

## ***Marsdenia purpurella* (Apocynaceae: Asclepiadoideae), a new species from the Philippines**

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**ABSTRACT.** *Marsdenia purpurella* Fernando & Rodda, a new species from the Philippines, is described and illustrated. It is distinguished from all known species of *Marsdenia* from the Philippines in its rotate corolla lacking a corolline corona, simple umbelliform inflorescence, and very short peduncle.

**Keywords.** Apocynaceae, Asclepiadoideae, *Gymnema*, *Marsdenia*, serpentine soils

### **Introduction**

*Marsdenia* R.Br. (Apocynaceae, Asclepiadoideae, Marsdenieae) includes about 300 species from tropical and warm temperate areas of the world, including Central and South America, Africa, the Mediterranean, Asia, Malesia, Australia, and Melanesia (Forster 1995b). The genus was revised, in part, for Asia, Malesia, and Australia (Forster 1995a, b), and now includes, among others, *Gymnema* R.Br. and *Dregea* E.Mey., two previously segregate genera also with representative species in the Philippines.

Merrill (1923) first recorded four species of *Marsdenia* for the Philippines, including three endemic species earlier described by Schlechter (Schlechter & Warburg 1904) and the widespread *Marsdenia tinctoria* R.Br. Two widespread species, *Marsdenia volubilis* (L.f.) Cooke, a species earlier enumerated by Merrill (1923) under *Dregea*, and *Marsdenia velutina* R.Br. (Forster 1995b), should now also be added to the list. Another two species, *Marsdenia tingens* (Roxb.) P.I.Forst., also a widespread species, and the Philippine endemic *Marsdenia pachyglossa* (Schltr.) P.I.Forst., were name combinations from *Gymnema* R.Br. (Forster 1995a). Six more Philippine endemic species of *Gymnema*, however, still need to be formally transferred to *Marsdenia*. Because the type materials for these six remaining species have not been available for examination and while awaiting the results of an extensive molecular phylogenetic study on *Marsdenia* (Livshultz pers. comm.), no name transfers are made at this time.

Following recent surveys of the metallophyte flora in the Philippines (Fernando et al. 2012), a new species of *Marsdenia* with woody climbing habit, clear exudate, umbelliform and unbranched inflorescences, and attractive greenish or yellow-green

flowers with purple tinge, was discovered in forest at middle elevations on Luzon Island. This particular taxon does not match any of the currently known species and is described below.

### The new species

#### *Marsdenia purpurella* Fernando & Rodda, **sp. nov.**

Distinguished from all known species of *Marsdenia* from the Philippines in its rotate corolla lacking a corolline corona, simple, umbelliform inflorescence, and very short peduncle.

TYPE: *Fernando 2415*, Philippines, Luzon Island, Zambales Province, Candelaria, Malimlim area, in forest on serpentine soils, on gentle slope, 695 m elevation, 15°41'13"N 120°02'54"E, flowers and young fruit, 19 Apr 2011 (holotype LBC; isotypes CAHUP, K, PNH, SING). Fig. 1–2.

