

Mucuna tapantiana (Fabaceae: Faboideae: Phaseoleae), a new species from Costa Rica

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Summary. A new species of *Mucuna* (Fabaceae: Faboideae: Phaseoleae), endemic to Costa Rica, is described and illustrated. *Mucuna tapantiana* is distinguished by its small, essentially glabrous leaflets, conspicuous filiform peduncle and pedicels, inflorescences with few green or yellowish-green flowers; fruits with softly villous, yellowish or brownish pubescence on the outer surface (when fresh), but without urticating trichomes, turning dark brown or blackish when dry, 1 – 2-seeded; seeds oblong and laterally compressed.

Key Words. Central America, Leguminosae, taxonomy.

Introduction

The genus *Mucuna*, with about 100 species, has a pantropical distribution, with 24 species occurring in the Neotropics and eleven of those in Central America. Five species are considered to be endemic to Central America, including the one here described.

The genus is characterised by its lianescent or scandent habit, with pinnately trifoliolate leaves, and showy flowers usually borne at the apex of a long, pendent peduncle in umbelliform or pseudo-racemose clusters. The resupinate, papilionaceous flowers have a campanulate calyx, and the standard petal is usually much shorter than the keel petals. The fruits are frequently large woody pods, often covered with urticating trichomes.

During the preparation of the treatment of the Fabaceae for the *Manual de Plantas de Costa Rica* (Zamora 2010), three *Mucuna* species were identified as new using provisional names. Two of these have since been provided with valid Latin binomials: *Mucuna* sp. B, now *M. globulifera* T. M. Moura, N. Zamora & A. M. G. Azevedo (Moura *et al.* 2013), from Costa Rica, Panama and Colombia; and *Mucuna* sp. C, now *M. monticola* N. Zamora, T. M. Moura & A. M. G. Azevedo (Moura *et al.* 2012), from Costa Rica and Panama. The third, *Mucuna* sp. A, is here described as *M. tapantiana*, endemic to Costa Rica. Below we present a description, illustrations, pictures and a distribution map of this new species.

Taxonomy

***Mucuna tapantiana* N. Zamora & T. M. Moura, sp. nov.**

Type: Costa Rica, Cartago, Parque Nacional Tapanti, bosque tropical lluvioso premontano, 1300 – 1700 m, 26 Oct. 1983, fl., fr., I. Chacón *et al.* 1546 (holotype CR!; isotypes: INB!, K!, MO!).

<http://www.ipni.org/urn:lsid:ipni.org:names:77136115-1>

Liana; stems very sparsely hirsute when juvenile, glabrous when old; stipules c. 0.4 cm long, pubescent, deciduous. Petioles 2.6 – 9 cm long, cylindrical, glabrous; pulvinulus 5 – 8 mm long, cylindrical, glabrous; rachis 1 – 2 cm long, glabrous; stipels absent; petiolules 5 – 6 mm long; terminal leaflet blade oblong, elliptic, ovate to ovate-elliptic, 7.5 – 15 × 3.2 – 5.5 cm, lateral leaflet blades ovate-oblong, asymmetrically-oblong or asymmetrically-ovate or ovate, 5.5 – 11 × 2.5 – 5 cm, all leaflets obtuse or rounded at the base, acuminate or cuspidate (acumen 10 – 16 mm) at the apex, with appressed hairs and very sparsely hirsute on both surfaces when juvenile, essentially glabrous on both surfaces when mature, glossy on upper surface when fresh, with 3 main ascending veins and conspicuous reticulate tertiary venation. *Inflorescence* axillary, pendent, pseudoracemose; peduncle 70 – 95 cm long, filiform; rachis 2.5 – 4 cm long, densely to sparsely appressed-sericeous, with 10 – 15 (– 20) flowers (1 – 3 at each node), the nodes spirally arranged, the internodes 2 – 4 mm long; bracts deciduous (not seen);

