on the Orange River) and Donkieberg, on the Farm Waterford (on the main Griquatown–Groblershoop road) proved fruitless. These latter dunes were composed of red sand, unlike that of Witsand. It therefore seems likely that this new species occurs only at Witsand, some 70 km south-west of Postmasburg.

CAPE PROVINCE.—2822 (Glen Lyon): Witsand, Hay. 28°32'S : 22°28'E. On white sand dunes. A common bush with dull yellow/brown flowers (–CB). *I.A.W. MacDonald 76/43*, 26.11.1976 (KMG, PRE).

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F. BRUSSE

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FABACEAE

STUDIES IN THE GENUS *LOTONONIS* (CROTALARIEAE). 10. *L. ESTERHUYSENIANA*, A NEW SPECIES FROM THE SOUTH-WESTERN CAPE

INTRODUCTION

The taxonomic position of an undescribed species with a superficial similarity to species of the section *Leobordea* (Del.) Benth. is considered in this paper. At first, the morphology did not seem unusual, but on closer examination it became clear that the species did not fit readily into any of the existing sections of *Lotononis* (DC.) Eckl. & Zeyh. The significance of the new species described below is that it indicates a direct relationship between the *L. pentaphylla* group [presently part of the section *Lipozygis* (E. Mey.) Benth., see Van Wyk 1989] and the section *Leobordea*. In terms of appearance however, it is rather insignificant.

A summary of similarities and differences between the new species and various groups of *Lotononis* is given in Table 1. The comparison shows that it has more in common with the sections *Leobordea* and *Lipozygis* than with *Leptis* (Eckl. & Zeyh.) Benth. It differs from *Leobordea* mainly in the alternate leaf arrangement and the smaller number of ovules and seeds. The character states also agree well with those of *Lipozygis* (*L. pentaphylla* group) except for the structure of the calyx and inflorescence. The only way to retain the present diagnostic value of the opposite leaf arrangement (for *Leobordea*) and the capitate inflorescence (for the *L. pentaphylla* group) would be to exclude the new species from these two groups. The very small number of ovules and the unusual combination of other characters are of sufficient diagnostic value to form a new monotypic section. This seems the most practical solution.

Lotononis esterhuyseniana *B-E. van Wyk*, sp. nov., distincta sine affinitatibus manifestis. Similis est *L. platycarpae* (Viv.) Pichi-Serm. aliisque speciebus sectionis *Leobordeae*, sed ab illis foliis alternis in ramis floriferis atque ovulis valde paucioribus (1 vel 2, non 5 vel ultra ut in *Leobordea*) differt. Etiam similis est *L. laticipi* B-E. van Wyk aliisque speciebus gregis *L. pentaphyllae* (sectionis *Lipozygis*), ab illis inflorescentia racemosa (non capitata), lobo carinale calycis parvo, leguminibus maioribus compressis atque calyce non inflato non legumen maturum includente, differt. Etiam similis est *L. microphyllae* Harv. (sectionis *Leptidis*), sed ab illa habitu annuo, fabrica calycis, forma longitudineque vexillae et numero parvo ovulorum differt.

TYPE.—Cape Province, 3219 (Wuppertal): Ceres District, Stompiesvlei, Swartruggens (in sand near pan, 4000 ft.), 19.11.1961, *Esterhuysen 29341* (BOL, holo.; C, K, MO, iso.). Figure 7.

The species is named after Miss Elsie Esterhuysen of the Bolus Herbarium, who collected and distributed the only material known so far. Through her numerous collections of rare and unusual species, Miss Esterhuysen has made a very significant contribution to the phytogeography and taxonomy of *Lotononis*.

