

Mucuna mooneyi (Leguminosae: Papilionoideae), a new species from Ethiopia

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Summary. A new species of *Mucuna* from Ethiopia is described, illustrated, and mapped. The species is recognizable by the dense pubescence on the abaxial surface of the leaflets and the violet corolla. It is morphologically similar to *M. poggei* var. *pesa* and *M. melanocarpa*, but *M. poggei* var. *pesa* has white, greenish white, or pale green corollas, and *M. melanocarpa* has the abaxial surface of the leaflets glabrous. In *M. melanocarpa* the fruits are smaller (7 – 9 × 1.5 cm) than in *M. mooneyi* (9 – 10 × 2 – 2.5 cm), while in *M. poggei* var. *pesa* the fruits are bigger (10 – 13 × 2 – 2.5 cm).

Key Words. Africa, Fabaceae, Faboideae, flora, paleotropics.

Introduction

Mucuna Adans. (Leguminosae: Papilionoideae) is a pantropical genus of about 105 species (Schrire 2005; Moura *et al.* 2013a, b, c). Within the tribe Phaseoleae, *Mucuna* is distinguished by the following combination of characters: plants unarmed, usually lianas; leaves pinnately trifoliate; stipules not extended below their point of attachment; calyx and abaxial surface of leaflets lacking yellow or orange gland dots; bracteoles present; standard petal usually much shorter than the four other petals; keel prominently beaked, the two keel petals usually hardened and thickened at the apex; anthers usually dimorphic, 5 larger and (sub-)basifixed, 5 smaller and versatile or dorsifixed; pods usually covered with bristly irritant trichomes; seeds large, globose, oblong or discoid (Verdcourt 2001; Du Puy & Labat 2002; Moura *et al.* 2013a, c).

Although a number of African regional studies have treated *Mucuna* there is no taxonomic treatment for the whole African continent. Verdcourt (1970) contributed significantly to the taxonomy of *Mucuna* in Africa, publishing five new combinations: *Mucuna gigantea* (Willd.) DC. subsp. *quadrialata* (Baker) Verdc., *M. poggei* Taub. var. *pesa* (De Wild.) Verdc., *M. poggei* var. *glabrescens* (Hauman) Verdc., *M. glabrialata* (Hauman) Verdc. and *M. coriacea* Baker subsp. *irritans* (Burt Davy) Verdc. The African Plant Database (<http://www.ville-ge.ch/musinfo/bd/cjb/africa/recherche.php>) lists ten accepted species names for *Mucuna* in continental Africa (excluding Madagascar), with eight accepted infraspecific taxa

(including autonyms), accepting all of the new combinations published by Verdcourt (1970) with the exception of *Mucuna gigantea* subsp. *quadrialata*.

We can therefore account for 14 accepted names (specific and infraspecific) of *Mucuna* occurring in continental Africa but, because no complete taxonomic treatment exists for the whole continent, current synonymy needs to be re-evaluated and a number of lectotypifications considered. The discovery of a new species in Africa is therefore not surprising.

A new species from Ethiopia is here described, illustrated and mapped.

***Mucuna mooneyi* T. M. Moura, Gereau & G. P. Lewis sp. nov.** Haec species quoad foliola abaxialiter dense pubescentia *Mucunae poggei* var. *pesae* (De Wild.) Verdc. similis, sed ab ea vexillo alisque atroviolaceis atque carina abaxialiter rubroviolacea intus pallide violacea (nec petalis albis nec albidoviridibus neque pallide viridibus) distinguitur. Typus: Ethiopia, Nadda, 22 Oct. 1954 (fl.), H. F. Mooney 6117 (holotypus ETH, isotypus K).

<http://www.ipni.org/urn:lsid:ipni.org:names:77146121-1>

Herbaceous climber; young branches pubescent. Leaves: stipules not seen; pulvinus cylindrical, c. 10 × 3 mm, pubescent; petiole 8 – 9 cm long, pubescent; rachis c. 2 cm long, pubescent; stipels linear, 6 – 7 mm long, pubescent; petiolules c. 5 mm long, pubescent; apical leaflet broadly elliptic, 9 – 11 × 8 – 12 cm, rounded at base; lateral leaflets 10.5 – 12 × 7 – 9 cm, asymmetrical,

