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Notes on Malesian *Fabaceae* (*Leguminosae-Papilionoideae*) 16. The genus *Mucuna*

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Key words

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Abstract The genus *Mucuna* is revised for the Flora Malesiana region. Several characters are discussed in some detail. The subdivision of the genus is discussed. We accept two subgenera: subg. *Mucuna* and subg. *Stizolobium*. Several groups of species showing similarity in some characters are discussed. A description of the genus is presented, two keys to the species are given. The main part of the paper consists of an enumeration of the species including descriptions of new species: three by Adema (*M. angustifolia*, *M. eurylamellata*, *M. kabaenensis*) and four by Wiriadinata (*M. aimun*, *M. havilandii*, *M. sakapipei*, *M. verdcourtii*). Neotypes are designated for *M. diabolica* and *M. novo-guineensis*. *Mucuna pachycarpa* Parreno is validated. A subspecies of *M. pruriens*, subsp. *novo-guineensis*, is raised to species level as *M. papuana*. The paper ends with dubious and excluded species, references, a list of species and a list of names.

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INTRODUCTION

Mucuna Adans. is a pantropical genus of c. 105 species. Almost all species are lianas, *M. stans* Welw. ex Baker is a treelet, some (cultivated) forms of *M. pruriens* (L.) DC. are herbaceous. The genus is furthermore characterized by its infamous irritating hairs, the hardened, hooked apical part of the keel petals, the inflorescences that are pseudoracemes or pseudopanicles with 3 flowers per brachyblast, the filaments that are apically widened and, just below the anthers, suddenly narrowed into a filiform apex, the anthers that are alternately basifixed and erect and medi- or dorsifixed, versatile and often crosswise and the disc consisting of 10 ± free lobes. In all flowering specimens Adema studied for the revision of *Mucuna* for Flora Malesiana he observed that the keel petals are very shortly ciliate along the upper margin. Similar short hairs are visible in some of the drawings made for Verdcourt (1981: f 5H, *M. reptans*, keel) and Wilmot-Dear (1987: f. 3J, *M. atropurpurea*, keel).

Mucuna belongs to the *Leguminosae-Papilionoideae* – Tribe *Phaseoleae* and in the classical sense (Taubert 1894, Krukoff & Barneby 1974, Lackey 1981) to the subtribe *Erythrininae* Benth. In molecular phylogenies *Mucuna* is a sister group of *Desmodieae* in a large '*Phaseoleae* s.lat. clade' (Shrire 2005 and literature cited there). A recent phylogeny of the genus *Mucuna* indicates that the genus as a whole and its subg. *Stizolobium* are monophyletic (Moura et al. 2016a). Surprisingly a group of species, originally included in the subg. *Mucuna*, *M. macrocarpa* Wall. and related species, show up as its own clade, that will be described as a new subgenus (Moura et al. 2016b).

For a large part of Asia and the Pacific revisions have been published: New Guinea (Verdcourt 1979), China and Japan (Wilmot-Dear 1984), India and Burma (Wilmot-Dear 1987), Pacific (Wilmot-Dear 1990), the Philippines (Wilmot-Dear 1991b), Thailand, Indochina and Peninsular Malaysia (Wilmot-Dear 1992) and Indonesia, Lesser Sunda Islands (Wiriadinata & Ohashi 1990). Here we present a revision of *Mucuna* for the Flora Malesiana region. Some of the characters will be briefly discussed. Furthermore, a genus description, two keys to the species, a discussion on the subdivision of the genus and an enumeration of species will be given. The latter gives full descriptions for new species only, for the other species synonymy, distribution, habitat and ecology and notes are given.

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NOTES ON CHARACTERS

Irritant hairs

The presence of irritant hairs is an infamous characteristic of *Mucuna* species. These hairs consist of 1–2 small basal cells and a large needle-like top cell. The top cell breaks off easily, leaving the basal cells as small stubs behind. These small stubs may give the leaflets a rough surface. The wall of the top cell is, at least in the upper part often rough by the presence of small knobs or teeth on the outside (Aminah et al. 1974). The itching is according to Hegnauer & Hegnauer (2001) caused by a combination of a piercing of the skin by the hairs and chemical compounds present in the hairs. Shelley & Arthur (1955) give the proteinase Mucunain as the active agent.

L-DOPA

L-DOPA, a precursor of Dopamine, is found in some species of *Mucuna*. For use in medicines for Parkinson's disease several of these species are cultivated, especially forms of *M. pruriens* cultivar-group Utilis. These forms of *M. pruriens* lack the irritating hairs. *Mucuna pruriens* belongs to the subg. *Stizolobium*, most other species producing L-DOPA belong to the subg. *Mucuna*: the American species *M. andreana* Micheli, *M. holtonii* (Kuntze) Moldenke, *M. mutisiana* (Kuntze) DC., *M. sloanei* Fawc. & Rendle, *M. urens* (L.) Medik. and the Asian *M. gigantea* (Willd.) DC. (see Wichers et al. 1984, Huizing & Wichers 1984, Hegnauer & Hegnauer 2001). L-DOPA is poisonous for several kinds of animals and seedlings of some plants (*Cruciferae*, *Linum*, *Com-*

positae, see Hegnauer & Hegnauer 2001). In plants L-DOPA is accumulated as a defence against herbivores.

Mucuna and bats

Many *Mucuna* species have long inflorescences and flowers that are whitish, greenish or purplish, several species are said to have a disagreeable, musty flower odour. Inflorescences may be caulinascent. These traits have been associated with possible bat pollination (see Van der Pijl 1941). Van der Pijl (1941) did not observe bat visits, but observed on wing and keel petals typical claw marks that indicate bat visit. He also observed night flowering, the production of copious, sticky nectar and explosive pollen disposition (see also Dobat & Peikert-Holle 1985). *Mucuna* flowers are often quite sturdy, another requirement for bat pollination. A direct observation of bat visits was done by Hopkins & Hopkins (1993), who describe how a bat (*Synycteris australis* (Peters)) alighted on an inflorescence of *M. macropoda* Baker f., its position on the inflorescence, nectar eating and pollen disposition (Hopkins & Hopkins 1993: f. 3, 4).

Some traits in the pollen morphology of *Leguminosae* have been associated with bird- or bat pollination (Ferguson & Skvarla 1982, Ferguson 1990). According to Ferguson & Skvarla (1982) especially exine sculpture and structure could be indicators of bird- or bat pollination. They mention coarsely rugulate to verrucate exine sculpture for species that are obviously bat-pollinated and the occurrence of tectal columellae or a double layer of columellae for some bird pollinated papilionoids. However, several genera and species adapted to bird- or bat pollination show no such specialisations and have perforate or finely reticulate exine sculpture. In 1984 Ferguson mentions verrucate ornamentation and complex exine stratification in some bird pollinated papilionoids. Stroo (2000) did not find any correlation between bat pollination and exine morphology. In his study only pollen size correlated positively with bat pollination: Pollen of bat plants is usually larger, 75 µm on the average, non bat-pollinated related species have significantly smaller pollen: 64 µm on the average. Pollen size seems also to be correlated with style length: In bat plants the styles are long, 52 mm on the average (range 4–240 mm), in non bat-pollinated relatives the average style length is 42 mm. In Asian *Mucuna* species the style length ranges from 12–150 mm, average c. 45 mm. *Mucuna macropoda*, a bat-pollinated species (Hopkins & Hopkins 1993), has styles of 20–21 mm long, while *M. platyphylla* (= *M. albertsii*), according to Stroo (2000) not bat-pollinated, has styles of 60–80 mm long. Probably style length cannot be used as a proxy for pollen size as an indicator of bat pollination.

Hairs on corolla parts

The standard of the corolla is usually glabrous. In several species it is outside ± sericeous, especially near the base, more rarely it has also some hairs at the inside. The presence of hairs at the outside of the standard has been used as a character in some keys. Standard outside glabrous or with some hairs in *M. angustifolia* Adema, *M. bennettii* F.Muell. *M. discolor* Merr. & L.M.Perry, *M. hainanensis* Hayata subsp. *multilamellata* Wilmot-Dear, *M. macropoda* Baker f. (see Hopkins & Hopkins 1993), *M. novo-guineensis* Scheff., *M. platyphylla* A.Gray, *M. sakapipei* Wiriad., *M. stanleyi* C.T.White, *M. toppingii* Merr.; with 2 basal sericeous patches in *M. diplax* Wilmot-Dear, *M. schlechteri* Harms (or glabrous), *M. tomentosa* K.Schum. (or glabrous); sericeous at base in *M. longipedunculata* Merr. Inside of the standard with some hairs in some specimens of *M. diplax*, *M. stanleyi*, *M. tomentosa*. Wings and keel petals have indumentum in the basal parts and along the claw. The patterns of these hairs seem to be specific. However, they are hard to describe or to quantify.

Keel petals

One of the identifying characters of *Mucuna* is found in the keel petals: The top part of the keel petals is firm (hardened, 'cartilaginous') and often hooked at the very apex. The keel petals as a whole are quite long and narrow and the top part is bent upwards just below the hardened part. The whole keel petal looks like some kind of hockey stick. As noted above in the introduction the upper margin of the keel petals is shortly ciliate, usually between the claw and the hardened part. In the basal part a lateral pocket is usually present normally more conspicuous than the lateral pocket of the wings.

Pod ornamentation

Pod ornamentation has played an important role in the systematics of *Mucuna*. De Candolle (1825), Bentham (in Bentham & Hooker 1867), Baker (1879) and Taubert (1894) use pod characteristics (presence or absence of wings or lamellae) as basis for their subdivisions of the genus (see also subdivision of the genus). For species identification and recognition of new species pod ornamentation is important, indeed. The ornamentation of the pod valves consist of several elements: presence or absence of wings along the sutures, presence or absence of lamellae, the orientation of lamellae (transverse to diagonal or longitudinal), number of lamellae, width of wings and height of lamellae. More or less smooth pods often have an inconspicuous reticulate pattern of veins. Pods are usually septate. Especially in ± smooth pods these septae may be seen as slight sunken lines at the outside of the valves.

Most species of *Mucuna* have wings along the sutures, 2 along the upper one and 2 along the lower one. Wings are absent in *M. bracteata* Roxb. ex Kurz, *M. diabolica* Backer, *M. kawakabuti* Wiriad., *M. longipedunculata*, *M. papuana* Adema, *M. pruriens* (L.) DC., *M. sericophylla* Perkins. Most of the species have also transverse to diagonal (oblique) lamellae. Smooth to reticulate veined pod valves are found in *M. acuminata* Graham ex Baker, *M. bracteata*, *M. canaliculata* Verdc., *M. gigantea* (Willd.) DC., *M. kawakabuti*, *M. lamii* Verdc., *M. mindorensis* Merr., *M. papuana*, *M. schlechteri*, *M. toppingii*, *M. warburgii* K.Schum. & Lauterb. (to inconspicuously lamellate). *Mucuna macropoda* has pods valves with one longitudinal lamella. *Mucuna reticulata* Burck is reticulate lamellate. Longitudinal ribs are found in *M. diabolica*, *M. pruriens*, *M. sericophylla*. *Mucuna longipedunculata* and *M. sumbawaensis* Wiriad. have longitudinally wrinkled pods. The pods of *M. discolor* Merr. & L.M.Perry and *M. kabaenensis* Adema are not known.

Seedlings

According to De Vogel (1980: 85) the seedlings of *Mucuna* belong to the *Horsfieldia* type, *Horsfieldia* subtype. The seedlings of several species were studied by Sastrapradja et al. (1975). They found two types: one with 'scale-like' first leaves (*M. acuminata*, *M. bennettii*, *M. gigantea*, *M. macrophylla*, *Mucuna* spec.) and one with simple, opposite first leaves (*M. pruriens*). As *Mucuna* spec. according to its seed characters probably belongs to the *M. pruriens*-group (subg. *Stizolobium*) they conclude that there is no difference between the subgenera of *Mucuna* in this character.

SUBDIVISION OF THE GENUS

Several times attempts to divide *Mucuna* in subgenera (Baker 1879, Wilmot-Dear 1984, 1990, 1991b, 1992), sections (De Candolle 1825, Bentham & Hooker 1867, Burck 1893, Taubert 1894) or subgenera and sections (Prain 1897a, Merrill 1910) were made. These divisions were mainly based on the pods: presence/absence of wings and lamellae and the seeds: length

of the hilum. However, most of these systems deal with only a few species and do not fully cover the large variation in ornamentation of the pod valves. Also, several species are probably not placed in the right group. *Mucuna macrocarpa*, placed by Taubert (1894) in sect. *Stizolobium* and by Baker (1879) in subg. *Stizolobium*, is not closely related to the species of the *M. pruriens*-group, which forms the larger part of that subgenus/section. The sect. *Stizolobium* as circumscribed by De Candolle (1825) contains mainly species not related to the *M. pruriens*-group. However, the genus *Mucuna* may easily be split into two groups: *Mucuna* s.str. and the *Mucuna pruriens*-group. Here we are following Wilmot-Dear (1984) who describes these groups as subgenera: subg. *Mucuna* and subg. *Stizolobium*. Apart from the differences in pods and seeds these subgenera also differ in leaflets, indumentum of anthers and shape of the ovary.

Mucuna Adans. subg. ***Mucuna***

Subg. *Mucuna*: Wilmot-Dear (1984) 31. — *Zoophthalmum* P.Browne (1756) 295. — *Mucuna* Adans. sect. *Zoophthalmum* (P.Browne) DC. (1825) 405. — *Mucuna* Adans. subg. *Zoophthalmum* (P.Browne) Prain (1897a) 65; (1897b) 407; Merr. (1910) 115.

Citta Lour. (1790) 456. — *Mucuna* Adans. sect. *Citta* (Lour.) Wight & Arn. (1834) 254; Benth. & Hook. (1867) 533; Burck (1893) 186; Taubert (1894) 366; Prain (1897a) 65; (1897b) 407; Merr. (1910) 115. — *Mucuna* Adans. subg. *Citta* (Lour.) Baker (1879) 185. — Type: *Citta nigricans* Lour.

Carpopogon Roxb. (1814) 54; (1832) 283. — *Mucuna* Adans. sect. *Carpopogon* (Roxb.) Wight & Arn. (1834) 254; Benth. & Hook. (1867) 533; Taubert (1894) 366; Prain (1897a) 67; (1897b) 408; Merr. (1910) 115. — *Mucuna* Adans. subg. *Carpopogon* (Roxb.) Baker (1879) 186. — Type: not indicated.

Mucuna Adans. subg. *Amphithera* Baker (1879) 185; Burck (1893) 183; Taubert (1894) 366. — Type: *Mucuna imbricata* DC.

Large lianas. *Leaflets* entire (see Note), secondary nerves anastomosing close to the margin, not ending in the margin. Medifixed, versatile *anthers* bearded, basifixed anthers glabrous or bearded at base and/or sericeous outside. *Ovary* straight. *Pods* straight, rarely ± falcate, often winged at the sutures, valves smooth or variously ribbed, reticulately, longitudinally or transversely to diagonally lamellate. *Seeds* rather large, discoid, rarely globular, ovoid or bean-shaped; hilum 18–80 mm long, (1/4–)1/2–9/10 of the circumference, without rim aril.

Distribution — Tropics and subtropics of the world. Most species of the genus *Mucuna* belong to this subgenus.

Note — Only some specimens of *M. mollissima* have ± crenate leaflets with nerves ± ending in the margin.

Mucuna Adans. subg. ***Stizolobium*** (P.Browne) Baker

Subg. *Stizolobium* (P.Browne) Baker (1879) 186; Burck (1893) 187; Prain (1897a) 68; (1897b) 409; Merr. (1910) 115; Wilmot-Dear (1984) 59. — *Stizolobium* P.Browne (1756) 290, t. 31, f. 4. — *Mucuna* Adans. sect. *Stizolobium* (P.Browne) DC. (1825) 405; Wight & Arn. (1834) 254; Miq. (1855) 211; Benth. & Hook. (1867) 533; Taubert (1894) 366. — Lectotype (Piper & Tracey 1910: 8): *Mucuna pruriens* (L.) DC.

Macranthus Lour. (1790) 461, '*Marcanthus*'. — Type: *Mucuna cochinchinensis* Lour.

Lianas or ± herbaceous climbers, very rarely treelets (*M. stans*). *Leaflets* ± crenate, secondary nerves ending in or anastomosing at the margin. All *anthers* glabrous. *Ovary* S-shaped. *Pods* straight to S-shaped, valves longitudinally ribbed or not. *Seeds* rather small, ± bean-shaped; hilum 4–7 mm long, 1/8–1/3 of the circumference, with rim aril.

Distribution — Tropics and subtropics of the world. *Mucuna pruriens* var. *utilis* is widely cultivated. In Africa the subgenus is represented by: *M. coriacea* Baker, *M. ferox* Verdc., *M. glabrialata* (Hauman) Verdc., *M. melanocarpa* Hochst. ex A.Rich., *M. poggei* Taub., *M. pruriens* (L.) DC., *M. stans* Welw.; in Asia by: *M. bracteata* Roxb. ex Kurz, *M. diabolica*, *M. papuana* Adema, *M. pruriens*, *M. sericophylla* Perkins; in Australia by: *M. diabolica* subsp. *kenneally* Verdc., *M. reptans* Verdc.; and in the Americas by: *M. pruriens*.

REMARKS ON SOME GROUPS OF SPECIES

Asian species related to Mucuna pruriens

Mucuna pruriens has long been seen as a very variable species, that at various levels was divided into smaller entities. Later several of these entities were split off as species: *M. bracteata* Roxb. ex Kurz in 1873 and *M. diabolica* (as *Mucuna forbesii* (Backer) Piper) in 1917. Characters used for the recognition of these entities as separate species include shape and size of bracts and bracteoles, length of the pedicels, size of flowers and flower parts, colour of the corolla and indumentum and ornamentation of the pods. Two entities (subsp. *novo-guineensis* Verdc. var. *sericophylla* (Perkins) Wilmot-Dear) have since their description been kept in *M. pruriens*. However, they differ from the two other varieties of *M. pruriens* (var. *pruriens*, var. *utilis* (Wall. ex Wight) Burck) in several characters that were used to split off *M. bracteata* and *M. diabolica*. The differences between *M. pruriens* subsp. *novo-guineensis* and *M. pruriens* var. *sericophylla* and *M. pruriens* s.str. are of the same order as those between *M. bracteata* and *M. diabolica* and *M. pruriens* s.str. (see Table 1). We decided to treat subsp. *novo-guineensis* (as *M. papuana* Adema) and var. *sericophylla*

Table 1 Differences between the Asian species of subg. *Stizolobium*.

Mucuna	*bracteata*	*diabolica*	*pruriens* var. *pruriens*	*pruriens* var. *utilis*	*papuana*	*sericophylla*
Shape terminal leaflets	rhomboid, broadly elliptic, broadly ovate	broadly ovate, rhomboid	ovate, rhomboid	ovate, rhomboid	ovate, rhomboid	orbicular, transverse elliptic
ratio l/w	1.2–1.5	1.0–1.2	1.3–2.3	1.2–1.7	1.3–1.5	0.7–1.0
Bracts to brachyblasts, shape	ovate	obovate	ovate	ovate	ovate	orbicular
length, mm	27–37	c. 10	7–10	c. 21	13–19	5–7
Bracts to flower, shape	narrowly elliptic, ovate	obovate	obliquely ovate	ovate	ovate	broadly ovate, orbicular
length, mm	8–20	c. 9	c. 6	c. 5	11–16	5–7
Pedicels length, mm	5–7	8–10	5–7	5–6	5	c. 7
Bracteoles, shape	narrowly obovate	± orbicular	elliptic	narrowly ovate	narrowly ovate	broadly elliptic
length, mm	15–16	6.2	4.8–4.9	c. 2.8	10–12.5	5–6
Calyx, length	10–14	23–30	9.5–14	c. 15.5	9–13	c. 10
Length median tooth	3–7	13–18.5	4.5–8	10.5	3–6	5–7
Flower colour	dark purple, maroon	yellow, greenish white	violet to dark purple	violet to dark purple	violet, greenish or whitish, pale yellow	black purple

(as *M. sericophylla* Perkins) as species distinct from *M. pruriens*. Apart from the differences given in Table 1 the accepted Asian species of this group mostly show some other conspicuous differences and also differ in distribution: *M. bracteata* has many sterile bracts at the peduncle of the inflorescence and pods with septa visible as slightly depressions at the outside, without ribs; *M. diabolica* has large flowers (keel petals 60–70 mm long) and ribbed pods; *M. pruriens* has pods with (inconspicuous) ribs, *M. papuana* has rather small flowers (keel petals 23–27 mm long) and pods with septa visible as slight depressions at the outside. *Mucuna pruriens* is widespread and cultivated and escaped in all tropics, *M. bracteata* occurs in India, Burma, China (Yunnan), Indochina, Thailand and Sumatra; *M. diabolica* in Java and the Lesser Sunda Islands; *M. sericophylla* in the Philippines; and *M. papuana* in New Guinea.

The red-flowered species of Asia and the Pacific

Several species of *Mucuna* have red or orange flowers. In Asia and the Pacific they are found in Celebes, the Moluccas, New Guinea and the Solomon Islands. In this area the following species have been described: *M. bennettii*, *M. elegans* Merr. & L.M.Perry, *M. kraetkei* Warb., *M. miniata* Merr., *M. novo-guineensis*, *M. peekelii* Harms and *M. warburgii*. *Mucuna bennettii* and *M. novo-guineensis* have often been confused. A good character in which these species differ is found in the stipellae: absent in *M. bennettii*, present in *M. novo-guineensis* and *M. warburgii*. *Mucuna bennettii* differs from *M. novo-guineensis* and *M. warburgii* also in shape and size of the terminal leaflets and number of ovules. *Mucuna novo-guineensis* and *M. warburgii* differ in shape of terminal leaflets, size of the calyx and number of ovules. Harms (1920) suggests in the description of *M. peekelii* that it may be a smaller flowered variant of *M. kraetkei*, according to Verdcourt (1979) *M. peekelii* is a synonym of *M. warburgii* and *M. kraetkei* a synonym of *M. novo-guineensis*. We think that *M. elegans* and *M. miniata*, both probably lacking stipellae, are only slightly smaller flowered forms of *M. bennettii* occurring at the most western and most eastern ends of it distribution area.

For Flora Malesiana we accept just three red-flowered *Mucuna* species: *M. bennettii* (incl. *M. elegans* and *M. miniata*) from Celebes, the Moluccas, New Guinea and the Solomon Islands, *M. novo-guineensis* (incl. *M. kraetkei*) from the Moluccas (Halmahera) and New Guinea and *M. warburgii* (incl. *M. peekelii*) from New Guinea.

Species with pods with bifurcate lamellae

Several species have pods with bifurcate lamellae. These lamellae are T-shaped in cross section. In Asia this character is known for three species: *M. biplicata* Teijsm. & Binn. from Sumatra, Peninsular Malaysia and Borneo and for *M. diplax* and *M. platyplekta* Quisumb. & Merr. both from the Philippines. The pods and seeds of these species differ in size: *M. biplicata*: Pods 6–11 by 3–5 cm, wings 4–7 mm wide, lamellae 3–5 mm high, horizontal part 1–4 mm wide. Seeds 18–21 by 17–20 by 8–9 mm, hilum c. 50 mm long, c. 3/4 of the circumference. *Mucuna diplax*: Pods 8–13.5 by 4–6 cm, wings 2–7 mm wide, lamellae 2–5 mm high, horizontal part 2 mm wide. Seeds 20–30 by 20–21 by 9.3 mm, hilum 50 mm long, 7/10 of the circumference. *Mucuna platyplekta*: Pods 8–12.5 by 3.5–6.5 cm, wings 6–15 mm wide, lamellae 4–10 mm high, horizontal part 5–15 mm wide. Seeds 16–26 by 18–22 by 10–12.7 mm, hilum 36–50 mm long, 3/5–2/3 of the circumference.

Species with dense soft indumentum on the lower surface of the leaflets

In Asian *Mucuna* species there is a set of species, *M. aimun* Wiriad., *M. keyensis* Burck, *M. mollissima* Teijsm. & Binn., *M. platyphylla*, *M. stanleyi*, *M. tomentosa*, *M. verdcourtii* Wiriad., that all have rather dense indumentum on the lower surface of the leaflets, usually tomentose, velutinous or sericeous, ± pilose in *M. stanleyi*. Specimens of several of these species have been identified as *M. platyphylla* or *M. stanleyi*. Some confusing is probably still possible. In a number of characters these species are rather similar or show sizeable overlaps. However, all species have characters that separate them from most or all other species. *Mucuna aimun* has large stipules (21 by 25 mm) and pods with very wide upper wings (15–25 mm). *Mucuna keyensis* has longest hairs 0.5–0.8 mm long, large flowers (7–9 cm long) and pods with narrow upper wings (2–6 mm wide). *Mucuna mollissima* has rather small stipules (c. 3 by 1 mm), the apex of the leaflets is obtuse to rounded or acute (acuminate in the other species) and rather small flowers (c. 3.1 cm long). *Mucuna platyphylla* has leaflets with a pulvinus (petiolule) of 9–11 mm long and pods with rather narrow wings (5–7 mm wide). *Mucuna stanleyi* has rather long hairs (longest hairs 1.8–4.2 mm long), rather large stipules (c. 24 by 6 mm), large calyces (27–31 mm long), quite large flowers (4–5.5 cm long), brachyblasts in fruiting specimens 16–50 mm long and pods with quite low lamellae (2–6 mm high). *Mucuna tomentosa* has rather short inflorescences (2.5–9 cm long) with short peduncles (0.4–2.4 cm long). *Mucuna verdcourtii* has long inflorescences (c. 42 cm long) with long peduncles (c. 30 cm long), large bracts to the flowers (50 by 20 mm) and large pods (25–28 by 3–5 cm). Most species are found in New Guinea, *M. keyensis* only in the Moluccas (Key Islands), *M. mollissima* in New Guinea, the Moluccas and the Solomon Islands, *M. platyphylla* is widespread and occurs in Christmas Island (Indian Ocean), the Lesser Sunda Islands (Flores), the Moluccas (Ternate), New Guinea and the Solomon Islands.

DESCRIPTION OF THE GENUS

Mucuna

Mucuna Adans. (1763) 325, nom. cons.; DC. (1825) 404; Wight & Arn. (1834) 253; Miq. (1855) 210; Benth. & Hook. (1867) 533; Burck (1893) 183; Taubert (1894) 366; Prain (1897a) 64; (1897b) 404; Baker (1879) 185; Merr. (1910) 115; Backer & Bakh.f. (1964) 629; Verdc. (1979) 433; Allen & Allen (1981) 446; Wilmot-Dear (1984) 23; (1990) 1; (1991b) 213; (1992) 203; Lewis et al. (2005) 405. — *Zoophthalmum* P.Browne (1756) 295. — *Mucuna* Adans. subg. *Zoophthalmum* (P.Browne) Prain (1897a) 65; (1897b) 407; Merr. (1910) 115. — Type: *Mucuna urens* (L.) Medik. (typ. cons.).

Stizolobium P.Browne (1756) 290, t. 31, f. 4. — *Mucuna* Adans. sect. *Stizolobium* (P.Browne) DC. (1825) 405; Wight & Arn. (1834) 254; Miq. (1855) 211; Benth. & Hook. (1867) 533; Taubert (1894) 366. — *Mucuna* Adans. subg. *Stizolobium* (P.Browne) Baker (1879) 186; Burck (1893) 187; Prain (1897a) 68; (1897b) 409; Merr. (1910) 115; Wilmot-Dear (1984) 59. — Lectotype (Piper & Tracey (1910) 8): *Mucuna pruriens* (L.) DC.

Citta Lour. (1790) 456. — *Mucuna* Adans. sect. *Citta* (Lour.) Wight & Arn. (1834) 254; Benth. & Hook. (1867) 533; Burck (1893) 186; Taubert (1894) 366; Prain (1897a) 64; (1967b) 404; Merr. (1910) 115. — *Mucuna* Adans. subg. *Citta* (Lour.) Baker (1879) 185. — Type: *Citta nigricans* Lour.

Negretia Ruiz & Pav. (1794) 98, t. 21; Blanco (1837) 586; (1845) 409; (1879) 387. — Type: not designated.

Carpopogon Roxb. ((1814) 54); (1832) 283. — *Mucuna* Adans. sect. *Carpopogon* (Roxb.) Wight & Arn. (1834) 254; Benth. & Hook. (1867) 533; Taubert (1894) 366; Prain (1897a) 67; (1897b) 408; Merr. (1910) 115. — *Mucuna* Adans. subg. *Carpopogon* (Roxb.) Baker (1879) 186. — Type: not designated.

Mucuna Adans. subg. *Amphiptera* Baker (1879) 185; Burck (1893) 183; Taubert (1894). — Type: *Mucuna imbricata* DC.

