

The *Solanum petrophilum* complex (Solanaceae) revised, with the description of three new species

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Abstract

Five species are here recognised for the *Solanum petrophilum* F.Muell. complex. They are the previously named *S. petrophilum* F.Muell. and *S. eardleyae* Symon, and three newly described species: *S. lobatum* A.R.Bean, *S. osteocarpum* A.R.Bean and *S. pallidifolium* A.R.Bean. All taxa are illustrated, described, and their distributions mapped. A key is provided for their identification.

Keywords: *Solanum*, Solanaceae, revision, taxonomy, morphology, stellate hairs, new species, central Australia.

Introduction

Mueller (1853) described *Solanum petrophilum* from specimens he collected in the Flinders Ranges of South Australia. Black (1926) subsequently applied the name widely in that state to any *Solanum* with stellate hairs, sinuately lobed leaves and a prickly calyx, and included specimens from the far north-west. Symon (1981) had a similar broad concept of *S. petrophilum*, encompassing populations from the ranges of northern S.A. and southern N.T., as well as populations from the Goldfields region of W.A. and near Broken Hill in N.S.W. He did note subtle differences between plants found in the Gawler Ranges and those found in the Flinders Ranges, and greater differences in the plants from central Australian ranges, for which he suggested subspecific status might be appropriate. He separated *S. eardleyae* from the complex, but did not proceed any further in segregating the taxa within *S. petrophilum* sens. lat.

The current study identifies three new species from central Australia that are related to *S. petrophilum*, but each differing in several characters from it. They are described here as *S. lobatum*, *S. osteocarpum* and *S. pallidifolium*. All of the populations from the more southerly areas (Gawler Ranges, Flinders Ranges, Broken Hill, goldfields area of Western Australia) are included under *S. petrophilum*. *Solanum eardleyae* is maintained with its current circumscription.

Solanum petrophilum and its allies belong to the *S. hystrix* group (Whalen 1984). This group is characterised by the non-acrescent calyx, the acicular prickles on stems and leaves, the prominent prickles on the calyx, prickles present on the leaves, the adult leaves lobed, and the corolla rotate with its inner surface glabrous. The *S. petrophilum* complex is further defined by the

lack of simple hairs, the attenuate linear calyx lobes and the fruits becoming white and bony at maturity.

Distribution and habitat

The distribution of all species of this complex is highly correlated to the occurrence of rocky hills and ranges. The two already named species, *S. petrophilum* and *S. eardleyae*, often occur also on flat or undulating terrain, while the three new species appear to be confined to rocky habitats, or within a few hundred metres of rock outcrops.

Sometimes two species of the complex occur together. For example, *Canty & Robinson BS23-24236* (AD) and *Canty & Robinson BS23-24243* (AD) were both collected from the same 100 × 100 metre quadrat near Mt Woodroffe. The former is *S. eardleyae* while the latter is *S. lobatum*.

Selected morphological characters

Degree of leaf lobing

The degree of lobing on the leaves is measured by the “lobing index”, where the index is the length of a lobe (measured along the lateral vein) midway along the leaf divided by the parallel length at the adjacent sinus (Bean 2004: 642). This is an important character for distinguishing taxa in the complex. *S. lobatum* has a deeply lobed leaf (index (1.8–) 2.2–4.5); *S. eardleyae* can be entire or with very shallow lobes (index 1–1.2); *S. pallidifolium* is consistently shallowly lobed (index 1.2–1.8), while *S. osteocarpum* and *S. petrophilum* leaves can be shallowly or deeply lobed (index 1.2–2.5).

Stellate hair types

Ordinarily, a stellate hair on a *Solanum* species has a central ray and a number of lateral rays (often eight) arranged like the spokes of a wheel in a single plane, i.e.

