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PLANT PORTRAITS

20. *Pultenaea trifida* J. Black (Leguminosae - Papilionoideae)

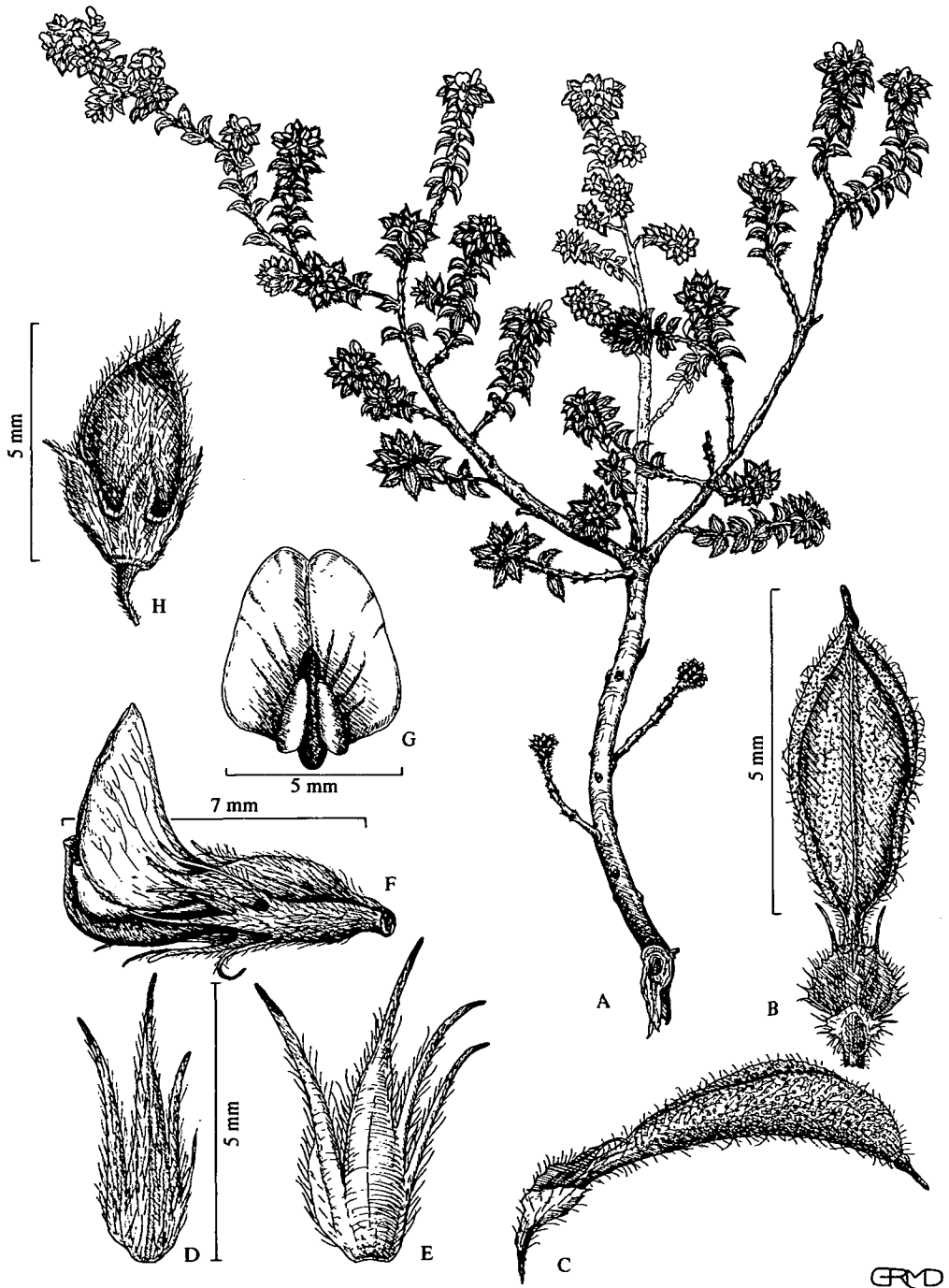
Pultenaea trifida J. Black, Trans. Roy. Soc. S. Aust. 33 (1909) 224, t. 14.