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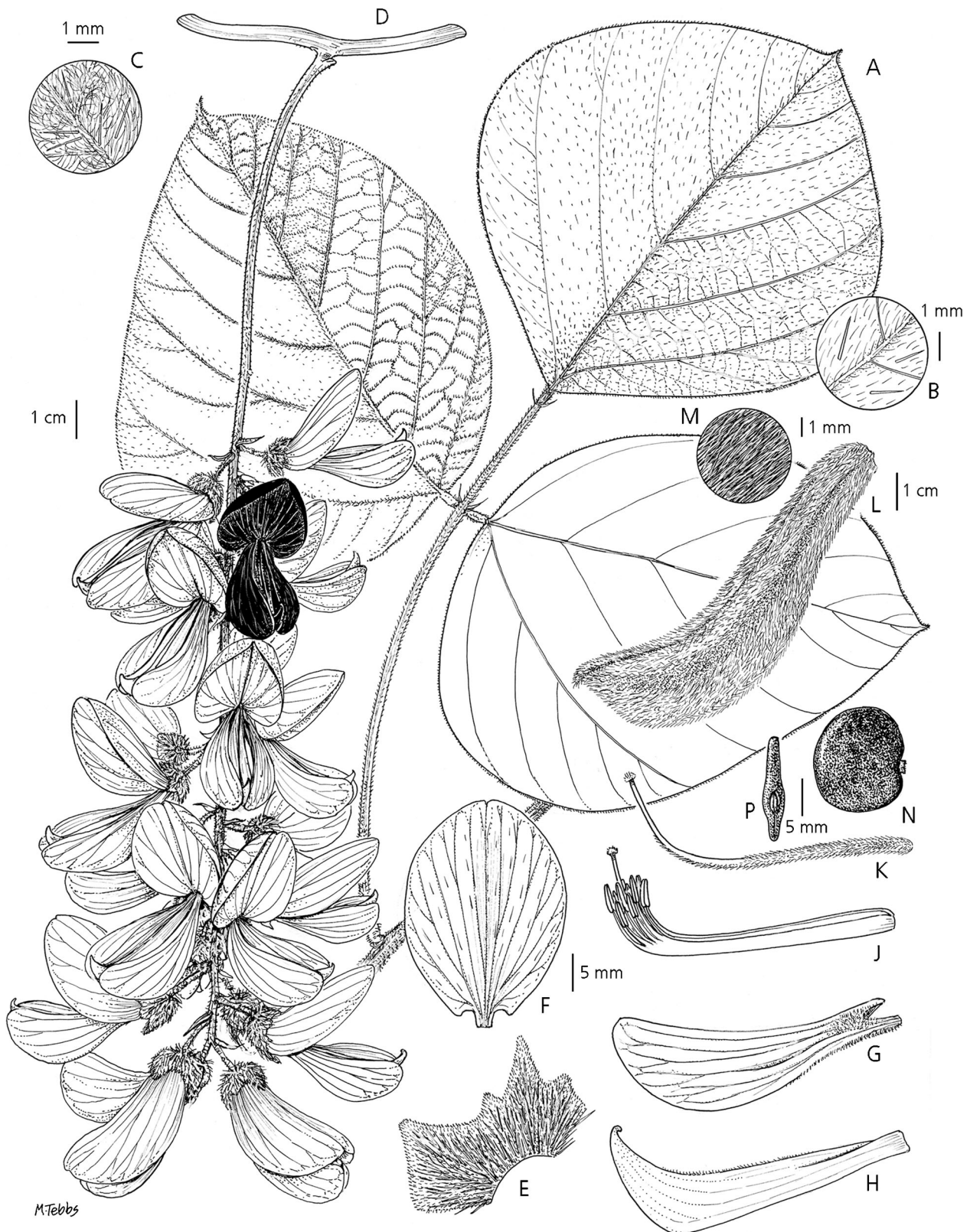
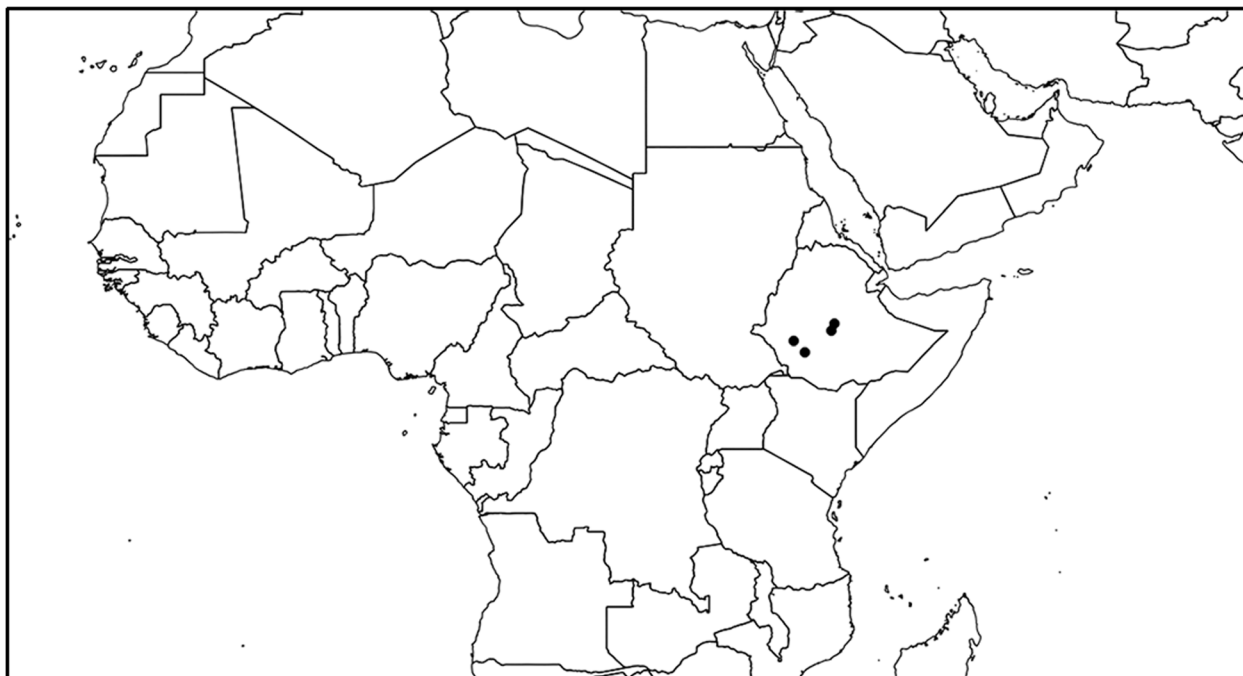


