

A Taxonomic Revision of *Mucuna* (Fabaceae: Papilionoideae: Phaseoleae) in Brazil

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Abstract—In advance of a comprehensive systematic study of New World *Mucuna*, we provide a taxonomic revision of the species of *Mucuna* that occur in Brazil. A new species, *Mucuna analucianae*, endemic to eastern and central Brazil, is described and illustrated. *Mucuna huberi* is designated as a synonym of *M. elliptica*, and a lectotype for *M. elliptica* is chosen. *Mucuna pluricostata* is considered to be a synonym of *M. pruriens*, and a lectotype for *M. pluricostata* is chosen. *Mucuna eriocarpa* is excluded from the genus. We recognize seven species of *Mucuna* in Brazil, only two of which are endemic to the country. Two of the seven species are assessed as endangered (EN) according to IUCN criteria.

Keywords—Leguminosae, lectotype, Neotropics, new species, nomenclature, synonym.

Mucuna Adans. (Leguminosae-Papilionoideae-Phaseoleae) is a pantropical genus of about 105 species (Schrire 2005). Within the tribe Phaseoleae, *Mucuna* is distinguished by the following combination: habit typically lianescent, stems unarmed, leaves trifoliolate, stipules not extended below the point of attachment, bracteoles frequently present, corolla with the standard usually much shorter than the keel petals and the keel prominently beaked and usually hardened and thickened at the apex, anthers sometimes dimorphic, with five of them larger and (sub-) basifixed and five others smaller and versatile or dorsifixed, pods usually covered with bristly irritant trichomes, and seeds usually large, globose, oblong, or discoid.

Recent taxonomic works on Neotropical *Mucuna* are relatively few, most of them being new species descriptions (Tozzi et al. 2005; Ruiz 2009; Moura et al. 2012; Moura et al. 2013a, b). Treatments differ in their estimates of the number of species of *Mucuna* occurring in Brazil. Tozzi et al. (2005) included six species in their key to Brazilian *Mucuna*; *M. huberi* Ducke, *M. japira* A. M. G. Azevedo, Agostini & Sazima, *M. pruriens* (L.) DC., *M. rostrata* Benth., *M. sloanei* Fawc. & Rendle, and *M. urens* (L.) Medik. In her synopsis of Colombian *Mucuna*, Ruiz (2009) listed two additional species with ranges extending into Brazil; *M. eriocarpa* Barb. Rodr. and *M. pluricostata* Barb. Rodr. These two names were considered by Tozzi et al. (2005) to be possible synonyms of *Dioclea* sp. and *M. pruriens* (L.) DC., respectively,

and they were excluded from a subsequent checklist of Brazilian *Mucuna* by Moura and Tozzi (2010).

To resolve taxonomic and nomenclatural issues in *Mucuna* and to better document inter- and intraspecific morphological variation and the geographical distributions of species, the first author undertook an extensive herbarium-based study of the genus throughout its neotropical range. Collections of the genus in 57 herbaria were consulted. The primary literature for all of the published names that have been applied to New World *Mucuna* was also examined.

In agreement with Tozzi et al. (2005), we are unable to find taxonomically significant differences between the types of *M. pluricostata* and *M. pruriens* and confirmed that the description of *M. eriocarpa* is likely based on material of a species of *Dioclea*. In addition, we consider *M. huberi* Ducke to be a synonym of *M. elliptica* (Ruiz & Pav.) DC. (based on *Negretia elliptica* Ruiz & Pav.). Of the 24 species of *Mucuna* currently recognized in the Neotropics, only seven occur in Brazil, two of which are endemic to the country (T. M. Moura, unpublished data). The Brazilian species of *Mucuna* include representatives of both recognised subgenera (*Mucuna* and *Stizolobium*) and display a wide range of morphological variation, including, for example, two contrasting floral pollination syndromes (Agostini 2008).

Below, we formally relegate *M. huberi* to the synonymy of *M. elliptica* and *M. pluricostata* to the synonymy of *M. pruriens*, and provide descriptions of the Brazilian species of *Mucuna* and a key to facilitate their identification.

KEY TO THE SPECIES OF *MUCUNA* OCCURRING IN BRAZIL

1. Fruits 7–8.5 cm long; seeds reniform; flowers purple *M. pruriens*
1. Fruits 10–25 cm long; seeds globose; flowers white, cream, yellow, orange or green, never purple 2
2. Inflorescence peduncle 4–20 cm long; corolla yellow or orange 3
3. Inflorescence umbelliform, the flowers clustered at the apex of the inflorescence and the internodes not visible;
fruits not rugose, not ornamented with lamellae *M. elliptica*
3. Inflorescence pseudo-racemose, the flowers spaced along the inflorescence rachis and the internodes visible;
fruits rugose, ornamented with lamellae 4
4. Inflorescence rachis to 1.5 cm long; stipels present; abaxial surface of leaflets densely sericeous *M. sloanei*
4. Inflorescence rachis more than 2 cm long; stipels absent; abaxial surface of leaflets with sparsely sericeous 5
5. Flowers 5.3–7 cm long; corolla yellow; Atlantic Coastal region of eastern Brazil *M. japira*
5. Flowers (5–)6–9.5 cm long; corolla orange; Amazonian region *M. rostrata*

2. Inflorescence peduncle over 30 cm long; corolla green or white to lilac 6
 6. Nodes on the inflorescence rachis distichously arranged, usually forming a 'zig-zag' pattern;
 inflorescence peduncle more than 1 m long; stipels absent *M. urens*
 6. Nodes on the inflorescence rachis spirally arranged, never forming a 'zig-zag' pattern;
 inflorescence peduncle to 1 m long; stipels present *M. analuciana*

TAXONOMIC TREATMENT

1. ***Mucuna analuciana*** T. M. Moura, V. F. Mansano & A. M. G. Azevedo, sp. nov.—TYPE: BRAZIL. Bahia, Ilhéus, área do CEPEC (Centro de Pesquisas do Cacau), km 2, 1 Setembro 1981, Santos, T.S. 3659 (holotype CEPEC; Isotype RB).

