

# Studies in the Leguminosae—Papilioideae of southern Africa

C. H. STIRTON\*

## ABSTRACT

Six African species of *Psoralea* are transferred to *Cullen* Medik.: *C. biflora* (Harv.) C. H. Stirton, *C. holubii* (Burtt Davy) C. H. Stirton, *C. drupacea* (Bunge) C. H. Stirton, *C. jaubertiana* (Fenzl) C. H. Stirton, *C. obtusifolia* (DC.) C. H. Stirton and *C. plicata* (Del.) C. H. Stirton. *Psoralea patersoniae* Schonl. based on an introduced garden plant is placed under synonymy of *Cullen corylifolia* (L.) Medik. The following new names are published: *Lebeckia waltersii* C. H. Stirton of subgenus *Plecolobium* C. H. Stirton; *Bituminaria bituminosa* (L.) C. H. Stirton of subgenus *Bituminaria* and *B. acaulis* (Stev.) C. H. Stirton of subgenus *Christevania* Barneby ex C. H. Stirton; *Rhynchosia arida* C. H. Stirton; *Eriosema gunniae* C. H. Stirton, *E. preptum* C. H. Stirton and *E. transvaalense* C. H. Stirton. *Eriosema capitatum* E. Mey. is placed in synonymy with *Psoralea tomentosa* Thunb., but as *P. tomentosa* Thunb. is a later homonym of *P. tomentosa* Cav. it should be referred to *P. sericea* Poir.

## RÉSUMÉ

### ÉTUDES SUR LES LEGUMINOSAE-PAPILIONOIDEAE D'AFRIQUE AUSTRALE

Six espèces africaines de *Psoralea* sont transférées à *Cullen* Medik.: *C. biflora* (Harv.) C. H. Stirton, *C. holubii* (Burtt Davy) C. H. Stirton, *C. drupacea* (Bunge) C. H. Stirton, *C. jaubertiana* (Fenzl) C. H. Stirton, *C. obtusifolia* (DC.) C. H. Stirton et *C. plicata* (Del.) C. H. Stirton. *Psoralea patersoniae* Schonl. basée sur une plante de jardin introduite est placée sous la synonymie de *Cullen corylifolia* (L.) Medik. Les nouveaux noms suivants sont publiés: *Lebeckia waltersii* C. H. Stirton et du sous-genre *Plecolobium* C. H. Stirton; *Bituminaria bituminosa* (L.) C. H. Stirton du sous-genre *Bituminaria* et *B. acaulis* (Stev.) C. H. Stirton du sous-genre *Christevania* Barneby ex C. H. Stirton; *Rhynchosia arida* C. H. Stirton, *Eriosema gunniae* C. H. Stirton, *E. preptum* C. H. Stirton et *E. transvaalense* C. H. Stirton. *Eriosema capitatum* E. Mey. est placé en synonymie avec *Psoralea tomentosa* Thunb., mais comme *P. tomentosa* Thunb. est un dernier homonyme de *P. tomentosa* Cav. il devrait se référer à *P. sericea* Poir.

## CONTENTS

1. *Cullen* Medik.
2. *Bituminaria* Heist. ex Fabricius
3. *Lebeckia* Thunb.

### INTRODUCTION

This paper is the first in a series of notes on the taxonomy of the Leguminosae — Papilioideae for the Flora of Southern Africa series. Included also are nomenclatural changes that appertain to floras lying beyond this area.

### 1. CULLEN Medik.

Recent investigations have shown that the South African representatives of *Psoralea* L. sensu Forbes (1930) should be rearranged into the genera *Psoralea* L., *Otholobium* C. H. Stirton and *Cullen* Medik. (Stirton, 1980). *Psoralea* L. emend. C. H. Stirton is now restricted to 17 Cape species. The new genus *Otholobium* comprises about 28 species widespread over the southern and eastern parts of southern Africa, with one species extending as far north as Kenya. New combinations will be made in *Otholobium* once the complicated nomenclatural problems have been resolved. The remaining seven African species of *Psoralea* L. sensu Hutch. are here transferred to *Cullen* Medik. The Asian and Australasian material of *Cullen*, comprising over 40 species, falls outside the scope of this investigation.

#### 1. *Cullen biflora* (Harv.) C. H. Stirton, comb. nov.

*Psoralea biflora* Harv., Fl. Cap. 2: 157 (1862). Type: South Africa, Burchell 1720 (K, holo.).

#### 2. *Cullen corylifolia* (L.) Medik, in Vorles, Churpf. Phys.-Oek. Ges. 2: 380 (1787).

*Psoralea corylifolia* L. Sp. Pl. 764 (1753). Type: India, Herb. Linn. 928, 24 (LINN, holo.).

4. *Rhynchosia* Lour.
5. *Psoralea* L.
6. *Eriosema* (DC.) G. Don

*Psoralea patersoniae* Schonl. in Rec. Albany Mus. 3:54 (1914). Type: South Africa, Redhouse, Paterson 383 (K, holo.!) syn. nov.

#### 3. *Cullen drupacea* (Bunge) C. H. Stirton, comb. nov.

*Psoralea drupacea* Bunge in Arb. Nat. Ver. Riga 221 (1847). Type: U.S.S.R., between Buchara and Samarkand, Lehmann s.n. (LE, not seen).

#### 4. *Cullen holubii* (Burtt Davy) C. H. Stirton, comb. nov.

*Psoralea holubii* Burtt Davy, Fl. Transv. 2: XXIX (1932). Type: South Africa, Matebe, Holub s.n. (K, holo.!).

#### 5. *Cullen jaubertiana* (Fenzl) C. H. Stirton, comb. nov.

*Psoralea jaubertiana* Fenzl in Flora 26: 392 (1843). Type: Syria, between Aleppo and Orfar, Kotschy (not seen).

#### 6. *Cullen obtusifolia* (DC.) C. H. Stirton, comb. nov.

*Psoralea obtusifolia* DC., Prodr. 2: 221 (1825). Type: South Africa, Burchell 1214 (P, holo.); K, iso.!).

#### 7. *Cullen plicata* (Del.) C. H. Stirton, comb. nov.

*Psoralea plicata* Del., Fl. Egypt. 252, t. 27, fig. 3 (1812). Type: between Qournah and Medynetabou, Delile s.n. (MPU, not seen).

*Psoralea odorata* Blatt. & Halb. in J. Bombay nat. Hist. Soc. 26: 238 (1918). Type India, Jodhpore, Barmer, Blatter 7005 (K, holo., photo.!).