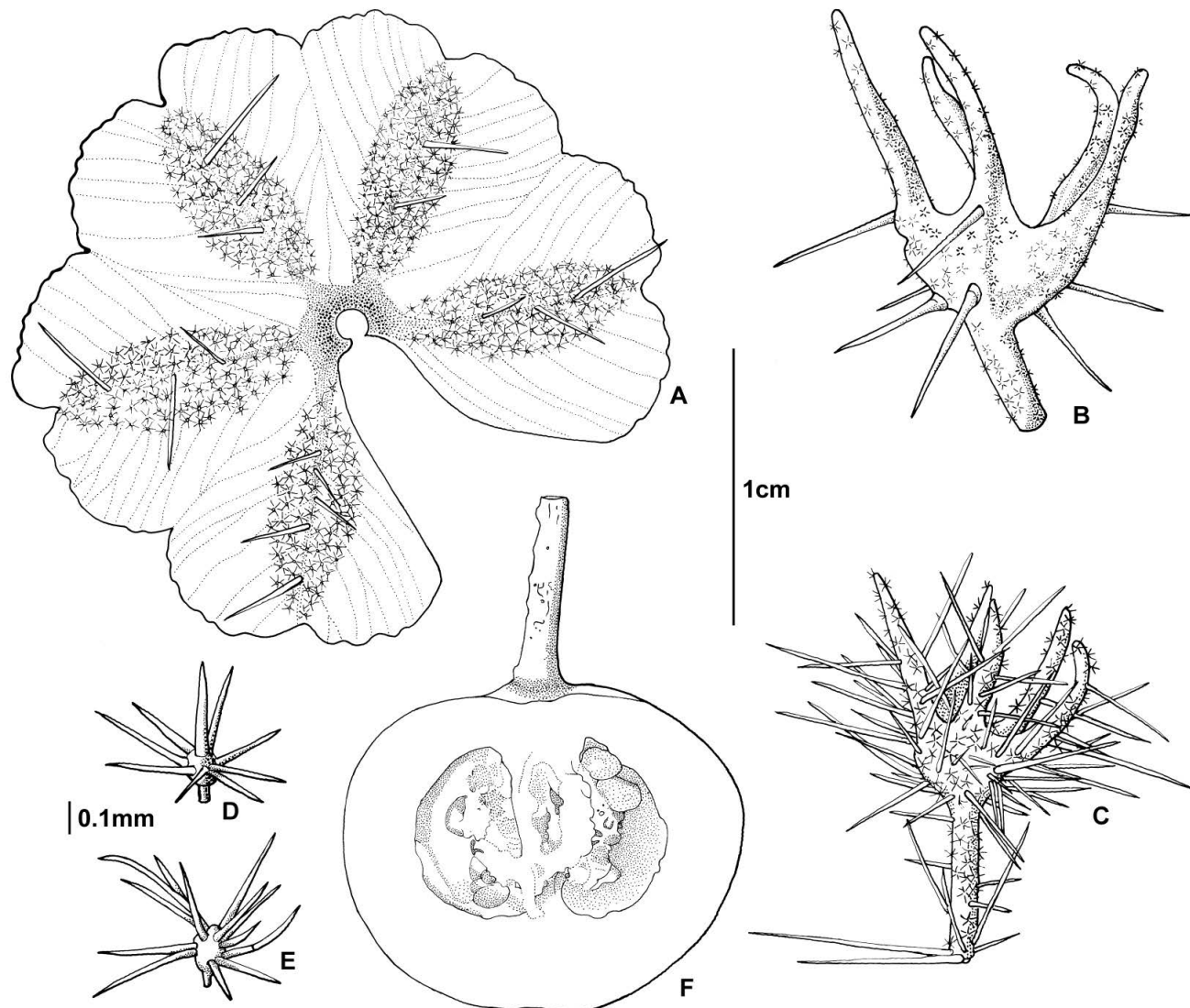


Fig. 1. **A** *Solanum eardleyae*, outer surface of corolla showing prickles along radial veins. **B** *S. petrophilum*, calyx and prickles. **C** *S. lobatum*, calyx and prickles. **D** *S. osteocarpum*, porrect stellate hair from lower leaf surface. **E–F** *S. pallidifolium*: **E** 2–3-tiered stellate hair from lower leaf surface; **F** longitudinal section of fruit. — Scale bars: A–C, F = 10 mm; D–E = 0.1 mm. — **A** P.D. Symon s.n. (AD 98567792); **B** B.J. Blaylock 482 (AD); **C** N.N. Donner 6551 (AD); **D** H.J. Eichler 17480 (AD); **E** D.J. Whibley 6480 (AD); **F** D.E. Murfet BS23-27433 (AD).

Key to the species of the *Solanum petrophilum* complex

1. Calyx prickles 10–35 per flower
 2. Bases of larger branchlet-prickles 0.6–1 mm wide; style strongly curved near base; 2–3-tiered stellate hairs absent. **S. petrophilum**
 - 2: Bases of larger branchlet-prickles 0.2–0.6 mm wide; style erect or slightly off-centre (not or scarcely curved near base); 2–3-tiered stellate hairs present **S. pallidifolium**
- 1: Calyx prickles 35–150 per flower
 3. Upper surface bright green with stellate hairs sparse, individual hairs 0.6–1.1 mm diameter; leaves deeply lobed, lobing index (1.8–) 2.2–4.5 **S. lobatum**
 - 3: Upper leaf surface grey-green, grey or silvery, with stellate hairs moderately dense to very dense, individual hairs 0.4–0.8 mm diameter; leaves entire or shallowly lobed, lobing index 1–2.5
 4. Leaves entire or with very shallow lobes (lobing index 1–1.2); inflorescences 8–15-flowered; upper surface of leaf with very dense indumentum **S. eardleyae**
 - 4: Leaves more distinctly lobed (lobing index 1.2–1.8); inflorescences 2–5 (–9)-flowered; upper surface of leaf with moderately dense to very dense indumentum
 5. 2–3-tiered stellate hairs absent, or rarely present on lower leaf surface (7–8 (–13) lateral rays); anthers 4.9–6.1 mm long; leaves elliptical **S. osteocarpum**
 - 5: 2–3-tiered stellate hairs (with 12–25 lateral rays) common on lower surface of leaves, especially along mid-vein, and occasional to common on upper leaf surface; anthers 3.3–4.0 mm long; leaves ovate to broadly ovate **S. pallidifolium**

