A revision of the genus *Dolichos* (Fabaceae, Papilionoideae, Phaseoleae), including Lesotho and Swaziland

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Abstract

A revision of the genus *Dolichos* in South Africa (Lesotho and Swaziland included) is presented. This legume genus, belonging to the bean tribe Phaseoleae, mainly has an African distribution, extending into Asia. In South Africa it is represented by nine species, two (*D. sericeus* and *D. trilobus*) of which extend into Tropical Africa. *Dolichos* is closely related to the genus *Macrotyloma* from which it can be distinguished by the short standard appendages, reticulate pollen and the generally purple flowers (standard appendages long, pollen tuberculate or spinulose and flowers yellow or orange in *Macrotyloma*). It also has affinities with the genera *Dipogon* and *Lablab*. The correct nomenclature, as well as complete synonymy, typification and distribution maps of all the species are provided.

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1. Introduction

The genus *Dolichos* L. belongs to the subtribe Phaseolinae of the Phaseoleae tribe (family Fabaceae, subfamily Papilionoideae). Distinguishing characteristics of the subtribe Phaseolinae include expanded, flattened or coiled styles, presence of appendages on the standard petal, keel petals that are usually fused along both margins and perhaps most importantly, the presence of a white spongy tissue that covers the hilum (Lackey, 1981).

*Dolichos* is chiefly African but also extends to Asia (Baker, 1871; Mackinder, 2001). The origin of the name *Dolichos* is unclear, but apparently “it was used by Dioscorides for some similar plant, or for some species of the allied genus *Phaseolus* L. (kidney-bean)” (Harvey, 1862). Adamson and Sailer (1950) noted that it is “a Greek name for a plant with edible pods”. According to Verdcourt (1978), the name is derived from a Greek word for “long”. A comprehensive background to the taxonomic history of the genus *Dolichos* was given by Verdcourt (1970). In this work, he divided *Dolichos* s.l. into several groups now recognised as genera, including Austrodolichos Verdc., *Macrotyloma* (Wight & Ar.) Verdc., Nesphostylis Verdc., Pseudeminia Verdc., Pseudovigna (Harms.) Verdc. and Sinodolichos Verdc. (Verdcourt, 1970; Mackinder, 2001). The latter three genera are now placed in the subtribe Glycininae (Lackey, 1981). Verdcourt (1970) also established the concept of *Dolichos* s.s., which he subdivided into three subgenera *Dolichos*, *Chloryllis* (E. Mey.) Verdc. and Odontichos Verdc. *Dolichos* subgenus *Odontichos* can be distinguished by, among other characters, the presence of a tooth at the base of the vexillary filament, uniformly thickened style (style thickened at the base in subgenera *Dolichos* and *Chloryllis*) and conspicuous bracteoles. *Dolichos* subgenus *Chloryllis* is characterised by greenish-yellow flowers, a nodulate inflorescence rachis and the curved style apex.

*Dolichos* s.s. is a relatively large genus comprising about 60 species (Mackinder, 2001). It is closely related to *Macrotyloma*, from which it differs in having short standard appendages (long and narrow in *Macrotyloma*), reticulate pollen (tuberculate or spinulose in *Macrotyloma*) and the generally purple, purplish pink or violet flowers (yellow or orange in *Macrotyloma*;
Verdcourt, 1970; Mackinder, 2001). Recent molecular data has revealed that Dolichos is successively a sister to Macrotyloma and Sphenostylis E. Mey. (Wojciechowski et al., 2004). Sphenostylis differs from the other two genera in having a laterally flattened style. Dolichos also has affinities with the monotypic genera Dipogon Liebm. and Lablab Adans, with which it is often confused. Lablab can be distinguished from Dolichos and related genera by several characters including a blade-like style; a non-penicillate stigma and verrucose margins (Fig. 1) on the pods (Verdcourt, 1978). While, Dipogon differs in that the base of the style is strongly curved in the same direction as the apex. Nine species of Dolichos occur in South Africa, including two (D. trilobus and D. sericeus) which extend into Tropical Africa.

2. Materials and methods

Plant material was studied during field trips and mainly from herbarium specimens loaned from BOL, NBG (including SAM) and PRE, and those housed in BM, GRA, JRAU, K, NH, NU, S and UPS.

3. Results and discussion

3.1. Vegetative morphology

The South African species of Dolichos are trailing, twining, prostrate or erect shrublets or suffrutices. Leaflet morphology is an important taxonomic character for distinguishing between species. The leaflets can be linear–lanceolate, lanceolate, hastate (D. hastaeformis), broadly elliptic, ovate, rhombic-ovate or slightly or distinctly tri-lobed (D. trilobus). Dolichos angustissimus and D. linearis both have linear–lanceolate leaflets, but the leaflet base in the former is cuneate while it is round in the latter. Furthermore, in D. angustissimus the leaflets tend to be conduplicate. In D. pratensis there are prominent diagnostic mucrons on the leaflets. Petioles length is of limited diagnostic value but can be used to distinguish between the two closely related species D. sericeus (up to 25 mm long) and D. trilobus (up to 70 mm long).

