

Studies in *Lotononis* (Crotalariaeae, Fabaceae). IV. Three new species of the *L. umbellata* group (section *Polylobium*) from the Cape Province

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Three new species of the section *Polylobium* (Eckl. & Zeyh.) Benth. of *Lotononis* (DC.) Eckl. & Zeyh. are described: *L. acocksii* B-E. van Wyk, *L. nutans* B-E. van Wyk and *L. purpurescens* B-E. van Wyk. Morphologically, these species are intermediate between *L. umbellata* (L.) Benth. and species of the section *Aulacanthus* (E. Mey.) Benth. The new species are all known only from the type localities in the south-western and southern Cape.

Drie nuwe soorte van die seksie *Polylobium* (Eckl. & Zeyh.) Benth. van *Lotononis* (DC.) Eckl. & Zeyh. word beskryf: *L. acocksii* B-E. van Wyk, *L. nutans* B-E. van Wyk en *L. purpurescens* B-E. van Wyk. Morfologies is hierdie soorte 'n oorgangvorm tussen *L. umbellata* (L.) Benth. en soorte van die seksie *Aulacanthus* (E. Mey.) Benth. Die nuwe soorte is almal slegs bekend van die tipe-lokaliteite in die Suidwes- en Suid-Kaap.

Keywords: Cape Province, Fabaceae, *Lotononis* section *Polylobium*, new taxa

Introduction

The section *Polylobium* (Eckl. & Zeyh.) Benth. of *Lotononis* (DC.) Eckl. & Zeyh. comprises three distinctive groups, namely the *L. umbellata*, *L. involucrata* and *L. angolensis* groups (van Wyk 1988). *L. umbellata* is the only species with single stipules originally included in *Polylobium* by Benth (1843). Other species of the section are estipulate or have the stipules paired at each node. These other species also have a subterranean caudex from which flowering shoots develop annually, while *L. umbellata* is best described as a prostrate shrub. Woody, perennial branches are present, at least in old plants.

The three new species described below are morphologically intermediate between *L. umbellata* and some species of the section *Aulacanthus* (E. Mey.) Benth. It is indeed possible to accommodate them all in *Aulacanthus* without modifying the original diagnosis of the section. The section *Polylobium* as presently circumscribed is therefore unsatisfactorily artificial and the three new species are only tentatively placed in this section. A more natural sectional classification is in preparation.

Lotononis acocksii B-E. van Wyk, sp. nov.

L. umbellatae (L.) Benth. valde similis sed habitu multo maiore (frutex metralis), foliolis anguste oblanceolatis nec obovatis, inflorescentiliis racemosis pauciflorisque (nec subumbellatis nec multifloris), et floribus maioribus differt; *L. comptonii* B-E. van Wyk etiam similis, sed ab hac specie habitu maiore, petiolis brevioribus, lobis lateralibus calycis minus connatis, vexillo basi late cuneato (nec cordato), et forma alarum differt; a *L. nutante* B-E. van Wyk floribus multo maioribus, inflorescentia racemosa pauciflora (nec 4-vel pluriflora) et ovario lineari (nec ovato) differt.

TYPUS.— Cape Province: Ladismith district, 3,2 km [2 miles] ENE of Vanwyksdorp, 31/7/1959, *Acocks* 20573 [PRE, charta 1, holotype; K, PRE (charta 2 & 3), isotypi].

Lax, sparsely branched woody shrub, up to 1 m tall. Branches slightly corky, yellow-brown; young twigs sparsely strigillose. *Leaves* digitately trifoliolate; petiole (4–)6–8(–10) mm long, persistent for some time after the leaflets are shed individually; leaflets narrowly oblanceolate, (4–)12–15(–18) mm long, (1,5–)2–3 (–4) mm wide, abaxially sparsely strigillose, adaxially glabrous. *Stipules* consistently present, single at each node, elliptic-oblong, midrib eccentric, (1–)3–5(–8) mm long. *Inflorescences* racemose, leaf-opposed, slender, long-pedunculate, 30–60(–80) mm long, sparsely (2–)3–4-flowered; bracts small, 1–2 mm long; bracteoles absent. *Flowers* 12–13 mm long, yellow; pedicel 2–5 mm long. *Calyx* 6–7 mm long, lobes triangular, with the lateral sinuses only slightly shallower than the upper or lower ones, minutely strigillose. *Standard* orbicular, 12 mm long, longitudinally striated, base broadly cuneate. *Wing petals* broadly oblong, as long as the keel; apex obtuse, subtruncate, sculpturing upper basal and upper central, in 6–7 rows of mostly intercostal lunae and lamellae. *Keel petals* broadly elliptical, 11 mm long, auriculate and pocketed near the base; apex obtuse. *Antthers* dimorphic. *Pistil* 10–12 mm long; ovary oblong-linear, 8 mm long, pubescent, verrucose along the upper suture. *Fruit* and *seed* unknown. (Figure 1).