**Terrestrial liana** with clear and sticky exudate from stems and leaves. **Stems** woody, branching, up to 8 m long, climbing on tree stems and branches; base of stems 6–10 mm in diameter; adventitious roots not observed; stems climbing by twining, the apical part green, and covered with brownish indumentum, turning light brown, smooth when mature, then wrinkled, and lightly fissured towards the base; internodes 5–12.5 cm long on young growing stems, up to 3–7(–12) cm long, 3–4 mm thick on mature, flower-bearing stems. **Leaves** simple, opposite, petiolate; petiole terete, 5–10 × 1–2 mm; lamina obovate, very rarely elliptic to broadly elliptic, 5.4–10 cm long × 2–5 cm wide, smooth and glabrous on both surfaces, discolorous, adaxial surface glossy dark green, abaxial surface pale green or sometimes glaucescent, newly expanding leaves glossy green; secondary nerves 4–6 on each side of the midrib, diverging at 65–70° from the midrib, the tips joined by an intra-marginal vein; leaf base obtuse to cuneate, sometimes narrowly and shallowly cordate; apex apiculate to cuspidate; the lamina edges thickened and distinctly finely revolute when dry; colleters or glands sometimes present at base of lamina. **Inflorescences** axillary, one per node, umbelliform, unbranched, up to 4 cm long, 3–5 cm wide; flowers 15–23 per umbel, rather loosely arranged and arching or pendulous; in young plants the very first few inflorescences bear only single flowers with shorter pedicels; very young developing inflorescence covered with brown indumentum, subtended by 1 or 2 minute, leaf-like bracts, to 2–5 mm long. **Flower buds** ovoid, purple to purplish-brown, rather glossy, turning paler just before anthesis; aestivation imbricate, young buds pubescent; peduncle axillary, brown-hairy, 2–4 mm long, rather persistent, bracts at base of the flower pedicels persistent; pedicel 1.5–2.2(4) cm long, terete, 1 mm diameter, pale brown to purplish-brown, the very basal part attached to the peduncle purplish; sepals ovate or lanceolate, 1.5–2 × 1–1.5 mm, purplish-brown, sparsely pubescent outside, glabrous inside, ciliate. **Flowers** at anthesis up to 1.8 cm diameter; **corolla** rotate, 5-lobed, greenish or yellow-green to light yellow; the corolla lobes basally fused for

1.5–2 mm, lobes  $7\text{--}7.5 \times 3.5\text{--}4$  mm, spreading, broadly lanceolate or linear, the distal portion lightly twisted, both surfaces smooth, glabrous, with slightly wavy, rather membranaceous margins; apices unequal, sometimes slightly twisted and strongly recurved, also with a purplish tinge; a darker mid-vein is faintly visible; corolline corona absent. **Staminal corona** not overtopping the style-head, c. 4.5 mm wide, 3 mm high, lobes 5, free, adnate to staminal column, same colour as the corolla, the central part of the corona purplish-white, adaxial appendages rounded to truncate, white on the outside and purple inside; style-head whitish at the tip and purple on the sides; alar fissures c. 2 mm long; **style-head** depressed-globose, 1–1.2 mm diameter. **Pollinarium** erect, with corpuscle and two pollinia; pollinium  $300\text{--}340 \times 120\text{--}140$   $\mu\text{m}$ , erect, nearly kidney-shaped or reniform, laterally attached near the base to the caudicles, pellucid margin absent; corpuscle narrowly ovoid, rather large,  $260\text{--}300$   $\mu\text{m}$  long  $\times$   $150$   $\mu\text{m}$  wide, brownish; caudicles  $140\text{--}170$   $\mu\text{m} \times 25$   $\mu\text{m}$ ; ovary ovoid, 1.7–1.8 mm long  $\times$  1 mm wide. **Fruit** a follicle, solitary, pendulous; broadly ensiform to fusiform-ovoid, 9–10 cm long  $\times$  1.9–2.7(–3) cm wide  $\times$  1.2–2.5 cm thick, dull green or slightly glauscecent, the surface generally smooth, drying longitudinally ribbed; fruit cross-section oblong to nearly circular; many-seeded; pericarp 4–5 mm thick; pedicel 1.8–2.2 cm long  $\times$  1–1.5 mm wide; sepals persistent in fruit; juvenile fruit ovoid, glossy purplish-green; seeds broadly ovate, 10–12 mm long  $\times$  5–7 mm wide, coma 1.5 cm long.