Prostrate annual up to 0,4 m wide. *Branches* sparsely leafy, minutely hirsute. *Leaves* invariably 3-foliolate, (5–)8–12(–15) mm long; petiole as long or longer than the terminal leaflet; leaflets relatively small, obovate, (2–)5–7(–9) × (1–)2–4(–5) mm, base cuneate, apex rounded to truncate, minutely but densely pubescent on both surfaces. *Stipules* single at each node, small, lanceolate to ovate, up to 3 × ± 1,5 mm, minutely pubescent on both surfaces. *Inflorescences* in terminal and leaf-opposed racemes, (3–)6–12(–15)-flowered; peduncle short, (2–)3–6(–12) mm long; bracts small and inconspicuous, lanceolate, ± 1 mm long; bracteoles absent. *Flowers* small, 7–8 mm long, yellow; pedicel up to 2 mm long. *Calyx* subequally lobed but with the lower lobe much narrower and slightly shorter than the upper four lobes; lateral sinuses a little shallower than the upper and lower ones; lobes narrowly triangular, acute. *Standard* suborbicular, much shorter than the keel; claw short, ± 1,5 mm long; lamina ± 4 × 3–4 mm, without lobes or callosities, abaxially pubescent along the apex. *Wing petals* oblong, much shorter than the keel, distinctly auriculate; pubescent along the apex; sculpturing in ± 4 rows of intercostal lunae, fading into transcostal lamellae towards the auricle. *Keel petals* broadly oblong, wider towards the obtuse apex, only slightly auriculate; claw ± 3 mm long; lamina 5–6 × ± 3 mm, pubescent on most of the upper half. *Androecium* long and narrow; anthers dimorphic; basifixed anthers oblong, almost twice as long as the small ovoid dorsifixed anthers; carinal anther similar to dorsifixed anthers. *Gynoecium* shortly stipitate; pistil very small, ovoid-oblong, pubescent, with 1 or 2 ovules; style with the basal part straight, broad and pubescent, the upper part short, slender, glabrous. *Pods* very small, ovoid, ± as long as the calyx, 3–3,5 × 2–2,5 mm, shortly stipitate, compressed (not inflated), densely pubescent, inde-