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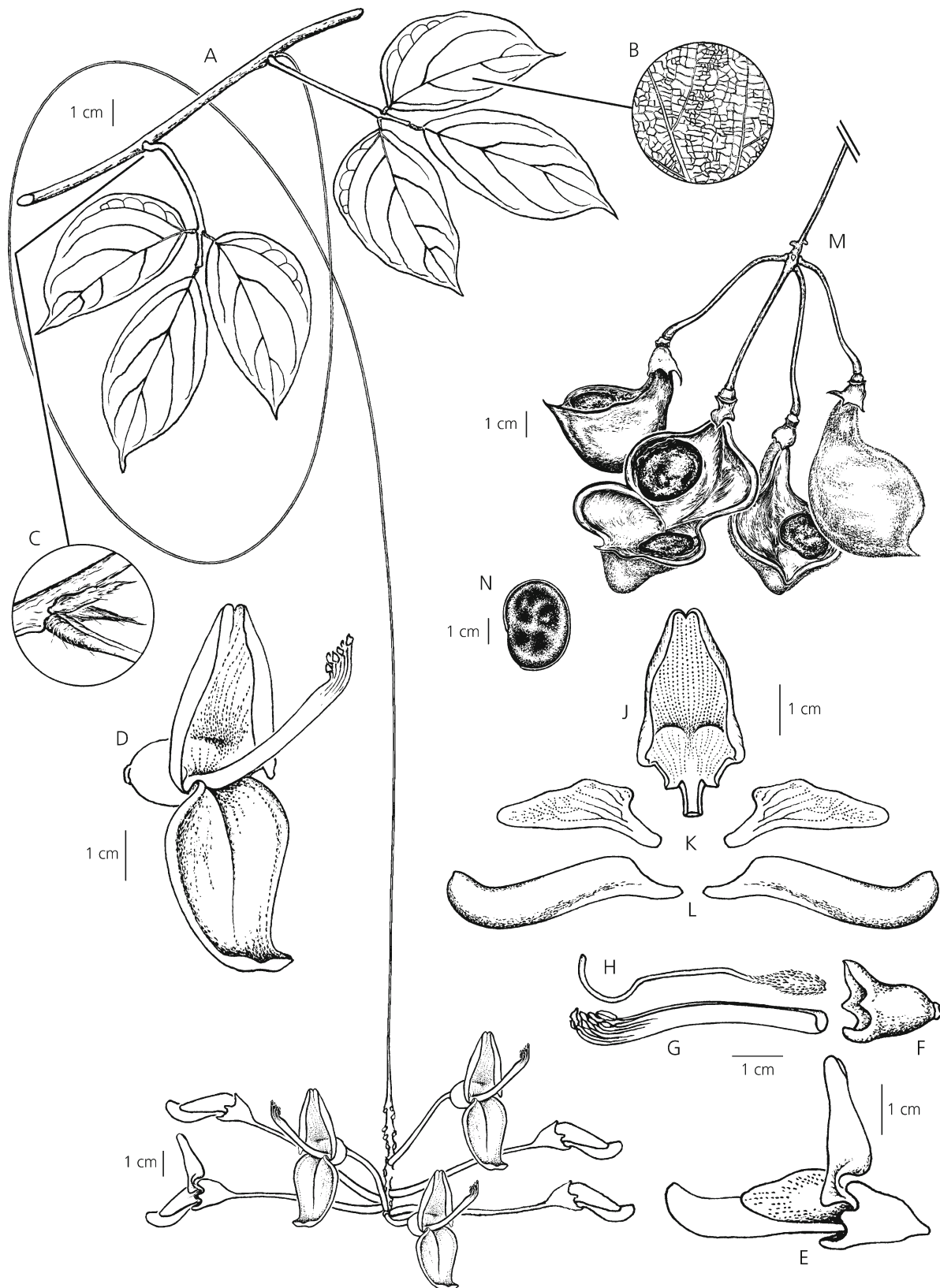


Fig. 1. *Mucuna tapantiana*. A leaves and inflorescence; B leaflet tertiary venation, lower surface; C stipules; D flower, frontal view; E flower, lateral view; F calyx; G stamens; H gynoecium; J standard petal; K wing petals; L keel petals; M fruits; N seed. Flowering material from Zamora *et al.* 2607 (INB); fruiting material from Guzmán 128 (INB) and Rodríguez & Vargas 4382 (INB). DRAWN BY CLAUDIA ARAGÓN.

