

Mucuna hainanensis Hayata subsp. *multilamellata*
Wilmot-Dear: a new name for a long-known
taxon (*Leguminosae* – *Phaseoleae*) and a key
to related species

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Summary. The taxon *Mucuna hainanensis* Hayata subsp. *multilamellata* Wilmot-Dear, is described. Due to an extensive and long-standing nomenclatural confusion this was formerly known as *M. nigricans* (Lour.) Steud. var. *nigricans*. Additional details of gross morphology not appearing in earlier literature are here given for both it and subsp. *hainanensis* (formerly known as *M. nigricans* var. *hainanensis*). A further taxon, formerly known as *M. nigricans* var. *hongkongensis* Wilmot-Dear is reduced to synonymy under *M. hainanensis* subsp. *hainanensis*. Keys to distinguish these subspecies from each other and from the other lamellate-fruited species found on the Asian mainland (this including all those species involved in the nomenclatural confusion) are appended.

This paper is intended to accompany a revision of the Philippine species of *Mucuna* which appears elsewhere in this volume. It includes information both from published revisions of the East Asian and Indian species (Wilmot-Dear 1984 & 1987), and from a revision (in press) of the Indochinese species, all of which is brought together in the keys.

A proposal appears elsewhere (Taxon, in press) to reject the name *Mucuna nigricans* (Lour.) Steud. As set forth there, the taxon referred to earlier (Wilmot-Dear (1984 & 1987)) under the name *M. nigricans* (Lour.) Steud. var. *nigricans* cannot be considered as referable to this name since it is absent from Vietnam, the country from which Loureiro described *Citrus nigricans*. In fact it has no name available even though it is not uncommon and is fairly widely distributed.

Before it can be formally described its taxonomic status needs reassessment. In 1984 (*loc. cit.*) I considered it to be distinct from *M. hainanensis* Hayata at varietal level. However, recent examination of most of the available material from throughout the geographical range of both taxa shows a very constant difference in fruit morphology; in addition the elucidation of the above nomenclatural confusion indicates that the two entities do not, as previously thought, show geographical overlap in Indochina. Instead, *M. hainanensis* occurs in Thailand, Vietnam, Hong Kong and Hainan, while "*M. nigricans* auctt." has a disjunct distribution, occurring both to the West (Indian subcontinent, Burma) and to the East (Philippines). It therefore seems worthy of recognition at subspecific level.

The same recent work has shown that the differences previously listed (Wilmot-Dear 1984) for leaf and flower morphology between these two entities do not hold good throughout the geographical range of *M. hainanensis* *sensu stricto*. It shows also that the variety *hongkongensis* (also described in *loc. cit.* 1984) cannot be considered distinct from *M. hainanensis* *sensu stricto*, since it falls within the range of variation of the latter as shown in Indochina.