Mucuna analuciana has flowers 4–5.5 cm long, the corolla pale green or white to lilac colored, fruits with lamellate ornamentation, stipels present, the inflorescence with the peduncle 30–80 cm long and spirally arranged nodes. It is morphologically closest to *M. urens*, but the latter lacks stipels and has inflorescences with the nodes arranged distichously and the peduncle more than 1 m long.

Liana; leaf-bearing portion of stems with sparse, appressed, silver-colored hairs; stipules 4 × 2 mm, triangular, pubescent, frequently caducous. Leaves alternate, trifoliolate; pulvinus 7 × 2 mm, cylindrical, covered by erect hairs; petiole ca. 6 cm long, with appressed or erect, sparse hairs; stipels 5–6 mm long, with sparse hairs; rachis 1.3–1.5 cm long, with appressed or erect, sparse hairs; pulvinule 3–5 mm long, with erect silver-colored hairs, these more dense than on the petiole and rachis; laminae ovate to elliptic sparsely sericeous on both surfaces, more densely so abaxially, that of the terminal leaflet 10–11 × 4.8–5 cm, rounded to acute at base, cuspidate to acuminate at apex, those of the lateral leaflets 8.5–10 × 4–5.2 cm, asymmetric at base, cuspidate to acuminate at apex; venation eucamptodromous, with the secondary veins in 4–5 pairs. Inflorescence an axillary, pendent pseudoraceme; peduncle 30–60(–80) cm long, with dense appressed, silver-colored hairs; rachis 4–7 cm long, secondary axis reduced and nodose; bracts not seen; pedicels ca. 1.5 cm long, sericeous, 2–3 per node, 10–17 per inflorescence, 2–5 mm apart, spirally arranged; bracteoles triangular 2–3.5 × 1–2 cm, frequently caducous. Flowers 4–5.5 cm long; calyx 1.7–2.5 cm long, campanulate, the lobes 3–5 mm long; corolla reportedly pale green or white to lilac, the standard 3.8–4.8 × ca. 3 cm, broadly elliptic, truncate basally, rounded apically, with the claw ca. 1 mm long, the wings 4–5 × ca. 0.8 cm, pubescent, oblong-ovate, acute basally, rounded to slightly acute apically, with the claw 3–4 mm long; keel petals 3.5–4.5 × 1.2 cm, slightly shorter than wings, pubescent at base, oblong, acute at apex and base, the claw ca. 2 mm long; stamens 10, diadelphous, nine with filaments fused in the basal 65% of their length, one free; filaments 3.2–4 cm long, glabrous; anthers dimorphic, basifixed, ca. 2 mm long; gynoeceum 4–5 cm long; ovary 5–10 × ca. 2 mm, sessile, oblong, densely sericeous; style 3.5–4 cm long, densely sericeous, glabrescent at apex; stigma peltate, villous. Fruits dehiscent legumes, 10 × 3 cm, oblong, acute at base, apiculate at apex, ornamented by transversal lamellae, densely pubescent, with irritating hairs covering the entire surface. Seeds not seen. Figure 1.

Phenology—Based on data recorded on specimen labels, *M. analuciana* flowers from October to May. Fruits have been collected in March and April.

Etymology—The specific epithet honors Ana Lucia Souza, a botanical illustrator at the Jardim Botânico do Rio de Janeiro, Brazil, who has illustrated most of the Neotropical species of the genus.

Vernacular Name—According to the labels of *Mexia* 4164 and 5196, this species is known as 'olho-de-boi' in Minas Gerais, Brazil.

Conservation Status—*Mucuna analuciana* has a restricted area of occupancy (AOO= 24 km²), and appears to be rare based on the paucity of known collections, none of which were made in protected areas. According to IUCN criteria (2001) *M. analuciana* is assessed as endangered [(EN B2ab(ii)(iii)(iv))].

Specimens Examined—BRAZIL. Minas Gerais: Viçosa, 17 Oct 1930 (fl.) *Y. Mexia* 5194 (BM, GH, K, MO, NY, P). Minas Gerais: Viçosa, road São Miguel, 24 Dec 1929 (fl./fr.), *Y. Mexia* 4164 (MO, BM, GH, K, NY, P). Rio de Janeiro: May 1885 (fl.), *A. F. M. Glaziou* 14675 (K, P); Feb 1992 (fl.), *A. F. M. Glaziou* 13424 (K!); Apr 1883 (fr.), *A. F. M. Glaziou* 13701 (K); Barra da Tijuca, 22 Mar 1964 (fl./fr.), *W. Hoehne* 5936 (K, NY). Goiás: Mun. Catalão, Fazenda Barra do Sr. Adib, a 3 km de Divinópolis, *A. H. Salles et al.* 2662 (HEPH, UB). Bahia: Ilhéus, área CEPEC (Centro de Pesquisa do Cacau), km 22 da rodovia Ilhéus/Itabuna (BR 415), 1 Sep 1981 (fl.), *T. S. Santos* 3659 (CEPEC, RB).

Geographical Distribution—The new species has been collected only in central and eastern Brazil, where it occurs in the states of Rio de Janeiro, Minas Gerais, Bahia, and Goiás (Fig. 2).