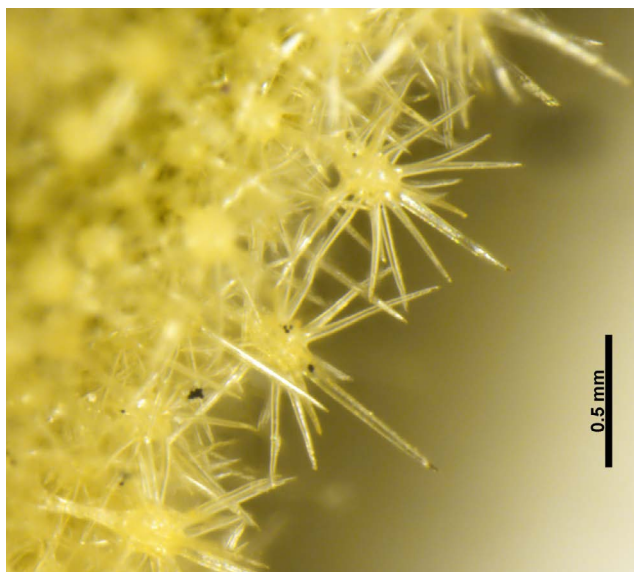


Fig. 2. Lower leaf surface of *Solanum pallidifolium*, showing 2–3-tiered hairs. — D. Edinger et al. 1891 (PERTH).

1-tiered (Fig. 1D). If the lateral rays are at right angles to the central ray, they are termed ‘porrect’, if the angle is less than 90 degrees, they are termed ‘ascending’. In *S. pallidifolium* and occasionally in *S. lobatum* and *S. osteocarpum*, hairs occur where the lateral rays are inserted at various points on an enlarged hub, forming two or three tiers of lateral rays, more or less parallel to each other. In this hair type, the central ray is quite discernible, and the number of lateral rays ranges from 12 to 25 (Fig. 1E, 2). This hair type is here termed a 2–3-tiered stellate hair, and it is a type rarely found elsewhere in Australian members of the genus. This hair is different from the multangulate hair of Roe (1971), as that hair type has rays arranged in a random manner forming a globose urchin-like structure where the central ray is indistinguishable.

The 2–3-tiered hair is found on a few collections of *S. lobatum*, and then only on the branchlets or the lower leaf surface. Similarly, it is found on a few collections of *S. osteocarpum*, and then only on the lower leaf surface. In the case of *S. pallidifolium*, 2–3-tiered hairs are found on all collections, and they occur on the branchlets, upper leaf surface, lower leaf surface, the inflorescence rachis and the calyx. Their frequency varies from occasional to abundant.

Stellate hair density

The terminology used for the density of the stellate hairs follows Bean (2004); the stellate hairs overlap for “very dense”, “dense” and “moderately dense”, while in “sparse” and “very sparse”, they do not overlap. The density of hairs on the upper leaf surface is diagnostic in the *S. petrophilum* complex. *S. lobatum* is notable for its sparse indumentum, and this correlates with the bright green appearance of the upper surface. *S. petrophilum* varies from sparse to moderately dense. *S. eardleyae* consistently has very dense indumentum on the upper

leaf surface, and *S. pallidifolium* and *S. osteocarpum* both vary from moderately dense to very dense.

Prickle density and distribution on leaves, branchlets and calyx

The distribution and density of prickles can be a useful character for separating the species in this group. *S. petrophilum* consistently has a low number of prickles (10–35) on the calyx, all other species tend to have very high numbers of prickles on the calyx (35–150), although some populations of *S. pallidifolium* have flowers that may bear as few as 15 prickles.

The density of prickles on the branchlets is quite variable, but *S. petrophilum* tends to have sparser prickles (2–9 per cm) than the other species.

The number of prickles on the upper leaf surface is somewhat diagnostic; *S. petrophilum* and *S. eardleyae* have the lowest numbers, 2–18 and 3–21 respectively. The other species tend have more prickles: 6–23 for *S. osteocarpum*, 5–57 for *S. lobatum*, and 8–16 for *S. pallidifolium*.

