

Endemic Families of Madagascar. IX.

A new littoral forest species of *Schizolaena* (Sarcoilaenaceae)

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ABSTRACT

Schizolaena raymondii is described from a single stand of low-elevation littoral forest in NE Madagascar, one of the island's floristically richest and most highly threatened ecosystems. The new species is illustrated and compared to other members of the genus; it most closely resembles three congeners with which it shares thick leaves with a rounded to acute apex, but is distinguished by having longer petals and a unique combination of leaf blade and peduncle lengths. *Schizolaena raymondii* is assigned a preliminary conservation status of Critically Endangered using the IUCN Red List criteria.

KEY WORDS

Sarcoilaenaceae,
Schizolaena,
conservation,
Madagascar,
littoral forest,
new species.

RÉSUMÉ

Familles endémiques de Madagascar. IX. Une nouvelle espèce de Schizolaena (Sarcocaulaceae) de la forêt littorale.

Schizolaena raymondii est décrite; elle est connue d'une seule parcelle de forêt littorale de basse altitude dans le NE de Madagascar, un des écosystèmes malgaches floristiquement les plus riches mais aussi parmi les plus menacés. Une illustration est fournie et la nouvelle espèce est comparée aux autres membres du genre. Elle se rapproche en particulier de trois autres espèces dont elle partage les feuilles épaisses à apex arrondi à aigu, mais dont elle se distingue par des pétales plus longs et une combinaison caractéristique de longueurs de limbes foliaires et de pédoncules. Une analyse préliminaire du statut de conservation selon les critères des Listes Rouges de l'UICN indique que *S. raymondii* est à rattacher à la catégorie «en danger critique d'extinction».

MOTS CLÉS

Sarcocaulaceae,
Schizolaena,
conservation,
Madagascar,
forêt littorale,
espèce nouvelle.

INTRODUCTION

The east coast of Madagascar is dotted with a series of small, isolated remnant patches of humid evergreen forest growing on unconsolidated sand. Restricted to a narrow strip that averages only a few kilometers in width, these littoral forests are estimated to contain 1550 species of vascular plants (Consiglio *et al.* in press; see also <http://www.mobot.org/MOBOT/research/littoral>), representing well over 10% of the entire Malagasy flora, currently estimated to comprise *c.* 12 000-13 000 species (Schatz 2001; Goodman & Benstead 2005) or perhaps as many as 14 000 species (Phillipson *et al.* 2006). In the past, littoral forest probably stretched almost continuously for nearly 1600 km, from SE of Antsiranana in the north to just beyond Tolagnaro in the south, spanning nearly 12° of latitude. Today, however, this distinctive, specialized vegetation has been dramatically reduced in extent, and now totals an estimated 47 900 ha (0.8% of the total land area of Madagascar, and just 10% of the formation's original extent), of which the largest stand covers only about 2650 ha.

During the last four years, we have collaborated with a team of colleagues to conduct an extensive inventory of the plants occurring in nine of the largest and best-preserved stands of littoral forest. The project aims to compile a compre-

hensive checklist of the vascular plant species in this highly threatened ecosystem, document the current extent of littoral forests, and formulate recommendations for conservation measures. To date our team has made about 9000 collections, including many that appear to represent new taxa. Here we describe a distinctive new species of *Schizolaena* Thouars, the largest genus of Sarcocaulaceae, Madagascar's most speciose endemic family. Our novelty adds to the 18 species of *Schizolaena* recently recognized by Lowry *et al.* (1999), six of which also occur in eastern littoral forest.

SYSTEMATICS

Schizolaena raymondii

Lowry & Rabehevitra, sp. nov.

(Fig. 1)

Differt a Schizolaena elongata, *S. hystrice* et *S. tampoketsana* *petalis longioribus* (7-8 mm) et *combinatione foliorum 7-7.5 cm longorum cum pedunculis* (4-)7-11 mm *longis*.

TYPUS. — **Madagascar.** Prov. Antsiranana, Fivondronana Voahemar, Fokontany Manakana, Forêt d'Ambondrobe, 13°43'14"S, 50°05'59"E, [c. 25-50 m], 26.X.2002, fr., *Rabevohitra*, *McPherson*, *Rabenantoandro* & *Ranarivelo* 4217 (holo-, MO!; iso-, G!, K!, P!, TEF[2]!).