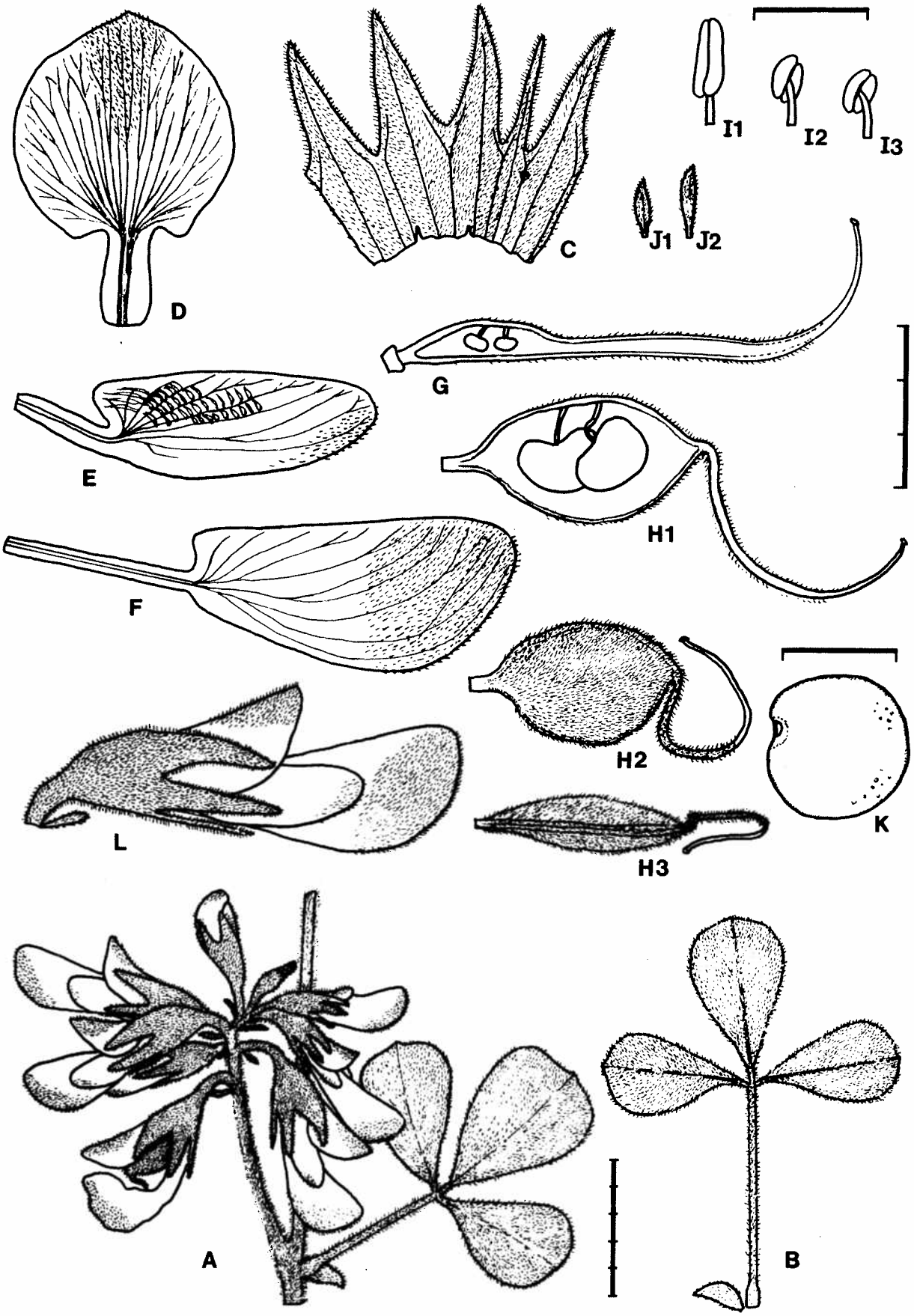

FIGURE 7.—*Lotononis esterhuyseniana*. A, flowering twig, showing the racemose inflorescence and a leaf in adaxial view; B, leaf and stipule in abaxial view; C, calyx opened out with the upper lobes to the left; D, standard petal; E, wing petal; F, keel petal; G, pistil. H1, H2 & H3, pods: H1, in longitudinal section, showing the seeds; H2, in lateral view; H3, in top view. I1, I2 & I3, anthers: I1, long basifixed anther; I2, carinal anther; I3, dorsifixed anther. J1 & J2, bracts; K, seed, showing the almost smooth surface; L, flower in lateral view. All from *Esterhuysen 29341*. Scales in mm.

TABLE 1.—Similarities and differences between *L. esterhuyseniana* and various other groups of the genus *Lotononis*

	L. esterhuyseniana	Section *Lipozygis* *L. pentaphylla* group	Section *Leobordea*	Section *Leptis* *L. mucronata* group
Habit	annual	annual	annual	perennial
Inflorescence	racemose	capitate	racemose to 1-flowered	racemose to 1-flowered
Pedicel	present	absent	present or when rarely absent, then the inflorescence 1-flowered	present
Leaf type	invariably 3-digitate	often 5-digitate	invariably 3-digitate	invariably 3-digitate
Leaf arrangement of flowering twigs	alternate	alternate	opposite	alternate
Pod:				
size	± as long as the calyx	very small, included within the calyx	as long or longer than the calyx	as long or longer than the calyx
shape	compressed	turgid	slightly turgid	slightly turgid
dehiscence	indehiscent?	indehiscent	dehiscent or tardily dehiscent	dehiscent or tardily dehiscent
Ovule number	1 or 2	2 to 12	6 to 15	4 to 18
Seed number	1 or 2	2 to 5	4 to 9	2 to 16
Calyx:				
shape	not inflated	inflated	rarely inflated	not inflated
carinal lobe	shorter than upper four lobes	not shorter	shorter than upper four lobes	not shorter
Standard:				
shape	suborbicular	oblong or suborbicular	oblong	oblong
length	much shorter than the keel	as long as the keel, rarely much shorter	usually much shorter than the keel	as long as the keel
Distribution	south-western Cape	western coastal areas of the Cape Province	Karoo, Namibia and northwards to Pakistan	eastern parts of southern Africa

hiscent (?); upper suture minutely verrucose, 1 or 2-seeded. *Seeds* suborbicular, ± 1,2 mm in diameter, testa pale orange-brown, sparsely and minutely tuberculate (Figure 7).

