A new species of *Mucuna* (*Leguminosae-Phaseoleae*) from Thailand, and a revised key to the species in Thailand, Indochina and The Malay Peninsula

C. M. WILMOT-DEAR*

Summary A new species of *Mucuna* Adans., *M. oligoplax* Niyomdham & Wilmot-Dear, is described from Thailand. Keys to distinguish it from other species found in Thailand, Indochina and the Malay Peninsula are appended.

The species described below was collected after a revision of the species in this region went to press (Wilmot-Dear in Kew Bull. 47: 203–245 (1992)) and is referred to in that paper in a footnote. Its resemblance in various characters to widely differing species has necessitated a partial rewriting of the keys there given. Revised keys have therefore been added.

Mucuna oligoplax *Niyomdham & Wilmot-Dear* sp. nov. fructu atque forma coloreque corollae *M. giganteae* (Willd.) DC. similis sed lamellis partialibus tantum sed manifestis ex superficie fructus orientibus, pedicellis omnibus ± aequilongis, partibus corollae maioribus, inflorescentia brevi atque lobis calycis longis *M. acuminatae* simulantibus, caule foliisque ferruginoso-pubescentibus *M. monospermae* simulantibus differt. Typus: Thailand peninsula, Songkhla, Nathawee, Khao Nam Kaang Nat. Park, 22 Oct. 1991, *Larsen et al.* 42455 (holotypus K!; isotypi AAU, BKF, L, PSU).

Woody trailing plant or climber 10–15 m long; young stems 4 mm diam with many shallow longitudinal ridges and a dense somewhat spreading dark red-brown pubescence. *Leaves* up to 30 cm long, petiole up to 12 cm, pubescent like the stem; leaflets fairly large, terminal leaflet c.12·5 × 8 cm, elliptic with shortly broadly acuminate apex and rounded base, lateral leaflets with abaxial half twice as wide as adaxial; lateral veins 6–7 pairs, gently curved throughout length but abruptly looping near margin, robust and prominent beneath, finely prominent above, coarse and fine reticulation finely prominent beneath; thinly chartaceous, drying dark greenish above, paler below, pubescent like the stem sparsely above, abundantly (densely on veins) below; stipels fairly robust, 3 mm long. *Inflorescence* axillary, axis very short and fairly robust, 3–4 cm long, 1·5 mm diam. but becoming extremely thick and woody ± 5 mm diam. in fruit, 2–3 axes arising from same axil but each unbranched, bearing 3(–4) flower-bearing side-branches each slightly lengthened, 2–3 mm long; pedicels very long indeed and all of fairly uniform length, (2–)2·5–3(–3·5) cm, and fairly robust, 1 mm in thickness

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*The Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AE, U.K.