Notes—Among the Brazilian species of *Mucuna*, it is morphologically most closely related to *M. urens*, but differs in its stipellate (vs. exstipellate) leaf rachis, shorter inflorescence peduncle (30–80 cm long vs. 1–2 m long), and spirally arranged (vs. distichous) nodes on the rachis of the inflorescence.

2. **MUCUNA ELLIPTICA** (Ruiz & Pav.) DC., Prodr. 2: 405. 1825. *Negretia elliptica* Ruiz & Pav., Systema Vegetabilium Florae Peruviana et Chilensis 176. 1798. — TYPE: PERU. Pozuza, Muña. Herbario de Ruiz y Pavon (lectotype: FI! 51700, chosen here).

Mucuna huberi Ducke, Arch. Jard. Bot. Rio de Janeiro 4: 90–91. 1925. syn. nov. —TYPE: BRAZIL. Dec 1906–Mar 1907 (holotype: RB! 17264; isotypes: U 227146, F! negative no. 2380).

Liana; stipels 2 mm long; leaflet laminae with an indumentum of dense golden, frequently erect hairs abaxially, these appressed and less dense adaxially, those of the lateral leaflets asymmetrical, 13.5–18.5 × 8.5–16 cm, rounded to weakly cordate at base, cuspidate at apex, that of the terminal leaflet obovate or elliptic, 15–18.5 × 10–15 cm, acute to rounded at base, cuspidate at apex. Inflorescence axillary, umbelliform; peduncle 6–20 cm long; bracts foliaceous, 2–3 × 2 cm, rounded at apex, densely sericeous on both surfaces; pedicels 1–2 cm long. Flowers 7.5–10 cm long; calyx 2.5 cm long, with the corolla orange-yellow; standard 5–6.5 × 3 cm, attenuate at base, rounded to retuse at apex, the claw 2–3 mm; wing petals 7.5–9 × 2 cm, attenuate at base, rounded to obtuse at apex, the claw 6–7 mm; keel petals 7.5–9.0 × 2.4 cm, attenuate at base, acute at apex, the claw 1 mm; stamen filaments 8–10 cm long, glabrous; style 7–9 cm long; ovary 0.7–1 × 0.4 cm, densely sericeous. Pods 10–24 × 5.5–6 cm, without lamellate ornamentation, clothed with dense, ferruginous, irritating hairs, acute at base, caudate at apex. Seeds 1–4 per pod, 3.5 × 3.5 cm, brownish to black, globose.

Phenology—Based on specimen data, *M. elliptica* flowers and fruits from April to August in Brazil.