Fig. 1. *Mucuna mooneyi*. A leaf; B detail of the hairs on the adaxial surface of the leaflets; C detail of the hairs on the abaxial surface of the leaflets; D inflorescence, with one flower illustrating the dark colour of the petals; E calyx opened out; F standard petal; G wing petal; H keel petal; J androecium, style tip and stigma; K gynoecium; L fruit; M indumentum on fruit surface; N seed side view; P seed hilar view. A – B de Wilde & B. E. E. de Wilde-Duyfjes 77778 (BR); C, L – P Thulin 1401 (K); D – K Westphal & Westphal-Stevens 2544 (BR). DRAWN BY MARGARET TEBBS.



Map 1. Geographical distribution of *Mucuna mooneyi*. Map produced using QGIS 2.2.0 Software.

rounded at base; all leaflet blades acuminate at apex (acumen 4 – 5 mm), adaxially with appressed trichomes, abaxially densely pubescent; venation eucamptodromous, secondary veins in 6 to 8 pairs. *Inflorescence* an axillary, pendent pseudoraceme, 30- to 50-flowered, two flowers fasciculate at each node; peduncle c. 12 cm long, pubescent; axis c. 18 cm long, densely pubescent, the secondary axes not evident; bracts not seen; pedicels 5 – 7 mm long, densely pubescent; bracteoles not seen. *Flowers* 4 – 4.5 cm long; calyx campanulate, with long, appressed trichomes on both surfaces, lobes 4, the adaxial lobe discrete, formed by two entirely connate sepals, the lateral lobes c. 2 × 1 mm, acute apically, the abaxial lobe c. 4 × 2 mm, acute apically; standard petal dark violet, c. 3 × 2 cm, broadly elliptic, basally acute, apically rounded, the claw 1 – 3 mm long, glabrous; wing petals very dark violet, c. 4.5 × 1.5 cm, oblong-ovovate, basally attenuate, apically rounded, pubescent at base, the claw 2 – 5 mm long; keel petals abaxially

red-violet, adaxially light violet, c. 4.7 × 1 cm, oblong, attenuate at base, acute at apex, glabrous, the claw c. 4 mm long; filaments c. 4.5 cm long, glabrous, 9 filaments fused from base for 65 – 70% of their length, vexillary filament free; 5 larger anthers oblong, basifixed, 2 – 3 mm long, the 5 smaller anthers orbicular, dorsifixed near base, c. 1 mm long; gynoeceum c. 5 cm long, ovary sessile, oblong, c. 10 × 2 mm, sericeous, 2- to 5-ovulate, style 3.7 – 4 cm long, sericeous, glabrescent at apex, stigma peltate, villous. *Fruits* 9 – 10 × 2 – 2.5 cm; pod surface covered with golden irritant hairs; *seeds* discoid, c. 1.5 × 1 cm; hilum c. 2 mm long. Fig. 1.

RECOGNITION. *Mucuna mooneyi* is distinguished from the other Ethiopian species, *M. pruriens* (L.) DC. and *M. melanocarpa* Hochst. ex A. Rich. by the dense pubescence on the abaxial surface of the leaflets. Its fruits are larger than those of *M. pruriens*, and the seeds are discoid not reniform (as in *M. pruriens*).

