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A new species of *Argyreia* (*Convolvulaceae*) from Myanmar

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Abstract: *Argyreia decemloba* Traiperm, Fujikawa & Staples, a new species of *Convolvulaceae* from Natma Taung National Park, Chin State, Myanmar, is described here with detailed illustrations and summaries for its distribution, ecology and IUCN conservation status. This new species is a high-climbing twiner that can be distinguished by a white or pale yellow corolla with a deep red or purple-black colour inside at the base of the tube, a ten-lobed corolla limb, and staminal filament bases expanded and densely covered by hispid hairs. *Argyreia decemloba* is here assessed as Near Threatened (NT) following IUCN Red List categories.

Key words: *Argyreia*, Chin State, *Convolvulaceae*, filament morphology, Mount Victoria, Myanmar, Natma Taung, new species discovery, SE Asian biodiversity, staminal trichomes, taxonomy

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Introduction

Located at the western edge of Southeast Asia and the eastern edge of the Indian subcontinent, Myanmar is a unique country where the Indian, Sino-Japanese, Southeast Asian and Malesian floristic regions intersect. Myanmar is well known for its rich plant diversity (Kress & al. 2003), resulting from the combined interaction of its geography, topography, climate, patterns of seasonal rainfall, and its high mountains and major rivers. Whereas comparatively little inventory-based botanical field work has been undertaken there, field investigations and the publication of Floras in surrounding countries have been actively progressing.

Based on a memorandum of understanding signed by the Kochi Prefectural Makino Botanical Garden, Japan, and the Forest Department of Myanmar, the Makino Botanical Garden and its associated international partner institutions have been conducting plant inventory research since 2000 (Tanaka 2005; Fujikawa 2016), building toward the production of a Flora of Myanmar. Major collecting efforts have been focused on Chin State (primarily Natma Taung National Park), Kayin State, Mandalay Region (primarily Popa Mountain Park), and southern Shan State, with additional collecting trips made to Kachin State, Mon State, and Sagaing Region. Over 30,640 collections (each with two to five duplicates) of vascular plants have been collected to date, housed in the herbaria

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of Myanmar's Forest Department (RAF) and the Makino Botanical Garden (MBK).

One focus of this research has been documenting the flora of Natma Taung National Park, formerly known as Mount Victoria. Between 2002 and 2014 a total of 15,836 collections were made in the park and contiguous areas. The first set of duplicates collected in the Natma Taung National Park is deposited in the Natma Taung National Park Office. Additional duplicates are distributed to herbaria as cited below. Herbarium codes follow Index herbariorum (Thiers 2018+). The ongoing project aims to publish the first taxonomic enumeration of the plants occurring within Natma Taung National Park, Chin State. An international collaborative team of botanists have, so far, identified 2364 species representing 183 families that occur there.

Many interesting species of *Convolvulaceae* have been found by the field teams during the collecting programme in the Natma Taung National Park. In the course of preparing the *Convolvulaceae* account for the *Taxonomic Enumeration of Flowering Plants of Natma Taung, Chin State, Myanmar* (Staples submitted), several collections of an *Argyreia* Lour. could not be matched with any known species. These specimens characterize a liana with broadly elliptic leaves, pendulous, capitate inflorescences on short peduncles with many overlapping bracts, and bicoloured flowers with a distinctive 10-lobed corolla limb. Concurrently with preparation of the family account for the *Enumeration*, a comprehensive nomenclatural review of the entire genus *Argyreia* was completed and published (Staples & Traiperm 2017) and our review confirmed that this *Argyreia* from Natma Taung did not, in fact, have a scientific name. Thirty-six species of *Argyreia* are distributed in Myanmar (Staples & Traiperm 2017) and this new one brings the total to 37. We describe the new species here.

Material and methods

Plant materials were collected from the field in Natma Taung National Park, Myanmar, between 2004–2013. Measurements reported here were taken from dried herbarium specimens. Type specimens of morphologically similar species were compared and verified directly or from digital images available online. Relevant literature, primarily protologues for similar species, was consulted. A preliminary conservation assessment was prepared based on the IUCN Red List categories and criteria (IUCN 2012), using GeoCAT (Bachman & al. 2011) to calculate the Extent of Occurrence (EOO) metrics.

