

New taxa of *Mucuna* (*Leguminosae-Phaseoleae*) from East Africa and Australia

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Summary. *M. ferox* n. sp. formerly confused with *M. poggei* Taub. is described from East Africa and *M. reptans* n. sp. and *M. diabolica* Backer ex Keuchenius subsp. *kenneallyi* n. subsp. from Northern Territory and Western Australia respectively. All three belong to subg. *Stizolobium* (P. Br.) Prain and are related to *M. pruriens* (L.) DC. The opportunity has been taken to make a few corrections to the Flora of Tropical East Africa account.

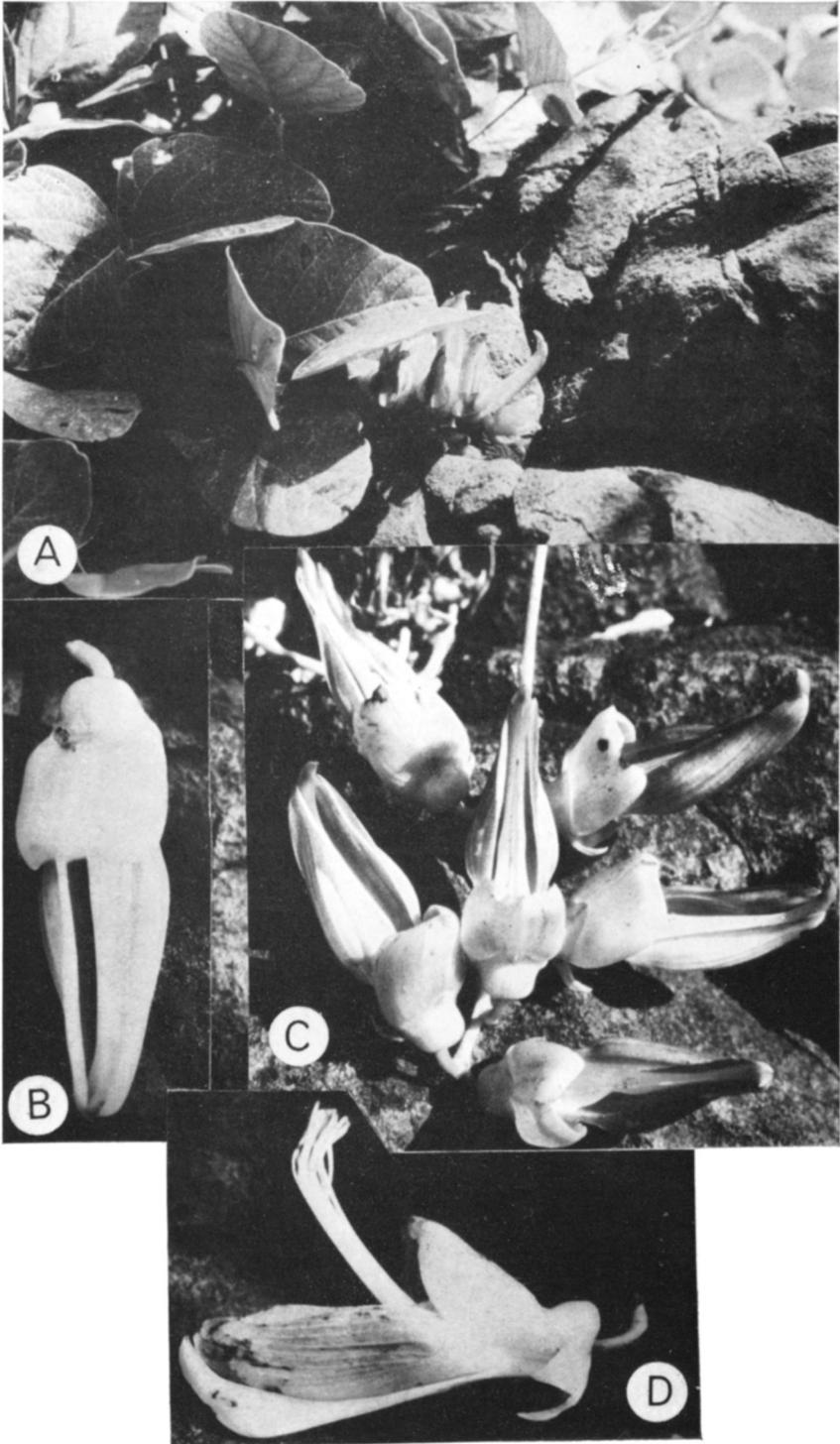
A few years ago Dr Bruce Maslin requested my assistance in naming a *Mucuna* collected by Mr K. Kenneally in Western Australia but short of pointing out that it was related to *M. pruriens* (L.) DC. and closely similar to an apparently unnamed specimen from Timor Laut, and also bore some resemblance to an East African specimen collected by M. Thulin and Mhoro, nothing further was done. The East African specimen had been named *Mucuna poggei* Taub. despite the dehiscent fruits. Quite recently Mr Kenneally asked me to name some further collections from Australia of yet a further species. Since all these *Mucuna* belong to subgenus *Stizolobium* it seemed reasonable to deal with them in one paper.