3.2. Reproductive morphology

In most species, the peduncles are longer than the petioles, apart from two species (D. linearis and D. trilobus) where they are shorter. In D. peglerae and D. pratensis, the peduncles are diagnostically nodulose. Bracts and bracteoles are usually persistent, except in D. peglerae and D. pratensis where they are caducous at a very early stage. Flower colour is mostly purple, purplish-pink or violet, except in D. pratensis where the flowers are green or greenish yellow. The calyx is generally shorter than the corolla and bilabiate in all species. The shape of the calyx lobes is of limited diagnostic value, e.g. D. decumbens and D. falciformis have similar leaf morphology but the calyx lobes are round in the former and triangular in the latter. The standard petal is characterised by the presence of short, cone-shaped appendages in all species. The keel petals are equal to or longer than the wing petals, but in D. peglerae and D. pratensis the keel petals are almost twice as long as the wings.

4. Taxonomic treatment

Leaves pinnately 3-foliolate; leaflets linear, linear-lanceolate or lanceolate, sometimes hastate or 3-lobed, with arising from a tuberous rootstock. *Dolichos* species: *D. trilobus*.

*Lablab* Adans., Fam. Pl. (Adanson) 2: 325 (1763); DC., Prod. 2: 401 (1825), *pro parte excl. type*. 


*Macrotyloma* Wight & Am.: 247 (1834), *pro parte excl. type*. 


Shrubs or suffrutes with trailing and/or twining branches arising from a tuberous rootstock. Leaves pinnately 3-foliolate; leaflets ovate, elliptic or linear, sometimes hastate or 3-lobed, with four linear stipels, one at the base of each lateral leaflet and two at the base of the terminal one, covered with silky white hairs; and stipules relatively small (up to 10 mm and 3 mm long respectively). *Dolichos* species: *D. trilobus*.

4.1. A key to the species of Dolichos in South Africa

1a. Leaflets with prominent mucrons, flowers green, pods not warty along the margins, peduncules nodulose/warty (subgenus *Chloryllis*) .................................. 9. *D. pratensis*. 

1b. Leaflets without mucrons, flowers pink, purple or violet, pods not warty along the margins, peduncle usually not nodulose (subgenus *Dolichos*).

2a. Leaflets mostly narrowly or broadly hastate or hasteate-linear ................................................................. 4. *D. hastaeformis*. 

2b. Leaflets linear, lanceolate, broadly elliptic, ovate or rhombic-ovate but never hastate.

3a. Leaflets linear, linear-lanceolate or lanceolate.

4a. Erect, robust suffrutex, leaflets usually conduplicate (folded double lengthwise); base cuneate; peduncles longer than pedioles ........................................ 1. *D. angustissimus*. 

4b. Prostrate, sparingly branched suffrutex, leaflets rarely conduplicate; base round; peduncles shorter than pedioles .............................................................. 5. *D. linearis*. 

3b. Leaflets broadly elliptic, ovate, rhombic or rhombic-ovate.


5b. Peduncles not nodulose; keel equal to or shorter than wings.

6a. Leaflets relatively large (up to 90 mm long), sometimes slightly or distinctly tri-lobed.

7a. Stems and leaves densely villous; bracteoles up to 7 mm long; carinal calyx lobe longer than the two lateral ones .............................................................. 7. *D. sericeus*. 

7b. Stems and leaves sparingly pubescent; bracteoles very small (up to 2 mm long); carinal calyx lobe equal to the two lateral ones ........................................ 8. *D. trilobus*.

6b. Leaflets relatively small (up to 40 mm long), never tri-lobed.

8a. Decumbent shrublet; stems not twining; leaflets and stipules relatively small (up to 10 mm and 3 mm long respectively), calyx lobes round ................. 2. *D. decumbens*.

8b. Scandent suffrutex; stems twining; leaflets and stipules relatively large (up to 40 mm and 6 mm long respectively), calyx lobes triangular, acute .......... 3. *D. falciformis*.

4.2. Dolichos L. subgenus Dolichos

4.2.1. *D. angustissimus* 


Erect, robust suffrutex. Stems slender, up to 0.4 m high, not striate-ribbed. Leaflets long, linear–lanceolate, mucrons absent, (40–) 60–100 × 2–6 mm, glabrous on both sides; petiole (7–) 12–22 mm long; stipules lanceolate, 2–3 × 1–2 mm. *Flowers* in axillary racemes, peduncles longer than petioles, without warts, (20–) 35–75 mm long, with (1) 2 to 4 flowers; flowers 5–8 mm long; bracts lanceolate, 1–2 × 0.5–1.0 mm; bracteoles narrowly ovate, 1–2 × 1.0–1.5 mm. *Calyx* sparsely pubescent, with equal lips, upper lip 3–4 mm long, lower lip 3–4 mm long; carinal lobe length longer than lateral ones. *Corolla* purplish-pink to purple; standard broadly obovate, 7–8 × 7–8 mm, claw 2–3 mm long; wings obovate, 5–6 × 2–3 mm, claw 2–3 mm long; keel more or less equal to wings, 4–5 × 2–3 mm, claw 2–3 mm long. *Ovary* narrowly oblong, 4 to 6-ovuled, 5–6 mm long. *Fruit* crescent-shaped, 25–35 × 3–4 (−6) mm, glabrescent, almost
shiny, without warts along the margins, 4 to 6-seeded. Seeds brown or black (Fig. 2).