Illustration: Based on fresh material preserved under *W. Bushman & R. Davies* 425, 23.x.1983, Kangaroo Island, Flinders Chase National Park, on Shackle Road, north of Rocky River Homestead, 35° 52'S, 136° 44'E.

Suberect shrub or small bush to 80 cm high, with greyish to brownish-grey thin but hard woody branches, commonly much branched, terminating in whitish-grey to rusty-tomentose wiry branchlets. *Leaves* dense, in a 1/3 phyllotaxis; petiole 1-5 mm long, pale-yellow; lamina greyish-green, obovate or sometimes ovate, recurved in the upper part, 3-5 mm long, 2-3.5 mm wide when flattened, otherwise concave by involute margins, glabrescent to sparsely pubescent above, densely pubescent or villous with curled or crimped, whitish, thin hairs below, midrib always visible on lower and sometimes on upper surface, terminating in a light-brown bristle-like mucro to 0.5 mm long. *Stipules* 1-2 mm long, lanceolate, joined basally, central rib extended into acute or long-acuminate tip, brown-leathery with scarious margins. *Inflorescence* terminal, consisting of few to many crowded flowers, only 4 or 5 in flower at a time, may proliferate later, when flowers appear axillary and singly, or are axillary and single at first. *Bracts* few, suborbicular to ovate, 1.5-2 mm long, distinctly keeled, reddish-brown medially, brown to light-brown distally with scarious, long or short-ciliate margins, sometimes pubescent on back. *Bracteoles* trifid (hence the specific epithet), 3.5-4.5 mm long, shorter or as long as the calyx, exstipulate, the central lobe more greenish and slightly longer but similar to light-brown lateral lobes, linear-lanceolate and white-pubescent basally with light-brown, subulate, glabrous tips. *Flowers* about 7 mm long, subsessile, on pedicel to 1 mm long and about 0.5 mm thick, with 2 opposite bracteoles attached at base of the calyx. *Calyx* campanulate, 4-5 mm long, rosy-reddish-brown, densely white-pubescent outside, glabrous inside, lobes widely lanceolate, the 2 upper broader and united higher up, tips subulate, light-brown, glabrous. *Standard* about 7 mm long including narrow claw, lamina suborbicular, about 5-6 mm diam., abruptly incurved in lower third and nearly at right angles to base, folded inwards and scarcely expanded, yellow and red-tinted centrally, without callosities or hairs. *Wings* 5-6 mm long, as long as keel, with a narrow claw 1.5 mm long, lamina yellow, obovate-spathulate with a distinct auricle basally. *Keel* on distinct yellowish claw 1.5 mm long, lamina crescent-shaped with subacute tip, purple in distal half, yellowish with distinct auricle at the base and a callus-like light-brown pouch. *Stamens* 10, free, filaments long, yellowish, filiform, anthers dorsifixed, green, 2-celled, dehiscing longitudinally. *Ovary* shortly stipitate, subglobose and attenuated into long filiform style terminating in a capitulate stigma, densely villous to base of style but less so distally. *Ovules* 2, on short funicles. *Pod* ovoid, protruding from the calyx, about 5 mm long, 2.5 mm wide, reddish-brown, white pubescent, the base of the style persists as a long-acute apex, dehiscing longitudinally and opening outwards like a split funnel. *Seed* carunculate, not seen.

Pultenaea is an endemic Australian genus of about 100 species and is represented in South Australia by 24 species of which 9 are endemic. Of 28 *pultenaeas* present in Western Australia only 2 are present here, but with eastern Australia there are 13 species shared. In South Australia the genus is distributed south of 32° latitude with the exception of one species in the Flinders Range, representing the most northern occurrence of the genus in the State.

P. trifida is very restricted in its range to the western part of Kangaroo Island, found generally between 136° 30'E to 137° 15'E longitude. It is widespread throughout the Flinders Chase National Park but was not found in its most southern portion below 36° latitude. The eastern boundary is along a line between Mount Pleasant in the south and head of the Cygnet River in the north. It is assumed that the vague locality on the specimen collected by J.B. Cleland on "16.ix.1924, Between Kingscote and Vivone Bay" does not represent a more easterly distribution of the species as no plants were ever found in the eastern part of the island.