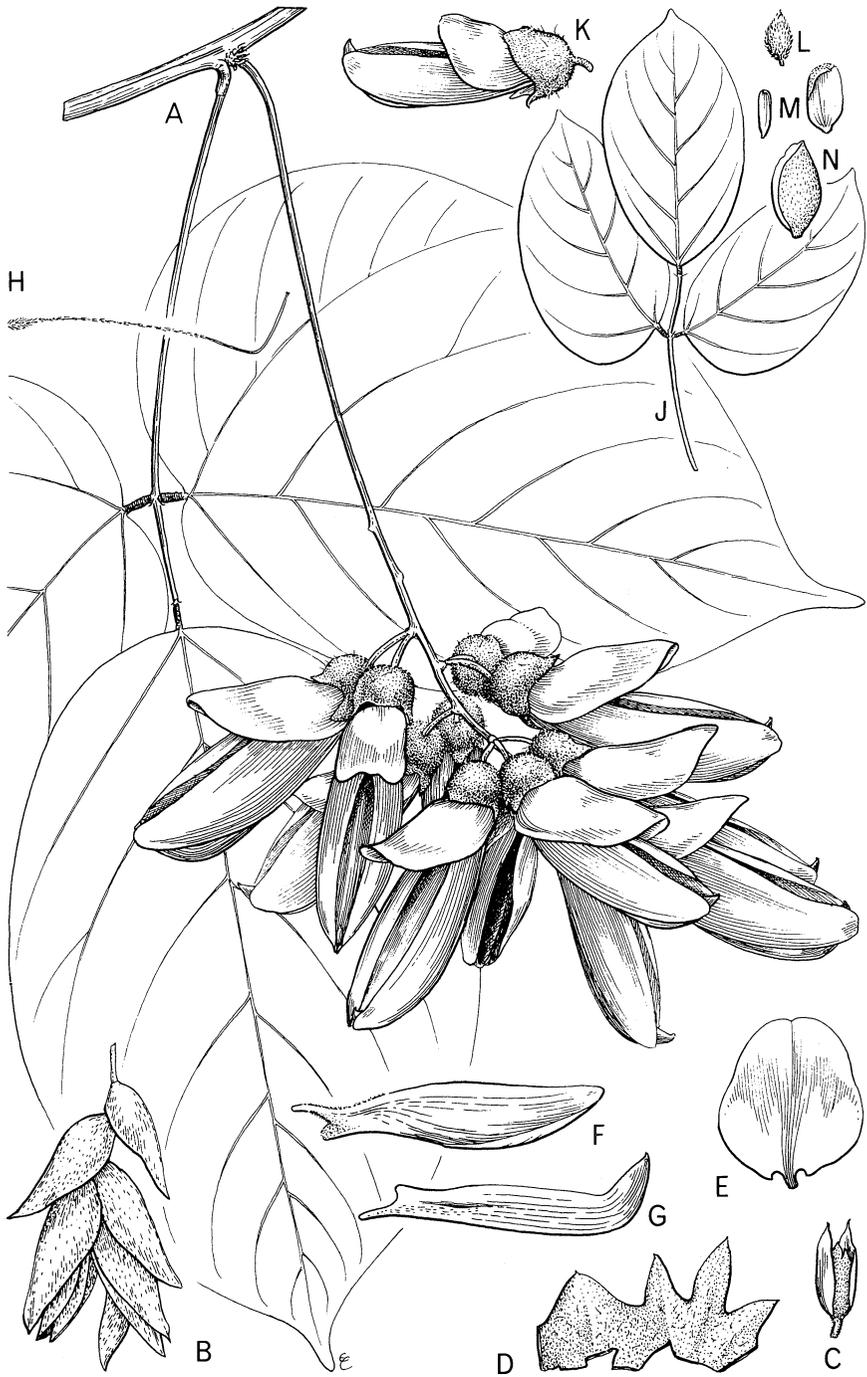


FIG. 1. *Mucuna hainanensis*. A-H subsp. *multilamellata*: A habit; B young inflorescence with bracts; C bud and bracteoles; D calyx; E standard; F wing; G keel; H pistil. J-N subsp. *hainanensis*: J leaf; K flower; L bud; M bracts; N bracteole. A, E-H from *Gamble* 23915; B from *Mooney* 2685; C, D from Hort. Kew. (1856); J, K from *Tutcher* 2140; L-N from *How & Chun* 70030. All $\times \frac{2}{3}$. Drawn by Eleanor Catherine.

Ample descriptions of both taxa appear elsewhere (Wilmot-Dear 1984 & 1987). I shall therefore here include, besides the formal diagnosis, only a brief description of the two taxa with special attention to those details which now need alteration or amplification in the light of recent work. A full synonymy is, however, included.

Mucuna hainanensis Hayata, Icon. Pl. Formos. 3: 72 (1913). Type: Hainan, May 1910, *Katsumada* s.n. (holotype TI; isotype HK).