Table 1. Differentiation of *Mucuna mooneyi* from the three most morphologically similar taxa.

Species/Characteristic	flower length (cm)	corolla colour	leaflet abaxial surface indumentum	fruit size (cm)	seed shape
<i>M. melanocarpa</i>	3.5 – 5	blackish purple	sparse	7 – 9 × 1.5	reniform to discoid
<i>M. mooneyi</i>	4 – 4.5	dark violet	dense	9 – 10 × 2 – 2.5	discoid
<i>M. poggei</i> var. <i>pesa</i>	4 – 6	white, cream, yellowish green or green	dense	10 – 13 × 2 – 2.5	discoid
<i>M. pruriens</i>	3.5 – 4.5	purple	sparse	7 – 8.5 × 1 – 2	reniform

DISTRIBUTION AND HABITAT. The species is known only from Ethiopia, in Arussi, Kaffa and Nadda provinces. Map 1.

SPECIMENS EXAMINED. ETHIOPIA. Along road to Gergertu, 23 km from Harawacha, alt. 1800 m, 2 Nov. 1967 (fl.), *E. Westphal* & *M. C. Westphal-Stevens* 2544 (BR, MO, WAG); **Kefa** province, about 15 km NW of Bonga, along road to Wush-Wush, 17 Aug. 1965 (fl.), *W. J. J. O. de Wilde* & *B. E. E. de Wilde-Duyffes* 77778 (BR); Yasukela, nr Abera, 23 Nov. 1960 (fl.), *H. F. Mooney* 8709 (ETH, K); Nadda, 22 Oct. 1954 (fl.), *H. F. Mooney* 6117 (holotype ETH, isotype K); 1 km S of Sudan Interior Mission, 21 Dec. 1961 (fr.), *F. G. Meyer* 7867 (K); **Arsi** province, Chilaro awraja, c. 5 km N of Asella at Kulumsa farm., 7 Oct. 1971 (fr.), *M. Thulin* 1401 (ETH, K).

CONSERVATION STATUS. Based on the six known collection points, *Mucuna mooneyi* has an Extent of Occurrence (EOO) of 29,831.243 km² and an Area of Occupancy (AOO) of 16 km² using the standard grid cell size of 4 km² (IUCN Standards and Petitions Subcommittee 2014). With a very small number of collection localities, this suggests that *M. mooneyi* might be assessed as Endangered under the B2 criterion (IUCN 2012), but this would require knowledge of threats to the species in its natural habitat and continuing decline in habitat quality, and no data are available about such threats. Lacking the knowledge of even a plausible threat that would be needed to assess it as Vulnerable (VU D2), we here assess it to be Data Deficient (DD).

PHENOLOGY. Collected in flower in August and November and in fruit in October and December.

ETYMOLOGY. The species is named for H. F. Mooney, who collected the type specimen. Herbert F. Mooney (1897 – 1964) was Irish and worked as forest adviser in the British Middle East Office (beginning in 1951). He first visited Ethiopia in 1953 and made a series of collections, a set of which were presented to the then University College of Addis Ababa in 1959 to form the foundation of what was to become the National Herbarium of Ethiopia. (See Mesfin Tadesse 1991).

NOTES. The morphological characteristics, including the herbaceous climbing habit, flowers 4 – 4.5 cm long, and seeds with a short, c. 2 mm long hilum place this new species in *Mucuna* subg. *Stizolobium* (P. Browne) Baker. Previously, Thulin (1989) recognised only two species of *Mucuna* as occurring in Ethiopia: *M. pruriens* and *M. melanocarpa* and in herbaria our new species was found identified under both names. Although both *M. pruriens* and *M. melanocarpa* have flowers 3.5 – 5 cm long and dark coloured corollas, the abaxial surface of their leaflets is not densely pubescent as in *M. mooneyi*. In addition, the fruits of *M. mooneyi* are larger than those of *M. pruriens*, and the seeds are discoid

and not reniform (as found in *M. pruriens*). A taxon with similar pubescence on its leaflets is *M. poggei* var. *pesa*, but in that variety the flowers are white, greenish white, or pale green, not purple. The maximum length of the flowers of *M. poggei* var. *pesa* is slightly longer (4 – 6 cm long) than in *M. mooneyi* (4 – 4.5 cm long). The morphological differences among these taxa are presented in Table 1. *M. ferox* Verdc. is also morphologically similar to *M. mooneyi*, especially in leaflet indumentum, but the species is even closer morphologically to *M. poggei* var. *pesa*, and we are investigating whether the two names should be treated as synonyms.

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