Flower number

The number of flowers in each cyme is diagnostic for the group. *S. eardleyae* has 8–15 flowers per inflorescence, often with an elongated rachis. *S. pallidifolium* has 1–5 flowers per inflorescence. *S. lobatum* usually has 6–11 flowers per inflorescence, but sometimes as few as three. *S. osteocarpum* generally has a short inflorescence with 2–5 flowers, but sometimes up to nine. *S. petrophilum* has 3–5 (–7) flowers.

Corolla prickles

In my observation, the presence of prickles on the outer surface of the corolla is another feature seemingly restricted to the *Solanum hystrix* group (member species listed in Bean 2004). Symon (1981: 7) mentioned that *S. hystrix* R.Br. and *S. hoplopetalum* Bitter & Summerh. bear prickles on the corolla, but during the present study, it has become clear that this character is more widespread. All flowering specimens of *S. eardleyae* bear five to 25 prickles along the main radial veins of the corolla of each flower (Fig. 1A). Some collections of *S. osteocarpum*, *S. pallidifolium*, and *S. lobatum* have prickles along the main radial veins of the corolla (usually only 5–10 per flower), while on other collections there are none. Only *S. petrophilum* is consistently without corolla prickles.

Materials and methods

This study is based on detailed morphological examination of herbarium specimens from PERTH, AD, BRI, CANB, DNA and NT. Measurements are based on dried material, except for those of the flower (style, anthers and corolla) where reconstituted material was measured. The format of the descriptions follows Bean (2004). Distribution maps have been compiled with DIVA-GIS Version 7.5.0, using localities or geocodes given on the labels of specimens from the herbaria listed above.

Taxonomy

Solanum eardleyae Symon

J. Adelaide Bot. Gard. 4: 212 (1981). **Type:** Northern Territory: Duffield Rocks, c. 91 km NE of Mt Davies Camp, 25° 36'S 129° 44'E, 1 October 1970, P.K. Latz 939 (holo: NT; iso: AD, CANB, MEL).

Solanum petrophilum auct. non F.Muell.: D.E.Symon in Jessop (ed.), Fl. Central Austral. 318 (1981), pro parte.

Illustration: Symon (1981: 213).

Erect rhizomatous perennial shrub, 0.5–2 m high. *Branchlets* terete, yellow, rusty or brown; prickles 18–76 per cm, straight and acicular, 2–9 mm long, 0.2–0.6 mm wide at base, 11–15 times longer than wide, glabrous; hairs stellate; stellate hairs very dense, 0.55–0.8 mm diameter, stalks 0–0.3 mm long, lateral rays 7–8, porrect or ascending, central ray 0.8–1.2 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; short glandular hairs absent. *Leaves* elliptical or ovate, 4.1–11.8 cm long, 1.4–4.5 cm wide, 1.4–3.3 times longer than broad, entire or shallowly lobed throughout; lobes 0–7 on each side, obtuse, lobing index 1–1.2; apex obtuse or acute, base cuneate or obtuse or cordate, oblique part 2–6 mm long, obliqueness index (Bean 2004) 3–7 percent; petioles 1.2–3 cm long, 21–32 % length of lamina, prickles present, indumentum not floccose. *Upper leaf surface* grey; prickles present on midvein only, 1–7, straight and acicular, 4–7 mm long; stellate hairs distributed throughout, very dense, c. 0.05 mm apart, 0.6–0.8 mm across, stalks 0–0.1 mm long; lateral rays 7–8, porrect or ascending; central ray 0.8–1.2 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; simple hairs absent; short glandular hairs absent. *Lower leaf surface* white to grey; prickles present on midvein only or present on midvein and lateral veins, 3–21, straight and acicular. Lower leaf surface stellate hairs very dense, not floccose, c. 0.05 mm apart, 0.5–0.7 mm diameter, stalks 0–0.2 mm long; lateral rays 7–8, porrect or ascending; central ray 0.7–1.2 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; simple hairs absent; short glandular hairs absent. *Inflorescence* supra-axillary, cymose (pseudoracemose), common peduncle 10–21 mm long, rachis prickles present, 8–15-flowered, with all flowers bisexual; flowers 5-merous; pedicels at anthesis 1–5 (–9) mm long, same thickness throughout, prickles absent or present. Calyx tube at anthesis 2–4 mm long; lobes attenuate, 5–9 mm long; prickles present, 75–140 per flower, 0.5–4.5 mm long; stellate hairs very dense, white or transparent, 0.55–0.7 mm across, stalks 0–0.3 mm long, lateral rays 7–8, central ray 0.8–1.2 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; simple hairs absent; short glandular hairs absent. Corolla purple, 16–23 mm long, rotate; outer surface with prickles, prickles 5–25; inner surface glabrous. Anthers 5–6.2 mm long; filaments 0.9–1 mm long; ovary with short glandular hairs only; functional style 11.5–13 mm long, erect or slightly off-centre near its

base then recurved towards apex, glabrous or with short glandular hairs only. Fruiting calyx lobes exceeding mature fruit, prickles 1.5–5 mm long. Mature fruits 3–6 per inflorescence, globular, 12–14 mm diameter, yellow or white, pericarp c. 2 mm thick, pedicels 2–8 mm long. **Fig. 1A, 3.**

