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A new species of Mimosa (Leguminosae) endemic to Central Madagascar

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Abstract

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A new species of *Mimosa* L. (*Leguminosae*: *Caesalpinioideae*) from Madagascar is described and illustrated. The species is known only from the Massif d'Ibity and surrounding area in the Central Highlands, where it occurs in the understory of Tapia forest. Its morphological affinities to similar Malagasy species are discussed and a key to identify them is included.

Résumé

KOENEN, E.J.M. (2024). Une nouvelle espèce de Mimosa (Leguminosae) endémique du centre de Madagascar. *Candollea* 79: 229–234. En anglais, résumés anglais et français. DOI: http://dx.doi.org/10.15553/c2024v792a2

Une nouvelle espèce de *Mimosa* L. (*Leguminosae*: *Caesalpinioideae*) de Madagascar est décrite et illustrée. L'espèce n'est connue que du Massif d'Ibity et de ses environs dans les Hautes Terres centrales, où elle se trouve dans le sous-bois de la forêt de Tapia. Les affinités morphologiques avec les espèces similaires malgaches sont discutées et une clé d'identification est incluse.

Keywords

FABACEAE – *Mimosa* – Madagascar – Endemic – New species – Taxonomy

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Introduction

Mimosa L. (*Leguminosae*) is one of the three genera placed in the Mimosa clade (along with *Adenopodia* C. Presl and *Piptadenia* Benth.), a subclade of the tribe *Mimoseae* in the subfamily *Caesalpinioideae* (previously referred to as the mimosoid clade, which broadly coincides with the formerly recognized subfamily *Mimosoideae*) (Koenen et al., 2020; Borges et al., 2024; Queiroz et al., 2024). The genus is nearly pantropical in its distribution but over 570 of the c. 615 species occur in the Americas with notable centers of diversity in Brazil and Mexico (Barneby, 1991; Borges et al., 2024), while the species from Africa, Asia, and Madagascar form a clade that is deeply nested among New World lineages in the phylogeny of the genus (Simon et al., 2011).

During fieldwork in Madagascar in January 2014, a shrub which can be referred to the genus *Mimosa* was collected and found to represent an undescribed species. Further collections of this same taxon were located in the herbarium of the Musée national d'Histoire naturelle in Paris. All collections are from mid-elevation Tapia forest vegetation. This vegetation type is named after the vernacular name of the dominant tree species of these forests, *Uapaca bojeri* Baill. (*Phyllanthaceae*), which typically forms an evergreen canopy with sclerophyllous ericoid shrubs dominating the understory (Moat & Smith, 2007) (Fig. 1F). Two endemic Malagasy plant families, *Asteropeiaceae* and *Sarcolaenaceae*, are also characteristic of this vegetation that is typically found at elevations ranging from 500–1800 m. Substantial areas of Tapia forest are found in Isalo, Ambatofinandrahana, Ibity, and Morarano, but it has been estimated that this vegetation type has been reduced by 43% since 1970 (Moat & Smith, 2007). The discovery of this species new to science highlights the occurrence of rare narrowly endemic and even undescribed species in these forests and their conservation value and importance.

The new species has been sampled in a phylogenetic analysis by Ringelberg et al. (2023), where a subtree of their metachronogram for the Old World species of *Mimosa* was inferred from RADseq data. The species was recovered with full support (1.0 PP) as the sister species of a fully supported clade of six species including *M. vilersii* Drake, *M. menabeensis* R. Vig., and *M. dumetaria* Villiers. These results lend further support to the need of describing this taxon as a new species. Since Villiers' treatment of the genus *Mimosa* for Madagascar in Du Puy et al. (2002), *M. manomboensis* G. Lefèvre & Labat and *M. dupuyana* M. Morales & Fortunato have been described (Lefèvre & Labat, 2006; Morales & Fortunato, 2016). Including the new species described here, 36 *Mimosa* species are currently known from the island, 34 of which are endemic or near-endemic.

Taxonomic treatment

Mimosa ibityensis E.J.M. Koenen, **sp. nov.** (Fig. 1, 2).

