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Notes on the genus *Millettia* (Fabaceae: Millettieae) in the Indo-Burmese region; a new species, new records and lectotypifications

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ABSTRACT

New species, new records and lectotypifications in *Millettia* are presented. *Millettia densiflora*, a new species discovered from Laos, is described and illustrated. Additionally, we provide a detailed morphological description, illustrations, colour plates, distribution map, phenology, conservation status and a discussion of its closest affinity. We further present first reports for Thailand (*Millettia cana*, *M. puerarioides* and *M. velutina*), and Laos (*M. velutina*). Lectotypes are designated for *Millettia cana*, *M. multiflora*, *M. oraria* and *M. velutina*. The full descriptions of *Millettia cana* and *M. multiflora* are provided for the first time based on fresh specimens.

KEYWORDS: *Fordia*, Indo-Burma, Indo-China, new taxon, lectotypification.

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INTRODUCTION

Millettia Wight & Arn. belongs to the tribe Millettieae of family Fabaceae. Based upon molecular studies (Hu, 2000; Hu *et al.*, 2000; Kajita *et al.*, 2001; Wojciechowski *et al.*, 2004; Schrire, 2005; de Queiroz *et al.*, 2015; Mattapha, 2017; Cooper *et al.*, 2019; Oyebanji *et al.*, 2020; Zhang *et al.*, 2021; Song *et al.*, 2022), it has long been considered as a highly complicated taxon because there are no unique distinguishing characters that differentiate it from closely allied genera, particularly with respect to *Derris* Lour., *Fordia* Hemsl. and *Pongamia* Vent. These phylogenies revealed that *Millettia* comprises several distinct taxa as is supported by other phylogenetic studies (Song *et al.*, 2022). For example, some species of *Millettia* have a synapomorphic calyx with imbricate lobes for which it has been proposed to reinstate the genus *Imbralyx* Geesink (Song, 2021); while those species that share the combination of conspicuous buds covered with scales, leaves without stipels, and ebracteolate flowers, have been transferred to the new genus *Huchimingia* Z.Q.Song & Shi J.Li (Song *et al.*, 2022). Nevertheless, the generic delimitation of *Millettia* remains phylogenetically unsatisfactorily resolved.

Millettia comprises 50–80 species in Asia, and it is highly diverse in Thailand and the Indo-Chinese region with over 30 species treated in the latest revisions (Lock & Heald, 1994; Lôc & Vidal, 2001; Mattapha, 2020a), followed by 15 species in the Malesian area (Adema, 2000), and 10–14 in China (Wei & Pedley, 2010). However, in Indochina the flora account of *Millettia* in Laos remains understudied, although taxonomic treatments were published by different authors, namely Lock & Heald (1994), Lôc & Vidal (2001) and Newman *et al.* (2007).

During botanical expeditions to Bolikhamxai Province of 2020 and 2021, an unknown *Millettia*

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was discovered growing in mixed deciduous and older secondary forests. To name it, we investigated the overall morphology of the specimen and checked it with all known species of *Millettia* published, namely Lock & Heald (1994), Lôc & Vidal (2001), Mattapha (2020a). No matches were found, and we concluded that the collection represents a new species for Laos.

In this work, we present 1) the new species from Bolikhamxai Province, Central Laos, which is herein described as *Millettia densiflora* Mattapha, Lanors. & Lamxay; 2) new records: *Millettia cana*, *M. puerarioides* and *M. velutina* are new for Thailand, and *M. velutina* for Laos; 3) Lectotypifications for four species: *Millettia cana*, *M. multiflora*, *M. oraria* and *M. velutina*; 4) the first diagnostic descriptions of the flowers of *M. cana* and the fruits and seeds of *M. muliflora*.

NEW SPECIES

Millettia densiflora Mattapha, Lanors. & Lamxay, **sp. nov.**

This species resembles *Millettia caerulea* (Grah.) Baker in having leaflets with caudate or acuminate apices, inflorescences with an intermediate form between pseudoraceme and pseudopanicle, violet flowers with densely sericeous standards and monadelphous stamens, but it differs in being a woody climber (vs scandent shrub or small tree in *M. caerulea*), absence of stipels (vs present in *M. caerulea*), secondary axes of inflorescences up to 15 cm long (vs up to 30 cm long in *M. caerulea*) and the standard with basal callosities (vs without basal callosities in *M. caerulea*). Type: Lao PDR, Bolikhamxai Province, Khamkeut District, Pongpatao Village, mixed deciduous forest and older secondary forest, ca 833 m alt., 12 Apr. 2021, *Lanorsavanh & Lamxay SL 2182* (holotype **HNL!**; isotypes **BKF!**, **FOF!**, **KKU!**). Figs. 1 & 2.