### 2. BITUMINARIA Heist. ex Fabricius

*Psoralea bituminosa* L. and *P. acaulis* Stev. are two widely cultivated species of *Psoralea* L. sensu lato. The recent decision to confirm the subdivision

\*Botanical Research Institute, Department of Agriculture and Fisheries, Private Bag X101, Pretoria, 0001.

of *Psoralea* L. into a number of genera (Stirton, 1980) has made it necessary to search for a generic name to accommodate them, the name *Psoralea* now being reserved for some 17 species of plants endemic to the southern tip of Africa. Most authors have used *Aspalathium* Medik (1787) as a segregant generic name to accommodate *P. bituminosa* whenever it was thought to be distinct from *Psoralea* (e.g. Meikle 1977). According to Dandy (1967), however, the name *Bituminaria* Heist. ex Fabricius (1759) is a synonym of *Psoralea* sensu lato. It predates *Aspalathium* and becomes available. There is however some controversy about selecting Fabricius generic names based on Heister's works. Some authors such as Holub (1970) and Rauschert (1968) consider Fabricius's generic names to be uninomials and invalidly published. Dandy (1967) and Stafleu & Cowan (1976) disagree with this considering that the typographical distinction of the uninomials clearly distinguishes them as generic names. Fabricius (Enum, 1759), however, consistently distinguishes generic names by capitals. After consulting Dr R. K. Brummitt and Mr R. D. Meikle (Royal Botanic Gardens, Kew) and in view of the conservation of a number of Fabricius's names, I have accepted that *Bituminaria* Heist. ex Fabricius, as the protologue shows, is validly published.

'*BITUMINARIA* Heister. *Trifolium asphaltites* f. *bituminosum* Rpp. & Dod. *Psoralea* Linn. *Planta* fere *arborescens*. *Flores* spicati pediculo communi longo sustinenter, 3. foliolis in 3. vel. 4 lacinias dissectis 3. utpl. flores ex ala sua emittentibus petiolatos. *Perianthum* tubulosum quinquefidum, una lacinia maxima. *Vexillum* purpuro violaceum oblongum sursum et ad latera reflexum in medio faciei internae 2. appendiculis instructum. *Alae* breviores albae rectae concavae. *Carina* brevior purpurea anterior, posterius alba obtusa bipetala, reliqua ut in alia trifoliis. *Sed fructus* sit. legumen compressum rotundo falcatum setosum ultra perianthium prominens, et continens semen unicum magnum figura phaseoli'.

*Bituminaria* Heist. ex Fabricius comprises two species and is closely related to or may be congeneric with *Pediomelum* Rydb. from North America. Pending further study which may indicate otherwise, I recognize two distinct subgenera: *Bituminaria* and *Christevania* Barneby ex C. H. Stirton.

**Bituminaria** Heist. ex Fabricius, Enum. 165 (1759); Dandy, Regn. Veget. (1967). Type species: *Bituminaria bituminosa* (L.) C. H. Stirton.

*Psoralea* L., Sp. Pl. 1: 762 (1753), pro parte.

*Aspalathium* Medik. Vorles. in Churpf. Phys.-Oek. Ges. 2: 380 (1787).

#### Key to subgenera

- Plant caulescent; leaflets entire; peduncles axillary (Mediterranean Europe and Macaronesia) . . . subgen. *Bituminaria*
- Plant acaulescent from superficial caudex; leaflets dentate; peduncles scapiform (north-eastern Turkey and W. Transcaucasus) . . . . . subgen. *Christevania*

#### Subgen. *Bituminaria*

Plant perennial, caulescent. Leaves pinnately trifoliolate, entire. Flowers shortly spicate on elongated axillary peduncles; bracts at each node of the inflorescence united through half their length or more, those at the lower nodes into a flabellate 3(5)-toothed blade, succeeding ones often narrower or the uppermost wanting; calyx ebracteolate. Fruit indehiscent, with a long sword-shaped beak which at length breaks off, furnished with glabrous spinulose processes; pericarp adnate to seed.

The single species in this subgenus, *B. bituminosa*, is very distinct yet remarkably variable throughout its range. It has been widely cultivated throughout Europe and to a lesser extent elsewhere. A survey of the available material would indicate that it comprises a number of distinct taxa, some of which are quite localized. This subgenus needs to be investigated anew over its entire range. Particular attention should be paid to floral dissections. *Psoralea morisiana* Pignatti & Metlesics belongs here and may be quite a distinct species. Its status will have to be determined in context of the overall range of *B. bituminosa* (see: Bol. Soc. Sarda Sci. Nat. 15: 53, 1975).

#### 1. *Bituminaria bituminosa* (L.) C. H. Stirton, comb. nov. Type: in Siciliae, Italiae, Narbonae colibus maritimis.

*Psoralea bituminosa* L., Sp. Pl. 1: 763 (1753); Boiss., Fl. Or., 2: 187 (1872); Stuart Thompson in J. Bot., Lond. 44: 306 (1906); Post, Fl. Palest., ed. 2, 1: 367 (1932); Davis, Fl. Turkey, 3: 264 (1970); Zohary, Fl. Palest., 2: 50, t. 66 (1972).

*Aspalathium frutescens* Medik. in Vorles. Churpf. Phys.-Oek. Ges., 2: 380 (1787); *Aspalathium herbaceum* Medik., l.c. 2: 381 (1787). *Aspalathium bituminosum* (L.) Fourr. in Ann. Soc. Linn. Lyon, ser. 2, 16: 365 (1868); Kuntze in Post & Kuntze, Lex. Gen. Phan., 48 (1903) as *Aspalathium bituminosum*; Meikle, Fl. Cyprus, 1: 489 (1977).

#### Subgen. *Christevania* Barneby ex C. H. Stirton, subgen. nov.

Planta perennis, acaulis. Folia subdigitatim trifoliolata, denticulata. Flores capitati, pedunculo elongato scapiformi; bracteae in quoque nodo inflorescentiae usque ad basin distinctae; calyx basi uncinque bracteola linearis instructus. Fructus indehiscent, rostro ensiformi processibus mollibus pubescens armato.

Type species: *Bituminaria acaulis* (Stev.) C. H. Stirton.

Plant perennial, acaulescent. Leaves subdigitately trifoliolate, denticulate. Flowers capitate on elongated scapiform peduncles; bracts at each node of the inflorescence separate to the base; calyx furnished at the base, each side with a linear bracteole. Fruit indehiscent, with a sword-shaped beak armed with soft pubescent processes.

The single species in this subgenus, *B. acaulis* (Stev.) C. H. Stirton, occurs in north-eastern Turkey and the west Transcaucasus.

#### 2. *Bituminaria acaulis* (Stev.) C. H. Stirton, comb. nov. Type: in iberia occidentali (W. Georgia).

*Psoralea acaulis* Stev. ap. Hoffmn. in Comm. Soc. Phys.-mat. Mosq. 1: 47 (1806); M. B. Fl. taur.-Cauc. 2: 206 (1808); Ldb., Fl. Ross. 1: 563 (1842); Boiss., Fl. Or. 2: 187 (1872); Grossg., Fl. Kavk. 2: 291 (1930); Vasil'chenko in Fl. U.S.S.R. 11: 226 (1945), Eng. transl. 1971; Davis., Fl. Turkey 3: 264 (1970). *Aspalathium acaulis* (Stev.) Hutch., Gen. Fl. Pl. 1: 420 (1964).