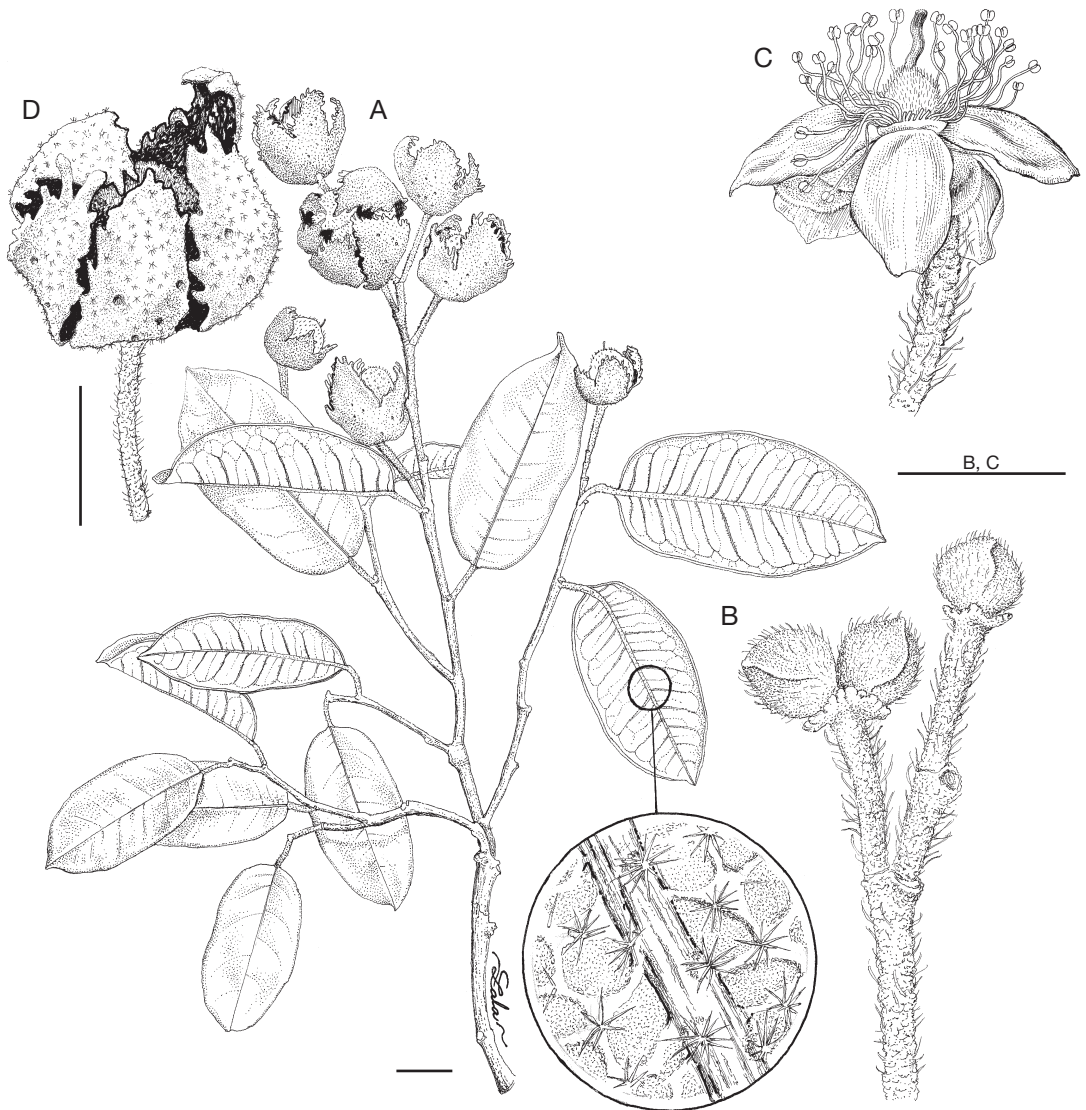


FIG. 1. — *Schizolaena raymondii* Lowry & Rabehevitra, sp. nov.: **A**, fruiting branch; **B**, flower buds; **C**, flower; **D**, mature fruit surrounded by involucre. A, B, D, *Rabehevitra et al.* 4217; C, *Rabehevitra et al.* 319. Scale bars: A, 1 cm; B, C, 8 mm; D, 5 mm.

PARATYPES. — **Madagascar**. Prov. Antsiranana, Fivondronana Vohemar, Fokontany Manakana, Forêt d'Ambondrobo, 13°43'06"S, 50°05'52"E, 53 m, 15.VII.2003, fl., *Rabehevitra, Razakamalala & Rakotomamonjy* 319 (G, K, MO[2], P, TEF, US, WAG). — Same locality, 13°42'46"S, 50°05'25"E, 20.V.2004, bud, fl., *y.fr., Rabehevitra & Razakamalala* 1013 (K, MO, P, TEF[2]).

DESCRIPTION

Trees *c.* 8–14 m tall. Twigs with scattered stellate indumentum. Leaves evenly distributed along branchlets, blades elliptic to slightly obovate, greenish-brown above, khaki green below (in dry material), subcoriaceous, 3–7.5 × 2–4.4 cm, with minute stellate indumentum below, more prominent on the midrib,

TABLE 1. — Characters distinguishing *Schizolaena raymondii* Lowry & Rabehevitra from the three species it most closely resembles.