Woody climber, young twigs greenish or dark green-brown, lenticellate, pubescent, old twigs brown or grey, lenticellate, glabrous. *Leaves* imparipinnate, spiral; petioles 5.8–10.5 cm long; rachis 7–10.5 cm long, pubescent; ultrajugal part 0.8–2 cm long, pubescent, green; stipules triangular or lanceolate, 2–3 × 1–2 mm, pubescent, caducous. *Leaflets* 7–9, opposite; petiolules 5–6 mm long, pubescent, green; lamina oblanceolate, elliptic; terminal leaflet slightly larger than lateral ones, 7–16 × 2.4–6 cm, chartaceous, base cuneate, margin entire to slightly undulate, apex caudate or acuminate, both surfaces green, adaxial surface glabrous, abaxial surface pubescent; secondary veins 5–8-pairs; stipels absent. *Inflorescences* intermediate between pseudoracemes and pseudopanicles, axillary, 7–30 cm long, densely pubescent; secondary axes up to 15 cm long, erect. *Brachyblasts* wart-like, bearing 8–10 flowers; bracts on inflorescence axes and on brachyblasts triangular or lanceolate, ca 2 × 1–1.5 mm, densely hairy, persistent; floral bracts linear, 1–2 mm long, apex acute, hairy, caducous; bracteoles narrowly ovate, ca 1 mm long, densely hairy, inserted at base of calyx tube, caducous. *Pedicels* 1.5–2 mm long, hairy. *Calyx* cup-shaped; tube 3.5–4 mm long, hairy; lobes minute, broadly triangular, 0.5–1 mm long, hairy outside, upper lobes slightly separate at apex. *Corolla* purple to light pink; standard suborbicular, 8–9 × 9–10 mm, with swelling basal callosities, apex emarginate, base tapering into the claw, margin inflexed, outside densely sericeous, inside glabrous with yellowish blotches, claw 2.5–3 mm long; wings slightly oblong to falcate, 7.5–8.5 × 2.5–3.5 mm, base auriculate, apex obtuse, margin entire, outside hairy especially in apical part, inside glabrous, claw 2–3.5 mm long; keel obovate or falcate, 6.5–7.5 × 2.5–3.5 mm, apex rounded, margin entire, outside densely sericeous, inside glabrous, lateral pocket ca 3 mm long, claw 3–4 mm long. *Stamens* monadelphous, with basal fenestrae 1.5–2 mm long; staminal tube 7–8 mm long, glabrous; free part of filaments 2.5–3 mm long; anthers ca 0.5 × 0.2 mm, glabrous. *Disk* absent. *Ovary* densely tomentose, ca 3–4-ovuled; style 2.5–3.5 mm long, hairy at base. *Pods* elliptic to oblong, 6–8.5 × 2.5–3 cm, laterally flattened, dehiscent, densely brown tomentose. *Seeds* unknown.

Distribution.— Known only from the type locality in Pongpatao Village, Khamkeut District, Bolikhamxai Province (Fig. 3). It is likely also present in Vietnam.

Ecology.— In mixed deciduous forest and older secondary forest, alt. ca 850 m. Flowering in Apr.; Fruiting in June.

Additional specimens examined.—Bolikhamxai Province, Khamkeut District, Pongpatao Village, 12 June 2021, *Lanorsavanh & Lamxay SL2184* (**HNL**).