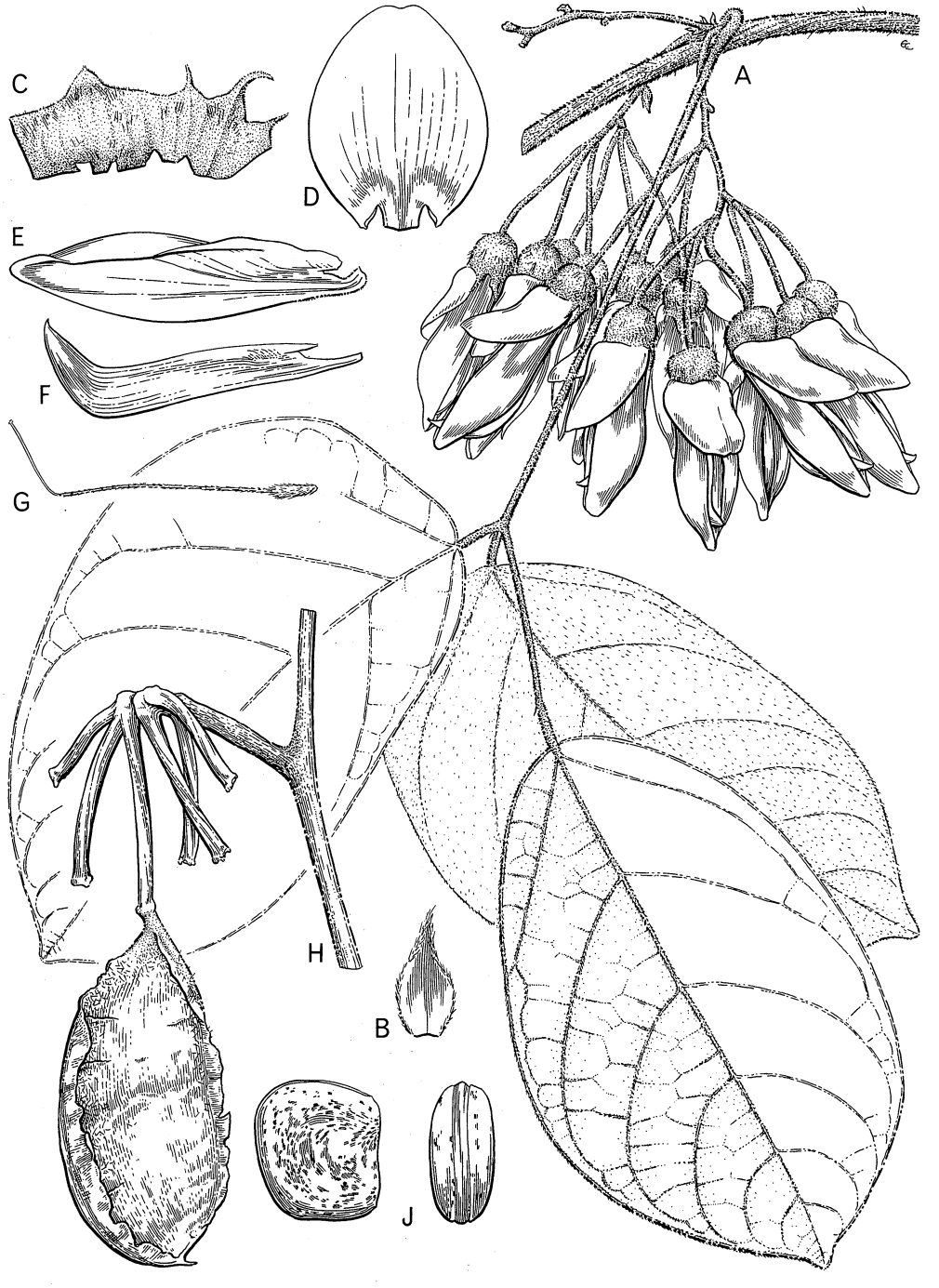

FIG. 1. *Mucuna oligoplax*. **A** leaf and inflorescence; **B** bract; **C** calyx; **D** standard; **E** wing; **F** keel; **G** pistil; **H** infructescence; **J** seed. From *Larsen et al.* 42455. **A, H** × ⅔, **B** × 2, rest × 1. Drawn by Eleanor Catherine.

(3–4 mm in fruit), these and main axes with dense pubescence of same nature as that of the stem but pale yellowish-orange; bracts and bracteoles very early deciduous, only few (very immature) bracts from very young undeveloped inflorescence seen, these ovate-lanceolate, long-acuminate, 7 × 3·5 mm, red-brown pubescent on outer surface. *Calyx* pubescent like the axis and with long coarse yellowish-orange bristles, fairly broadly cup-shaped, 7–8 × 12–14 mm; lobes fairly short but well-marked, lowest 6–8 mm long, up to 3 mm wide at extreme base but rapidly narrowing, 1·5 mm wide through most of its length, laterals 2–3 × ± 1·5 mm; upper lip fairly distinct. Flowers white, tinged greenish and purplish in parts; standard c. 3 × 3 cm, very slightly cleft at apex, basal auricles c. 3 mm long; wing relatively narrow 4·9–5·2 × 1·2 cm, slightly upcurved and tapering to ± acute apex, basal claw 6–7 mm and auricle 2 mm long; keel slightly shorter than wing, ± 4·5 cm, straight but abruptly markedly upcurved at apex, base as in wing. *Fruit* black, leathery, 2-seeded, oblong with both margins slightly convex and not swollen around each seed, 8–9 × 3·5–4 cm, markedly laterally flattened with faces slightly swollen over each seed (thickness of undehisced pod unknown); surface ornamented with a sparse spreading red-brown pubescence, a dense covering of irritant red-brown deciduous bristles and a fine pattern of raised lines similar to those on *M. gigantea* fruits but slightly coarser and shallower than the latter; also ornamented with a few transverse lamellae arising erratically from any part of surface but especially near to upper margin, these of irregular length and height and poorly-developed, never extending across more than ¼ – ⅓ of fruit surface, 1–10 mm long and some up to 3 mm high in places but others mere slight protuberances: each margin with a pair of irregularly dentate wings 3–5 mm wide. *Seed* reniform, 2·2 × 1·8 × 1 cm, surface shiny light orange-brown mottled with dark brown; hilum black extending through ¾ of circumference.