Climbing herbs or small, slender to large, stout, woody lianas, rarely shrubs or treelets (*M. stans*). *Leaves* trifoliolate, lateral leaflets asymmetric; stipules present, often caducous; stipellae absent or present. *Leaflets* entire or ± crenate, if crenate, secondary veins ending in the margin. *Inflorescences* axillary, terminal or raminascent, pseudoracemes or pseudopanicles,

sometimes, by the lengthening of brachyblasts and/or pedicels, ± umbel-like; flowers fascicled, 3 at the top of a brachyblast. *Bracts* to brachyblasts and flowers present, caducous; bracteoles present at the top of the pedicel or base of calyx, caducous. *Calyx* campanulate, bilabiate, upper lip entire or bidentate, lower lip tridentate or trilobed. *Corolla*: standard with two basal auricles, without callosities; wings ± equal in length to shorter than the keel petals, lateral pocket usually inconspicuous; keel petals usually hard ('horny'), pale and hooked at apex, lateral pocket inconspicuous to conspicuous. *Stamens* diadelphous, upper (vexillary) one free; filaments at least below the shorter anthers broadened at apex, suddenly narrowed in a short stipe; anthers alternately longer, basifixed and upright and shorter, versatile or dorsifixed and usually crosswise. *Disc* consisting of 10 partly free lobes. *Ovary* with 1 to several ovules; style long, bent in apical part, stigma with several rows of short, ± upright hairs at the base. *Pods* usually compressed, often winged at the sutures, valves smooth to ribbed or lamellate. *Seeds* discoid, bean-shaped or globular, with a short hilum (subg. *Stizolobium*) or a hilum > 1/2 the circumference (subg. *Mucuna*).

Distribution — Pantropical, c. 105 species. In Malesia 48 species.

Note — Root nodules are recorded for several species, incl. *M. pruriens* (see Allen & Allen 1981). Red exudate is noted for several species. The genus is famous for its irritating hairs. However, the itching is not caused by the hairs but by a chemical histamine-liberating reaction. The active agent is probably Mucunain, a proteolytic enzyme. Various histamine-liberating alkaloids are also recorded. Several species are a rich source of L-DOPA and precursors used for treatment of Parkinson's disease (see Allen & Allen 1981; Hegnauer & Hegnauer 2001: 341–347).

KEYS TO THE SPECIES OF MUCUNA IN MALESIA

A. Bracketed key to the species of *Mucuna* in Malesia

Note — Flowers not known for: *M. eurylamellata*, *kawakabuti*, *pachycarpa*, *platyplekta*, *verdcourtii*. Fruits not known for: *M. angustifolia*, *discolor*, *kabaenensis*. (Mature) seeds not known for: *M. aurea*, *schlechteri*, *tomentosa*, *toppingii*, *verdcourtii*, *warburgii*. In the part of the key for fruiting specimens (lead 58, etc.) the indumentum of the pods is given without the irritating hairs; the width of the pods is given not including the width of the wings. Although most species are recognisable it is difficult to find good characters to separate them in a key. Several leads show overlaps in character states. In several places a choice has to be made or both parts of a lead have to be followed. Some species occur several times in the key.

1. Leaflets ± crenate, secondary nerves ending in or anastomosing at the margin. All anthers glabrous. Ovary S-shaped. Hilum of seeds 4–7 mm long, 1/8–1/3 of the circumference, with rim aril 2
1. Leaflets entire, rarely ± crenate (*M. mollissima*), secondary nerves anastomosing close to the margin, rarely ending in the margin (*M. mollissima*). Medifixed, versatile anthers bearded, basifixed anthers glabrous or bearded at base and/or sericeous outside. Ovary straight. Hilum of seeds 18–80 mm long, (1/4–)1/2–9/10 of the circumference, without rim aril 6
2. No sterile bracts at the peduncle of the inflorescences. Bracts to the brachyblasts 5–21 mm long. Bracteoles 2.8–12.5 mm long 3
2. Peduncle of the inflorescences with many sterile bracts, these often still present when in fruit. Bracts to the brachyblasts 27–35 mm long. Bracteoles 15–16 mm long. — Corolla dark purple or maroon. Pods not ribbed, septa visible from outside . . . . . 8. *M. bracteata*
3. Bracts to the brachyblasts obovate or orbicular. Bracts to the flowers obovate or broadly ovate to orbicular. Bracteoles ± orbicular or broadly elliptic 4
3. Bracts to the brachyblasts ovate. Bracts to the flowers (obliquely) ovate. Bracteoles elliptic or narrowly ovate . 5
4. Terminal leaflets broadly ovate or rhomboid, ratio l/w (index) 1.0–1.2. Bracts to the brachyblasts obovate, c. 10 mm long. Bracts to the flowers obovate, c. 9 mm long. Pedicels 8–10 mm long. Calyx 23–30 mm long, median (lower) tooth 13–18.5 mm long. Corolla yellow or greenish white. — Pods with longitudinal ribs . . . . 11. *M. diabolica*
4. Terminal leaflets orbicular or transversely elliptic, ratio l/w (index) 0.7–1.0. Bracts to the brachyblasts orbicular, 6–9 mm long. Bracts to the flowers broadly ovate to orbicular, 5–7 mm long. Pedicels c. 7 mm long. Calyx c. 10 mm long, median (lower) tooth 5–7 mm long. Corolla black purple. — Pods with (in)conspicuous longitudinal ribs . . . . . 40. *M. sericophylla*
5. Bracts to the brachyblasts 7–10 or c. 21 mm long. Bracts to the flowers 5–6 mm long. Bracteoles 2.8–4.9 mm long. Corolla violet to dark purple. Pods with (inconspicuous) longitudinal ribs . . . . . 35. *M. pruriens*
5. Bracts to the brachyblasts 13–19 mm long. Bracts to the flowers 11–16 mm long. Bracteoles 10–12.5 mm long. Corolla white, greenish, whitish cream, greenish white or pale yellow. Pods without ribs, septa visible . . . . . 32. *M. papuana*
6. Flowering specimens 7
6. Fruiting specimens 58
7. Flowers red, orange or yellowish orange 8
7. Flowers in various shades of white, green, yellow, pink, violet, purple, blue or maroon 10
8. Stipellae present. Terminal leaflets (broadly) ovate, broadly elliptic or ± orbicular, 10–19 by 5–13.5 cm, ratio l/w (index) 1.2–1.9. Ovules 3–4 or 8–10 9
8. Stipellae absent. Terminal leaflets elliptic to ovate, 8.5–14 by 3.5–8.5 cm, ratio l/w (index) 1.6–2.6. Ovules 4–6 . . . . . 5. *M. bennettii*
9. Terminal leaflets (broadly) ovate, broadly elliptic or ± orbicular. Calyx 12–22 mm long, upper lip 2–4 mm long, lateral teeth 1.5–2.5 mm long, median tooth 4–7 mm long. Ovules 3–4 . . . . . 30. *M. novo-guineensis*
9. Terminal leaflets ovate. Calyx 19–28 mm long, upper lip 3–10 mm long, lateral teeth 7–10 mm long, median tooth 10–11.5 mm long. Ovules 8–10 . . . . . 48. *M. warburgii*
10. Stipellae absent 11
10. Stipellae present 14
11. Inflorescences 1.5–10.5 cm long, peduncle up to 4 cm long. Standard: claw 3–5 mm long, blade 15–20 mm long. Blade of keel petals 14–20(–23) mm long. Ovules 4–5 12
11. Inflorescences 31–79 cm long, peduncle 29–61 cm long. Standard: claw 3–4 mm long, blade 21–25 mm long. Blade of keel petals 20–22 mm long. Ovules 8 . . . . . 27. *M. macropoda*
12. Inflorescences pseudoracemes, 1.5–5 cm long. Pedicels 10–20 mm long. Ovary 2–7 mm long, style 12–20 mm long 13
12. Inflorescences pseudopanicles, 10.5 cm long. Pedicels 26 mm long. Ovary 7 mm long, style 28 mm long. — Celebes: Kabaena . . . . . 20. *M. kabaenensis*
13. Pedicels 10–15 mm long. Calyx 11–15 mm long. Standard: claw 3–3.5 mm long, blade 15–16 mm long. Ovary 5–6 mm long, style 12–15 mm long. — Papua New Guinea: Central Prov. . . . . 13. *M. discolor*

13. Pedicels 16–20 mm long. Calyx 17–18 mm long. Standard: claw 3–5 mm long, blade 16–20 mm long. Ovary 2–7 mm long, style 15–20 mm long. — New Guinea: Papua Barat; Papua New Guinea: Chimbu, W Sepik Prov. 24. *M. lamii*
14. Corolla violet, (dark) purple, (dark) blue or maroon . . 15
14. Corolla white(ish), yellow(ish), yellow-green, green(ish), pink or cream-coloured 24
15. Bracts to the brachyblasts 25–45 by 10–30 mm. Bracts to the flowers 21–30 by 7–12 mm. Bracteoles 8–25 by 2.5–8 mm. Median (lower) calyx tooth 10–17 by 3–9 mm . . 16
15. Bracts to the brachyblasts 7–12.5 by 4–11 mm. Bracts to the flowers 2–26 by 2.5–10 mm. Bracteoles 3.8–17 by 1.4–6 mm. Median (lower) calyx tooth 2–9(–19) by 2–10 mm 17
16. Blade of keel petals 45 by 8 mm. Ovules 3 . . . . . 17. *M. hainanensis* subsp. *multilamellata*
16. Blade of keel petals 52–70 by 10 mm. Ovules 5 . . . . . 38. *M. samarensis*
17. Inflorescences 1.5–9 cm long 18
17. Inflorescences 9–30 cm long 21
18. Inflorescences pseudoracemes or pseudopanicles, not umbellate. Bracts to the flowers 3.3 by 3.0 mm or 11–21 by 5–6 mm 19
18. Inflorescences umbellate pseudoracemes. Bracts to the flowers 19 by 11 mm. — Standard: claw c. 2 mm long, blade 25–35 by 20–35 mm . . . . . 1. *M. acuminata*
19. Terminal leaflets elliptic or obovate. Bracteoles 11–15 by 3–6 mm. Standard: claw 3–4 mm long, blade 20–28 by 15–20 mm. Ovules 2 20
19. Terminal leaflets ovate. Bracteoles 3.8–4.1 by 1.4–2 mm. Standard: claw 2–4 mm long, blade 23–30 by 20–25 mm. Ovules 2–5. — Calyx 11–12 mm long, median (lower) tooth 2–6 by 5–7 mm . . . . . 6. *M. biplicata*
20. Terminal leaflets elliptic or obovate. Pedicels 11–15 mm long. Calyx 12–15 mm long, median (lower) tooth 6–9 by 5–6 mm. Standard: claw 3–4 mm long, blade broadly obovate, 20–23 by 15–20 mm . . . . . 18. *M. havilandii*
20. Terminal leaflets elliptic. Pedicels 17–20 mm long. Calyx c. 26 mm long, median (lower) tooth 7–19 by 2–10 mm. Standard: claw 3–4 mm long, blade obovate 26–28 by 18–20 mm . . . . . 42. *M. stenoplax*
21. Bracts to the flowers 6–26 by 2.5–10 mm. Bracteoles 7–21 by 2–4 mm. Calyx 11–20 mm long. Standard: claw 2.5–5 mm long, blade 30–48 by 22–28 mm 22
21. Bracts to the flowers 2 by 3 mm. Bracteoles 5–7 by 4–5 mm. Calyx 8–11 mm long. Standard: claw 2–4 mm long, blade 21–25 by 20–25 mm . . . . . 46. *M. toppingii*
22. Bracts to the flowers 6–14 by 2.5–5 mm. Bracteoles 7–17 by 2–4 mm 23
22. Bracts to the flowers 20–26 by 5–10 mm. Bracteoles 20–21 by 2.5–3 mm. — Papua New Guinea . . . . . 2. *M. aimun*
23. Terminal leaflets (narrowly) elliptic to ovate. Bracts to the flowers 6.5–7.5 by 4–5 mm. Bracteoles 7–11 by 3–4 mm. Standard: claw 3 mm long, blade 30–35 by 26 mm, both sides with some hairs . . . . . 12. *M. diplax*
23. Terminal leaflets broadly elliptic to broadly ovate or orbicular. Bracts to the flowers 6–14 by 2.5–4 mm. Bracteoles 9–17 by 2–3.3 mm. Standard: claw 2.5–5 mm long, blade 38–48 by 22–28 mm, outside glabrous or with some hairs, inside glabrous . . . . . 33. *M. platyphylla*
24. Inflorescences pseudopanicles 25
24. Inflorescences pseudoracemes 37
25. Twigs puberulous, tomentose, pilose. Lower surface of leaflets tomentose or pilose, rarely ± sericeous. Inflorescences 2.5–20(–28) cm long 26
25. Twigs glabrous to sericeous or hirsute. Lower surface of leaflets with scattered appressed hairs to sericeous or hirsute. Inflorescences (3–)15–700 cm long 30
26. Twigs tomentose or puberulous, longest hairs 0.4–1.5 mm long. Stipellae 6–14 mm long. Standard: claw 2.5–5 mm long; blade 20–48 by 13–28 mm 27
26. Twigs pilose, longest hairs 2.0–4.2 mm long. Stipellae 2–6 mm long. Standard: claw 5–12 mm long; blade 35–43 by 19–30 mm. — Corolla green or green with sooty markings . . . . . 41. *M. stanleyi*
27. Lower surface of leaflets tomentose 28
27. Lower surface of leaflets sericeous or velutinous 29
28. Stipellae 2–4 by 0.2–0.4 mm. Inflorescences 19–25 cm long. Blade of standard 28–35 by 22–28 mm. Blade of keel petals 43–55 by 5 mm. Ovules 1. — Borneo . . . . . 14. *M. elmeri*
28. Stipellae 4.8–6 by 0.2–0.6 mm. Inflorescences 4.5–9 cm long. Blade of standard 20–30 by 20–25 mm. Blade of keel petals 28–37 by 3–7 mm. Ovules 3–4. — Papua New Guinea . . . . . 45. *M. tomentosa*
29. Lower surface of leaflets sericeous. Bracts to the flowers 7–10 by 2.5–4 mm. Blade of standard 20 by 13 mm. Blade of keel petals 25 by 4 mm . . . . . 29. *M. mollissima*
29. Lower surface of leaflets velutinous. Bracts to the flowers 10–11 by 3 mm. Blade of standard 38–48 by 22–28 mm. Blade of keel petals 50–70 by 7–9 mm 33. *M. platyphylla*
30. Lower surface of leaflets with scattered appressed hairs to sericeous. Calyx 13–32 mm long, median (lower) tooth 3–11 by 4–10 mm 31
30. Lower surface of leaflets hirsute, rarely thinly sericeous. Calyx 25–33 mm long, median (lower) tooth 17–23 by 6–8 mm. — Bracts to the brachyblasts 32–40 by 16–28 mm. Bracts to the flowers 28–32 by 9–17 mm . . . . . 26. *M. macrophylla*
31. Inflorescences 4–150 cm long. Calyx 13–33 mm long, median (lower) tooth 3–23 by 4–10 mm. Standard outside glabrous, rarely (*M. subumbellata*) with some appressed hairs at base just above the claw. Ovules 2–7 32
31. Inflorescences 100–700 cm long. Calyx 14–32 mm long, median (lower) tooth 3–7 by 8 mm. Standard outside sericeous at base. Ovules 8 . . . . . 25. *M. longipedunculata*
32. Lower surface of leaflets glabrous to thinly sericeous. Inflorescences 13–150 cm long. Blade of keel petals 21–70 by 5–13 mm. Ovules 4–7 33
32. Lower surface of leaflets sericeous. Inflorescences 4–15 cm long. Blade of keel petals 62–80 by 5–11 mm. Ovules 2–4 . . . . . 22. *M. keyensis*
33. Calyx 13–24 mm long, median (lower) tooth 3–11 by 6–9 mm. Standard: claw 2–6 mm long; blade 20–50 by 15–36 mm, outside glabrous 34
33. Calyx 13 mm long, median (lower) tooth 6 by 4 mm. Standard: claw 2.5 mm long; blade 17–18 by 15 mm, outside with few appressed hairs at base just above the auricles. — Solomon Islands . . . . . 43. *M. subumbellata*
34. Calyx 17–23 mm long, median (lower) tooth 7–11 by 6–9 mm. Standard: claw 4–6 mm long, blade 31–50 by 23–30 mm. Blade of keel petals 40–70 by 5–13 mm 35
34. Calyx 13–15 mm long, median (lower) tooth 3–6 by 6–7 mm (*M. mindorensis*: calyx 'tube' 10 mm). Standard: claw 2–4 mm long; blade 20–27 by 15–23 mm. Blade of keel 35–45 by 5–6 mm 36
35. Median (lower) tooth of calyx 7–8 by 9 mm. Blade of standard 38–50 by 27–36 mm. Blade of keel petals 59–70 by 13 mm . . . . . 10. *M. curranii*

35. Median (lower) tooth of calyx 7–11 by 6 mm. Blade of standard 31–36 by 23–30 mm. Blade of keel petals 40–57 by 5–8 mm. — Philippines: Luzon; Celebes . . . . . 36. *M. reticulata*
36. Lower surface of leaflets glabrous or with scattered appressed hairs. Inflorescences 15–16 cm long. Standard: claw 2–4 mm; blade 20–23 by 15–23 mm. Blade of keel petals 35–40 by 5–6 mm . . . . . 19. *M. hooglandii*
36. Lower surface of leaflets thinly sericeous. Inflorescences 20–60 cm long. Standard: claw 3.5 mm long; blade 27 by 16 mm. Blade of keel petals 45 by 5 mm . . . . . 28. *M. mindorensis*
37. Pseudoracemes (pseudo)umbellate 38
37. Pseudoracemes not (pseudo)umbellate 40
38. Inflorescences 4–33.5 cm long. Calyx 10–14 mm long, median (lower) tooth 2–6 by 4–9 mm. Standard: claw 5–8 mm long; blade 17–40 by 15–25 mm. Keel petals: claw 5–8 mm long; blade 21–45 mm long 39
38. Inflorescences 5–7.5 cm long. Calyx 19–26 mm long, median (lower) tooth 7–15 by 7–9 mm. Standard: claw c. 2 mm long; blade 25–35 by 20–35 mm. Keel petals: claw c. 5 mm long, blade 45–55 long . . . . . 1. *M. acuminata*
39. Pedicels 12–40 mm long. Median (lower) calyx tooth 2–4 by 6–9 mm. Standard: claw 2.5–5 mm long; blade 19–40 by 16–25 mm, outside glabrous . . . . . 16. *M. gigantea*
39. Pedicels 10–12 mm long. Median (lower) calyx tooth 6 by 4 mm. Standard: claw 2.5 mm long; blade 17–18 by 15 mm, outside with few appressed hairs just above the auricles. — Solomon Islands . . . . . 43. *M. subumbellata*
40. Flowers white(ish), green(ish), yellow(ish) or pink, if yellow-(ish) not golden yellow 41
40. Flowers bright golden yellow, rarely greenish at base. — Papua New Guinea (Bougainville Isl.); Solomon Islands; Fiji . . . . . 7. *M. brachycarpa*
41. Lower surface of leaflets sericeous, velutinous, tomentose, pilose or puberulous, indumentum usually obscuring the veins 42
41. Lower surface of leaflets glabrous to thinly sericeous, rarely hirsute, indumentum not obscuring the veins 49
42. Upper surface of leaflets glabrous to thinly sericeous, thinly pubescent, thinly puberulous or ± tomentose or tomentose on midrib and veins 43
42. Upper surface of leaflets sericeous. — Stipules c. 21 by 25 mm. Inflorescences 11–12 cm long. Calyx 11–12 mm long, median (lower) tooth 6–7 mm long. — New Guinea . . . . . 2. *M. aimun*
43. Indumentum of twigs puberulous, tomentose or (thinly) sericeous, longest hairs 0.4–1.5 mm long. Stipellae 2–6 mm long. Calyx 11–22 mm long, median (lower) tooth 2–15 mm long. Standard: claw 2–5 mm long, blade 20–48 by 13–39 mm. Keel petals: claw 5–10 mm long, blade 28–80 by 3–11 mm 44
43. Indumentum of twigs pilose, longest hairs 2.0–4.2 mm long. Stipellae 6–14 mm long. Calyx 27–32 mm long, median (lower) tooth 16–23 mm long. Standard: claw 5–12 mm long, blade 35–43 by 19–30 mm. Keel petals: claw 7–19 mm long, blade 45–63 by 4–8 mm. — Ovules 4–7 . . . . . 41. *M. stanleyi*
44. Terminal leaflets (broadly) elliptic, (broadly) ovate or orbicular. Ovules 2–6 45
44. Terminal leaflets obovate or broadly elliptic. Ovules 1. — Borneo . . . . . 14. *M. elmeri*
45. Blade of standard 20–30 by 13–25 mm. Blade of keel petals 25–37 by 3–7 mm 46
45. Blade of standard 28–47 by 18–39 mm. Blade of keel petals 44–80 by 5–11 mm 47
46. Stipellae c. 4 mm long. Terminal leaflets ovate to broadly elliptic. Inflorescences 19–25 cm long. Brachyblasts 2–3 mm long. Standard: claw 5 mm long, blade 20 by 13 mm. Keel petals: claw 6.5 mm long, blade 25–37 by 4 mm . . . . . 29. *M. mollissima*
46. Stipellae 4.8–6 mm long. Terminal leaflets (broadly) ovate to orbicular. Inflorescences 2.5–9 cm long. Brachyblasts 4–6 mm long. Standard: claw 2.5–4 mm long, blade 20–30 by 28–25 mm. Keel petals: claw 5–8 mm long, blade 28–37 by 3–7 mm. . . . . 45. *M. tomentosa*
47. Twigs puberulous or tomentose. Stipellae 3–6 mm long. Leaflets above glabrous to (very) thinly sericeous, below puberulous, tomentose or velutinous. Keel petals: claw 6.5–10 mm long, blade 45–70 by 7–11 mm 48
47. Twigs thinly sericeous. Stipellae 2.6–3 mm long. Leaflets above thinly pubescent, below sericeous. Keel petals: claw 8–9 mm long, blade 62–80 by 5–11 mm. — Moluccas: Key Islands . . . . . 22. *M. keyensis*
48. Terminal leaflets ± elliptic, 8–13.2 by 4.5–7.5 cm, ratio l/w (index) 1.6–2.3, below puberulous to tomentose. Inflorescences up to 13 cm long. Brachyblasts c. 3 mm long. Standard: claw 5 mm long, blade 28–30 by 18–25 mm. — Philippines: Luzon . . . . . 4. *M. aurea*
48. Terminal leaflets broadly elliptic or broadly ovate to orbicular, 6–16 by 5–13 cm, ratio l/w (index) 1.0–1.7, below velutinous. Inflorescences 11–28 cm long. Brachyblasts 4–13 cm long. Standard: claw 2.5–5 mm long, blade 38–48 by 22–28 mm. — Christmas Isl. (Indian Ocean), Celebes, Lesser Sunda Islands, Moluccas, New Guinea . . . . . 33. *M. platyphylla*
49. Inflorescences 65–143 cm long. Pedicels 20–35 mm long 50
49. Inflorescences 3–60 cm long. Pedicels 7–27 mm long 52
50. Calyx 6–15 mm long, median (lower) tooth 2–7 mm long. Standard: claw 2.5–4 mm long, blade 13–38 by 4–23 mm. Keel petals: claw 2.5–8 mm long, blade 13–30 by 8–23 mm 51
50. Calyx c. 23 mm long, median (lower) tooth 7–8 mm long. Standard: claw 4–6 mm long, blade 30–50 by 27–36 mm. Keel petals: claw 10 mm long, blade 59–70 by 13 mm. — Philippines: Luzon . . . . . 10. *M. curranii*
51. Stipellae 3–4 mm long. Bracts to brachyblasts 32–37 by 15–20 mm. Bracts to flowers 19–22 by 6–11 mm. Pedicels 30–35 mm long. Bracteoles 17.5–22 by 2.5–6 mm. Keel petals: claw 7–8 mm long, blade 37–38 by 8–12 mm. — Philippines: Luzon . . . . . 3. *M. angustifolia*
51. Stipellae 2.5–6 mm long. Bracts to brachyblasts c. 6 by 4 mm. Bracts to flowers 3.2–12 by 1.8–6 mm. Pedicels 7–30 mm long. Bracteoles 4–16 by 1.2–5 mm. Keel petals: claw 5–8.5 mm long, blade 17–30 by 5–13 mm. — New Guinea . . . . . 39. *M. schlechteri*
52. Terminal leaflets narrowly to broadly ovate, narrowly to broadly elliptic or obovate, ratio l/w (index) 1.5–4.0. Calyx 6–15 mm long, median (lower) tooth 2–8 mm long. Standard: claw 2–4 mm long, blade 13–33 by 10–23 mm. Keel petals: claw 3.5–8.5 mm long, blade 17–48 by 4–13 mm 53
52. Terminal leaflets broadly elliptic to orbicular, ratio l/w (index) 1.2–1.4. Calyx 25–33 mm long, median (lower) tooth 17–23 mm long. Standard: claw 4 mm long, blade 33–45 by 24–32 mm. Keel petals: claw 5–13 mm long, blade 40–60 by 5–8 mm. — Bracts to brachyblasts 32–40 by 16–28 mm. Bracts to flowers 28–33 by 5–17 mm. Bracteoles 24–26 by 6 mm . . . . . 26. *M. macrophylla*