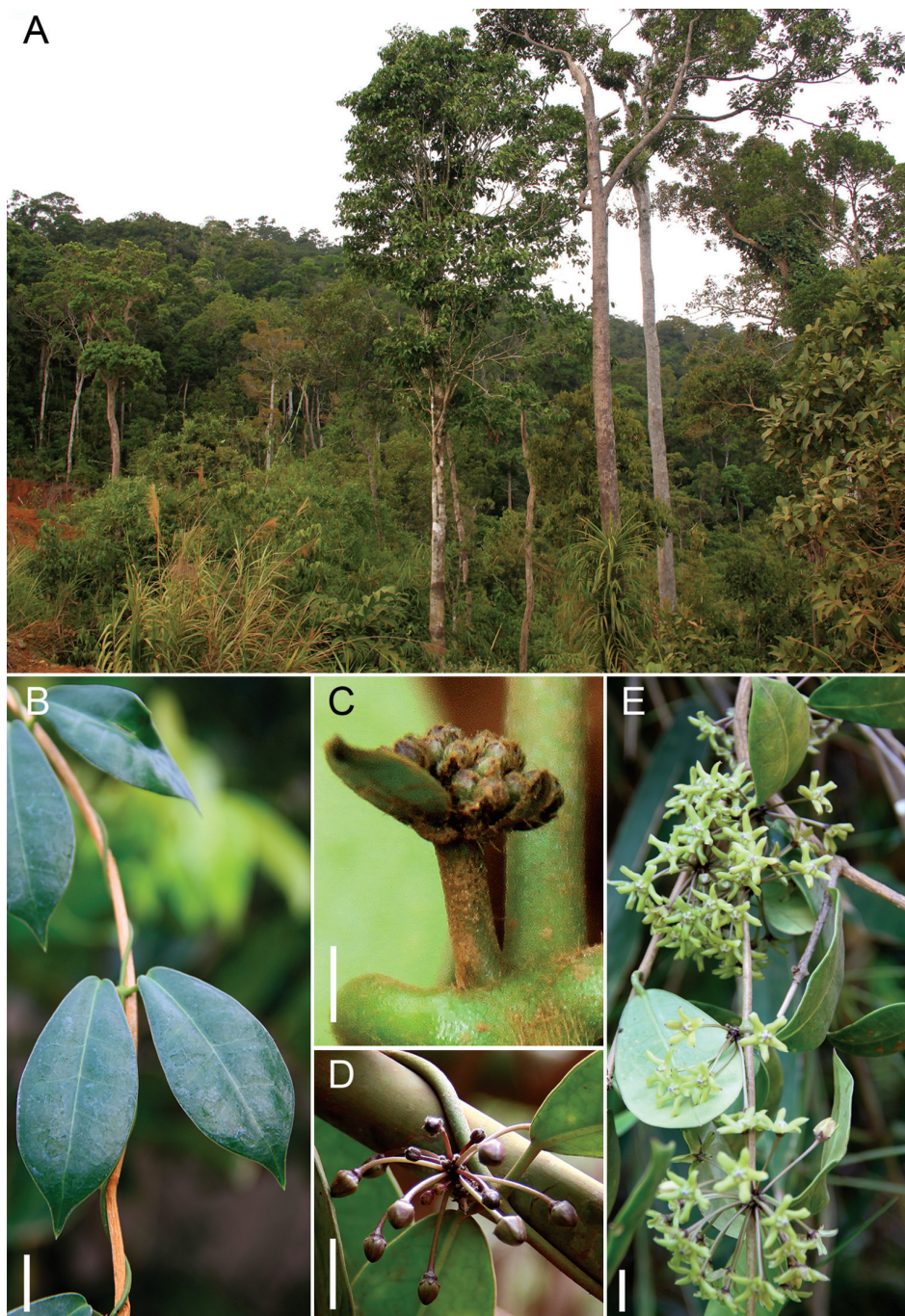
*Notes.* The Philippine species of *Marsdenia* originally belonging to *Gymnema* or still to be transferred to *Marsdenia* present a corolline corona, whereas *Marsdenia purpurella* is distinct because it only has a staminal corona. Among the further four *Marsdenia* species from the Philippines, *M. philippinensis* Schltr., *M. tinctoria* R.Br., *M. velutina* R.Br., and *M. warburgii* Schltr. have branched or raceme-like inflorescences, whereas *M. purpurella* has simple, umbelliform inflorescences. *Marsdenia pergulariiformis* Schltr. inflorescences are similar to those of *M. purpurella*, but they are held by a longer peduncle (1.5–2 cm vs. 2–4 mm long). Further, the pedicels of the flowers of *M. pergulariiformis* are shorter (0.5–0.7 cm vs. 1.5–2.2(–4) cm long) and the flowers are campanulate, not rotate.