#### 3. *LEBECKIA* Thunb.

For a number of years an undescribed Cape legume has been circulating under the manuscript name '*Waltersia heleniae*'. The correct generic placement of this undescribed species has remained unresolved ever since it was first discovered and collected by Dr I. B. Walters. It had been variously referred to *Buchenroedera*, *Wiborgia* and *Lebeckia*. Apart from the collections cited and the one in Dr Walters's per-

sonal herbarium, this species has apparently not been collected by the early collectors. This seems surprising considering the plant's rather distinctive features and, so, notwithstanding its localized distribution, it is to be expected that additional collections may still be found misfiled in undetermined covers among various genera. I have referred it to *Lebeckia* notwithstanding the un-*Lebeckia* like presence of prominent involucrate stipules. The only other legume in South Africa which I know to have similar stipules is *Argyrolobium involucratum*. The alternative is to describe a new monotypic genus. Such an approach would be somewhat premature until *Lebeckia* and its segregates have been adequately revised and until more is known about this species which I am describing as *Lebeckia waltersii*. This species is easily separated from all other *Lebeckia* species by its unique stipules and plicate pods. I am therefore establishing the subgenus *Plecolobium* to accommodate it. This name refers to the concertina-like pods.

Subgen. *Plecolobium* C. H. Stirton, subgen. nov.

Frutices parvi valde ramosi, stipulis conferruminatis petiolo adnatis ramulos omnino vaginantibus. *Fructus* plicati, indehiscentes, modice lignosi.

Type species: *Lebeckia waltersii* C. H. Stirton.

Small profusely branched shrubs with fused stipules adnate to the petiole and completely sheathing the branches. *Fruits* indehiscent, plicate, somewhat woody.

*Lebeckia waltersii* C. H. Stirton, sp. nov., affinitate incerta.

Frutex erectus ramosissimus 50–60 cm altus. *Stipulae* conferruminatae petiolo adnatae, ramulos omnino vaginantes. *Folia* trifoliolata, argentea; foliola 4–10 mm longa, usque 2 mm lata, subsessilia, aequalia, anguste obovata, curvata, conduplicate. *Inflorescentia* 1–3-flora, axillaris. *Flores* 10 mm longi, pedicello 3–5 mm longo. *Calycis* dentes tubo breviores, lobis vexillaribus maxime fissis, tenuiter pubescentes. *Vexillum* 8,6 mm longum, usque 9,5 mm latum, unguiculatum, dorso sericeum. *Petala* alaria carinalibus subaequilonga. *Pistillum* 10–11-ovulatum; ovarium sericeum. *Stamina* monadelpha, axialiter usque ad basin fissa, antheris dimorphis. *Stigma* minutum. *Fructus* plicatus. *Semina* reniformia, late brunnea.

TYPE.—CAPE, 3319 (Worcester): Worcester Commonage (—CB), Rourke 1484 (K, holo.).

Erect much-branched shrub 50–70 cm high. *Stipules* fused and wholly adnate to the petiole and completely sheathing branches, becoming bifurcate in leaves that subtend inflorescences, sericeous. Leaves trifoliolate, very shortly petiolate. Leaflets 4–10 mm long, 1,5–2,0 mm wide, subsessile, equal in size, narrowly obovate, somewhat recurved, base cuneate, apex obtuse, conduplicate, rarely flattened, sericeous. Inflorescences axillary, 1–3-flowered, borne on short lateral branches. Flowers 10 mm long, bright yellow (less yellow than in *L. cytisoides*, however), each subtended by a very small erect bract, ebracteolate; pedicel 3–5 mm long. Calyx 4 mm long; triangular teeth shorter than the 3 mm tube, vexillar lobes less connate than lateral and keel lobes; finely pubescent outside, glabrous inside. Standard 8,5 mm long, up to 9,5 mm wide, claw 3 mm long, broadly ovate, auricles and appendages absent, apex emarginate, back silky. Wing petals 10,5 mm long, 4,0 mm wide, claw 3 mm long, cultrate, sparsely pubes-

cent, equal in length to keel; sculpturing upper basal and left central, finely lamellate-lunate; auriculate. Keel petals fused, 9,5 mm long, 3,5 mm wide, somewhat pubescent. Pistil 7–8 mm long; ovary 5 mm long, subsessile, flattened and most hairy above and below, sparsely laterally style erect, glabrous, height of curvature 2,5–3,0 mm; stigma minute, very finely penicillate. Stamens monadelphous, sheath split adaxially; anthers dimorphic, basifixated anthers narrowly ovate and 2,5 mm long, dorsifixated anthers rounded and 1,3 mm long. Fruit 15–20 mm long, 4–5 mm wide, plicate, indehiscent, somewhat woody, persisting on the plant for more than a year. Seeds 3 mm wide and long, reniform, greenish brown.  $2n = 32$  (count by Christine Brighton, Jodrell Laboratories, Kew). Fig. 1.

*Lebeckia waltersii* is endemic to the south-western Cape (Fig. 2) and is found growing in renosterbos-veld on Table mountain sandstone conglomerate in association with *Pteronia* and *Elytropappus*. Flowering occurs in July.

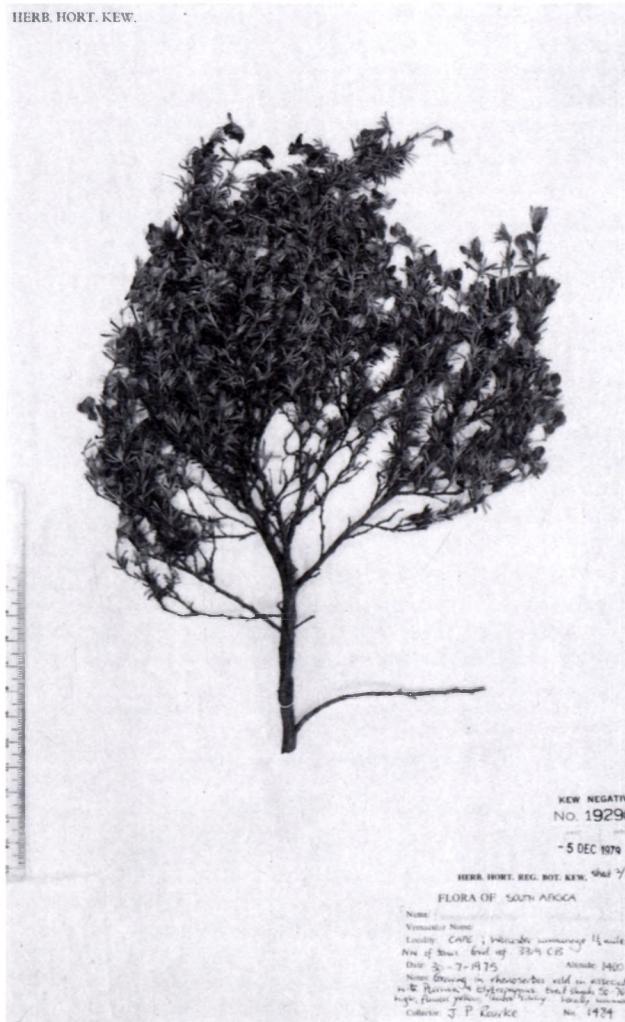


FIG. 1.—*Lebeckia waltersii*. Rourke 1484, holotype in K.