53. Standard: claw 3.5–4 mm long, blade 27–33 by 15–16 mm. Keel petals: claw 5 mm long, blade 45 by 5–7 mm 54
53. Standard: claw 2–4 mm long, blade 13–30 by 9–28 mm. Keel petals: claw 3.5–8.5 mm long, blade 17–48 by 4–13 mm 55
54. Petioles 8–10 cm long. Stipellae 3.5–5 mm long. Pedicels 10–15 mm long. Corolla pale green or white. Standard: claw 3.5 mm long, blade 27 by 16 mm . . . . . 28. *M. mindorensis*
54. Petioles 4–8 cm long. Stipellae 1.5–2.3 mm long. Pedicels 15–27 mm long. Corolla green. Standard: claw 4 mm long, blade 33 by 15 mm . . . . . 44. *M. sumbawaensis*
55. Petioles 3.5–11 cm long. Stipellae 1.2–3.8 by 0.1–0.2 mm. Terminal leaflets elliptic to (narrowly) ovate, 6–15 by 3–8.5 cm, ratio l/w (index) 1.6–2.3. Ovules 2 or 4–8 56
55. Petioles 2.5–17.5 mm long. Stipellae 2.5–6 by 0.1–0.4 mm. Terminal leaflets narrowly to broadly elliptic or obovate, 7.5–20 by 5–13 cm, ratio l/w (index) 1.6–4.0. — Pedicels 7–30 mm long . . . . . 39. *M. schlechteri*
56. Stipellae 1.2–3.8 by 0.1 mm. Standard: claw 2–3 mm long, blade 15–21 by 10–20 mm. Keel petals: claw 5–7 mm long, blade 19–26 by 4–4.5 mm. Ovules 2 57
56. Stipellae c. 1.5 by 0.2 mm. Standard: claw 3 mm long, blade 19–30 by 9–28 mm. Keel petals: claw 3.5–7 mm long, blade 25–48 by 4.4–5 mm. Ovules 4–8. — Terminal leaflets elliptic to ovate, 7–15 by 4.5–8.5 cm, ratio l/w (index) 1.6–2.1 . . . . . 9. *M. canaliculata*
57. Stipellae 1.2–2.0 by 0.1 mm. Terminal leaflets narrowly ovate, 6–9 by 3–4.5 cm, ratio l/w (index) 2.2–2.3, upper surface glabrous. Brachyblasts 1 mm long. Pedicels c. 10 mm long. Standard: claw 2 mm long, blade 15 by 14 mm. Keel petals: claw 5 mm long, blade 19 by 4.5 mm . . . . . 23. *M. kostermansii*
57. Stipellae 2.4–3.8 by 0.1 mm. Terminal leaflets ovate, 6–12.2 by 3–7 cm, ratio l/w (index) 1.6–2.1, upper surface with scattered hairs. Brachyblasts 1–3 mm long. Pedicels 10–16 mm long. Standard: claw 2–3 mm long, blade 20–21 by 10–20 mm. Keel petals: claw 5–7 mm long, blade 25–26 by 4 mm . . . . . 37. *M. sakapipei*
58. Pods smooth, (inconspicuous) reticulate veined or longitudinally wrinkled 59
58. Pods with transverse or oblique to diagonal lamellae, rarely reticulate lamellate or with 1 longitudinal lamella 70
59. Pods smooth 60
59. Pods (inconspicuous) reticulate veined or longitudinally wrinkled 65
60. Pods 7–25 by 1.5–6.5 cm, winged, usually not constricted between the seeds 61
60. Pods 24–30 by 3 cm, not winged, constricted between the seeds. — Lesser Sunda Islands: Sumba . . . . . 21. *M. kawakabuti*
61. Twigs glabrous to thinly sericeous. Pods 8–25 by 3–6.5 cm, wings 2–20 mm wide 62
61. Twigs hirsute or thinly sericeous. Pods c. 7 by 3 cm, wings 'narrow'. — Borneo . . . . . 46. *M. toppingii*
62. Infructescences not umbel-like. Pods 13–25 by 1.5–4.5 cm, puberulous, thinly sericeous or with few non-irritating hairs, wings 2–20 mm wide. — New Guinea 63
62. Infructescences ± umbel-like. Pods 8–18 by 3–6.5 cm, sericeous, wings 4–12 mm wide . . . . . 16. *M. gigantea*
63. Stipellae present. Pods 13–25 by 3–4.5 cm, wings 2–7 mm wide 64
63. Stipellae absent. Pods 13.5–18.5 by 1.5–2 cm, wings 10–20 mm wide . . . . . 24. *M. lamii*
64. Stipellae 1.5 by 0.2 mm. Infructescences raminascent. Pods broadly strap-like, 13–25 by 3–4.5 cm . . . . . 9. *M. canaliculata*
64. Stipellae 2.5–6 by 0.1–0.4 mm. Infructescences axillary, rarely raminascent. Pods flattened ellipsoid, 13.5–16 by 3–4.5 cm . . . . . 39. *M. schlechteri*
65. Pods flattened ellipsoid or strap-like, (inconspicuous) reticulate veined, wings 3–12 mm wide 66
65. Pods ± flattened ellipsoid, obovoid or (broadly) flattened cylindrical, longitudinally wrinkled, not winged or wings 7–13 mm wide 68
66. Terminal leaflets elliptic to ovate or rhomboid, 6–15 by 3–9 cm. Infructescences ± umbel-like pseudoracemes . . . 67
66. Terminal leaflets broadly ovate, 15–20 by 6–10 cm. Infructescences pseudoracemes or pseudopanicles. — Pods 16–24 by 3–5.6 cm . . . . . 28. *M. mindorensis*
67. Seeds ovoid or discoid, c. 15 by 12 by 7 mm, hilum c. 27 mm long, c. 1/2 of the circumference . . 1. *M. acuminata*
67. Seeds discoid or ± heart-shaped, 20–45 by 16–40 by 7–14 mm, hilum 50–75 mm long, c. 4/5 of the circumference . . . . . 16. *M. gigantea*
68. Stipellae 2.8–6.3 mm long. Infructescences 36–700 cm long. Pods 13–26 cm long. Seeds 22–35 by 22–28 by 12–21.5 mm, hilum 3/4 of the circumference. — Philippines 69
68. Stipellae 1.5–2.3 mm long. Infructescences 15–25.5 cm long. Pods 10.5–17.5 cm long. Seeds c. 24 by 20 by 6.6 mm, hilum c. 4/5 of the circumference. — Lesser Sunda Islands . . . . . 44. *M. sumbawaensis*
69. Terminal leaflets ovate-elliptic to orbicular, 6–19 by 4.5–10 cm, both sides with few scattered hairs to thinly sericeous; lateral leaflets 9–15.5 by 5–8.2 cm. Infructescences 100–700 cm long. Pods 13–26 by 3.5–4 cm, sutures not thickened. Seeds 12–21.5 mm thick 25. *M. longipedunculata*
69. Terminal leaflets broadly ovate, c. 16.5 by 14 cm, above pubescent, below densely pubescent, lateral leaflets c. 16.5 by 12 cm. Infructescences c. 36 cm long. Pods 24–26 by 5 cm, sutures thickened. Seeds 8 mm thick . . . . . 31. *M. pachycarpa*
70. Pods with 1 longitudinal lamella or reticulate lamellate 71
70. Pods with transverse to oblique or ± diagonal lamellae 72
71. Stipules triangular, c. 3 by 1 mm. Stipellae absent. Infructescences pseudoracemes. Pods with 1 longitudinal lamella, wings 3–7 mm wide. Seeds 25–29 by 18–20 by 12–15 mm, hilum 18–23 mm long, c.1/4 of the circumference . . . . . 27. *M. macropoda*
71. Stipules ± falcate, 6–8 by 1.0–1.1 mm. Stipellae present. Infructescences pseudopanicles. Pods reticulate lamellate, wings 5–11 mm wide. Seeds 20–25 by 15–26 by 5–7.8 mm, hilum 62–65 mm long, 0.87–0.94 of the circumference . . . . . 36. *M. reticulata*
72. Lamellae bifurcate (T-shaped). 73
72. Lamellae straight 75
73. Terminal leaflets narrowly to broadly elliptic or (broadly) ovate, 7–14 by 2.5–14 cm, ratio l/w (index) 1.2–1.8 or 2.0–2.6. Pods 8–13.5 by 3.5–6.5 cm, puberulous. Seeds 16–30 by 18–22 by 9.3–12.7 mm. — Philippines . . . 74
73. Terminal leaflets ovate, 7.5–18 by 4–11 cm, ratio l/w (index) 1.6–2.0. Pods 6–11 by 3–5 cm, sericeous. Seeds 18–21 by 17–20 by 8–9 mm. — Sumatra, Peninsular Malaysia, Borneo . . . . . 6. *M. biplicata*
74. Stipules c. 4 by 1 mm. Terminal leaflets (narrowly) elliptic to ovate, 7–14 by 2.5–9 cm, ratio l/w (index) 2.0–2.6. Infructescences axillary. Seeds 20–30 by 20–21 by 9.3 mm, hilum 50 mm long, 7/10 of the circumference . . . . . 12. *M. diplax*

74. Stipules c. 5 by 4 mm. Terminal leaflets broadly elliptic to (broadly) ovate,12–13 by 6.5–14 cm, ratio l/w (index) 1.2–1.8. Infructescences raminascent. Seeds 16–26 by 18–22 by 10–12.7 cm, hilum 36–50 mm, 3/5–2/3 of the circumference . . . . . 34. *M. platyplekta*
75. Pods flattened ellipsoid or (broadly) strap-like, rarely flattened obovoid, 6–28 by 2.0–6 cm. Seeds 1–several 76
75. Pods discoid, rarely flattened ellipsoid, 7.5–8.5 by 4–6 cm. Seeds always 1. — Borneo . . . . . 14. *M. elmeri*
76. Twigs tomentose, pilose, rarely hirsute or puberulous 77
76. Twigs glabrous to sericeous, velutinous, thinly pubescent or puberulous 84
77. Twigs pilose or hirsute. Stipellae 1.9–4 or 6–14 (*M. stanleyi*) mm long. Lamellae of pods 2–6 mm high 78
77. Twigs tomentose, rarely puberulous. Stipellae 4–8 mm long. Lamellae of pods 3–22 mm high 80
78. Stipellae 1.9–4 mm long. Longest hairs on axial parts up to 1.5 mm 79
78. Stipellae 6–14 mm long. Longest hairs on axial parts 2.0–4.2 mm long. Wings of pods 9–10 mm wide. — Papua New Guinea . . . . . 41. *M. stanleyi*
79. Twigs pilose. Lower surface of leaflets tomentose. Terminal leaflets 8.5–10.5 by 4.5–6.5 cm, ratio l/w (index) 1.4–1.7. Pods 8.5 by 3 cm, lamellae up to 2 mm high. Seeds orbicular. — Borneo . . . . . 18. *M. havilandii*
79. Twigs hirsute. Lower surface of leaflets hirsute, rarely thinly sericeous. Terminal leaflets 6–15.5 by 4.5–12 cm, ratio l/w (index) 1.2–1.4. Pods 15.5–16.5 by 3–5 cm, lamellae 3–4 mm high. Seeds discoid. — Sumatra, Java, Flores . . . . . 26. *M. macrophylla*
80. Lower surface of leaflets tomentose. Lamellae of pods 11–12 mm high 81
80. Lower surface of leaflets velutinous or sericeous. Lamellae of pods 4–10 or 22 mm high 82
81. Longest hairs on axial parts 1.0–1.5 mm long. Stipellae 4.8–6.0 by 0.2–0.6 mm. Terminal leaflets 6–13 by 5–11.5 cm, ratio l/w (index) 1.1–1.2 mm. Wings of pods c. 10 mm wide, lamellae 11 mm high . . . . . 45. *M. tomentosa*
81. Longest hairs on axial parts 1.3–3 mm long. Stipellae 7 by 0.3 mm. Terminal leaflets 8–15.5 by 5–13.5 cm, ratio l/w (index) 1.2–1.6. Wings of pods 5–15 mm wide, lamellae 11–12 mm high . . . . . 47. *M. verdcourtii*
82. Stipellae 4–8 by 0.3–0.4 mm. Lower surface of leaflets velutinous. Pods 8–12 by 2–2.5 cm, lamellae 22 or 5–7 mm high. Hilum of seeds 45–66 mm long, 4/5 of the circumference 83
82. Stipellae 4 by 0.1–0.3 mm. Lower surface of leaflets sericeous. Pods 15–23 by 2.5–5 cm, lamellae 4–10 mm high. Hilum of seeds 27–32 mm long, 1/2 of the circumference . . . . . 29. *M. mollissima*
83. Stipellae 6–8 mm long. Pods 9.5 by 2.3 cm, wings 14–20 mm wide, lamellae 22 mm high. Seeds 10–20 by 19–20 by 14.4 mm, hilum 46–49 mm long 15. *M. eurylamellata*
83. Stipellae 4–6 mm long. Pods 8–12 by 2–2.5 cm, wings 3–4 mm wide, lamellae 5–7 mm high. Hilum of seeds 55–66 mm long . . . . . 33. *M. platyphylla*
84. Twigs sericeous, velutinous or puberulous. Lower surface of leaflets sericeous, tomentose or velutinous 85
84. Twigs glabrous to thinly sericeous, rarely thinly hirsute, sericeous or (thinly) puberulous. Lower surface of leaflets tomentose or sericeous to velutinous 88
85. Pods 8–13 by 2–3 cm, wings 2–9 mm wide, lamellae 1–7 mm high. Seeds 15–26 by 10–22 by 6.3–9.2 mm . . . 86
85. Pods 18 by 3 cm, wings 12–25 mm wide, lamellae 8–10 mm high. Seeds 20–25 by 18–27 by 10–12.4 mm. — Stipellae 4–6 by 0.2–0.3 mm. Papua New Guinea . . . . . 2. *M. aimun*
86. Twigs (thinly) sericeous or velutinous. Stipellae 1.9–3.6 by 0.1–0.5 mm. Lamellae of pods 5–7 mm high 87
86. Twigs puberulous. Stipellae 4–6 by 0.3–0.4 mm. Lamellae of pods 5–7 mm high. — Lower surface of leaflets velutinous . . . . . 33. *M. platyphylla*
87. Lower surface of leaflets tomentose. Terminal leaflets 8.5–10.5 by 4.5–6.5 cm. Pods 8.4 by 3 cm. Seeds 15 by 10 cm. — Borneo . . . . . 18. *M. havilandii*
87. Lower surface of leaflets sericeous. Terminal leaflets 10–16 by 7.5–11 cm. Pods 10.5–13.2 by 2.8–3.6 cm. Seeds 24–26 by 19–22 cm. — Key Islands . . 22. *M. keyensis*
88. Stipellae present, often caducous. Seeds 15–45 by 11–45 by 5–7 mm, hilum 36–60(–80) mm long, 1/2–4/5 of the circumference 89
88. Stipellae absent. Seeds 21–29 by 22–25 by 9.1–13.6 mm, hilum 61–67 mm long, 3/5 of the circumference. — Inflorescences raminascent . . . . . 5. *M. bennettii*
89. Twigs glabrous to thinly sericeous, (thinly) puberulous or thinly hirsute. Pods 6–27 by 2.2–5.5 cm. Seeds 12.5–45 by 13–45 by 3–17 mm 90
89. Twigs sericeous. Pods 7–9.5 by 3.5–4 cm. Seeds 17–18 by 13 by 1 mm. — Inflorescences raminascent. Papua New Guinea: Bougainville; Solomon Islands; ?Fiji . . . . . 7. *M. brachycarpa*
90. Leaflets elliptic or narrowly ovate to ovate or orbicular, 6–19 by 2.5–11.3 cm, ratio l/w (index) 1.2–2.8 91
90. Leaflets narrowly ovate, rarely narrowly elliptic, 5.8–11.6 by 1.3–3.9 cm, ratio l/w (index) 2.6–4.4. — Philippines: Luzon, on ultrabasics . . . . . 3. *M. angustifolia*
91. Pods 6.8–11 by 2.2–4.5 cm. Seeds 13–24 by 13–20 by 3–12 mm, hilum 33–4 mm long. — Peninsular Malaysia; Halmahera; Papua New Guinea: Bougainville; Solomon Islands 92
91. Pods 9–27 by 2.2–5.3 cm. Seeds (not known for *M. warburgii*) 12.5–43 by 11–45 by 4–17 mm, hilum 36–80 mm long 94
92. Stipellae 2.4–7 by 0.1–0.4 mm. Pods 4.5–7.5 by 2.2–4.5 cm, wings 3–8 mm wide, lamellae 1–8 mm high. Seeds 13–24 by 13–20 by 3–12.3 mm, hilum 33–43 mm long, 4/5 or 7/10 of the circumference 93
92. Stipellae 1.2–2.0 by 0.1–0.2 mm. Pods 7–11 by 2.5–3 cm, wings 2–4 mm wide, lamellae 1–2 mm high. Seeds 15–17 by 15–18 by 8.7–12 mm, hilum 40 mm long, 3/4 of the circumference. — Bougainville, Solomon Islands (Guadalcanal) . . . . . 43. *M. subumbellata*
93. Stipellae 2.4–3.8 by 0.1 mm. Pods 6.0–7.5 by 2.5–4.5 cm, wings 4–8 mm wide, lamellae 6–8 mm high. Seeds 13–16 by 13–15 by 3–3.6 mm, hilum 33 mm long, 4/5 of the circumference. — Halmahera . . . . . 37. *M. sakapipei*
93. Stipellae 4–7 by 0.2–0.4 mm. Pods 4.5–9 by 2.2–4 cm, wings 3–7 mm wide, lamellae 1–4 mm high. Seeds 20–24 by 15–20 by 10–12.3 mm, hilum 36–43 mm long, 7/10 of the circumference. — Peninsular Malaysia . . . . . 42. *M. stenoplax*
94. Infructescences rami- or caulinascent 95
94. Infructescences axillary 98
95. Pods 9.5–15.5 by 2.5–3.5 cm, wings 4–15 mm wide, lamellae 3–4 mm high 96
95. Pods 11–27 by 3.5–5.5 cm, wings 1–3 mm wide, lamellae inconspicuous or 2–3 mm high. — Moluccas, New Guinea 97
96. Stipellae 2.1–2.2 by 0.3 mm. Pods 9.5–15 by 2.5–3.8 cm, lamellae 3–4 mm high. Hilum of seeds 45 mm long, 3/4

of the circumference. — Papua New Guinea . . . . . 19. *M. hooglandii*

96. Stipellae 3–4.6 by 0.2–0.5 mm. Pods 10.5–15.5 by 3.5–4.5 cm, lamellae 3–4 mm high. Hilum of seeds 37–43 mm long, 2/3 of the circumference. — Philippines . . . . . 38. *M. samarensis*

97. Stipellae acicular, 2.2–5.0 by 0.1–0.3 mm. Infructescences rami- or caulinascent, pseudoracemes or pseudopanicles, 9–60 cm long, peduncles 1–5 mm long. Pods 11–27 by 4.2–5.5 cm, lamellae 2–3 mm high. — Seeds 40–45 by 40–45 by 15–17 mm, hilum 80 mm long, 2/3 of the circumference . . . . . 30. *M. novo-guineensis*

97. Stipellae acicular or narrowly triangular, 1.0–3.0 by 0.1–0.8 mm. Infructescences raminascent, pseudoracemes, 4–35 cm long, peduncles 1–15 cm long. Pods 22.5 by 3.5 cm, lamellae inconspicuous . . . . . 48. *M. warburgii*

98. Stipellae 2.5–5.0 by 0.2–0.4 mm. Upper surface of leaflets with few appressed hairs to thinly sericeous, rarely glabrous. Pods 11–18 by 2.2–5.5 cm, wings 2–15 mm wide, lamellae 1–5 mm high. 99

98. Stipellae 1.2–2.0 by 0.1 mm. Upper surface of leaflets glabrous. Pods 9 by 3–4 cm, wings 1–3 mm wide, lamellae 1 mm high. — Lesser Sunda Islands (Flores). . . . . 23. *M. kostermansii*

99. Leaflets 6–15.5 by 2.5–12 cm, ratio l/w (index) 1.2–2.2, upper surface thinly sericeous, rarely with some appressed hairs. Pods 11–18 by 2.5–5 cm, wings 2–15 mm wide, lamellae 1–4 mm high 100

99. Leaflets 10–17 by 4.7–10.5 cm, ratio l/w (index) 1.9–2.5, upper surface glabrous or with few appressed hairs. Pods 13–14 by 3.5–5.5 cm, wings 7–10 mm wide, lamellae up to 5 mm high. — Philippines . . . . . 17. *M. hainanensis* subsp. *multilamellata*

100. Leaflets 6–13 by 2.5–7.5 cm, ratio l/w (index) 2.1–2.2. Pods 11–18 by 2.2–4 cm, wings 2–5 mm wide, lamellae 1–2 mm high. Hilum of seeds 45 mm long, 3/4 of the circumference. — Philippines . . . . . 10. *M. curranii*

100. Leaflets 6–15.5 by 4.5–12 cm, ratio l/w (index) 1.2–1.4. Pods 15.5–16.5 by 3–5 cm, wings 4–15 mm wide, lamellae 3–4 mm high. Hilum of seeds 36 mm long, 2/3 of the circumference. — Sumatra, Java, Lesser Sunda Islands (Flores) . . . . . 26. *M. macrophylla*

B. Multi entry key

Bold: two or more character states present; ?: character(state) unknown.

1. *acuminata*
2. *aimun*
3. *angustifolia*
4. *aurea*
5. *bennettii*
6. *biplicata*
7. *brachycarpa*
8. *bracteata*
9. *canaliculata*
10. *curranii*
11. *diabolica*
12. *diplax*
13. *discolor*
14. *elmeri*
15. *eurylamellata*
16. *gigantea* subsp. *gigantea*
17. *hainanensis* subsp. *multilamellata*
18. *havilandii*
19. *hooglandii*
20. *kabaenensis*
21. *kawakabuti*
22. *keyensis*
23. *kostermansii*
24. *lamii*
25. *longipedunculata*
26. *macrophylla*
27. *macropoda*
28. *mindorensis*
29. *mollissima*
30. *novo-guineensis*
31. *pachycarpa*
32. *papuana*
33. *platyphylla*
34. *platyplekta*
35. *pruriens*
36. *reticulata*
37. *sakapipei*
38. *samarensis*
39. *schlechteri*
40. *sericophylla*
41. *stanleyi*
42. *stenoplax*
43. *subumbellata*
44. *sumbawaensis*
45. *tomentosa*
46. *toppingii*
47. *verdcourtii*
48. *warburgii*

1. Habit
   a. liana: 1, 2, 3, 4, 5, 6, 7, **8**, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, **32**, 33, 34, **35**, 36, 37, 38, 39, **40**, 41, 42, 43, 44, 45, 46, 47, 48
   b. ± herbaceous climber: **8**, **32**, **35**, **40**

2. Twigs, indumentum
   a. glabrous: **3**, **5**, **6**, **7**, **8**, **9**, **10**, **12**, **16**, **19**, 23, **30**, **34**, **36**, **37**, **43**, **44**, **48**
   b. (thinly) hirsute: **26**, **30**, **35**, **36**, **46**
   c. tomentose: **4**, **14**, 15, 29, **31**, **33**, 45, 47
   d. some hairs: **7**, **12**, **17**, 21, **43**
   e. (thinly) sericeous: 1, **2**, **3**, **5**, **6**, **7**, **8**, **9**, **10**, **11**, 13, **16**, **17**, **18**, **19**, 20, 22, 24, 25, **26**, 27, 28, **30**, 32, **35**, **36**, **37**, 38, 39, 40, 42, **43**, **44**, **46**, **48**
   f. velutinous: **2**
   g. (thinly) puberulous: **4**, **11**, **14**, **33**, **34**, **37**
   h. pilose: **18**, **31**, 41

3. Stipellae
   a. absent: 5, 13, 20, 21, 24, 27
   b. present: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 22, 23, 25, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48

4. Stipellae, length
   a. 1.0–5.0 mm: 1, **2**, 3, 4, 6, 7, 8, 9, 10, 11, 12, 14, 16, 17, 18, 19, 22, 23, **25**, 26, 28, 29, 30, 31, 32, **33**, 34, **35**, **36**, 37, 38, **39**, 40, **42**, 43, 44, **45**, 46, 48
   b. 5.1–14 mm: **2**, 15, **25**, **33**, **35**, **36**, **39**, 41, **42**, **45**, 47

5. Terminal leaflets, l/w
   a. longer than broad: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, **11**, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, **22**, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, **33**, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48
   b. ± as long as broad: **11**, **22**, **33**, **40**
   c. broader than long: **40**

6. Leaflets, apex
   a. obtuse: **11**, **24**, **29**, **32**, **35**
   b. rounded: **11**, **24**, **26**, **29**, **32**, **35**, 40
   c. acute: **8**, **16**, **19**, **27**, **29**, **35**
   d. acuminate: 1, 2, 3, 4, 5, 6, 7, **8**, 9, 10, 12, 13, 14, 15, **16**, 17, 18, **19**, 20, 21, 22, 23, **24**, 25, **26**, **27**, 28, 30, 31, 33, 34, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48

7. Leaflets, margin
   a. entire: 1, 2, 3, 4, 5, 6, (?7), 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, **29**, 30, 31, 33, 34, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48
   b. ± crenate: 8, 11, **29**, 32, 35, 40

8. Leaflets, indumentum above
   a. glabrous: 1, **3**, **4**, **5**, **6**, **9**, **12**, **13**, **16**, **17**, **19**, **20**, 23, **27**, **28**, **30**, **33**, **34**, **43**, **44**, **45**, **46**
   b. some hairs to (very) thinly hairy: **3**, **4**, **5**, **6**, 7, **8**, **9**, 10, 11, **12**, **13**, 14, 15, **16**, **17**, 18, **19**, **20**, 21, 22, 24, 25, 26, **27**, **28**, 29, **30**, 32, **33**, **34**, 35, 36, 37, 38, 39, 40, **41**, 42, **43**, **44**, **45**, **46**, **47**, 48
   c. ± densely hairy: 2, **8**, 31, **41**, **45**, **47**

9. Leaflets, indumentum below
   a. glabrous or with some hairs to (very) thinly hairy: 1, 3, 5, 6, 7, **8**, 9, 10, 12, 16, 17, 19, 20, 21, 23, 24, 25, **26**, **27**, 28, 30, 36, 37, 38, 39, **42**, **43**, 44, 46, 48
   b. hairy: 2, 4, **8**, 11, 13, 14, 15, 18, 22, **26**, **27**, 29, 31, 32, 33, 34, 35, 40, 41, **42**, **43**, 45, 47

10. Leaflets, lateral veins
   a. ± gently curved, more strongly near the margin, anastomosing close to the margin: 1, 2, 3, 4, 5, 6, 7, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, **29**, 30, 31, 33, 34, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48
   b. straight or uniformly curved, running right into and along the margin: 8, 11, **29**, 32, 35, 40

11. Inflorescences
   a. pseudoracemes, not umbellate: 2, 3, 4, 5, **6**, 7, 8, 9, 11, **12**, **13**, **14**, 15, 21?, **22**, 23, 24, **26**, 27, **28**, **29**, **30**, 31?, 32, **33**, **34**, 35, 37, **38**, 39, 40, **41**, 42, **43**, 44, **45**, 46, 47, 48
   b. umbellate pseudoracemes: 1, **13**, 16, 21?, 31?, **43**
   c. pseudopanicles: **6**, 10, **12**, **14**, 17, 18, 19, 20, 21?, **22**, 25, **26**, **28**, **29**, **30**, 31?, **33**, **34**, 36, **38**, **41**, **43**, **45**

12. Inflorescences, insertion
   a. axillary or terminal: **1**, 2, 3, 4, **5**, **6**, 8, 10, 11, 12, 13, **14**, 15, **16**, 17, **18**, 20, 21?, **22**, 23, 24, **25**, 26, **27**, **28**, **29**, 31?, 32, **33**, 35, **36**, 37, **39**, 40, **41**, 42, 43, 44, 45, 46, 47
   b. rami- or caulinascent: **1**, **5**, **6**, 7, 9, **14**, **16**, **18**, 19, 21?, **22**, **25**, **27**, **28**, **29**, 30, **33**, 34, **36**, 38, **39**, **41**, 48

13. Inflorescences, length
   a. 1–15 cm: 1, 4, **5**, 6, **7**, **8**, **9**, **13**, 14, 15, **16**, **17**, **18**, 20, 21?, 22, **23**, 24, **26**, **30**, 32, **33**, **34**, **35**, **36**, 37, **41**, 42, 45, **46**, **47**, **48**
   b. 15–26 cm: 2, **5**, **7**, **8**, **9**, **12**, **13**, **16**, **17**, **18**, 19, 21?, **23**, **26**, **28**, 29, **30**, **33**, **34**, **35**, **36**, **38**, **39**, 40, **41**, **43**, 44, **46**, **47**, **48**
   c. 27–700 cm: 3, **5**, **7**, **8**, 10, 11, **12**, **13**, **16**, **17**, 21?, 25, 27, **28**, **30**, 31, **33**, **35**, **36**, **38**, **39**, **43**, **47**, **48**

14. Inflorescences, length peduncle
   a. up to 8 cm: 1, 4?, 5, 6, 7, 8, 9, **11**, 12, 13, 14, 15, **16**, 18, 20, 21?, 22, 23?, 24, 26, **29**, 30, 31?, 32, 33, 34?, 35, **36**, **37**, **38**, 40, 41, 43, 45, 46, **47**, **48**
   b. 8–15 cm: 4?, **11**, **16**, 17, 19, 21?, 23?, **29**, 31?, 34?, **36**, **37**, **38**, **44**, **48**
   c. 15–680 cm: 3, 4?, 10, **16**, 21?, 23?, 25, 27, 28, **29**, 31?, 34?, **36**, 39, **44**, **47**

15. Length brachyblast
   a. up to 5 mm: 1, 2, **3**, 4, 5, **6**, 7, 9, 11, 12, 13, **14**, **16**, 17, 18, 20, 21?, **24**, **25**, **27**, 28?, 29, **30**, 31?, 32, **33**, 34?, 35, **36**, 37, 38, **39**, 40?, 42, 43?, **45**, 46, 47, **48**
   b. 5–10 mm: **3**, **6**, 8, 10, **14**, **16**, **19**, 21?, **22**, 23, **24**, **25**, **27**, 28?, **30**, 31?, **33**, 34?, **36**, **39**, 40?, 43?, **44**, **45**, **48**
   c. 10–50 mm: **14**, 15, **19**, 21?, **22**, **25**, 26, **27**, 28?, 31?, **33**, 34?, **36**, 40?, 41, 43?, **44**

16. Length pedicel
   a. 5–10 mm: **5**, **7**, 8, **9**, 11, **13**, 21?, **23**, **29**, 31?, 32, **33**, 34?, 35, **39**, 40, **41**, **45**, **46**, 47?
   b. 10–20 mm: 1, **2**, 4, **5**, 6, **7**, **9**, **13**, 14, **16**, **17**, 18, 19, 21?, 22, **23**, 24, 25, 26, 27, 28, **29**, 30, 31?, **33**, 34?, **36**, 37, **39**, **41**, 42, 43, 44, **45**, **46**, 47?, 48
   c. 20–41 mm: **2**, 3, **5**, **7**, 10, 12, 15, **16**, **17**, 20, 21?, 31?, 34?, **36**, 38, **39**, **45**, 47?

17. Length bracteoles
   a. 2–9.4 mm: **1**, 4?, 5, 6, 7?, **9**, 11, **12**, 13?, **16**, **17**, 20?, 21?, 23?, 28?, 30, 31?, **33**, 34?, 35, 37?, **39**, 40, 45, 46, 47?, 48?
   b. 9.5–15 mm: **1**, 4?, 7?, **9**, **12**, 13?, 15, **16**, **17**, 18, 20?, 21?, 22, 23?, 24, 28?, 29, 31?, 32, **33**, 34?, 37?, **38**, **39**, **41**, 42, 43, 44, 47?, 48?
   c. 15–30 mm: 2, 3, 4?, 7?, 8, **9**, 10, 13?, 14, **17**, 19, 20?, 21?, 23?, 25, 26, 27, 28?, 31?, **33**, 34?, 36, 37?, **38**, **39**, **41**, 47?, 48?