Holotypus: Madagascar. Reg. Amoron'i Mania [Prov. Fianarantsoa]: massif d'Ibity, col des Tapias along RN7 between Antsirabe and Ambositra, 20°14'11"S 47°05'56"E, 1450 m, 8.I.2014, fl., fr., *Koenen, Andrianirina & Aebli 188* (TAN!; iso-: G!, K!, MO!, P!, WAG!, Z!).

Mimosa ibityensis E.J.M. Koenen is morphologically similar to M. vilersii Drake, but differs in having smaller leaflets up to 4 × 1 mm (up to 12 × 2.5 mm in M. vilersii) and unarmed replum (with prickles in M. vilersii).

Shrubs, scrambling, up to 1 m high. *Twigs* grooved, puberulous, with some red glandular hairs in the grooves when young, covered with many scattered, caducous prickles. *Stipules* linear, 2–3 mm long, persistent. *Leaves* bipinnate, up to 7 × 4 cm, with a delicate feather-like appearance, rachis 0–5 cm long, both grooved above and on the sides, pubescent and sometimes with prickles beneath, pinna apex shortly mucronate; petiole 1–1.5(–2) cm long. *Pinnae* in (1–)3–9 pairs per leaf, axes (0.5–)1–2 cm long, ridged above, pubescent and with red glandular hairs near the leaflet bases, paraphyllidia present. *Leaflets* (6–)10–25 pairs per pinna, c. 3–4 × 1 mm, sessile, narrowly oblong, base oblique, broadly rounded on the proximal side, cuneate on the distal side, apex rounded, midrib displaced towards the distal margin with usually only a single visible secondary vein arising from the leaflet base on the proximal side, sometimes a faintly visible additional secondary vein on the proximal side and/or also one on the distal side, glabrous except for the ciliate leaflet margins. *Inflorescences* in axillary capitula of c. 25 flowers, solitary or in pairs, peduncle 2–3.5 cm long, grooved, pubescent with red glandular hairs in the grooves, often with a pubescent linear bract up to 1 mm long located up to 1 cm below the capitulum. *Flowers* diplostemonous, 4-merous, sessile, subtended by a pubescent linear bracteole to 1 mm long. *Calyx* cup-shaped, up to 1 mm long, with an entire margin, with a few hairs near the base and a ciliate margin, pale brown. *Corolla* c. 3 mm long, tube 1.5–2 mm long, lobes with an acute apex, pale brown to slightly pinkish. *Stamens* 8, filaments c. 7 mm long, bright pink, anthers dorsifixed, white. *Ovary* 1.2–1.5 mm long, pubescent, on a 0.2–0.5 mm long stipe, style c. 7 mm long. *Fruit* (unripe) a craspedium, up to 4.5 × 1.2 cm, on a 6–7 mm long stipe, 2-seeded, constricted between the seeds, pubescent and covered with scattered red glandular hairs, replum lacking prickles. *Seeds* (mature) not seen.

Etymology. – The epithet *ibityensis* refers to the Massif d'Ibity as all known collections of the new species come from this mountain range and its vicinity.

Fig. 1. – *Mimosa ibityensis* E.J.M. Koenen. **A.** Inflorescence and foliage; **B.** Close-up of inflorescence; **C.** Immature fruit; **D.** Leaf; **E.** Habit; **F.** Habitat: Tapia forest at the type locality, with the characteristic tree species *Uapaca bojeri* Baill. [*Koenen et al. 188*] [Photos: E. Koenen]

Fig. 2. – *Mimosa ibityensis* E.J.M. Koenen. **A.** Leaf rachis apex; **B.** Individual flower; **C.** Flower opened out to show pistil and stamens; **D.** Bracteole; **E.** Pinna pulvinule with paraphyllidia below the first pair of leaflets; **F.** Adaxial view of leaflet; **G.** Abaxial view of leaflet; **H.** Flowering branch; **I.** Base of petiole with stipules and prickles on the main stem; **J.** Fruiting branch. [*Koenen et al. 188*, K] [Drawing: R. Wise]

Distribution, ecology and phenology. – Central Highlands of Madagascar. The new species is known only from the Massif d'Ibity and surrounding area. It was found in sclerophyllous Tapia forest on quartzite rock at elevations of 1450–1750 m (Fig. 1F). Specimens in flower have been recorded from October to January and in March, unripe fruits in January.