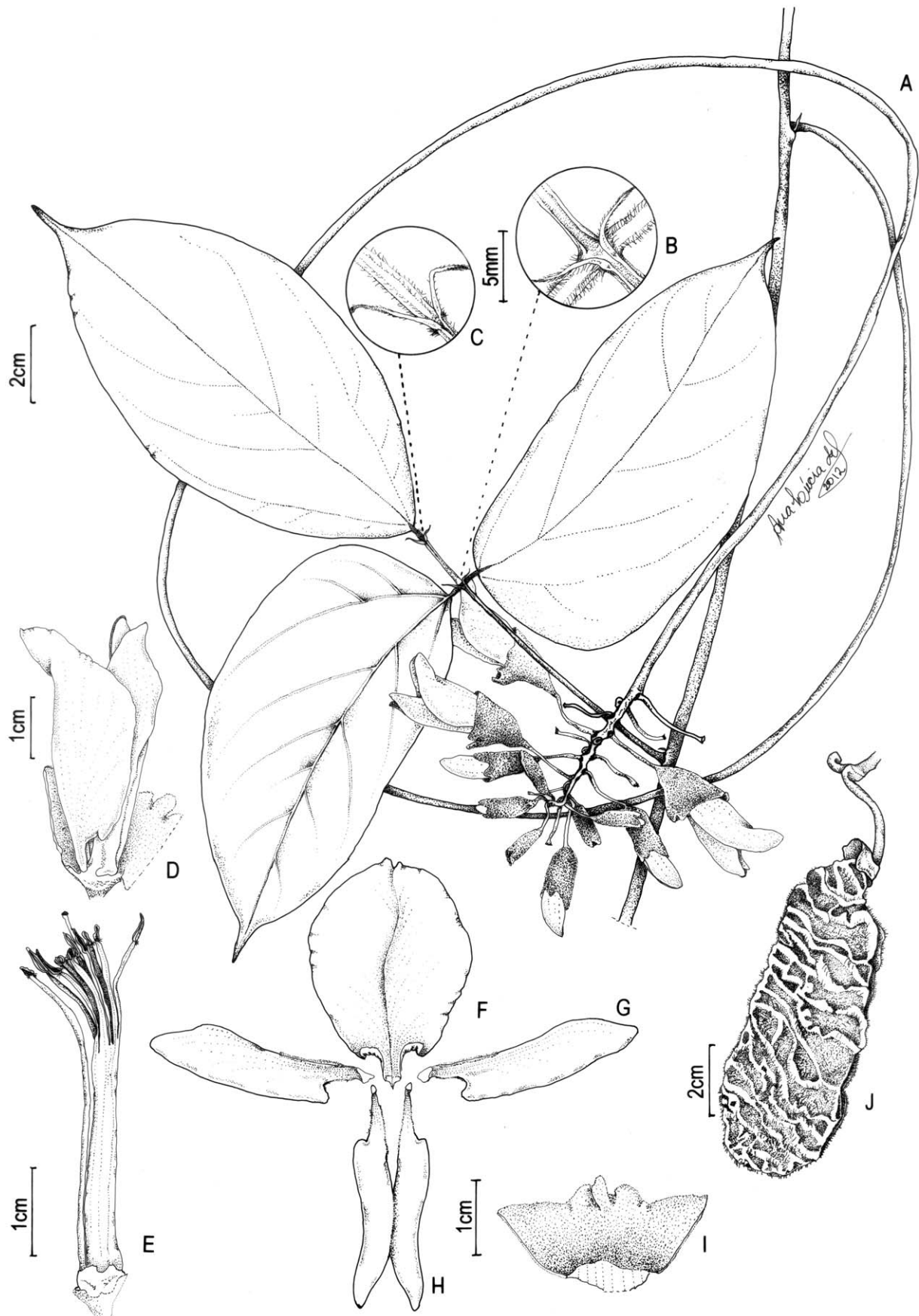


FIG. 1. *Mucuna analuciana*. A. Leaf and inflorescence. B. Detail of stipels. C. Detail of stipels on the terminal leaflet. D. Flower with part of calyx removed. E. Androecium (showing staminal tube and exerted gynoecium apex). F. Standard petal. G. Wing petals. H. Keel petals. I. Calyx opened out (inner surface). J. Fruit. Drawn by Ana Lucia Souza.

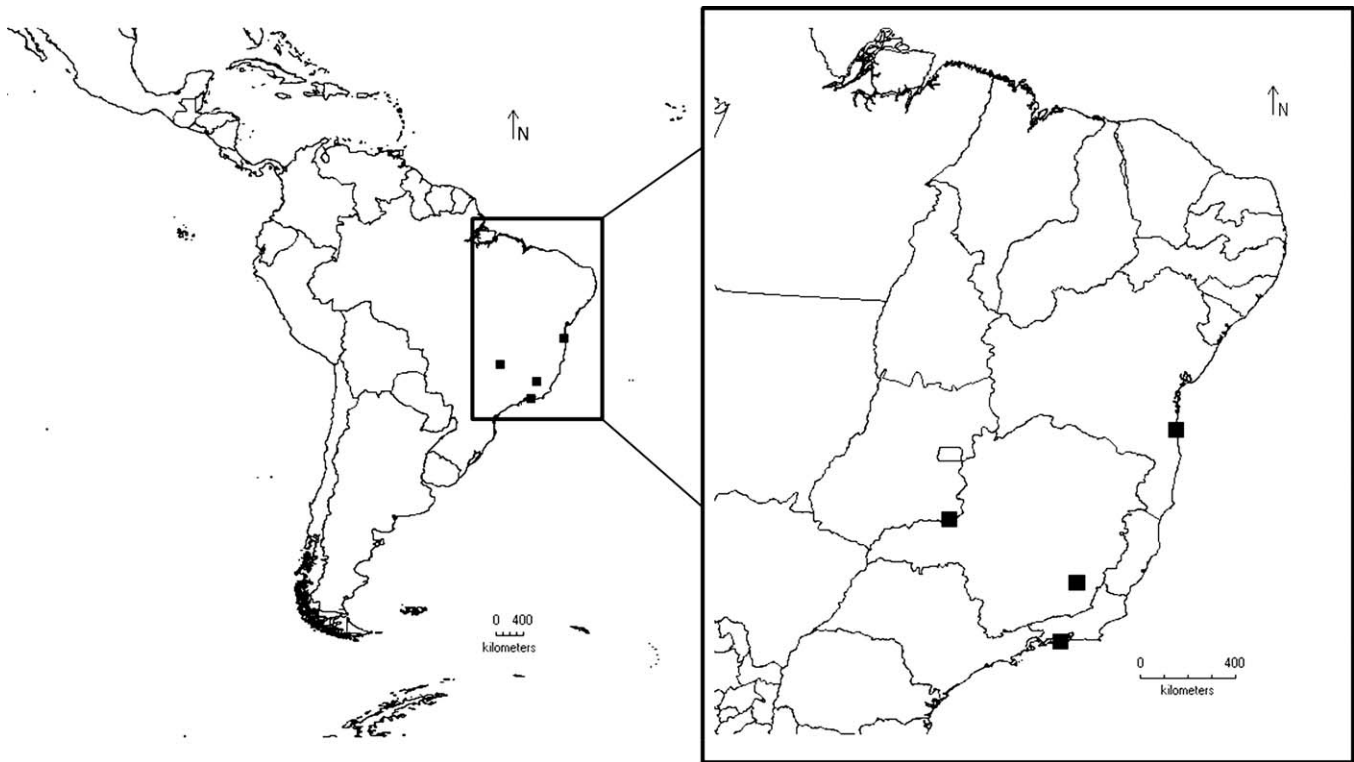


FIG. 2. Distribution of *Mucuna analuciana*. Map created by DIVA/BRAHMS.

Conservation Status—*Mucuna elliptica* occurs in Bolivia, Brazil, Ecuador and Peru. The area of occupancy of this species is considered to be restricted (AOO = 112 km²), so on this basis it could be described as globally endangered. However, due to the wide geographical distribution of the species, we do not have enough information about the habitat and populations of *M. elliptica*. In this case we prefer to describe this temporarily as data deficient (DD) according to IUCN criteria (2001).

Representative Specimens Examined—BRAZIL. Amazonas: Benjamin Constant, May 1945 (fl.), R.L. Froes 20889 (K, NY, US); São Paulo de Olivença, 22 Aug 1929 (fl./fr.), A. Ducke 23411 (K, RB, US). Acre: Vicinity of Serra da Moa, 24 Apr 1971 (fl.), G.T. Prance et al. 12398 (K, NY, W).