4.2.1.1. Distribution and habitat. This species occurs in South Africa and Lesotho. In South Africa, it is widely distributed in all provinces but not in Limpopo (Fig. 3). It grows in rocky grasslands, grassy plains and subalpine grasslands.

4.2.1.2. Diagnostic characters. *D. angustissimus* can be distinguished by its very long and narrow leaflets. These are similar to those of *D. linearis*, but are generally narrower in the former with a tendency to be conduplicate. Meyer (1836) placed the two in different sections, based on whether or not the face of the style is channelled. The channeling, however, is difficult to see even under a good dissecting microscope. Perhaps the most useful distinguishing character between the two species is in the shape of the leaflet base, in *D. linearis* it is round while in *D. angustissimus* it is cuneate.

4.2.1.3. Taxonomic note. Hilliard and Burtt (1988) indicated that *D. angustissimus* and *D. angustifolius* are two different species. According to these authors, Ecklon & Zeyher’s plant (*D. angustifolius*) deserved to be recognised because of “its smaller anticous lobe (1 × 0.75–1.5 mm), in having a swelling at the base of the style, which is distinctly channelled on either side while the inner face of the style itself is not channelled, and the lack of the hairs along the upper suture of the ovary”. Upon examination of a specimen cited by Hilliard and Burtt (1988) representing *D. angustifolius* (Sidey 3737, PRE), we found that in some flowers, there is no swelling at the base of the style, despite the fact that the anticous calyx lobe is small. Floral dissections of several specimens showed that relatively large anticous calyx lobes can co-occur with a swollen style base on the same flower, e.g. some flowers of Goossens 62 (PRE) collected in Pretoria. This specimen has a swollen style base and an anticous calyx lobe measuring 1.6 × 1 mm in length (Fig. 4). Therefore, we here regard these as one taxon.

4.2.1.4. Additional specimens examined. South Africa: 2526 (Zeerust): Lichtenburg (− CC), J.D. Sutton 346 (PRE). 2527 (Rustenburg): Alongside railway line one mile on Koster side of Derby (− CC), B. Clarke 258 (K). 2528 (Pretoria): Van Riebeeck Natuurreservaat (− BC), P. Kok 224 (PRE); near Pretoria (− CA), R. Schlechter 3605 (K), L.C.C. Liebenberg 3147 (K); Waterkloof, Pretoria (− CC), P. Fairall 1572 (NBG), G. Germishuizen 8712.
Fig. 4. Flower dissections of Dolichos angustissimus showing gynoecia and calyces from various specimens. Vouchers: (A–D) J. Sidey 3767 (PRE); (E, F) B.-E. Van Wyk 1588 (JRAU); (G, H) A.P. Goussens 62 (PRE). Scale bars: a–h, 1 mm.


3126 (Queenstown): Broughton near Molteno (–AD), H.F. Flanagan 1582 (BOL, K, NU, S); 20 km from Dordrecht on Molteno road, top of hill near Stormberg Stud farm (–BD), B.-E. Van Wyk 1588 (JRAU); Queenstown (–DD), J.L. Sidey 3737 (S), T. Cooper 183 (BM), E.E. Galpin 1537 (GRA). 3128 (Umtata): Maclear, Farm Lancelot (–AA), S.P. Bester 1341 (NH). 3226 (Fort Beaufort): between Klipplaatrivier and Zwartkei (–BA), Drège s.n. a (BM, K, PRE, S). 3324 (Steyterville): Zwartkopsrivier (–DB), C.F. Ecklon & C.L.P. Zeyster s.n. (S). 3325 (Port Elizabeth): Uitenhage (–CD), R. Schlechter 2560 (NH); 2.4 miles from Coega on Grahamstown road (–DC), D.M. Comins 756 (BOL).

Lesotho: 2828 (Bethlehem): Leribe (–CC), A. Dieterlen 175 (PRE). 2927 (Masera): ‘Mamathe (–BB), W.J. Lawson 859 (NH); Botlabelo, near Masera (–BC), A. Dieterlen 1018 (PRE); Mountain Road behind Rual (10 km from Roma) (–BD), M. Schmitz 8404 (PRE). 2928 (Marakele): Bokong, Katse, slope above stream east of Katse Village (–AD), K.P. Braun 2102 (PRE); Kao, Pelaneng River, about 200 m upstream from bridge (–BA), K.P. Braun 2168 (BM); Liseleng stream (–BC), A. Jacot-Guillarmod 2267 (PRE). 2929 (Underberg): Mokhotlong, Lesotho (–AC), R.H. Compton 21485 (NBG), A. Dohoe 305 (K), A. Jacot-Guillarmod 998 (GRA).

