

## LEGUMINOSAE

### *VIGNA VERDCOURTII* (PAPILIONOIDEAE), A NEW SPECIES FROM EASTERN AFRICA

The genus *Vigna* Savi (Papilionoideae) is an important group which includes several domesticated species, five in Asia and two in Africa, the African ones being the cowpea, *Vigna unguiculata* (L.) Walp., and the Bambara groundnut, *Vigna subterranea* (L.) Verdc. Major advances in the knowledge of the genus are the works of Verdcourt (1970) and Maréchal *et al.* (1978).

Since 1978, various phylogenetic works, especially Thulin *et al.* (2004), indicate a much smaller genus *Vigna*, reduced to 50–60 species. Apart from the Asian species of subgenus *Ceratotropis*, and despite several changes made in the nomenclature (Pasquet 2001), most of the African taxa had already been described by 1978. Six new species were described after 1978 (Mithen &

Kibblewhite 1989; Pasquet & Maréchal 1989; Pienaar 1991, 1993; Du Puy & Labat 2002); however, some of them are controversial (including *Vigna benuensis* Pasquet & Maréchal) and will probably not survive the phylogenetic test of DNA sequence analysis.

During the preparation of the account of *Vigna* for *Flora zambesiaca* (Pasquet 2001), a few specimens were difficult to identify. These specimens were close to *V. oblongifolia* A.Rich. and pubescent forms of *V. luteola* (Jacq.) Benth. (= *V. fischeri* Harms), but they were char-



FIGURE 25.—*Vigna verdcourtii*. A, flowering and fruiting branches; B, seedling from accession X3080, National Botanic Garden of Belgium, Meise; C, seed. A, *Page-Wilkes* 926 (EA); B, C, *Robson & Angus* 407 (K). Scale bars: A, B, 10 mm; C, 1 mm. Artist: Nicholas Muema, East African Herbarium, Nairobi, Kenya.



acterized by standard dimensions longer than wide, an unusual character in *Vigna*, and only encountered in two unrelated species, i.e. *V. schimperi* Baker from subgenus *Haydonia* (R. Wilczek) Verdc. and *V. owahuensis* Vogel from subgenus *Vigna* in the Hawaiian archipelago.

Later, from one matK sequence (Feleke 2007), it appeared that these specimens clearly belonged to a fairly rare new species within subgenus *Vigna*, known at present from only thirteen specimens.

***Vigna verdcourtii* Pasquet, sp. nov.**, (Sect. *Vigna*–*Papilionoideae*), floribus flaveis 12.5–18.0 mm longis, *V. schimperi* Baker similis sed exino grani pollinis reticulato atque ovario ovula 7–10 gerenti differt; formis pubescentibus *V. luteolae* (Jacq.) Benth. similis sed vexillo longiore quam latiore differt.

*Vigna fischeri* sensu Thulin in *Opera Botanica* 68: 172 (1989), non Harms.

TYPE.—Ethiopia, Kaffa, Amero, 2 250 m, 1 December 1960, Mooney 8745 (K, holo.; ETH, FT, S, iso.).

Twining herb. *Rootstock* unknown. *Stems* covered with spreading ferruginous hairs. *Stipules* triangular-lanceolate, 5–6 × 1.5 mm, slightly bilobed at base, multinerved; lobes rounded, 1.5 mm long. *Leaves* trifoliolate; terminal leaflets lanceolate, rarely ovate, 35–77 × 13–30 mm, acute and mucronulate at apex, rounded-subcordate

at base, sometimes slightly hastate, sparsely to densely soft-pubescent on both surfaces; petiole 15–45 mm long; rhachis 5–15 mm long. *Inflorescence* axillary, 2–16-flowered; peduncles 10–160 × 0.8–2 mm, not winged; rhachis 8–17 mm long, 1–8-noded; internode 1–3 mm long. *Flowers* 12.5–18 × 10–14 mm, yellow with purple marks; pedicel 1–4 mm long, very slightly expanding during fruiting. *Bracteole* oblong or lanceolate, 3–6 × 0.5–1.5 mm, 1-nerved. *Calyx* pubescent; tube 3 mm long; lobes 1.5 mm long, the lower twice as long, the upper pair joined to form acute or bifid lip. *Standard* longer than wide, obovate, usually 14–16 × 10–13 mm, with two small oblique appendages. *Keel* slightly twisted toward right or not twisted (seen from rhachis top), whitish with a short purple beak. *Alternate anthers* without a pair of glands at base. *Pollen exine* reticulate. *Ovary* 7–10-ovuled. *Pod* black, slightly compressed, curved or almost straight, 45–48 × 4.0–4.5 mm, slightly constricted between seeds, covered with ferruginous and white bristly hairs, with a short curved beak. *Seed* 3–4 × 2.5 mm, 1.5 mm thick, black; hilum 1.5 mm long, eccentric, with a conspicuous fork-shaped eccentric aril. Figures 25, 26.