Lotononis acocksii is closely related to *L. umbellata* (L.) Benth. but differs in the much larger habit (a sparse shrub of ca. 1 m tall), the narrowly oblanceolate leaflets (obovate in *L. umbellata*), the few-flowered racemes (many-flowered and sub-umbellate in *L. umbellata*) and the larger flowers. It is also similar to *L. comptonii* B-E. van Wyk, but differs from this species in the larger habit, the shorter petioles, the fusion, to a lesser degree, of the lateral and upper calyx lobes, the broadly cuneate base of the standard (cordate in *L. comptonii*) and the shape of the wing petals. From *L. nutans* B-E. van Wyk it differs in the habit, the much larger flowers, the racemose and few-flowered inflorescences (4- or more

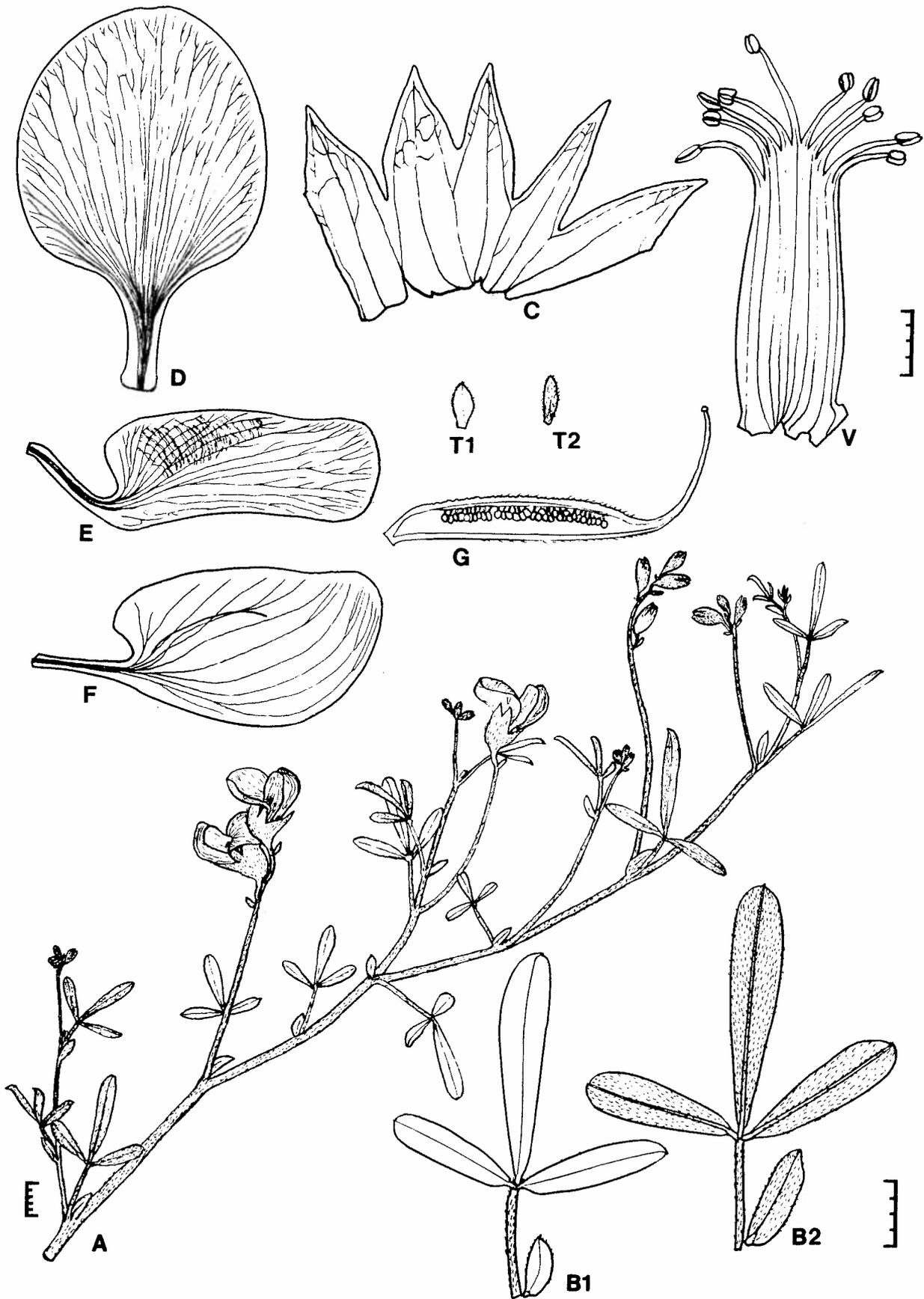


Figure 1 *Lotononis acocksii*. A, flowering branch; B1, B2, leaves in adaxial (B1) and abaxial (B2) view, showing the single stipule and minutely strigillose vestiture; C, calyx opened out, with the upper lobes to the left, vestiture not shown; D, standard petal; E, wing petal; F, keel petal; G, pistil (note the verrucose upper suture); T1, T2, bracts; V, androecium. (All from *Acocks 20573*). Scale in mm. (Note the scale difference between Figures 1 and 2. The flowers and flower parts of *L. acocksii* are almost double the size of those of *L. nutans*).

flowered and sub-umbellate in *L. nutans*) and the linear ovary (ovate in *L. nutans*).

The only known collection of *L. acocksii* is from the southern parts of the Rooiberg near Ladismith (Figure 4), where it was found in Spekboomveld (a veld type dominated by *Portulacaria afra* Jacq.) on a southern aspect. The specific epithet commemorates J.P.H. Acocks (1911–1979), one of the most prolific South African collectors. He has discovered several undescribed species of *Lotononis*, two of which are described here as new.

Material examined

—3321 (Ladismith): Ladismith district, 3,2 km [2 miles] ENE of Vanwyksdorp (–CB), 31/7/1959, *Acocks 20573* [PRE, holo.; K, PRE (2 sheets), iso.].