Geographical Distribution—*Mucuna elliptica* occurs in Bolivia, Brazil, Ecuador and Peru. In Brazil it is restricted to the Amazon region (in the states of Acre and Amazonas).

Notes—Amongst the Brazilian *Mucuna* species, *M. elliptica* is unique in its umbelliform inflorescence and fruits that lack lamellate ornamentation on the valves (both characters only found in *M. elliptica* among the Brazilian species).

Ruiz and Pavon (1798) did not cite any specimens in the protologue of *Negretia elliptica*, but described the flowers and fruits and gave a collection locality in Peru for their new taxon. Among the Ruiz and Pavon material at BM, F, FI, and MA, the lectotype is the only specimen of *M. elliptica* that has both flowers and fruits. Although the label on the specimen does not cite the specific locality given in the protologue, it does have "Peru" written on it, and there is a hand-written annotation, probably by Ruiz, that reads "*Negretia elliptica*." The specimen BM 000931436 in the Natural History Museum, London, has previously been cited as the type of *N. elliptica*. It carries the same annotation as the newly selected lectotype, but only comprises flowers.

Ducke (1925) listed several purportedly diagnostic characters for *Mucuna huberi*, including an umbelliform inflores-

cence and a comparatively large corolla. Nevertheless, the type collection of *M. huberi* (Ducke s. n. RB 17264) falls squarely within the range of variation contained within our circumscription of *M. elliptica*. Since the name *M. elliptica* has priority, *M. huberi* is relegated to synonymy.

Mucuna eriocarpa Barb. Rodr. was described based on material from Bahia that also apparently had fruits lacking ornamentation, but we have been unable to locate any type material for the name, beyond an illustration of the fruit. Since the original description and illustration lack diagnostic characters for the genus, and since species of *Mucuna* with fruits lacking ornamentation are otherwise unknown in this part of Brazil, we conclude that *M. eriocarpa* was likely based on material of the morphologically similar genus *Dioclea*, of which there are several species in Bahia.

3. *MUCUNA JAPIRA* A.M.G. Azevedo, Agostini & Sazima, Taxon 54(2): 452. 2005.—TYPE: BRAZIL. São Paulo: Ubatuba, núcleo Picinguaba, Praia da Fazenda, ponte do Rio Fazenda, 5 Jun 2002 (fl.), K. Agostini 1 (holotype: UEC!).

Liana; stipels absent; leaflet laminas densely sericeous on the abaxial surface, appressed and sparse on the adaxial surface, those of the lateral leaflets asymmetrical, 6.2–10.5 × 3.2–5.2 cm, rounded to truncate at base, cuspidate at apex, that of the terminal leaflet elliptic, 10–13.5 × 3.8–6.5 cm, acute at base, cuspidate at apex. Inflorescence an axillary pseudoraceme; peduncle 4–8.5 cm long; bracts and bracteoles caducous; pedicels c. 1 cm long. Flowers 5–7 cm long; calyx 1.7–3 cm long; corolla yellow, the standard 4.8–5.3 × 3–3.5 cm, attenuate at base, rounded at apex, with the claw 2 mm long, the wing petals 6–7 × 1.5 cm, attenuate at base, obtuse at apex, with the claw 3–4 mm long, the keel petals 6–7 × 1 cm, attenuate at base, acute at apex, with the claw 1 mm

long; stamen filaments cream-colored, 6–7 cm long, glabrous; style 5–6 cm long; ovary 10 × 2 mm. Pods 10–20 × 4 cm, acute at base and apex, with a dense covering of irritating hairs, ornamented by transversal lamellae. Seeds (only a photograph examined), 1–5 per pod, globose.

Phenology—Flowering in May and June; fruiting in August.

Conservation Status—*Mucuna japira* presents a restricted extent of occurrence (EOO = 4,336.53 km²), and area of occupancy (AOO = 60 km²). Therefore, following IUCN (2001) criteria, *M. japira* is assessed as endangered [EN B2ab(v)].

Representative Specimens Examined—BRAZIL. Rio de Janeiro: Paraty, beria da estrada para o Corisco, a 2 km da Rodovia Rio-Santos (BR 101), 29 Nov 1994 (fl.), L.C. Giordano et al. 1827 (RB); estrada Paraty-Cunha, aprox. 1 km após Paraty, 22 May 1996 (fl.), R. Cesar & V.L.G. Klein 514 (RB!); subindo rio Corisquinho, 11 May 1994 (fl.), R. Marquete 1814 (RB); Parati-Mirim, 19 May 1999 (fl.), C. Almeida 277 (RB). São Paulo: São Sebastião, Baraqueçaba, 17 Jun 1985 (fl./fr.), N. Taroda et al. 17672 (UEC); Ubatuba, Picinguaba, Parque Nacional Serra do Mar, 18 Oct. 1998 (fl.), R.B. Singer 98/102 (UEC); estrada da casa da farinha, 03 May 1989 (fl.), F. C. P. Garcia et al. 355 (HRCB, RB); ca. 9 km da rodovia Rio-Santos, 6 May 2000 (fl.), R. Forzza & A. Amorim 1532 (SPF); núcleo Picinguaba, 22 May 1989 (fl.), M. Kirizawa & J. A. Correa 2151 (SP); próximo a ponte do Rio Quindim, floresta ombrófila densa de terras baixas, 26 Jun 2007 (fl.), E. Ramos & H. R. Gonçalves 286 (IAC); Estação Experimental do IAC, 3 Jun 1995 (fl.), L. C. Bernacci et al. 1916 (IAC).