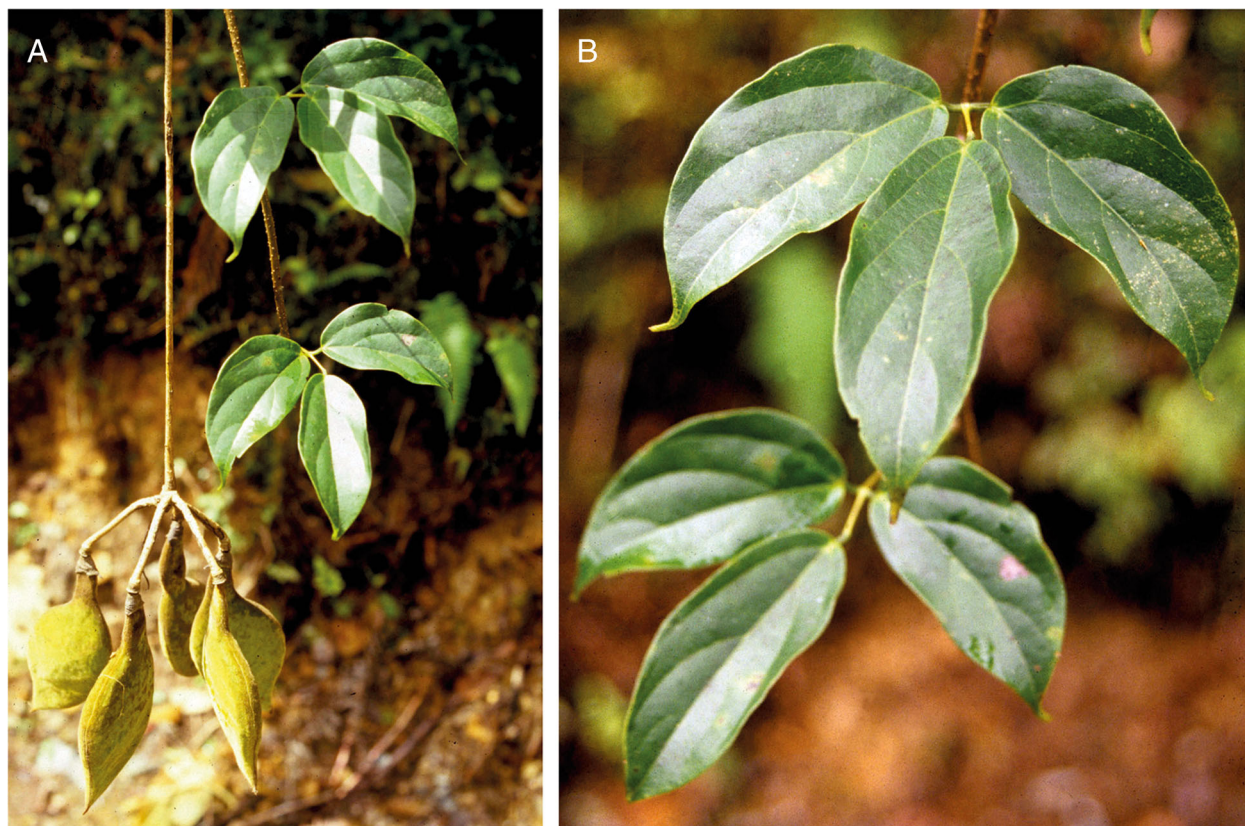
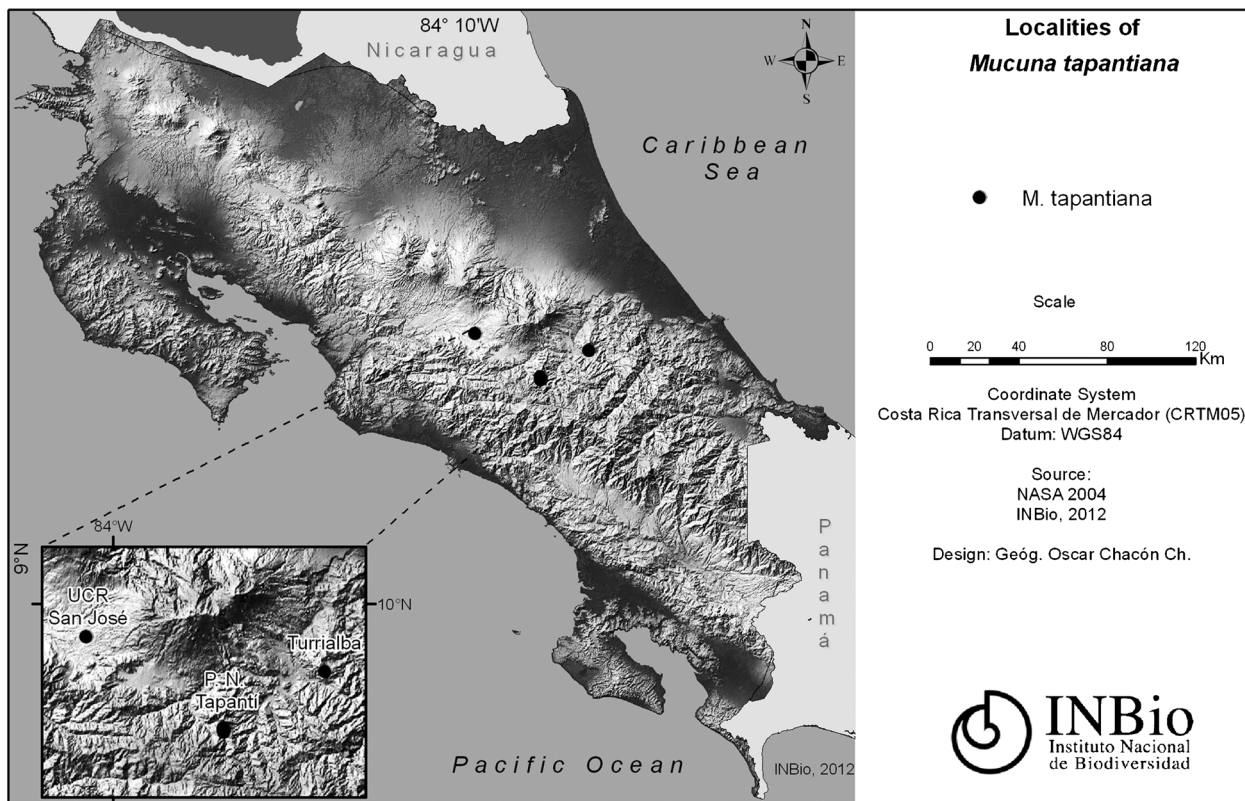