Mucuna poggei Taub. has a distinctive contorted indehiscent fruit, the seeds having a hilum which extends about $\frac{1}{3}$ of the way around the circumference. Dr Mats Thulin drew my attention to a specimen which had been named routinely as *M. poggei* yet had dehiscent fruits and the seeds with very short hila; in foliage, however, it resembled *M. poggei* to a very marked extent. Fortunately the specimen has both correlated flowers and fruits and it seemed likely that some if not all of the material I had called *M. poggei* var. *pesa* (De Wild.) Verdc. during my work* for the Flora of Tropical East Africa was actually identical with the Thulin and Mhoro specimen. At that time unfortunately not a single specimen I referred to var. *pesa* had correlated fruits. Since it appeared that the abruptness of the curvature of the keel might provide a floral character I reborrowed the type of *M. pesa* De Wild. and also requested any fruiting material which might be available from its type locality. Unfortunately no fruiting material from close to the type locality is available but what I have accepted as correlated young fruiting material from a locality some 500 km away, *Liben* 2590 (Territoire Luisa, Tumba), shows that *M. poggei* var. *pesa* can stand, the name not being available for the species with dehiscent fruits. (Fig. 1B, C). A *Gossweiler* specimen, 4753 from Angola, Cazengo fortunately has correlated flowers and young fruits, the latter being of a size almost exactly similar to those on *Liben* 2590. Fruits from both have been boiled up and dissected; both have 3-4 developing seeds and the structure of the funicle, immature hilum and aril is the same in both save that the fruits of 4753 are slightly more developed. (Fig. 1A). Since the flowers on this sheet are 8.5 cm long there is no doubt it is *M.*

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* Flora of Tropical East Africa. Leguminosae (Part 4) Papilionoideae Part 2: 566 (1971) & Kew Bull. 24: 287-288 (1970).

PLATE 17



Mucuna reptans. **A** foliage; **B** flower; **C** terminal part of inflorescence; **D** flower showing erect male parts. All from *G. Keighery* 2643, Mitchell Plateau, W. Australia.

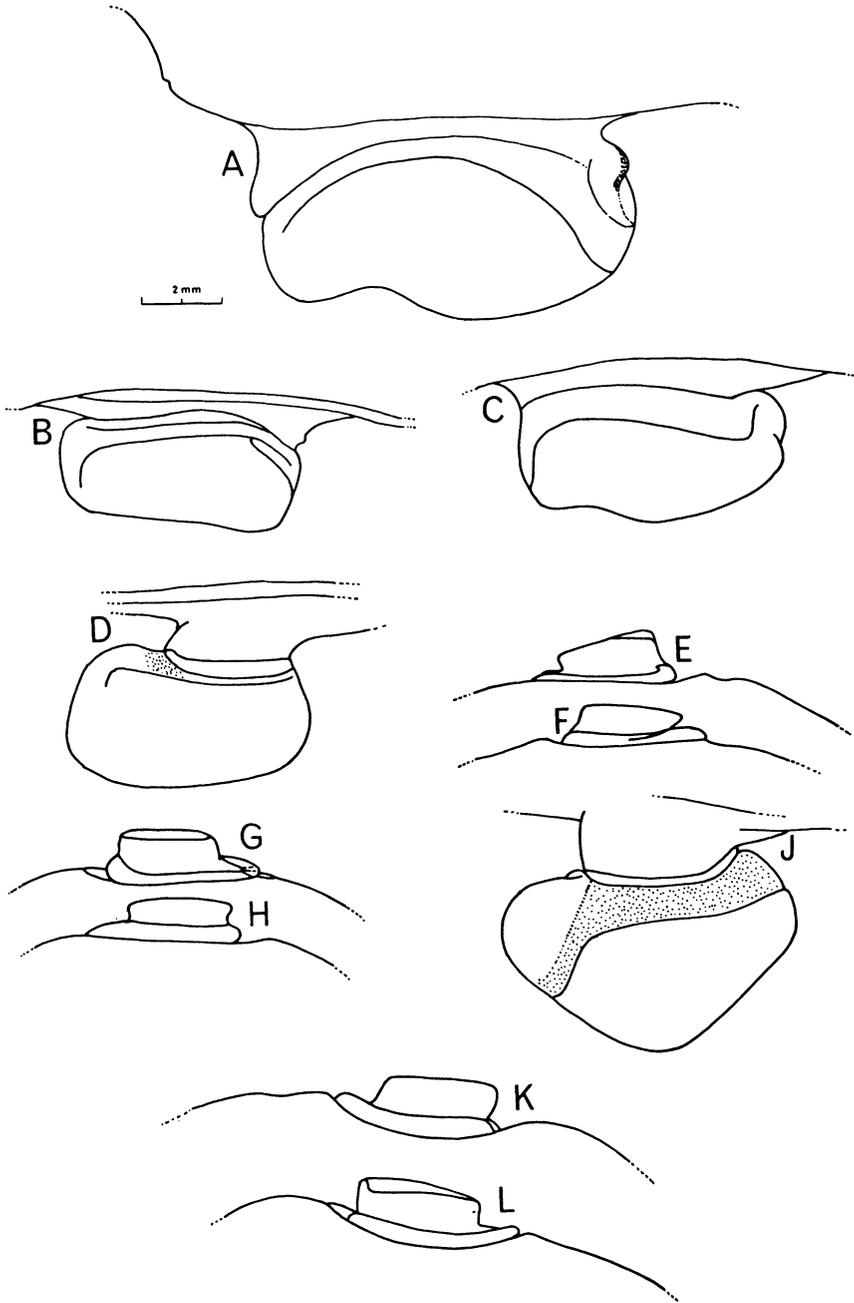


FIG. 1. **A** *Mucuna poggei* var. *poggei*, fertilized ovule from young fruit, from *Gossweiler* 4753; **B, C** *M. poggei* var. *pesa*, alternate fertilized ovules from young fruit, from *Liben* 2590. **D** *M. melanocarpa*, fertilized ovule from young fruit, from *Gillett* 14641; **E-H** *M. melanocarpa*, two ripe seeds from alternate sides of placenta, rim aril & funicle remnant, the pairs are the different side views of the same seed, from *Meyer* 7867. **J** *M. ferox*, fertilized ovule from young fruit, from *Thulin & Mhoro* 854; **K, L** *M. ferox*, ripe seed, rim aril & funicle remnant, different side views of same seed, from *Thulin & Mhoro* 854. Drawn by B. Verdcourt.