Geographical Distribution—*Mucuna japira* is endemic to the Atlantic Forest of the states of Rio de Janeiro and São Paulo.

Notes—The closest species morphologically is *M. rostrata*, but *M. japira* has yellow flowers (versus orange in *M. rostrata*), and in Brazil *M. rostrata* occurs only in Amazonian Forest.

4. MUCUNA PRURIENS (L.) DC. Prodr. Systematis Naturalis Regni Vegetabilis 2: 405. 1825. *Dolichos pruriens* L., Herbarium Amboinense 23. 1754.—TYPE: INDONESIA. Amboina, *Rumphius*, Herb. Amb. 5t. 142 (1750).

Mucuna pluricostata Barb. Rodr., Pl. Jard. Rio de Janeiro 6: 9, pl. 4, f. a. 1898. Syn. nov. — Lectotype: Tab IV. Fig. A, Pl. Jard. Rio de Janeiro, vol. VI. 1898, chosen here.

Liana; stipels linear, 3–4 mm long; leaflet laminas with silvery appressed hairs on both surfaces, these denser on the abaxial surface, those of the lateral leaflets asymmetrical, 15.5–17.5 × 10–10.8 cm, truncate at base, acute or mucronate at apex, that of the terminal leaflet ovate to elliptic, 10–17 × 7–12 cm, acute to rounded at base, acute to mucronate at apex. Inflorescence an axillary, pseudoraceme; peduncle 5.5–10 cm long; rachis 5–35 cm long; bracts and bracteoles caducous; pedicels 4–7 mm long. Flowers 3.5–4.5 cm long; calyx 1.2–1.7 cm long; corolla purple, the standard 2–2.5 × 1.5 cm, attenuate at base, rounded at apex, with the claw 1 mm long, the wing petals 3.5–4.5 × 1 cm, attenuate at base, obtuse at apex, with the claw 2 mm long, the keel petals 3.5–4.5 × 0.5 cm, attenuate at base, acute at apex, with the claw 1–2 mm long; stamen filaments 3.7–4 cm long, glabrous; style 2.5–3.5 cm long; ovary 10 × 1–3 mm, densely sericeous. Pods 7–8.5 × 1–2 cm, clothed with irritating hairs, acute at base and apex. Seeds 4–5 per pod, reniform, black, white, or striped (brown and black) 1–1.5 × 1 cm.

Phenology—Based on specimen data, *M. pruriens* flowers and fruits throughout the year.

Conservation Status—*Mucuna pruriens* is widely distributed in both the Old and New World Tropics (and Subtropics). According to IUCN (2001) criteria *M. pruriens* is assessed as of least concern (LC).

Representative Specimens Examined—BRAZIL. Amazonas: Manaus, km 19 of Manaus-Caracará road BR-174, 4 km N of junction with

Manaus-Itacoatirara road, 18 Jun 1983 (fr.), J. L. Zarucchi et al. 2835 (RB). Bahia: Itabuna, 30 Jun 1980 (fl.), T. S. Santos 3613 (RB!); Belmonte, fazenda Boa Vista, margem direita do Rio Jequitinhonha, 14 Apr 1975 (fl.), T. S. Santos 2956 (RB). Goiás: ca. 5 km NE of Goiás Velho, 13 Feb 1980 (fr.), J. H. Kirkbride 3447 (RB!); Monte Alegre, fazenda Sumidouro, 12 Apr 2000 (fl.), R. C. Mendonça et al. 4154 (RB).

Geographical Distribution—*Mucuna pruriens* is widely distributed throughout the Tropics and Subtropics, and widely cultivated in Brazil as forage and green manure.

Notes—*Mucuna pruriens* is the only species of *Mucuna* in Brazil with purple flowers and reniform seeds. Although sometimes considered to be native in Brazil, we think it more likely that it has become naturalized by escape from cultivation. Two varieties are recorded in Brazil: *M. pruriens* var. *pruriens* (the fruits with a dense indumentum of long golden hairs) and *M. pruriens* var. *utilis* (with short, silver, non-irritating hairs and longitudinal ribs on the pods).

In the protologue of *M. pluricostata*, Barbosa Rodrigues (1898) cited no specimens, but did cite the illustration 'Tab IV. fig. A' f. 9. The author also commented that he received a packet of seeds of unknown provenance from which he germinated some plants. He reported that he never saw flowers on his cultivated specimens because at the time of flowering he was away on a trip, but he did study the resulting fruits on his return. As he did not cite a specimen, we here select the image Tab IV. fig. A. in: *Plantas Novas Cultivadas no Jardim Botânico do Rio de Janeiro*, vol VI, 1898, as the lectotype of *Mucuna pluricostata*.

Barbosa Rodrigues (1898) commented on the similarity between *M. pluricostata* and *M. pruriens*, and differentiated the two species by the number and form of the ribs on the surface of the fruit valves. In *M. pruriens*, the valves has one longitudinal rib, while in *M. pluricostata*, there are more than one, discontinuous ribs. Due to the wide morphological variation (including in fruit form) occurring in *M. pruriens* throughout its pantropical distribution, we were unable to find any significant differences between it and *M. pluricostata*. In consequence, we here propose *M. pluricostata* as a new synonym of *M. pruriens*.

5. MUCUNA ROSTRATA Benth., Flora Brasiliensis 15(1): 171, pl. 157. 1859.—Lectotype: BRASIL. Solimões, Gapó, June/1851, Spruce 1625 (K 502761), designated by Moura et al. (2013c).