4.2.2. D. decumbens


Decumbent shrublet. Stems sprawling. 0.3–0.6 m high, not striate-ribbed. Leaflets rhombic-ovate, 10–26 × 10–25 mm, mucrons absent, sparsely pubescent beneath, glabrescent above; petiole (5–) 10–18 (–30) mm long; stipules ovate, 2–3 × 1–2 mm. Flowers in axillary pseudo-umbels, peduncles longer than petioles, not warty, (18–) 25–65 mm long, with (2–) 4 to 10 flowers; flowers 6–7 mm long; bracts ovate, 1.0–1.5 × ±1 mm; bracteoles linear-lanceolate, ±1 × ±0.5 mm. Calyx sparsely hairy, upper lip slightly longer than lower lip, upper lip 2.0–3.5 mm long, lower lip 2–3 mm long; carinal lobe length equal to lateral ones. Corolla violet, pink or blue with dark purple keel tip; standard suborbicular, 5–7 × 5–7 mm, claw 1.5–2.0 mm long; wings obovate, 4.5–5 × ±2 mm, claw 3–4 mm long; keel more or less equal to wings, 4.5–5 × 2–3 mm, claw 3–4 mm long. Ovary narrowly oblong, 4.5 mm long, 1 or 2-ovuled. Fruit linear, 25–30 × 4–5 mm, densely silky, without warts along the margins, 1 to 2-seeded. Seeds brown or brown mottled black (Fig. 5).
4.2.2.1. Distribution and habitat. Restricted to the Western and Eastern Cape Provinces of South Africa (Fig. 6). It grows in fynbos and has been recorded from a range of different soil types including hard, sandy gravel overlying solid ironstone, well-drained sandstone soil, gritty loam over granite and shale.
4.2.2.2. Diagnostic characters. *Dolichos decumbens* has a similar leaflet shape to *D. falciformis*, but *D. decumbens* is a non-twinning, prostrate shrub while the latter is a twining, scandent suffrutex. *D. decumbens* has smaller leaflets (up to 26 mm wide, as opposed to up to 40 mm wide) and stipules (2–3 × 1–2 mm, compared to 5–6 × 3–4 mm), rounded calyx lobes (triangular in *D. decumbens*) and is also less hairy than *D. falciformis*.


4.2.3. *D. falciformis*

E. Mey., Comm. Pl. Afr. Austr.: 144 (1836); Harv., Fl. Cap. 2: 246 (1862); J.H. Ross in Flora of Natal: 209 (1972). Type: South Africa, Eastern Cape Province, “inter Omamendo et Omsamculo” [between Mtentu River, 3129BB Port St. Johns and Mzimkulu River, 3030CB Port Shepstone]. Drège s.n. (K!, lectotype, here designated; K!, MO!, S!, isotypes). [Note: There are two sheets in K, one from herbarium Benth. and the other from Hook., the latter is chosen as lectotype because the locality details are indicated on this sheet].

Scandent creeping suffrutex. Stems 4-angled, strigate-ribbed, up to 1.8 m long. Leaflets ovate to broadly ovate, with prominent white coloured veins, 23–40 × 20–40 mm, mucrons absent, pubescent on both sides; petiole 15–20 mm long; stipules ovate–lanceolate, 5–6 × 3–4 mm. *Flowers* in axillary pseudumbels, pedicels much longer than petals, without warts, 9–15 cm long, with 3 to 6 flowers; flowers 6–8 mm long; bracts linear-lanceolate, 1.0–1.5 × 0.5 mm; bracteoles linear–lanceolate, 1–3 × 0.8–1.0 mm. *Calyx* puberulous, with equal lips, upper lip ± 3 mm long, lower lip 3–4 mm long; carinal lobe length equal to lateral ones. *Corolla* purplish pink; standard reflexed, broadly obovate, purple at the tip, 6–8 × 6–8 mm, claw 2–3 mm long; wings obovate, 5–7 × 3–4 mm, claw 2–3 mm long; keel slightly shorter than wings, 4–5 × 2–3 mm, claw 2–3 mm long. *Ovary* narrowly oblong, 3 to 5-ovuled, 3–4 mm long. *Fruit* straight at first and becoming falcate, 25–30 × 5–7 (~10) mm, glabrescent, not warty along the margins, 3 to 5-seeded. *Seeds* reniform or almost round, black (Fig. 7).

![Fig. 7. Vegetative and reproductive morphology of *Dolichos falciformis*: (A) flowering branch; (B1) adaxial view of bracts; (B2 and B3) abaxial view of bracteoles; (C) calyx opened out with upper lobes to left; (D) standard petal; (E) wing petal; (F) keel petal; (G) staminal tube showing anthers; (H) lateral view of ovary; (I) lateral view of pod. Vouchers: (A) *E.E. Galpin s.n. sub BOL 2615* (BOL); (B) *H. Bolus 11075* (BOL); (C, E, F, H) *A. Pegler 278* (BOL); (D) *F.M. Leighton 2808* (BOL); (I) *W.P. Giffitin s.n. sub BOL 2610* (BOL). Scale bars: a, 10 mm; b, f–h, 0.5 mm; c–e, 1 mm; i, 4 mm.](image-url)
4.2.3.1. Distribution and habitat. The species is found in South Africa in the North-West, Mpumalanga, Gauteng, KwaZulu-Natal and Eastern Cape Provinces (Fig. 8). It occurs in burnt grassveld and on rocky slopes.

4.2.3.2. Diagnostic characters. Dolichos falciformis resembles *D. decumbens* in leaflet shape but differs from it in the larger (up to 40 mm wide, as opposed to up to 26 mm wide in *D. decumbens*) and much more prominently veined leaflets and the larger stipules (5–6×3–4 mm, compared to 2–3×1–2 mm in *D. decumbens*). This species also differs from *D. trilobus* and *D. sericeus* in having shorter pods.