Distribution & habitat. *Solanum eardleyae* is common in the Musgrave Range and Everard Range areas of far northern South Australia, and it extends into Northern Territory as far north as Mt Zeil and Mt Hay, and west to Duffield Rocks. There is also a single collection (Symon 17331 & Symon, AD) from the Stuart Highway far to the south of any other populations (Fig. 5). It is apparently absent from the areas around the Mann Ranges and Tomkinson Ranges. It inhabits hills and mountains, and the sandy plains and sandy colluvia adjacent to them, particularly appearing beside tracks where there has been recent disturbance.

One herbarium label (Bates 58153, AD) states that *S. eardleyae* is “the commonest [*Solanum*] species around the Musgraves”. The single plant collected from the Stuart Highway (Symon 17331 & Symon) presumably resulted from seeds inadvertently brought there in road building material.

Notes. *Solanum eardleyae* is most readily distinguished by its entire or very shallowly lobed adult leaves, the very dense indumentum on both leaf surfaces, and the large number of flowers per inflorescence. It is the tallest species of the complex, reportedly reaching two metres in height. Some populations of *S. osteocarpum* can also have a very dense indumentum on the leaves, but the leaves of *S. osteocarpum* are considerably more deeply lobed (lobing index 1.5–2.3) and it has only 2–5 (–9) flowers per inflorescence.

Specimens examined:

NORTHERN TERRITORY: Mulga Park, Anon. s.n. [*Pastoral Board*] (AD 98027031); Lake Cotterill, George Gill Ra., 8 July 1968, A.C. Beaglehole 25937 (AD); Lower Gorge, Kings Canyon, George Gill Ra., 8 July 1968, A.C. Beaglehole 26095 (AD); Mt Connor, 17 June 1974, G.W. Carr 1854 & A.C. Beaglehole 45633 (AD, DNA); Yununba Hill, c. 15 km ESE of Mulga Park Hmsd, 21 Aug. 1973, N.N. Donner 4329 (AD, BM); 6 km E of Kulgera on Finke road, 20 May 1988, M.D. Kimbel 119 (DNA, NT); Curtin Springs area, base of Mt Connor, 27 Apr. 1974, P.K. Latz 4980 (DNA); Mt Frazer, N Musgrave Ra., 29 Apr. 1974, P.K. Latz 5058 (DNA); Mt Hay, 20 km W of Hamilton Downs Hmsd, 16 Aug. 1995, P.K. Latz 14474 (DNA); 16 km W of Erldunda Hmsd, 2 Aug. 1997, P.K. Latz 15381 (DNA, MEL, NT); 30 km N of Ernabella, 20 Nov. 1999, P.K. Latz 16054 & D.E. Albrecht (NT); SW slopes of Mt Connor, 11 June 1975, D.E. Symon 10386 (AD, CANB, DNA); Mt Zeil, W side of mountain, 25 Nov. 1988, B.G. Thomson 2730 (DNA, NT).

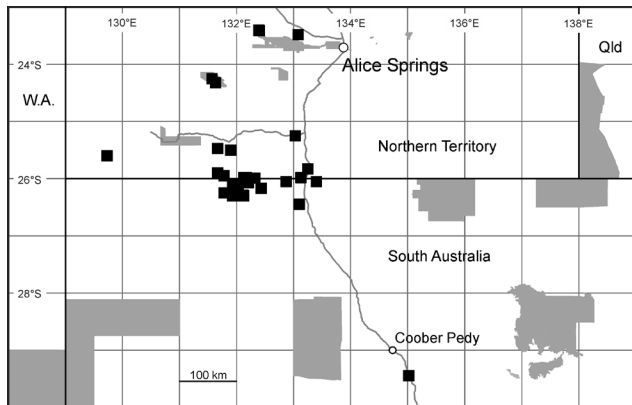
SOUTH AUSTRALIA: Alcurra Ck, 23 Apr. 2001, R. Bates 58153 (AD); Mitchell Nob, 7 May 2001, R. Bates 58496 (AD); 10 km NNE from Mt Woodroffe, 2.2 km direct SSW of Ngarutjara, 15 Oct. 1994, P.D. Canty & A.C. Robinson BS23-24236 (AD); SW of Mt Cuthbert, 16 July 1982, P.E. Conrick 799 (AD); 7.5 km SW from Womikata Bore Homeland, 22 Feb. 1995, P.B. Copley & S.J. Pillman BS23-24533 (AD);



Fig. 4. Representative specimen of *S. lobatum* (Hj. Eichler 17346, AD).



Fig. 3. Representative specimen of *Solanum eardleyae* (R. Hill 707 & T.R. Lethian, AD).