Pultenaea trifida J. Black. A, habit; B, C, leaf in surface and side view respectively; D, E, variation of bracteoles; F, flower with bracteole; G, flower in front view; H, fruit.

The species occurs inside the 700 mm isohyet of average annual rainfall (K. Burrows, Natural History of Kangaroo Island, p. 55). The landform and soil types are at present being described by R. Davies (in prep.) as being light hilly uplands of broad crests, valley slopes and broad gentle-sloping drainage lines. The soils of the sites where the species occurs are light sandy clay-loam, sandy loam or loamy sand.

P. trifida was found, except for the cleared areas under agriculture, in tall shrubland of *Eucalyptus remota* as well as in tall open shrubland where it occurs as a codominant in the understorey. The species was also observed at a lower frequency in low open forest with *E. baxteri* dominant, and less commonly widespread in association with *E. diversifolia* in tall open shrubland. It was also found in open heath dominated by *Caustis pentandra* and *Melaleuca gibbosa*.

The earliest collection was made in 1886 by J.G.O. Tepper, "the indefatigable collector of plants" and the above collections of this species were also made in the vicinity, or at the same locations. From the present collections it seems that enough of the population of the species is adequately conserved and under no threat of extinction in spite of its restricted range.

The main flowering season is spring, but flowers have been recorded from late September to the beginning of January, usually in small numbers at any time. There may be up to 10 buds in the terminal inflorescence, but only a small number (about 4) will be in flower at one time and most of the buds never develop. The fertility also appears to be very low: from about 27 collections examined only one pod was found on a specimen collected in January still bearing a few flowers.

P. trifida is similar to *P. densifolia* F. Muell., which occurs widespread over Eyre and Yorke Peninsula, Murray, Southern Lofty and the South-Eastern Regions as well as western Victoria. *P. densifolia* is spreading in eastern and southern parts of Kangaroo Island, but apparently outside the 700 mm isohyet (K. Burrows, Natural History of Kangaroo Island, p. 55) and comes into contact with but does not overlap with *P. trifida*. The two species have a similar prostrate to suberect habit, small dense leaves and terminal inflorescence, but they can be distinguished by almost glabrous leaves, ovate scarious bracts and a purple sometimes red-streaked standard in *E. densifolia*.

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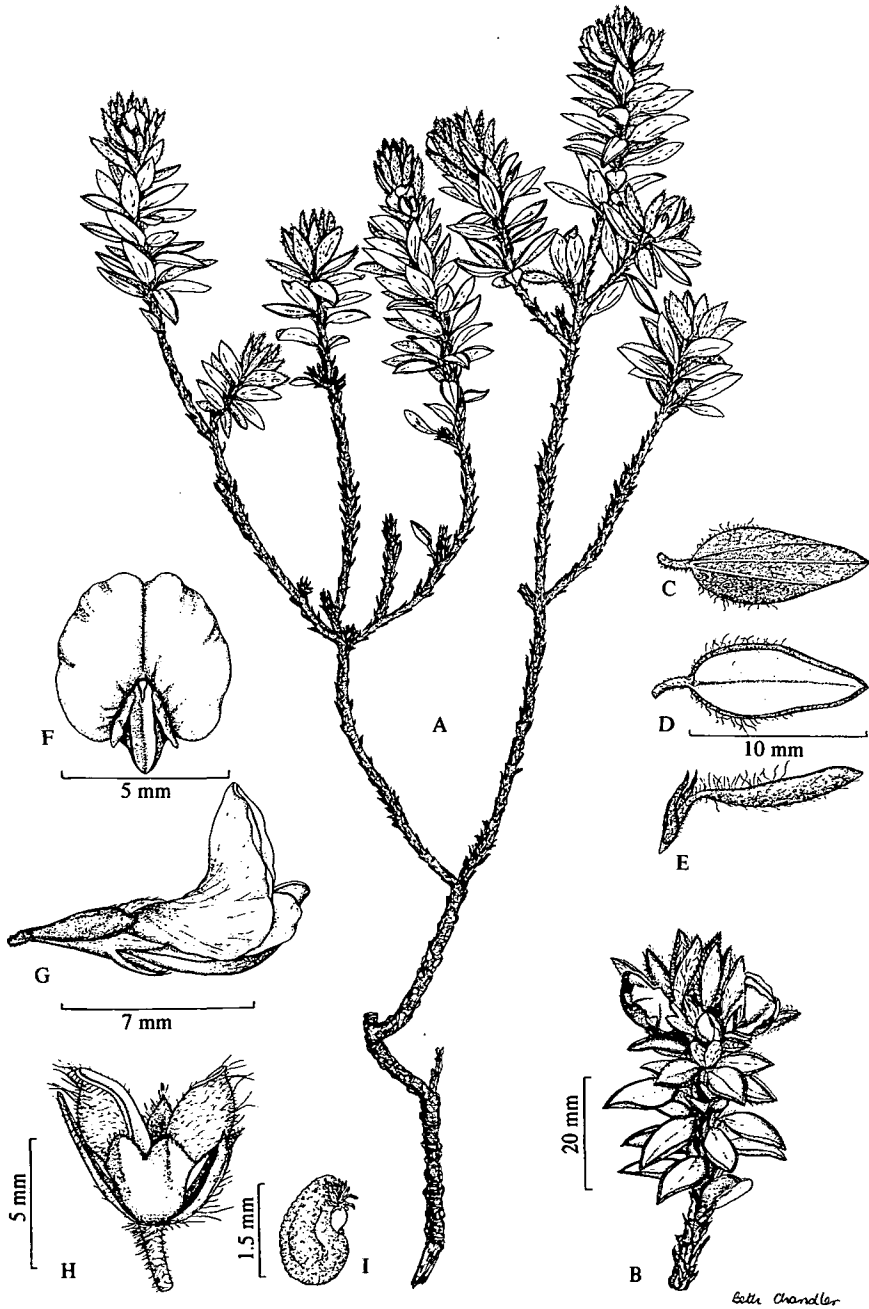
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21. *Pultenaea trinervis* J. Black (Leguminosae - Papilionoideae)

Pultenaea trinervis J. Black, Trans. Roy. Soc. S. Aust. 47:370 (1923).

Illustration: Based on fresh material preserved under R. Davies s.n., 22.vi.1983, 4 km NE of Newland Head along eastern boundary of State Planning Authority Land, Southern Lofty Region, South Australia.

Low shrub with rather diffuse or suberect habit, to 0.5 m high, with brown-green to dark-green aspect. Branches slender and divided into several often long, wiry terminal branchlets, villous at first, later only covered with leathery stipules, finally reddish-brown to blackish-brown and free of stipules and hairs. Leaves dense at the end of branches, with a 1/3 phyllotaxis, absent on older branches; petioles distinct, appressed to stem, 0.5-1 mm long, cylindric, c. 0.2 mm thick, yellowish-grey, villous; lamina spreading, lanceolate to ovate-lanceolate, commonly 8-12 mm long but sometimes only 4 mm, 1.5-4 mm wide when expanded, rigid, subacute to mucronate but not pungent-pointed, above concave, glabrous, grey-green to green, usually lighter in colour with hardly visible venation, below darker green, often with reddish-brown tinge, with 3 distinct nerves running from the base, the midnerve



Pultenaea trinervis J. Black. A, habit; B, terminal inflorescence; C-E, leaf from below, above and in side view respectively; F, flower in front view; G, flower in side view; H, dehiscent fruit; I, seed.

terminating at apex, villous all over, more so on margins. *Stipules* ovate-acute, bilobed, 2-keeled, 1-2 mm long, with scarious brown to dark red-brown margins, sometimes faintly ciliate, often pubescent on back, persistent on older branches. *Flowers* 6-8 mm long, 1-2 axillary along the branches or terminal in short proliferating head-like inflorescence, supported at the base of petiole by 2 stipules of the subtending leaves, the calyx partly exposed. *Bracts* absent. *Bracteoles* 2, opposite, adnate at base of calyx, ovate-oblong, about 2.5 mm long and usually exceeding the tube, red-brown, scarious, often keeled, usually glabrous except for some short cilia, or sometimes with few hairs. *Calyx* campanulate, 3-4 mm long, straw-coloured to pinkish-red, glabrescent to pubescent with short white hairs outside, glabrous inside, teeth triangular and shorter than tube, margins fimbriate to long-ciliate. *Standard* on distinct flat claw c. 1.5 mm long, lamina suborbicular, c. 7-8 mm diam. when flattened, scarcely notched, gradually recurved in distal half and expanded outwards, yellow, sometimes red-streaked, callosities usually absent or vaguely developed. *Wings* oblong-obovate, as long as keel, yellow, auriculate above the c. 2 mm long colourless claw. *Keel* 5-6 mm long, on distinct yellowish claw to 2 mm long, lamina narrowly crescent-shaped, more purple coloured in distal half than on proximal, tip obtuse, with a narrow and long auricle basally, without pouches. *Stamens* 10, free, filaments filiform, yellowish; anthers small, to 0.4 mm long, reniform, dorsifixed, green to purple, splitting lengthwise. *Ovary* subsessile, obpyriform, gradually constricted into a long filiform style which terminates in an inconspicuous stigma, white-villous as well as base of style, style distally glabrous. *Pod* obovoid, 4-5 mm long, exceeding the calyx, reddish-brown, white-pubescent, base of the style persists as an apiculate apex on a subobtuse apex, 2-seeded, dehiscent lengthwise. *Seed* reniform, c. 1.5 mm long, reddish-dark-brown, dull. *Caruncle* whitish to light-yellow, long-papillose.

P. trinervis is endemic to South Australia. It is quite common in the Southern Lofty Region south of 35° latitude and not extending beyond 130° longitude into the Murray Mallee. It is also frequent in the southern parts of Eyre Peninsula south of 34° latitude and rare north except for 3 collections one each from Coolanie Valley, Mangalo and Carpie Punta. On Kangaroo Island it is rarely found at Muston, Parndana and Ravine des Casoars. It is found quite frequently in hilly country, sandy flats and extending to the beaches, and is also found along road sides. It appears as a undershrub in open woodlands, heath-like tall open shrublands and grows on laterite, sandy or gravelly soils, on hillsides and in valleys and coastal shrubland.

The flowering season is generally in spring, starting as early as August with odd flowering plants recorded throughout the summer from January to March, and fully developed pods with seeds found by the end of December. Although plants usually have ample flowers the fertility appears to be rather low, as only a few pods have been present on plants investigated. The flowers appear to be insect pollinated. In fully opened flowers the stigma protrudes from the tip of the keel where the 2 joined petals have a notch-like slit, while the anthers are encased in the keel below the stigma.

P. trinervis and *P. involucrata* Benth. both have a similar habit, branches, ramification as well as 3-nerved leaves and occur sympatrically in the Southern Lofty Region. The inflorescence of *P. involucrata* differs in that each flower is later surrounded by numerous imbricate bracts which completely conceals the calyx. *P. trinervis* also resembles *P. villifera* Sieber var. *villifera* from eastern New South Wales, but differences in their leaf are quite striking as the latter "has rigid, pungent leaf tips and slender acicular tips and stipules and bracteoles". *P. trinervis* was first described as *P. villifera* var. *australis* Benth, Fl. Aust. 2 (1864) 137 based on collections by both R. Brown and F. Mueller from Port Lincoln and from Encounter Bay by C. Wilhelmi [the type specimens have not been seen by the author]. Since then more material has been obtained and J.M. Black expressed the opinion that "it would be better to treat it as a distinct species" and in this respect H.B. Williamson, the monographer of the genus *Pultenaea*, agreed (*Transaction Royal Society of South Australia* 47 (1923) 370).

In South Australia *P. villifera* is represented only in the form of the var. *glabrescens* J. Black on Kangaroo Island and it is remarkably distinct from *P. trinervis* and *P. villifera* var. *villifera* by large flat pungent-pointed leaves. Comments made by J. Thompson (*Contributions from the New South Wales National Herbarium Flora Series 101.1* (1961) 62) that South Australian material is probably not conspecific with var. *villifera* agree with my observation on ample material from South Australia. I now believe that *P. trinervis* is not a geographic variant of *P. villifera*, but a endemic species of South Australia.

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22. *Eremophila pentaptera* J. Black (Myoporaceae)

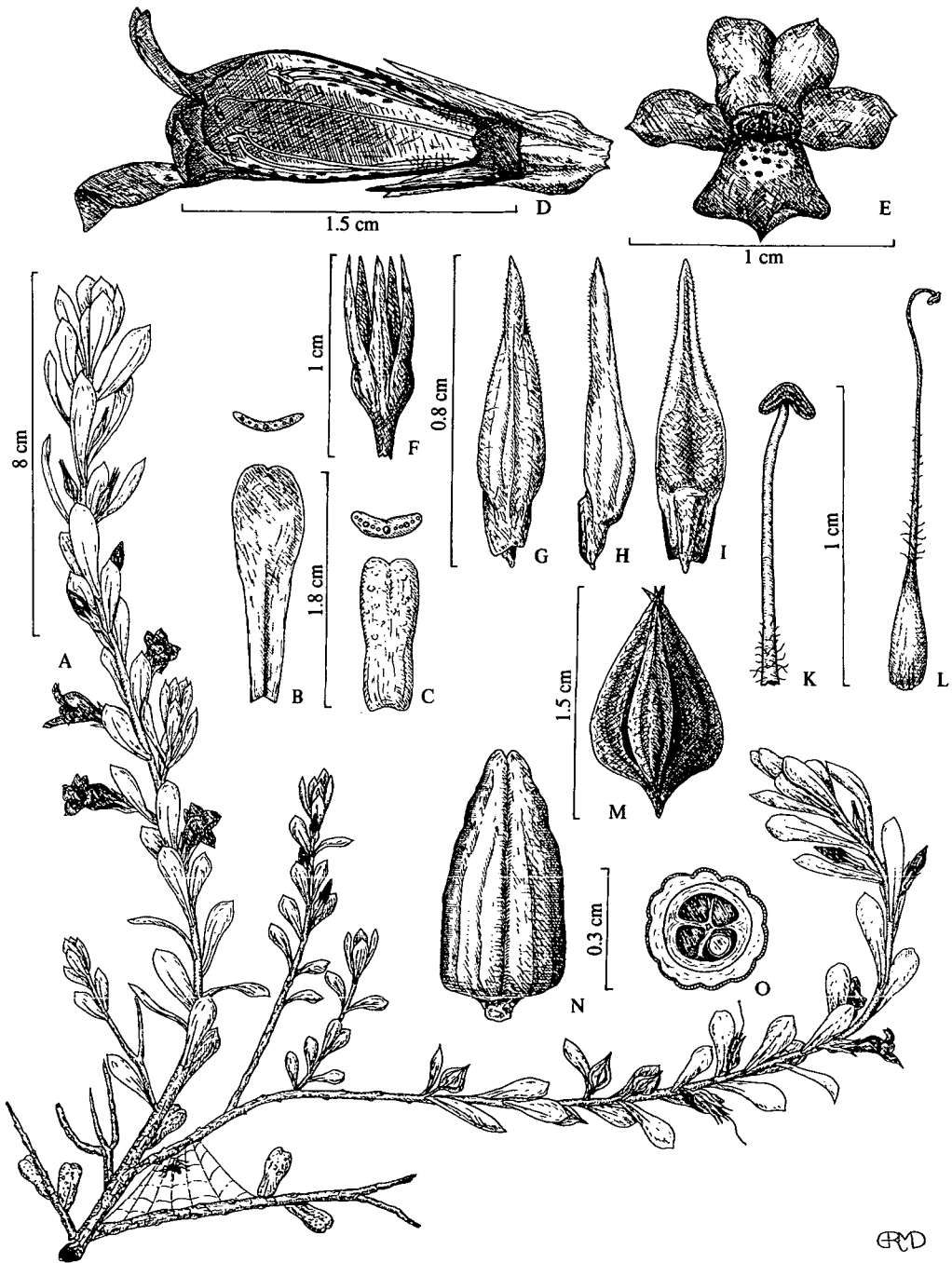
Eremophila pentaptera J. Black, Trans.Proc.Roy.Soc.S.Aust. 46:570 (1922).

Illustration: Based on cultivated and dried material preserved as *Lothian 4751*, 27.vii.1968, between Pedirka and the Stevenson River, c. 26° 39'S, 135° 12'E (AD).

Small shrub to 0.4 m tall. *Branches* erect or spreading, light-green to reddish-brown, greyish-white to buff in woody parts, terete but ribbed when dry, longitudinally fissured on woody parts, non-tuberculate, obscurely glandular-pubescent. *Leaves* sessile, alternate, fleshy to succulent, green or glaucous grey-green, oblanceolate, 12-29.5 (-36) x 3-7 (-10) mm, obtuse or rarely acute, entire, concavo-convex to almost flat, faintly to prominently tuberculate on lower side at least when dry, smooth above; glabrous or obscurely sparsely glandular-pubescent often with hairs restricted to the margins, non-viscid. *Flowers* solitary; pedicel 3.5-6.5 mm long, terete in lower part, dilating upwards and distinctly 5-ribbed, glabrous. *Sepals* 5, imbricate, green often tinged purplish, lanceolate, 9-12.5 x 1.5-3.5 mm, apex obtuse or acute, fleshy, prominently sharply keeled and triquetrous in cross-section towards the base; margins membranous, white often tinged purplish; outside surface glabrous; inside surface and margins glandular-puberulous. *Corolla* 22-32 mm, light-purple to reddish-violet, lower half of medial lobe of lower lip white or cream, faintly lilac spotted; lobes obtuse, lowermost one dilated; outside surface of lobes and tube glabrous; inside surface of tube and base of medial lobe of lower lip villous often with a very dense band below the medial lobe. *Stamens* 4, included but extending to the throat, filaments hirsute at base, anthers glabrous. *Ovary* ovoid-oblong, yellow, quadrilocular with one ovule per loculus, 3.5-5 x 1-2.5 mm, glabrous; style villous. *Fruit* ovoid to bottle-shaped, 6-7.5 x 2.3-3 mm, ribbed, often verrucose when immature, glabrous. *Seed* ovoid-oblong, c. 3.5 x 1 mm, cream.

This rare species was described from material collected on flats at Millers Creek by F. Wood-Jones in 1922. Both E.H. Ising (1932) and T.R.N. Lothian (1968) made collections in the Pedirka area north of Oodnadatta with Lothian collecting the species on Tableland slopes and plains and Ising in "a little creek through Gibbers". More recently B.P. Isaacson and F.A. Mason located the species on the lower rubbly slopes of a small isolated hill north of Copper Hills Homestead. It seems likely from this information that the species favours rocky slopes or flats on soils subject to periodic flooding.

E. pentaptera is unique in the genus by having thick fleshy to succulent leaves. During dry periods (in cultivated specimens) plant growth is slow, the leaves are short, thick, more or less oblong and dull glaucous-green but during wetter periods growth is rapid, the leaves bright green, long, thinner especially in the distal part, oblanceolate in shape. These observations are consistent with the herbarium specimens, Lothian collecting his material in winter during an obviously wet season while the other collections were made in drier periods. The very white woody branches and the distinctly keeled sepals and ribbed pedicel are also distinctive features



Eremophila pentaptera J. Black. A, flowering branch; B, C, fleshy leaves with transverse sections; D, opened flower; E, flower in front view; F, calyx; G, H, I, calyx lobes from outside, side and inside respectively; K, stamen; L, ovary with slender style; M, mature fruit enclosed in calyx; N, fruit; O, transverse section of fruit.

of this species. This species was accidentally omitted from the fourth edition of the 'Flora of South Australia' (1986).

E. pentaptera is in cultivation in South Australia but it is not common. The species roots readily from cuttings but is susceptible to rot. Grafted plants appear to overcome this problem.

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