4.2.4. *D. hastaeformis*

E. Mey., Comm. Pl. Afr. Austr.: 142 (1836); Harv., Fl. Cap. 2: 244 (1862). Types: South Africa, Eastern Cape Province, “Kookhuis ad Vischriiver” [Cookhouse at Visrivier, 3225DB Somerset East], Drège s.n. a (K!, lectotype, here designated; Sl!, isolectotype). [Note: The Cookhouse specimen in K is chosen as lectotype because it is of a better quality and has more flowers.]


Straggling shrublet. Stems slender, twining, 0.5 m long, not striate-ribbed. Leaflets narrowly or broadly hastate, or oblong, 13−25×5−7 mm, mucrons absent, scabrous on both sides; petiole (5−) 8−10 mm long; stipules lanceolate, 2−3×1−2 mm. Flowers in leaf-opposed or pseudo-umbellate racemes, peduncles longer than petioles, without warts, (25−) 34−90 mm long, with 2 to 6 flowers; flowers small, (3−) 4−7 mm long; bracts lanceolate, 1.0−1.5×0.5−1.0 mm; bracteoles linear-lanceolate, ±1×0.5−0.7 mm. *Calyx* pubescent, with equal lips, upper lip ±3 mm long, lower lip ±3 mm long; carinal lobe length equal to lateral ones. *Corolla* bright pink or pale mauve becoming purple with age; standard broadly ovate, 5−6×5−6 mm, claw ±1 mm long; wings obovate, 5−6×1−2 mm, claw 2−3 mm long; keel more or less equal to wings, 4−5×2−3 mm, claw 2−3 mm long. *Ovary* narrowly oblong, 2 or 3-ovuled, 4−5 mm long. *Fruit* linear, straight, 25−35×4−6 mm, densely silky, not warty along the margins, 2 or 3-seeded. *Seeds* brown or black (Fig. 9).

4.2.4.1. Distribution and habitat. This species is restricted to the Eastern and Western Cape Provinces of South Africa (Fig. 10). It occurs on well-drained loamy soil in sourveld, karroid scrub and grassland.

4.2.4.2. Diagnostic characters. This aptly named species resembles *Dolichos linearis* and *D. decumbens* in its trailing growth habit, but differs from the two species in having mostly hastate leaflets or if not hastate, then at least the leaflets are lobed at the base.

4.2.4.3. Additional specimens examined. South Africa: 3225 (Somerset East): Near Farrgage Lodge (between Somerset East and Cookhouse) (−DC), *J. P. H. Acocks* 15712 (K). 3226 (Victoria East): Alice (−DC), *H. M. Giffen* 9561 (PRE). 3324 (Steyterville): Zwartkopsrivier (−DA), *C. L. P. Zeyher* s.n. sub NBG 32924 (SAM); 2 miles W of Gamtoos river drip, on Humansdorp – Hankey road (−DD), *H. G. Fourcade* 3624, 5410 (BOL). 3325 (Port Elizabeth): “Modderfontein ad Brakrivier” Modderfontein at the Brakrivier, (−BD), *J. F. Drège* s.n. b (MO); Addo Elephant Park (−BD), *B. P. Botha* 5769 (PRE); Bethelsdorp (−CB), *E. R. Long* 262 (K); Uitenhage (−CD), *R. Baur* s.n. [Author’s personal copy]
Fig. 9. Vegetative and reproductive morphology of *Dolichos hastaeformis*: (A) flowering branch; (B1) adaxial view of bracts; (B2 and B3) abaxial view of bracteoles; (C) calyx opened out with upper lobes to left; (D) standard petal; (E) wing petal; (F) keel petal; (G) staminal tube showing anthers; (H) lateral view of ovary; (I) lateral view of pod. Vouchers: (A) R.D. Bayliss 2450 (NBG); (B–D) J.D. Thode 3796 (NBG); (E–H) P. Bohnen 7281 (NBG); (I) P. MacOwan 5 (BOL). Scale bars: a, 10 mm; b, c, e, f, h, 0.5 mm; d, g, 1 mm; i, 4 mm.

Fig. 10. Known distribution of *Dolichos hastaeformis*. 
4.2.5. D. linearis

E. Mey., Comm. Pl. Afr. Austr.: 142 (1836); Hilliard and Burtt in Notes Roy. Bot. Gard., Edinb.45: 85 (1988); A. Schreib. in FSWA 60: 34 (1980), pro parte. Type: South Africa, Eastern Cape Province, Stormberg [3126BC Queenstown], Drège s.n. d (P!, lectotype, chosen by Hilliard & Burtt, 1988); [Note: 1. One of the syntype specimens (Drège s.n. c from Klipplaatrivier) is excluded as it belongs to D. angustifolius (also excluded by Harvey, 1862). 2. The Glenfilling collection in S appears to belong to D. linearis and not to D. angustifolius as suggested by Hilliard and Burtt (1988)].