18. Calyx, length upper lip (upper lip broader than long!)
   a. 1–3 mm: **2**, **3**, **5**, 7, 8, 9, **11**, 15?, 16, **18**, **19**, 20, 21?, **22**, 23?, **25**, 28?, **30**, 31?, **33**, 34?, **39**, **40**, 44?, 46, 47?
   b. 3–10 mm: **1**, **2**, **3**, 4, **5**, 6, 10, **11**, 12, 13, 14, 15?, 17, **18**, **19**, 21?, **22**, 23?, 24, **25**, 27, 28?, 29, **30**, 31?, 32, **33**, 34?, 35, 36, 37, 38, **39**, **40**, **41**, 42, 43, 44?, 45, 47?, 48
   c. 10–16 mm: **1**, **3**, **5**, **11**, 15?, 21?, 23?, 26, 28?, 31?, 34?, **41**, 44?, 47?

19. Calyx, length lateral teeth
   a. 1–5 mm: **2**, 3, **5**, 6, 7, **8**, 9, 15?, 16, **18**, 19, 20, 21?, **22**, 23, 25, 28?, **29**, 30, 31?, 32, **33**, 34?, **35**, 37, 39, 40, **42**, 43, 44, **45**, 46, 47?
   b. 5–10 mm: 1, **2**, 4, **5**, **8**, 10, **11**, 12, 13, 14, 15?, 17, **18**, 21?, **22**, 24, 27, 28?, **29**, 31?, **33**, 34?, **35**, 36, **38**, **42**, **45**, 47?, 48
   c. 10–17 mm: **11**, 15?, 21?, 26, 28?, 31?, 34?, **38**, 41, 47?

20. Calyx, length median tooth
   a. 2–7 mm: 2, 3, 6, 7, 8, **9**, 15?, 16, **18**, 19, 20, 21?, 23, 25, 28?, 30, 31?, 32, **33**, 34?, **35**, 37, 39, 40, 43, 44, **45**, 46, 47?
   b. 7–14 mm: **1**, 4, **5**, **9**, 10, **11**, 12, 13, 14, 15?, 17, **18**, 21?, 22, 24, 27, 28?, 29, 31?, **33**, 34?, **35**, 36, **38**, **42**, **45**, 47?, 48
   c. 14–23 mm: **1**, **5**, **11**, 15?, 21?, 26, 28?, 31?, 34?, **38**, 41, **42**, 47?

21. Corolla colour (apart from the main colour, petals may show spots or honey marks in a different one)
   a. white(ish): **1**, 2?, 4?, **9**, 10, **11**, **14**, **15**, **16**, **19**, 21?, 22, **24**, **25**, **26**, **27**, **28**, **29**, 31?, **32**, **33**, 34?, **36**, **37**, **45**, 47?
   b. cream-coloured: 2?, 4?, **13**, 21?, 31?, **32**, 34?, **36**, **45**, 47?
   c. yellow(ish): 2?, 4?, **5**, 7, **11**, **14**, **19**, 21?, **24**, **25**, **29**, 31?, **32**, **33**, 34?, **45**, 47?
   d. yellow-green: 2?, 4?, **16**, **19**, 21?, 31?, 34?, 47?
   e. (pale, lemon, light, apple) green(ish): **1**, 2?, 3, 4?, **9**, **11**, **13**, **14**, **15**, **16**, **19**, 20, 21?, 23, **24**, **26**, **27**, **28**, **29**, 31?, **32**, **33**, 34?, **37**, 39, 41, 43, 44, **45**, 47?
   f. red(dish): 2?, 4?, **5**, 21?, **30**, 31?, 34?, 47?, **48**
   g. orange: 2?, 4?, **5**, 21?, **30**, 31?, 34?, 47?, **48**
   h. violet: 2?, 4?, **6**, 21?, 31?, **33**, 34?, **35**, **46**, 47?
   i. (dark, blackish) purple: **1**, 2?, 4?, **6**, **8**, 12, 17, 18, 21?, 31?, 34?, **35**, 38, 40, 42, **46**, 47?
   j. (dark) blue: 2?, 4?, **6**, 21?, 31?, 34?, **46**, 47?
   k. maroon: 2?, 4?, **8**, 31?, 34?, 47?

22. Keel petals, length of blade
   a. 14–27 mm: 2?, **9**, 13, 15?, **16**, 20, 21?, 23, 24, 27, 29, 31?, 32, 34?, 37, **39**, 40?, **43**, 47?
   b. 28–57 mm: 1, 2?, 3, 4, 6, 7, 8, **9**, 12, 14, 15?, **16**, 17, 18, 19, 21?, **26**, 28, 31?, **33**, 34?, 35, 36, **38**, **39**, 40?, **41**, 42, **43**, 44, 45, 46, 47?
   c. 59–100 mm: 2?, 5, 10, 11, 15?, 21?, 22, 25, **26**, 30, 31?, **33**, 34?, **38**, 40?, **41**, 47?, 48

23. Basifixed anthers
   a. glabrous: 2?, **7**, 8, **9**, 11, 15?, 21?, 23?, **24**, 25?, 27, 28?, 31?, 32, **33**, 34?, 35, 36, 37?, 40?, 44?, **45**, 47?
   b. outside with some hairs to sericeous: 1, 2?, 3, **4**, 5, 6, **7**, **9**, **14**, 15?, **17**, 18, **19**, 20, 21?, 22, 23?, **24**, 25?, **26**, 28?, 30, 31?, **33**, 34?, 37?, **38**, **39**, 40?, **41**, 43, 44?, **45**, **46**, 47?, 48

c. at base with some hairs to bearded or woolly: 2?, **4**, 10, 12, 13, **14**, 15?, 16, **17**, **19**, 21?, 23?, 25?, **26**, 28?, 29, 31?, 34?, 37?, **38**, **39**, 40?, **41**, 44?, **46**, 47?

24. Versatile, medifixed anthers
a. glabrous: 2?, 8, 11, 15?, 21?, 31?, 32, 34?, 35, 40?, 47?
b. bearded: 1, 2?, 3, 4, 5, 6, 7, 9, 10, 12, 13, 14, 15?, 16, 17, 18, 19, 20, 21?, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31?, 33, 34?, 36, 37, 38, 39, 40?, 41, 42, 43, 44, 45, 46, 47?, 48

25. Number of ovules
a. 1: 2?, 14, 15, 21?, 31?, 40?, 43?, 44?, 47?
b. 2–4: **1**, 2?, 3, 4, **5**, **6**, **7**, **8**, **9**, **10**, 12, 15?, **16**, 17, 18, 21?, 22, 23, **24**, **26**, 28, **29**, 30, 31?, 33, 34?, **35**, 37, 40?, **41**, 42, 43?, 44?, 45, 46, 47?
c. 5–7: **1**, 2?, **5**, **6**, **7**, **8**, **9**, **10**, **11**, 13, 15?, **16**, 19, 20, 21?, **24**, **26**, **29**, 31?, 32, 34?, **35**, 36, 38, 39, 40?, **41**, 43?, 44?, 47?
d. 8–10: 2?, **9**, **11**, 15?, 21?, 25, 27, 31?, 34?, 40?, 43?, 44?, 47?, 48

26. Pods, shape
a. (flattened) ellipsoid: 1, 2, 3, 4, **5**, **6**, 7, 12, 13?, **14**, 15, **16**, 17, 18, 19, 20?, 22, 23, **24**, 26, 27, 28, **30**, 31, 33, 34, 36, 37, **38**, 39, 40?, 41, **42**, 43, **44**, 45, 46
b. flattened ovoid or flattened obovoid: **5**, **6**, 13?, 20?, **24**, **38**, 40?, **44**
c. (broadly) strap-shaped: **5**, 8, 9, 10, 11, 13?, **16**, 20?, 21, 29, **30**, 32, 40?, 47, 48
d. discoid: 13?, **14**, 20?, 40?, **42**
e. flattened cylindrical: 13?, 20?, 25, 40?
f. ± S-shaped: 13?, 20?, 35, 40?

27. Pods, indumentum
Note — The pods of most species have two kinds of indumentum consisting of irritating and non-irritating hairs, resp. For the key only the non-irritating hairs are mentioned, rarely there are only (very) few non-irritating hairs present. Very old pods may be almost totally glabrous.
a. (thinly) sericeous: 1, 2, 6, 13?, 16, 20?, **22**, 23, 24, 25, 28, 29, 30, 32, 33, 35, **36**, 40?, **43**, **44**, **48**
b. puberulous: 3, 4, 5, 12, 13?, 14, 15, 17, 19, 20?, 21, **22**, 26, 27, 34, 38, 39, 40?, 41, **43**, **44**, 45, **47**, **48**
c. few non-irritating hairs: 9, 13?, 18, 20?, 37, 40?, 42, 46?
d. velutinous or villous: 8, 11, 13?, 20?, 40?, **47**
e. pubescent: 7, 10, 13?, 20?, 31, 40?, 46
f. (thinly) hirsute: 13?, 20?, **36**, 40?, **43**

28. Pods, wings
a. not winged along sutures: 7?, 8, 11, 13?, 20?, 21, 25, 31, 32, 35, 40?
b. winged along sutures: 1, 2, 3, 4, 5, 6, 7?, 9, 10, 12, 13?, 14, 15, 16, 17, 18, 19, 20?, 22, 23, 24, 26, 27, 28, 29, 30, 33, 34, 36, 37, 38, 39, 40?, 41, 42, 43, 44, 45, 46, 47, 48

29. Pods, ornamentation of valves (hairs excluded)
a. smooth: 8, 9, 13?, **16**, 20?, 21, 24, 32, 39, 40?, 46
b. reticulately lamellate: 13?, 20?, 36, 40?
c. (inconspicuous) reticulate veined: 1, 13?, **16**, 20?, 28, 40?, **48**
d. (irregular) transverse to diagonal lamellate: 2, 3, 4, 5, 6, 7, 10, 12, 13?, 14, 15, 17, 18, 19, 20?, 22, 23, 26, 29, 30, 33, 34, 37, 38, 40?, 41, 42, 43, 45, 47, **48**
e. longitudinal lamellate: 13?, 20?, 27, 40?, 45
f. (inconspicuous) longitudinal ribs or ridges: 11, 13?, 20?, 31, 35, 40?
g. longitudinally wrinkled: 13?, 20?, 25, 40?, 44

30. Lamellae, if present
a. bifurcate at apex (T-shaped): 6, **12**, 13?, 20?, 34, 40?
b. not bifurcate at apex: 1, 2, 3, 4, 5, 7, 10, 11, **12**, 13?, 14, 15, 17, 18, 19, 20?, 22, 23, 26, 27, 29, 30, 33, 36, 37, 38, 40?, 41, 42, 43, 45, 47, 48

31. Seeds, shape
a. (flattened) discoid: **1**, **2**, 3, 4?, 5, **6**, 7, 9, 10, 11, **12**, 13?, 14, **16**, 19, 20?, 21, 22, 23, **25**, 26, 27, 28, 29, 30, 31, 33, **36**, 37, **38**, 39?, 40?, 41, **42**, 43, 44, 45?, 46?, 47?, 48?
b. (flattened) ellipsoid: 4?, 8, 13?, 17, 20?, 24, **25**, 34, 39?, 40?, **42**, 45?, 46?, 47?, 48?
c. (flattened) ovoid: **1**, **2**, 4?, **6**, 13?, 20?, 39?, 40?, 45?, 46?, 47?, 48?
d. bean-shaped, reniform, heart-shaped: **12**, 13?, **16**, 20?, 32, 35, **38**, 39?, 40?, 45?, 46?, 47?, 48?
e. globular or orbicular: 4?, 13?, 15, 18, 20?, **25**, 39?, 40?, 45?, 46?, 47?, 48?
f. quadrangular (cuboid): 4?, 13?, 20?, **36**, 39?, 40?, 45?, 46?, 47?, 48?

32. Seeds, length
a. 7–20 mm: 1, **2**, 3, 4?, **6**, 7, 8, **10**, 11, **12**, 13?, **14**, 15, **16**, **17**, 18, 19, 20?, 21, **24**, 26, 29, 32, **34**, 35, **36**, 37, **38**, 40?, 41, **42**, 43, 45?, 46?, 47?, 48?
b. 21–36 mm: **2**, 4?, 5, **6**, 9?, **10**, **12**, 13?, **14**, **16**, **17**, 20?, 22, 23, **24**, 25, 27, 28, 31, 33, **34**, **36**, **38**, 39, 40?, **42**, 44, 45?, 46?, 47?, 48?
c. 37–47 mm: 4?, 13?, **16**, 20?, 30, 40?, 45?, 46?, 47?, 48?

33. Seeds, length of hilum
a. 4–10 mm: 4?, 7?, 8, 11, 13?, 17?, 18?, 20?, 23?, 31?, 32, 35, 39?, 40?, 45?, 46?, 47?, 48?
b. 15–49 mm: 1, 2, 3, 4?, 7?, 10, **12**, 13?, 15, 17?, 18?, 19, 20?, 21, 23?, 24, 26, 27, 28, 29, 31?, **34**, 37, 38, 39?, 40?, 41, 42, 43, 45?, 46?, 47?, 48?
c. 50–80 mm: 4?, 5, 6, 7?, 9, **12**, 13?, 14, 16, 17?, 18?, 20?, 22, 23, 25, 30, 31?, 33, **34**, 36, 39?, 40?, 44, 45?, 46?, 47?, 48?

34. Seeds, length of hilum/circumference of seed
a. 1/8–1/3: 4?, 8, 11, 13?, 17?, 20?, 27, 32, 35, 39?, 40?, 45?, 46?, 47?, 48?
b. 1/2–9/10: 1, 2, 3, 4?, 5, 6, 7, 9, 10, 12, 13?, 14, 15, 16, 17?, 18, 19, 20?, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34, 36, 37, 38, 39?, 40?, 41, 42, 43, 44, 45?, 46?, 47?, 48?

35. Altitude (m asl)
a. up to 150 m: **1**, **5**, **6**, **7**, 12, 13?, **14**, **16**, 17, 18?, 19, 20?, 21?, 22?, **24**, **26**, 28, **29**, **30**, 31?, **32**, **33**, 34?, **35**, **36**, 37, 38, **39**, **40**, **41**, 42, 47?, 48
b. 150–1100 m: **1**, 3, **5**, **6**, **7**, **8**, **9**, **11**, 13?, **14**, **15**, **16**, 18?, 20?, 21?, 22?, 23, **24**, 25, **26**, 27, **29**, **30**, 31?, **32**, **33**, 34?, **35**, **36**, **39**, **40**, **41**, 43, 44, **45**, **46**, 47?
c. 1100–2100 m: **1**, 4, **8**, **9**, 10, **11**, 13?, **15**, 18?, 21?, 22?, **26**, **29**, **30**, 31?, 34?, **35**, **39**, **41**, **45**, **46**, 47?
d. > 2100 m: 2, 13?, 18?, 21?, 22?, 34?, 47?

36. Distribution
a. Peninsular Malaysia: **1**, **6**, **16**, 42
b. Singapore: **1**, **16**
c. Sumatra: **1**, **6**, 8, **16**, **26**, **35**
d. Java: **1**, **11**, **16**, **26**, **33** (Christmas Island), **35**
e. Borneo: **6**, 14, **16**, 18, **35**, 46
f. Philippines: 3, 4, 10, 12, **16**, 17, 25, 28, 31, 34, **35**, **36**, 38, **40**
g. Celebes: **5**, **11**, **16**, 20, **33**, **35**, **36**
h. Lesser Sunda Islands: **1**, **11**, **16**, 21, 23, **26**, **33**, **35**, **40**, 44
i. Moluccas: **5**, **16**, 22, **29**, **30**, **33**, **35**, 37
j. New Guinea: 2, **5**, 7, 9, 13, 15, **16**, 19, 24, 27, **29**, **30**, 32, **33**, **35**, 39, 41, 43, 45, 47, 48

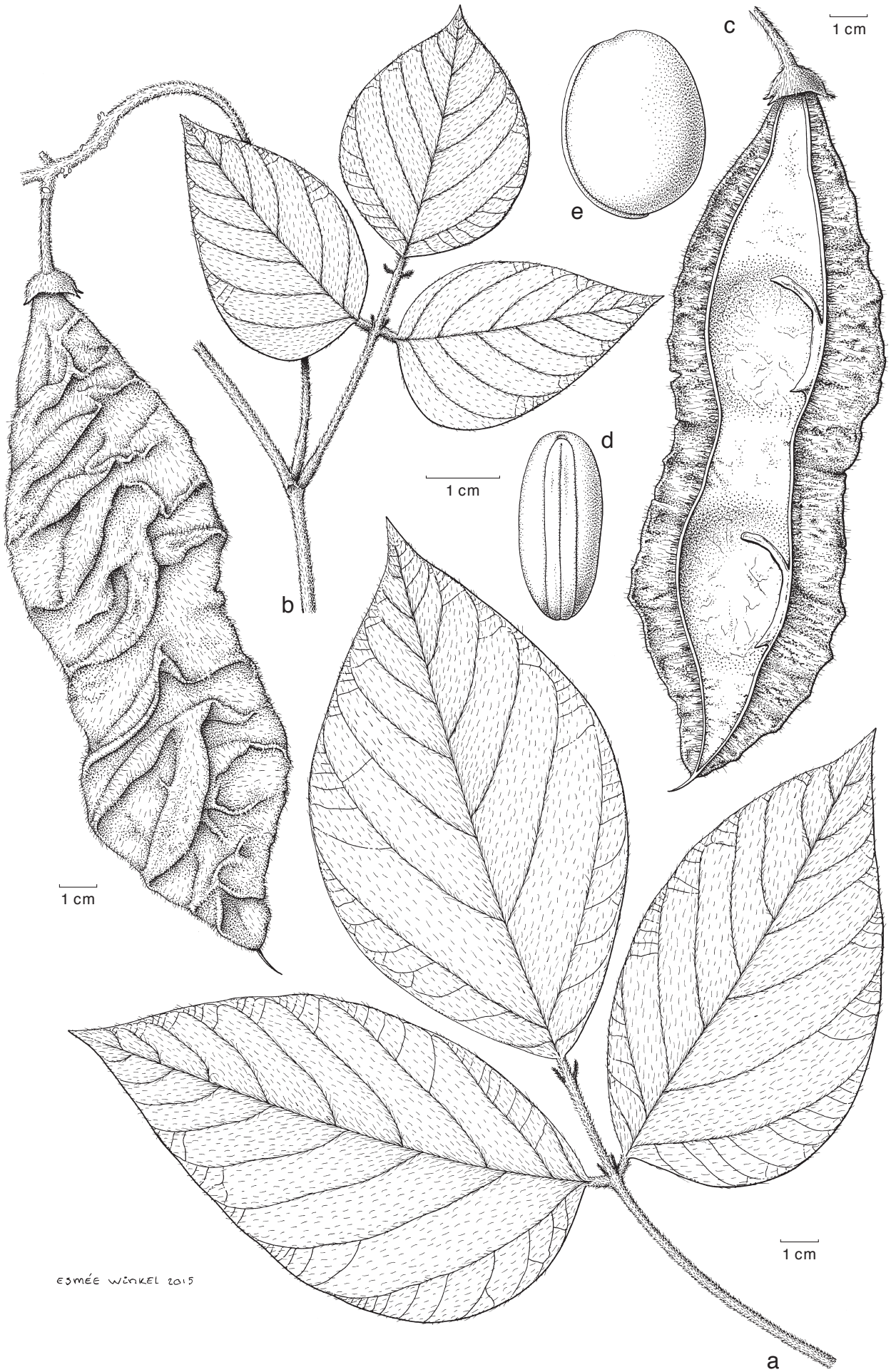

Fig. 1 *Mucuna aimun* Wiriad. a. Leaf; b. piece of twig with a leaf and a part of an infructescence; c. pod from inside; d. seed, top view; e. seed lateral view (all: *ANU 2606* (*Flenley*)). — Drawing Esmée Winkel.

ENUMERATION OF SPECIES

1. *Mucuna acuminata* Graham ex Baker

Mucuna acuminata Graham ex Baker (1879) 185; Prain (1897a) 67; Ridl. (1922) 577; Backer & Bakh.f. (1964) 630; Wilmot-Dear (1992) 214. — Type: *Wall. Cat 5621* (K-Wall, BM, K), Penang, 1822.
Mucuna lucidula Burck (1893) 190. — Type: *Beccari PS 621* (K, L), Sumatra, Ajer Mantjoer.

Distribution — *Malesia*: Peninsular Malaysia; Singapore; Sumatra; Java; Lesser Sunda Islands: Bali, Flores.

Habitat & Ecology — Primary and secondary forest, watersides, shrubbery, hedges, edges of sugarcane fields. Altitude up to 1400 m. Flowering: January, February, July, August, December; fruiting: January, February, May to August.

Note — The inflorescence is basically a pseudoraceme with (few) brachyblasts clustered at the apex of the rachis with 3 flowers at the apex of the brachyblasts. The whole looks like an umbel. The calyx is in bud more or less cylindrical or urn-shaped, when the corolla starts to expand the calyx widens and gets pushed backwards, finally the calyx is campanulate and tucked up. Ripe pods are mostly glabrous except for the wings, the irritant hairs are present at the wings for a long time.

2. *Mucuna aimun* Wiriad., *sp. nov.* — Fig. 1

Twigs ferruginous tomentose. Petioles 4–8 cm long, rachis 1–3 cm long. Leaflets elliptic or ovate, 6.5–15 by 4–9.5 cm, above ferruginous sericeous to velutinous. Inflorescences pseudoracemes, 15–16 cm long. Calyx campanulate, 11–12 mm long, tube c. 5 mm long. Pods 18 by 3 cm, wings 12–25 mm wide, valves with irregular, transverse lamellae. Seeds 20–25 by 18–27 by 10–12.4 mm. — Type: *ANU 2606 (Flenley)* (holo L; iso LAE), W Highlands Prov., Wabag, Ecological site 11, near Yogonda, 1/4 mile W of R. Lai.

Liana to 4 m long. *Twigs* terete, 3–5 mm diam, ferruginous sericeous to velutinous (see Note). *Stipules* narrowly ovate, c. 21 by 2.5 mm, outside sericeous, inside glabrous. *Petioles* 4–8 cm long, terete, ferruginous sericeous; rachis mostly as the petiole 1–3 cm long; pulvinus 8–13 mm long. *Stipellae* acicular, 4–6 by 0.2–0.3 mm, hirsute or ± sericeous. *Leaflets*: terminal elliptic or ovate, 6.5–15 by 4–9.5 cm, index 1.3–1.9, base acute to rounded, apex acuminate, acumen 6–11 mm long, above sericeous, below sericeous to velutinous, midrib and nerves slightly raised above, nerves 5–7 per side, 8–30 mm apart, anastomosing near the margin; lateral mostly as the terminal 7–13 by 4–6.5 cm; pulvinus 5–8 mm long. *Inflorescences* axillary, pseudoracemes, 15–16 cm long, peduncle 13.5 cm long, ferruginous sericeous to velutinous. *Bracts* to the brachyblasts ovate, 20–25 by 5–11 mm, outside sericeous, inside thinly sericeous. *Brachyblasts* in fruit 2.5–3 mm long. *Bracts* to the flowers narrowly ovate, 20–26 by 5–10 mm, outside sericeous, inside thinly sericeous. *Pedicels* c. 2 cm long (in fruit). *Bracteoles* narrowly ovate, 20–21 by 2.5–3 mm, both sides sericeous. *Calyx* campanulate, 11–12 mm long, tube c. 5 mm long; upper lip triangular, 3 mm long, lateral teeth triangular, 5 mm long, median tooth triangular, 6–7 mm long; outside pubescent and with scattered irritating hairs. Corolla (only immature ones seen). *Pods* flattened ellipsoid, 18 by 3 cm, sericeous and with irritating hairs, sutures winged, upper wing 15–25 mm wide, lower one 12 mm wide, with irregular transverse lamellae, lamellae interrupted, overlapping in the middle, 8–10 mm high. *Seeds* flattened ovoid or discoid, 20–25 by 18–27 by 10–12.4 mm; hilum 32–33 mm long, 0.45 of the circumference.

Distribution — *Malesia*: Papua New Guinea: W Highlands Prov.

Habitat & Ecology — Mountain rain forest, with good drainage. Altitude 2750–2900 m. Flowering September; fruiting March.

Uses — Seeds eaten.

Specimens seen. Papua New Guinea, W Highlands Prov., Wabag, Ecological site 11, near Yogonda, 1/4 mile W of R. Lai, alt. 2750 m, *ANU 2606 (Flenley)*, 11 Mar. 1965; W Highlands Prov., near Sirunki, alt. 2900 m, *ANU 909 (Walker)*, 19 Sept. 1962; E Highlands Prov., Kainantu Subprov., Aiyura, alt. 1500 m, *NGF 19030 (Womersley)*, 8 Sept. 1963.

Note — Hairs tend to be patent, longest ones 1–2.5 mm long. In vegetative characters *M. aimun* resembles *M. mollissima*, *M. platyphylla*, *M. tomentosa* and *M. verdcourtii*. From these species it differs in pod and seed characters.

3. *Mucuna angustifolia* Adema, *sp. nov.* — Fig. 2

Liana up to 8 m high. Leaflets narrowly ovate, rarely elliptic, 5.7–11.6 by 1.3–3.9 cm, index 2.6–4.4. Inflorescences axillary, rarely terminal, pseudoracemes, 90–105 cm long, peduncle 75–84 cm long. Pedicels 30–35 mm long. Keel petals 44–46 mm long. Ovules 3–4. — Type: *Ridsdale & Reynoso 1420* (holo L), Philippines, Luzon, Zambales, Santa Cruz, Acoje Mine concession area, ultrabasic, 23 May 1986.