Fig. 5. Distribution of *Solanum eardleyae*.

Track between Ernabella and Mt Woodroffe turnoff, 30 June 1958, *R. Hill 707 & T.R. Lothian* (AD, BH, G, P); 17.7 km E of Ngarutjara, APY Lands, 11.6 km direct WSW of Mt Cuthbert, 18 Oct. 1994, *P.J. Lang BS23-24439* (AD); 5 km S of NT border on Tarcoola–Alice Springs railway, 20 Aug. 1979, *B. Lay 1246* (AD); 10 miles [16 km] N of Kenmore Park Stn, 12 Aug. 1962, *D.E. Symon 2705* (AD); Stuart Hwy, 60 km S of Coober Pedy, 41 km N of Glendambo, 11 Jan. 2009, *D.E. Symon 17331 & J. Symon* (AD, NT); Vicinity of Ernabella Mission, 13 June 1976, *P.D. Symon s.n.* (AD 98567792); Ernabella, E end of Musgrave Ra., 21 May 1966, *F.T. Turvey s.n.* (AD); 0.5 km S of Ernabella, 21 Sep. 1990, *P.G. Wilson 777 & R. Rowe* (AD).

Solanum lobatum A.R.Bean, *sp. nov.*

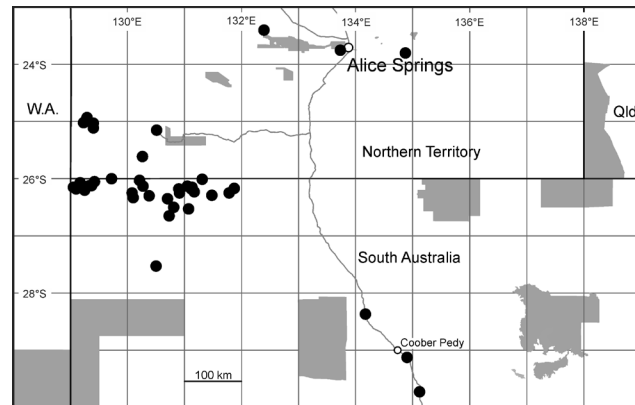
With affinity to S. petrophilum, but differing by the more deeply lobed adult leaves, greater number of prickles on the leaves, the larger stellate hairs of the upper leaf surface, and the greater number of calyx prickles (75–150 per flower).

Type: South Australia: At foot of Mt Harriet, Musgrave Range, 5 September 1963, *D.J.E Whibley 932* (holo: AD!; iso: AAU, M, NY, all n.v.).

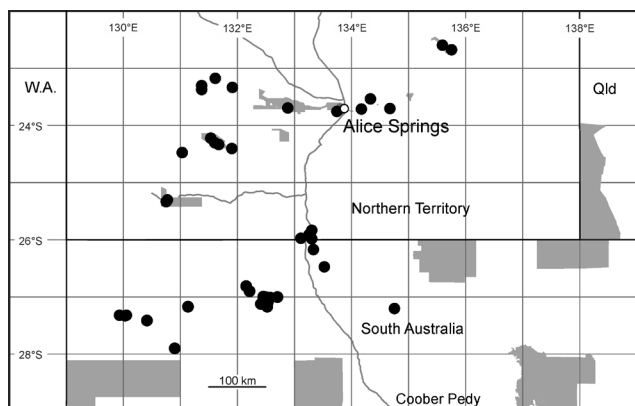
Solanum petrophilum auct. non F.Muell.: *D.E.Symon* in Jessop (ed.), *Fl. Central Austral.* 318 (1981), pro parte; *D.E.Symon*, *Rev. genus Solanum in Austral.*, *J. Adelaide Bot. Gard.* 4: 214 (1981), pro parte; *R.W.Purdie et al.* in *A.S.George* (ed.), *Fl. Austral.* 29: 149 (1982), pro parte; *D.E.Symon* in Jessop & Toelken (eds), *Fl. S. Austral.*, ed. 4, 3: 1269 (1986), pro parte; *W.R.Barker et al.* (eds), *J. Adelaide Bot. Gard. Suppl.* 1: 124 (2005), pro parte; *P.S.Short et al.* (eds), *Checkl. Vasc. Pl. N. Territory* 71 (2011).

Illustration: Barker (2010), left-hand photo (Pitjan-tjara Lands, A. Robinson).