poggei var. *poggei*. I am therefore satisfied that *Liben* 2590 is conspecific but, as it has dense indumentum on the undersurface of the leaves, is almost certainly the small-flowered var. *pesa*. Some of the material I had associated with var. *pesa* in the Flora is, however, better associated with the *Thulin & Mhoro* specimen. Until a very complete range of correlated fruiting and flowering specimens is available some doubt will remain about the identity of some sheets. I am describing the *Thulin & Mhoro* specimen as a new species.

Mucuna (subg. **Stizolobium**) **ferox** Verdc. sp. nov. affinis *M. melanocarphae* Hochst. ex A. Rich., corolla viridescenti-alba, seminibus majoribus, *M. pruriensis* (L.) DC. affinisque fructibus et seminibus majoribus differt; *M. poggei* Taub. similis, carina magis regulariter curvata, fructu dehiscenti, hilo 4 mm longo diversa. Typus: Tanzania, *Thulin & Mhoro* 854 (holotypus K; isotypi DSM, EA, UPS).

Planta alte scandens; caules in siccitate striati, nigrescentes, pilis pallidis patentibus \pm dense obtecti. *Stipulae* mox caducae non visae. *Foliola* 3, supra appresse hirsuta, pilis superficiem haud occultantibus, infra dense appresse argyro-sericeo-velutina; terminalia ovata, 12 \times 11 cm, apice acuminata, basi rotundata; lateralia obliqua, usque 13 \times 10.5 cm; petiolus 5–13 cm longus; rhachis 1.7–2.5 cm longa; stipellae lineares, 5 mm longae. *Inflorescentiae* \pm 25 cm longae, probabiliter 50–100-florae, dense appresse argyro-hirsutae, fasciculis sessilibus plurifloris; pedunculi 15–18 cm longi, indumento ut in caule. *Calyx* subtiliter appresse pubescens et setis aurantiaco-brunneis irritantibus longioribus satis sparse obtectus; tubus demum late cupuliformis, 8 mm longus, 1.5–2 cm latus, intus aurantiaco-hirsutus, lobis lateralibus anguste triangularibus 3 \times 2.5 mm, lobis 2 superioribus in labio leviter emarginato 3 \times 8 mm connatis, lobo inferiore angustissime triangulari 5 \times 3 mm. *Corolla* viridescenti-alba; vexillum late ellipticum, \pm 4 \times 3 cm, apice leviter emarginatum, ungue 4 mm longo 5 mm lato; alae \pm oblanceolatae, 5–5.7 \times 1.2–1.5 cm, apice rotundatae, basi in unguem 9 mm longum et appendiculum 5 \times 3 mm productae, margine inferiore prope basin pubescentes; carina 4.8–5.2 \times 7.5 mm, prope apicem abrupte \pm rectangulariter curvata, parte sursum flexa 1.6–2 cm longa apice valde incrassata, ungue 7–9 mm longo. *Androecium* 4.5 cm longum, prope apicem abrupte curvatum, parte flexo 1.5 cm longo, partibus liberis filamentorum 1.1–1.2 cm longis apice leviter dilatatis; filamentum vexillare omnino liberum. *Discus* \pm 11-lobatus, 1.5 mm altus. *Legumen* juventute \pm sigmoideum, apice uncatum, demum curvato-oblanceolatum, 10–13 \times 2.1–2.4 cm, 3–4(–5)-seminatum, longitudinaliter bicostatum, costis a marginibus leguminis per 8 mm separatis, setis aurantiaco-brunneis irritantibus appressis densissime obtectum. *Semina* saturate brunnea, compressa ellipsoidea, 1.35–1.55 cm longa, 1.2–1.35 cm lata, 3.5–4.5 mm crassa; hilum 4 mm longum arillo nigro angusto marginatum, vestigium funiculi 3 mm lato adnatum. (Fig. 1 J–L, 2.)

TANZANIA. Kilosa District: near Ruaha R., 12 km W of Kidatu Bridge, 450 m, 4 Sept. 1970, *Thulin & Mhoro* 854 (holotype K; isotypes DSM, EA, UPS):—climber high up in trees along small stream, flowers in dense racemes, greenish white, fruits and calyces with stinging hairs.