Lotononis nutans B-E. van Wyk, sp. nov.

L. acocksii B-E. van Wyk valde similis, sed habitu prostrato, inflorescentiis subumbellatis multifloris, floribus multo minoribus nutantibus, ovario ovato differt. *L. umbellatae* (L.) Benth. etiam valde similis, sed ab hac habitu valde diffuso, petiolis longioribus aliquamdiu post exuendum foliolorum persistentibus, foliolis lanceolatis, ovario ovato (nec lineari), fructu multo brevioribus turgidioribus differt.

TYPUS.— Cape Province: 69,6 km [43,5 miles] WSW of Uniondale, 20/9/1960, *Acocks 21585* (PRE, holotypus).

Prostrate, diffuse shrub. *Branches* sparsely leafy; young twigs minutely strigillose. *Leaves* digitately trifoliolate; petiole (5–)7–10(–12) mm long, persistent for some time after the leaflets are shed individually; leaflets oblanceolate, (3–)6–10(–12) mm long, (1,5–)3–4 mm wide, abaxially sparsely strigillose, adaxially glabrous. *Stipules* consistently present, single at each node, elliptic to elliptic-oblong, (2–)3–5(–6) mm long. *Inflorescences* subumbellate, leaf-opposed or terminal on short lateral branches, slender, long-pedunculate, 25–45 mm long, densely (4–)5–6(–7)-flowered; bracts small, up to 1,5 mm long; bracteoles absent. *Flowers* very small, 6–7 mm long, yellow; pedicel 1–2 mm long. *Calyx* 4 mm long, lobes triangular, with the lateral sinuses shallower than the upper and lower ones, minutely strigillose. *Standard* orbicular, 6–7 mm long, longitudinally striated, base broadly cuneate. *Wing petals* broadly oblong, as long as the keel; apex obtuse; sculpturing upper basal and upper central, in 6–7 rows of mostly intercostal lunae and lamellae. *Keel petals* broadly elliptical, 6 mm long, auriculate and pocketed near the base; apex obtuse. *Anthers* dimorphic. *Pistil* 5–6 mm long; ovary ovate, 4 mm long, pubescent. *Fruit* (immature) small, oblong-ovate, 8 mm long, 2,5 mm wide, laterally inflated, verrucose along the upper suture, glabrous. *Seed* unknown. (Figure 2).