L. esterhuyseniana is a distinct species with no obvious affinities. It is similar to *L. platycarpa* (Viv.) Pichi-Serm. and other species of the section *Leobordea* but differs from these in the alternate arrangement of the leaves on flowering twigs and also in the much smaller number of ovules (more than five in section *Leobordea*). It is also similar to *L. laticeps* B-E. van Wyk and other species of the *L. pentaphylla* group (section *Lipozygis*), but differs from these in the racemose inflorescence (not capitate), the small carinal lobe of the calyx, the larger and compressed pods and in the calyx, which is not inflated and which does not enclose the pod at maturity. It also resembles *L. microphylla* Harv. (section *Leptis*) but differs from this species in the annual habit, the calyx structure, the shape and length of the standard petal and the small number of ovules.

The geographical distribution of *L. esterhuyseniana* supports the suggested affinity with the *L. pentaphylla* group (presently section *Lipozygis*) and the section *Leobordea* rather than with the section *Leptis*. The single known locality is shown in Figure 8.

CAPE.—3219 (Wuppertal): Ceres District, Stompiesvlei, Swartruggens (−DC), *Esterhuysen 29341* (BOL, holo.; C, K, MO, iso.).

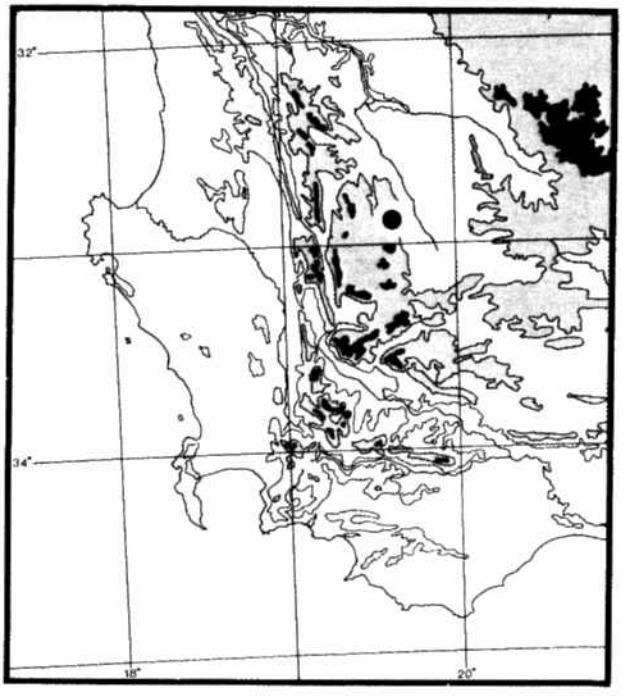

FIGURE 8.—The known geographical distribution of *Lotononis esterhuyseniana*.

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STUDIES IN THE GENUS *LOTONONIS* (CROTALARIEAE). II. A NEW SPECIES OF THE SECTION *LEOBORDEA* FROM NORTH-WESTERN NAMIBIA

INTRODUCTION

The section *Leobordea* (Del.) Benth. is geographically the most widespread section of *Lotononis* (DC.) Eckl. & Zeyh. *L. platycarpa* (Viv.) Pichi-Serm. occurs throughout Africa and eastwards to Pakistan but the other species of the section are all restricted to southern Africa.

Bentham (1843) listed the small subsessile flowers, the subsessile leaf-opposed inflorescences and the small carinal lobe of the calyx as diagnostic characters for the section, but also mentions the dichotomous branches. Detailed studies of the genus as a whole have shown that the length of the pedicels, the inflorescence structure and the calyx structure are rather variable, and that most of the diagnostic characters of *Leobordea* also occur sporadically in other sections. It is suggested here that the opposite arrangement of leaves on flowering branches is the only reliable character to distinguish *Leobordea* from other sections of *Lotononis*. In the section *Leptis* (Eckl. & Zeyh.) Benth., some leaves may occasionally be subopposite, but the leaves are not invariably opposite as in *Leobordea*. It is important to note that the distinction only applies to flowering nodes. Basal leaves that are formed during the vegetative phase are alternate (also in *Leobordea*). This is true for all species of *Lotononis* except *L. lenticula* (E. Mey.) Benth. (section *Oxydium* Benth.) where the basal nodes (but not the flowering nodes) have opposite leaves.