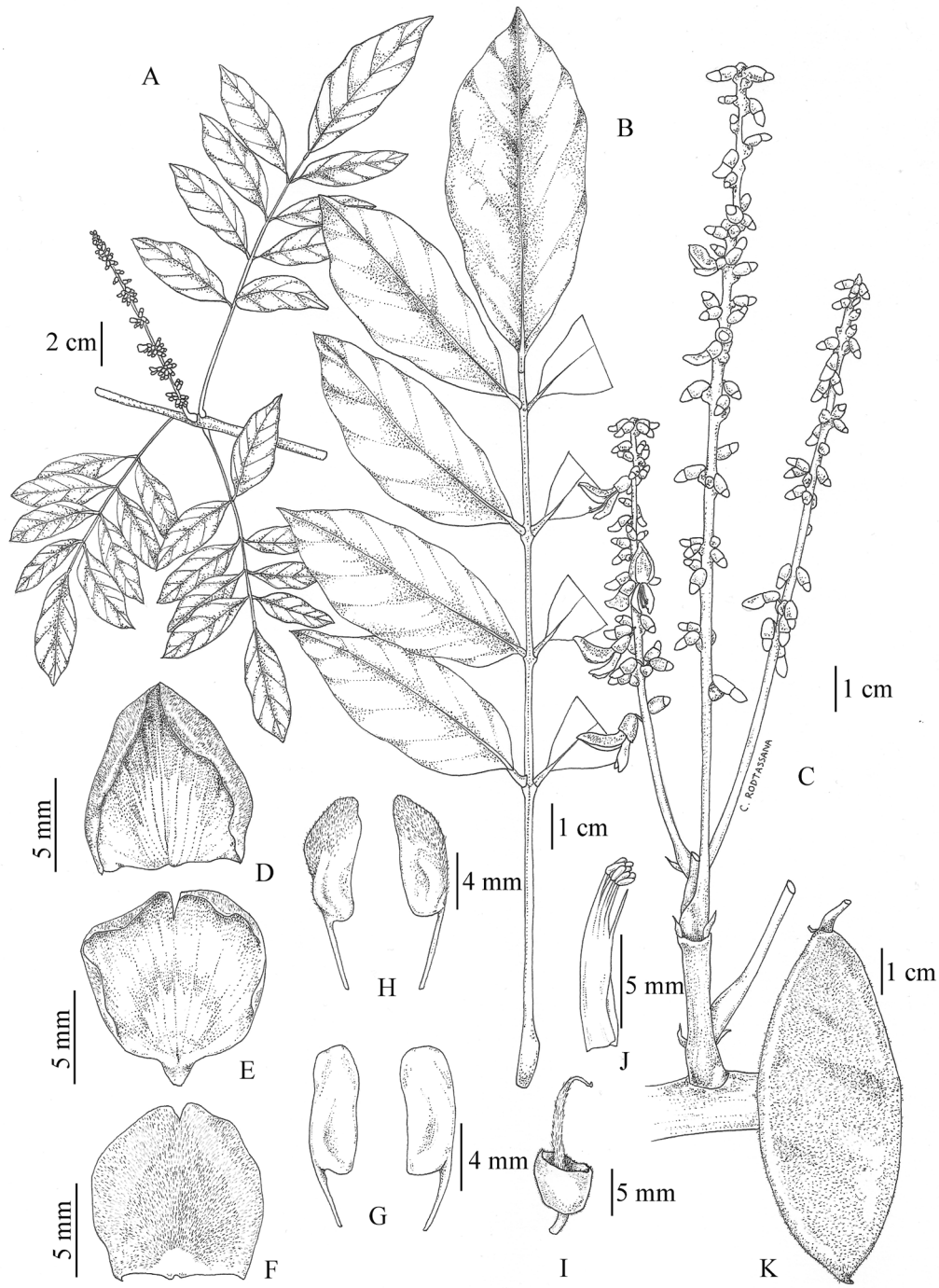

Figure 1. *Millettia densiflora* Mattapha, Lanors. & Lamxay: A. Leaves and pseudoracemose inflorescence; B. Leaf; C. Pseudopaniculate inflorescence; D. & E. Ventral views of standard; F. dorsal view of standard; G. Wing petals showing outer surfaces; H. Keel petals showing outer surfaces; I. Calyx & ovary; J. Stamens; K. Fruit. A.–J. drawn from *Lanorsavanh & Lamxay SL2182*; K. drawn from *Lanorsavanh & Lamxay SL2184*. Illustrations by Chadtip Rodtassana.

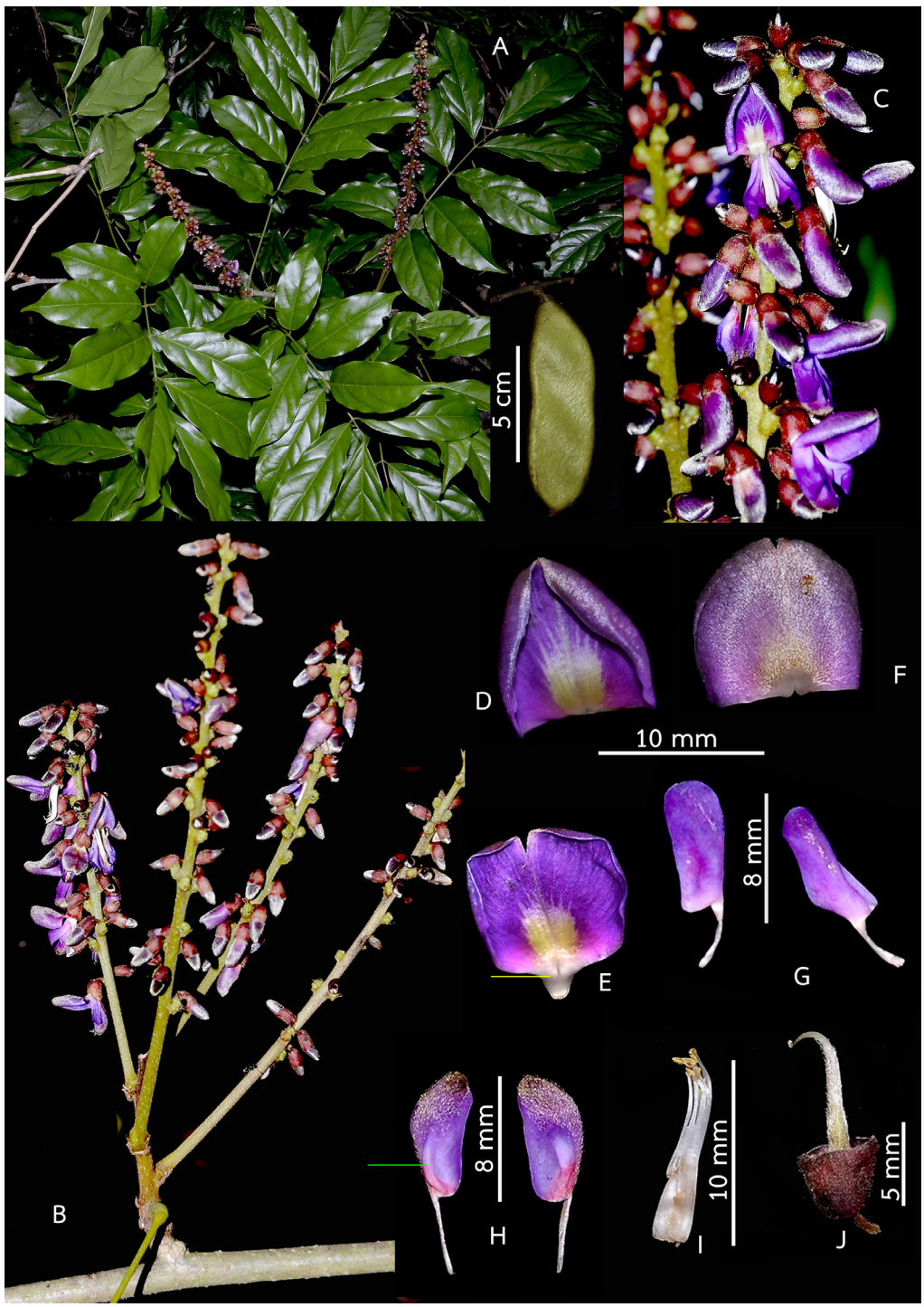

Figure 2 Colour photographs of *Millettia densiflora* Mattapha, Lanors. & Lamxay: A. Leaves and pseudoracemose inflorescences; B. Pseudopanicles with brachyblasts; C. Part of inflorescence; D. & E. Ventral view of standard (yellow line showing basal callosities); F. Dorsal view of standard; G. Wing petals; H. Keel petals (outer surfaces showing dense hairs, and lateral pocket (green line)); I. Stamens; J. Calyx and ovary inside. Photos by S. Lanorsavanh.

Etymology.— The specific epithet refers to the densely packed flowers on the brachyblasts of the inflorescence.