L. nutans is closely related to *L. acocksii* but differs in the prostrate habit, the sub-umbellate and many-flowered inflorescences, the much smaller and nodding flowers and the ovate ovary. It is also very similar to *L. umbellata*, but differs from this species in the much sparser habit, the longer petioles that persist for some

time after the leaflets are shed, the lanceolate shape of the leaflets, the ovate ovary (linear in *L. umbellata*) and in the much shorter and more turgid fruit.

The conspicuously nodding flowers and fruit have suggested the specific epithet. *L. nutans* is only known from a single specimen that was collected in stony Mountain Rhenosterveld between Uniondale and George in the southern Cape (Figure 4).

Material examined

3322 (Oudtshoorn): 68,6 km [43,5 miles] WSW of Uniondale (–DC), 20/9/1980, *Acocks 21585* (PRE, holo.).

Lotononis purpurescens B-E. van Wyk, sp. nov.

Distincta, haud manifeste speciei ullae cognitae similis; *L. umbellatae* (L.) Benth. distanter affinis sed habitu diffuso procumbenti (nec prostrato), foliolis ellipticis multo angustioribus, inflorescentia racemosa 2-vel 3-flora, raro usque 5-flora, floribus laete purpureis (nec flavis), petalis tenuibus cadentibus, vexillo acuto ala late oblongis vel sub-orbicularibus differt.

TYPUS.— Cape Province: Montagu, ca. 2,5 km along footpath to Donkerkloof, 4/10/1987, *B-E. van Wyk 2718* (PRE, holotype; BOL, JRAU, K, M, MO, NBG, SAAS, STE, isotypi).

Sparsely branched shrublet, up to 0,3 m tall and 0,5 m wide. *Branches* yellow and slightly corky, slender, sparsely leafy; young twigs minutely strigillose. *Leaves* digitately trifoliolate; petiole (3–)6–10(–17) mm long, persistent for some time after the leaflets are shed individually; leaflets elliptic to oblanceolate, (4–)8–15(–22) mm long, (2–)3–4(–5) mm wide, very thin in texture, abaxially sparsely strigillose, adaxially glabrous. *Stipules* consistently present, single at each node, ovate, elliptic to elliptic-oblong or slightly falcate, (1,5–)3–6(–8) mm long. *Inflorescences* racemose, leaf-opposed or sub-terminal, slender, long-pedunculate, (15–)40–70(–90) mm long, sparsely (1–)2–3(–5)-flowered; bracts small, linear, up to 2 mm long; bracteoles absent. *Flowers* small, 8–10 mm long, pale purple; petals very thin in texture, caducous; pedicel 1,5–2,5 mm long. *Calyx* 5–6 mm long, lobes narrowly triangular, with the lateral sinuses only slightly shallower than the upper and lower ones, minutely strigillose. *Standard* ovate, pointed, 8–9,5 mm long, with two weakly developed callosities at the apex of the claw. *Wing petals* very broadly oblong to sub-orbicular, shorter than the keel; sculpturing upper basal and upper left central, in 6–7 rows of inter- and transcostal lunae and lamellae. *Keel petals* semicircular, 8–9 mm long, auriculate and pocketed near the base; apex obtuse. *Anthers* dimorphic. *Pistil* 8 mm long; ovary linear, 4–6 mm long, pubescent. *Fruit* (immature) oblong-ovate to oblong, 5–10 mm long, 3 mm wide, laterally only slightly inflated, verrucose along the upper suture, sparsely pubescent. *Seed* unknown. (Figure 3).

Lotononis purpurescens is a distinct species with no obvious affinities. It is similar to *L. umbellata*, but differs in the diffuse and procumbent habit (not prostrate as in