Liana up to 8 m. *Twigs* terete, striate, 1–3 mm diam, glabrous to very thinly sericeous. *Stipules* narrowly elliptic, 3–4 by 0.6–0.7 mm, outside with few appressed hairs, inside glabrous, caducous. *Petioles* 3–6 cm long, ± grooved, glabrous or with few scattered appressed hairs; rachis mostly as the petiole, 0.8–2 cm long; pulvinus 4–8 mm long. *Stipellae* acicular, 2.4–4.8 by 0.1–0.3 mm, glabrous or with few appressed hairs. *Leaflets*: terminal narrowly ovate, rarely elliptic, 5.8–11.6 by 1.3–3.9 cm, index 2.6–4.4, base cuneate or rounded, apex acuminate, acumen 3–15 mm long, above glabrous or with few appressed hairs, below glabrous or with few appressed hairs mainly at midrib, midrib and nerves raised above, nerves 4–7 per side, 3–31 mm apart, anastomosing near the margin; lateral mostly as the terminal, obliquely narrowly ovate, 5.7–11.6 by 1.4–4 cm; pulvinus 2–6 mm long. *Inflorescences* axillary, rarely terminal, pseudoracemes, 90–105 cm long, peduncle 75–84 cm long, peduncle mostly glabrous, upwards sericeous, flowering part densely sericeous. *Bracts* to the brachyblasts ovate, 32–37 by 15–20 mm, outside (thinly) sericeous, inside thinly sericeous, caducous. *Brachyblasts* 2–9 mm long, sericeous. *Bracts* to the flowers ovate or elliptic, 19–22 by 6–11 mm, both sides thinly sericeous, caducous. *Pedicels* 30–35 mm long, sericeous. *Bracteoles* elliptic or narrowly obovate, 17.5–22 by 2.5–6 mm, both sides thinly sericeous, caducous. *Calyx* 14 mm long, tube 7–10 mm long; upper lip triangular or semicircular, 2–14 by 14–34 mm, lateral teeth triangular, 2.5–5 by 4–6 mm, median tooth triangular, 5–7 by 6–7 mm; outside sericeous and with irritating hairs, inside sericeous. Corolla pale green. *Standard*: claw 3–4 mm long, glabrous; blade broadly ovate or broadly elliptic, 22–26 by 18–23 mm, bidentate, auricle 1 mm long, outside glabrous or with few appressed hairs in basal part, inside glabrous. *Wings*: claw 5–6 mm long, outside sericeous along both margins, ciliate along both margins, inside sericeous along both margins; blade elliptic, 35–38 by 8–13 mm, rounded, auricles 3 mm long, lateral pocket 6–8 mm long, outside sericeous between claw and auricle, at auricle and just above, ciliate along lower margin in lower 1/4–1/3, inside glabrous. *Keel petals*: claw 7–8 mm long, glabrous; blade ± boat-shaped, 37–38 by 8–12 mm, acute, auricles 1 mm long, lateral pocket 7–8 mm long, hard part 7 mm long, both sides glabrous, short-ciliate along upper margin. *Stamens* 44–45 mm long, tube 30–37 mm long, free part of filaments below versatile anthers 8–10 mm long, below basifixed ones 7–8 mm long, glabrous; versatile anthers 1.5 by 0.5 mm, with few hairs at the base, basifixed anthers 2.6 by 0.4 mm, outside with some appressed hairs in basal part. *Disc* 0.8–0.9 mm high, glabrous. *Ovary* 6–8 mm long, sericeous, stipe c. 1 mm long, sericeous; ovules 3–4; style 42–43 mm long, sericeous at base, thinning upwards, apical part glabrous. *Pods* flattened ellipsoid, 13 by 3 cm, upper wing 5 mm wide, lower wing 3 mm wide, lamellae

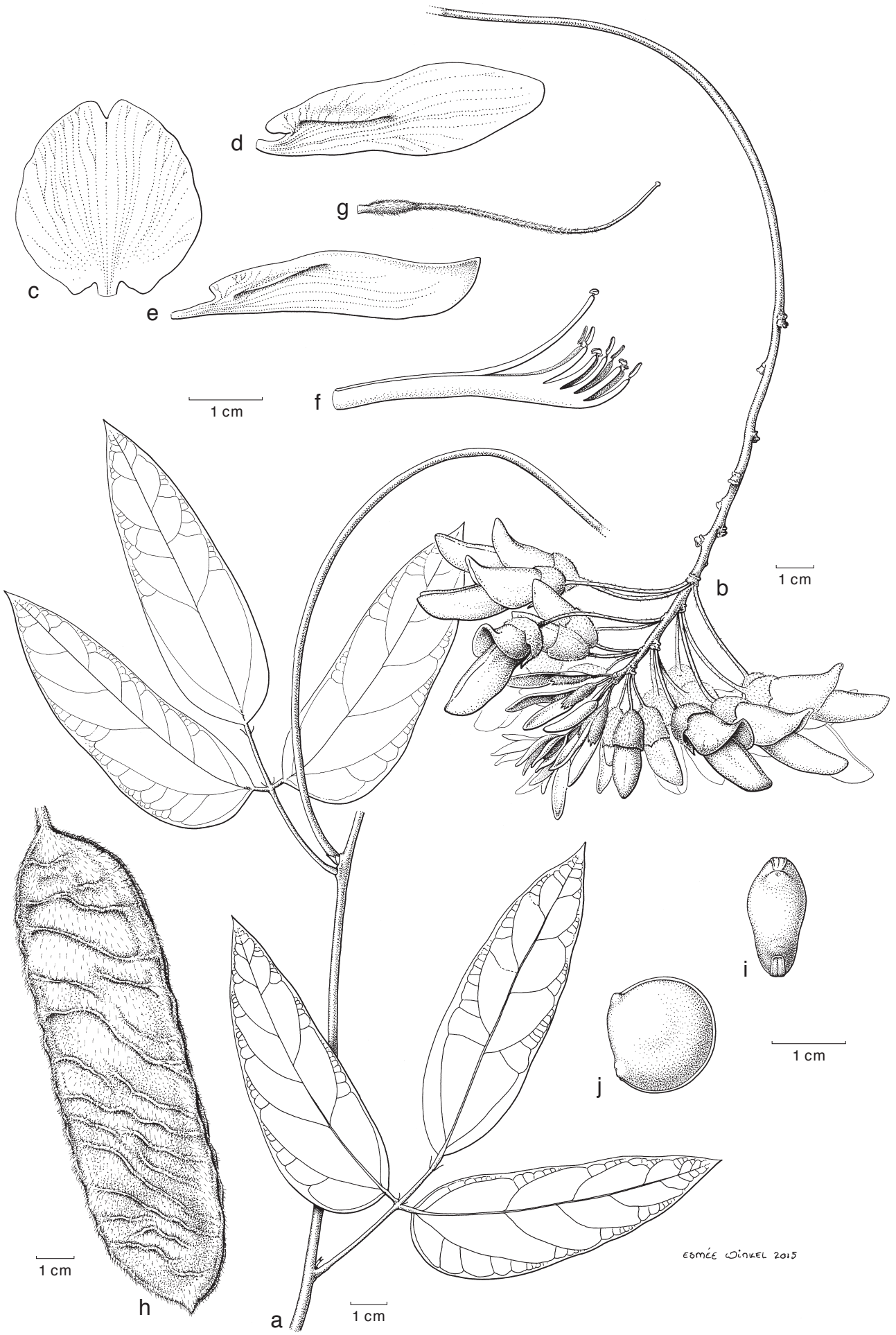

Fig. 2 *Mucuna angustifolia* Adema. a. Twig with lower part of inflorescence; b. upper part of inflorescence; c. standard; d. wing petal; e. keel petal; f. stamens; g. ovary; h. pod; i. seed, top view; j. seed, lateral view (all: *Ridsdale & Reynoso 1420*). — Drawing Esmée Winkel.

oblique, 2 mm high, valves ± puberulous and with irritating hairs. *Seeds* discoid, 16 by 15 by 8.1 mm; hilum 41 mm long, c. 3/4 of the circumference.

Distribution — *Malesia*: Philippines: Luzon, Zambales Prov.

Habitat & Ecology — Secondary forest. Soil: ultrabasic. Altitude up to 200 m. Flowering: May, November; fruiting May.

Specimens seen. Philippines, Luzon, Zambales Prov., Mansinlok Mine, on road to Bontak, *Argent et al. 99290*; Luzon, Zambales Prov., Santa Cruz, Acoje Mine concession area, *Ridsdale & Reynoso 1420*, *1546*.

Note — In many aspects rather similar to *M. curranii*. The new species differs especially in the narrower leaflets (index: 2.6–4.4, in *M. curranii* 2.1–2.2); the inflorescence with a longer peduncle, longer pedicels and smaller flowers (44–66 mm long, in *M. curranii* 69–80 mm long), the indumentum of the corolla parts and the number of ovules (3–4, in *M. curranii* 4–7). According to the fields notes the colour of the corolla is pale green in the new species and whitish in *M. curranii*. The new species is recorded from ultrabasic at c. 200 m, while *M. curranii* is found on limestone at 1300–2200 m.

4. *Mucuna aurea* C.B.Rob.

Mucuna aurea C.B.Rob. (1908) 183; Merr. (1910) 118; (1923) 307; Wilmot-Dear (1991b) 229. — Type: *Williams 1292* (holo NY; iso K, PNH, US), Philippines, Luzon, Prov. Benguet, Baguio.

Distribution — *Malesia*: Philippines: Luzon.

Habitat & Ecology — Thickets. Altitude c. 1650 m. Flowering: July, November, December; fruiting: March.

Note — This species is remarkable in its golden yellowish calyx indumentum. H.C. Conklin & Buwaya (*PNH 79648*) give the flower colour as red, however, the duplicates of this specimen in K and L lack flowers. *Mucuna aurea* is very similar to *M. platyphylla* differing mainly in the somewhat smaller flowers and slightly larger pods. The flower colour of *M. aurea* is recorded as red, while *M. platyphylla* has white to green or yellowish flowers. *Mucuna platyphylla* is up to now not found in the Philippines. According to the original description the flowers occur singly or in pairs. However, the few specimens seen all have brachyblasts with three scars, so presumably there have been three flowers, as is normally found in *Mucuna*.

5. *Mucuna bennettii* F.Muell.

Mucuna bennettii F.Muell. (1876) 63; Verdc. (1979) 439; Wilmot-Dear (1990) 32. — Type: *D'Albertis s.n.* (A n.v.), Papua New Guinea, Fly river.
Mucuna miniata Merr. (1917a) 278; [*Parrana miniata* Rumph. (1747) 10]. — Type: *Robinson Pl. Rumph. Ambon. 566* (A, K, L, NY), Moluccas, Ambon, between Paso and Roema Tiga.
Mucuna elegans Merr. & L.M.Perry (1942) 406; Verdc. (1979) 442. — Type: *Brass 2734* (BISH, L), Solomon Isl., San Cristoval Isl., Magona river.
Mucuna warburgii auct. non K.Schum. & Lauterb.: Verdc. (1979) 457, p.p.; Wilmot-Dear (1992) 243.

Distribution — *Malesia*: Celebes; Moluccas; New Guinea; Solomon Islands; New Hebrides: Vanuatu.

Habitat & Ecology — Primary or secondary, or depleted forests, often along rivers, swamp forest, sago swamps, fresh water swamp behind the beach. Altitude up to 400 m. Soil: limestone, clay. Flowering: April to October, December; fruiting: March, April, October.

Note — *Brass 5724*, a flowering specimen, was collected between January and March. Calyx in bud ± cylindrical, when the flower expand it becomes campanulate, but not tucked up. Three fruiting specimens have been included in the present description: *Van Balgooy 6500* from Aru Islands, fruit collected from underneath a flowering specimen of *M. bennettii*; *Prawiroadmodjo & Maskuri 1541* from Celebes, originally identified as *M. elegans*; *Sands 1211* from PNG, W Sepik Prov. The fruits of these specimens are all rather similar differing only in length. The vegetative parts of the last two specimens agree very well with the description of *M. bennettii*. *Jeswiet 145*: Pedicels sometimes swollen, probably some kind of gall. Specimens from the Moluccas (originally *M. miniata*) and the Solomon Islands (originally *M. elegans*) have usually slightly smaller flowers. In other characters no differences were found. *Mucuna warburgii* was described with stipellae. Here we include the specimens identified as *M. warburgii*, but lacking stipellae.

6. *Mucuna biplicata* Teijsm. & Binn. ex Kurz

Mucuna biplicata Teijsm. & Binn. ex Kurz (1874) 186; Burck (1893) 186, pl. 14, f. 1; Prain (1897a) 66; Ridl. (1922) 576; Wilmot-Dear (1992) 228. — Type: *Teijsmann & Binnendijk s.n.* (BO), cult. in Hort. Bot. Bogor. (originally from Borneo).
Mucuna anguina auct. non Wall.: Scheff. (1872) 413.

Distribution — *Malesia*: Sumatra; Peninsular Malaysia; Borneo.

Habitat & Ecology — Primary, secondary or disturbed forests, often along rivers, riverbanks, belukar. Soil: limestone, red soil, yellow sandy clay, loam, sand. Altitude up to 600 m. Flowering: January, February, May to August, October, December; fruiting: January, February, April, June to August, November, December.

Uses — Exudate is used for healing cuts and wounds; internally it is used for curing diarrhoea.

Note — The horizontal part of the lamellae is 1–4 mm wide. Vegetatively resembling *M. toppingii*. However, *M. biplicata* differs from the latter in the inflorescences and fruits. Also closely resembling *M. acuminata*. From this species it differs in the obscure calyx teeth and the oblique bifurcate lamellae interrupted in the middle. *Mucuna acuminata* has developed calyx teeth and ± smooth pods. *Lörzing 12877*: One of the pods with lamellae and wings broadly fimbriate, lamellae not bifurcate. The specimen *SAN 81200* probably belongs here, however, the label gives the flower colour as 'pinkish'.

7. *Mucuna brachycarpa* Rech.

Mucuna brachycarpa Rech. (1913) 562; Verdc. (1978a) 459; (1979) 439, pl. A, f. 106C; Wilmot-Dear (1990) 11. — Type: *Rechinger 4807* (W n.v.), Bougainville, Kieta.

Distribution — *Malesia*: Papua New Guinea: Bougainville; Solomon Islands; Fiji.

Habitat & Ecology — Old secondary forest, along creeks, in swamp forest. Altitude up to 600 m. Flowering: April to November.

Note — The original description was based on a single pod. According to Verdcourt (1979) the common yellow-flowered *Mucuna* of the Solomons most probably belongs to the same species. Merrill & Perry (1942: 405) associated the pod with a specimen collected by Brass on Bougainville (*Brass 3514* n.v.). This specimen is the type of *M. subumbellata*. Wilmot-Dear (1990) notes that two specimens from Santa Ysabel (*BSIP 2245*) and Guadalcanal (*R 55613*) should be included here. Verdcourt (1978a: 459) mentioned these specimens as 'Sp. C'. The description of the pods and seeds were taken from the description by Wilmot-Dear (1990).

8. *Mucuna bracteata* Roxb. ex Kurz

Mucuna bracteata Roxb. ex Kurz (1873) 231; [*Carpopogon bracteatum* Roxb. (1814) 54, nom. nud.]; Wilmot-Dear (1984) 59. — Type: *J. Roxburgh s.n.* (n.v.), India, Chittagong.

Distribution — India, Burma, China (Yunnan), Thailand, Laos, Vietnam; *Malesia*: Sumatra.

Habitat & Ecology — Forest, thickets, open grasslands, along paths and streams. Altitude 600–2000 m. Flowering: January, July, November, December; fruiting: February, May, October.

Note — Wilmot-Dear (1984) gives 2 flowers per brachyblast. However, the structure of the inflorescence is a bit more complicated. Often there are two or three flowers at the top of a brachyblast, but sometimes the brachyblasts are slightly longer with one flower at the base and two or three flowers at the top of a very short lateral branch. The whole inflorescence than looks a bit like a mix of a pseudoraceme and a pseudopanicle. According to Wilmot-Dear (1984) De Candolle is the author of the epithet of this species. However, De Candolle (1825: 406) did not describe or name the species. He only placed Roxburgh's name for an Indian plant in *Mucuna*. Kurz (1873) was the first to describe this species attributing the species name to Roxburgh. Roxburgh (1814) cites as 'donor' of the specimen J.R. (= James Roxburgh) and as place of collection Chittagong. Bracts and bracteoles are mostly caducous, however, some of the basal sterile bracts may be still present when fruiting. Young pods are ± S-shaped, mature pods are nearly straight.

9. *Mucuna canaliculata* Verdc.

Mucuna canaliculata Verdc. (1978a) 460; (1979) 440. — Type: *NGF 35864 (Streimann)* (BULOLO, CANB, K, L, LAE), Papua New Guinea, Morobe Prov., Wau Subprov., Upper Watut, Minnoa Creek.

Distribution — *Malesia*: Papua New Guinea: Morobe, W Highlands, Western Prov.

Habitat & Ecology — Foothill, montane or Castanopsis forest, swamp forest. Altitude (3 m, see Note) 1000–1600 m. Flowering: April, November; fruiting: June, September, October.

Note — The indumentum of the pods mainly consists of irritating hairs. The specimen *NGF 18443* from Western Prov. was collected at an altitude of 3 m much lower than all other specimens. *NGF 22604* from Morobe Prov. lacks stipellae and differs slightly in the size of the flower parts.

10. *Mucuna curranii* Elmer

Mucuna curranii Elmer (1907) 230; Merr. (1910) 116; (1923) 308; Wilmot-Dear (1991b) 231. — Type: *Elmer 8442* (A, BO, F, K, L, NY, PNH†), Luzon, Benguet, Baguio.

Distribution — *Malesia*: Philippines: Luzon.

Habitat & Ecology — Soil: limestone. Altitude 1600 m. Flowering: January to March, December; fruiting: March to July. Altitude 1300–2200 m. According to Merrill (1923: 308) in ravines and thickets.

Note — Closely resembling *M. longipedunculata* from which it differs in pod characters: flattened with wings along the sutures and oblique lamellae in *M. curranii*, almost cylindrical, without wings and lamellae in *M. longipedunculata*. The type specimen (*Elmer 8442*) is probably a fruiting specimen. To the Kew and Leiden duplicates some (dissected) flowers are added, may be from another specimen.

11. *Mucuna diabolica* Backer

Mucuna diabolica Backer in Keuchenius (1924) 33; K.Heyne (1927) 824; Backer & Bakh.f. (1964) 629. — Neotype (here designated by Adema): *Backer 2487* (L2054767), Java, Besoeki, N-helling van de Idjen boven Bajeman, 600–700 m, 18 June 1918.
Stizolobium forbesii Piper (1917) 61. — *Mucuna forbesii* (Piper) Backer (1945) 515. — Type: *Forbes 3320B* (K), Timor laut, Nov. 1883.

Distribution — *Malesia*: Java; Celebes; Lesser Sunda Islands: Sumbawa, Flores, Lombok, Alor, Timor.

Habitat & Ecology — Forest, monsoon forest, shrubbery, village margin. Soil: clay, loam. Altitude 150–1200 m. Flowering: March, May to July; fruiting: June, August.

Note — Young pods are ± S-shaped, mature ones are nearly straight. When Backer described *M. diabolica* he was unaware of the earlier published name *Stizolobium forbesii* Piper. Later he probably found this name and in 1945 he made a new combination for the species as *M. forbesii* (Piper) Backer. However, he clearly missed the name *M. forbesii* Baker f. (see *M. platyphylla*) which was published in 1923. At the moment Backer transferred *Stizolobium forbesii* Piper to *Mucuna* there was already *M. forbesii* Baker f. blocking the use of Piper's epithet in *Mucuna* and the species has to be called *M. diabolica*. In Backer's original description of *M. diabolica* no specimens were cited. In L there is only one specimen collected by Backer on Java available. This specimen is selected as neotype.

12. *Mucuna diplax* Wilmot-Dear

Mucuna diplax Wilmot-Dear (1991b) 240, f. 11, map 4. — Type: *Williams 231* (holo NY; iso A, K, NY, US).
Negretia urens Blanco (1837) 586; (1845) 409; (1879) 387, nom. illeg., non Tussac. — Neotype (here designated): *Merrill Sp. Blanc. 779* (holo L; iso K), Luzon, Rizal Prov., San Mateo.
Mucuna monosperma auct. non Wight: Fern.-Vill. (1880) 63.
Mucuna imbricata auct. non Baker: Merr. (1905a) 38; (1906) 67.
Mucuna nigricans auct. non (Lour.) Steud.: Merr. (1910) 116; (1918) 187.

Distribution — *Malesia*: Philippines: Luzon, Polillo, Mindoro.

Habitat & Ecology — Forest, riverside regrowth. Altitude up to 70 m. Flowering: January, December; fruiting: February.

Note — According to Wilmot-Dear (1991b) the patch of hairs at the outside of the standard reaches higher than the upper lip of the calyx. The L duplicate of *Merrill Spec. Blanc. 779* has only some scattered hairs visible above the calyx rim. The horizontal part of the lamellae is 2 mm wide.

13. *Mucuna discolor* Merr. & L.M.Perry

Mucuna discolor Merr. & L.M.Perry (1942) 405; Verdc. (1979) 442. — Type: *Brass 3901* (holo A?; iso BO, NY), Papua New Guinea, Dieni, Ononge road.

Distribution — *Malesia*: Papua New Guinea: Central Prov.

Habitat & Ecology — Secondary bushes, roadsides. Flowering: April.

Note — Only known from the type collection. According to the label the leaflets are purple below. The flowering part of the inflorescences is rather short, in the shortest inflorescence ± 'pseudo-umbellate'.

14. *Mucuna elmeri* Merr.

Mucuna elmeri Merr. (1929) 108. — Type: *Elmer 20416* (C, K, L, NY, P), Borneo, Sabah, near Tawao.
Mucuna monosperma auct. non Wight: Miq. (1855) 214; Craib (1928) 44, p.p.

Distribution — *Malesia*: Borneo.

Habitat & Ecology — Primary or disturbed forest along rivers. Altitude up to 1000 m. Flowering: February, May, June, August, October; fruiting: January, February, June, September, October.

Uses — The sap is used against mouth ulcers.

Note — Distinct from most other *Mucuna* species by having only 1 ovule and 1 seed. In the upper part of the valves of the pods the lamellae are often inconspicuous or even absent. *S 46210 (Yii & Othman)* probably belongs here, however, the flower colour is given as yellow.

15. *Mucuna eurylamellata* Adema, *sp. nov.* — Fig. 3

Twigs tomentose. Petioles 23–45 mm long, tomentose, rachis 10–18 mm long, tomentose. Longest hairs on twigs 1.0–2.0 mm long, on petiole and rachis 2.5 mm long. Pods c. 9.5 by 2.5 cm, upper wing 15–20 mm wide, lower wing 14–17 mm wide, lamellae oblique c. 22 mm high. Seeds ± globular, 18–20 by 19–20 by 14.4 mm. — Type: *LAE 60525 (Croft & Lelean)* (holo L; iso K), Papua New Guinea, Central Prov., Port Moresby subprov., SW slope Lake Myola No.1, 1900 m.

Liana up to 3.5 m. *Twigs* terete, 2–3 mm diam, tomentose (see Note). *Stipules* ovate, c. 7 by 3 mm, outside sericeous, inside glabrous, caducous. *Petioles* 23–45 mm long, ± terete, tomentose (see Note); rachis mostly as the petiole, 10–18 mm long; pulvinus 4–8 mm long. *Stipellae* acicular, 6–8 by 0.3–0.4 mm, ± sericeous. *Leaflets*: terminal broadly elliptic, obovate or ± orbicular, 6–10 by 4.5–6.5 cm, index 1.2–1.4, base rounded, apex acuminate, acumen 3–6 mm long, above with scattered appressed hairs, midrib and nerves sericeous, below velutinous, midrib and nerves sericeous, sometimes with some very long hairs, midrib raised above, nerves flat or raised above, 3–5 per side, 9–25 mm apart, anastomosing close to the margin; lateral mostly as the terminal, obliquely ovate, 4.5–8.0 by 3.0–5.0 cm, index 1.5–1.7; pulvinus 4–5 mm long. *Inflorescences* axillary, pseudoracemes, 2–12 cm long, peduncle 0.5–2.5 cm long, tomentose. *Brachyblasts* in fruit c. 15 mm long. *Bracts* to the flowers ovate, c. 16 by 8 mm, outside sericeous and with some irritating hairs, inside with some hairs at the base. *Pedicel* in fruit c. 23 mm long. *Bracteoles* narrowly ovate, c. 14 by 5 mm, outside sericeous, inside glabrous. Corolla greenish white. *Pods* flattened ellipsoid, c. 9.5 by 2.5 cm, stipe 5 mm long, upper wing 15–20 mm wide, lower wing 14–17 mm wide, lamellae oblique, c. 22 mm high, valves puberulous and with many irritating hairs. *Seeds* ± globular, 18–20 by 19–20 by 14.4 mm; hilum 46–49 mm long, c. 4/5 of the circumference.

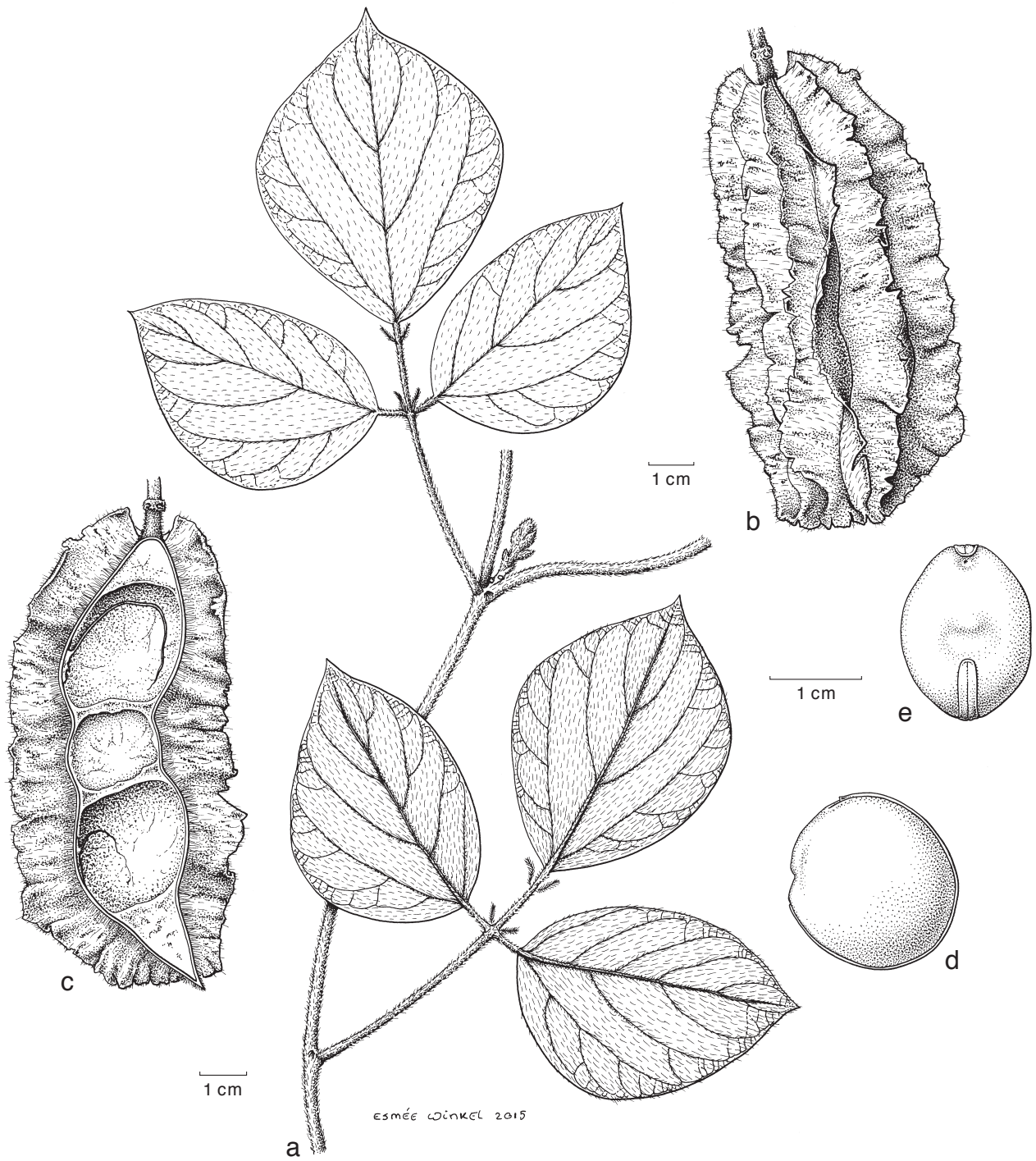

Fig. 3 *Mucuna eurylamellata* Adema. a. Twig; b. pod from outside; c. pod from inside; d. seed, lateral view; e. seed, top view (all: *LAE 60525* (*Croft & Lelean*)). — Drawing Esmée Winkel.

Distribution — *Malesia*: Papua New Guinea: Central Prov.

Habitat & Ecology — Secondary growth, edge of forest and grassland. Altitude 560–2100 m. Flowering: January, June; fruiting: October.

Specimens seen. Papua New Guinea, Central prov., Uniri river, c. 1500 ft, *Carr 15251*, 26 Jan. 1930; Central Prov., Port Moresby Subprov., SW slope Lake Myola No. 1, 1900 m, *LAE 60525 (Croft & Lelean)*, 1 Oct. 1973; Central Prov., Myola, near airstrip, 1080 m, *Hopkins & Hopkins 1017*, 19 May 1989.

Note — Longest hairs on twigs 1.0–2.0 mm long, on petiole and rachis 2.5 mm long.

16. *Mucuna gigantea* (Willd.) DC.

Mucuna gigantea (Willd.) DC. (1825) 405; Miq. (1855) 213; Burck (1893) 187; Prain (1897a) 68; Ridl. (1922) 577; Backer & Bakh.f. (1964) 630; H.Ohashi & Tateishi (1976) 164; Verdc. (1979) 125; Tateishi & H.Ohashi (1981) 92; Wilmot-Dear (1984) 56; (1991b) 217; (1992) 213. — *Dolichos giganteus* Willd. (1800) 1041. — Type: Rheede, Hort. Malab. 8 (1688) 63, t. 36.
[*Kaku-valli* Rheede (1688) 63, t. 36.]
[*Lobus litoralis* Rumph. (1747) 10, t. 6.] See Merr. (1917a) 277.
Mucuna gigantea (Willd.) DC. subsp. *plurisema* Verdc. (1978b) 126; (1979) 444; Wilmot-Dear (1991b) 218. — Type: *LAE 51631 (Streimann & Kairo)* (holo LAE; iso A, BO, BRI, CANB, K, L, NSW, SING), Papua New Guinea, Central Prov., km 27 Port Moresby-Sogeri road, sec. forest by rim in savannah.

a. subsp. *gigantea*

Distribution — Africa, Seychelles, India, Burma, China, Japan, Indochina; throughout *Malesia*; Australia, Solomon Islands, Hawaii, Tahiti, Niue Island, Cook Island, Mariana Islands, New Hebrides, New Caledonia.

Habitat & Ecology — Beaches, sand dunes, coastal forest, primary and secondary forest, along rivers and roads. Soil: volcanic ash, sand, limestone. Altitude up to 700 m. Flowering and fruiting: throughout the year.