Sparingly branched, prostrate creeping suffrutex. Stems 4-angled, strigate-ribbed, up to 1 m long. Leaflets linear-lanceolate or lanceolate, rarely complex, 50–80 × 4–10 mm, mucrons absent, glabrescent on both sides; petiole 10–25 (30) mm long; stipules ovate–lanceolate, 2–3 × 1–2 mm. Flowers in axillary umbellate racemes, peduncles shorter than petioles, without warts, 6–15 mm long, often 1-flowered or with 2 to 4 flowers; flowers (4–) 6–8 mm long; bracts linear, 2–3 × 0.2–0.5 mm; bracteoles linear-lanceolate, ±2 × ±0.5 mm. Calyx thinly pubescent, much shorter than the corolla, with equal lips, upper lip 2.0–2.5 mm long, lower lip 2.0–2.5 mm long, carinal lobe length equal to lateral ones. Corolla purplish pink; standard reflexed, suborbiculate, purple at the tip, 4–6 × 4–6 mm, claw 1–2 mm long; wings obovate, 3–5 × 1.0–1.5 mm, claw 3–4 mm long; keel almost equal to the wings, 3–5 × 2.0–2.5 mm, with a linear claw 3–4 mm long. Ovary narrowly oblong, 1 or 2-ovuled, 3–4 mm long. Fruit straight to slightly falcate, 20–30 × 4–5 mm, glabrescent, without warts along the margins, 2 to 4-seeded. Seeds almost round, black or brown (Fig. 11).

4.2.5.1. Distribution and habitat. Dolichos linearis occurs in the southern parts of Lesotho and in the Limpopo, Northern Cape, Gauteng, Mpumalanga, Free State, Western Cape, Eastern Cape and KwaZulu-Natal Provinces of South Africa. It grows on river boulder beds and other disturbed places at altitudes up to 1440 m (Fig. 12).

4.2.5.2. Diagnostic characters. Dolichos linearis superficially resembles D. angustissimus in leaflet shape, but differs from it in growth form; the latter tends to be more erect whereas the former tends to be prostrate. In D. angustissimus, the leaflets are very much longer than wide (60–100 × 2–6 mm), are usually conduplicate and have a cuneate base whereas in D. linearis, the leaflets are not very much longer than wide (50–80 × 4–10 mm), are rarely conduplicate and have a round base. Furthermore, in D. linearis the peduncles are shorter than petioles (peduncles up to 15 mm long, petioles up to 30 mm long), whereas they are longer in D. angustissimus (peduncles up to 75 mm long, petioles up to 22 mm long).


Lesotho: 2929 (Underberg): Mokhotlong (–AC), L.C.C. Liebenberg 5777 (PRE). 3028 (Matatiele): Qacha’s Neck-
Sekakes rd, near White Hill (−AB), K.D. Gordon-Gray 4033 (NU).

4.2.6. D. peglerae


Diffuse suffrutex. Stems twining, slender, up to 1 m long, not striate-ribbed. Leaflets broadly ovate or rhomboid, with prominent veins, 25–60×20–45 mm, mucrons absent, glabrescent above, scabrous beneath; petiole 25–65 mm long; stipules ovate–lanceolate, 2–4 × 1.0–1.5 mm. Flowers in dense fasciculate racemes forming at intervals along peduncle, peduncles much longer than petioles, nodulose, robust, 50–220 (−260) mm long, with 5 to 7 flowers; flowers 10–20 mm long; bracts and bracteoles caducous. Calyx hispidulous, much shorter than corolla, with equal lips, upper lip 3–5 mm long, lower lip 3–5 mm long; carinal lobe length equal to lateral ones. Corolla pink to mauve or purple fading yellow with age; standard ovate, 15–20 × 10–15 mm, claw 2–3 mm long; wings obliquely ovate, 6–8 × 4–5 mm, claw 4–5 mm long; keel longer than wings, 12–18 × 4–5 mm, claw 2 mm long. Ovary linear, hispidulous, 7–13 mm long, 4 to 6-ovuled. Immature fruit falcate, 30–40 × 5–8 mm, glabrescent (Fig. 13).

4.2.6.1. Distribution and habitat. This rare species is known from a few localities in the KwaZulu-Natal and Eastern Cape Provinces in South Africa (Fig. 14). It occurs on forest margins.

4.2.6.2. Diagnostic characters. Dolichos peglerae is superficially similar to Lablab purpureus in leaflet shape and the presence of nodulose (warty) peduncles, but differs from it in having very small, caducous bracteoles, larger flowers (up to 20 mm long compared to up to 15 mm long), and non-rostrate keel petals (apart from the more obvious generic characters such as the blade-like style; the non-penicillate stigma and verrucose margins on the pods in Lablab). D. peglerae also shares the nodulose inflorescence rachis with D. pratensis, a character which makes D. peglerae intermediate with Dolichos subgenus Chloryllis. The two species however differ in leaflet shape (broadly ovate or rhomboid in D. peglerae compared to distinctly 3-lobed in D. pratensis) and flower colour (pink or mauve in D. peglerae, green or greenish-yellow in D. pratensis).