Fig. 2. *Mucuna tapantiana*. **A** pendulous infructescence, showing 1-seeded fruits; **B** leaves. PHOTOS: A. RODRÍGUEZ-INBIO (Rodríguez & Vargas 4382, INB).

pedicels 3.5–8.5 cm long, filiform, sparsely and minutely appressed-sericeous. *Flowers* 4–4.5 cm long; calyx green, campanulate, 10–14 × 12 mm, densely appressed-sericeous on the inner and outer surfaces; lobes 4, the adaxial (upper) one obtuse, formed by two connate sepals, the abaxial (lower) sepals 3, unequal, the longest one (4–) 5–7 mm long, the two shorter ones 2 mm long, the apex acute or rounded. *Corolla* green or yellowish green; standard petal 2.7–4.1 × 1.7–2.0 cm, elliptic to elliptic-oblong, glabrous, concave or boat-shaped, the margins involute, with a cordate base and an acute to obtuse, emarginate apex, the claw 7–12 mm long; wing petals 2.5–3.0 × 0.9–1.0 cm, narrowly oblong, base attenuate, apex rounded, margins ciliate at the base, the claw c. 10 mm long; keel petals 4–4.5 × 0.8–1.0 cm, narrowly oblong-sigmoid, base attenuate, apex falcate and obtuse, the claw c. 10 mm long. *Stamens*, diadelphous (with 9 stamens fused and one free); filaments 3.6 cm long; anthers ovate to oblong, 2–3 mm long, basifixed. *Gynoeceium* 4–4.5 cm long; ovary 8–9 mm long, sessile, oblong, densely yellowish-hispid, 2-ovulate; style 3.8 cm long, sparsely hirsute, glabrous near the apex; stigma capitate. *Fruit* oblong or ovate-oblique, 7–15 × 4.5–5 cm, base obtuse to very long-attenuate (up to 3 cm long) due to abortion of the

proximal seed (when pod 1-seeded), apex acute or acuminate, constricted between the seeds (when pod 2-seeded), adaxial margin concave and undulate (or deeply undulate) at both ends (when pod 1-seeded) or deeply undulate-concave (when pod 2-seeded), abaxial margin concave and smooth (when pod 1-seeded) or shallow undulate-concave (when pod 2-seeded), somewhat laterally compressed but biconvex, smooth, densely and softly villous on outer surface, with no urticating trichomes, yellowish green or dark greenish brown when fresh turning dark brown or blackish when dry. *Seeds* 1–2 per pod, 3.0–4.0 × 2.2–3.0 cm, oblong, laterally compressed, black. Figs 1, 2.

RECOGNITION. *Mucuna tapantiana* is diagnosed by its small, essentially glabrous, abruptly acuminate and trinerved leaflets; filiform peduncles 70–95 cm long; inflorescence rachis 2.5–4 cm long, with few [10–15 (–20)] flowers; filiform pedicels 3.5–8.5 cm long; green or yellowish green flowers 4–4.5 cm long, with the wing petals shorter than the keel petals; fruits densely soft villous, dark brown on the outer surface (yellowish green, greenish or yellowish when fresh), lacking urticating trichomes, 1–2-seeded; and seeds oblong and laterally compressed.



Map 1. Geographical distribution of *Mucuna tapantiana* in Costa Rica.

DISTRIBUTION. *Mucuna tapantiana* is an endemic species to Costa Rica (Map 1).

