reported to be largely restricted to the Mangoro basin and vicinity east of Antananarivo. Most of the herbarium material of *D. arborea* was collected at 1000–1500 m but one specimen was collected as low as 300 m (Perrier de la Bâthie, 1951).

Although the pollinators of *D. schatzii* are unknown, the pale pink and yellow colors of the androecium in this species seem to undergo a change to deep pink probably following pollination (Fig. 2). Flowers that have undergone color change involving petals, anthers, or filaments following pollination offer no food rewards (Gori, 1983). Pollinators evidently pick up on this signal and probably increase their foraging efficiency by visiting only unpollinated flowers. Flower color change following pollination has been reported for some neotropical genera of *Melastomataceae* and appears to be more widespread than published reports indicate (Todzia & Almeda, 1991; Martins & Almeda, 2017).

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