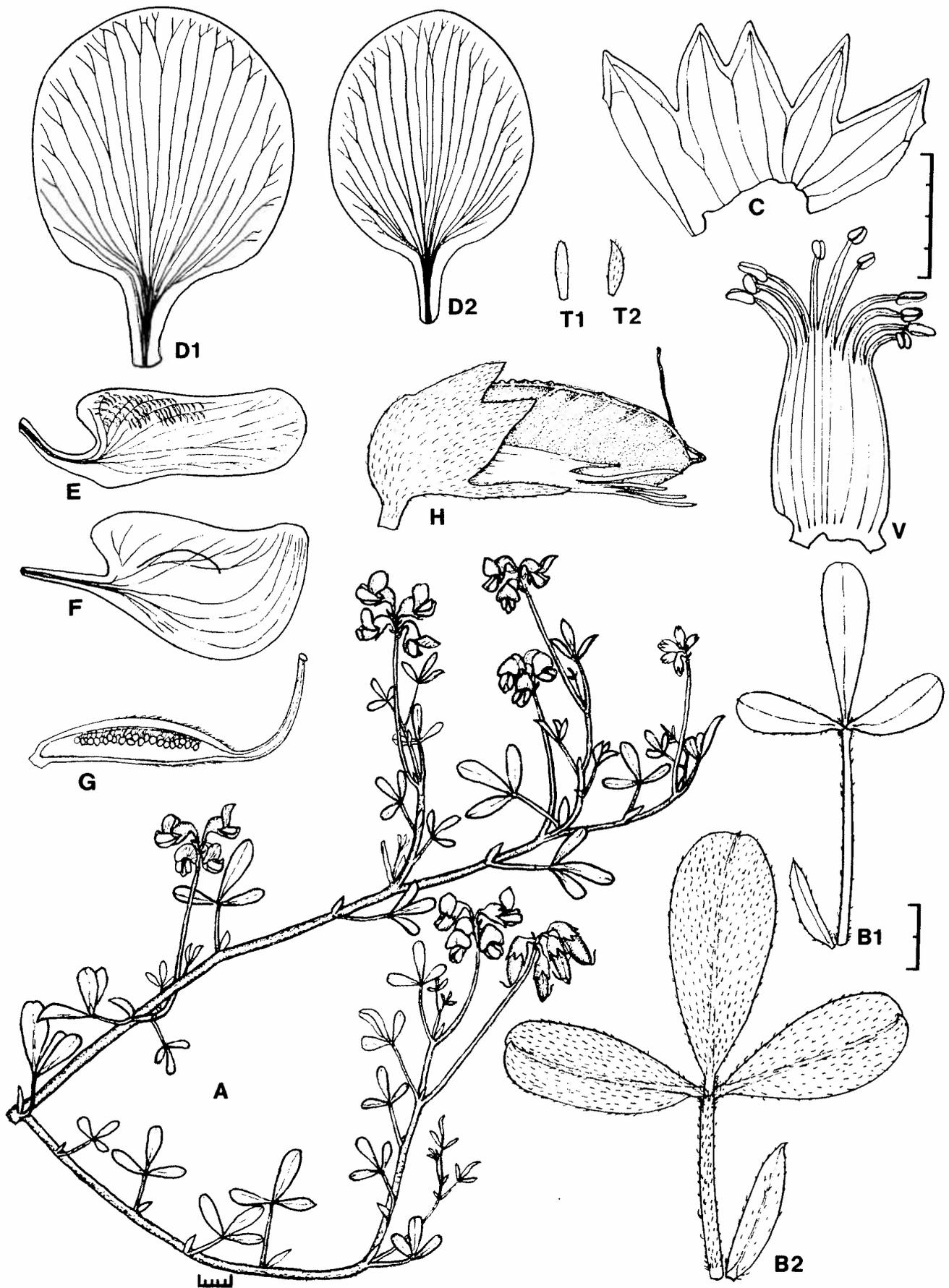


Figure 2 *Lotononis nutans*. A, flowering branch; B1, B2, leaves in adaxial (B1) and abaxial (B2) view; C, calyx opened out with upper lobes to the left, vestiture not shown; D1, D2, standard petals from an older (D1) and a younger (D2) flower; E, wing petal; F, keel petal; G, pistil; H, fruit, showing the verrucose upper suture; T1, T2, bracts; V, androecium. (All from Acocks 21585). Scale in mm.