Erect rhizomatous perennial shrub, 0.3–0.6 m high. *Branchlets* terete, yellow, grey, rusty or brown; prickles 10–46 per cm, straight and acicular, 1.5–11 mm long, 0.2–0.6 mm wide at base, 11–18 times longer than wide, glabrous; hairs stellate; stellate hairs very dense, 0.4–0.8 mm diameter, stalks 0–0.2 mm long, lateral rays 7–8 (–23), porrect, ascending or rarely 2–3-tiered; central ray 0.8–2 times as long as laterals, not gland-tipped; short glandular hairs absent. *Leaves* elliptical or ovate, 3.0–8.5 cm long, 1.1–4.1 cm wide, 1.7–4.1 times longer than broad, deeply lobed throughout, or occasionally shallowly lobed; lobes 4–8 on each side, obtuse, lobing

Fig. 6. Distribution of *S. lobatum*.

index (1.8–) 2.2–4.5; apex obtuse, base cuneate, cordate or obtuse, oblique part 0–11 mm long, obliqueness index 0–7 percent; petioles 0.8–2.5 cm long, 18–36 % length of lamina, prickles present, indumentum not floccose. *Upper leaf surface* green; prickles present on midvein and lateral veins, 9–56, straight and acicular, 1.5–11 mm long; stellate hairs distributed throughout, sparse, 0.35–1.0 mm apart, 0.6–1.1 mm across, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray 1.0–2.0 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; simple hairs absent; short glandular hairs absent. *Lower leaf surface* white to grey or yellowish; prickles present on midvein and lateral veins, 5–57, straight and acicular. Lower leaf surface stellate hairs dense to very dense, not floccose, 0.05–0.25 mm apart, 0.6–1.0 mm diameter, stalks 0–0.3 mm long; lateral rays 7–8 (–25), porrect or ascending, rarely 2–3-tiered; central ray 1.0–2.0 times as long as laterals, not gland-tipped; simple hairs absent; short glandular hairs absent. *Inflorescence* leaf-opposed or supra-axillary, cymose (pseudo-racemose), common peduncle 6–41 mm long, rachis prickles present, (3–) 6–11-flowered, with all flowers bisexual; flowers 5-merous; pedicels at anthesis 3–7 mm long, same thickness throughout, prickles absent or present. Calyx tube at anthesis 1.5–3.5 mm long; lobes attenuate, 3.5–10 mm long; prickles present, 75–150 per flower, 1–7.5 mm long; stellate hairs dense to very dense, white or transparent or purplish, 0.4–0.7 mm across, stalks 0–0.2 mm long, lateral rays 6–8 (–16), porrect, ascending, or rarely 2–3-tiered; central ray 1.0–2.0 times as long as laterals, not gland-tipped; simple hairs absent; short glandular hairs absent. Corolla purple, 12–16 mm long, rotate; outer surface with or without prickles, prickles 0–10; inner surface glabrous. Anthers 4.1–5.6 mm long; filaments 1–1.5 mm long; ovary glabrous or with short glandular hairs only; functional style 8.5–11 mm long, erect or slightly off-centre near its base then recurved towards apex, glabrous or with short glandular hairs only. Fruiting calyx lobes more than half length of mature fruit or exceeding mature fruit, prickles 1.5–7 mm long. Mature fruits 1–7 per inflorescence, globular, c. 12 mm diameter, yellow or white, pericarp 1–1.5 mm thick, pedicels 5.5–10 mm long. **Fig. 1C, 4.**

Fig. 7. Distribution of *S. osteocarpum*.

Distribution & habitat. *Solanum lobatum* is found mainly in far south-western N.T. (Petermann Ranges), and in the western Musgrave Ranges, the Mann Ranges and the Tomkinson Ranges of far northern South Australia, but extends as far north as Alice Springs and south to some isolated mountains south of the Musgrave Ranges (e.g. Mt Crombie, Mt Harriet). There are also three recent collections from the Stuart Highway (Fig. 6). This species grows on or adjacent to rocky outcrops and hills, at least some of which are granitic in origin. Soils are shallow to deep sands.

The recent specimen records from the Stuart Highway (Symon 16116, 17392 & 17393) were all from isolated plants immediately beside the highway. It is presumed that these resulted from seeds inadvertently brought there in road building material.

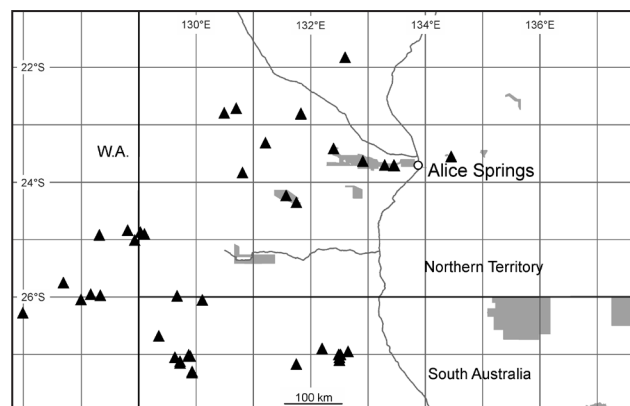
The westernmost herbarium record of *S. lobatum* in South Australia (in the Tomkinson Ranges) is only about 10 km from the Western Australian border, so it seems highly likely that this species will eventually be found in the latter state.