Vernacular.— Chak chan kheua in Laotian (ຈັກຈັ່ນເຄືອ).

Preliminary conservation assessment.— *Millettia densiflora* is currently known only from the type locality, which is outside a protected area. The species grows in disturbed primary forest next to a village. The forest is facing a high risk of clearing for agricultural purposes. There are about 50 mature individual plants known from a single population as preliminarily observed. The species is assessed here as Data Deficient (DD) because there is inadequate information to make a direct assessment based on the current distribution. It can meet the criterion Critically Endangered (CR), by following the IUCN Red List guidelines (IUCN, 2019) because of the small population with a number of mature individuals < 50, but future research will re-evaluate the status when more data is available.

Notes.— 1. *Millettia densiflora* is characterised by being a woody climber, having leaflets with acuminate or caudate apices and lacking stipels, inflorescences intermediate between pseudoracemes and pseudopanicles, the secondary axils of the inflorescences being shorter than the main axils, standards and keel petals with densely sericeous outer surface and monadelphous stamens with the staminal tube 7–8 mm long.

2. The species resembles an unidentified *Millettia* specimen, *LAO 469* (**FOF**), collected from Khammouan Province, regarding the habit being a woody climber and having similarities in the leaf shape and elliptic fruits with tomentose hairs. Unfortunately, this collection bears no flowers to be compared with the new species, therefore, further study and collections are needed to determine if it is identical with *Millettia densiflora*.

3. The seed morphology of this species is not included in the description because the seeds were in the developing stage, therefore, it will be provided in a further study.

NEW RECORDS & LECTOTYPIFICATIONS

1. Millettia cana Benth. in Miq., Pl. Jungh. 2: 250. 1852; Dunn, J. Linn. Soc. 41: 186. 1912. Type: Myanmar, Irrawaddi River, Yenangheum (Yenangyaung), Magwe District, 1826, [*Wall. Cat.*

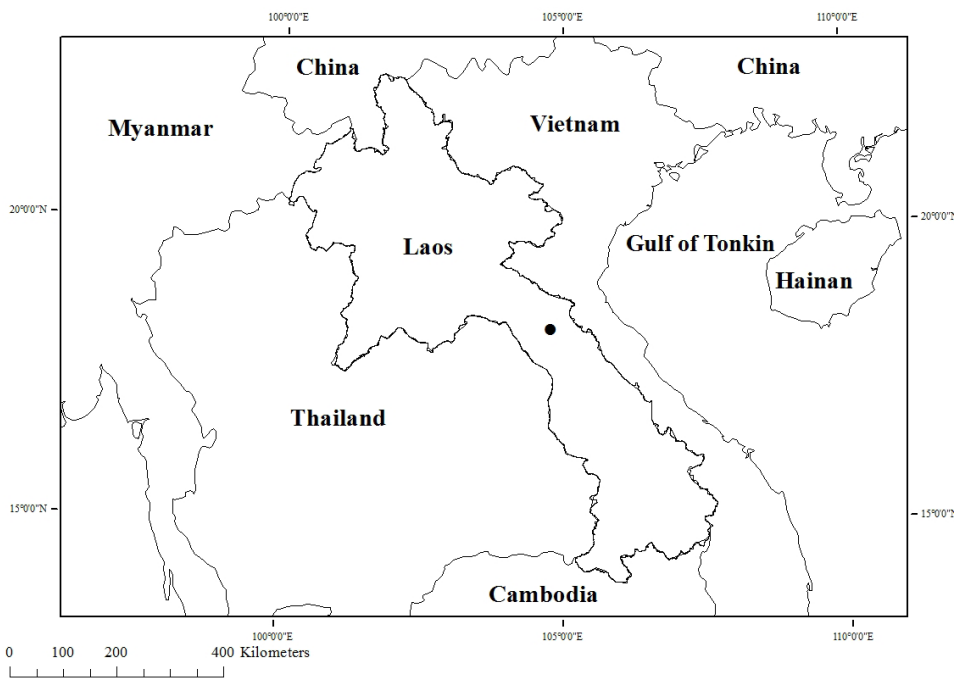

Figure 3 Distribution map of *Millettia densiflora* Mattapha, Lanors. & Lamxay (black circle).

no. 5903], (lectotype **K-W** [K001122529!], designated here; isolectotype **K** [K000848727!]).— *Phaseolodes canum* (Benth.) Kuntze, Revis. Gen. Pl. 1: 201. 1891.

— *Pongamia cana* Grah. in Wall., Num. List., Cat. no. 5903. 1831-32, **nom. nud.**