Liana; stipels absent; leaflet laminas silvery with appressed hairs on both surfaces, with the hairs more dense abaxially, those of the lateral leaflets asymmetrical, 6.5–17 × 3.5–8.4 cm, rounded at base, cuspidate at apex, that of the terminal leaflet leaflet elliptic to ovate, 9.5–19 × 5–10.3 cm, rounded to acute at base, cuspidate at apex. Inflorescence an axillary, pseudoraceme; peduncle 3.5–15 cm long; bracts and bracteoles caducous; rachis 7–15 cm long; pedicels 0.7–2.1 cm long. Flowers (5 –) 6–9.5 cm long; calyx 2–3 cm long; corolla orange, the standard 3.5–6 × 4 cm, attenuate at base, rounded at apex, with the claw 1–2 mm long, the wing petals 5.7–8.5 × 2 cm, attenuate at base, obtuse at apex, with the claw 3 mm long, the keel petals (5 –) 6.5–9.5 × 2.2 cm, attenuate at base, acute at apex, with the claw 1–2 mm long; stamen filaments 6–9 cm long, glabrous; style 6–8 cm long; ovary 1–1.5 × 0.2 cm, densely sericeous. Pods 8–20 × 4 cm, ornamented by transversal lamellae, with a dense indumentum of irritating hairs, acute at base, acute to aristate at apex. Seeds 3–5 per pod, blackish, globose, 2 × 2 cm.

Phenology—Based on specimen data, *M. rostrata* flowers and fruits from April to July.

Conservation Status—Due to its wide distribution, *Mucuna rostrata* is assessed as of least concern (LC).

Representative Specimens Examined—BRAZIL. Acre: Serra Moa, river margin near guard's house, 30 Apr 1971 (fl.), P. J. M. Maas et al. P12672 (GH, INPA, K, NY, P, R, US); vicinity of Periquito, Rio Juruá-Mirim, river bank, 19 May 1971 (fl.), P. J. M. Maas et al. P13156 (INPA, K, MO, NY, R, US, W); Marechal Thaum, Bacia Alto Juruá, Rio Alto Juruá, 31 May 1994 (fl.), M. Silveira 745 (INPA, MO, NY). Amazonas: Rio Purus, between Campinas & Tambaqui, 19 Jun 1971 (fl.), G. T. Prance et al. 13406 (INPA, NY, US); estrada Manaus-Porto Velho km 27, 01 Jun 1975 (fl.), J. Leonardo 49534 (INPA); Rio Solimões, margem direita, "Paraná do Barroso," 30 Jun. 1999 (fl.), L. Lohmann 272 (INPA, MO, SPF). Rondônia: Island in Rio Madeira, opposite Jaciparaná, 27 Jun 1968 (fl.), G. T. Prance et al. 5257 (COL, GH, INPA, NY, P, R, RB, US).

Geographical Distribution—*Mucuna rostrata* is widely distributed in the Neotropics. In Brazil it is found only in the Amazonian Region (in the states of Acre, Amazonas, Amapá, Pará, and Rondônia), frequently in riverine forests.

Notes—*Mucuna rostrata* is characterized by its distinctive orange colored corolla, the principal characteristic that differentiates this from *M. japira*. *M. elliptica* also presents an orange-yellow corolla, however the inflorescence in *M. elliptica* is pseudoumbelliform, whilst in *M. rostrata* is pseudoracemose.

6. *MUCUNA SLOANEI* Fawc. & Rendle, Journal of Botany, British and Foreign 55(650): 36. 1917.—LECTOTYPE: Jacq. Amer. 202. t. 182. f. 84. 1763. (image), designated by Moura et al. (2013c).

Liana; stipels linear, 1–4 mm long; leaflet laminas sericeous abaxially, sparsely sericeous adaxially, those of the lateral leaflets asymmetrical, 7–14 (–17) × 4–11 cm, truncate to rounded at base, acute to acuminate at apex, that of the terminal leaflet ovate to elliptic, 7.5–14 (–17) × 3.5–10 cm, acute to rounded at base, acute to acuminate at apex. Inflorescence an axillary, pseudoraceme; peduncle 5–18 cm long; rachis reduced, 1–1.5 cm long; bracts caducous; bracteoles 1–2.5 × 0.7–1.5 cm, occasionally persistent; pedicels 1–1.5 cm long. Flowers 5–6.5 cm long; calyx 2–3.3 cm long; corolla yellow, the standard 3–4 × 3.2 cm, attenuate at base, rounded to retuse at apex, with the claw 3–5 mm long, the wing petals 5–6.5 × 1.8 cm, attenuate at base, obtuse at apex, with the claw 3–4 mm long, the keel petals 5–6.5 × 1–1.7 cm, attenuate at base, acute at apex, with the claw 3 mm long; stamen filaments 5–7 cm long, glabrous; style 5–6.3 cm long; ovary 5–7 × 2–3 mm, densely sericeous. Pods 13–16 × 3.5–5 cm, densely tomentose, ornamented by transversal lamellae, with an indumentum of irritating hairs, acute at base, acuminate at apex. Seeds 1–5 per pod, globose, 2.1–2.5 × 2.1–2.8 cm.

Phenology—Specimen data indicate that *M. sloanei* flowers and fruits from January to August.

Conservation Status—Given its wide distribution, *M. sloanei* is assessed as of least concern (LC).