Results and Discussion

Argyreia decemloba Traiperm, Fujikawa & Staples, **sp. nov.** – Fig. 1, 2.

Holotype: Myanmar, Chin State, Mindat Township, between Chi Chaung River (Chi river) and 3 miles from Mindat along Mindat-Kanpetlet mountain road, Natma Taung National Park, 21°21'17.3"–21°21'38.6"N, 93°56'10.9"–93°56'06.6"E, 760–1025 m, 3 Sep 2013, *K. Fujikawa, P. Srisanga, C. Maknoi, Myint Hlaing & Law Shine 95008* (MBK 249177!; isotypes: QBG!, RAF!, SING!).

Diagnosis — Three species of *Argyreia* are known to have a white or pale yellow corolla with a deep red or purple-black colour inside at the base of the tube as well as a 10-lobed limb: *A. barbata* (Wall.) Raizada; *A. maymyensis* (Lace) Raizada; and *A. decemloba* (Table 1). *Argyreia barbata* and *A. maymyensis* have quite narrow, linear inflorescence- and floral bracts that do not cover up the calyx and corolla base; the hispid-hirsute indumentum of *A. barbata*, composed of dense, bristly hairs may obscure the floral organs underneath. In contrast, *A. decemloba* has broad, laminar inflorescence- and floral bracts that cover the floral organs underneath; the abaxial surface of the bracts has a completely different, dimorphic indumentum composed of two different trichome types (Table 1).

Description — Climbing *lianas*; main stems woody at base, herbaceous above, tips twining, covered with one type of simple, non-glandular, yellowish hispid, patent trichome. *Leaves* simple, bifacial; *petiole* 2.5–9 cm long, grooved adaxially, hirsute; *leaf blade* ovate or elliptic, 11–24 × 6.5–12 cm, base cuneate or obtuse, margin entire, apex acuminate or acute, texture chartaceous, adaxially slightly darker, glabrous, abaxially paler, hirsute; *secondary veins* 11–13 on either side, at first running beside midvein, then angling away to margin (more evident on adaxial surface), veins slightly raised adaxially, more prominently raised abaxially. *Inflorescences* axillary, pendulous, capitate, few-flowered; *peduncle* always shorter than subtending petiole, thick, 0.5–2 cm long; *bracts*

Table 1. Diagnostic characters for three similar species of *Argyreia* in Myanmar.

Inflorescence bracts character	***Argyreia barbata***	***Argyreia maymyensis***	***Argyreia decemloba***
shape	linear	linear to linear-lanceolate	ovate, obovate, lanceolate or elliptic
size	17–23 × 1–2 mm	18–21 × 1–2 mm	outer bracts 18–25 × 15–20 mm, inner ones diminishing in size
indumentum	hispid-hirsute	hirsute	dimorphic: longer, pilose, yellowish hairs underlain by shorter, strigose, yellowish hairs