CAPE.—3319 (Worcester); Worcester (—CB), Rourke 1484 (K; NBG; PRE); Esterhuysen 35048 (K; BOL); Walters s.n. (NBG; Herb. Walters).

*Hutchinson* 253 (K) collected between Vredenburg and Hoetjies Bay may be conspecific with *Lebeckia waltersii*. It may even represent another species. It has overall a similar appearance to *Rourke* 1484 but differs in its non-conduplicate, wider leaves, more than 1-flowered inflorescence, less prominent stipule

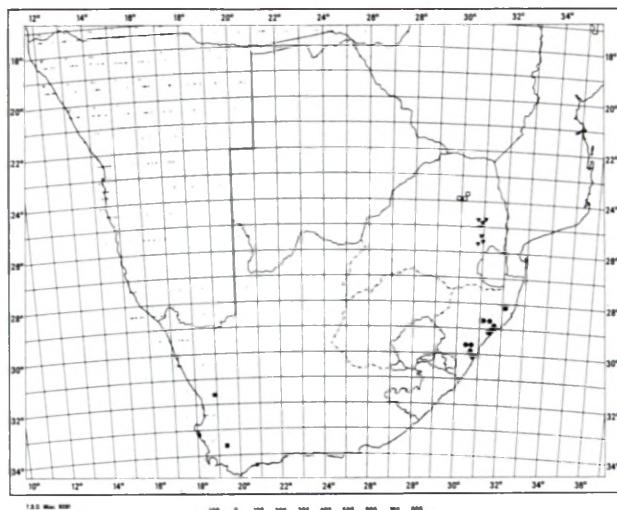


FIG. 2.—Known distribution in southern Africa of *Lebeckia waltersii* (■), *Rhynchosia arida* (★), *Eriosema gunniae* (▼), *E. preptum* (●) and *E. transvaalense* (○).

scars and disjunct distribution. I have included it tentatively under *L. waltersii* as it fits nowhere else. It had been incorrectly named *Wiborgia sericea* Thunb. Hutchinson 253 is without fruits, which are required for a firm decision. I have seen no further collections of it.

*L. waltersii* is an attractive shrub which, with its mass bloom of small yellow flowers, should delight gardeners. There is a very real danger however that this species may become extinct unless the citizens of Worcester, its locality, take concerted action to ensure its protection. It is limited to probably only some ± 60 individual plants divided into a few colonies (Walters, 1980, pers. comm.) Perhaps Worcester could adopt it as their town flower? If other towns and villages throughout the country similarly adopted a rare or endangered species specific to their area perhaps much could be done to ensure the adequate protection and propagation of many species of plants across the length and breadth of South Africa.

The specific epithet *waltersii* is given in recognition of the determined campaign that Dr I. B. Walters of Worcester has waged in ensuring that *L. waltersii* was at least named before it disappeared! It is now up to the citizens of Worcester.

#### 4. RHYNCHOSIA Lour.

**Rhynchosia arida** C. H. Stirton, sp. nov., affinitate incerta.

Frutex deciduus usque 1 m altus et latus verne florens; ramuli virgati, puberuli et sparsim glandulosi. Folia trifoliolata; foliola ovata vel elliptica, apice uncinata, basi truncata, 10–20 mm longa, 9–13 mm lata, atrovirentia; lateralia inaequalia, basi obliqua, terminalia symmetrico breviora; supra puberula, infra glabrescentia, in utroque superficie glandulosa. Stipulae subulatae, glandulosae. Petioles 9–13 mm longi. Racemi axillares, 2–4-flori, foliis longiores; pedunculus 13–20 mm longus. Flores lutescentes, 14–16 mm longi; bractea 4–5 mm longa, caduca, leviter navicularis. Calyx 15–16 mm longus, inaequaliter lobatus, sparsim pilosus, glandulosis magnis basi bulbosis conspicue tectus; tubus 5 mm longus; lobus carinalis ceteris longior, lanceolatus, acuminatus; lobi laterales falcati; lobi cornuti per dimidium longitudinis conferruminati. Vexillum unguiculatum, 11–12 mm longum, 10 mm latum,

late ovatum, glabrum et eglandulosum, vix reflexum, carina brevius sed alis longius, callis leviter evolutis et bene supra parvas auriculas sitis. Alae glabrae, 10–11 mm longae, carina breviores, marsupio evoluto, auricula bene evoluta, sculptura secus crista tam marsupii leviter evoluta, lamellatae. Carina glabra, laminis 13 mm longis, usque 7–8 mm latis, basi curvatis, apice obtusis, marsupioevoluto. Vagina staminalis 12–13 mm longa, stamine discreto 14 mm longo, antheris uniformibus, filamentorum breviorum medifixis, longiorum basifixis, dehiscencia longitudinali. Gynoecium 13 mm longum, ovarium 4 mm longum, cum gyrophore 1 mm longo; pubescencia brevi, patente; curvatura 5 mm alta; stigma capitatum, ultra stamina exsertum. Nectarium 0,4–0,6 mm altum, margine undulato. Legmina 3–4 cm longa, 1 cm lata, falcata, lignosa, margine undulato, subtiliter pubescente. Semina ignota.

TYPE.—Cape, 3118 (Vanrhynsdorp), Mount Matsikamma (—DB), Acocks 15125 (K, holo.; PRE, iso.!).

Deciduous shrub up to 1 m high and broad, flowering in spring; branchlets virgate, puberulous and sparsely glandular. Leaves trifoliolate; leaflets ovate or elliptic, apex uncinate, base truncate, 10–20 mm long, 9–13 mm wide, dark green; laterals unequal-sided, oblique at base, smaller than symmetrical terminal leaflet; puberulous above, glabrescent below, glandular on both surfaces. Stipules subulate, glandular hairy. Petioles 9–13 mm long. Racemes axillary, 2–4-flowered, longer than leaves, peduncle 13–20 mm long. Flowers yellow, 14–16 mm long; bracts 4–5 mm long, caducous, slightly boat-shaped. Calyx 15–16 mm long, unequally lobed, sparsely pilose, conspicuously covered with large bulbous-based glands; tube 5 mm long; keel lobe longest, lanceolate, acuminate, laterals falcate, vexillar lobes fused for half their length. Standard unguiculate, 11–12 mm long, 10 mm wide, broadly ovate, glabrous, eglandular, scarcely reflexed, shorter than keel but longer than wings, appendages weakly developed and situated well above small auricles. Wings 10–11 mm long, glabrous, shorter than keel, pocket present, auricle well developed, sculpturing weakly developed along ridge of pocket, lamellate. Keel blades 13 mm long, 7–8 mm wide at maximum, glabrous, incurved, apex obtuse, pocket present. Staminal sheath 12–13 mm long, free stamen 14 mm long, anthers uniform, medifix and basifix, dehiscence longitudinal. Gynoecium 13 mm long, ovary 4 mm long with gynophore 1 mm long; clothed with short patent pubescence; curvature 5 mm high; stigma capitate, exerted beyond stamens. Nectar 0,4–0,6 mm high, margin undulate. Fruits 3–4 cm long, 1 cm wide, falcate, woody, upper margin undulate, finely pubescent. Seed unknown. Fig. 3.