Tree 4–12 m tall; young twigs densely tomentose. *Leaves* imparipinnate, spiral; petioles 2–3.5 cm long, densely tomentose; rachis 2.5–4 cm long, shallowly grooved above; ultrajugal part up to 1.5 cm long; stipules ovate to oblong, 2–3 × ca 2 mm, outside densely tomentose or sometimes glabrous, inside glabrous, persistent. *Leaflets* 5–7, opposite; petiolules 1.5–2.5 mm long, densely pubescent; terminal leaflet slightly larger than lateral ones, sometimes smaller, obovate; lateral ones orbicular, ovate, oblong, elliptic or obovate, 3.5–7 × 1.5–2.7 cm, base rounded or cuneate, margin entire, apex acute, upper surface densely tomentose, soon moderately hairy to glabrescent; lower surface densely tomentose to moderately tomentose; secondary veins 4–5 pairs; stipels absent. *Inflorescences* pseudoracemose, sometimes with a few branches at base, axillary, 7–13 cm long, densely tomentose. *Brachyblasts* wart-like or indistinct, bearing 2–3 flowers; bracts subtending brachyblast oblong, 2–3 × 0.5–0.8 mm, apex acute, outside densely tomentose, inside sparsely hairy at apex to glabrous, sub-persistent or caducous. *Pedicels* 5–6 mm long, densely tomentose. *Calyx* cup-shaped, 3.5–4 mm long; lobes 5, triangular, minute, indistinct, dark red outside pubescent, inside glabrous. *Corolla* white to greenish or pink; standard orbicular, 9–10 × 9–10, apex emarginate, base forming basal callosities, margin entire, glabrous on both sides, claw 1–1.5 mm long; wings oblong or triangular, 7–8 × 3–3.5 mm, base truncate, apex obtuse or acute, margin entire, glabrous on both sides, claw 2.5–3.5 mm long; keel falcate, 5.5–6 × 3.5–4 mm, apex rounded, margin entire, with lateral pocket, glabrous on both sides, claw 2–2.5 mm long. *Stamens* monadelphous, with basal fenestrae ca 2 mm long; staminal tube 5–6 mm long, glabrous; free filament parts 1–2 mm long; anthers ca 0.6 × 0.5 mm, glabrous. *Ovary* densely tomentose, 2–4-ovuled; style 4–5 mm long, hairy at base. *Pods* strap-shaped, 8–11 × 2–2.5 cm, glabrous, dehiscent. *Seeds* orbicular, 0.9–1 × 1–1.2 cm, reddish to black.

Thailand.— SOUTH-WESTERN: Prachuap Khiri Khan Province, Sam Roi Yot District, deciduous forest, 23 Apr. 2020, *Sungkaew & Teerawatananon 1599* (**BKF**); ibid., *Sungkaew & Teerawatananon 1600* (**BKF**).

Distribution.— Myanmar (type).

Ecology.— Deciduous forest, alt. ca 300 m. Flowering in April–May, fruiting June–July.

Notes.— 1. *Millettia cana* is characterised by having 5–7 leaflets, lacking stipels, the leaves varying in shape ranging from obovate, orbicular, ovate, oblong to elliptic, inflorescences with dense tomentose hairs and monadelphous stamens with the staminal tube 5–6 mm long.

2. Baker (1876) formerly described the habit of *Millettia cana* as a climber, while Dunn (1912) recounted it as a tree. We observed a few populations and found that it was clearly a tree. Probably, plants of the species start being liana-like with straggling branches. When becoming older with bigger stems, they may develop into trees. This is also found in other species such as *M. caerulea* and *M. extensa* Benth. The detailed information of the corolla was not yet described in previous studies (Baker, 1876; Kurz, 1877; Dunn, 1912) due to possibly insufficient flower material. Baker (1876) originally described calyces that are minute and densely brown-sericeous with deltoid teeth, which are half as long as the tube, but information on the corolla remained undescribed, which we could remedy here.

3. There are two sheets, K000848727 and K001122529 stored under *Wallich Numerical List 5903* (**K-W**). However, none of these sheets has been annotated as type. The latter is chosen as a lectotype, because it possesses numerous leaflets and has more complete fruits.

2. Millettia puerarioides Prain, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 46: 358. 1897. Type: Myanmar, Tenasserim: Choungya, 1,219 m, 30 Mar. 1877, *Geo Gallatly 531* (lectotype **K** [K000848744!], designated by Song *et al.* (2021)). Fig. 4.

Thailand.— NORTHERN: Mae Hong Son, Sop Moei District, Thi Cha Village, along the stream, alt. 700 m, 3 Apr. 2013, *Pongamornkul 3416* (**QBG**-66424); ibid., alt. 812 m, 3 Sept. 2020, *Pongamornkul 7256* (**QBG**) & *7257* (**QBG**).

Distribution.— Myanmar (type), China (Yunnan).

Ecology.— Dry evergreen forest by a stream, alt. 700–800 m. Flowering March–April; fruiting May–September.

Figure 4. *Millettia puerarioides* Prain: A. Leaves & a young shoot; B. Inflorescences borne on stem; C. Part of inflorescence; D. Brachyblasts & flowers showing the dorsal view; E. Close up of a floral bud (partly dissected); F. Inner side of standard; G. Inner side of wing petal; H. Outside of keel petal; I. Stamens; J. Fruits; K. Seeds. Photos by W. Pongamornkul.

Vernacular.— Thi sa (ทีชะ).

Notes.— 1. *Millettia puerarioides* is apparently distinguished by its caudate apex, glaucous lower surface of leaflets and pseudoracemes, pendulous inflorescences arising from leafless nodes, borne along the stem, 22–50 cm long. It shares morphological characters with the genus *Fordia*, a genus known to be heterogeneous (Mattapha, 2017), by rami- and caulinascent inflorescences. Regarding the fruit characters, *M. puerarioides* has inflated pods. This differs from the fruits of *Fordia*, which are falcate and flattened (Buijsen, 1988; Dasuki & Schot, 1991; Mattapha 2020b). A further phylogenetic study should indicate the exact generic position of the species.

2. An unknown *Millettia* specimen, *Pongamornkul 3416* (**QBG**-66424), collected from Mae Hong Son, Northern Thailand near the Burmese border, is marked by having caudate leaflets that are glaucous beneath, and relatively long inflorescences, up to 50 cm long. Unfortunately, due to the unavailability of fruits for a precise identification, the species remains unidentified. Ultimately, we re-visited the locality in 2020 in the same season to obtain more flowering and fruiting samples. After careful diagnosis and comparison with the type specimens, it did match the description of *Millettia puerarioides* in the protologue very well. Therefore, it is here newly recorded for Thailand, known from a single locality, previously it was already known from a few collections from Myanmar (Prain, 1897; Brandis, 1906; Dunn, 1912) and Southern China (Yunnan) (Song *et al.*, 2021).