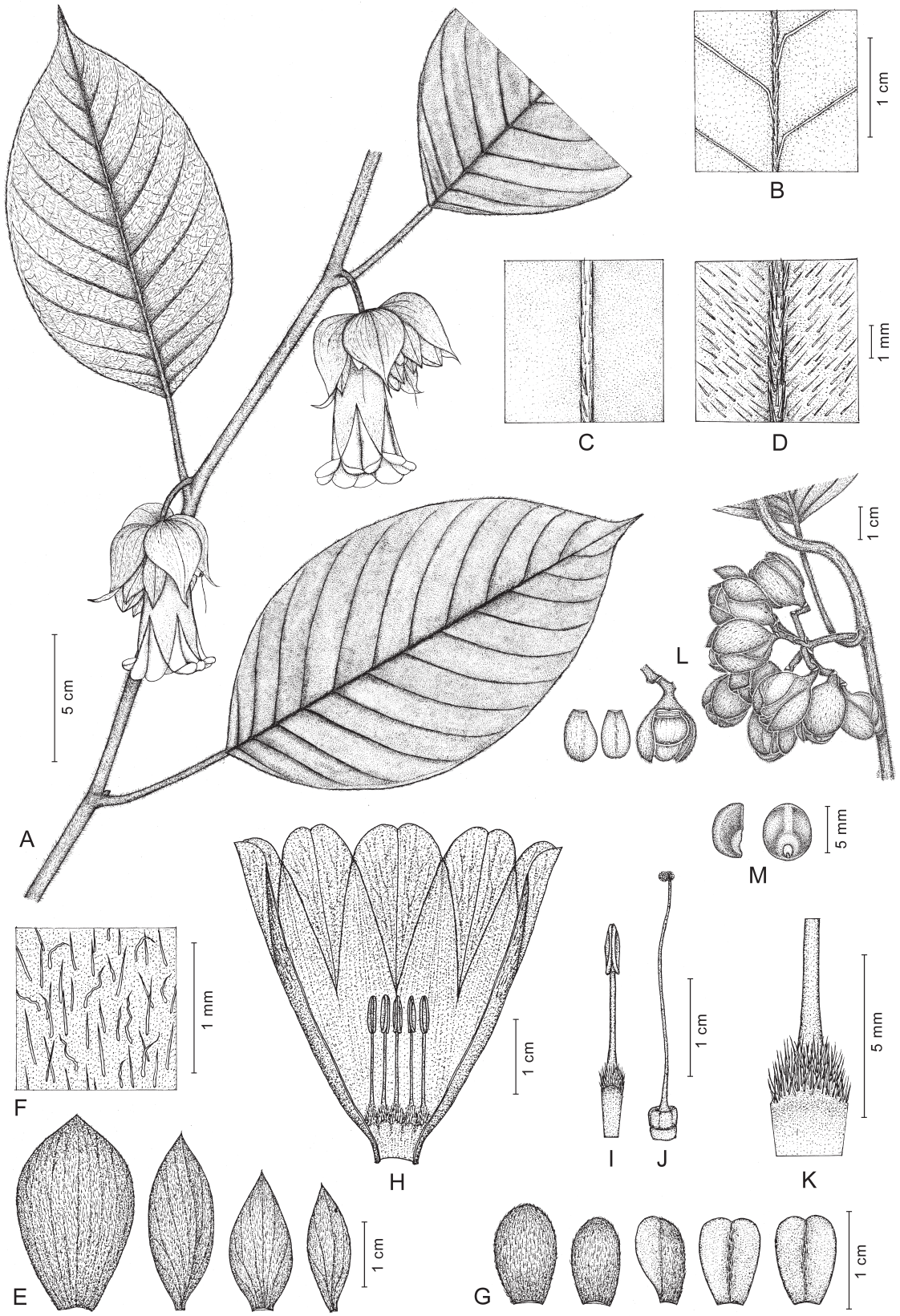

Fig. 1. *Argyreia decemloba* – A: stem with leaves and inflorescences; B: secondary veins at first run beside midvein on adaxial leaf surface; C: adaxial leaf surface; D: abaxial leaf surface; E: inflorescence bracts, outer (left) to inner (right); F: abaxial bract surface, showing 2 trichome types; G: 5 sepals from outer (left) to innermost (right); H: opened corolla with 5 stamens; I: single stamen; J: pistil, showing undulate disk and biglobose stigma; K: filament insertion showing dense covering of straight, hispid trichomes; L: fruits (right) and fruit with sepals (left); M: seeds in side view (left) and top view (right). – All drawn by N. Chitchak from voucher specimens *Fujikawa & al. 95008* (QBG) (A–K), *Kuroiwa & al. 30480* (MBK) (L–M).

Fig. 2. *Argyreia decemloba* inflorescence and corolla details – A, B: plant habit (voucher: *Fujikawa & al. 95008*); C: flower in frontal view, showing 10-lobed corolla limb, included genitalia, and reddish interior of corolla tube; D: inflorescence and flower in lateral view, showing capitate inflorescence with short, thick peduncle, overlapping whitish bracts, and triangular-funnelform corolla shape (voucher: *Fujikawa & al. 94296*). – All photographs by C. Maknoi.