It is now over thirty years since the first and only specimen of this species was collected in semi-succulent karoo along the lower slopes of Mt Matsikamma (Fig. 2). *R. schlechteri* Bak., *R. bullata* Benth. ex Harv., *R. ferulæfolia* Benth. ex Harv., *R. pinnata* Harv. and *R. viscidula* Steud. are the only species of *Rhynchosia* that are distributed in Mediterranean areas of the Cape and are therefore outliers in an essentially subtropical genus. These rare, unrelated species, including *R. arida*, are endemic to the Cape. All have narrow disjunct distributions with few relatives elsewhere in the genus.

The specific epithet *arida*, meaning becoming dry, is in reference to the semi-succulent karoo vegetation

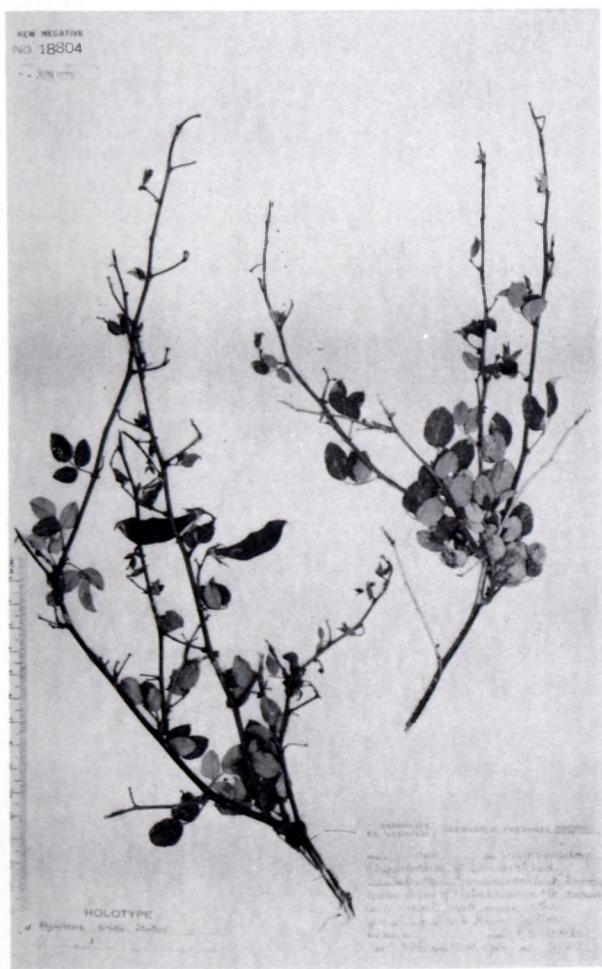


FIG. 3.—*Rhynchosia arida*. Acocks 15125, holotype in K.

in which the species grows. As far as I know, *R. arida* is the only *Rhynchosia* which is restricted to this habitat.

##### 5. PSORALEA L.

*Eriosema capitatum* E. Mey., Comm. 130 (1836), was treated by Harv., Fl. Cap. 2: 262 (1862), as a species unknown. A close study of the protologue shows that *E. capitatum* cannot be an *Eriosema*.

'Caule erecto antrorsum appresso pubescentes canescentes, foliolis lanceolato-oblongo utrinque acutiusculis subtus incano-sericeis, capitulis subglobosis involucratis longe pedunculatis (italics mine)'.

There is no species of *Eriosema* in South Africa which has an involucrate subglobose flower-head. Furthermore, the type locality Ruigtervalléi falls outside the distribution range of *Eriosema*. The protologue does, however, indicate features that might suggest *Psoralea* L.

A study of the literature indicates that *E. capitatum* should be placed in synonymy under *Psoralea tomentosa* Thunb., a distinctive Cape species. A problem arises, however, in that *P. tomentosa* Thunb., Prodr. 2: 135 (1800), is a later homonym of *P. tomentosa* Cav., Icon. 3: 21, t. 240 (1795), a validly described species from Mexico, now accepted as *Dalea tomentosa* (Cav.) Willd. The earliest available name for *P. tomentosa* Thunb. is *P. sericea* Poir.

*Psoralea sericea* Poir., Dict. 5: 687 (1804); in DC., Prodr. 2: 218 (1825); Meisn., in J. Bot., Lond. 2: 81 (1843); Drège, in Linnaea 19: 645 (1846); Presl, Bot. Bemerk. 60 (1844).

*Rhynchodium sericeum* Presl, Bot. Bemerk. 60 (1844).

*Psoralea tomentosa* Thunb., Prodr. 2: 135 (1800) non Cav. (1795); in DC., Prodr. 2: 218 (1825); Harv., Fl. Cap. 2: 156 (1862).

*P. pedunculata* Ker-Gawl. in Bot. Register t. 223 (1817) non Poir. (1816) nec Vail. (1891); Meisn., l.c. 2: 81 (1843).

*Eriosema capitatum* E. Mey., Comm. 130 (1836) syn. nov.; Meisn., l.c. (1843); Presl, Bot. Bemerk. 60 (1844); Harv., l.c. 2: 262 (1862).

*Rhynchosia cephalotes* Steud. Nom. 2, 2:588 (1841), syn. nov.

##### 6. ERIOSEMA G. Don

1. *Eriosema gunniae* C. H. Stirton, sp. nov., *E. cordato* E. Mey. affinis, a qua imprimis ramulis floriferis erectis brevioribus, floribus luteis et bracteis persistentibus aequantibus differt.

Herba perennis, 10–15 cm alta, verne florens. Rami erecti, pilis velutinis dense obtecti. Folia pro maxima parte 1-foliolata; 6–9 cm longa, 2,5–3,0 cm lata anguste elliptica vel anguste ovata usque lanceolata, apex acuta, cuneata, utrinque (sed praecipue in nervaturis) sericeo-pubescentia, glandulosa, margine aliquantum revoluta. Stipulae 15–20 mm longae, lanceolatae, coalitae, glandulosae et pilosae. Petioli 10–20 mm longi. Racemi axillares, 10–15-flori, foliis aequilongi; pedunculus 6–9 cm longus. Flores lutescentes, 8–10 mm longi; bracteae ± 8 mm longae, persistentes. Calyx 5–7 mm longus, lobis aequalibus, pilis stramineis patentibus usque 2,5 mm longis dense obtectus, tubo 2 mm longo; lobi deltoidei, acuminati, lobus carinalis longior, laterales falcati, lobi cornuti non coaliti. Vexillum 9–10 mm longum, 4,5–5,5 mm latum, unguiculatum, reflexum, obovatum, extra glandulosum et pilosum, carina et alis longius; calli bene evoluti, conferruminati cucullati, ab auriculis prominentibus liberi. Alae 8,5–9,0 mm longae, 2,0–3,2 mm latae ad maximum, oblongae, auriculatae, carina longiores. Carina glandulosa et pilosa, laminis 6–7 mm longis, 3 mm latis ad maximum, marsupio evoluto. Vagina staminalis 5,5–6,0 mm longa, stamine discreto 5,4–6,0 mm longo, antheris uniformibus. Gynoecium 5 mm longum, ovarium 2,5 mm longum, cum gynophoro 0,5 mm longo, longe pubescens; curvatura 2,0 mm alta; stigma capitatum, ultra stamina exsertum. Nectarium evolutum, margine revolutum. Legumina et semina matura non visa.