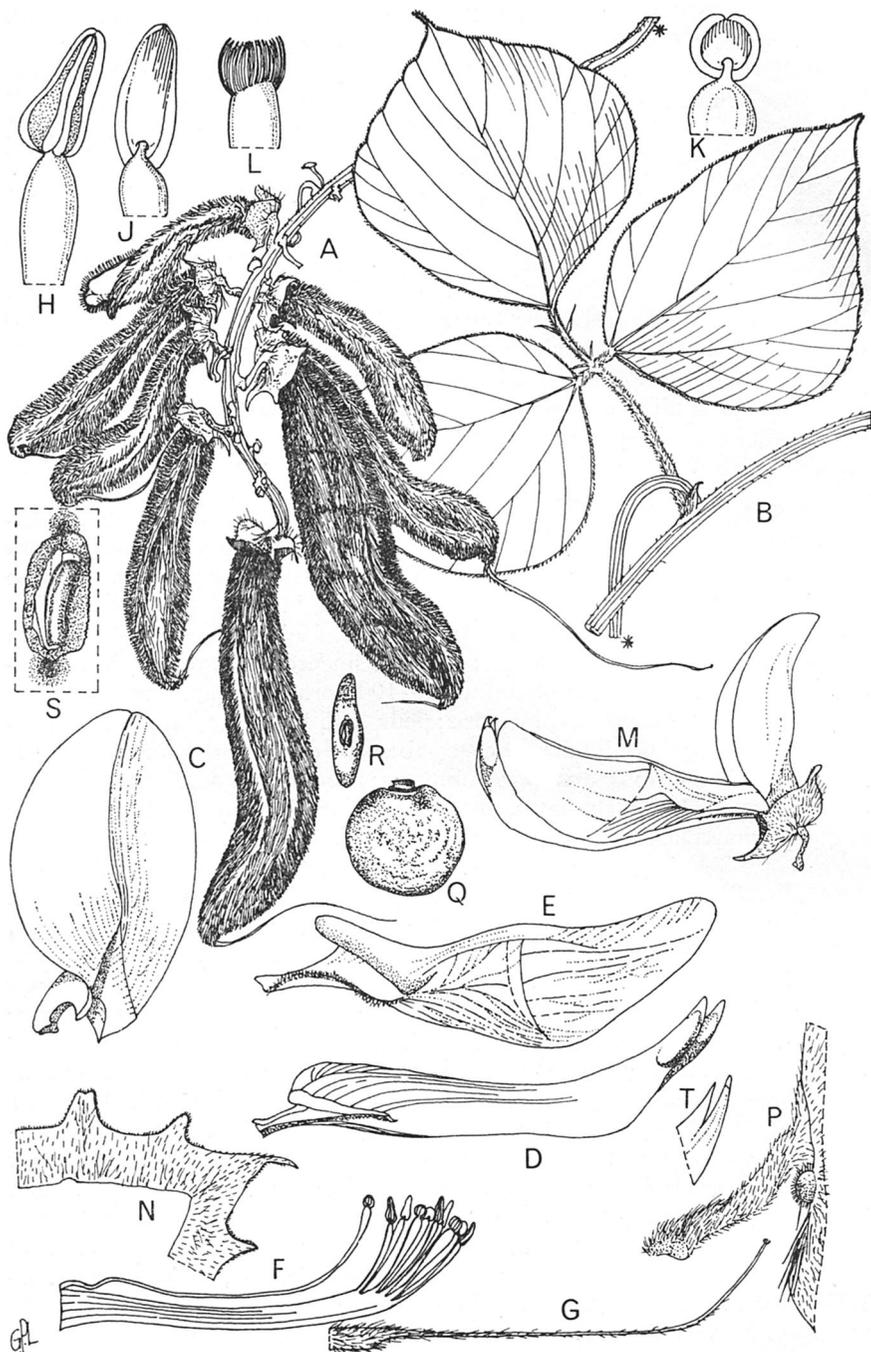


FIG. 2. *Mucuna ferox*. A infructescence $\times \frac{1}{3}$; B leaf $\times \frac{1}{3}$; C standard $\times 1$; D keel $\times 1$; E wing $\times 1$; F androecium $\times 1$; G gynoecium $\times 1$; H-K anthers $\times 6$; L stigma $\times 18$; M flower $\times \frac{2}{3}$; N calyx $\times 1$; P pedicel & calyx appendage $\times 3$; Q, R seed $\times 1$; S close up of hilum area $\times 4$; T variation on beak $\times 1$. All from Thulin & Mhoro 854. Drawn by G. P. Lewis.

It is possible that *Hornby* 702, Tanzania, Mpwapwa, 1050 m, 20 Aug. 1935 (EA, K) and *Culwick* 17, Tanzania, Ulanga Valley, 360 m, June 1935 (EA, K) both cited by me as *M. poggei* var. *pesa* in the references mentioned (p. 743) belong to *M. ferox* but without fruiting material from the areas concerned it is not quite certain. The keel shape in *Hornby* 702 is correct for *M. ferox* but the *Culwick* specimen is sterile. If these two are correctly referred then the following emendations can be made—terminal leaflet rounded oblate, 15–17.5 × 13.8–19 cm; lateral leaflets 17–18.5 × 14.2–17 cm; petiole to 22 cm and rhachis to 4.5 cm long. A further correction can be made to the previous papers; *Tweedie* 1893, Kenya, N Kavirondo District, S Elgon, R. Kuiuwa (K) was incorrectly referred to *M. poggei* var. *pesa* by me but is undoubtedly true var. *poggei*—the leaf-indumentum and calyx agree with this variety but the flowers are somewhat shorter, possibly not quite mature.

At the time the F.T.E.A. account was written fruiting material of *M. melanocarpa* was not available or at least had been confused under *M. pruriens* and I considered it might be very close to *M. poggei*; the dehiscent fruits indicate a much closer relationship with *M. pruriens* and *M. ferox*. There are many sheets from Ethiopia without both flowers and correlated fruits and also without colour-notes for the flowers. The possibility that *M. poggei* occurs there also must await much more correlated material. The isotype of *M. melanocarpa* at Kew bears only one very young fruit and Richard does not indicate whether or not the fruits he saw were ripe. Collectors should note that good correlated fruiting material is needed of all *Mucuna* from Ethiopia, Tanzania and SE Zaire in order to tie up this problem finally; in fact it is a rule with *Mucuna* species in general that fruits and seeds are usually crucial for identification. (Fig. 1D-H.)