The new species described below provides an interesting example of convergence in *Leobordea*. Schreiber (1970) confused the species with the superficially similar *L. stipulosa* Bak. f. The many-flowered fascicles of the two species are remarkably similar in appearance due to the presence of large leaflike structures around the base of the inflorescences. In the new species, these are enlarged bracts and not enlarged stipules as in *L. stipulosa*.

Lotononis bracteosa *B-E. van Wyk*, sp. nov. *L. stipulosae* Bak. f. valde affinis sed habitu minori, foliis basalibus oppositis (*L. stipulosa* foliis basalibus alternis), foliolis minoribus, stipularum magnitudine formaque, quae oblongae vel ovatae ad 5 × 3 mm sunt, inflorescentiam non tegentes (in *L. stipulosa* late cordatae, plerumque valde maiores quam 5 × 3 mm, inflorescentiam tegentes), differt. Stipulae inflorescentiam subtendentes costam unicam, dum illae *L. stipulosae* venas plures e basi habent. Etiam bracteis 2–4 mm latis, late ellipticis vel obovatis (in *L. stipulosa* infra 2 mm latis, lanceolatis differt).

L. stipulosa Bak. f. sensu Schreib.: 85 (1970).

TYPE.—Namibia, Outjo District, mountains 14 miles [22,4 km] east of Torra Bay, *Giess, Volk & Bleissner 6198* (PRE, holo.; M, PRE, WIND, iso.).

Prostrate or procumbent herbaceous annual, often small and short-lived. All mature parts densely pubescent. *Leaves* trifoliolate, densely pubescent on both surfaces. *Leaflets* elliptic to oblanceolate, (4–)6–11(–16) × (1,5–)2–4(–5) mm; base cuneate; apex acute. *Stipules* broadly oblong to ovate, up to 5 × 3 mm. *Inflorescences* sessile, umbellate, (2–)5–8(–12)-flowered; bracts conspicuous, broadly elliptic to broadly obovate, 3–4 × 2–4 mm; apex acute to obtuse, mucronate; base cuneate to cordate. *Flowers* subsessile, 6–8 mm long. *Calyx* not inflated, densely pubescent, with the upper and lateral lobe on either side fused higher up in pairs, the lower lobe slightly narrower and shorter; lobes usually broadly acuminate. *Standard* ovate to oblong, usually shorter than the keel, densely pubescent. *Wing petals* oblong, not much shorter than the keel, pubescent along the lower edge of the lamina; apex obtuse to acute; sculpturing upper basal and upper left central, in 4 rows of intercostal lunae, fading into thin transcostal lamellae towards the auricle. *Keel petals* half oblong-elliptic to oblong, densely pubescent; apex obtuse. *Pods* sessile, scarcely longer than the persistent calyx, broadly obovoid to broadly oblong, only slightly inflated, upper suture ± smooth, ± 8-seeded. *Seeds* suborbicular, testa minutely and densely tuberculate (Figure 9).

Closely related to *L. stipulosa* Bak. f. but differs in the smaller habit, the smaller leaflets and in the size and shape of the stipules, which are oblong to ovate, up to 5 × 3 mm and not covering the inflorescence (broadly cordate, usually much more than 5 × 3 mm and covering the inflorescences in *L. stipulosa*). The stipules subtending the inflorescences have a single midrib, whereas those of *L. stipulosa* have several veins from the base (Figure 9). It also differs in the 2–4 mm wide, broadly elliptic to obovate bracts (less than 2 mm wide and lanceolate in *L. stipulosa*). The bracts are visible and conspicuous, not hidden by the large and foliaceous stipules as in *L. stipulosa* (Figure 9). There is no vegetative phase as in *L. stipulosa*, where the basal parts of the branches are without inflorescences and the basal leaves alternate. In *L. bracteosa*, inflorescences are formed at the first nodes and the basal leaves are opposite.