Note — Pods often have a stipe up to 10 mm long. *BNBFD 7393 (Keith)* probably belongs here. According to the label the flower colour is pink. Several times *M. gigantea* was split into subspecies. However, the authors who proposed these splits use different characters, making it difficult to compare these subspecies. Verdcourt (1979) uses fruit characters (size of fruits and number of seeds), while Ohashi & Tateishi (1976) and Tateishi & Ohashi (1981) use flower characters (size of standard in relation to size of wings, length of the claw of wing petals in relation to the whole length of wing petals). In the Flora Malesiana region the subspecies described by Verdcourt are found: subsp. *gigantea* and subsp. *plurisema*. According to Verdcourt the differences between these subspecies are: subsp. *gigantea*: Flowers small. Fruits 10–18 by 3.5–6 cm with 1–4 seeds; subsp. *plurisema*: Flowers larger (up to 4 cm). Fruits 15.5 by 3.5–4 cm with 5–6 seeds. However, the flower-size in subsp. *gigantea* varies from 27 mm to 53 mm, so flower-size is not a good character. Pods of subsp. *gigantea* measure 8–18 by 3–6.5 cm. In this character there is no difference at all; the size of the pods of subsp. *plurisema* falls right in the range of subsp. *gigantea*. In specimens of subsp. *gigantea* pods may be found with 4–5 seeds. In the ovary up to six ovules may be found, so 6 seeds may be expected. To conclude: the differences as given by Verdcourt are insufficient to support subspecies. According to Ohashi & Tateishi (1976) and Tateishi & Ohashi (1981) the Malesian material belongs to subsp. *gigantea*. The other subspecies, subsp. *tashiroi* (Hayata) H.Ohashi & Tateishi, is a Taiwanese endemic.

17. *Mucuna hainanensis* Hayata

Mucuna hainanensis Hayata (1913) 72; Wilmot-Dear (1991a) 205. — Type: *Katsumada s.n.* (holo TI; ?iso HK), Hainan.

a. subsp. *multilamellata* Wilmot-Dear

Mucuna hainanensis Hayata subsp. *multilamellata* Wilmot-Dear (1991a) 207; (1991b) 234. — Type: *King s.n.* (holo K; iso K), Cult. Hort. Kew (ex Calcutta).
Mucuna nigricans auct. non (Lour.) Steud.: Merr. (1910) 116, p.p.; (1918) 187, p.p.; (1923) 309, p.p.
Negretia urens auct. non Tussac: Blanco (1837) 586, p.p.; (1845) 409, p.p.; (1879) 387, p.p.

Distribution — Nepal, India, Bangladesh, Burma; *Malesia*: Philippines: Luzon, Guimaras Isl., Leyte, Mindanao.

Habitat & Ecology — Along creeks. Altitude up to 100 m. Flowering: January, March, July, October; fruiting: November.

Note — Also known as *M. nigricans* var./subsp. *nigricans*. *Mucuna hainanensis* is one of the species formerly confused with *M. nigricans*. The latter name is now a rejected name, see Dubious and Excluded Species. For more detailed synonymy and a comprehensive discussion, see the papers by Wilmot-Dear (1991a, b). The subsp. *hainanensis* is found in China, Vietnam and Thailand.

18. *Mucuna havilandii* Wiriad., *sp. nov.* — Fig. 4

Twigs ferruginous tomentose. Leaflets 6.5–10.5 by 4–6.5 cm, terminal elliptic or obovate, lateral obliquely ovate. Inflorescences pseudopanicles or pseudoracemes, 1.5–7 cm long. Calyx campanulate, 12–15 mm long, golden sericeous, tube 3–9 mm long. Blade of standard 20–23 mm long; blade of wing petals 3.3–4 cm long; blade of keel petals 3.2–4 cm long. Pods 8.5 by 3 cm, lamellae inconspicuous. — Type: *Haviland s.n.* (holo K), Sarawak, near Kuching

Liana. *Twigs* terete, striate, 2–4 mm diam, ferruginous sericeous to pilose, glabrescent. *Stipules* caducous. *Petioles* 6.5–11 cm long, grooved, ferruginous puberulous, glabrescent; rachis mostly as the petiole, 2–3.5 cm long; pulvinus 7–10 mm long. *Stipellae* acicular, 1.9–3.6 by 0.1–0.5 mm, with few hairs to sericeous at both sides. *Leaflets*: terminal elliptic or obovate, 8.5–10.5 by 4.5–6.5 cm, index 1.4–1.7, base truncate or rounded, apex acuminate, acumen 2–10 mm long, above with scattered appressed hairs to thinly sericeous, below tomentose, midrib raised above, nerves slightly raised above, 4–6 per side, 13–26 mm apart, anastomosing near the margin; lateral mostly as the terminal, obliquely ovate, 6.5–10.5 by 4–6.5 cm; pulvinus 4–8 mm long. *Inflorescences* axillary or raminascent, pseudopanicles or pseudoracemes, 1.5–7 cm long, peduncle 0.2–0.7 cm long, ferruginous sericeous, branches 2.5–4 cm long. *Bracts* to the brachyblasts ovate, c. 7.5 by 5 mm, outside ± pilose, inside glabrous. *Brachyblasts* 1–5 mm long. *Bracts* to the flowers ovate or elliptic, 11–21 by 5–6 mm, outside sericeous and with irritating hairs, inside thinly sericeous, caducous. *Pedicels* 11–15 mm long, ferruginous tomentose. *Bracteoles* ± elliptic or narrowly ovate, 11–15 by 3–5 mm, outside sericeous, inside sericeous and with irritating hairs. *Calyx* in bud cup-shaped, in anthesis broadly campanulate, 12–15 mm long, tube 3–9 mm long; upper lip triangular, 1–5 by 10–15 mm, lateral teeth triangular, 3.5–6 by 4–8 mm, median tooth triangular 6–9 by 5–6 mm; outside golden sericeous and with irritating hairs, inside sericeous. Corolla purplish. *Standard*: claw 3–4 mm long; blade broadly ovate, 20–23 by 15–20 mm, auricles 2 mm long, both sides glabrous. *Wings*: claw 5–7 mm long, outside with some hairs between claw and auricle, ciliate along both margins in upper part, inside with some hairs at upper margin at base; blade elliptic, 3.3–4 by 0.4–1.2 cm, rounded, auricle 2.5–3.5 mm long, lateral pocket 5–6 mm long, outside sericeous at auricle and just above, ciliate at lower margin at

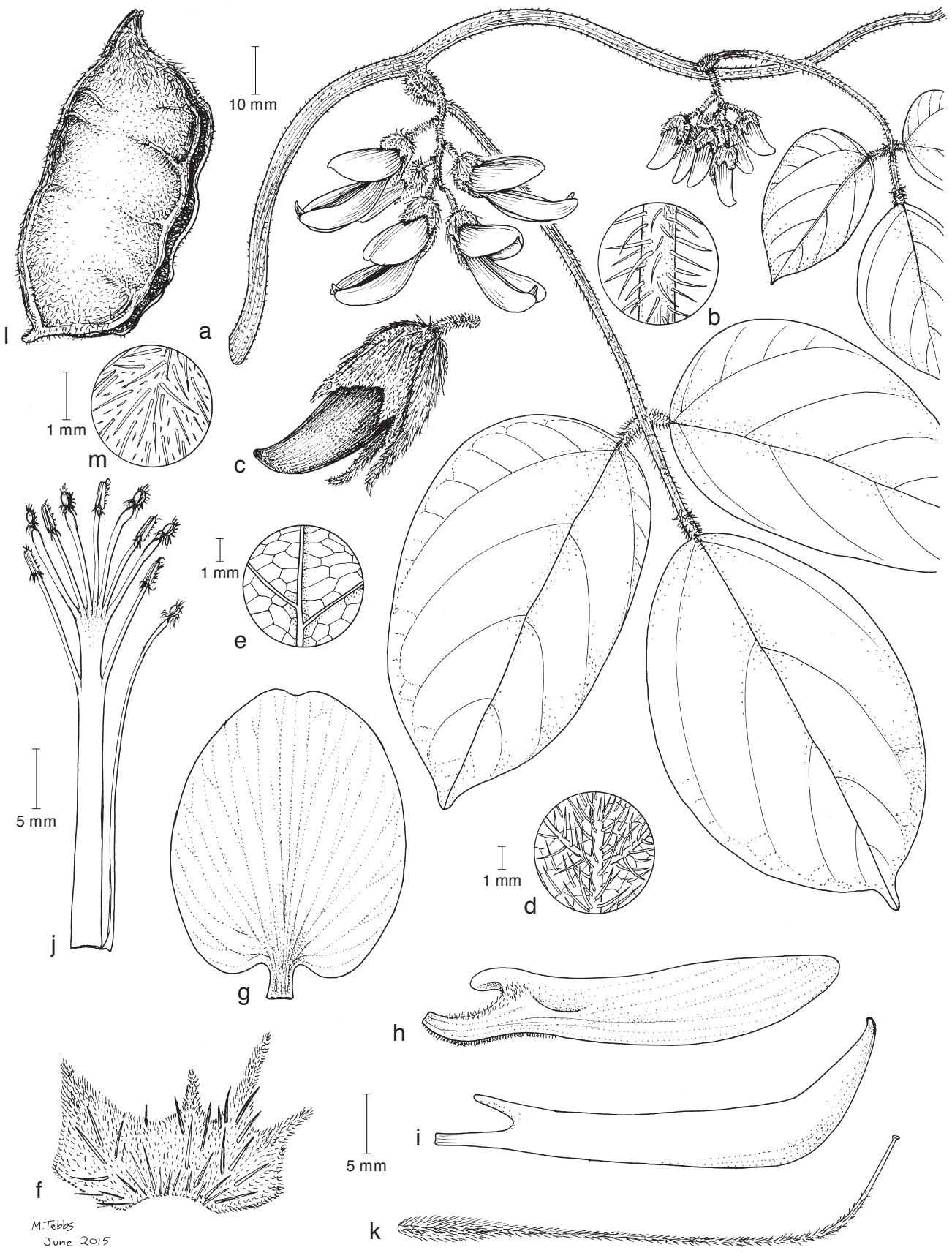

Fig. 4 *Mucuna havilandii* Wiriad. a. Twig with leaves and an inflorescence; b. detail of stem indumentum; c. bud; d. detail of lower leaflet surface; e. detail of upper leaflet surface; f. calyx opened, from outside; g. standard; h. wing petal; i. keel petal; j. stamens, sheath opened; k. ovary and style; l. fruit; m. detail of fruit indumentum (a, b, d. e: *SAN 151208 (Pereira et al.)*; c, f–m: *Haviland 967*). — Drawing Margaret Tebbs.

base, inside glabrous. *Keel petals*: claw 6.5–8.5 mm long, with some scattered hairs to ciliate along upper margin; blade narrowly elliptic, ± falcate at apex, 3.2–4 by 0.5–0.7 cm, auricles 2–3.5 mm long, hard part 7–9 mm long, lateral pocket 5–7 mm long, both sides glabrous, short-ciliate along upper margin. *Stamens* 3.8–4.5 cm long, tube 2.8–3.6 cm long, free part of filaments below versatile anthers 6–8 mm long, below basifixed ones 7–9 mm long; versatile anthers 0.9–1.1 by 0.7–1.2 mm, bearded, basifixed anthers 1.8–2 by 0.6–0.7 mm, outside ± villous at base more appressed upwards. *Disc*

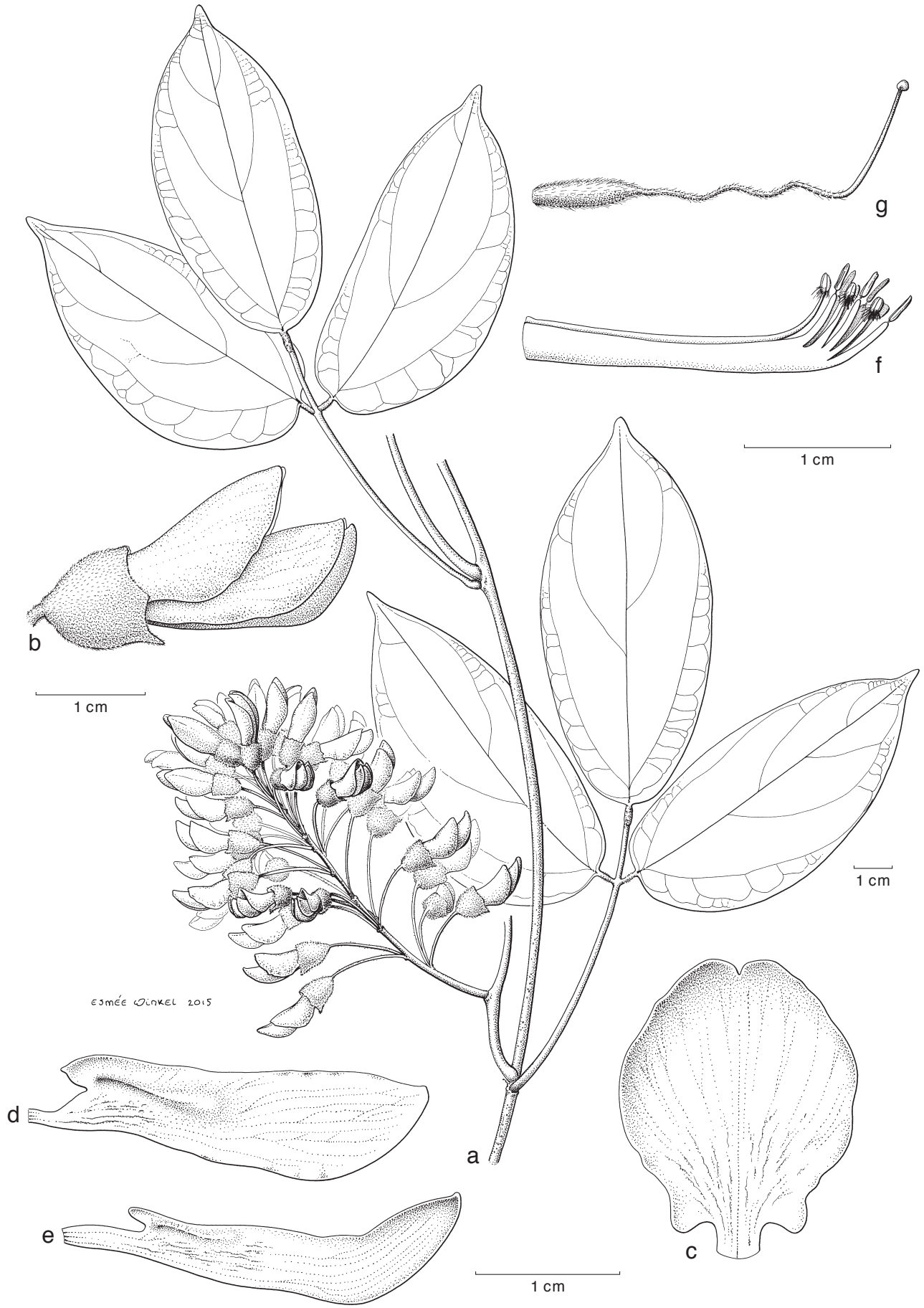

Fig. 5 *Mucuna kabaenensis* Adema. a. Habit; b. flower; c. standard; d. wing petal; e. keel petal; f. stamens; g. ovary (all: *McDonald & Ismail 400*). — Drawing Esmée Winkel.

0.7–1.1 mm high. *Ovary* 5 mm long, stipe 0.9–1.0 mm long, sericeous and with irritating hairs; ovules 2; style 3.5–3.8 cm long, sericeous, thinning upwards, upper part glabrous. *Pods* flattened ellipsoid, 8.5 by 3 cm, upper wing c. 7 mm wide, lower wing 6–9 mm wide, lamellae inconspicuous, more distinct at lower margin in basal part, interrupted in the middle, up to 2 mm high, the lower part of the lamellae more developed than the upper part, valves with few hairs and some irritating hairs. *Seeds* orbicular, 1.5 by 1.0 cm; hilum > 1/2 the circumference.

Distribution — *Malesia*: Borneo: Sarawak, Sabah.

Habitat & Ecology — Lowland or secondary forest. Flowering: July, November.

Note — This species is ± similar to *M. acuminata* but differs in the ferruginous indumentum of the lower surface of the leaflets, the less well developed calyx teeth, the two-seeded pods with at least some lamellae. *Mucuna acuminata* has ± smooth pods and usually more than 2 seeds. The type of *M. havilandii* (*Haviland s.n.*) is a flowering specimen to which an old pod (collected from the forest floor under or near the specimen?) is added. This pod is very different from the pods of other Bornean species of *Mucuna* in the inconspicuous, interrupted lamellae. One of the flowers of the specimen has a very young pod, which shows after partial removal of the indumentum obscure lamellae. This young fruit does not contradict the idea that the pod added to *Haviland s.n.* belongs to the present species.

19. ***Mucuna hooglandii*** Verdc.

Mucuna hooglandii Verdc. (1978a) 459, f. 1; (1979) 444, f. 102, 106E. — Type: *Hoogland 4328* (CANB, K, L, LAE), Papua New Guinea, Milne Bay Prov., Cape Vogel Peninsula, some km inland of Tapio.

Distribution — *Malesia*: Papua New Guinea: Milne Bay, ?Central Prov.

Habitat & Ecology — Secondary forest. Altitude up to 150 m. Flowering: March, July; fruiting: July.

20. ***Mucuna kabaenensis*** Adema, *sp. nov*. — Fig. 5

Twigs thinly sericeous. Stipellae absent. Leaflets with 2–3 nerves per side. Inflorescences pseudopanicles, 10.5 cm long. Corolla green with purple throat. — Type: *McDonald & Ismail 4003* (holo L), Celebes, Kabaena, Gunung Sabampolulu, 1 km S-SE of Tangkeno. Altitude 700–900 m, 3 July 1993.

Liana. *Twigs* terete, 3 mm diam, thinly sericeous. *Stipules* caducous. *Petioles* 5–6.3 cm long, grooved, striate, thinly sericeous; rachis mostly as the petiole, 2.5–3.7 cm long, pulvinus 5–6 mm long. *Stipellae* absent. *Leaflets*: terminal narrowly elliptic or narrowly obovate, 9–9.6 by 4–4.2 cm, index 2.0–2.4, base rounded, apex acuminate, acumen 5–8 mm long, above glabrous or with few appressed hairs, below very thinly sericeous, midrib and nerves more densely so, midrib raised above, nerves flat or slightly raised above, 2–3 per side, 23–36 mm apart, anastomosing near the margin; lateral mostly as the terminal, obliquely, narrowly ovate, 8.7–8.8 by 4.2 cm; pulvinus 5–6 mm long. *Inflorescences* axillary, pseudopanicles, 10.5 cm long, peduncle 2.5 cm long, thinly sericeous, becoming denser upwards, branches 8–9 cm long. *Bracts* to the brachyblasts caducous. *Brachyblasts* 1–2 mm long. *Bracts* to the flowers caducous. *Pedicels* c. 26 mm long, sericeous. *Bracteoles* caducous. *Calyx* 11 mm long, tube 8–9 mm long; upper lip ± semicircular, 1 by 14 mm, lateral teeth triangular, 1 by 4 mm, median tooth triangular, 2.5 by 5 mm; outside sericeous and with some irritating hairs, inside sericeous. Corolla light green with dark purple throat. *Standard*: claw 3 mm long, glabrous; blade ± orbicular, 20 by 19 mm, emarginate, auricles 1 mm long, both sides glabrous. *Wings*: claw 5 mm long, outside sericeous along both margins, ciliate along both margins, inside sericeous along lower margin; blade ± elliptic, 25 by 7 mm, rounded, auricles 2 mm long, lateral pocket 10 mm long, outside sericeous at auricle and just above up to top of lateral pocket, ciliate along lower margin in lower part, inside sericeous along lower margin in lower part. *Keel petals*: claw 8 mm long, glabrous, ciliate along upper margin in upper part; blade ± elliptic, bent in apical part, 23 by 5 mm, acute, auricles 1.5 mm long, lateral pocket 8 mm long, hard part 5 mm long, glabrous, short-ciliate along upper margin. *Stamens* 36 mm long, tube 23–29 mm long, free part of filaments below versatile anthers 6 mm long, below basifixed ones 6 mm long; versatile anthers 0.7 by 0.6 mm, bearded, basifixed anthers 2.2 by 0.4 mm, outside with some appressed hairs at base. *Disc* 0.6 mm high, glabrous. *Ovary* 7 mm long, sericeous; ovules 5; style 28 mm long, sericeous thinning upwards apical part glabrous.

Distribution — *Malesia*: Celebes: Kabaena.

Habitat & Ecology — W slopes of Gunung Sabampolulu. Mixed ecotone of grassland and short forest. Soil: serpentine. Altitude 700–900 m. Flowering: July.

Note — Only known from the type. The irritating hairs on the calyx seem to be softer than in other species. Vegetatively similar to *M. gigantea*, but different in stipellae: absent in the new species, present in *M. gigantea* and the inflorescences: pseudopanicles in the new species, umbel-like pseudoracemes in *M. gigantea*. Because of the absence of stipellae similar to *M. bennettii*, which has much larger, red flowers and *M. kawakabuti* of Sumba, which differs slightly in the size of the leaflets, in the ratio l/w of the leaflets 2.5–3.0 in *M. kawakabuti*, 2.0–2.4 in the new species and the number of nerves 6–7 in *M. kawakabuti*, 2–3 in the new species.

21. ***Mucuna kawakabuti*** Wiriad.

Mucuna kawakabuti Wiriad. in Wiriad. & H.Ohashi (1990) 97. — Type: *Iboet 395* (BO, L), Lesser Sunda Islands, Sumba, Maumarru.

Distribution — *Malesia*: Lesser Sunda Islands: Sumba.

Habitat & Ecology — Forest. Fruiting: May.

Note — Only known from the type, a fruiting specimen consisting of vegetative shoots and loose pods. The pods are very different from those of other Malesian species with pods without wings and lamellae. They look similar to those of *M. macrocarpa* Wall., which are, however, usually longer with more seeds and less hairy (to almost glabrous). *Mucuna macrocarpa* is found from India to China, Japan, Laos, Vietnam and Thailand.

22. ***Mucuna keyensis*** Burck

Mucuna keyensis Burck (1893) 189. — Type: ?Expédit. Néerland. (BO? n.v.).

Distribution — *Malesia*: Moluccas: Key Islands.

Note — The only specimens present in L are all collected in the Bogor Botanical Garden. The original material was collected in the Key Islands. *Mucuna keyensis* is very similar to *M. platyphylla* from which it differs in indumentum, shape and size of bracteoles, size of median (lower) calyx tooth, length of claw of the keel petals and the length of the ovary.

23. ***Mucuna kostermansii*** Wiriad.

Mucuna kostermansii Wiriad. in Wiriad. & H.Ohashi (1990) 99, f. 3. — Type: *Kostermans & Wirawan 775* (holo BO; iso AAU, K, L), Lesser Sunda Islands, Flores, along road Bea Laing-Rana Mese.

Distribution — *Malesia*: Lesser Sunda Islands: Flores.

Habitat & Ecology — Altitude 1000 m. Flowering and fruiting: May.

Note — Only known from the type specimen.

24. *Mucuna lamii* Verdc.

Mucuna lamii Verdc. (1978a) 463, f. 2; (1979) 446, f. 103. — Type: *BW 5523 (Van der Sijde)* (holo L; iso Djajapura, L), Papua, Cycloop Mountains.

Distribution — *Malesia*: New Guinea: Papua Barat; Papua New Guinea: Chimbu, W Sepik, E Sepik Prov.

Habitat & Ecology — Primary or secondary forest. Soil: sandy. Altitude 100–800 m. Flowering: March, May, September, October; fruiting: February, May, September, October.

Note — Several labels give the colour of the lower surface of the leaflets as purplish. Some inflorescences may look 'pseudo-umbellate' especially when young. The blade of the wings is ± constricted above the claw.

25. *Mucuna longipedunculata* Merr.

Mucuna longipedunculata Merr. (1905b) 18; (1910) 117; (1923) 308; Wilmot-Dear (1991b) 223, f. 3A–H, 4. — Type: *Elmer 6233* (K, NY, PNH†), Luzon, Prov. Benguet, Sablan.
Mucuna macmillanii Elmer (1915) 2736; Wilmot-Dear (1991b) 226. — Type: *Elmer 13594* (A, BISH, E, K, L, MO, NEB, NY, PNH†, UC, US), Mindanao, Aguson, Cabadbaran, Mt Urdaneta,

Distribution — *Malesia*: Philippines: Luzon, Polilo, Catanduanes, Surigao, Biliran, Mindanao.

Habitat & Ecology — Forest along stream, logged forest. Altitude 200–300 m. Flowering: March to June; fruiting: May, June.

Note — The peduncle of the inflorescence is extremely long, slender and wiry, quite elastic and strong. The branches of the pseudopanicles become shorter upwards, in the apical part they are reduced to brachyblasts. The seeds of the two fruiting specimens seen by us are misshapen (see also Wilmot-Dear 1991b: 223: "seeds …. very misshapen in dry state (?soft in living state)"). From Mindanao *M. macmillanii* was described which only differs in some measurements most clearly in the smaller bracteoles. Here we unite *M. macmillanii* with *M. longipedunculata*.

26. *Mucuna macrophylla* Miq.

Mucuna macrophylla Miq. (1855) 213; Burck (1893) 190; Backer & Bakh.f. (1964) 630. — Type: *Zollinger 1143*? (BO?, P?, fragm. U), Java, Tjikoja (see Note).
Stizolobium junghuhniana Kuntze (1891) 208; Backer (1938) 81. — *Mucuna junghuhniana* (Kuntze) Backer ex Koord.-Schum. (1911) 65. — Type: *Kuntze 5308* (n.v.), Java, Rambai.
Mucuna blumei Burck (1893) 185. — Lectotype (here designated): *Blume 771* (holo L; iso L), Java, aan de kalkberg te Kuripan.
Mucuna ovalis Baker f. (1924) 32. — Type: *Forbes 1417* (K, L) Sumatra, Lampong, Kota-Djawa.
Mucuna gigantea auct. non (Willd.) DC.: Benth. (1852) 237.

Distribution — *Malesia*: Sumatra (once collected, see Note); Java; Lesser Sunda Islands: Flores.

Habitat & Ecology — Forest, open place in forest. Soil: limestone. Altitude up to 1350 m. Flowering: January to April, October, December; fruiting: March to May, August.

Note — The only specimen mentioned by Miquel for *M. macrophylla* is: "Java, tusschen struiken bij Tjikoja". According to the first author this is the specimen *Zollinger 1147*. The Utrecht herbarium (now at L) holds a specimen labelled as Typus fragment. The only other information is on an older label saying in Miquel's handwriting: "Mucuna macrophylla M, Java". This fragment consist of a lateral leaflet of 19.5 by 13.5 cm, much larger than usually in *M. macrophylla*. Prain (1897b: 407) mentions the name *M. junghuhniana* in observations sub *M. imbricata*. It is unclear whether or not he meant to make a new combination. Burck (1893) mentions several localities for his species *M. blumei*: Java, Koeripan, prope Buitenzorg et Oengarang, Forbes in herb. Lugd. Bat. The first locality refers to *Blume 771*. The second and third localities to a Junghuhn collection (*Junghuhn 193*); the L duplicate of that collection consist of a piece of a branch and a leaf, the sheet bears three labels: one attached to fragment 'Jul montis Rembang' and two that refer to 'Oengarang', one with the months Mei, Jun., the other with the months April-Jun. The fourth locality probably refers to *Forbes 1417*, Lampongs, Kota-Djawa, the type of *M. ovalis* Baker f. This specimen was collected in Sumatra. For *M. blumei* the Blume specimen was selected as the lectotype. The twigs of older specimens tend to have a more appressed indumentum. *Forbes 1417* (the type of *M. ovalis*) has both pseudopanicles and very short pseudoracemes with only 1–2 brachyblasts. A Teysmann specimen (*4492 HB*), collected in 'Lampongs', probably also belongs here. The flower colour of *Schmutz 4292* is given as blue ('blaublühend').

27. *Mucuna macropoda* Baker f.

Mucuna macropoda Baker f. (1923) 11; Verdc. (1979) 448; Hopkins & Hopkins (1993) 297, f. 1–4. — Type: *Forbes 289* (BM, seen photo at K), PNG, Sogeri.

Distribution — *Malesia*: Papua New Guinea: Central Prov.

Habitat & Ecology — Forests. Altitude 800–1100 m. Flowering: June, July, October; fruiting: October.

Note — Hopkins & Hopkins (1993) observed visits by small bats at night. Also several species of ants were seen crawling over the flowers and small beetles were collected from an inflorescence. The dissected flowers were all ± damaged by insects. Some parts were not complete. Several measurements were taken from the publication by Hopkins & Hopkins (1993).

28. *Mucuna mindorensis* Merr.

Mucuna mindorensis Merr. (1908) 231; (1923) 309; Wilmot-Dear (1991b) 221. — *Mucuna acuminata* Merr. (1906) 196, nom. illeg. — Type: *Merrill 4069* (K, L, NY, PNH, US), Mindoro, Baco R.

Distribution — *Malesia*: Philippines: Mindoro.

Habitat & Ecology — On beaches. Fruiting: March, May.

Note — Irritating hairs seem to be lacking. The cells of the reticulum of the pod are often quite conspicuous, 3–8 by 1–5 mm, although borders between cells may be inconspicuous.