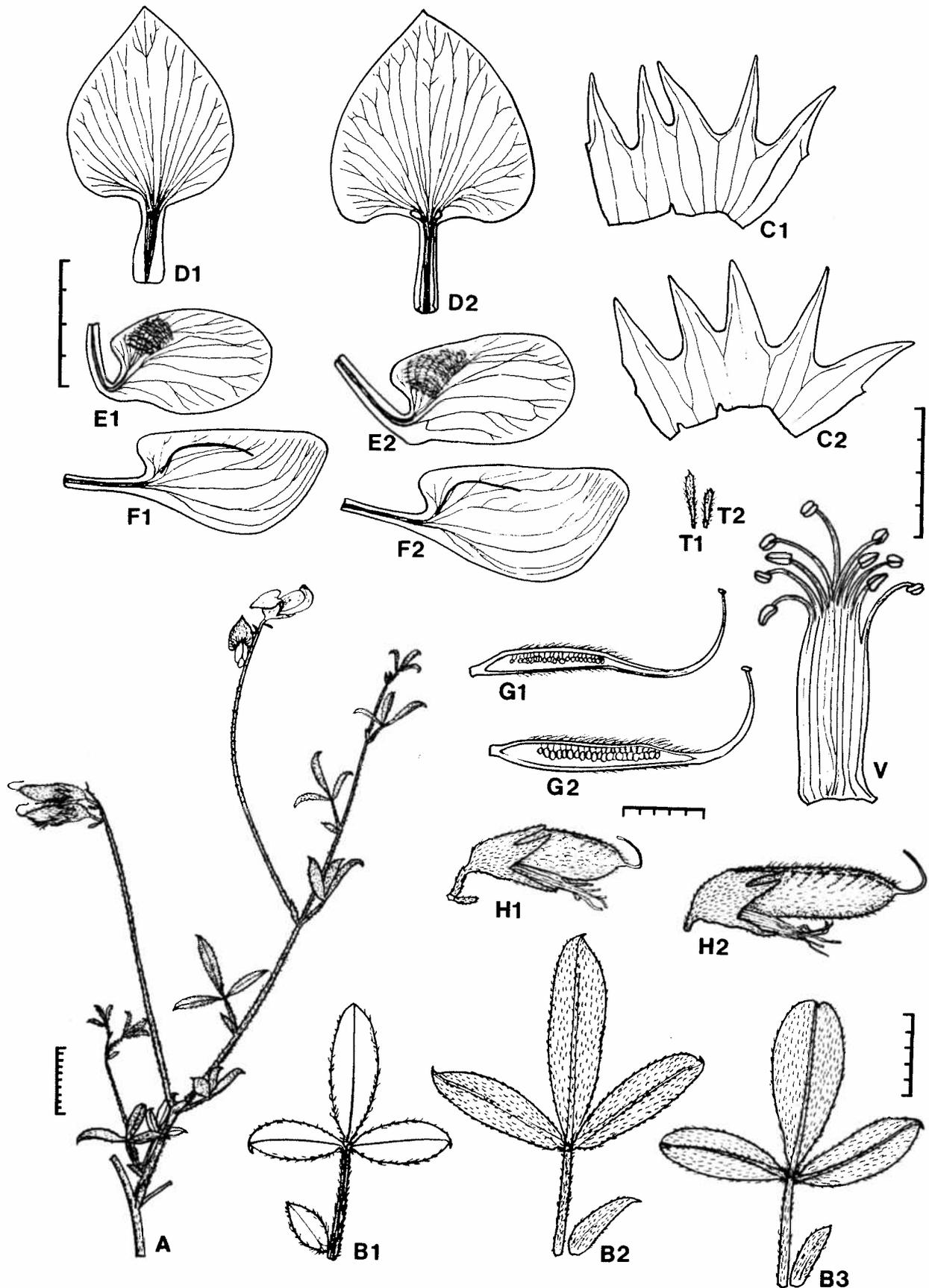


Figure 3 *Lotononis purpurescens*. A, flowering branch, showing the slender and sparsely flowered inflorescences; B1, B2, B3, leaves in adaxial (B1) and abaxial (B2, B3) view, showing the recurved leaflet apices and single stipules; C1, C2, calyx opened out, upper lobes to the left, showing the fusion of the lateral lobes; D1, D2, standard petals (note the shape); E1, E2, wing petals, showing the almost orbicular shape; F1, F2, keel petals; G1, G2, pistils; H1, H2, immature fruit, showing the slightly verrucose upper suture; T1, T2, bracts; V, androecium. (C1, D1, E1, F1 & G1 from a young flower, C2, D2, E2, F2 & G2 from an older flower; all from *B-E. van Wyk 2718*). Scale in mm.