3. Millettia multiflora Collett & Hemsl., J. Linn. Soc., Bot. 28: 41. 1891.Type: Myanmar, Meiktila, Mar. 1888, *H. Collett 516* (lectotype **K** [K000848729!], designated here; isolectotype **CAL** [CAL0000008153!]). Fig. 5.

Tree, 10–13 m tall; young twigs densely hairy. *Leaves*: petioles 4–5.5 cm long, densely hairy; rachis 9.5–19.5 cm long, shallowly grooved above, densely hairy, ultrajugal part 1.7–2.2 cm long; stipules ovate, ca 1.3 × 0.8 mm, densely hairy. *Leaflets* 9–11, opposite; petiolules 4–5 mm long, hairy; lamina elliptic to obovate, 3.6–6.8 × 3.1–4.8 cm, apex obtuse to shortly acuminate, base obtuse to rounded, margin repand, upper surface hairy along veins, lower surface densely hairy; lateral veins 6–8 pairs; stipels setaceous, 2–4 mm long, hairy. *Inflorescences* pseudoracemes, 15–27 cm long, axillary or subterminal, densely hairy. *Brachyblasts* wart-like, 3–5 × ca 2 mm, each bearing 6–8 flowers; bracts triangular, ca 1 mm × 1.5 mm, outside densely hairy, inside glabrous; bracteoles ovate, ca 0.6 × 0.5 mm, inserted at base of the calyx tube, outside densely hairy, inside glabrous. *Pedicels* 3–4 mm long, densely hairy. *Calyx* red, cup-shaped, outside densely hairy, inside glabrous; tube ca 4 mm long; lobes triangular, apex acute; upper lobe 1, ca 2 × 5 mm; lower lobes 3, ca 2 × 2–3 mm. *Corolla* purple; standard orbicular, ca 16 × 12 mm, claw ca 4 mm long, apex retuse, base obscurely auriculate, with two basal callosities, margin inflexed, upper half at both sides sericeous; wings oblong, ca 15 × 3–4 mm, claw ca 4 mm long, apex rounded, base auriculate, margin entire, upper half of outer surface sericeous, inside glabrous; keel oblong, ca 16 × 4 mm, claw ca 7 mm long, apex obtuse, base cuneate, margin entire, upper part of outer surface sericeous, inside glabrous. *Stamens* diadelphous; filaments 11–12 mm long; anther oblong, ca 0.8 × 0.5 mm. *Disk* absent. *Ovary* densely hairy with sericeous hairs, 7–8 mm long, style ca 4 mm long, glabrous. *Pods* oblong, laterally compressed, 9.5–13 × ca 1.7 cm, densely hairy. *Seeds* 2–4, orbicular, 1.4–1.5 cm in diam.

Distribution.— Endemic to Myanmar. Sagaing Region, Yinmabin District, Yinmabin Township, near Shwe Taung Oo Pagoda, alt. 40 m, 16 May 2019, *K.Z. Hein 040* (**RAF**). Naypyitaw Union Territory: Dekkhina District, Pyinmana Township, Laekwin Taung, alt 600 m, 28 May 2016, *MY42* (**RAF** & **TNS** [TNS01279891]).

Ecology.— Dry forest, alt. ca 50 m. Flowering March–May; fruiting June–July.

Notes.— 1. *Millettia multiflora* is similar to *M. tecta* (Craib) Mattapha & Chantar. by its obovate leaflets, pseudoracemes and presence of brachyblasts, but differs in having stipels (absent in *M. tecta*), smaller leaflets, 3.6–6.8 × 3.1–4.8 cm (10–20 × 5–10 cm in *M. tecta*), and smaller standards of ca 16 × 12 mm (20–30 × 20–30 mm in *M. tecta*). The fruits were not described in the original and previous publications (Collett & Hemsley, 1891; Dunn, 1912), and, together with the seeds, are here described for the first time.