Climber with stems and leaves glabrous or sparsely fine-adpressed-hairy. Leaflets elliptic to elliptic-ovate, varying greatly in size. Inflorescences short or up to 40 cm long, sometimes bearing bracts on lower (non-flower-bearing) part of axis, these of very different form from those (upper) bracts subtending buds or groups of buds, broadly ovate, long-acuminate; upper (flower-subtending) bracts broadly elliptic or obovate with rounded and often hooded apex. Corolla purple. Fruit ornamented with a pair of wings 0.8–1.4 cm wide running along either margin and 8–25 simple flap-like raised lamellae running somewhat obliquely transversely across either face, at least some of these extending into the wings.

subsp. ***hainanensis***

M. suberosa Gagnep. in Lecomte, Not. Syst. 3: 27 (1914). Types: Vietnam: Tonkin, *D'Alleizette* 345, *Balansa* 2260, *Bon* 2925 & 332 (syntypes P!); *Balansa* 2257 & 4402, *Bon* 2938 (syntypes P!; isosyntypes K!).

M. nigricans sensu Tateishi & Ohashi in Bot. Mag. Tokyo 94: 99 (1981).

M. nigricans sensu auctt. non (Lour.) Steud. var. *hainanensis* (Hayata) Wilmot-Dear in Kew Bull. 39: 43 (1984).

M. nigricans sensu auctt non (Lour.) Steud. var. *hongkongensis* Wilmot-Dear in op. cit.: 45 (1984).

Leaves up to 25 cm long; terminal leaflet of very variable size, 4.5–12 × 2.5–5.5 cm, obovate-elliptic or elliptic, lateral veins (3–)5(–7) pairs. Inflorescences unbranched (apart from 5–11 reduced, knob-like, flower-bearing sidebranches); lower (non-flower-subtending) bracts, where present, 20–30 × 10–16 mm; upper bracts 10–20 × 8–18 mm; bracteoles linear-ob lanceolate or narrowly elliptic, 9–13 × 2–4 mm. Corolla with standard 2.7–3.2 cm long, wing (4.2–4.5–)5.5 × (8–)12–15 mm, relatively broad, keel of similar length. Fruit varying widely in shape from broadly symmetrically oblong with very convex upper margin and straight lower margin, rather short and containing usually 2 seeds, to linear-oblong but strongly indented between 3–4 seeds; 7–17 × 3–5 cm, length:width ratio ranging from 2–4:1; lamellae 8–12(–14), very oblique, rather thin in texture; surface bearing abundant irritant red bristles, but otherwise glabrescent and rather shiny.

DISTRIBUTION. Thailand, Vietnam; Hong Kong, Hainan.

subsp. ***multilamellata*** Wilmot-Dear subsp. nov. a subspecie typica legumine semper pubescentia densa obtecto nec glabrescenti vel nitenti, atque lamellis 20–25 parum oblique transverse currentibus nec 8–12(–14) valde oblique currentibus, foliolisque saepe maioribus usque 17 × 10.5 cm nec usque

12 × 6.5 cm, differt. Typus: Hort. Kew, July 1879, ex Calcutta, *King* s.n. (holotypus (fl. & fr., "sheet 2") K!; isotypus (fl., "sheet 1") K!).

M. nigricans sensu Indian and Philippine authors; Tateishi & Ohashi in Bot. Mag. Tokyo 94: 100 (1981); Wilmot-Dear in Kew Bull. 39: 43 & 45 (1984) & in op. cit. 42: 30 (1987); *non* (Lour.) Steud.

M. imbricata DC. ex Bak. in Hook.f., Fl. Brit. India 2: 185 (1876) *pro parte* (specimens collected by Griffith & Hooker); *sensu* many Indian authors as cited in Kew Bull. 42: 31 (1987) (see also tom cit: 33) *non* Baker *sensu stricto*.