*Distribution.* Philippines: Luzon Island (Zambales Province) and Palawan Island. Endemic.

*Specimens examined.* PHILIPPINES. **Luzon Island.** Zambales Province, Candelaria, Malimlim area, 695 m elevation, open flowers and young fruit, 19 Apr 2011, *Fernando 2415* (holotype LBC; isotypes CAHUP, K, PNH, SING); ibidem, flower buds and immature fruits, 1 Apr 2012, *Fernando 3006* (LBC, PNH, SING); ibidem, newly developing flower buds, 18 Jan 2013, *Fernando 3081* (LBC); **Palawan Island.** Taytay, open flowers, May 1913, *Merrill 9355* (SING).

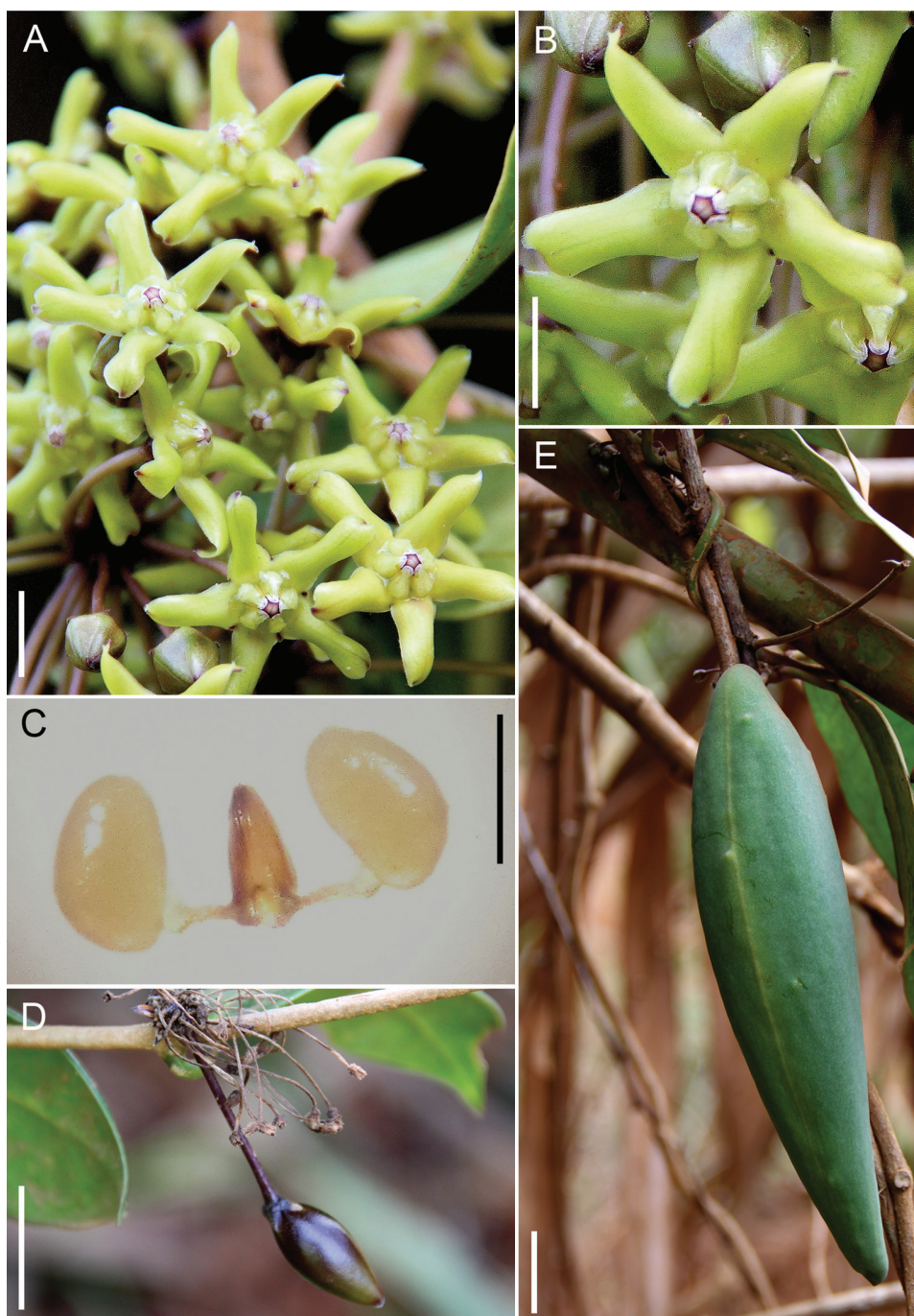
*Etymology.* The epithet *purpurella* refers to the purple tinge on the style head of the staminal corona and on the apices of the corolla lobes.