THAILAND. Peninsula: Songkhla prov., Nathawee, Khao Nam Kaang Nat. Park; 20 Oct. 1991, *Larsen et al.* 42455 (holotype K, isotypes AAU, BKF, L, PSU).

HABITAT. Roadside in clearing in evergreen rain forest; 150 m.

A species whose closest affinities are unclear. In fruit characters it most closely resembles *M. gigantea*, differing in its consistently two-seeded fruits, its distinct (even where very poorly-developed) lamellae, and the dark mottling on its light brown seed. It also resembles that species in colour and relative proportions of corolla-parts but flowers are considerably larger, 4·9–5·2 rather than up to 4 cm long. In its very short inflorescence axis and long calyx-lobes it more closely resembles *M. acuminata*. It differs from both these species in its consistently very long pedicels of fairly uniform length in any one inflorescence. Vegetatively it differs markedly from both these species in its abundant ± spreading deep red-brown pubescence very reminiscent of *M. monosperma* although that species has much more abruptly and distinctly short-acuminate leaflets and, except in the shortness of its inflorescence, is very dissimilar in flower and fruit.

It is very gratifying to have such complete material in this single collection and also a photograph. Without both flowers and fruit it would not have been easy formally to describe this distinctive species because of its close resemblance in

different characters (either leaf, flower or fruit) to three separate species.

The species was collected during an expedition supported by the Danish National Research Council grant no. 11-9018-2 PD. A duplicate was sent to Kew by Dr C Niyomdham, one of the collectors, with a query as to its identity.

The name chosen emphasises the small number of fruit-lamellae.

Revised Keys to species of Mucuna in Thailand, Indochina and the Malay Peninsula

A. *Flowering material*

1. Standard and wing petal margins with short but distinct border of cilia in apical region up to ¼ or ⅓ length; leaflets without persistent stipels... ..... **macrocarpa**
   Standard and wing glabrous in apical part, pubescent only in basal (claw) region; stipels persistent or not.....2
2. Corolla bright fiery red-orange, wings and keel very long, 6-8 cm, and all uniformly curved throughout their length to give distinct scimitar-shape to flower (cultivated)..... **warburgii**
   Corolla purple or greenish white, usually shorter and never scimitar-shaped . 3
3. Flowers very, large, standard 5-5·5 cm, wings 7·5 cm long, keel 7·8 cm long; persistent stipels absent..... **thailandica**
   Flowers smaller, standard up to 3·5(-3·8) cm, wings and keel up to 6(-6·3) cm long; persistent stipels present.....4
4. Lateral veins of leaflets gently curved throughout most of their length but near margin considerably more sharply curved and becoming indistinct or running parallel to margin; terminal leaflet elliptic or ovate; wings tapering to apex.....5
   Lateral veins straight or uniformly curved throughout their length and clearly running into margin; terminal leaflet often rhombic or rhombic-ovate; wing apex broadly rounded, not tapering.....13
5. Inflorescence axis with flower-bearing side-branches and pedicels all of very varying lengths, decreasing towards apex so as to form a pseudumbel; indumentum of stem, leaves and inflorescence-axis absent or fine, pale and adpressed; flowers greenish-white, small 3-4·5 cm long.....6
   Inflorescence not pseudumbellate, flower-bearing side-branches all of similar length or all completely reduced and knob-like, pedicels all of similar length; flowers and indumentum various.....7
6. Axis of inflorescence usually at least 8 cm, often up to 25 cm long, unbranched with flowers all crowded at apex and remainder of axis devoid of bracts or scars; standard relatively large, ⅔ - ¾ keel length, wings and keel 2·8-4 cm long; calyx lobes very short and quite broad, lowest lobe 1-3 mm, laterals 1-2 mm long..... **gigantea**
   Axis of inflorescence either very short, 2·5-3 cm long, or very rarely (Java) -6 cm and branched, without long naked basal portion; standard relatively shorter, ± ½ keel length, keel ± 4·5 cm long, wings often shorter than keel; calyx lobes much longer and relatively narrower, lowest 6-9 mm,