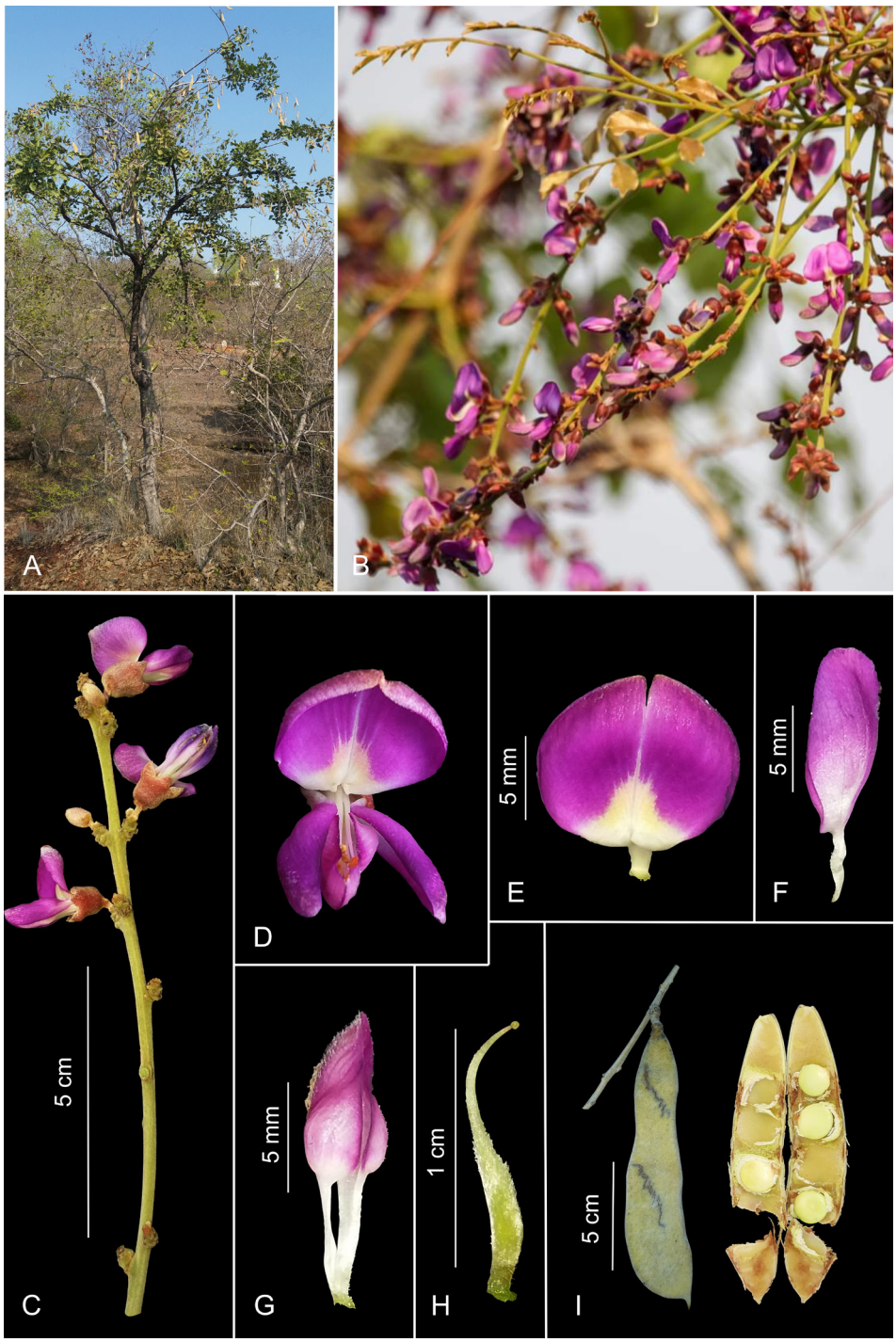

Figure 5. *Millettia multiflora* Collett & Hemsl.: A. Habit; B. Inflorescences; C. Part of inflorescence; D. Close up of a flower; E. Inner side of standard; F. Inner side of wing petal; G. Keel petals; H. Ovary; I. Fruit & seeds. Photos by P.T. Aung (B) & K.Z. Hein (A, C–I).

2. Dunn (1912) mentioned the syntypes for *Millettia multiflora*, which included three collections: *H. Collett 516* (**K**), *H. Collett 553* (**CAL**) and *Abdul Huk s.n.* (herbarium not known). The sheet of *H. Collett 516* at **K** was chosen as the lectotype, because it bears leaflets and numerous flowers with a diagnosed floral part, while the second collection has fewer leaflets and flowers, and the last collection is untraceable.

4. Millettia oraria (Hance) Dunn, J. Linn. Soc., Bot. 41: 149. 1912; Wei & Pedley in Wu *et al.*, Fl. China 10: 181. 2010.— *Tephrosia oraria* Hance, J. Bot. 24: 17. 1886. Type: China (Hong Kong), Cape d'Aguilar, 6 Nov. 1884, *C. Ford s.n.* (lectotype, **K** [K000848715!], designated here), isolectotype, **BM** [BM001217830!]).

Distribution.— China (type).

Ecology.— Secondary forest, ca 700 m altitude. Flowering May–June; fruiting May–July.

Notes.— 1. So far, a lectotype for *Millettia oraria* was not yet selected. Originally, *Millettia oraria* was described in the genus *Tephrosia* Pers. by Hance (1886), but later it was formally transferred to *Millettia* by Dunn (1912). There are two sheets referring to the original publication, K000848715 (**K**) and BM001217830 (**BM**), the first sheet is appropriate to be a lectotype and was selected here, because of bearing numerous leaflets, flowers and with illustrations of detailed flowers, while the latter has fewer leaflets and flowers.

2. Similar to *M. principis* from which it differs in the shorter inflorescences, young branches and the lower surface of leaflets that are densely tomentose (vs glabrescent in *M. principis*), and bracteoles inserted below the calyx (vs at the middle in *M. principis*).

5. Millettia velutina Dunn, J. Linn. Soc., Bot. 41: 149. 1912. Type: China, Yunnan, Mengtze, *Henry 9728D* (lectotype **K** [K000848714!], designated here; isolectotypes **K** [K000848713!, *Henry 9728* **US** [image no.00003975!, *Henry 9728* [image no.02324202!, *Henry 9728B* [image no 02324201!], *Henry 9728C*, **MO** (*Henry 9728F*)). Fig. 6.

— *Millettia yunnanensis* Pamp. var. *robusta* Pamp., Nuovo Giorn. Bot. Ital., N.S. 17(1): 27. 1910. Type: China (Yunnan), côteaux, May 1904, *Maire 160* (holotype **P** [P02141873!].

Thailand.— NORTHERN: Nan Province, Chaloem Phra Kiat District, Doi Phukha National Park, on limestone area in the East of Doi Phu Wae, alt. 1,703 m, 12 July 2016, *Tamura et al. T-30683* (**KYO**); ibid, alt. 1,700–1,800 m, 30 Sept. 2021, *Inkaew PI2021-1* (**BKF**, **KKU**).

Laos.— Bolikhamxai Province, Chaychamphon District, Nam-on Village, alt. ca 685 m, 26 May 2020, *Lanorsavanh & Lamxay SL1888* (**HNL**, **FOF**).

Distribution.— China (type).