M. atropurpurea sensu Kanjilal, For. Fl. Siwalik & Jaunsar U.P.: 152 (1911) *non* (Roxb.) DC.

Leaves up to 32 cm long; terminal leaflet 8–17 × 6–10.5 cm, elliptic or elliptic-ovate. Inflorescences branched once or twice in lower part (in addition to bearing ± 8 knoblike flower-bearing sidebranches); non-flower-subtending bracts 20–30 × 10–30 mm, upper bracts 20–30 × 10–20 mm; bracteoles as in typical subspecies. Corolla with standard as in typical subspecies, wings and keel often longer, 5.5–6 cm long, wing usually 1.5 cm wide. Fruit linear-oblong with 3–4 seeds, 13–14 × 3.5–5.5 cm, length:width ratio 3–4:1; lamellae 20–25, running only slightly obliquely, rather thick in texture; surface with a scattering of irritant bristles but also always covered with abundant short fine ± spreading red-gold pubescence giving a dull appearance to surface and a very distinct outline to lamella-margins.

DISTRIBUTION. N & E Indian subcontinent, Burma; Philippines.

The disjunct distribution of this subspecies is curious. I can offer no explanation for its absence from both China and Indochina. From herbarium data even the habitat requirements of the two subspecies appear similar.

The type has been selected as being the only collection seen which has both mature flowers and mature fruit. It does not, however, appear in the illustration since an adequate plate had already been prepared for a general monograph of the genus which is in preparation by Dr B. Verdcourt.

Since the name *M. nigricans* (Lour.) Steud. has, during the long period of nomenclatural confusion, been applied to 4 other species, the following keys to all lamellate-fruited species of the Asian mainland may be helpful in clarifying the identity both of collections and of literature references under this name. Those marked * have been referred to under this name. Species with lamellate fruits all fall within subgenus *Mucuna*. They do not constitute a formal taxonomic unit, nor are they florally distinct from those with non-lamellate fruits. However, fruits are often recognisable as lamellate at a very tiny and immature stage when further details are not yet clear. Such fruits may appear on still-flowering material, so a key using floral characters may be helpful.

KEYS TO SPECIES OF *MUCUNA* WITH LAMELLATE FRUITS ON THE ASIAN MAINLAND

A. Floral characters

1. Flowers 7–9 cm long; margin of standard and wings conspicuously ciliate in apical region up to ¼ or ⅓ length (S. China & Hong Kong) **macrobotrys**
- Flowers up to 6.5 cm long; margin of standard and wings eciliate or ciliate only in basal ⅓ 2