laterals 3–6 mm long (Malay Peninsula)..... **acuminata**

7. Pubescence on stems, petioles and leaflets (at least veins beneath) deep red, spreading; pedicels up to 1 cm, bracts and bracteoles early-deciduous. 8
   Pubescence on stems and leaves, where present, pale or golden, adpressed or spreading; pedicels, bracts and bracteoles various..... 9
8. Pedicels up to 1 cm long; pubescence on inflorescence deep red; calyx lobes short and ± broadly triangular, lowest 4·5 × 1·5–4 mm; flowers dark purple, up to 4·4 cm long..... **monosperma**
   Pedicels (2–)2·5–3·5 cm long; pubescence on inflorescence golden; calyx lobes longer and rapidly narrowing, lowest 6–8 × 1·5 mm except at extreme base; flowers white, c.5 cm long..... **oligoplax**
9. Calyx lobes small, lowest 1·5–4 mm long, laterals up to 2 mm long; bracts small and early-deciduous (Malay Peninsula)..... **biplicata**
   Calyx lobes larger, lowest at least 6 mm and laterals 4 mm (bracts various). 10
10. Flower-bearing side-branches lengthened, ± 3 mm long; pedicels very long, 2 cm; flowers small, 4·5 cm long; bracts early-deciduous.... **stenoplax**
    Flower-bearing side-branches reduced, knob-like, pedicels up to 1 cm long; flowers and bracts various..... 11
11. Hairs on inflorescence-axis and calyx spreading, very short, 0·1–0·2 mm long and almost velvety; flowers 4·5–4·8 cm long; bracts small, 5–17 × (2–)5–7 mm, fairly early-deciduous..... **revoluta**
    Hairs on inflorescence axis and calyx adpressed, the majority at least 0·4 mm long, not velvety; flowers usually 5–6 cm long; at least the lower bracts often persistent, large and broad, 20–40 × 10–20 mm 12
12. Calyx lobes relatively broad and broadly acute at apex, lowest 6–10 × c. 5 mm; all bracts broadly ovate, (22–)30–40 mm long..... **interrupta**
    Calyx lobes relatively narrow and long-acuminate, lowest 8–10 × 2–3 mm; upper (flower-subtending) bracts elliptic or obovate with broadly rounded, often hooded, apex, 10–20 mm long..... **hainanensis**
13. Flowers long, wings 6–6·3 × 1·5 cm, keel ± equalling wings.. **gracilipes**
    Flowers short, wings 2·5–3·5 × 0·6–0·8 cm; keel usually distinctly longer, up to 4(–4·5) cm..... 14
14. Inflorescence axis with many bracts throughout length including lower, (flowerless) part, bracts 8–24 mm long but always some considerably over 8 mm, persistent to mature flowering and often to fruiting stage; leaflets beneath with veins usually conspicuously darker and less densely pubescent than surface..... **bracteata**
    Inflorescence axis without bracts or scars in lower, flowerless part; bracts up to 8(–10) mm long, earlier-deciduous; leaflets beneath with surface no more densely pubescent nor paler than veins..... 15
15. Bracts and bracteoles usually fairly broad and never acuminate; pubescence on stem, leaflets and inflorescence axis rather orange-brown giving distinct yellowish-orange tinge, especially to leaflet-veins beneath..... **pruriens** var. **hirsuta**
    Bracts and bracteoles narrow, long-acuminate; pubescence on all parts of plant, where present, silvery (scattered irritant orange bristles often also present)..... 16

16. Irritant orange bristles present on stems, inflorescence axis or calyx..... .....**pruriens** var. **pruriens**
Irritant orange bristles completely absent from plant..**pruriens** var. **utilis**