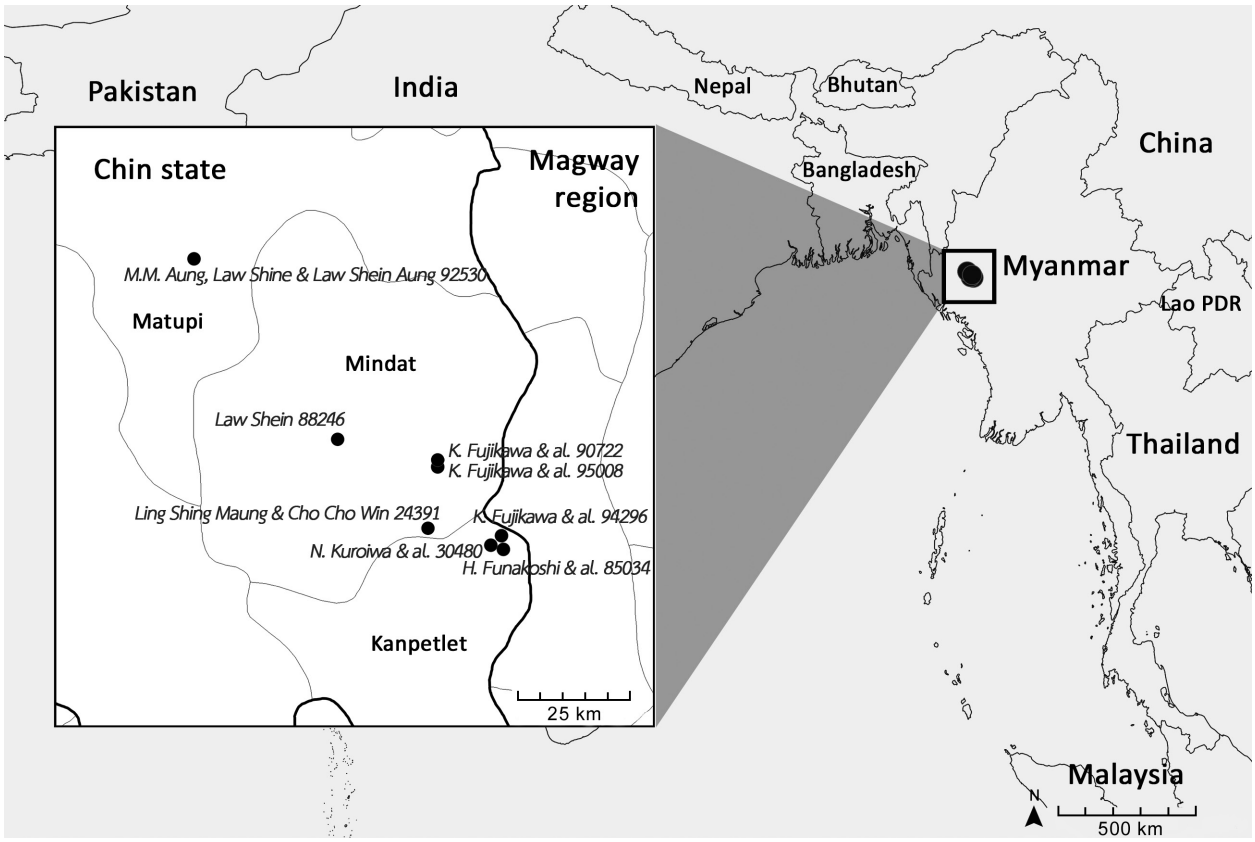

Fig. 3. Distribution of *Argyreia decemloba* in Chin State, Myanmar: three collections at Kanpetlet Township, *Fujikawa & al. 94296*, *Kuroiwa & al. 30480*, *Funakoshi & al. 85034*; four collections at Mindat Township, *Law Shein 88246*, *Fujikawa & al. 90722*, *Fujikawa & al. 95008*, *Ling Shing Maung & Cho Cho Win 24391*; one collection at Matupi Township, *Aung & al. 92530*.