Ecology.— Secondary forest, alt. 700–1,800 m. Flowering May–June; fruiting May–July.

Vernacular.— Chak chan khon (จักจั้นขน).

Notes.— 1. Dunn (1912) described *Millettia velutina* based on a collection of *Henry 9728*, which comprises four sheets; *9728*, *9728B*, *9728D & 9728F*. We found that there were, in fact, five gatherings belonging to *Henry 9728* including *9728*, *9728B*, *9728C*, *9728D & 9728F*, one of which, *9728C*, was not cited by Dunn (1912) in the original publication. Of these, none of them was annotated in the protologue. The sheet of *Henry 9728* has only leaflets and fruits. The sheets *9728B* (**US** image no.02324202) and *9728C* (**US** image no 02324201) seem in a better condition but possess fewer leaflets and flowers. Therefore, we choose the sheet *9728D* at **K** [K000848714] as the lectotype, which is appropriate because it has leaflets and inflorescences bearing numerous flowers.

2. We traced *Maire 160*, consisting of only a single sheet at **P** (P02141873), which was annotated as the type, bearing leaves and inflorescences with dissected flowers, therefore, it is regarded as the holotype of *Millettia yunnanensis* var. *robusta*.

3. *Millettia velutina* is characterized by its densely tomentose hairs scattered throughout the branches, both surfaces of leaflets, inflorescences and calyx lobes, the upper calyx lobes completely connate, monadelphous stamens, presence of a floral disk and tomentose fruits.

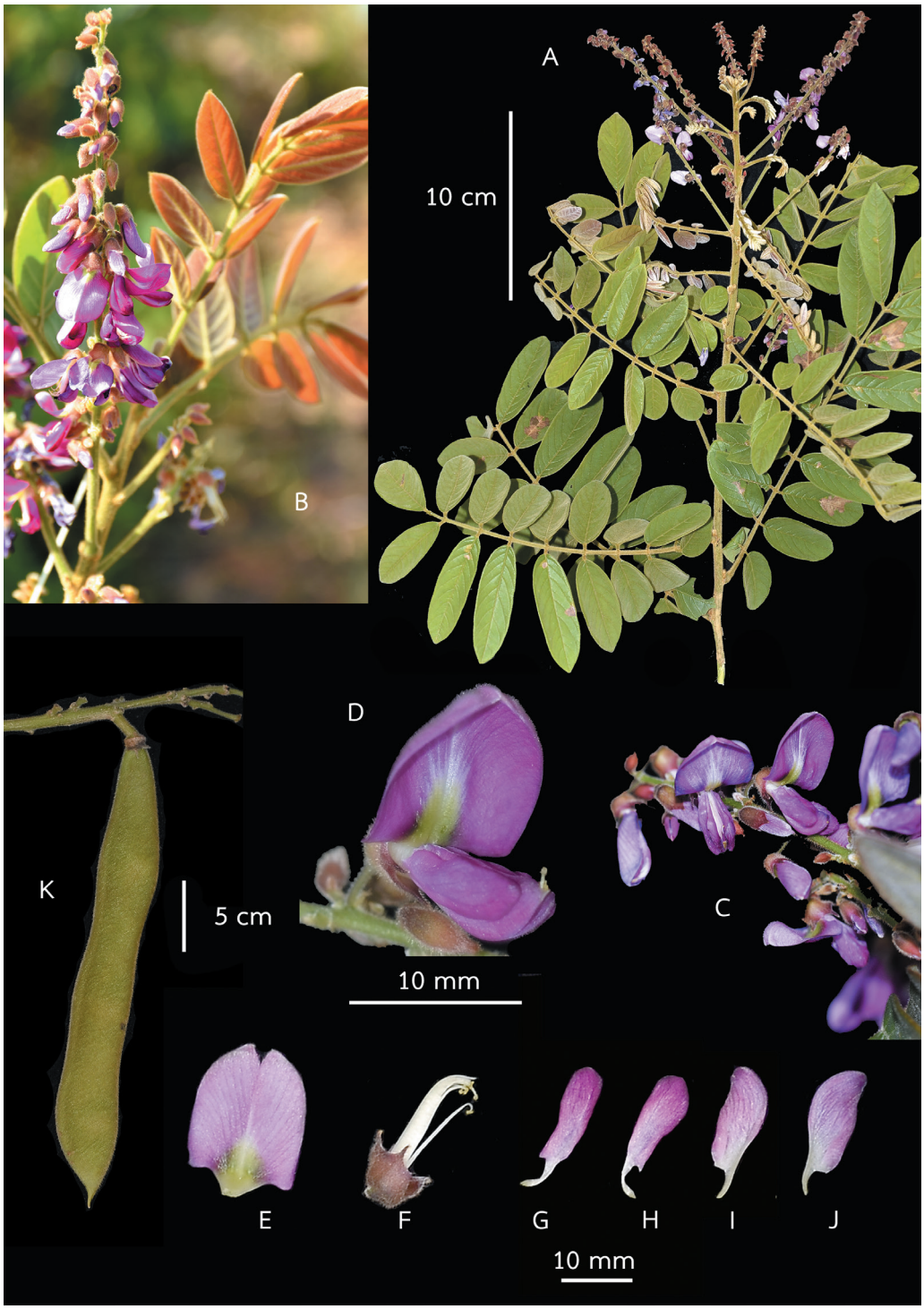

Figure 6. *Millettia velutina* Dunn: A. Leaves & inflorescences; B. Inflorescences; C. Part of inflorescence; D. Close up of flower; E. Inner side of standard; F. Calyx & stamens; G. & H. Wing petals; I. & J. Keel petals; K. Fruit. Photos by S. Lanorsavanh.

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