**Fig. 1.** *Marsdenia purpurella* Fernando & Rodda: **A.** Habitat at type locality. **B.** Young branch showing twining habit and leaf shape and arrangement. **C.** Newly emerging inflorescence. **D.** Flower buds. **E.** Mature stem with clusters of open flowers and one leaf showing abaxial surface. Scale bars: B, D, E (1 cm); C (1 mm). B & E from *Fernando 3006*; C from *Fernando 3081*; D from *Fernando 2415*. (Photos: Edwino S. Fernando)





**Fig. 2.** *Marsdenia purpurella* Fernando & Rodda: **A.** Clusters of open flowers. **B.** Close up of a single flower showing discoid outline of staminal corona. **C.** Pollinarium with a rather large corpuscle and pollinia lacking pellucid margins. **D.** Young fruit. **E.** Immature fruit. Scale bars: A, B (5 mm); C (300  $\mu$ m); D, E (1 cm). A, B from *Fernando 2415*; C based on material in spirit, *Fernando 2415*; D, E from *Fernando 3006*. (Photos: Edwino S. Fernando)

*Habitat and ecology.* The type specimen of this species was discovered in forest on serpentine soils on a gentle slope at about 695 m elevation. The trees in this area may reach up to 20 m tall and includes the nickel hyperaccumulator *Rinorea bengalensis* (Wall.) Kuntze. Some of the other common plants that grow together with this species include the bamboo *Schizostachyum lumampao* (Blanco) Merr. and the rattan *Calamus vidalianus* Becc. Other species of Apocynaceae seen in this area are the white-flowered vine *Parameria laevigata* (Juss.) Moldenke and the epiphytic shrubs *Hoya multiflora* Blume and *H. cumingiana* Decne., although these are infrequent. Chemical analyses of the soil from this particular area in Zambales indicate 0.53–0.81% nickel, 0.28–0.40% cobalt, and 24.09–29.55% iron (Fernando et al. unpubl. data). The Palawan specimen (Merrill 9355) was collected from Taytay, a non-ultramafic area in the northern part of the island.

*Conservation status.* We consider this species to be Endangered (EN B12ab(ii,iii,iv)). Its extent of occurrence is estimated to be less than 5000 km<sup>2</sup>, and thus far, it is known only from two distant locations in the Philippines. A continuing decline is observed, inferred, and projected in its (a) area of occupancy; (b) area, extent and/or quality of habitat, and (c) number of locations or subpopulations. Part of the area of the type locality in Zambales is subject to open pit mining for heavy metals. The other locality in Palawan is now largely degraded habitat and thus far represented only by a single century-old collection.

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