4.2.7. D. sericeus


Diffuse shrub. Stems twining, slender, about 1.2 m long, not striate-ribbed. Leaflets broadly elliptic to broadly ovate, 30–72 × 25–40 mm, mucrons absent, densely villous on both sides; petiole (6–) 10–25 mm long; stipules ovate–lanceolate, 5–7 × 2–3 mm. Flowers in leaf-opposed racemes, sometimes unifloral, peduncles longer than petioles, without warts, 25–35 mm long, with 2 to 10 flowers; flowers 10–20 mm long; bracts lanceolate to ovate, 3–5 × 0.8–1 mm; bracteoles linear-lanceolate, 1–2 × ±0.5 mm. Calyx glabrous or densely silky, lips almost equal in length, upper lip 4–7 mm long, lower lip 4–8 mm long, carinal lobe of the lower lip longer and narrower than lateral ones. Corolla purple or pink, fading creamy with age; standard suborbiculate, 7–16 × 7–12 mm, claw 1–2 mm long; wings obovate, 6–12 × 6–8 mm, claw 2–3 mm long; keel more or less equal to the wings, 6–12 × 3–5 mm, claw 2–5 mm long. Ovary narrowly oblong, 6 to 10-ovuled, 6–10 mm long.
Fruit straight or crescent-shaped, 38–65 × 6–10 mm, glabrescent, not warty along the margins, 6–many-seeded. Seeds ellipsoid or reniform, dark brown to black (Fig. 15).

4.2.7.1. Distribution and habitat. There are four subspecies of *D. sericeus*: subsp. *sericeus* (widespread in the highlands of tropical Africa and southern Africa), subsp. *formosus* and subsp. *pseudofalcatus* (all occurring in East Africa). Only the typical subspecies occurs in South Africa and Swaziland. In South Africa, it is widely distributed in KwaZulu-Natal Province but it also occurs at a few localities in Mpumalanga Province (Fig. 16). Plants grow on sandy or loamy soils in grazed disturbed grasslands and in forest margins.

4.2.7.2. Diagnostic characters. In growth form, *Dolichos sericeus* is close to *D. trilobus*, especially in those forms of *D. trilobus* in which the leaflets are not distinctly 3-lobed. However, *D. sericeus* is much more pubescent than *D. trilobus* ssp. *trilobus* and ssp. *transvaalensis*. The former has relatively larger bracteoles (up to 7 mm long compared to up to 2 mm long) and stipules which are mostly ovate. *D. sericeus* subsp. *sericeus* differs from subsp. *formosus* and subsp. *pseudofalcatus* in having relatively larger flowers and from subsp. *glabrescens* in having pubescent calyces.

4.2.7.3. Additional specimens examined. South Africa: 2427 (Thabazimbi): Waterberg district, Leeupoort (− BC); F.A. Rogers 24022 (BM). 2530 (Lydenburg): 18 km from Lydenburg turn off on Lydenburg-Machadodorp road (− AD), C.A. Prentice 92 (PRE); Lydenburg, south of Sabie (− BB), P.J. Muller 2453 (PRE); Lowveld Botanic Garden, garden side near cemetery (− BD), E. Buitendag 435 (NBG). 2831 (Nkandla): Hlabisa district, St. Lucia Estuary Game Park (− BB), E.S. Pooley 2273 (NU); Mtunzini district, Twin Streams (− DD), H.J. McAllister s.n. sub PRE 56212 (PRE); Inchanga (− DA), H. Loubser s.n. sub PRE 56212 (PRE); Inanda (− DB), J.M. Wood 565 (BM, K). 3030 (Port Shepstone): 15 km from Ixopo on rd to Pietermaritzburg (− AA), T. Edwards 950A (NU); Alexandra District, Dumisa station (− AD), H. Runnalls 1650 (K); Umzinto district, Renishaw north (S of Amahlangwe River) (− BD), H.
4.3. A key to the subspecies of D. trilobus

Leaflets thin, ovate or rhomboid .............................................. subsp. trilobus.

Leaflets thick, slightly or distinctly tri-lobed, central lobe rounded ................................................................. subsp. transvaalicus.

4.3.1. D. trilobus subsp. trilobus

Leaflets thin, ovate or rhomboid, 15–65 × 20–52 mm, with central lobe acute; petiole 25–35 mm long, stipules ovate–lanceolate, 3–4 × 2–3 mm. Peduncle 5–43 mm long. Pods 25–75 mm long.

4.3.1.1. Distribution and habitat. In South Africa, this subspecies appears to be restricted to the KwaZulu-Natal Province. No specimens could be found in any South African herbaria (BOL, GRA, NBG, NH, NU, PRE, SAM) and it is possible this subspecies is extinct in South Africa. From South Africa it extends through the northern parts of southern Africa to East Africa and into Arabia and Asia. It grows in grassland, open woodland and at forest margins.

4.3.1.2. Diagnostic characters. The typical subspecies differs from subspecies transvaalicus in having ovate or rhomboid leaflets, while the latter mostly has distinctly tri-lobed leaflets with the central lobe rounded. D. trilobus subspecies trilobus has longer peduncles and shorter petioles.

4.3.1.3. Additional specimens examined. South Africa: 2931 (Stanger): Durban, 25 May 1885 (−CC), J.M. Wood 3185 (K).

4.3.2. D. trilobus subsp transvaalicus


**D. pseudodebilis** Harms in Fedde Repert. 14:160 (1915); Verdc. in Kew Bull. 24: 423 (1970). Type: Namibia, Waterberg, Dinter 1808 (B†; SAM!, lectotype, here designated). [Note: Since Dinter’s specimens in B were destroyed, the SAM specimen is chosen as lectotype. There are two syntypes in SAM, one from Grootfontein and the other from Waterberg (both in Namibia), the Waterberg specimen is chosen as lectotype because it is of better quality, showing clearly the tri-lobed leaves of the species].