SPECIMENS EXAMINED. COSTA RICA. Cartago: Cantón de Paraíso, P. N. Tapantí-Macizo de la Muerte, cuenca del Río Reventazón, 9°45'00"N, 83°47'00"W, 1400 m, 15 May 2003 (fr.), *Acosta* 3211 (INB); Tapantí, bosque tropical lluvioso premontano, 1300 – 1700 m, 26 Oct. 1983 (fl., fr.), *Chacón et al.* 1546 (CR, INB, MO); Cantón de Paraíso, P. N. Tapantí-Macizo de la Muerte, cuenca del Río Reventazón, sector Quebrada Segunda, Sendero Árboles de Caídos, 9°45'20"N, 83°47'00"W, 1300 m, 25 Aug. 1997 (fl.), *Guzmán* 128 (INB); Cantón de Paraíso, P. N. Tapantí, cuenca del Río Reventazón, alrededores del Mirador, 9°44'53"N, 83°46'55"W, 1600 m, 4 Feb. 1999 (fr.), *Rodríguez & Vargas* 4382 (INB); Cantón de Turrialba, 7 km N of La Suiza on the road to Pacayitas. wet forest, 9°52'N, 83°35'W, 1200 m, 8 Sept. 1990 (fl.), *Solomon* 19257 (INB, MO); Cantón de Paraíso, P. N. Tapantí, cuenca del Río Reventazón, Valle de Orosí, orillas del puesto de Administración, 9°45'20"N, 83°47'00"W, 1200 m, 3 Sept. 1997 (fl.), *Zamora et al.* 2607 (INB). San José: San Pedro, Jardín Botánico José María Orozco de la UCR, 5 March 1985 (fr.), *Poveda & Agustín* 3956 (CR, MO). **HABITAT.** *Mucuna tapantiana* has been collected at elevations of 1200 – 1700 m, mainly from Parque Nacional Tapantí, on the Caribbean slope of the

northern Cordillera de Talamanca, in the upper basin of the Río Grande de Orosí, in rain forests near the Park headquarters. Only one collection is known from Jardín Botánico José María Orozco of the Universidad de Costa Rica, San José, on the Pacific slope, where it appears to grow wild.

CONSERVATION STATUS. Although *Mucuna tapantiana* is known from Protected Areas, the species is endemic to Costa Rica, and is uncommon in the field. The Extent of Occurrence (EOO = 336.51 km²) and Area of Occupancy (AOO = 12 km²) according to IUCN (2001) criteria lead us to assess *M. tapantiana* as an endangered (EN) species.

PHENOLOGY. Flowering from August to October; fruiting from February to March.

ETYMOLOGY. The epithet refers to the locality where the species was first collected and from where most collections come.

NOTES. Morphologically, *Mucuna tapantiana* belongs to a small group of species within the neotropical members of the genus that have flowers with the wings petals shorter than the standard petals. Related species with this character are *M. argyrophylla* Standl., *M. holtonii* (Kuntze) Moldenke, *M. mollis* (Kunth) DC. and *M. monticola* N. Zamora, T. M. Moura & A. M. G. Azevedo. However, *M. argyrophylla*, *M. holtonii*, and *M. mollis* all have leaflets with the abaxial surface densely pubescent (rather than glabrous or essentially glabrous

in *M. tapantiana*), and *M. monticola* differs by its fruits with the surface conspicuously and irregularly lamellate or reticulate-ridged and with urticating hairs (rather than smooth and without urticating hairs in *M. tapantiana*).

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References

- IUCN (2001). *IUCN Red list Categories and Criteria: Version 3.1*. IUCN Species Survival Commission. IUCN, Gland and Cambridge.
- Moura, T. M., Zamora, N. A., Lewis G. P., Mansano, V. F. & Tozzi, A. M. G. A. (2013). *Mucuna globulifera* (Leguminosae-Papilionoideae), a new species from Costa Rica, Panama and Colombia. *Kew Bull.* 68: 151 – 155.
- _____, _____, Torke, B. M., Mansano, V. F. & Tozzi, A. M. G. A. (2012). A new species of *Mucuna* (Leguminosae-Papilionoideae) from Costa Rica and Panama. *Phytotaxa* 60: 1 – 8.
- Zamora, N. (2010). Fabaceae. In: B. E. Hammel, M. H. Grayum, C. Herrera & N. Zamora (eds), *Manual de Plantas de Costa Rica. Vol V. Dicotiledóneas (Clusiaceae–Gunneraceae)*. Pp. 395 – 775. *Monogr. Syst. Bot. Missouri Bot. Gard.* 119: 1 – 970.