TYPE.—Transvaal, 2530 (Lydenburg): Witklip Forest Research Station (—BD), Stirton 1482 (PRE, holo!).

Perennial herb, 10–15 cm tall, flowering in spring. Stems erect, densely covered with straw-coloured hairs. Leaves mostly 1-foliolate, 6–9 cm long, 2,5–3,0 cm wide, narrow-elliptic to narrow-ovate to lanceolate, apex acute, base cuneate, both sides sericeous especially along veins, glandular; margin somewhat revolute. Stipules 15–20 mm long, lanceolate, fused, glandular and hairy. Petioles 10–20 mm long. Racemes axillary, 10–15-flowered, equalling leaves, peduncle 6–9 cm long. Flowers yellow, 8–10 mm long. bracts ± 8 mm long persistent. Calyx 5–7 mm long, lobes equal, triangular, acuminate, keel lobe longest, laterals falcate, vexillar lobes free. Standard 9–10 mm long, 4,5–5,5 mm wide, clawed, reflexed, obovate, glandular and hairy, longer than keel and wings; appendages well developed, fused and hooded, free from prominent auri-cles. Wings 8,5–9,0 mm long, 2,0–3,2 mm wide at maximum, oblong, auriculate, longer than keel. Keel blades 6,0–7,0 mm long, 3 mm wide at maximum, glandular and hairy, pocket present. Staminal sheath 5,5–6,0 mm long, free stamen geniculate, 5,4–6,0

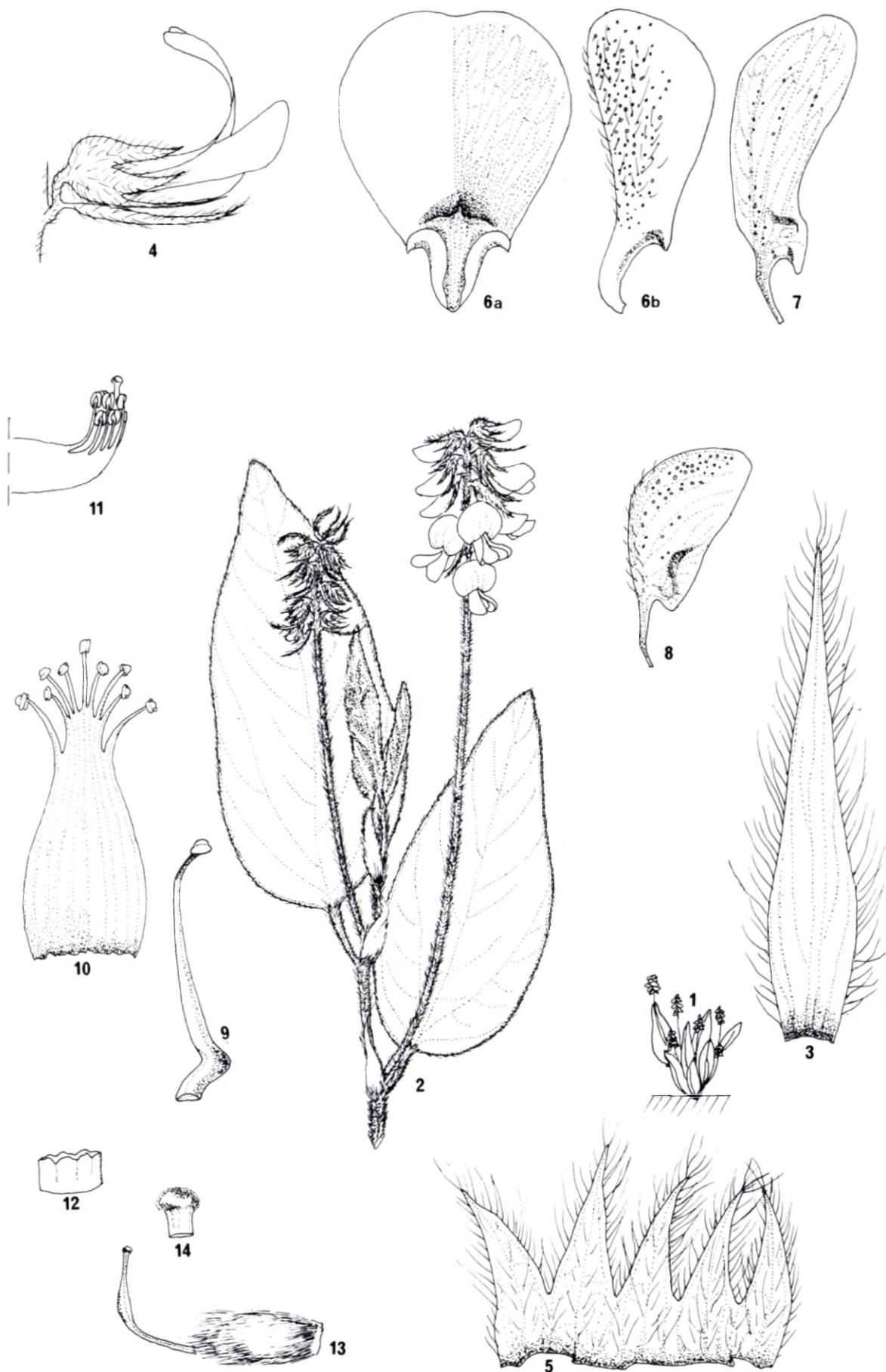


FIG. 4.—*Eriosema gunniae*. 1, habit; 2, stem with flowers,  $\times 0.5$ ; 3, flower bract,  $\times 7.5$ ; 4, flower,  $\times 2.3$ ; 5, calyx opened out,  $\times 5.3$ ; 6a, standard opened out,  $\times 3.8$ ; 6b, standard closed,  $\times 3.8$ ; 7, wings,  $\times 3.8$ ; 8, keel,  $\times 3.8$ ; 9, vexillary stamen,  $\times 5.3$ ; 10, staminal sheath,  $\times 5.3$ ; 11, staminal sheath closed with stigma and portion of style exserted,  $\times 5.3$ ; 12, discoid floral nectary,  $\times 15$ ; 13, gynoecium,  $\times 5.3$ ; 14, stigma,  $\times 33$ .

mm long; anthers uniform. *Gynoecium* 5 mm long; ovary 2,5 mm long with 0,5 mm gynophore, densely covered with long hairs, curvature 2,0 mm high; stigma capitate, exerted beyond stamens. *Nectary* present; margin revolute. *Mature fruits* and seeds not seen. Fig. 4.

Restricted to the eastern Transvaal between Pilgrims Rest, Graskop, Witklip, Sudwala and Nels-hoogte (Fig. 2). This species is found on undisturbed grassy plateaux. It grows commonly in association with another rare legume, *Rhynchosia villosa* (Meisn.) Druce.