Representative Specimens Examined—BRAZIL. Bahia: Camamu, povoado de Barcelos do Sul, 18 Jul 2005 (fl.), A. M. Miranda & M. I. Silva 5147 (UFP). Distrito Federal: Rodovia DF-205, próximo a entrada da Fazenda Portal dos Angicos, 2 Apr 2003 (fl.), A. F. Pontes et al. 589 (SPF); Riverão da Contagem, ca. 25 km N of Brasília, 14 Dec. 1965 (fl.), H. S. Irwin et al. 11301 (SP, W); Curralinho, DF-150 indo para Brazilândia, 26 Mar 2002 (fl.), C. S. Caires & V. C. Mendes 83 (INPA, UB). Goiás: cidade de Goiás, fazenda Esmeraldas, perto córrego Paciência, 13 Feb 1980 (fl.), J. H. Kirkbride 3446 (UFG); Nerópolis, Parque Estadual Altamiro de Moura Pacheco, 30 Mar 2005 (fl.), M. L. Fonseca et al. 5716 (UFG). Pará: Rio Maiucurú, Igarapé do Mutum, 28–29 Jul 1981 (fl.), J. Jangoux & B. G. S. Ribeiro 1564 (SPF). Pernambuco: Cabo de Santo Agostinho, Nov 2005, M. Oliveira 2205 (UFP).

Geographical Distribution—*Mucuna sloanei* is widely distributed in the Neotropics, and occurs throughout most of

Brazil (Moura and Tozzi 2010). It is most often collected close to rivers.

Notes—Although Tozzi et al. (2005) considered *M. sloanei* to have umbelliform inflorescences, short internodes are discernible, thus we consider it to have a reduced inflorescence rachis. The only Brazilian species with a truly umbelliform inflorescence is *M. elliptica*.

7. *MUCUNA URENS* (L.) Medik., Vorlesungen der Churpfälzischen physikalisch-ökonomischen Gesellschaft 2: 399. 1787. *Dolichos urens* L. Systema Naturae, Editio Decima 2: 1162. 1759.—LECTOTYPE: Plukenet, Phytographia: t. 213, f.2. 1692, Verdcourt ex Turland and Jarvis (1997).

Liana; stipels not seen; leaflet laminas with appressed and sparse hairs on both surfaces, those of the lateral leaflets asymmetrical, 8–15 × 3.6–7 cm, acute to rounded at base, cuspidate at apex, that of the terminal leaflet elliptic, 9–16 × 4.3–7 cm, rounded to acute at base, cuspidate at apex. Inflorescence a pseudoraceme, axillary or inserted on old branches (ramiflorous); peduncle 1–1.7 m long; bracts not seen; bracteoles 2–3 × 1.5 cm, sericeous, caducous; rachis frequently forming a 'zig-zag' pattern; pedicels 0.7–2 cm long. Flowers 3.5–4 cm long; calyx 1–1.7 cm long; corolla reportedly cream-colored or greenish, the standard 3.2–3.5 × 3–3.5 cm, attenuate at base, emarginate at apex, with the claw 1 mm long, the wing petals 3.5–4.1 × 1.4 cm, attenuate at base, rounded to obtuse at apex, with the claw 1–2 mm long, the keel petals 3.5–4 × 1.6 cm, attenuate at base, acute at apex, with the claw 1 mm long; stamen filaments cream-colored, 3–4 cm long, glabrous; style 3–4 cm long; ovary 7 × 1–2 mm. Pods 8–20 × 3–4 cm, acute at base and apex, with a dense covering of irritating hairs, ornamented by transversal lamellae. Seeds 1–5 per pod, brownish, globose, 3.5 × 3.5 cm.

Phenology—Based on specimen data, *M. urens* flowers and fruits from October to July.

Conservation Status—Given its wide distribution in the Neotropics, *M. urens* is assessed as of least concern (LC).

Representative Specimens Examined—BRAZIL. Amazonas: Rio Cuieiras (Jauari) at foot of Serra Aracá, 10 Jul 1985 (fl.), G. T. Prance et al. 29436 (INPA!). Minas Gerais: Tombos, 25 July 1935 (fl.), M. Barreto 1753 (SP!). Pará: Santana do Araguaia, 100 km S of Redenção on road PA 150, 18 Feb 1980 (fl.), T. Plowman et al. 8897 (GH!, INPA!, MO!, NY!, US!). Santa Catarina: Joinville, BR 101, 24 Jan 2002 (fl.), R. L. C. Bortoluzzi & A. Reis 1109 (ICN!). São Paulo: Iguape, Estação Ecológica Juréia-Itatins, Restinga entre o Rio Una e o Rio Verde, 13 Dec 1991 (fl.), M. P. Costa et al. 59 (SP!); Peruíbe, estação ecológica Juréia-Itatins, ca. 17 km S de Peruíbe, entre o Parequê e o Rio Una, 27 May 1996 (fr.), L. P. Queiroz et al. 4467 (SP!); Ubatuba, Reserva Biológica do Instituto Florestal, 25 Oct 1979 (fl.), W. Mantovani 166 (SP!); núcleo Picinguaba, 22 May 1989 (fr.), M. Kirizawa & J. A. Correa 2162 (SP!).

Geographical Distribution—*Mucuna urens* is widely distributed in the Neotropics, occurring in the Caribbean Islands and from Honduras to Brazil. It occurs throughout Brazil and is commonly collected close to rivers, near the sea (in Restinga vegetation), and also in disturbed areas, especially along roads.

Notes—*Mucuna urens* is the only Brazilian species of the genus that has the primary axis of the inflorescence forming a 'zig-zag' pattern. The other Neotropical species that presents this characteristic is *Mucuna mitis* (Ruiz & Pavon) DC., occurring in Bolivia, Ecuador and Peru.

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