Leaflets thick, slightly or distinctly 3-lobed, 50–90 × 20–46 mm, central lobe rounded; petiole 15–40 mm long; stipules ovate–lanceolate, 3–5 × 1–3 mm. Peduncle 7–20 mm long. Pods 40–70 mm long.

4.3.2.1. Distribution and habitat. This subspecies occurs in Swaziland and South Africa (Limpopo, Gauteng, Mpumalanga, KwaZulu-Natal and Eastern Cape Provinces). It can be found in loamy soils on rocky outcrops, rocky grassland, mountain savanna and along roadsides.

4.3.2.2. Diagnostic characters. This subspecies differs from the typical subspecies in having “notably thicker leaflets with the middle lobe generally rounded” (Mackinder, 2001).

A. Fabia 1061 (PRE); Ohrigstad Nat. Res. (−DA), N. Jacobsen 1283 (PRE); Pilgrim’s Rest (−DD); E.E. Galpin s.n. sub BOL 2572 (BOL). 2431 (Acomhoek): 5 km from Klaserie on the road to Mariepskop (−DB), D.J. Botha 2478 (PRE). 2528 (Pretoria): Meintjes Kop near Pretoria (−CA); H. Bolus 11840 (BOL); Pretoria University Farm, behind Silvertown on ridge (−CB), L.E. Codd 861 (PRE). 2529 (Witbank): Loskop irrigation dam (−AD), A.O.D. Mogg 17262 (PRE); 14 km from Nelspuit to Komatipoort (−AC), E.E. Galpin s.n. sub BOL (PRE).


4.3.3. *D. pratensis*  
(E.Mey.) Taub. in Engl. & Prantl., Naturl. Pflanzenfam. 3 (3): 383 (1894); Verdc. in Kew Bull. 24: 379–447 (1970). Chloryllis pratensis E. Mey., Comm. Pl. Afr. Austr.: 149 (1836). Dolichos chloryllis Harv., Fl. Cap. 2: 246 (1862). Type: South Africa, Eastern Cape, Gekau [3128DB Umtata], Drège s.n. (B?); Grahamstown [3326DA Grahamstown], R.Story 3237 (PRE!), lectotype here designated; BOL!, K!, isolectotypes. [Note: Despite considerable efforts, no type specimens could be located. The type specimen is likely to have been in Berlin but was possibly destroyed by the fire during World War II. The Grahamstown specimen is chosen as type because it is from the Eastern Cape Province and housed in more than one herbarium.]

Diffuse suffrutex. Stems slender, 4-angled, striate-ribbed, up to 0.7 m long. Leaflets distinctly 3-lobed, with prominent net-venation, 40–90 × 35–60 mm, mucrons conspicuous, scabrous on both sides; petiole 10–55 mm long; stipules ovate, striated, 5–9 × 3–4 mm. Flowers in pseudo-racemes, peduncles much longer than petals, nodulose, 75–140 (−260) mm long, 15-many-flowered; flowers (5–) 8–15 (−20) mm long; bracts and bracteoles caducous. Calyx brown, pubescent, with equal lips, upper lip 4–5 mm long; lower lip 4–5 mm long. Corolla green or greenish-yellow; standard oblong, 10–6 × 7–9 mm, glabrous, claw 1–3 mm long; wings almost straight, blunt, 7–12 × 2–3 mm, claw 1–3 mm long; keel longer than wing, 10–16 × 4–6 mm.

Fig. 19. Vegetative and reproductive morphology of Dolichos pratensis: (A) flowering branch; (B1) adaxial view of bracts; (B2 and B3) abaxial view of bracteoles; (C) calyx opened out with upper lobes to left; (D) standard petal; (E) wing petal; (F) keel petal; (G) staminal tube showing anthers; (H) lateral view of ovary; (I) lateral view of pod. Vouchers: (A, C−G, h2) E. Moss 8586 (BOL); (h1) J. Thode 3247 (PRE); (I) R. Story 3237 (PRE). Scale bars: a, 10 mm; b−e, g, 1 mm; f, 2 mm; h, 4 mm.
claw 1–3 mm long. Ovary narrowly oblong, 4–5-ovuled, 6–8 mm long. Fruit oblong, sometimes very broad, 56–60 × 10–15 mm, scaberulous, warty along the margins, 3–4-seeded (Fig. 19). Seeds dark brown or black (Fig. 19).

4.3.3.1. Distribution and habitat. The species occurs in Lesotho (known only from one locality) and in South Africa in the Limpopo, North-West, Gauteng, Free State, KwaZulu-Natal and Eastern Cape Provinces (Fig. 20). It occurs on stony hillside and in open grassland or under trees.

4.3.3.2. Diagnostic characters. Dolichos pratensis can be distinguished by the small lateral teeth on the leaflets, each with a prominent mucron (a short, sharp point extending from the leaf veins — also mucro), the peculiar green flowers and warty pods along the margins. It is close to D. falciformis. It also has a nodulose inflorescence rachis — also mucro), the peculiar green flowers and warty pods along the margins, 3–4-seeded (Fig. 19). Seeds dark brown or black (Fig. 19).


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References