Mucuna diabolica Backer ex Keucheni in Mededeelingen van het Proefstation voor Thee No. 90: 33 (1924); Heyne, De Nuttige Planten van Nederlandsch Indie, ed. 2, : 824 (1927); Backer & Bakhuizen van den Brink jr., Fl. Java 1: 629 (1963). Type: Central and East Java, no specimen cited.

Stizolobium forbesii Piper in Proc. Biol. Soc. Washington 30: 61 (1917). Type: Timor Laut, *Forbes* 3320B (holotype K).

Mucuna forbesii (Piper) Backer, Beknopte Flora van Java 5: 128 (1941), non Bak. f. (1923).

subsp. **diabolica**

Pod with longitudinal ribs 8–10 mm apart, one 2.5–3 mm from the margin the other 4.5–5 mm from the other margin. *Seeds* smaller, 1.35–1.4 cm long, 1 cm wide, 5 mm thick; hilum 8 mm long with reduced black rim-aril; funicle remnant 3.2 mm wide. (Fig. 3.)

subsp. **kenneallyi** Verdc. subsp. nov. a subsp. *diabolica* seminibus majoribus, costis fructus confertioribus 3–5 mm distantibus differt. Typus: Western Australia, *Kenneally* 6391 (holotypus PERTH; isotypus K).

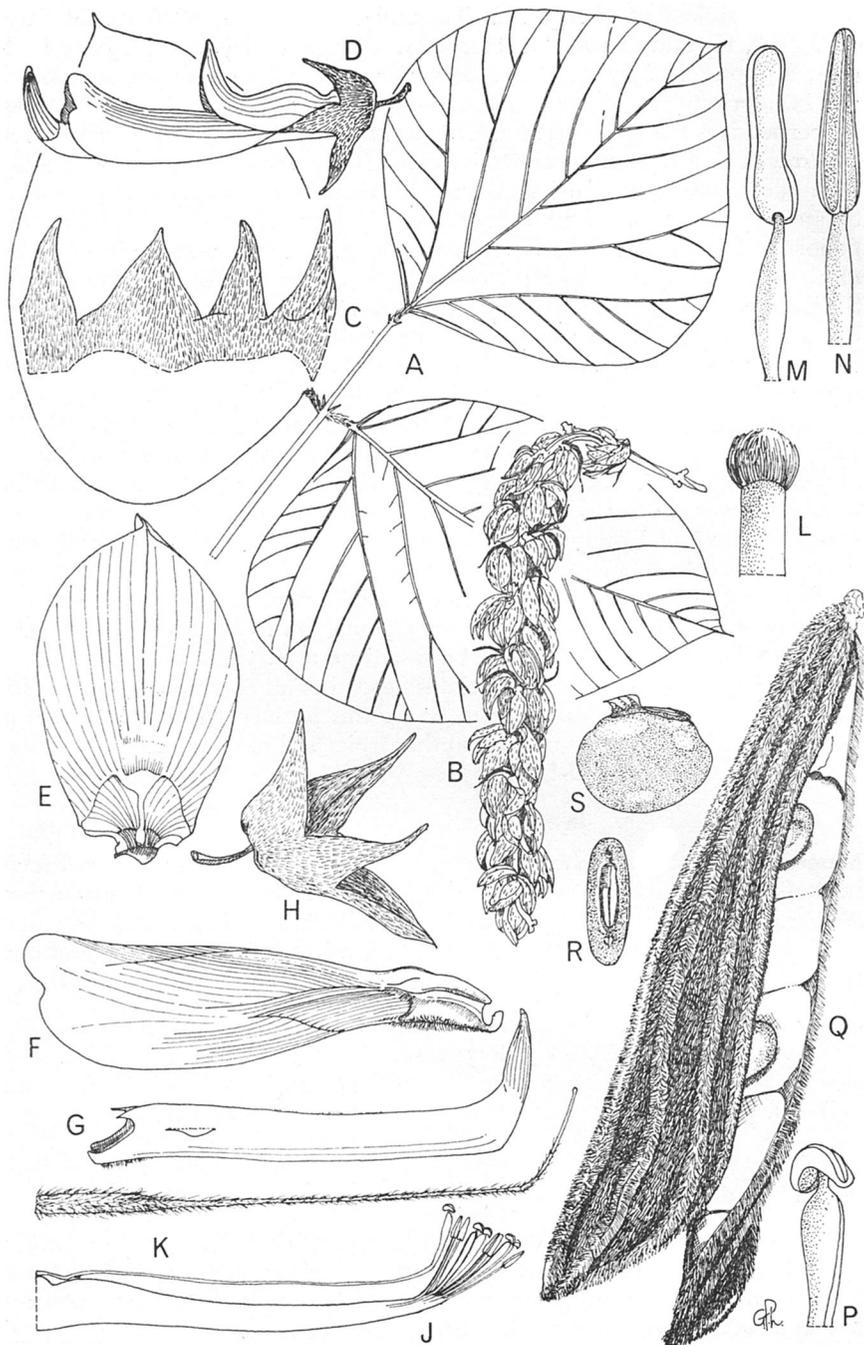


FIG. 3. *Mucuna diabolica* subsp. *diabolica*. **A** foliage $\times \frac{2}{3}$; **B** inflorescence in bud $\times \frac{2}{3}$; **C** calyx, opened out $\times 1$; **D** flower $\times \frac{2}{3}$; **E** standard petal $\times 1$; **F** wing $\times 1$; **G** keel $\times 1$; **H** calyx $\times 1$; **J** androecium $\times 1$; **K** gynoecium $\times 1$; **L** stigma $\times 15$; **M**, **N**, **P** anthers $\times 8$; **Q** pod $\times \frac{2}{3}$; **R** hilum area of seed $\times 1$; **S** lateral view of seed $\times 1$. **A-P** from Riedel s.n.; **Q-S** from Forbes 3320B. Drawn by G. P. Lewis.