	<i>S. raymondii</i>	<i>S. elongata</i>	<i>S. hystrix</i>	<i>S. tampoketsana</i>
Petal length (mm)	7(-8)	5-6	4	5-6
Length of largest leaf blade (cm)	7-7.5	(3.5)-4-5.5	8.5-10.5	5-6.5
Peduncle length (mm)	(4)-7-11	4-12	1-3(-5)	1-2
Calyx indumentum (abaxial surface)	short stellate-villous	tufted papillose stellate	evenly sericeous stellate	evenly sericeous stellate
Distribution	Manakana	Masoala National Park to Fort Dauphin	Marojejy National Park to Tsianivoho	Andranofeno Sud

glabrous above, apex acute, often folded in pressed material, margin entire, minutely thickened, revolute (sometimes weakly so), base broadly cuneate or rounded to truncate or slightly subcordate, venation brochidodromous, with 8-11 pairs of alternate to subopposite secondary veins joined by rounded arches, midrib weakly channeled above, raised below; petiole 4-6(-7) mm long, with moderate to dense stellate indumentum; stipules unknown, caducous, leaving small scars. Inflorescences axillary and terminal sparsely-branched cymes, usually several borne together toward branch tips, each (1)-2-12-flowered, primary axis 12-37 mm long, densely papillose stellate-strigose, most trichomes with a central branch much longer than the others, bracts unknown, caducous, peduncles (ultimate axes borne below the involucre) (4)-7-11 mm long, densely papillose stellate-strigose, involucre in flower with 5 irregular lobes, densely papillose stellate-strigose, containing 1 or 2 sessile flowers; sepals 3, imbricate, broadly ovate, adaxially concave, 4-5 mm long at anthesis, minutely villous on adaxial surface (glabrous towards the base), with dense, short stellate-villous indumentum on abaxial surface, apex rounded, margins entire; petals 5, elliptic to ovate, slightly succulent in fresh material, chartaceous when dry, 7(-8) × 3.5(-5) mm, glabrous, with minute white striations (in dry material), apex rounded to broadly acute; stamens *c.* 80, filaments slender, *c.* 5-7 mm long, glabrous, anthers ellipsoid, 0.3-0.4 mm long; ovary broadly depressed ovoid in fresh material, to depressed globose in dry material, densely woolly tomentose, 3-locular; style cylindrical, curved and S-shaped at anthesis, *c.* 2.5-3 mm long, stigma terminal, circular, glabrous. Fruit subglobose, 14-16 mm in diam., with dense stellate indumen-

tum, most trichomes with the central branch much longer than the others, capsule dehiscent by 3 longitudinal sutures, exocarp cartilaginous, rugose, dry sepals and filaments persistent; involucre expanded, broadly cupulate to funnelform, fleshy, reddish purple in fresh material, 20-25 × 7-12 mm at maturity, abaxial surface sparsely stellate pubescent, adaxial surface moderately to densely stellate pubescent, with 5 broadly ovate to narrowly elliptic, unequal lobes divided 1/2-2/3 of the way to the base, each lobe with 8-10(-12) narrowly triangular to elliptical (rarely lanceolate), sometimes bifid to dentate teeth, each 2-5 mm long; seeds 1 per locule, ovoid, dark brown, 5-7 mm long, 3-5 mm in diam., moderately to densely covered with small, fleshy, round to elliptic globules, slightly raised from surface when fresh, shrinking and plane with surface when dry, hylum depressed concave.

REMARKS

Schizolaena raymondii is locally abundant but restricted to a single locality in NE Madagascar, the Ambondrobo littoral forest, a well preserved 2650 ha stand situated *c.* 40 km S of the town of Vohehar. Using the key provided by Lowry *et al.* (1999), both flowering and fruiting material of our new species would be identified as belonging to a group that includes *S. elongata*, *S. hystrix* and *S. tampoketsana*, all of which share coriaceous or subcoriaceous leaves with a rounded to acute (but not acuminate) apex and revolute margins, glabrous petals, and an involucre that is divided at least half way to the base. However, *S. raymondii* is easily distinguished from each of these, as summarized in the Table 1.

VERNACULAR NAME

Voandrozana.

CONSERVATION STATUS

Application of the IUCN (2001) threat criteria suggests that *Schizolaena raymondii* should be assigned a preliminary status of Critically Endangered (CR B1ab2ab) because its Extent of Occurrence is less than 100 km², its Area of Occupancy is less than 10 km², and it occurs at a single unprotected site where human pressures will likely lead to continued decline of the only known population.

ETYMOLOGY

The species epithet honors our good friend and colleague Raymond Rabevohitra, curator of the TEF herbarium in Antananarivo, who has contributed greatly to our knowledge of Madagascar's woody flora, and who played a key role in our study of the island's fascinating eastern littoral forests.

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