2. Wings with abundant long adpressed hairs 1–2 mm long in upper $\frac{2}{3}$ of inner surface; flowers crowded in upper $\frac{1}{2}$ of inflorescence axis or less; terminal leaflet \pm rhombic with lateral veins running right into margin (S. & C. China) **lamellata**
Wing glabrous except for much shorter hairs in claw region; flowers spaced throughout axis or crowded; terminal leaflet usually elliptic or ovate, lateral veins always becoming indistinct near margin or sharply curved and running parallel to it 3
3. Calyx lobes broad, almost oblong, with rounded apex, lowest 4–8 mm long; terminal leaflet narrowly elliptic usually over twice as long as wide, with 3–5 pairs of lateral veins arising at a very acute angle (less than 45°) from the midrib with basal pair extending well into upper half of lamina and second pair almost to apex (Peninsular India & Sri Lanka) **atropurpurea**
Calyx lobes broadly or narrowly triangular, acute or acuminate (length various); terminal leaflet relatively wider with lateral veins arising at a less acute angle (over 45°) and even second pair extending little into upper half of lamina 4
4. Indumentum on stem, petioles and leaflets beneath at least on veins, conspicuous and abundant at least in parts, ferruginous or dark red; inflorescence short up to 7 cm long, flowers up to 4 cm long; calyx lobes very short, lowest and laterals up to 4.5 mm and 2 mm respectively 5
Indumentum absent or sparse, usually pale; calyx and inflorescence various but flowers usually larger 6
5. Inflorescences arising from axils of leaves; indumentum dark red; leaflets narrowing abruptly to short wide acumen with rounded and mucronate tip (India; Indochina) **monosperma**
Inflorescences arising from old wood; indumentum ferruginous; leaflets narrowing more gradually to acute, acuminate or apiculate apex (Hong Kong) **championii**
6. Calyx lobes small, lowest 1.5–4 mm, laterals up to 2 mm long; leaflets often abruptly acuminate; bracts small, early deciduous (Malay Peninsula, Sumatra, Borneo) **biplicata**
Calyx lobes larger, at least 6 and 4 mm long respectively; leaflets narrowing more gradually to apex; bracts various 7
7. Terminal leaflet rather angular in outline, rhombic-ovate or rhombic-elliptic, narrowing gradually and evenly into acumen; at least lower lateral veins rather straight; wing petals relatively wide, $\pm 5 \times 2$ cm, flowers purple. (Taiwan & Ryukyu Is.) ***membranacea**
Terminal leaflet outline, and veins, more curved; wing, even if longer, narrower never over 1.5 cm; flowers purple or white 8
8. Flower-bearing sidebranches lengthened ± 3 mm long, pedicels 2 cm long; flowers 4.5 cm long, all bracts small, early-deciduous (Thailand & Malay Peninsula) **stenoplax** (in press)
Flower-bearing sidebranches completely reduced, knoblike, pedicels up to 1 cm long; flowers and bracts various 9
9. Pubescence on inflorescence-axis spreading, very short and velvety; floral bracts narrowly elliptic, early-deciduous, not exceeding 5×3 mm; flowers purple up to 4.5 cm long (SW China; Indochina) ***revoluta** (in press)

- Pubescence on axis adpressed, longer; bracts broadly ovate or obovate, often persistent, at least 10×8 mm; flowers various 10
10. Calyx lobes relatively broad, $6-10 \times 5-6$ mm, broadly acute at apex; floral bracts broadly ovate, long-persistent, 22-40 mm long; flowers white, 5.5 cm long. (SW China; Indochina; Bhutan & Burma) ***interrupta**
- Calyx lobes usually relatively narrower, $5-10 \times 2-4(-6)$ mm and always tapering into acuminate apex; bracts and flowers various 11
11. Floral bracts all acuminate, often long-persistent; wing of corolla small and narrow, 4.5×0.8 cm long (NE & E Indian subcontinent; Burma) ***imbricata**
- Floral bracts of two forms, upper (flower-subtending) ones apically rounded and often hooded, rarely persistent; wing of corolla usually relatively wider, (8-)12-15 mm, and often longer, (4.2-4.5-) 5.5-6 cm, purple. (N & E Indian subcontinent; Burma; Indochina; China; Philippines) ***hainanensis**

B. Fruit characters

1. Lamellae on fruit each a simple raised flap, often continuous across whole width of fruit 2
- Lamellae on fruit each bifurcated at apex to give "T" shape in cross-section and all interrupted at middle of pod giving a longitudinal "line" along face 10
2. Lateral veins of leaflets running right into margin; fruit linear-oblong, straight, small and narrow up to 10×2.5 cm (S & C China) **lamellata**
- Lateral veins becoming indistinct near margin or sharply-curved and running parallel to it; fruit various 3
3. Fruit length:width ratio 4:1; fruit up to 10 cm long, linear-oblong with margins \pm parallel, slightly curved; marginal wing up to 4 mm wide (SE China) **cyclocarpa**
- Fruit length:width ratio 2-3:1 or if 4:1 then fruit much longer at least 16 cm, or wing at least 1 cm wide 4
4. Pubescence on stems, petioles, leaflet veins beneath (if there present) and infrutescence conspicuous, dark-red, spreading; fruit 1-(very rarely 2-) seeded, short up to 7.5 cm long and \pm as broad as long, elliptic in outline, with 5-6 lamellae converging from either margin towards centre of face and almost all lamellae there interrupted (India; Indochina) **monosperma**
- Either: pubescence \pm absent or sparse, pale or golden; or: fruit 3-4-seeded, long and relatively narrower $\pm 16 \times 4.5$ cm with at least 12 \pm parallel obliquely transverse lamellae, these rarely, if at all, interrupted 5
5. Petioles, leaflets beneath (especially veins) and at least young stems with ferruginous hairs; fruit at least 16 cm long (Hong Kong) **championii**
- Petioles, leaflets and stems glabrous or with sparse pale hairs 6
6. Fruit-lamellae of very irregular height (width) 1-2 cm widening to 4 cm in places and each running to distal edge of marginal wing which at this point sharply widens and thus presents an irregularly-dentate appearance (Thailand & Malay Pen.) **stenoplax** (in press)