Caulis striatus, inferne cortice suberoso desquamanti obtectus, superne dense appresse flavo-griseo-pubescentis. *Folia* juvenilissima dense appresse hirsuta; petiolus 5.7–9 cm longus; rhachis 0.7–1.3 cm longa; foliolum terminale rotundatum vel oblatum, 5–5.6 × 5.4–5.6 cm; foliola lateralia valde obliqua, 4.5–7.5 × 3.8–5.5 cm; foliola utrinque appresse pilosa pilis superficiem vix obscurantibus; stipellae subulatae, 3 mm longae; stipulae lineares, 5 mm longae, mox deciduae. *Flores* non visi. *Legumen* 10.8–16.5 × 2.8–3.2 cm, setis aurantiaco-brunneis irritantibus densissime obtectum, margine incrassatum, costis approximatis 3–5 mm separatis medio longitudinaliter ornatum, 4–5-seminatum vel abortu 1-seminatum etiam seminis abortivis 5 provisum. *Semina* nigro-brunnea, elliptica, 2.2–2.35 cm longum, 1.5–1.6 cm latum, 5 mm crassum, hilo 1.35–1.45 cm longo et arillo marginali nigro ornata; vestigium funiculi 5 mm longum. (Fig. 4.)

AUSTRALIA. Western Australia: W Kimberley Coast, off Admiralty Gulf, Fenelon I., 14°08'S, 125°42'E, in white sand behind beach, 27 July 1977, *Kenneally* 6386 (holotype of subspecies PERTH; isotype K); climber on *Albizia*, & same locality, and data, *Kenneally* 6391 (K, PERTH).

When first attempting to name *Kenneally's* specimen its similarity to the Timor Laut material was noted and at the time it was thought that that too might be a subspecies of *M. diabolica*, a species which appeared to be unrepresented at Kew. On further investigation of the name *M. forbesii* (Piper) Backer non Bak. f. which Backer gives as a synonym of *M. diabolica* I was amazed to find that the two Timor Laut specimens, namely *Forbes* 3320B and *Riedel* s.n., were cited specimens of Piper's *Stizolobium forbesii*—in fact the former is the holotype. Piper presumably either had these sheets on loan or saw them at Kew during a visit to Europe but did not write them up and they had remained unwritten up for the past 63 years. Piper cites material from Timor Laut (*Forbes*), Malay Archipelago (*Riedel*), Larat I. (*Treub*), Java (*Koorders*), Kei Is. (*Treub*). Actually *Riedel's* sheet is also from Timor Laut and does not bear the phrase Malay Archipelago; it is the *Forbes* sheet which has a label "Flora of Malay Archipelago: Timor Laut". Larat I. is near the northern tip of Tanimbar I., the main Island of the Timor Laut group. Piper well realised that his species was similar to '*Stizolobium poggei* (Taub.) Hiern from Africa' although he did not know that that had indehiscent fruits and a long hilum. Apart from the two sheets from Timor Laut I have seen only two sheets cultivated at Bogor and kindly sent on loan from Leiden. Its true wild distribution is not at all clear.

Mucuna reptans Verdc. sp. nov. affinis *M. pruriensis* (L.) DC. habitu prostrato, floribus majoribus differt. Typus: Australia, Northern Territory, *Byrnes* 1802 (holotypus K; isotypus NT).

Planta prostrata; caules striati, pilis albis vel brunnescentibus ± patentibus pubescentes. *Stipulae* caducae non visae; stipellae subulatae, 3 mm longae. *Foliola* 3, supra vix dense appresse hirsuta, pilis superficiem haud obscurantibus, infra dense appresse sericeo-velutina, apice rotundata et apiculata vel emarginata, basi cuneata, rotundata vel truncata; terminalia rhomboidea, prope basin latissima, 8.5–12 × 6.8–8.2 cm; lateralia obliqua, 9–12 × 6.2–8.5 cm; petiolus 11–15 cm longus; rhachis 1.6–2 cm longa; petioluli 5–9 mm longi. *Inflorescentiae* 6–10 cm longae, ± 7-florae, pedunculis 8–27 cm longis

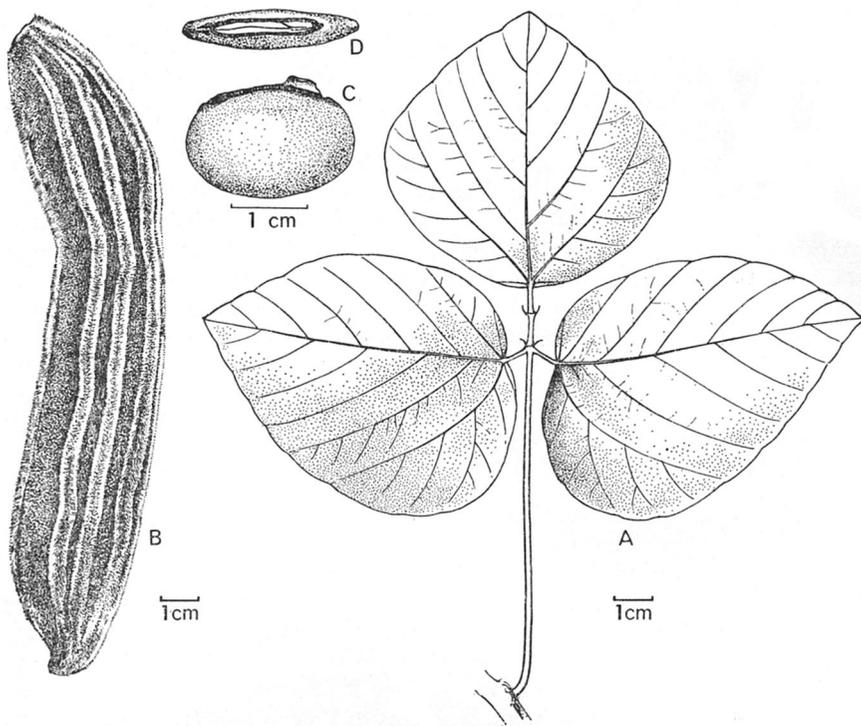


FIG. 4. *Mucuna diabolica* ssp. *kenneallyi*. **A** leaf; **B** fruit; **C**, **D** seed. All from *Kenneally* 6386. Drawn by Mrs S. Genovese with seed added by G. P. Lewis.

pubescentibus, pedicellis 6–10 mm longis; flores odori mucido redolentes. *Calyx* appresse griseo-sericeo-pubescentis setisque aurantiacis sparsis obtectus; tubus late cupuliformis, 6–7 mm longus, lobis lateralibus triangularibus (3–) 5–7 mm longis 6–7 mm latis, lobo inferiore lanceolato vel anguste triangulari 7–8 × 3–7 mm, lobis 2 superioribus in labio triangulari 7–10 × (0.6–)1.3–1.8 cm minute bifido ambitu acuto vel rotundato connatis. *Corolla* saturate rubra, vel viridis, vel viridis et flava, nigro-maculata, vel fide Keighery vexillum pallide flavum, alas pallide sordide purpureas, et carinam pallidam apice viridem praebens. *Vexillum* oblatum, 2.5–3.5 × 1.8–3.3 cm, apice mucrone brevi bifido terminatum, basi areis incrassatis duabus 8–9 mm longis capiens. *Alae* oblongo-oblanco-latae, 4.5–5.8 cm longae, usque 1.8 cm latae, ungue 3 mm longo, basi dente brevi 2 mm longo productae, margine basi hirsutae. *Carina* gracilis, 4.5–6.5 cm longis, 6–8 mm latis, apice abrupte rectangulariter curvatus, parte sursum flexa 1.8–2 cm longa apice incrassata. *Androecium* 5.3 longum, prope apicem abrupte curvatum, partibus liberis filamentorum 1–1.1 cm longis; filamenta 5, apice leviter dilatata, antheris 2–3 mm longis praedita; filamenta 5 altera apice magis dilatata antheris horizontalibus 0.5 mm longis praedita; filamentum vexillare omnino liberum. *Ovarium* lineare, 1.1 cm longum, ± 8-ovulatum; stylus 5.2 cm longus, apice curvatus, basi hirsutus, parte flexa 1.2 cm longa glabra, stigmatibus 0.5 mm lato penicillato terminatus. *Discus* 1.5 mm longus, ± 10-lobatus. *Legumen* curvatum, 6.5–7.5 × 1.1–1.3 cm, 4–7-seminatum, setis