Notes. Some specimens from the Tomkinson Range (e.g. N.N. Donner 6551) have very few flowers per inflorescence, the leaves are not as deeply lobed, and the indumentum includes some 2–3-tiered stellate hairs. These specimens may represent a distinct taxon, but more specimens and observations are needed before this can be decided.

Etymology. The epithet refers to the deeply lobed adult leaves, which are more dissected than in any other species of the complex.

Specimens examined:

NORTHERN TERRITORY: Mt Zeil, 0.5 km S of summit, 10 July 1998, D.E. Albrecht 8667 (NT); 3 km NE of Butler Dome summit, 84 km WSW of Uluru, 17 Oct. 2010, D.E. Albrecht 13269 & P.K. Latz (NT); Lasseter's Cave, Hull R., 24 June 1958, G. Chippendale 4610 (DNA); Petermann Ra. Res., Mannanana Ra., 10 Sep. 1978, T.S. Henshall 2184 (DNA); Petermann Ra., 24 Sep. 1971, P.K. Latz 1777 (DNA); 8 km NNW of Ringwood Stn Hmsd, 19 Nov. 2001, P.K. Latz 18342 (NT); 22 km ESE of Angatja, 63 km W of Amata, 31 Aug. 2009, P.K. Latz 24721 (AD, NT); Temple Bar Stn, 1 June

Fig. 8. Distribution of *S. pallidifolium*.

1993, D.J. Nelson 2872 (DNA, NT); Mt Zeil, summit, 6 Sep. 1999, J. Risler & R.A. Kerrigan 288 (DNA, NT).

SOUTH AUSTRALIA: S facing slopes of Hinckley Ra., Tomkinson Ra., c. 7 km by road W of main Pipalyatjara (Mt Davies Camp)–Wingellina road, 4 Sep. 1978, W.R. Barker 3212 (AD); W end of Musgrave Ra., c. 2 km N of No. 25 Bore, c. 25 km direct WSW of Amata, 11 Sep. 1978, W.R. Barker 3509 (AD); 1 km SE from Hanging Knoll, 6 May 1993, P.D. Canty & J.S. Gillen BS23-23590 (AD); 14 km ENE from Mt Cooperinna, 5 May 1994, P.D. Canty et al. BS23-23842 (AD); 9 km SSE from Mitchell Nob, 18 Oct. 1994, P.D. Canty & A.C. Robinson BS23-24179 (AD); 10 km NNE from Mt Woodroffe, 2.2 km direct SSW of Ngarutjara, 15 Oct. 1994, P.D. Canty & A.C. Robinson BS23-24243 (AD); Cave Hill, Musgrave Ra., 18 June 1958, J.B. Cleland s.n. (AD); Tomkinson Ra., 25 Aug. 1954, J.B. Cleland s.n. (AD); Mt Davies in Tomkinson Ra., c. 15 km E of WA border and 20 km S of NT border, 29 June 1960, J.B. Cleland s.n. (AD); N side of Mt Crombie, approximately 60 km SSW of Amata, 16 Sep. 1985, P. Copley 1352 (AD); 8 km W of Mt Crombie, 16 Sep. 1985, P. Copley 1425 (AD); Creek c. 2.5 km NW of Mt Davies Camp, 4 Sep. 1978, N.N. Donner 6551 (AD); Between Deering Hills and Mann Ra., c. 18 km NE of Mt Cooperinna, 9 Sep. 1978, N.N. Donner 6622 (AD, DNA); W slope to summit of Mt Morris, 7 Sep. 1963, H.J. Eichler 17346 (AD); 7.6 km direct ENE of Yurangka, 20 Oct. 1998, P.J. Lang & P.D. Canty BS23-28913 (AD); Musgrave Park, c. 55 km WNW of Mt Woodroffe, Aug. 1963, R. Lange 4 (AD); College Glen, E Mann Ra., 17 May 1991, P.K. Latz 11863 (AD, DNA, NT); Piltardi rock hole, Mann Ra., 21 Sep. 1958, W.S. Reid 75 (AD); Mt Harriet, SW from Mt Woodroffe, Musgrave Ra., 1 Oct. 1955, W.S. Reid s.n. (AD); c. 0.75 km W of road to Waltjitjara, c. 6.5 km by road NNE of turnoff from Pipalyatjara to Putaputa road, Tomkinson Ra., 6 Sep. 1978, K. Stove 499 (AD); 3 miles N of Mt Davies Camp, Tomkinson Ra., 5 Aug. 1962, D.E. Symon 2536 (AD); 12 miles S of Cheesmans Peak Corner, 7 Aug. 1962, D.E. Symon 2596 (AD); 58 km S of Cadney Park on main road, 17 km N of turnoff to Murloocoppie Rockhole, 29 Jan. 2000, D.E. Symon 16116 & J. