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## DAVIESIA AND LEPTOSEMA (FABACEAE) IN CENTRAL AUSTRALIA : NEW SPECIES AND NAME CHANGES

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### Abstract

Two new species, *Daviesia eremaea* and *D. purpurascens*, are described; the names *D. benthamii* Meisn. and *Leptosema chambersii* F. Muell. are reinstated, and *Leptosema anomalum* (Ewart et Morrison) comb. nov. is transferred from *Jacksonia*.

### Introduction

This paper is a precursor to the handbook to the Flora of Central Australia, due to be published early in 1981. Its purpose is to formalise new and reinstated names for use in the Flora and is therefore presented ahead of monographs of the genera *Daviesia* and *Leptosema* currently in preparation by the author.

### *Daviesia* Sm.

This is a large but apparently natural genus easily distinguished from its relatives. In earlier literature, e.g. Hutchinson, *Gen. Flower. Plant.* 2(1964)335-9, it was separated from other genera in the tribe *Podalyriaceae* Benth. by its simple, xeromorphic leaves, (ob-)triangular pod, 2 ovules and arillate seed. To these the following diagnostic characters should be added:

*Stipules* greatly reduced or absent; *inflorescence* axillary, a short raceme or modification of one, with several barren bracts crowded towards the base of the peduncle; *flowers* generally < 10 mm long, articulate on the pedicel; *legume* exserted, compressed or turgid, dehiscing elastically into supervolute valves.

#### 1. *Daviesia benthamii* Meisn. in Lehm., *Plantae Preissianae* 1(1844)48.

*D. aphylla* F. Muell. ex Benth., *Flor. Aust.* 2(1864)88, syn. nov.; *D. acanthoclona* F. Muell., *Fragm. Phyt. Aust.* 10(1876)32, syn. nov.; *D. nudula* J.M. Black, *Trans. R. Soc. S. Aust.* 71(1947)20, syn. nov.

The correct name for this species lapsed when Bentham, *Flor. Aust.* 2(1864)84, placed it as a synonym of *D. incrassata* Sm., a vegetatively similar but not closely related species. *D. benthamii* is widespread in dry country from Shark Bay in W.A. to Renmark in S.A. It shows geographic variation in leaf and inflorescence which will be analysed in the forthcoming revision. Each of the above synonyms belongs to a distinct geographic form.

#### 2. *Daviesia eremaea* M.D. Crisp sp. nov.

a *D. benthamii* Meisn. ac *D. genistifolia* A. Cunn. ex Benth. foliis erectis longioribus (4—12 cm longis) et pedicellis longioribus (—8 mm longis) differt.

*Holotype*: Northern Territory, 12 miles [19km] NE of Narwietooma Station, M. Lazarides 5991, 15.ix.1956, fl. & photo (CANB). *Isotypes*: AD, BRI, CANB, NT, PERTH.

The specific epithet alludes to its desert habitat.

Glabrous *shrub* with many stems, 0.9—1.8 m tall. *Branchlets* erect, terete, smooth. *Leaves* alternate, erect, articulate with the branchlet, terete, acuminate, more or less

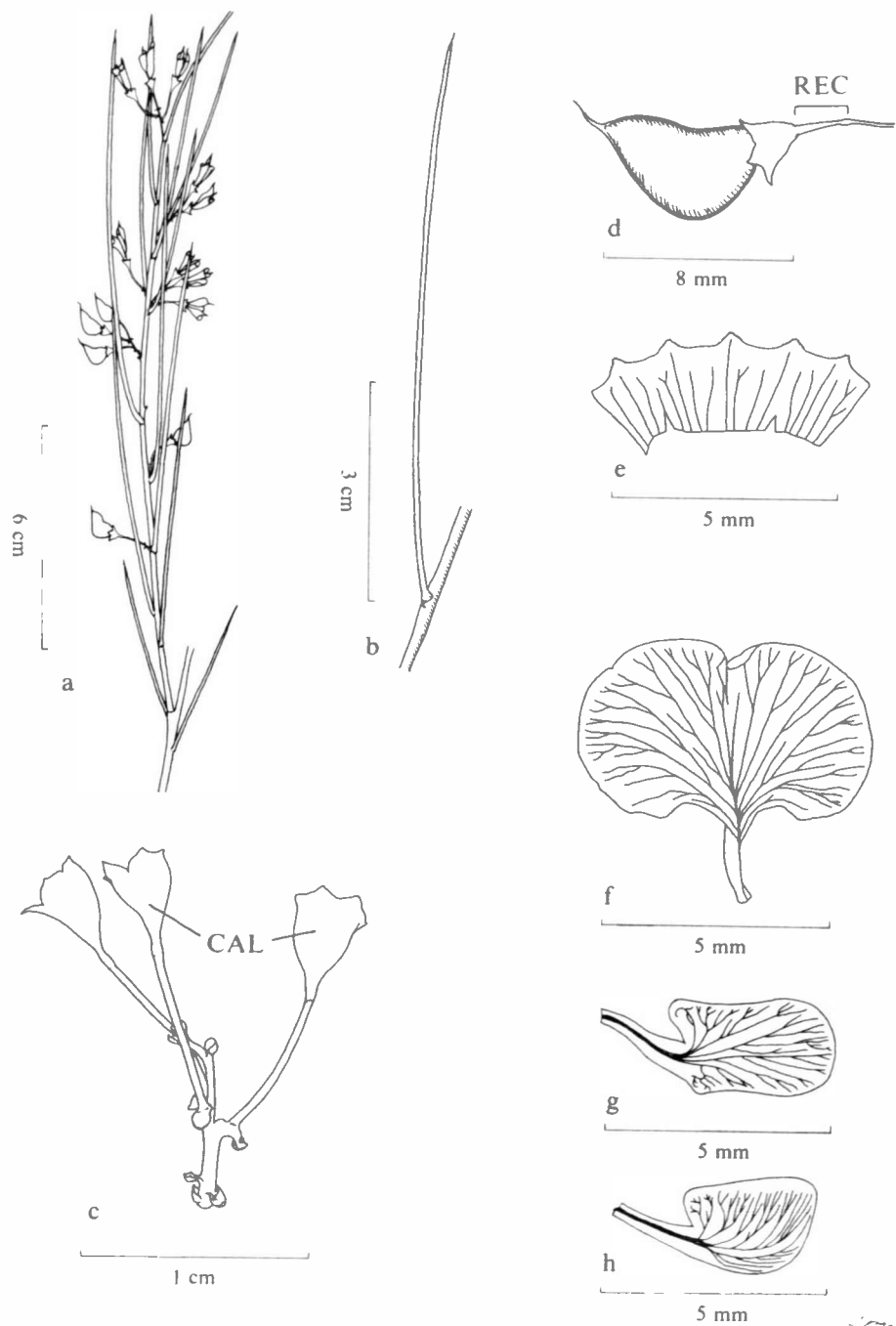


Fig 1. *Daviesia eremaea* M.D. Crisp. a, habit; b, leaf; c, raceme; d, legume; e, calyx, cut open and flattened with upper 2 lobes at right; f, standard (claw twisted); g, wing; h, keel-petal. (a, b, d, from *Nelson 99*; c, e-h, from *Lazarides 5991*). CAL = calyx. REC = receptacle.

pungent, thickened at the base, 4–12 cm long x c. 1 mm diam. *Racemes* 1 or 2 per axil, 3–5 flowered; rhachis 3–7 mm long. *Pedice* slender, 4–8 mm long. *Calyx* oblique-campanulate, abruptly contracted at the base into the slender, 1.5–2 mm long receptacle; tube 2–2.5 mm long; lobes sub-apiculate, c. 0.5 mm long. *Corolla* papilionaceous; *standard* c. 6 x 7 mm; lamina transverse-elliptic, retuse, slightly cordate, yellow marginally, grading to red at the centre; claw c. 2 mm long; *wings* obovate-oblong, auriculate on the upper and slightly so on the lower margin at the base, c. 5 mm long including the 1.5–2 mm claw, reddish; *keel-petals* half transverse-broad-obovate i.e. truncate on the upper margin, obtuse, auriculate above at the base, c. 4.5 x 2 mm including the 1.5 mm claw, reddish. *Stamens* free, dimorphic i.e. inner row of 5 with flat incurved filaments and anthers sub-dorsifixed, subglobular, without connective; outer row of 5 with longer filaments slightly dilated upwards and anthers basifixed, larger, oblong, with a narrow-triangular connective. *Ovary* subsessile, narrow-elliptic, tapering to the incurved style. *Legume* compressed, asymmetric, transverse-obtriangular, c. 7 x 7 mm, dehiscing elastically; dorsal suture sigmoid; seed not seen. (Fig 1.)

#### Distribution (Map 1)

Northern Territory: Central Australia—west of Alice Springs, from Stuart Bluff Range south towards the South Australian border.

#### Specimens seen

NORTHERN TERRITORY: c. 76 miles [122 km] NE of Mt Davies Camp, P.K. Latz 943, 2.xi.1970, fr. (NT, AD, DNA); 12 km S of Mt Currie, 25°06'S, 130°33'E, P.K. Latz 5751, 23.ix.1974, fl. & fr. (NT, AD, CANB, DNA, PERTH); Lake Neale area, 24°28'S, 130°22'E, J.R. Maconochie 1897, 28.viii.1973, fl. (NT); Lakes Neale/Amadeus area, 24°28'S, 130°25'E, J.R. Maconochie 1900, 28.viii.1973, fl. (NT, DNA); 7 miles [11 km] S of Mount Wedge homestead, D.J. Nelson 99, 18.x.1961, fr. (NT, CANB).

#### Affinity

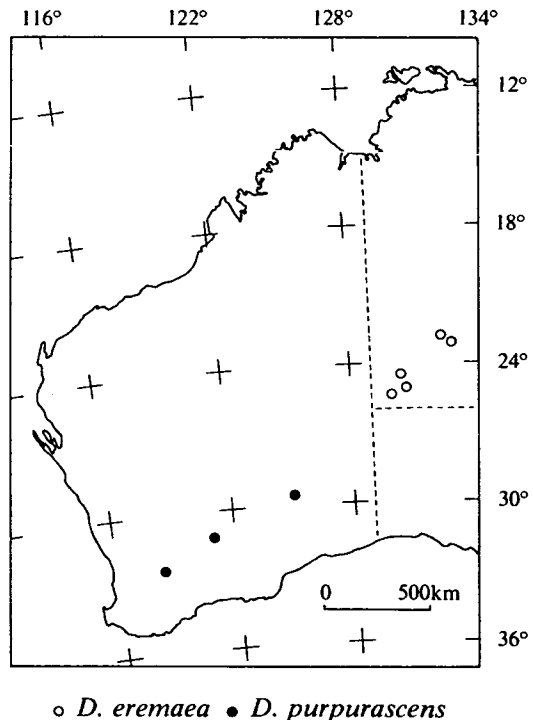
*D. eremaea* is closely related to *D. genistifolia* A. Cunn. ex Benth. and to *D. benthamii* (q.v.), both of which have leaves which are shorter (< 8 cm long; usually < 5 cm) and widely divergent at 45–90° to the branchlet.

In *D. genistifolia* the leaf is either continuous or articulate with the branchlet, and the pedicel is less than 2 mm long. In *D. benthamii* the leaves are rigid, continuous with the branchlet, often much reduced in number and size, and the pedicel rarely longer than 4 mm.

#### Ecology

*D. eremaea* occurs on red sand, often at the bases of dunes. Associated vegetation includes *Triodia* spp. and either *Casuarina decaisneana* F. Muell. or mallee eucalypts e.g. *E. gamophylla* F. Muell.

Although known from five locations, the new species appears to be rare at any given



Map 1. Distribution of *Daviesia eremaea* and *D. purpurascens*.

site. Further investigation is needed to determine whether it is threatened with extinction. Possibly, it occurs in the adjacent areas of Western Australia and South Australia.

### 3. *Daviesia purpurascens* M.D. Crisp sp. nov.

*D. benthamii* Meisn. characteribus vegetativis similis est sed manifesto ob legumen turgidum nec triangulare, quod inelastice dehiscit, et ob ramulos foliaque glaucescentia saepe purpurascencia differt.

*Holotype*: Western Australia, 6.3 km N of Bending on Naremben road, 32°20'S, 118°19'E, *M.I.H. Brooker* 6329, 12.viii.1979, fl., spirit material (CBG). *Isotypes*: AD, CANB, K, NSW, PERTH.

The specific epithet refers to the frequently purplish glaucescence of the leaves and branchlets.

Glabrous *shrub* with many stems, 0.4–0.9 m tall. *Branchlets* numerous, rigid, flexuose, grey-green to purplish-glaucous. *Leaves* alternate, ascending to divaricate, continuous with the branchlet, terete, gently tapered, rigid, pungent, 5–50 mm long x 0.7–1.5 mm diam., grey-green to purplish-glaucous. *Racemes* 1–3 per axil, 2–7-flowered; rhachis 0–15 mm long. *Pedice*l 0.5–3 mm long. *Calyx* oblique-campanulate, turgid in fruit, scarcely contracted into the c. 0.75 mm receptacle; tube 1.5–2 mm long; lobes subequal, very broad- to depressed-triangular, subacute to obtuse, c. 0.5 mm long; upper 2 lobes slightly shorter and broader than the others. *Corolla* papilionaceous; *standard* 5.5–6 x 6–7 mm; lamina depressed-ovate, retuse, sub-cordate, yellow marginally, grading to maroon at the centre; claw 1.5 mm long; *wings* oblong to obovate, auriculate on the upper, and sometimes on the lower margin at the base, 5–5.5 mm long including a 2 mm claw, maroon towards the apex; *keel* inflated, saccate; laminae half broad-obovate, more or less obtuse, auriculate like the wings, 3 x 2–2.5 mm, maroon in the upper half, on a 2 mm claw. *Stamens* free, dimorphic i.e. inner row with flat inflexed filaments and anthers basifixed, subglobose, without connective; outer row with similar but longer filaments and anthers larger, oblong, with a narrow-triangular connective. *Ovary* narrow, tapered below to a short stipe and above to the inflexed style. *Legume* turgid, broad-oblique-obovate to obtrullate in outline, 4–6 x 3–4 mm, not dehiscing elastically; immature *seed* arillate. (Fig 2.)

#### *Distribution* (Map 1)

Known from three disjunct populations in Western Australia viz. near Kondinin in the wheat belt, Gnarlbine Rocks south of Coolgardie, and near Plumridge Lakes in the Great Victoria Desert.

#### *Specimens seen*

WESTERN AUSTRALIA: 33 km from Naremben along rd to Kondinin, 32°20'S, 118°18'E, *M.D. Crisp* 5517, 27.i.1979, fr. (CBG, PERTH); 18 km ENE of Kondinin, 32°27'S, 118°28'E, *M.D. Crisp* 6168, 26.ix.1979, fr. (CBG, PERTH, NSW); 30 km SSW of Coolgardie, 3 km NW of Gnarlbine Rock, 31°08'S, 120°56'E, *M.D. Crisp* 5607-9, 31.i.1979, fr. & photo (CBG, AD, PERTH); *ibid.*, *M.D. Crisp* 5902-3, 18.ix.1979, fl., photos, spirit material (CBG, L, MEL, PERTH); near Gnarlbine, *R. Helms s.n.*, 12.xi.1891, fr. (AD, MEL, PERTH); Victoria Desert, Camp 54, Elder Exploring Expedition, *R. Helms s.n.*, fr., poor fl. (AD, NSW, MEL).

#### *Affinity*

I do not know of any close relatives to *D. purpurascens*. It differs from other species of *Daviesia* by its non-triangular pod. Nevertheless the type of inflorescence, especially the sterile bracts at the base, and the morphology of the floral parts clearly place it in *Daviesia*.