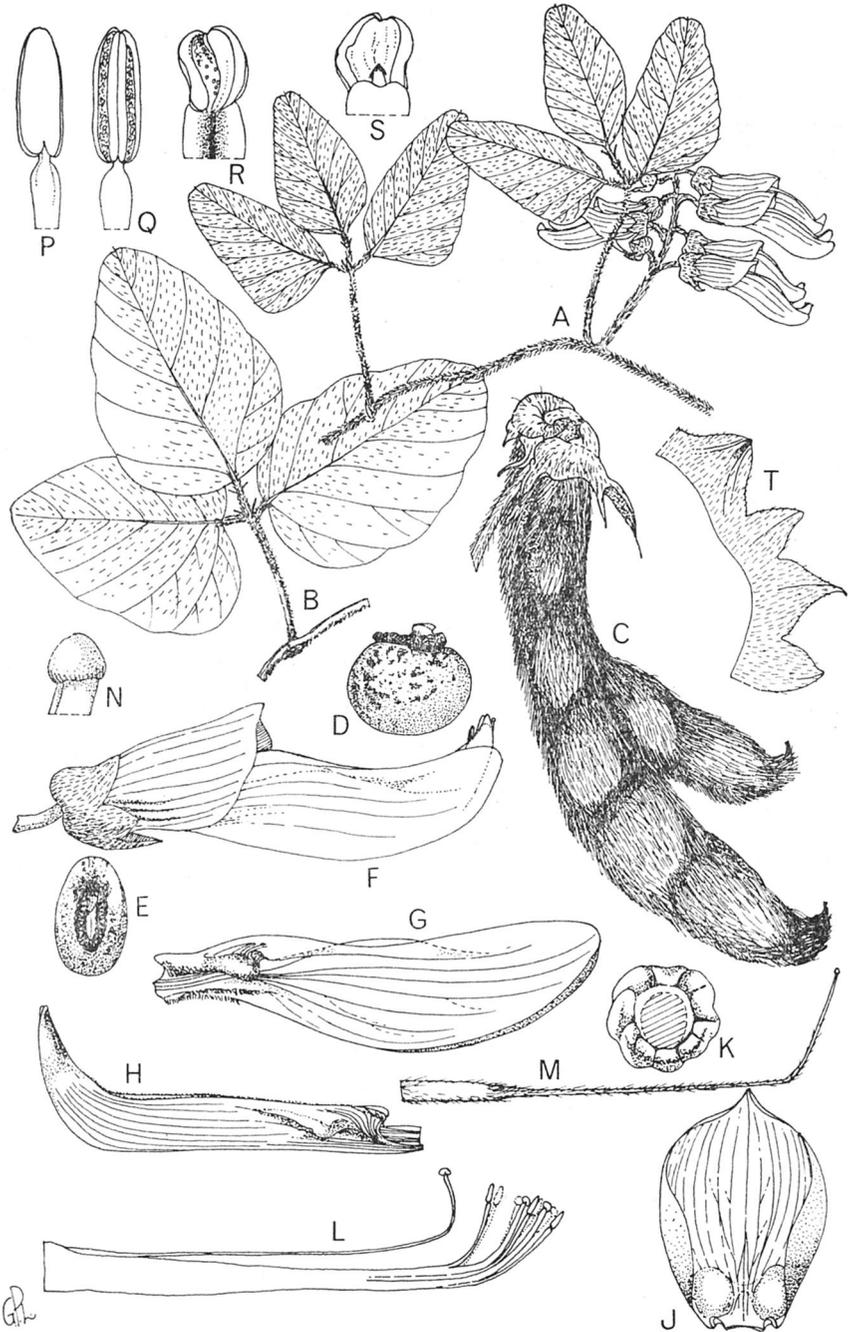


FIG. 5. *Mucuna reptans*. A young foliage & inflorescence $\times \frac{1}{3}$; B mature foliage $\times \frac{1}{3}$; C fruit $\times 1$; D seed, side view $\times 2$; E seed, top view $\times 2$; F flower $\times 1$; G wing petal $\times 1$; H keel $\times 1$; J standard $\times 1$; K nectaries $\times 4$; L androecium $\times 1$; M gynoeceum $\times 1$; N stigma $\times 16$; P-S anthers (2 varieties, front & back) $\times 8$; T calyx opened out $\times 1$. A-B from E. C. Saxon 3531/B spirit material; C from N. Byrnes s.n.; D-T from J. A. Smith s.n. Drawn by G. P. Lewis.

aurantiaco-brunneis appressis irritantibus obtectum, inter semina oblique sulcatum. *Semina* pallide brunnea et nigro-maculata usque nigra, ellipsoidea vel fere discoidea, 6.2–8.3 mm longa, 5.5–7 mm lata, 3.5–5 mm crassa; hilum pallidum vel nigrum 3 mm longum, arillo nigro rugato 4–5 mm longo marginatum, vestigio funiculi 1–1.5 mm lato adnatum. (Fig. 5 & Plate 17.)

AUSTRALIA. Northern Territory: Adelaide R., Daly R. Road, growing in laterite soils in open forest [sic], 4 April 1967. *Byrnes* 217 (K, NT): prostrate vine with dark red flowers and same locality, along river bank, 15 April 1970, *Byrnes* 1901 (K, NT):—annual trailing vine; Green Ant Creek, 13° 35' S, 131° 15' E, *Eucalyptus* forest on slate slope, 6 March 1970, *Byrnes* 1802 (holotype K; isotype NT):—prostrate vine with light green flowers. Western Australia: 1 km NE of Amax Basecamp on E side Camp Creek, closed grassland over Carson volcanics, 22 May 1978, *Kenneally* 6793 (PERTH):—pods with golden yellow mildly irritant indumentum; NW Kimberley, Mitchell Plateau, 5 km E of Amax base camp, tributary of the Lawley R., 14° 50' S, 125° 54' E, on basalt beside creek and on laterite scree, 1 March 1979, *J. A. Smith* s.n. (PERTH):—creeper along ground, never seen climbing into trees, flowers mottled black with yellow and green; Mitchell Plateau, Lone Dingo Plateau, 14° 35' S, 125° 45' E, on laterite, 5 March 1979, *Butler* s.n. (PERTH):—creeper; Mitchell Plateau, scrambling over basalt boulders, 17 Feb. 1980, *Keighery* 2643 (K, colour transparencies, PERTH):—standard pale yellow, wings dull pale purple, keel pale, green at apex becoming yellow, flowers with musty odour; Kalumburu, Yeriru Creek, 5 June 1979, *Saxon* s.n. (PERTH):—vern. name 'kulalart' (sterile material only seen, associated spirit material not seen).

The reported variation in flower-colour is most unusual in this genus but G. Keighery's transparencies taken after this paper had been written have been most helpful but it is possible dark red and green variants occur since it is not likely an error was made by the collectors. Mr Kenneally suggests in his letter accompanying the slides that the distinctly musty scent may attract rodent pollinators. Before this observation was available it seemed that ground birds or bats might be responsible for pollination since in *Mucuna* red-flowered species are mostly bird-pollinated and greenish or whitish-flowered species are mostly bat-pollinated.

I am grateful to the Curators of the herbaria at Meise, Brussels and Leiden for the loan of material and to Mr G. P. Lewis for some of the illustrations.