ovate, obovate, lanceolate or elliptic, outer ones largest, concave, 1.8–2.5 × 1.5–2 cm, inner ones diminishing in size, abaxially hairy with 2 types of trichomes: longer, pilose, yellowish and shorter, strigose, yellowish, adaxially glabrous, apex acute; *pedicels* c. 5 mm long, rounded, terete, yellowish sericeous. *Flowers* diurnal; *sepals* subequal, 3 outer obovate-elliptic, 0.7–1 × 0.55–0.65 cm, abaxially yellowish sericeous, adaxially glabrous, margin entire, apex rounded, third sepal asymmetrical, 2 inner sepals obovate-emarginate, 0.8–0.85 × 0.5–0.6 cm, glabrous inside, outside yellowish sericeous only along keel, thinner at margins. *Corolla* triangular-funnelform, 4–4.5 cm long, white with reddish inside tube in lower ½, glabrous inside and out (young buds with a few apical hairs). *Stamens* included, equal; *filament* 2.4–2.5 cm long, insertion thickened, expanded, c. 0.6 cm long, densely hispid with trichomes 0.15–0.3 cm long; *anther* linear-oblong, c. 0.5 × 0.15 cm; *pollen* globose, pantoporate, minutely spinulose. *Pistil* included, longer than stamens; nectary disc margins undulate, glabrous; *ovary* ovoid, glabrous, c. 0.2 cm high; *style* c. 2.5 cm long; *stigma* 2-lobed. *Fruit* enclosed in persistent, accrescent calyx, outer fruiting sepals enlarging to 1.5–1.6 × 1–1.1 cm, inner sepals 1.3–1.5 × 0.8–1 cm, turning dark brown on abaxial surface, pale brown on adaxial surface and not spreading when dry; *berry* subglobose, 1–1.2 cm in diam., glabrous, outer wall leathery, shiny dark brown, wrinkled when dry. *Seeds* 4, trigonous-rounded, 5–6 mm long, black, glabrous, surface dull (not shiny); *hilum* horseshoe-shaped, brown, basal.

Phenology — Collected in flower from July to September; fruiting in March, October and December.

Distribution and ecology — So far known only from Chin State, Myanmar, occurring at elevations of (740–)1025–1200(–1530) m. A high-climbing twiner in trees and shrubs inhabiting open, sunny places such as roadsides, footpaths in secondary forest, edges of deciduous forest, clearings in evergreen forest, and in semi-evergreen forest; preferring moist soils along streams or the banks of rivers. The soil type has not been reported.

Conservation status — Based on the eight known collection sites, the Extent of Occurrence (EOO) is 641 km^2 when calculated in the GeoCAT system (Bachman & al. 2011). Accordingly, the species would fall into the IUCN category of Vulnerable (IUCN 2012). However, *Argyreia decemloba* has been collected three times within the last five years and is found in a protected area: the Natma Taung National Park. We therefore assess the species as Near Threatened (NT) at the present time and point out that further fieldwork is needed to assess changes in population distribution and abundance in the future.

Etymology — The specific epithet recognizes the distinctive 10-lobed corolla limb.

Additional specimens examined — MYANMAR: CHIN STATE: Kanpetlet Township, along footpath between Kanpetlet and Yelong Pan Village, Natma Taung National Park, 21°13'07.9"N, 94°03'46.4"E, 1260–1435 m, 23 Aug 2013, *K. Fujikawa*, *P. Srisanga*, *C. Maknoi*, *Tin Mya Soe*, *Ling Shein Man*, *Tun Tin & Law Shine 94296* (MBK 249172, QBG, SING); near Kanpetlet, Natma Taung National Park, 21°12'N, 94°02'30"E, 1000–1200 m, 3 Mar 2004, *N. Kuroiwa, K. Fujikawa & H. Sonoki 30480* (MBK 72057); near Kanpetlet, 21°11.5'N, 94°04'E, 1200 m, 2 Sep 2011, *H. Funakoshi, Hong Mang, Shein Man*, *Law Shein & Wai Min Htay 85034* (MBK 235966, SING); Mindat Township, around Chi Chaung River (Chi River), 3 mi. from Mindat, between Mindat and Kanpetlet mountain road, Natma Taung National Park, 21°21'17.3"–21°21'38.6"N, 93°56'10.9"–93°56'06.6"E, 740–1025 m, 10 Dec 2012, *K. Fujikawa*, *K. Miyake*, *M. M. Aung*, *K. Yabe*, *Myint Hlaing*, *Tun Tin & Law Shine 90722* (MBK 246919); Mindat area, Natma Taung National Park, 22 Oct 2011, *Law Shein 88246* (MBK 239573); Mt Victoria, Natma Taung National Park, 14 Aug 2002, *Ling Shing Maung & Cho Cho Win 24391* (MBK 49597); Matupi Township, along the roadside between Taingsi village and Swangan village, 21°46.176'N, 93°27.025'E, 1530 m, 16 Jul 2013, *M. M. Aung*, *Law Shine & Law Shein Aung 92530* (MBK 251793, RAF).

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