- Fruit-lamellae and wings of fairly uniform width throughout their length, lamellae extending less, if at all, into wings 7
7. Pod with 20–25 lamellae; surface with short but dense pubescence of fine, \pm spreading red-gold hairs giving a dull appearance to surface and a distinct golden outline to lamella-margins (India, Philippines).
 ***hainanensis** subsp. **multilamellata**
 Pod with up to 16 lamellae; surface with or without pubescence but this rather less conspicuous, pod surface thus usually rather shiny 8
8. Lamellae interrupted or branching and joining near middle giving appearance almost of a line running longitudinally along pod; fruit up to 9 cm long, relatively broad, width \pm $\frac{1}{2}$ length; terminal leaflet with rather straight outline and at least lower lateral veins rather straight throughout most of length (Taiwan & Ryukyu Is.) ***membranacea**
 Lamellae never branched although some short or interrupted; fruit often relatively narrower; leaflet-outline and veins more curved 9
9. Upper (adaxial) marginal wings of fruit rather wider than lower, often twice as wide; leaflets large, 13–15 \times 7.5–8.5 cm (S China & Hong Kong) **macrobotrys**
 Upper and lower marginal wings of fruit of \pm equal width; leaflets rarely over 12 \times 5 cm (Hainan & Hong Kong; Indochina)
 ***hainanensis** subsp. **hainanensis**
10. Lamellae continuing to distal edge of marginal wings which at this point sharply widen, thus appearing irregularly dentate (Malay Peninsula, Sumatra, Borneo). **biplicata**
 Lamellae not running at all into wings, these of \pm uniform width 11
11. Floral bracts usually persistent to fruiting stage, very large 20–40 \times 7–20 mm; fruit (very rarely 2–)3-seeded with lamella halves upcurved, marginal wings flat (SW China; Indochina; Bhutan & Burma) ***interrupta**
 Floral bracts not or rarely persistent to fruit stage, smaller; fruit usually 2-seeded; lamella-halves and wings undulate, or revolute and inrolled respectively 12
12. Lamellae and wings undulate; bracts sometimes persistent. (NE & E Indian Subcontinent; Burma). ***imbricata**
 Lamella-halves revolute, wings inrolled; bracts never persistent 13
13. Terminal leaflet narrowly elliptic usually at least twice as long as wide, lateral veins arising at very acute angle (less than 45°) from midrib with lowest pair extending well into upper $\frac{1}{2}$ of lamina and second pair almost to apex. (Peninsular India & Sri Lanka) **atropurpurea**
 Terminal leaflet relatively broader, veins arising at less acute angle (over 45°) from midrib, even second pair extending little into upper half of lamina. (SW China; Indochina) ***revoluta** (in press)

Note: Errata in Kew Bull. 39(1) (1984): p. 52, width of fruit of *M. championii* (omitted) 4.5 cm; p. 49, distribution of *M. membranacea* includes Taiwan (omitted).

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