Mueller & Tate in *Trans. R. Soc. S. Aust.* 16(1896) assigned the Helms collections of *D. purpurascens* to the superficially similar *D. acanthoclona* F. Muell. (= *D. benthamii*, q.v.). However, the latter differs by its laterally compressed obtriangular pods which

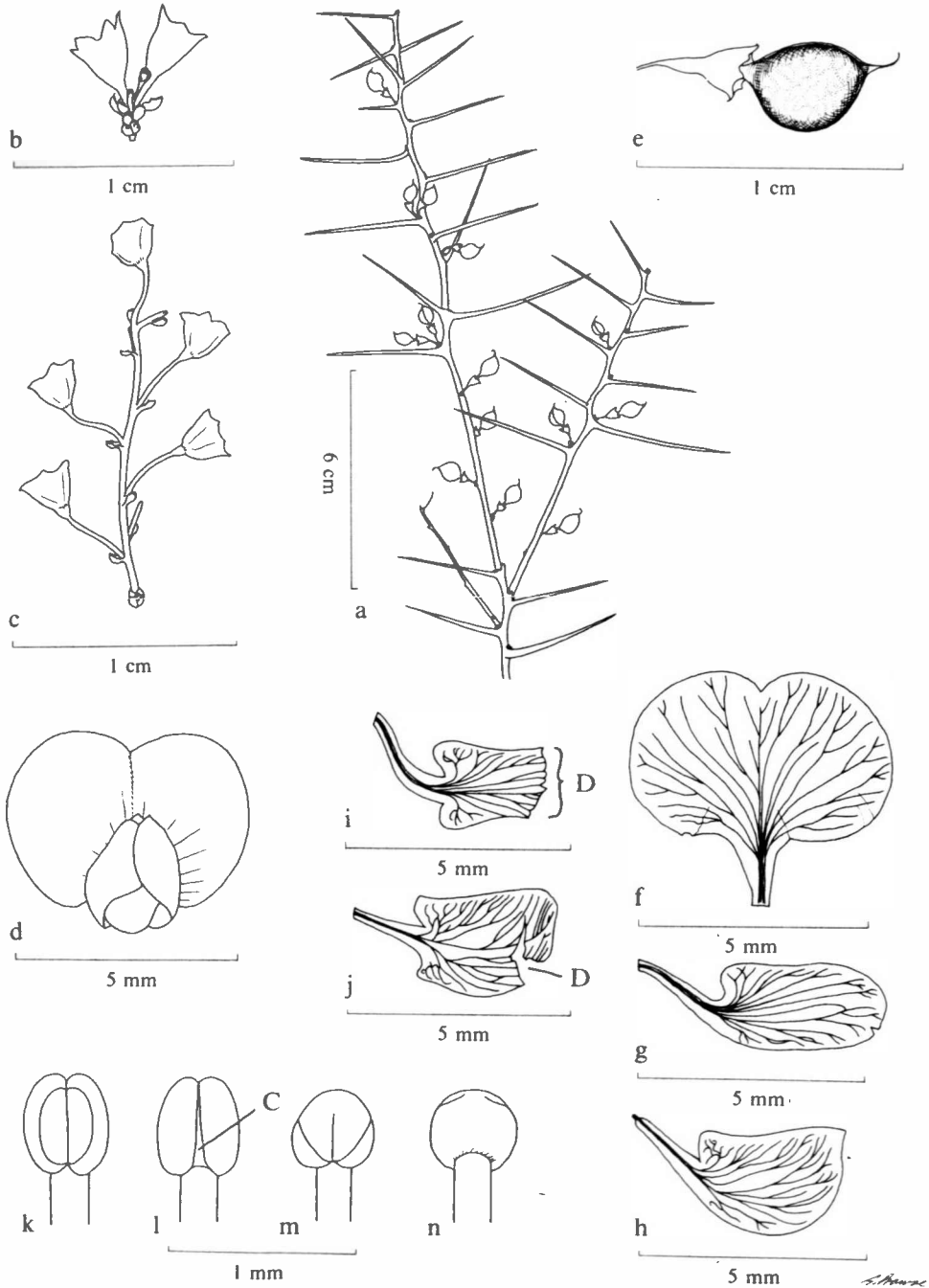


Fig 2. *Daviesia purpurascens* M.D. Crisp. a, habit; b, c, racemes, showing variation; d, flower; e, legume; f, standard; g, i, wings, showing variation; h, j, keel-petals, showing variation. (i, j, insect-damaged). k-n, anthers; k, from outer row, front view; l, outer row, rear view; m, inner row, front view; n, inner row, rear view. (a, e, from *Crisp 6168*; b, d, f-h, k-n, from *Brooker 6329*; c, i, j, from *Helms, 16.ix.1891*). C = connective. D = insect damage.

dehisce elastically, forming supervolute valves, and also by its greenish-yellow branchlets and leaves which are never glaucescent. *D. purpurascens* is always slightly glaucous, although the purple tinge is strongest in summer.

#### *Geographic variation*

There is some morphological variation between the populations of the new species. In the Victoria Desert the wing- and keel-petals have auricles on the lower margins which are absent at Kondinin and scarcely developed at Gnarlbine (Fig 2, g-j). Similarly, the raceme is longest with up to seven flowers in the Victoria Desert, and shortest with two flowers at Kondinin (Fig 2, b,c). Other characters vary slightly between populations. This pattern suggests a southwest-northeast cline, but until more extensive collections are made, I am reluctant to propose infraspecific taxa.

#### *Ecology*

*D. purpurascens* is found on red sand-dunes in the Victoria Desert and at Gnarlbine, and on white sand-plains at Kondinin. At Gnarlbine and Kondinin it is in the shrubby understorey of mallee dominated by *Eucalyptus* spp. including *E. eremophila* (Diels) Maiden, *E. foecunda* Schau. and *E. transcontinentalis* Maiden. The vegetation at the Victoria Desert site is unknown.

*D. purpurascens* is uncommon both at Kondinin and at Gnarlbine, where it is threatened by clearing and sand-mining respectively. I was unable to relocate it in the Victoria Desert, despite an extensive search. Thus, the species must be considered both rare and endangered.

#### **Leptosema Benth.**

*Leptosema* Benth., *Comm. legum. gen.* (1837)20; *Ann. Wiener Mus.* 2(1839)84; *Hutch., Gen. Flower. Plant.* 2(1964)342.

*Brachysema* R.Br. sect. *Leptosema* (Benth.) Benth., *Flor. Aust.* 2(1864)9.

The history of the genus *Leptosema* is summarised in the references above. Bentham (1864) gives diagnostic characters to separate it from *Brachysema* s.str. Hutchinson (1964) reinstated *Leptosema* but did not deal with any species except the type. There are two species in Central Australia.

1. ***Leptosema chambersii*** F. Muell., *Essay plant. coll. E. Fitzalan during Lieut. Smith's exped. estuary Burdekin* (1860)8.

*Brachysema chambersii* (F. Muell.) F. Muell. ex Benth., *Flor. Aust.* 2(1864)13.

2. ***Leptosema anomalum*** (Ewart et Morrison) M.D. Crisp comb. nov.

*Jacksonia anomala* Ewart et Morrison, *Proc. R. Soc. Vict. n.s.* 26(1913)158, *basionym*.

The original authors suggested that this species may belong to *Brachysema* sect. *Leptosema*, but placed it in *Jacksonia* because of the 2 ovules (as opposed to several in other *Leptosema* spp.) and the small size of flowers. However, the number of ovules varies from 2—several in some related genera, and cannot be a critical character at generic level. Furthermore, there are several species of *Leptosema* with flowers of comparable size to those of *L. anomalum*. In other respects, especially the racemose inflorescence and peculiar floral morphology, *L. anomalum* is a typical *Leptosema* and clearly distinct from *Jacksonia*.

#### **Acknowledgements**

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