TRANSVAAL.—2430 (Pilgrims Rest): Pilgrims Rest (-DD), Rogers 14908; Graskop (-DD), Galpin 14580 Holland s.n. 2530 (Lydenburg); Witklip Forest Research Station (-BD), Stirton 1482; pass above Sudwala Caves (-DB), Grobbelaar 1439; Nels-hoogte (-DB), Muller 2157.

*Eriosema gunniae* was first collected near Pilgrims Rest in 1915. It has been commonly referred to *E. cordatum*, but can be distinguished by its stigma exserted from the staminal sheath and by its persistent flower bract that approximates the length of the flower. Four collections are included temporarily in *E. gunniae*: Young A72 from Middelburg, Young A214 from Susterstroom, Rudatis 2513 from Tautesberg and Grobelaar 1675 from Steenkampbergen. This composite group occurs to the west of the range of *E. gunniae* sensu stricto. Further collections from the intervening areas may enable their correct status to be decided.

This distinctive *Eriosema* is named in honour of Miss Mary Gunn, who was a recipient of the 1976 Bolus Medal for outstanding achievement in the field of botany by an amateur botanist (see Veld & Flora 62: 30–31, 1976). Her knowledge of botanical literature and plant collectors has been of great importance to both South African plant taxonomy and taxonomists alike.

## 2. *Eriosema preptum* C. H. Stirton, sp. nov., affinitate incerta.

Herba perenna erecta 20–60 cm alta, flore vernale. *Caules* 1–15, pilis albis brevibus trichomatibusque longioribus interspersis vestiti. *Caudex* stylopodium longo, gracilis moniliformis iuventute, aetate undulescens vel constringens sed dauciformescens. *Folia* trifoliolata raro infima unifoliolata (nunc vulgo obovata), 4,5–6,0 cm longa, 2,0–3,0 cm lata, lateralia minora asymmetrica, elliptica vel anguste obovata, apice subacute, basin versus cuneata, sparse pubescentia, infra dense lanata, venibus prominentibus ob indumentum densum trichomatibus longioribus appressis, glandularia, marginibus revolutis. *Stipulae* 8–14 mm longae, libri. *Racemi* axillares, (8–) 25–35 florati ut pseudospicae congestae, folia subtendentia superantes. *Flores* 6–7 mm longi, ad 3 mm lati, aurantiaci venis rubribus vel croceo-aurantiacis, bractei 6 mm longi, cito caduci. *Lobi* calycis aequales, triangulares, tubam aequantes. *Vexillum* 6–7 mm longum, obovatum, appendix praesens connata, per summum unquem de auriculo in auriculum extensa; dorsum pubescens, glandulare. *Petala carinae* breviora quam alae. *Gynoecium* dense pubescens. *Fructi* 10–12 mm longi, 8 mm lati, molliter sericei. *Semini* grisei vel pallide brunnei, guttati vel maculati.

TYPE.—Natal, 2930 (Pietermaritzburg): Scottsville, Pietermaritzburg (-CB), Stirton 1242 (PRE, holo.; K, iso.).

Perennial herb, erect, 20–60 cm tall, spring flowering. Stems 1–15, clothed in short white hairs with

longer hairs interspersed. *Rootstock* with long stylopodium, thin and beaded when young but becoming wavy or constricted but carrot-like when mature. Leaves 3-foliolate, rarely the lowest leaves 1-foliolate (then mostly obovate), 4,5–6,0 cm long, 2,0–3,0 cm wide, laterals smaller and asymmetrical, elliptic to narrowly obovate, apex subacute, base cuneate, sparsely pubescent above, densely woolly below with veins prominent due to dense covering of longer appressed hairs, glandular, margins revolute. *Stipules* 8–14 mm long, free. *Racemes* axillary, (8–) 25–35 flowered in congested pseudo-spikes, overtopping the subtending leaves. *Flowers* 6–7 mm long, up to 3 mm wide, orange with red veins or yellow-orange; bracts 6 mm long, rapidly caducous. *Calyx* teeth equal, triangular, ± equal to calyx tube. *Standard* 6–7 mm long, obovate, appendage present, fused, extending across top of the claw from auricle to auricle, back hairy and glandular. *Keel petals* shorter than wing petals. *Gynoecium* densely hairy. *Fruits* 10–12 mm long, 8 mm wide, softly sericeous. *Seeds* grey or light brown, with speckles or blotches. Fig. 5.

*Eriosema preptum* is endemic to Natal (Fig. 2) and extends some 100 km inland from the coastal belt. In the past it has been consistently called *E. squarrosum*, an unrelated Cape species. The nature of this confusion will be dealt with in detail in a subsequent paper on the *Eriosema squarrosum* complex. This species favours sandy sites along roadsides and ditches but is also commonly found in grassland.

NATAL.—2831 (Nkandla): Nkwaleni River Valley (-CB), Codd 1839; 18 km from Eshowe to Ginginghlovu (-DC), Stirton 1297. 2832 (Mtubatuba): Hluhluwe Game Reserve (-AA), Scott-Smith 10. 2930 (Pietermaritzburg): Pietermaritzburg (-CB), Stirton 368, 1139, 1242, 1410; 5 km from Table Mountain to Pietermaritzburg (-DA), Stirton 1032; near mid-Iollovo (-DC), Stirton 1114. 2931 (Stanger): 43 km from Stanger to Mtunzini (-AB), Stirton 407, 1001, 1002; near Compensation (-BA), Stirton 1160. 3030 (Port Shepstone): 8 km from Eston to Winkelspruit (-BB), Stirton 1122.

## 3. *Eriosema transvaalense* C. H. Stirton, sp. nov., *E. cordato* E. Mey. affinis, sed floribus minoribus, pubescentia, florum colore seminibus differt.

Herba perenna ad 15 cm alta, flore vernale. *Caules* multi, implexi, prostrati vel decumbentes, basi ramificantes, subtiliter pubescentes pilis flavescens reflexis. *Folia* trifoliolata, infima semper unifoliolata, 3,5–6,5 cm longa, 2,5–3,5 cm lata rotundata vel ovata, ellipticascentia, ambo superficies virides, subtiliter pubescentes; ima venatione prominente elevata. *Stipulae* semiconnatae. *Rhachis* 3–4 mm longa. *Racemi* 6–8 florati, foliolos superantes. *Flori* laeti rosei flavique, 9–10 mm longi, 3 mm lati, bracteo ad 5 mm longo. *Calyx* 6 mm longa, lobi tubam subaequantes. *Vexillum* 9 mm longum, 6 mm latum, obovatum, subcucullatum; dorsum tomentosum glandulare; appendices praesentes, supra unquem, connatae et ad auriculos leniter evolutos extensae. *Petala carinae* dense glandulares. *Gynoecium* 6 mm longum, ovarium dense pubescens. *Fructus* 15–16 mm longus, 10 mm latus, oblique oblongus rostro 2 mm longo, molliter flavopubescent, glandularis. *Semen* 5–6 mm longum, 3 mm latum, castaneum purpureomaculatum.