*Diagnostic features and affinities:* *Vigna verdcourtii* is sister to the mainly yellow-flowered group which includes *V. lanceolata* Benth., *V. pseudovenulosa* (Marechal, Mascherpa & Stainier) Pasquet & Maesen, *V. subterranea* (L.) Verdc., *V. filicaulis* Hepper, *V. multinervis* Hutch. & Dalziel, *V. heterophylla* A. Rich., *V. pubigera* Baker, *V. oblongifolia* var. *oblongifolia*, *V. luteola*, *V.*

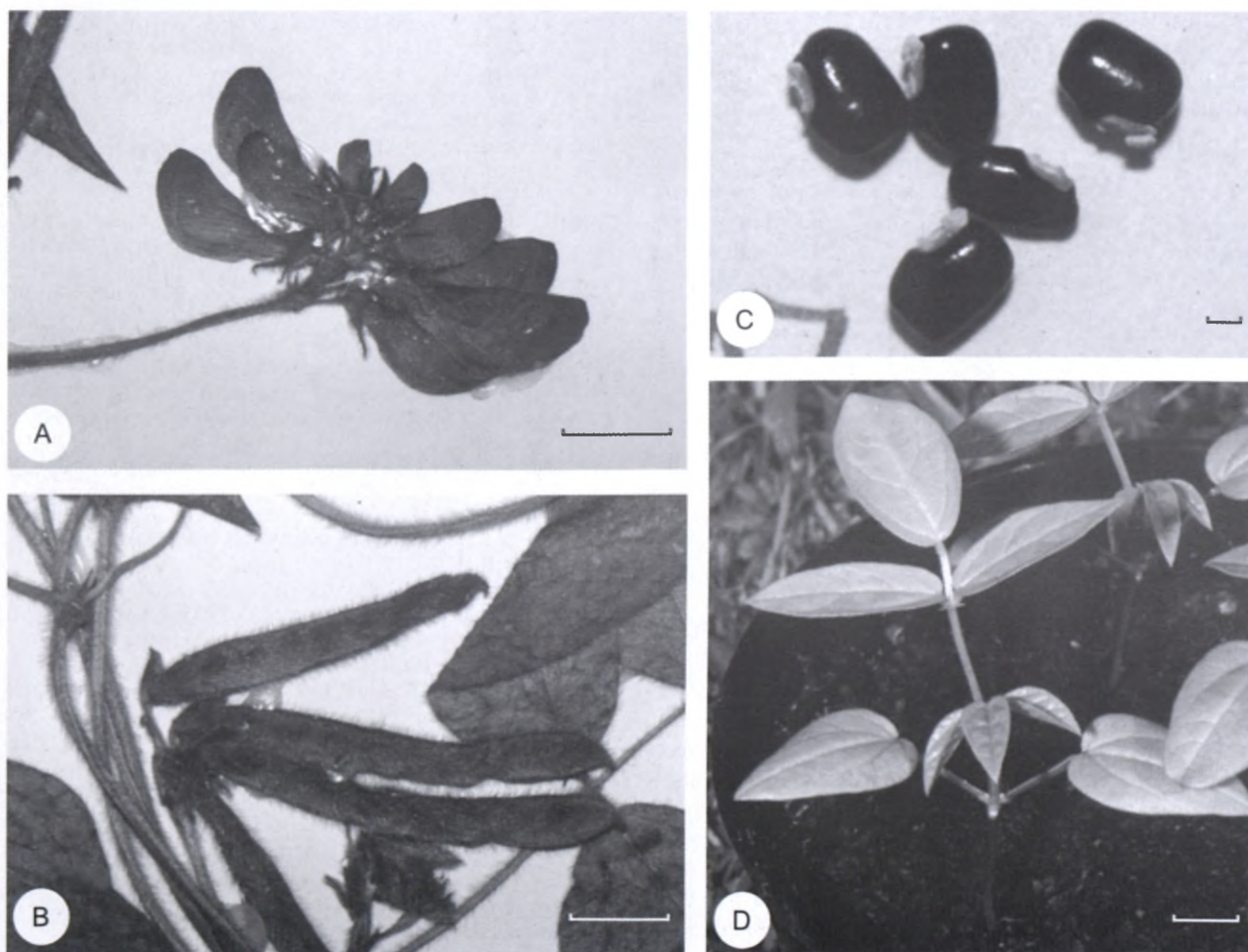


FIGURE 26.—*Vigna verdcourtii*. A, flower; B, pods; C, seeds; D, seedlings from accession X3080, National Botanic Garden of Belgium. Meise. A, B, Luke 7032 (EA); C, Robson & Angus 407 (K). Scale bars: A,B,D, 10 mm; C, 1 mm.