29. *Mucuna mollissima* Teijsm. & Binn. ex Kurz

Mucuna mollissima Teijsm. & Binn. ex Kurz (1874) 187; Verdc. (1979) 441, f. 106d; Wilmot-Dear (1990) 23. — *Stizolobium mollissimum* (Teijsm. & Binn. ex Kurz) Piper (1917) 53. — Type: *Anon. s.n.* (BO?), Cult in Hort. Bog. (originally from Halmahera).
Mucuna cyanosperma K.Schum. in K.Schum. & Hollrung (1899) 98; Burck (1893) 183, t. 13. — Type: *Hollrung 411* (holo B†), Papua New Guinea, bei Hatzfeldthafen.
Mucuna amblyodon Harms (1920) 372; Verdc. (1979) 438. — Type: *Peekel 180* (B?), Bismarck Arch., Neu-Mecklenburg, Namatanai.
Mucuna baileyana Merr. & L.M.Perry (1942) 404. — Type: *Brass 1104* (holo A; iso K), Papua New Guinea, Vailala River, Ihu.
Mucuna clemensiae Merr. & L.M.Perry (1948) 156. — Type: *Clemens 6573* (holo A; iso K), NE New Guinea, Tobou.
Mucuna urens DC. var. *papuana* F.M.Bailey (1910) 20. — Syntypes: *Le Hunte s.n.* (n.v.), *Schenkler s.n.* (K) (see Note).

Distribution — *Malesia*: Moluccas; New Guinea: Solomon Islands.

Habitat & Ecology — Primary and secondary forest, disturbed forest, Sago swamps, forest edge, along paths and roads. Soil: black volcanic soil, sand, clay, rocky clay, gravel. Altitude up to 1500 m. Flowering and fruiting: throughout the year.

Note — Wilmot-Dear (1990) gives *Schlenker s.n.* as the type of *M. urens* var. *papuana*. However, Bailey based his variety on sterile specimens collected by Le Hunte and fruits collected by Schlenker, stating: "All the above is from some specimens collected by Sir G.R. Le Hunte." That description is followed by a description of the pods and seeds collected by Schlenker. Clearly a lectotype should be chosen from the specimens of Le Hunte. The calyx in bud is ± cylindrical. When the corolla expands the calyx widens and becomes campanulate, however, it is not pushed downwards and in the end it is not tucked up. Longest hairs 0.4–1.5 mm long.

30. *Mucuna novo-guineensis* Scheff.

Mucuna novo-guineensis Scheff. (1876) 18; Verdc. (1979) 450, f. 104, 107A; Wilmot-Dear (1990) 32. — Neotype (here designated by Adema): *Van Royen & Sleumer 6300* (L), Netherlands New Guinea, distr. Hollandia, Cycloop Mountains, road Sentani to Bozai village, 110 m, 26 July 1961.
Mucuna kraetkei Warb. (1891) 329. — Type: *Warburg s.n.*? (n.v.), Papua New Guinea, Hatzfeldhaven.

Distribution — *Malesia*: Moluccas: Halmahera; New Guinea.

Habitat & Ecology — Primary, secondary or swamp forest, usually along rivers, at river or stream banks. Altitude up to 2000 m. Soil: stoney clay, limestone, granite, volcanic sediments. Flowering: February to November; fruiting: March, July, December.

Uses — Stems are used for lashing and bridge construction. The sap is used for dying stringbags. Men in Haus Tambura (E Sepik prov.) drink the sap during ceremonial occasions.

Note — Sap is watery, colourless or milky at first slowly turning to red and later to black. *Mucuna novo-guineensis* is in New Guinea a rather common liana. From other red/orange-flowered *Mucuna* species (*M. bennettii*, *warburgii*) it can easily be distinguished by its very short calyx teeth. *Mucuna novo-guineensis* is a rather variable species, especially in the length of inflorescences and peduncles and in the indumentum of several parts. Shrimps are attracted by flowers that drop into the water (pers. comm. Wanda Ave, Wim Vink). *Mucuna novo-guineensis* was described by Scheffer (1876) on fruiting specimens. The description of calyx and fruits fit nicely with that of specimens usually called *M. novo-guineensis*. He based his description on three specimens collected by Teijsmann in New Guinea: near Doré, near Andaj and in the Humboldt baai. As far as known to us no Teijsmann material from these localities exist nowadays. In his manuscript for a Flora Malesiana treatment Wiriadinata named *Teijsmann 7465* as 'type'. The BO and L duplicates of this specimen consist of leafy twigs only and are in a bad shape. The L duplicate seems to lack stipellae and probably belongs to *M. bennettii*. As Scheffer used three specimens in his description Wiriadinata should have selected a lectotype. However, as there are no original Teijsmann specimens available, a neotype is needed. The specimen *Teysmann 7465* proposed as type is of uncertain provenance and not identifiable. We decide to select as neotype a specimen from the same general area (W Irian, 'Netherlands New Guinea') were Teijsmann collected his original specimens.

31. *Mucuna pachycarpa* Parreno ex Wilmot-Dear

Mucuna pachycarpa Parreno ex Wilmot-Dear (1991b) 221, f. 2, map 1. — Type: *BS 89471 (Ramos & Edaño)* (holo A), Mindanao, Cota bato prov., Nupol, 18 Apr. 1932.

Distribution — *Malesia*: Philippines: Mindanao.

Notes — E.P. Parreno described this species as part of his revision of *Mucuna* of the Philippines for a MSc thesis at the University of Kentucky. This manuscript was never published. According to Wilmot-Dear (1991b) Harry Wiriadinata was about to publish the description of Parreno's new species in the Journal of Japanese Botany, however, also that never occurred. So Wilmot-Dear was the first to published the name of *M. pachycarpa*, however, at that time a latin description was needed. So the name was not valid published. Here we validate the name by reference to the description by Wilmot-Dear.

Mucuna pachycarpa is in several aspects rather similar to *M. longipedunculata* which differs in: the narrower leaflets (4.5–10 cm wide), longer inflorescences (1–7 m long), sutures of the pods which are not thickened.

32. *Mucuna papuana* Adema, *stat. nov. & nom. nov.* — Fig. 6

Mucuna pruriens (L.) DC. subsp. *novo-guineensis* Verdc. (1978a) 462; (1979) 453. — Type: *Hartley 10172* (CANB, K, L, LAE), Papua New Guinea, Morobe Prov., Burep River, NE of Lae.

Distribution — *Malesia*: Irian Jaya: Ayawasi; Papua New Guinea: Morobe, W Sepik.

Habitat & Ecology — Primary and secondary forest, regrowth, roadsides, bushes, streamside in grassland, savannah, dry gully. Altitude up to 1100 m. Flowering: April to June, September, October, December; fruiting: April, June, September, November.

Note — Most specimens are collected in Morobe Prov., PNG. One collection from Irian Jaya (*Ridsdale 2252*, Ayawasi) is included here. Probably also a collection from W Sepik Prov., PNG (*Hoover 439*) belongs to the present species. However, the last specimen is collected at a much higher altitude (600–1100 m). Verdcourt (1979) cites several specimens seen by him in Lae and remarks that the specimens cited by Schumann & Lauterbach (1901: 365) as *M. pruriens* may be referable to the present species. However, no duplicates of these specimens (*Hollrung 147*, *Lauterbach 15*, *461*, *2092*, *2279*) were seen by Verdcourt, Wiriadinata or Adema.

33. *Mucuna platyphylla* A.Gray

Mucuna platyphylla A.Gray (1854) 443; Wilmot-Dear (1990) 17. — Type: *U.S. Expl. Exped. s.n.* (US 47902) (holo US; iso A), Fiji, Ovalou, Rewa, 1840.
Mucuna albertisii F.Muell. (1876) 64; Burck (1893) 190; Verdc. (1979) 433, f. 106a. — Type: *D'Albertis s.n.* (holo MEL), Papua New Guinea, Fly River.
Mucuna ceramensis Burck (1893) 184. — Lectotype (here designated): *Teysmann s.n.* (holo BO), Ceram.
Mucuna forbesii Baker f. (1923) 11. — Type: *Forbes 148* (BM), Papua New Guinea, Sogere.
Mucuna schmutzii Wiriad. in Wiriad. & H.Ohashi (1990) 102. — Type: *Schmutz 342* (holo L), Flores, Dentjang.

Distribution — *Malesia*: Christmas Isl.: Indian Ocean, introduced?; Celebes: Gorontalo; Lesser Sunda Islands: Flores: Moluccas: Ternate, Morotai; New Guinea; Solomon Islands; New Caledonia.

Habitat & Ecology — Primary and secondary forests, disturbed forests, open woodland, Sago swamp, regrowth bordering road, along rivers. Altitude up to 800 m. Flowering: January, April to August, December; fruiting: July.

Notes — Sometimes two pseudopanicles per axil. Longest hairs 0.6–1.5 mm long.

Kostermans 1366 (Moluccas, Morotai) probably belongs here, however, on the label the flower colour is given as red. *Mitchel 46* (Christmas Isl., Indian Ocean) probably belongs here, however, the specimen differs slightly in the measurements of the flower parts. Four New Guinean collections (*Hoogland 3683*, *NGF 1595*, *16324*, *Van Royen & Sleumer 6175*) differ slightly from the majority of the material, mainly in the wider terminal leaflets, the smaller bracts, bracteoles and flowers, however, overlaps in many measurements occur. No matching material with fruits and seeds has been found. For now these specimens are included in *M. platyphylla.*

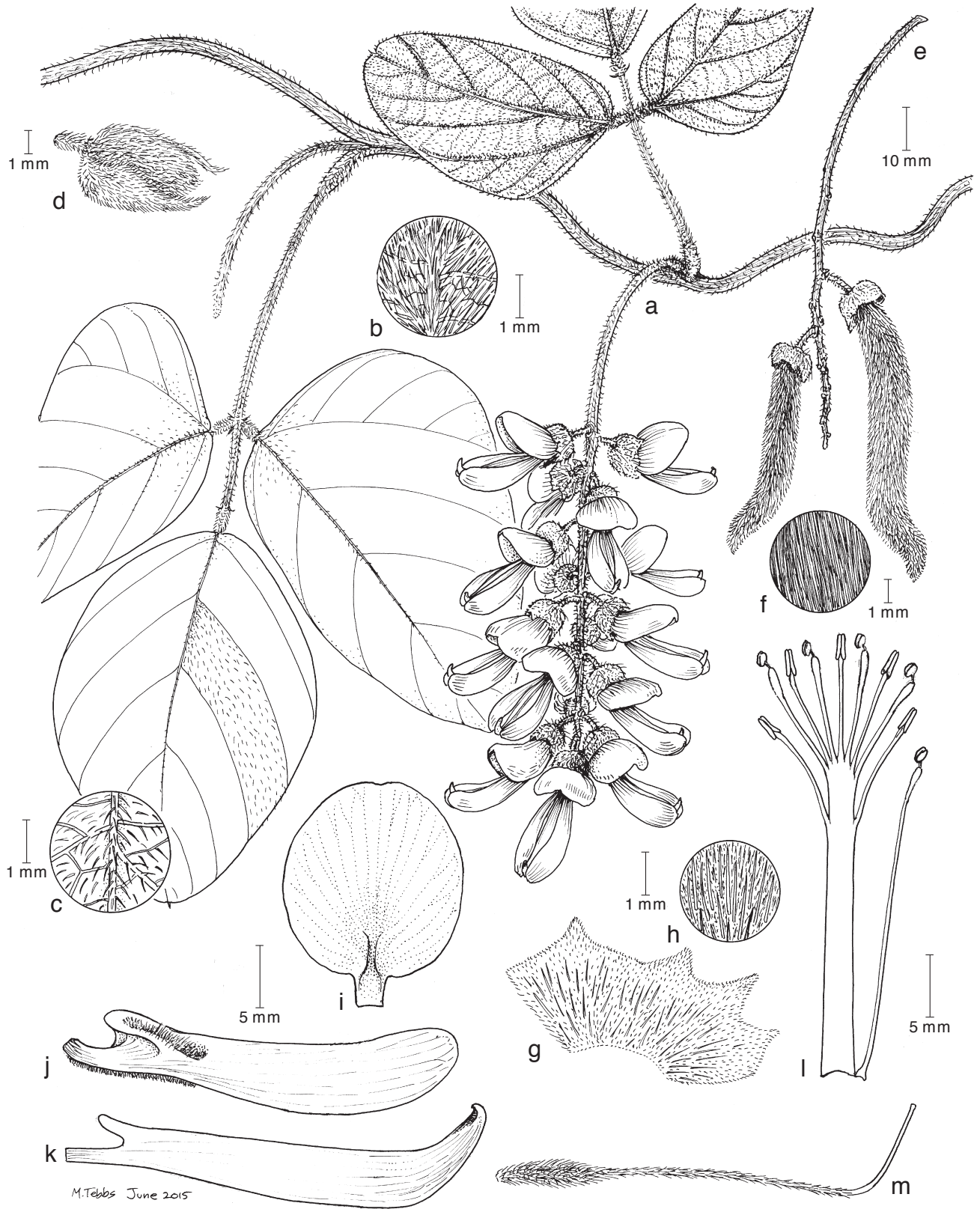

Fig. 6 *Mucuna papuana* Adema. a. Habit; b. detail of lower leaflet surface; c. detail of upper leaflet surface; d. bud with bracteoles; e. part of infructescence with immature fruits; f. detail of fruit indumentum; g. calyx opened, from outside; h. detail of calyx indumentum; i. standard; j. wing petal; k. keel petal; l. stamens, sheath opened; m. ovary and style (a–c, e, f: *Hartley 10172*; d: *Hoover 493*; g–m: *NGF 29884 (Coode)*). — Drawing Margaret Tebbs.

34. *Mucuna platyplekta* Quisumb. & Merr.

Mucuna platyplekta Quisumb. & Merr. (1928) 152; Wilmot-Dear (1991b) 244, f. 12, map 3. — Type: *BS 47232 (Ramos & Edaño)* (holo PNH†; iso NY, UC), Luzon, Isabela prov., San Mariano.

Distribution — *Malesia*: Philippines: Luzon.

Habitat & Ecology — Dry open forest, along streams. Altitude low. Fruiting: February to April.

Note — This species is only known in fruit. The fruits are similar to those of *M. biplicata* and *M. diplax*, which differ in the indumentum of twigs and inflorescence axes (appressed in *M. biplicata* and *M. diplax*, glabrous to thinly puberulous in *M. platyplekta*), the indumentum of the lower surface of the leaflets (thinly strigose in *M biplicata*, very thinly sericeous in *M. diplax*, sericeous in *M. platyphylla*) and the width of the

horizontal part of the lamellae (1–4 mm in *M. biplicata*, 2 mm in *M. diplax*, 5–15 mm in *M. platyplekta*).

35. *Mucuna pruriens* (L.) DC.

Mucuna pruriens (L.) DC. (1825) 405; Decne. (1835) 147; Baker (1879) 187; Fern.-Vill. (1880) 63; Burck (1893) 187; Prain (1897a) 68; K.Heyne (1916) 326; Ridl. (1922) 577; Merr. (1923) 309; Burkill (1935) 1503; Backer & Bakh.f. (1964) 629; Verdc. (1979) 451; Wilmot-Dear (1984) 61; (1991b) 245; (1992) 235. — *Dolichos pruriens* L. (1754) 23; (1759) 132. — *Stizolobium pruriens* (L.) Medik. (1787) 399. — *Stizolobium pruriens* (L.) Pers. (1807) 299. — *Mucuna prurita* Hook. (1831) 348; Benth. (1852) 237; Miq. (1855) 211. — Type: Rumphius, Herb. Amboin. 5 (1747) t. 142.
[*Cacara nigra* Rumph. (1747) 381, t. 138.] See Merr. (1917a) 279.
[*Cacara pilosa* Rumph. (1747) 392.] See Merr. (1917a) 279.
[*Cacara pruritus* Rumph. (1747) 393, t. 142.] See Merr. (1917a) 277.
Marcanthus cochinchinensis Lour. (1790) 461. — *Mucuna cochinchinensis* (Lour.) A.Chev. (1919) 91. — *Mucuna pruriens* (L.) DC. forma *cochinchinensis* (Lour.) Backer in Backer & Bakh.f. (1964) 629. — Type: *Loureiro s.n.* (BM), Cochinchina.
Carpopogon niveus Roxb. [(1814) 54, nom. nud.]; (1832) 285. — *Mucuna nivea* (Roxb.) Wight & Arn. (1834) 255. — Lectotype (Wilmot-Dear 1984): Roxburgh drawing 1601 (K).
Carpopogon capitatus Roxb. (1832) 284. — Lectotype (Wilmot-Dear 1984): Roxburgh drawing 285 (K) ('Soorootoo').
Mucuna hirsuta Wight & Arn. (1834) 254. — *Mucuna pruriens* (L.) DC. var. *hirsuta* (Wight & Arn.) Wilmot-Dear (1987) 44. — *Mucuna pruriens* (L.) DC. forma *hirsuta* (Wight & Arn.) Backer in K.Heyne (1916) 327; in Backer & Bakh.f. (1964) 629. — Type: *Wight 750* (E, K), Pen. Ind. Or.
Mucuna capitata Wight & Arn. (1834) 255; Benth. (1852) 237; Miq. (1855) 212. — *Mucuna pruriens* (L.) DC. var. *capitata* (Wight & Arn.) Burck (1893) 187. — *Mucuna pruriens* (L.) DC. forma *capitata* (Wight & Arn.) K.Heyne (1916) 328. — Type: ?*Wight 754*?
Negretia mitis Blanco (1837) 588 (nom. illeg., non Ruiz & Pav.); (1845) 410; (1879) 388, pl. 405b; Merr. (1918) 188. — Neotype (here designated): *Merrill Species Blancoanae 863* (K), Luzon, Manila.
Mucuna utilis Wall. ex Wight (1840) pl. 280; Miq. (1855) 212. — *Mucuna pruriens* (L.) DC. var. *utilis* (Wall. ex Wight) Burck (1893) 187; Wilmot-Dear (1984) 62; (1990) 34; (1991b) 249. — *Mucuna pruriens* (L.) DC. forma *utilis* (Wall. ex Wight) K.Heyne (1916) 327. — Type: Wight, Ic. Pl. Ind. Or. 1 (1840) pl. 280.
Mucuna velutina Hassk. (1844) 277. — Type: not indicated.
Negretia pruriens Blanco (1845) 411. — Neotype (here designated): *Merrill Species Blancoana 645* (L), Luzon, Rizal, Fort William McKinley.
Mucuna lyonii Merr. (1906) 197. — Type: *Lyon s.n.* (K, PNH†, US), cultivated, Luzon, Manila (seeds from Luzon, Pampanga).
Stizolobium deeringianum Bort (1909) 31, f. 1, pl. 2, 3. — *Mucuna deeringiana* (Bort) Merr. (1910) 118; (1923) 308; Wilmot-Dear (1984) 63. — Type: *Carleton s.n.* (n.v.), Florida, Argo.
Stizolobium aterrima Piper & Tracy (1910) 18, t. 4B, 7. — *Mucuna aterrima* (Piper & Tracy) Merr. (1917a) 279. — Type: not indicated.
Mucuna atropurpurea auct. non DC.: Fern.-Vill., Nov. App. (1880) 63.

Distribution — Tropical Africa, Madagascar, Mascarenes, S Asia, *Malesia*: Sumatra; Java; Philippines: Luzon, Mindanao; Celebes; Lesser Sunda Islands: Bali, Lombok, Soemba, Flores, Timor; Moluccas: Ceram, Halmahera; New Guinea. Also cultivated in the tropics of the old and new world.

Habitat & Ecology — Primary and secondary forests, monsoon forest, grasslands, along hedges and fields, along rivers, at the sea coast, along roads. Soil: sand, loam, limestone, volcanic soil. Altitude up to 1300 m. Flowering: January, April to July, September, October, December; fruiting: January, April to December.

Note — A very variable species. At several levels, from species to formae, entities have been described, many of the names concern cultivated forms. Wilmot-Dear (1984) who revised *Mucuna* for several areas in Asia is consistent in the use of varieties for the most distinguishable forms. Here we follow her lead and distinguish several varieties of which two occur in Malesia (var. *pruriens* and var. *utilis*). All cultivated forms are combined in var. *utilis*. Backer (1916 and in Backer & Bakhuizen van den Brink 1964) mentions the form/variety *hirsuta* for E Java. No specimen of this variety from Java was seen by the present authors. *M. pruriens* var. *hirsuta* is found in Continental Asia.

Key to the varieties

1. Irritating hairs present at least at inflorescence axes, calyx and pods. Bracts to the brachyblasts 7–10 mm long. Bracteoles elliptic, 4.8–4.9 mm long. Calyx 9.5–14 mm long. Pods 7–9.5 by 1.0–1.6 cm. Seeds 8–13 by 6.5–11 by 2.0–4.5 mm. — Wild, widespread . . . . . a. var. *pruriens*
1. Irritating hairs absent. Bracts to the brachyblasts c. 21 mm long. Bracteoles narrowly ovate, c. 2.8 mm long. Calyx c. 15.5 mm long. Pods 4.6–11 by 1.4–2.0 cm. Seeds 11–17 by 11–16 by 6.3–7.6 mm. — Cultivated, in tropics and subtropics . . . . . b. var. *utilis*

a. var. ***pruriens***

Irritating hairs present at least at inflorescence axes, calyx and pods. Terminal *leaflets* 7–16 by 3–10 cm, index 1.3–2.3; lateral 7.5–13 by 4–10 cm. *Inflorescences* 6–30 cm long, peduncle 1.5–4.5 cm long. *Bracts* to the brachyblasts 7–10 by 1–3 mm. *Bracts* to the flowers obliquely ovate, c. 6 by 2.5 mm. *Bracteoles* elliptic, 4.8–4.9 by 1.2 mm. *Calyx* 9.5–14 mm long. *Pods* 7–9.5 by 1.0–1.6 cm. *Seeds* 8–13 by 6.5–11 by 2.0–4.5 mm; hilum 4–7 mm long, 1/5–1/7 of the circumference.

Distribution — Tropical Asia, throughout *Malesia*; also recorded from Africa and S and C America, there probably always introduced.

Habitat & Ecology — As the species.

Note — Cultivated for the presence of L-DOPA.

b. var. ***utilis*** (Wall. ex Wight) Burck

Mucuna pruriens (L.) DC. var. *utilis* (Wall. ex Wight) Burck (1893) 187; Wilmot-Dear (1984) 62; (1990) 34; (1991b) 249; Wulijarni-Soetjipto & Maligalig (1997) 199. — *Mucuna utilis* Wall. ex Wight (1840) pl. 280; Miq. (1855) 212. — *Mucuna pruriens* (L.) DC. forma *utilis* (Wall. ex Wight) K.Heyne (1916) 327. — Type: Wight, Ic. Pl. Ind. Or. 1 (1840) pl. 280.
Marcanthus cochinchinensis Lour. (1790) 461. — *Mucuna cochinchinensis* (Lour.) A.Chev. (1919) 91. — *Mucuna pruriens* (L.) DC. forma *cochinchinensis* (Lour.) Backer in Backer & Bakh.f. (1964) 629. — Type: *Loureiro s.n.* (BM), Cochinchina.
Carpopogon niveus Roxb. [(1814) 54, nom. nud.]; (1832) 285. — *Mucuna nivea* (Roxb.) Wight & Arn. (1834) 255. — Lectotype (Wilmot-Dear 1984): Roxburgh drawing 1601 (K).
Carpopogon capitatus Roxb. (1832) 284. — Lectotype (Wilmot-Dear 1984): Roxburgh drawing 285 (K) ('Soorootoo').
Mucuna capitata Wight & Arn. (1834) 255; Benth. (1852) 237; Miq. (1855) 212. — *Mucuna pruriens* (L.) DC. var. *capitata* (Wight & Arn.) Burck (1893) 187. — *Mucuna pruriens* (L.) DC. forma *capitata* (Wight & Arn.) K.Heyne (1916) 328. — Type: ?*Wight 754*?
Negretia mitis Blanco (1837) 588 (nom. illeg., non Ruiz & Pav.); (1845) 410; (1879) 388, pl. 405b; Merr. (1918) 188. — Neotype (here designated): *Merrill Species Blancoanae 863* (K), Luzon, Manila.
Mucuna lyonii Merr. (1906) 197. — Type: *Lyon s.n.* (K, PNH†, US), cultivated, Luzon, Manila (seeds from Luzon, Pampanga).
Stizolobium deeringianum Bort (1909) 31, f. 1, pl. 2, 3. — *Mucuna deeringiana* (Bort) Merr. (1910) 118; (1923) 308; Wilmot-Dear (1984) 63. — Type: *Carleton s.n.* (n.v.), Florida, Argo.
Stizolobium aterrima Piper & Tracy (1910) 18, t. 4B, 7. — *Mucuna aterrima* (Piper & Tracy) Merr. (1917a) 279. — Type: not indicated.

Irritating hairs absent. Terminal *leaflets* 5.5–11 by 4.5–8 cm, index 1.2–1.7, lateral 5.9–12.7 by 4.0–8.3 cm. *Inflorescences* 1.5–32 cm long, peduncles 1–4.5 cm long. *Bracts* to the brachyblasts ovate, c. 21 by 2 mm. *Bracts* to the flowers ovate, c. 5 by 1.5 mm. *Bracteoles* narrowly ovate, c. 2.8 by 0.5 mm. *Calyx* c. 15.5 mm long. *Pods* 4.6–11 by 1.4–2.0 cm. *Seeds* 11–17 by 11–10 by 6.3–7.6 mm; hilum 4–5 mm long, c. 1/8 of the circumference.

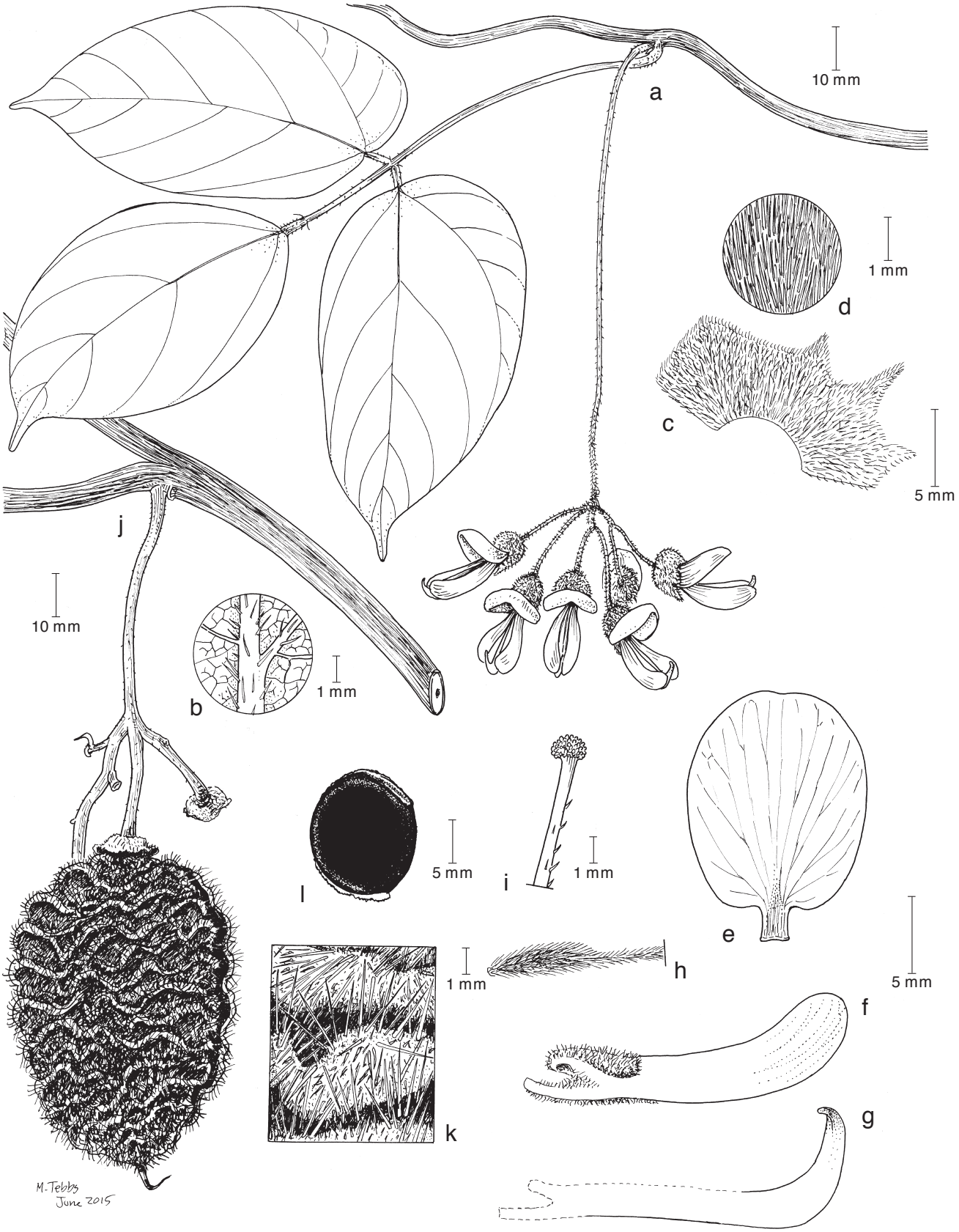

Fig. 7 *Mucuna sakapipei* Wiriad. a. Piece of twig with a leaf and an inflorescence; b. detail of leaflet lower surface; c. calyx opened, from outside; d. detail of calyx indumentum; e. standard; f. wing petal; g. keel petal; h. ovary and lower part of style; i. upper part of style and stigma; j. infructescence and fruit; k. detail of indumentum and ornamentation; l. seed (all: *De Haan 1773*). — Drawing Margaret Tebbs.