TYPE.—Transvaal, 2329 (Pietersburg): near Ebenezer Dam (-DD), Stirton 1438 (PRE, holo.; K, iso.).

Perennial herb, up to 15 cm tall, spring flowering. Stems many, matted, prostrate or decumbent, branching at the base, finely pubescent with reflexed yellowish hairs. Leaves 3-foliolate, with lower leaves



FIG. 5.—*Eriosema preptum*. 1, habit; 2, stem with fruits and flowers,  $\times 0.5$ ; 2b, stem vesture,  $\times 4$ ; 3, node showing free stipules,  $\times 3.3$ ; 4, stipule,  $\times 2.3$ ; 5, flower bract,  $\times 7.5$ ; 6, calyx opened out,  $\times 5.3$ ; 7a, standard opened out,  $\times 3.3$ ; 7b, standard closed,  $\times 3.3$ ; 8, wing,  $\times 3.3$ ; 9, keel,  $\times 3.3$ ; 10, vexillary stamen,  $\times 5.3$ ; 11, staminal sheath,  $\times 5.3$ ; 12, discoid floral nectary,  $\times 15$ ; 13, gynoecium,  $\times 5.3$ ; 14, stigma,  $\times 33$ ; 15, fruit,  $\times 2$ ; 16a, seed with strophiole, face view,  $\times 5.3$ ; 16b, seed with strophiole, marginal view showing hilum,  $\times 5.3$ .

always 1-foliolate, 3,5–6,5 cm long, 2,5–3,5 cm wide, rounded to ovate, becoming elliptic, both surfaces green, finely pubescent above and below, lower surface with prominent raised venation. *Stipules* semi-connate. *Rhachis* 3–4 mm long. *Racemes* 6–8 flowered, overtopping leaflets. *Flowers* pale pink and yellow, 9–10 mm long, 3 mm wide, bract up to 5 mm long. *Calyx* 6 mm long, teeth ± equal to tube. *Standard* 9 mm long, 6 mm wide, obovate, somewhat hooded, back tomentose, glandular; appendages present, above the claw, fused and extending to weakly developed auricles. *Wing petals* 9 mm long, longer than keel, prominent peg present which fits tightly into the pocketed keel, sparsely glandular and hairy. *Keel petals* densely glandular. *Gynoecium* 6 mm long; ovary densely pubescent. *Fruit* 15–16 mm long, 10 mm wide, obliquely oblong with 2 mm long beak, softly yellow pubescent, glandular. *Seed* 5–6 mm long, 3 mm wide, chestnut brown with purple flecks. Fig. 6.

This species was collected for the first time as recently as five years ago and is endemic to isolated populations in the Magoebaskloof-Haenertsberg region (Fig. 2). *E. transvaalense* hybridizes with *E. angustifolium* Schinz. It grows in open grassland and is particularly evident along firebreaks.

TRANSVAAL.—2329 (Pietersburg): near Ebenezer Dam (-DD), *Stirton* 1438. 2330 (Tzaneen): Magoebaskloof Hotel (-CB), *Stirton* 1445.



FIG. 6.—*Eriosema transvaalense*, Stirton 1438, holotype in PRE.

## ACKNOWLEDGMENTS

I should like to express my thanks to the following people. Messrs H. K. Airy-Shaw and R. D. Meikle and Dr R. K. Brummitt, Royal Botanic Gardens, Kew, for their indispensable advice and assistance with nomenclatural problems and Dr. H. F. Glen for two of the Latin translations.

The Director, Royal Botanic Gardens, Kew, for use of the facilities of the Royal Botanic Gardens, Kew, for permission to use Kew negatives 19290 and 19292 and to Mr M. Svanderlik for taking the photographs.

Dr J. H. Ross (Royal Botanic Gardens and National Herbarium, Victoria); Prof. D. Isely and Dr N. Lersten (Iowa State University), Mr R. Barneby (New York Botanical Garden); Prof. R. Dahlgren (Copenhagen); Mr K. H. Mattisson (Lund) and Dr R. Polhill, Dr B. Verdcourt and Mr G. L1. Lewis (Royal Botanic Gardens, Kew) for discussions and helpful criticism of the work leading up to this paper.

Finally, I would like to thank Dr J. P. Rourke (Compton Herbarium) for drawing my attention to the *Lebeckia waltersii* problem; Dr I. B. Walters (Worcester) for his patient and constructive correspondence and Dr A. Schreiber (Botanische Staats-sammlung, München) for her opinions about *Lebeckia*.

## *UITTREKSEL*

Ses Psoralea-spesies van Afrika word na Cullen Medik. oorgedra: *C. biflora* (Harv.) C. H. Stirton, *C. holubii* (Burtt Davy) C. H. Stirton, *C. drupacea* (Bunge) C. H. Stirton, *C. jaubertiana* (Fenzl) C. H. Stirton, *C. obtusifolia* (D.C.) C. H. Stirton en *C. plicata* (Del.) C. H. Stirton. Psoralea patersoniae Schonl., gebaseer op 'n ingevoerde tuinplant, word as 'n sinoniem onder Cullen corylifolia (L.) Medik. geplaas. Die volgende nuwe name word gepubliseer: Lebeckia *waltersii* C. H. Stirton van die subgenus **Plecolobium** C. H. Stirton; Bituminaria **bituminosa** (L.) C. H. Stirton van die subgenus Bituminaria en *B. acaulis* (Stev.) C. H. Stirton van die subgenus **Christenia** Barneby ex C. H. Stirton; Rhynchosia *arida* C. H. Stirton; Eriosema *gunniae* C. H. Stirton, *E. preptum* C. H. Stirton en *E. transvaalense* C. H. Stirton. Eriosema capitatum E. Mey. word as 'n sinoniem onder Psoralea tomentosa Thunb. geplaas, maar aangesien P. tomentosa Thunb. 'n latere homoniem van P. tomentosa Cav. is, moet dit na P. sericea Poir. verwys word.

## REFERENCES

- DANDY, J. E., 1967. Index of generic names of vascular plants 1753–1774. *Regn. Veg.* 51: 1–130.

FORBES, H. M. L., 1930. The genus *Psoralea* Linn. *Bothalia* 3: 116–136.

HOLUB, J. 1970. *Lamiastrum* versus *Galeobdolen* and comments on problems of unitary designations in Fabricius's work 'Enumerati methodicae plantarum horti medici helmstadiensis'. *Folia geobot. phytotax.* 5: 61–88.

MEIKLE, R. D., 1977. *Flora of Cyprus*. Kew: Bentham-Moxon Trust.

RAUSCHERT, S., 1968. Zur frage der Gattungsnamen bei Fabricius. *Taxon* 17: 153–156.

STAFLEU, F. A. & COWAN, A. S., 1976. *Taxonomic Literature*. 1: A—G. Utrecht: Bohn, Scheltema & Holkema.

STIRTON, C. H., 1980. Psoraleeae. In R. Polhill & P. Raven, *Advances in legume systematics*. 329–336. Kew: Royal Botanic Gardens.