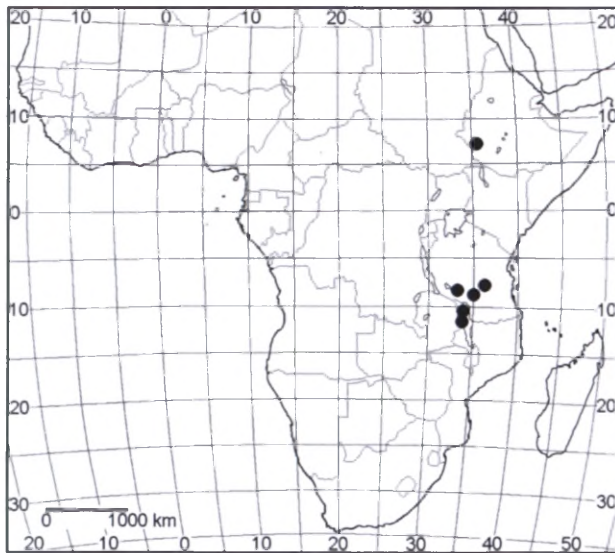


FIGURE 27.—Known distribution of *Vigna verdcourtii*.

*marina* (Burm.) Merr., *V. oblongifolia* var. *parviflora* (Baker) Verdc., and *V. owahuensis* (Feleke 2007).

The general plant morphology is very similar to both that of *Vigna oblongifolia* var. *oblongifolia* (especially the pubescence, the number of ovules, and the pod and seed morphology), and to that of the pubescent forms of *V. luteola* (= *V. fischeri*) due to the leaf shape and the flower size (Figure 25). Previously, *Mooney 8745* was identified as *V. fischeri* by Thulin (1983, 1989), and *Robson & Angus 407* as *V. oblongifolia* by the author (Pasquet 2001). Most of the specimens were labelled *V. fischeri*, one *V. luteola*, and one *V. oblongifolia*.

The contracted inflorescence and the standard being longer than wide (Figure 26) suggest *Vigna schimperi*, but the *V. verdcourtii* pollen exine is not smooth, the stipule is produced below the point of insertion, and the ovule number (7–10) is much lower than that of *V. schimperi* (13–20).

*Distribution and ecology:* *Vigna verdcourtii* appears to be restricted to the mountainous areas of tropical East Africa (Figure 27) occurring at 1 500–2 300 m. This is higher than the *V. luteola* altitudinal range, and similar to that of *V. schimperi*. However, the ecology is more related to that of the *V. luteola* group: streambanks, forest edges, fallows and cleared land in forest areas. In fact, this exactly matches pubescent forms of *V. luteola*.

The number of specimens available is small, but it highlights a surprising feature of its distribution. The taxon is found between latitude 8°N and 12°S, but it has never been collected between 6°N and 6°S (Figure 27), notably in Kenya and northern Tanzania, which have been intensively surveyed in the past and where pubescent forms of *V. luteola* are encountered. This may be due to a photoperiod sensitivity which could prevent the plant from flowering when day length is not variable enough. The area of occurrence of *V. verdcourtii* is fully included within that of *V. schimperi*, which extends from

13°N to 12°S, with numerous collections from Kenya and northern Tanzania.

#### Other material examined

TANZANIA.—Iringa Prov., Mufindi, 6500' [1 980 m], 15 October 1931, *Davies 29* (EA); Udzungwa Mountain NP, Ruipa River, 1 650 m, 6 October 2000, *Luke, Bytebier, Butynski, Ehardt, Perkins & Kimaro 7032* (EA, K); Mufindi, ± 6200' [1 900 m], 25 July 1969, *Paget-Wilkes 549* (EA); Mufindi, Lugeme, ± 6200' [1 900 m], 18 September 1971, *Paget-Wilkes 926* (EA, K); Mufindi, Nymalala, ± 6200' [1 900 m], 17 September 1971, *Paget-Wilkes 937* (EA, K); Mufindi Dist., Livalonge Tea Estate, [± 1 700 m], 27 August 1971, *Perdue & Kibuwa 11269* (EA, K); Rungwe Dist., Ngozi Poroto Mtns, 2 100 m, 17 October 1956, *Richards 6537* (K); Mbeya Dist., Kikondo, 2 250 m, 20 October 1956, *Richards 6654* (K); Nyassa Hochland, Station Kyimbila, 1913, *Stolz 2157* (C, HBG, L, LD, S, U).

MALAWI.—Chikangawa, ± 1 800 m, 9 July 1952, *Jackson 956* (BR, K); edge of rainforest path leaving Nyika, 7300' [2 225 m], 7 July 1971, *Pawek 5033* (K).

ZAMBIA.—Nyika Plateau, below Rest House on path to N Rukuru waterfall, 2 150 m, 27 October 1958, *Robson & Angus 407* (BM, K, PRE).

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