Distribution — Cultivated in the tropics and subtropics, also in *Malesia*. Sometimes escaped and naturalized.

Habitat & Ecology — Cultivated fields and gardens; as an escape in secondary and disturbed forests, roadsides. Altitude up to 300 m. Flowering: April, June, September, October, December; fruiting: April to July, October, December.

Note — Mainly cultivated for the presence of L-DOPA (see Hegnauer & Hegnauer 2001: 343–345). Also cultivated as food for humans and animals. Var. *utilis* is at present seen as a cultivar-group (Cv.-group Utilis) see Westphal (1974) 121 and Wulijarni-Soetjipto & Maligalig (1997) 199.

36. *Mucuna reticulata* Burck

Mucuna reticulata Burck (1893) 183; Koord. (1898) 440; Wilmot-Dear (1991b) 226. — Type: *Teijsmann s.n.* (BO), Celebes, Baleh Angin.
Mucuna foveolata Merr. (1922) 389; (1923) 308. — Type: *FB 28379 (Mabesa)* (K, PNH†), Luzon, Tabayas Prov., Kabibihan.

Distribution — *Malesia*: Philippines; Celebes.

Habitat & Ecology — Primary or secondary forest. Soil: (coral) limestone. Altitude up to 900 m. Flowering: May to August; fruiting: March, June, August, October.

Uses — The seed is reported as a medicine for diarrhoea (Koorders 1898).

Note — The species is remarkable for the reticulate lamellae on the pods. In vegetative characters *M. reticulata* resembles *M. longipedunculata*, which, however, has rather different pods. Several specimens have a small leaf at the top of the peduncle of the inflorescence. The indumentum of the lamellae tends to be patent, that of the pod valves is more appressed. *Afriastini 1992* (Celebes, Dusun Rea, Desa Sondoong) probably belongs here, however, the label gives the flower colour as glaucous green.

37. *Mucuna sakapipei* Wiriad., *sp. nov.* — Fig. 7

Twigs glabrous, (thinly) puberulous or very thinly sericeous. Petioles 4–11 cm long. Leaflets ovate, 5.5–12.2 by 3–7 cm, acumen 5–11 mm long, nerves 3–6 per side. Inflorescences axillary, pseudoracemes, 8–11.5 cm long. Calyx 10–11 mm long. Corolla pale green. Ovules 2. — Type: *De Haan 1773* (holo BO; iso A, K, L), Halmahera, Distr. Weda, Pajahi road, 26.11.1950.

Liana. *Twigs* terete, striate, diam 1–6 mm, glabrous, (thinly) puberulous or very thinly sericeous. *Stipules* caducous. *Petioles* 4–11 cm long, striate, puberulous or with scattered appressed hairs; rachis mostly as the petiole, 1.5–3.2 cm long; pulvinus 3–6 mm long. *Stipellae* acicular, 2.4–3.8 by 0.1 mm, glabrous or with some hairs. *Leaflets*: terminal ovate, 6–12.2 by 3–7 cm, index 1.6–2.1, base rounded or truncate, apex acuminate, acumen 5–11 mm long, above with scattered appressed hairs, below with scattered appressed hairs or thinly sericeous, midrib and nerves slightly raised above, nerves 3–6 per side, 5–46 mm apart, anastomosing near the margin; lateral mostly as the terminal, 5.5–12 by 3–7 cm; pulvinus 3–7 mm long. *Inflorescences* axillary, pseudoracemes, 8–11.5 cm long, peduncle 7–10 cm long, at base glabrous to sericeous at apex or thinly puberulous at base becoming denser upwards. *Bracts* to the brachyblasts ovate, 6–7 by 2.5 mm, outside sericeous, inside glabrous. *Brachyblasts* 1–3 mm long. *Bracts* to the flowers ovate, c. 7.5 by 3.0 mm, outside sericeous, inside glabrous. *Pedicels* 10–16 mm long, ferruginous puberulous. *Bracteoles* caducous. *Calyx* in bud cup-shaped, at anthesis broadly campanulate, 10–11 mm long, tube c. 6 mm long; upper lip semicircular, 4 by 14 mm, bidentate, lateral teeth triangular, 2–4 by 5 mm, median tooth triangular, 4–5 by 6 mm; both sides (ferruginous) sericeous. Corolla pale green. *Standard*: claw 2–3 mm long, with some hairs at apex; blade ± orbicular, 2–2.1 by 1–2 cm, outside with some hairs at base, inside glabrous. *Wings*: claw 5 mm long, ciliate along lower margin; blade elliptic-falcate, 2.7–3 by 0.5–0.7 cm, auricle 3 mm long, outside sericeous at auricle and just above, ciliate along lower margin at base, inside sericeous along lower margin. *Keel petals*: claw 5–7 mm long; blade falcate, 2.5–2.6 by 0.4 cm, auricle inconspicuous, hard part c. 5 mm long, lateral pocket inconspicuous, outside with some hairs between claw and auricle. *Stamens* 2.5 cm long, tube 2 cm long, glabrous; anthers of longer filaments 0.1 mm long, bearded, of shorter filaments 0.2 mm long, with some hairs. *Disc* c. 1.0 mm high. *Ovary* 4.5–5 mm long, sericeous; ovules 2; style 22 mm long, sericeous, apical part glabrous. *Pods* flattened ellipsoid, 6.0–7.5 by 2.5–4.5 cm, reddish brown irritating hairs, upper wing 4–7 mm wide, lower wing 4–8 mm wide, with transverse, 6–8 mm high lamellae, valves with few hairs and irritating hairs. *Seeds* discoid, 13–16 by 13–15 by 3–3.6 mm; hilum 33 mm long, 4/5 of the circumference.

Distribution — *Malesia*: Moluccas: Halmahera.

Habitat & Ecology — Primary forest. Soil: volcanic tuff. Altitude up to 20 m. Flowering: November; fruiting: September, November.

Note — The flowers of the only flowering specimen available to Adema at L are insect-damaged. Some of the characters could not be fully described.

38. *Mucuna samarensis* Merr.

Mucuna samarensis Merr. (1922) 390; (1923) 309; Wilmot-Dear (1991b) 237, f. 9b, c, 10. — Type: *BS 24341 (Ramos)* (PNH†; iso K, NY, US).

Distribution — *Malesia*: Philippines: Luzon, Samar, Mindanao.

Habitat & Ecology — Primary or disturbed forest, along rivers. Soil: limestone or ultrabasic. Altitude up to 50 m. Flowering: April; fruiting: February, April, May.

39. *Mucuna schlechteri* Harms

Mucuna schlechteri Harms (1920) 373; Verdc. (1979) 453, f. 105, 107B, B.1; (1980) 521. — Type: *Schlechter 17449* (B†?), Udu, Waria River.
Mucuna lane-poolei Summerh. (1926) 240; Verdc. (1979) 446; (1980) 525. — Type: *Lane-Poole 372 (E. Stanley)* (BRI?), Papua New Guinea, Owen Stanley Range.

Distribution — *Malesia*: New Guinea: Irian Jaya; Papua New Guinea: Morobe, W Sepik, Central, Northern, Milne Bay Prov.

Habitat & Ecology — Primary and secondary forest, riverside. Altitude up to 1760 m. Soil: ultrabasic (once recorded). Flowering: January, June to September, November; fruiting: July to September.

Note — Flowering parts of inflorescences often quite long, densely set with short, thick brachyblasts, giving the top part a knobby outlook or less dense and brachyblasts more slender. Brachyblasts usually 1.5–2 mm thick, more slender ones 0.5–1.1 mm thick. Apex of wing petals ± hardened like that of keel petals. Pods show no visible ornamentation on the valves. Seeds look ± mature, however, in drying they seem to have shrunk and become irregular ('misshapen', see also *M. longipedunculata*). Seed coat ± shiny black, pitted. Verdcourt (1980) discusses the differences between *M. lane-poolei* and *M. schlechteri* citing the close similarity of these species. He decided to keep the species separate. Comparing the available material of *M. lane-poolei* (*Darbyshire 346*, *Eyma 4681*) with the description of *M. schlechteri* gives only individual differences, except for the length of the pedicels (7 mm in both specimens) and the indumentum of the disc-lobes (glabrous or with a few hairs in the two specimens). We think that these differences are too small to keep the species separate and have united the two, making *M. lane-poolei* a synonym of *M. schlechteri*.

40. *Mucuna sericophylla* Perkins

Mucuna sericophylla Perkins (1904) 86; Merr. (1910) 117; (1923) 310. — *Mucuna pruriens* (L.) DC. var. *sericophylla* (Perkins) Wilmot-Dear (1991b) 247. — Type: *Warburg 12438* (B†), Luzon, Cayagan.
Mucuna luzoniensis Merr. (1906) 196. — Type: *Elmer 5599* (NY, PNH†, US), Luzon, La Union.

Distribution — *Malesia*: Philippines: Leyte, Luzon, Mindanao, Jolo.

Habitat & Ecology — Primary or secondary forests. Soil: clayey loam. Altitude up to 500 m. Flowering: January, February, May, November.

Note — The label of *Bernhardt s.n.* gives the flower colour as black, according to Merrill in the description of *M. luzoniensis* the flower colour is black purple.

41. *Mucuna stanleyi* C.T.White

Mucuna stanleyi C.T.White (1922) 36; Verdc. (1979) 455; Wilmot-Dear (1990) 19. — Type: *White 497* (BRI, K), Papua, Mafulu.

Distribution — *Malesia*: Papua New Guinea: Morobe, E Highlands, New Britain, Central, Milne Bay Prov.

Habitat & Ecology — Primary and secondary forest, logging area, roadsides. Soil: limestone. Altitude up to 2100 m. Flowering: April to November; fruiting: September to November.

Notes — Twigs, petiole and rachis, and inflorescence axes with patent hairs of various length. Longest hairs at twigs, petiole and rachis 2.0–4.2 mm long, at inflorescence axes 2.8–3.5 mm long.

In several aspects rather similar to *M. platyphylla*. *Mucuna stanleyi* differs in the conspicuous indumentum with the longest patent hairs 1.8–4.2 mm long (in *M. platyphylla* 1–1.5 mm long), the much longer stipellae, larger bracts and brachyblasts, larger calyx, the presence of hairs at the stamen tube and the smaller seeds.

Brass 5327 according to the label with 'panicles very stiff; petals pale green' probably belongs here. The L sheet is rather incomplete consisting of a twig with an old inflorescence without flowers or fruits to which a leaf and an old flower with a young fruit are added. It is not certain that all parts belong together. Also *NGF 24252* with, according to the label, pale green flowers, could belong to *M. stanleyi* from which it differs mainly in the seemingly glabrous stamen tube and glabrous longer anthers. It also resembles *M. platyphylla* from which it differs in the length of the longest hairs. *Veldkamp & Stevens 5924* has been included here, this specimen differs from *M. stanleyi* in its smaller leaflets, on average shorter 'longest' hairs and longer pedicels. According to the label of *Hopkins & Hopkins 1016* the 'Flowers [are] visited by striped possum at night'; *Hopkins & Hopkins 1018* states: 'Seeds attacked by moth and fly larvae.'.

42. *Mucuna stenoplax* Wilmot-Dear

Mucuna stenoplax Wilmot-Dear (1992) 218, f. 4, map 2. — Type: *FRI 19916 (Chan)* (K, KEP, L), Peninsular Malaysia, Perlis, Kaki Bukit FR.

Distribution — *Malesia*: Peninsular Thailand; Peninsular Malaysia.

Habitat & Ecology — Primary and secondary forests. Altitude up to 150 m. Flowering: February; fruiting: February to April.

Note — The pods of this species resemble those of the species of the *M. biplicata* group. However, the lamellae of the pods of *M. stenoplax* are not bifurcate, while *M. biplicata* has bifurcate lamellae. The long brachyblasts of *M. stenoplax* easily distinguish it from similar looking species (*M. hainanensis*, *M. interrupta* Gagnep., *M. revoluta* Wilmot-Dear).

43. *Mucuna subumbellata* Wilmot-Dear

Mucuna subumbellata Wilmot-Dear (1990) 8. — Type: *Brass 3514* (holo A; iso BISH, BM n.v.), Solomon Islands, Ngela, 25.1.1933
Mucuna brachycarpa auct. non Rech.: Merr. & L.M.Perry (1942) 405.
Mucuna 'spec. E', Verdc. (1979) 410.

Distribution — *Malesia*: Papua New Guinea: Bougainville; Solomon Islands: Guadalcanal.

Habitat & Ecology — Rainforest, along track. Altitude c. 900 m. Flowering: January; fruiting: April.

Note — Known from just a few specimens. The specimens in L are not complete, only one flower was available. Several characters could not be described in full detail. However, the description has been corrected by comparison with the description of Wilmot-Dear (1990). Merrill & Perry (1942) associated the species *M. brachycarpa* Rech. with *Brass 3514* (green-flowered), the type of the present species. In Merrill's time the common yellow-flowered species from Bougainville was not known. Verdcourt (1979) in his comments to the unnamed species *Mucuna* spec. E argued that Rechinger's species, described on a single pod, was probably identical with the yellow-flowered species of Bougainville. Wilmot-Dear (1990) has taken the same view and described the green-flowered species as a new one: *M. subumbellata*, with *Brass 3415* as the type. Vegetatively, *M. subumbellata* is very similar to *M. gigantea*.

44. *Mucuna sumbawaensis* Wiriad.

Mucuna sumbawaensis Wiriad. in Wiriad. & H.Ohashi (1990) 104, f. 5, 6. — Type: *Kuswata 148* (A, BO, K, L), W Sumbawa, Setongkat Atas.

Distribution — *Malesia*: Lesser Sunda Islands: Sumbawa.

Habitat & Ecology — Secondary forest, riverside, savannah forest. Soil: andesite breccia. Altitude 200–650 m. Flowering: May, December; fruiting: May.

Note — Close to *M. gigantea* which differs mainly in the pods: *M. sumbawaensis* pods wrinkled and with thick wings, *M. gigantea* pods smooth with thin wings. *Mucuna sumbawaensis* is also rather similar to *M. longipedunculata* of the Philippines from which it differs in the shorter inflorescences that are pseudoracemes, not pseudopanicles, the short pedicels, smaller calyces, slightly smaller corollas and the winged pods. The material seen at K and L by Adema has flowerbuds and young and ripe pods.

45. *Mucuna tomentosa* K.Schum.

Mucuna tomentosa K.Schum. in K.Schum. & Lauterb. (1905) 277; Verdc. (1979) 457. — Neotype (here designated): *NGF 27849 (Streimann & Kairo)* (holo BO; iso A, BISH, BRI, CANB, K, L, SING), Papua New Guinea, Morobe Prov., Wau Subprov., Bulolo, Taun Creek, BGD lease.

Distribution — *Malesia*: New Guinea: Irian Jaya: Manokwari Prov.; Papua New Guinea: E Highlands, Morobe, Oro, Central Prov.

Habitat & Ecology — Primary or secondary forests, abandoned garden, roadsides. Altitude 800–2100 m. Flowering: May to August; fruiting: June.

Note — Schumann based his description of *M. tomentosa* on *Nyman 663* (Kaiser Wilhelmsland, Sattelberg, 700 m ü.M.). According to Verdcourt (1979) this material was destroyed. A neotype has been chosen. The indumentum of axial parts consists of hairs of different lengths, longest hairs 1.0–1.5 mm long. The keel petals resemble some kind of hockey stick.

46. *Mucuna toppingii* Merr.

Mucuna toppingii Merr. (1917b) 85. — Type: *Clemens 10085* (K), Borneo, Mt Kinabalu, Kiau.

Distribution — *Malesia*: Borneo, Sabah: Mt Kinabalu, Tambunan.

Habitat & Ecology — Primary forest, along trail. Altitude 500–1700 m. Flowering: January, February, October to December.

Note — Vegetatively rather similar to *M. biplicata* differing in the inflorescence and pods. *Kokawa & Hotta 5257* has been included here; it differs mainly in the indumentum of the axial parts: more hirsute with short patent hairs. Also *SAN 44348* may belong here; this specimen differs in the more hirsute indumentum of the axial parts and in some small differences in sizes of flower parts and in the indumentum of the petals.

47. *Mucuna verdcourtii* Wiriad., *sp. nov.* — Fig. 8

Twigs brown tomentose. Leaflets broadly ovate to orbicular, 8–16 by 5–13 cm, above thinly tomentose or sericeous, below brown tomentose, nerves 5–6 per side. Inflorescences pseudoracemes, up to 42 cm long. Pods 25–28 by 3–5 cm. — Type: *NGF 4896 (Womersley)* (holo L), Papua New Guinea, E Highlands Prov., A1 valley near Nondugl.

Liana. *Twigs* terete, 3–6 mm diam, brown tomentose. *Stipules* caducous. *Petioles* 5.5–15.5 cm long, ± grooved above, brown tomentose; rachis mostly as the petiole 2–5 cm long; pulvinus 8–10 mm long. *Stipellae* acicular, 7 by 0.3 mm, ± hirsute. *Leaflets*: terminal, broadly obovate to orbicular, 8–15.5 by 5.6–13 cm, index 1.2–1.6, base truncate to cuneate, apex acuminate, acumen 2–8 mm long, above thinly tomentose or sericeous, below brown tomentose, ± shiny, midrib and nerves slightly raised above, nerves 5–6 per side, 17–30 mm apart, anastomosing near the margin; lateral mostly as the terminal, obliquely ovate, 8–16 by 5–12 cm; pulvinus 5–10 mm long. *Inflorescences* axillary, pseudoracemes, up to 42 cm long, peduncle up to 30 cm long, brown tomentose. *Bracts* to the brachyblasts obovate, 50 by 25 mm, inside thinly sericeous, outside sericeous. *Brachyblasts* c. 3 mm long. *Bracts* to the flowers narrowly ovate, 35 by 9 mm, inside thinly sericeous, outside sericeous. Flowers not known. *Pods* flattened, broadly strap-shaped, 25–28 by 3–5 cm, upper wing 8–15 mm wide, lower wing 5–15 mm wide, lamellae oblique, 11–12 mm high, valves villous and puberulous with abundant irritating hairs. *Seeds* undeveloped.

Distribution — *Malesia*: Papua New Guinea: Madang, E Highlands Prov.

Note — Verdcourt (1979) described the species (B) without giving it a name. According to him *M*. 'B' (= *M. verdcourtii*) is rather similar to *M. albertsii* or *M. stanleyi*, but very different in the very large bracts and pods. The specimen *ANU 909 (Walker)* mentioned by Verdcourt belongs to *M. aimun*. According to Womersley on the label of *NGF 4696* the flowers are reported to be red. This is, according to Verdcourt, a mistake due to confusion with other species. The longest hairs of *M. verdcourtii* are 1.3–3 mm long.

48. *Mucuna warburgii* K.Schum. & Lauterb.

Mucuna warburgii K.Schum. & Lauterb. (1901) 365; Verdc. (1979) 457; Wilmot-Dear (1992) 243. — Syntypes: *Lauterbach 856*, *953*, *1162*, *3205* (n.v.), Papua New Guinea, 'Kaiser Wilhelmsland'.
Mucuna peekelii Harms (1920) 373. — Type: *Peekel 370* (n.v.), Bismarck Arch., Neu-Mecklenburg, Namatanai, Salinum, Matakan.
Mucuna bennettii auct. non F.Muell.: I.Polunin (1987) 132, pl. 127.

Distribution — *Malesia*: New Guinea.

Habitat & Ecology — Primary forest, swamp forest, along rivers. Altitude up to 50 m.

Note — The original description of *M. warburgii* mentions stipellae: 'stipellis minutis filiformibus'; 'Die Stipellen sind kaum 5 mm lang.'. This species forms with *M. bennettii* and *M. novoguineensis* the group of *Mucuna* with large, red to orange flowers. The first species lacks stipellae and has large calyx teeth, the second species has stipellae and short calyx teeth, *M. warburgii* has stipellae and large calyx teeth, it also has more ovules than the two other species. In the original description of *M. warburgii* four Lauterbach specimens are mentioned. Up to now I have not seen any of these, also Verdcourt (1979) and Wilmot-Dear (1992) mention none of these specimens. For the moment I refrain from selecting a lecto- or a neotype.

DUBIOUS AND EXCLUDED SPECIES

Mucuna monosperma Roxb. ex Wight

Mucuna monosperma Roxb. ex Wight in Hook. (1831) 346; Craib (1928) 444. — *Carpopogon monosperma* Roxb. [(1814) 54, nom. nud.]; (1832) 283. — Lectotype (Wilmot-Dear 1992): *Roxburgh 276* (holo BM; ? iso K n.v.).

Several times mentioned for Sumatra (Miquel 1855, Prain 1897a, b, Craib 1928), Borneo (Ridley 1938) or the Philippines (Fernandez-Villar 1880). No specimens from Sumatra or the Philippines identified as *M. monosperma* have been seen by the present authors. The specimen of Fernandez-Villar may belong to *M. diplax*. The Bornean specimens belong to *M. elmeri*, which is also one-seeded. We do not know what the Sumatran references represent. The species name has been credited to De Candolle, however, in the Prodromus he gives *M. monosperma* in a list of species that may belong to the genus *Mucuna*. He cites Roxburgh as the source of the name.

Mucuna nigricans (Lour.) Steud.

Mucuna nigricans (Lour.) Steud. (1841) 163. — *Citta nigricans* Lour. (1770) 456. — Lectotype (Wilmot-Dear 1992): *Loureiro s.n.* (holo BM n.v.), Cochinchina (Vietnam).

The lectotype is sterile and could belong to a number of species. The history of the use of the name is rather confusing. The name is now a rejected name (McNeil et al. 2006: 472, 476). See for a more detailed discussion Wilmot-Dear (1991c, 1992).

Mucuna ? wertheimii Burck

Mucuna ? wertheimii Burck (1893) 188, pl. 14, f. 2. — Type: *Exped. Neerl. s.n.*, Key Islands (n.v.).

The species was described after a fruiting specimen from the Key Islands. The pod in the drawing accompanying the description looks very similar to a *Dioclea*-pod, not much different from those of *D. hexandra*.

In Kew I have seen a photograph annotated as: *Mucuna* cf *wertheimii* Burck, cult. Hort. Bog. XVIII.D.10, fl. 8.XI. 1910. Fl. aurantiacum rubri (orange red). According to Verdcourt not *Mucuna bennettii*, *warburgii*, *elegans*, etc. The flowers of *Mucuna ? wertheimii* are not known. The flowers of *Dioclea hexandra* are white, pinkish or purplish.

Negrecia mansa Blanco

Negrecia mansa Blanco (1879) 387.

Probably a *Mucuna* species. Not mentioned in Kew Index, IPNI and Merrill (1918: 188).

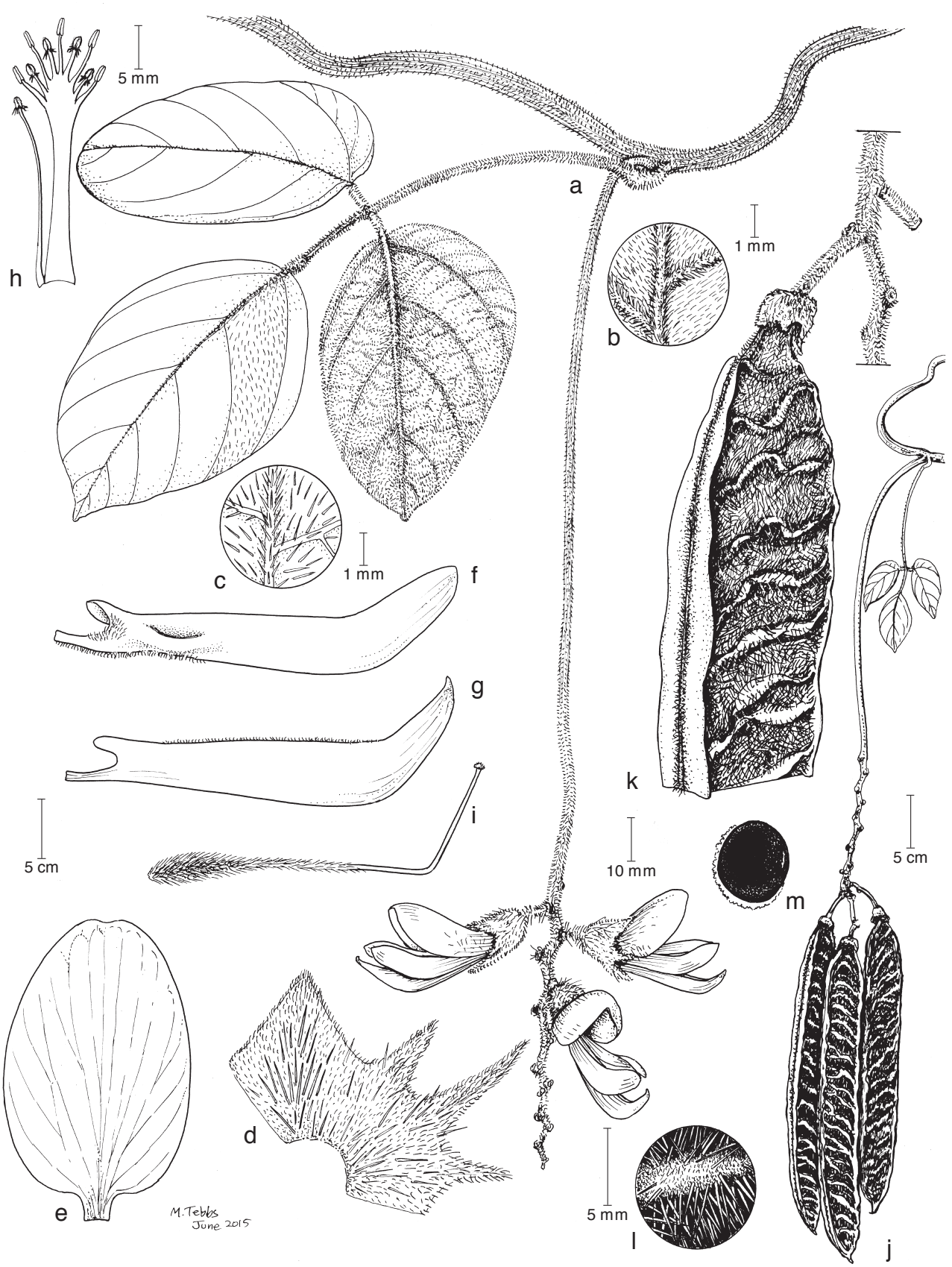

Fig. 8 *Mucuna verdcourtii* Wiriad. a. Part of twig with a leaf and an inflorescence (reconstructed); b. detail of leaflet lower surface; c. detail of leaflet upper surface; d. calyx opened, from outside; e. standard; f. wing petal; g. keel petal; h. stamens, sheath opened; i. ovary and style; j. infructescence; k. basal part of pod; l. detail of pod indumentum; m. seed (all: *NGF 4896 (Womersley*). — Drawing Margaret Tebbs.

Negretia urens Blanco

Negretia urens Blanco (1837) 586; (1845) 409; (1879) 387, nom. illeg.

According to Fernandez-Villar (1880) this is *Mucuna monosperma* Roxb. ex Wight. However, this species does not occur in the Philippines. Merrill (1905a, 1906) identified it as *M. imbricata* DC. ex Baker. A species also absent from the Philippines. The specimen cited by Merrill as an example of *Negretia urens* (*Merrill 3783*) is according to Wilmot-Dear (1991b: 250) a mixed collection which is for the greater part *M. diplax* to which pods and seeds of *M. platyplekta* are added. Later Merrill (1910, 1918) changed the identification to *M. nigricans* (Lour.) Steud. This, however, is a confusing and misapplied name. The material once named *M. nigricans* belongs to at least five taxa (Wilmot-Dear 1991c). In the Philippines two of these taxa are found: *M. hainanense* subsp. *multilamellata* and *M. diplax* (see Wilmot-Dear 1991a, b). However, it is not clear from Blanco's description of the pods to which of these species his *Negretia urens* belongs. Merrill's illustrative specimen of *Negretia urens* Blanco (*Merrill sp. Blanc. 779*) belongs to *M. diplax*.

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[1] The pods added to the Kew duplicates belong to *M. warburgii*.

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