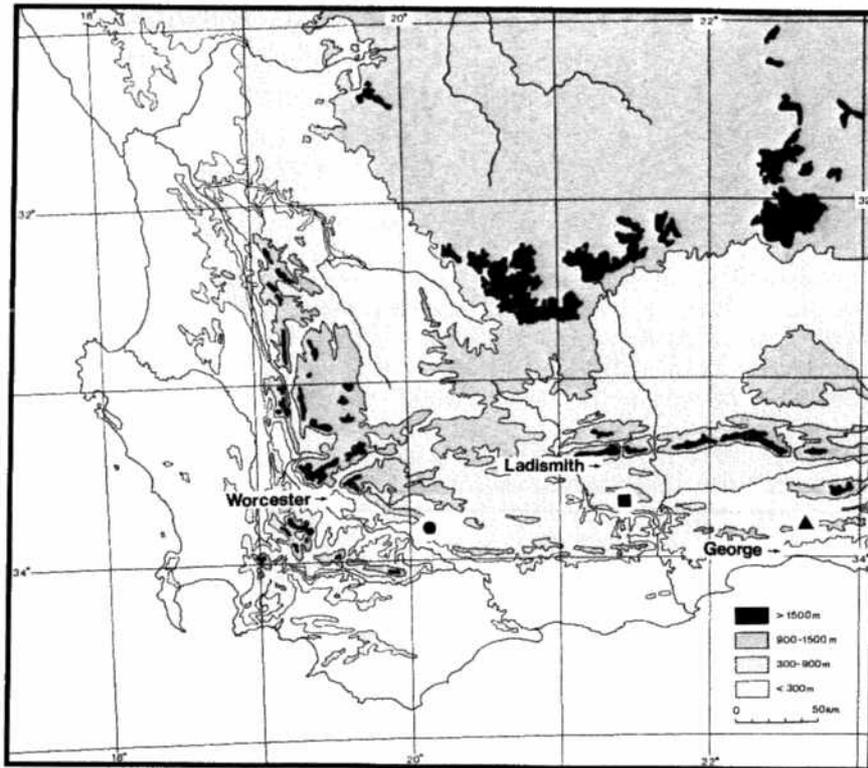


Figure 4 The known geographical distribution of *Lotononis acocksii* (■), *L. nutans* (▲) and *L. purpurescens* (●).

L. umbellata), the much narrower and elliptic leaflets, the racemose and few-flowered inflorescences (mostly 2- or 3-flowered, rarely up to 5-flowered), the pale purple flowers (yellow in *L. umbellata* and all other species of the sections *Polylobium* and *Aulacanthus*), the thinly textured and caducous petals, the pointed standard and the broadly oblong to almost orbicular wing petals.

The pale purple colour of the flowers is unusual. Pink flowers are known from a few annuals such as *L. brachyloba* (E. Mey.) Benth. and *L. rosea* Dümmer. Perennial species, and particularly the more woody ones, commonly have yellow or blue flowers but purple or pink have only been recorded in a form of *L. dichiloides* Sond. [section *Krebsia* (Eckl. & Zeyh.) Benth.] and also in *Buchenroedera meyeri* Presl. The general morphology is very similar to that of *L. umbellata* and some species of the section *Aulacanthus*, so that the species is readily accommodated in this group. A study of alkaloids (van Wyk & Verdoorn, in prep.) has indeed shown it to be very similar to *L. umbellata* and *L. rigida* (E. Mey.) Benth.

L. purpurescens is only known from the immediate vicinity of Donkerkloof at Montagu, where it was first collected in 1921. I found it in clayey soil on a dry western aspect. The rather unusual vegetation in which it grows is dominated by *Protea nitida* Mill., *Boophane disticha* (L. f.) Herb. and *Themeda triandra* Forssk.

Material examined

—3320 (Montagu): Montagu district, Donkerkloof (–CC), 26/9/1946, *Compton 18472* (NBG), 9/1946, *Lewis 2087* (SAM); Montagu Baths (–CC), 10/1921, *Page s.n. sub BOL 15441* (BOL), *s.n. sub PRE 53522* (PRE); Montagu, ca. 2,6 km along footpath to Donkerkloof (–CC), 27/6/1987, *B-E. van Wyk 2654, 2655* (JRAU), 4/10/1987, *B-E. van Wyk 2718* (PRE, holo.; BOL, JRAU, K, M, MO, NBG, SAAS, STE, iso.), 2719 (GRA, K, PRE, NH), 2720 (K, PRE), 2721 (C, NBG).

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