Notes. – The distinguishing features of this new species of *Mimosa* are: leaves with (1–)3–9 pairs of pinnae each with (6–)10–25 pairs of small leaflets, and especially the absence of prickles on the replum (the persistent margin) of the fruits (Table 1). *Mimosa vilersii* has also been reported from Tapia forest vegetation, but differs in having larger, more widely spaced leaflets and a prickly replum. *Mimosa andringitrensis* R. Vig., endemic to the Andringitra Massif and occurring in ericoid lichen forest and scrubland up to 2000 m, can be easily separated from the new species by the leaves with fewer pinnae (1–3) and fewer but larger pairs of leaflets per pinna (4–8), and the prickles on the replum (Du Puy et al., 2002). *Mimosa dumetaria* has similar foliage but has prickles on the replum (Du Puy et al., 2002); it is known only from the type locality in dry spiny scrub close to sea level near Toliara. *Mimosa menabeensis* is similar in having fruits lacking prickles on the replum but these are larger and not constricted between the seeds; in addition, it generally has larger leaves with more pinnae pairs and leaflet pairs per pinna. It thrives at lower elevations in N, W, and S Madagascar and is absent from the Central Highlands (Du Puy et al., 2002).

Additional specimens examined. – Madagascar. **Reg. Amoron'i Mania (Prov. Fianarantsoa):** col des Tapias, ad septentrionem Ambositra (Ilaka) in fruticetis montanis pauperrimis, fl., 19.XI.1967, *Bernardi 11585* (P [P00465257]!); 45 km avant Ambositra, col des Tapias, I.1964, fl., *Bosser 18800* (P [P00465261, P00465262]!); Ambositra, 10.X.1939, fl., *Decary 15101* (P [P00465263, P00465264]!); ibid., 10.X.1906, fl., *d'Alleizette s.n.* (P [P00464400]!). **Reg. Vakinankaratra (Prov. Antananarivo):** massif d'Ibity, forêt sclérophylle de Tapia sur quartzite, à 2 km sud du village d'Ibity, 20°04'43"S 47°00'44"E, 1738 m, 21.X.2004, fl., *Lehavana et al. 149* (MO, P [P00735992]!, TAN); pente de l'Ibity au S d'Antsirabe, [20°07'S 47°01'E], III.1914, fl., *Perrier de la Bâthie 4232* (P [P00581877]!). **Sine loco:** s.d., *Anon. 1444* (P [P00464401, P00464402]!).

Addition to the key to the species of Mimosa in Madagascar

[to be introduced at couplet 27 of key by Du Puy et al. (2002)]

27. Fruit with prickles or protuberances on replum .... ***M. vilersii***
27a. Fruit lacking prickles or protuberances on replum 28
28. Leaves with (1–)3–9 pairs of pinnae, (6–)10–25 pairs of leaflets per pinna; fruit up to 4.5 cm long, constricted between seeds; Central Highlands in Tapia forest between 1450–1750 m ..... ***M. ibityensis***
28a. Leaves with (2–)9–35 pairs of pinnae, 13–50 pairs of leaflets per pinna; fruit up to 8.5 cm long, not constricted between seeds; N, W, and S Madagascar in deciduous woodland up to 700 m ..... ***M. menabeensis***

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Table 1. – Comparision of morphology, habitat, and distribution between *Mimosa ibityensis* E.J.M. Koenen and similar species based on Du Puy et al. (2002) and own observations.

	M. ibityensis	*M. vilersii*	*M. andringitrensis*	*M. dumetaria*	*M. menabeensis*
Nº of pairs of pinnae per leaf	(1–)3–9	(2–)3–10	1–3	2–7	(2–)9–35
Nº of leaflet pairs per pinna	(6–)10–25	9–21	4–8	11–20	(6–)10–25
Leaflet dimension [mm]	up to 4 × 1	up to 12 × 2.5	up to 11.5 × 7.5	up to 8 × 2	up to 4.5 × 1
Replum of fruit armed	no	yes	yes	yes	no
Habitat	Tapia forest on quartzite rock	montane vegetation	montane ericoid and lichen forest and scrubland	unknown	deciduous woodland on sand or limestone
Distribution	C Madagascar	C Madagascar	C Madagascar	C Madagascar	N, W, S Madagascar

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