B. *Fruiting material* (excluding *M. gracilipes* and *M. thailandica* for which no fruit known)

1. Fruits either woody and large, at least 26 cm long and linear oblong, or leathery and medium-sized to large, oblong; leaflets with lateral veins gently curved but near margin more sharply curved and becoming indistinct or running ± parallel to margin.....2
Fruits fleshy, small (not over 10 cm long), linear (but sometimes misshapen and swollen in parts); leaflets with lateral veins straight or uniformly curved throughout length and running right into margin.....12
2. Fruits large, woody, linear-oblong and often swollen around seeds, very much longer than wide, 23–45 × 3–5 cm; (margins winged or not)..3
Fruits medium or large, leathery, oblong, length up to 4 × width, up to 17 cm long; each margin with pair of wings.....4
3. Surface of fruit shallowly ridged but otherwise unornamented; margins unwinged.....**macrocarpa**
Surface of fruit ornamented with very low transverse lamellae; margins narrowly winged (cultivated).....**warburgii**
4. Fruit surface patterned with reticulation of raised lines but otherwise unornamented.....5
Fruit surface ornamented with either 5–18 raised lamellae running obliquely transversely, or at least a few partly-developed lamellae running transversely, across face.....6
5. Reticulation of raised lines so distinct, fine and close as to give surface almost a pitted appearance; fruit straight and oblong, often broadly so, (3·5–) 4–5·5(–6) cm wide.....**gigantea**
Reticulation coarser and often indistinct; fruit distinctly curved, up to 3 cm wide.....**acuminata**
6. Fruit with only few, scattered, partly-developed lamellae arising at any point on face, extending transversely (never obliquely) across at most ⅓ of face, 1–10 mm long and up to 3 mm high in places or mere slight protuberances .....**oligoplax**
Fruit with 5–18 lamellae, these well-developed and extending obliquely transversely across face, usually continuous across whole face or uniformly interrupted along mid-line.....7
7. Lamellae on fruit surface each a simple raised flap, usually continuous across face.....8
Lamellae each bifurcated to give a "T" shape in cross-section and all interrupted along mid-line of fruit.....10
8. Fruit 1 (–very rarely 2)-seeded, asymmetrically oblong to elliptic, often broader than long and never over 1½ times as long as broad; surface lamellae tending to converge towards centre of pod; pubescence on stems, petioles and fruit (also leaflet veins beneath if there present), fine, deep red,

spreading; fruit with coarse red bristles also..... **monosperma**

Fruit (1–)2–3-seeded, asymmetrically oblong to linear-oblong, at least twice as long as broad; lamellae ± parallel; pubescence on vegetative parts absent or pale to golden; fruits with bristles but without conspicuous short fine pubescence.....8

9. Lamellae on fruit of very irregular height (width) 1–2 mm high but increasing to 4 mm in places and all running to distal edge of wing; wing of irregular width 3–4 mm but widening sharply to 5–6 mm at points where lamellae occur, resulting in a jaggedly dentate appearance..... **stenoplax**

Lamellae on fruit of fairly uniform height, 4–5 mm high; wing very wide and even, 8–14 mm..... **hainanensis**

10. Lamellae all extending to distal edge of marginal wings at which point wing widens sharply to give a jaggedly toothed appearance..... **biplicata**

Lamellae never extending into wings, these of ± uniform width.....11

11. Fruit (1–)2-seeded, 6–9 × 4–4·5 cm; lamellae 8–12 in number with strongly revolute apical halves; marginal wings strongly inrolled; bracts never persistent..... **revoluta**

Fruit 3-seeded, 13–14 × 6–7 cm; lamellae ± 18 in number with spreading or ± upcurved apical halves; marginal wings ± flat; some floral bracts often persistent to fruiting stage, these large and conspicuous . **interrupta**

12. Indumentum of fruit silky, not irritant nor deciduous, usually adpressed and pale, often dense..... **pruriens** var. **utilis**

Indumentum of fruit a bristly, spreading, dense covering of irritant deciduous reddish or brown bristles.....13

13. Lower (non-fruit-bearing) part of infructescence with numerous bract-scars, some bracts often still present especially near base, these conspicuous, 8–24 mm long; leaflets beneath usually with veins conspicuously darker and less pubescent than surface..... **bracteata**

Lower part of infructescence lacking bracts and scars, bracts never persistent to fruit stage; leaflet surface not less pubescent nor paler than veins.14

14. Stems, petioles, leaflets beneath and infructescence-axis with orange-brown pubescence giving distinct yellowish-orange tinge especially to leaflet-veins beneath..... **pruriens** var. **hirsuta**

Stems, leaves and infructescence, if pubescent, silvery . **pruriens** var. **pruriens**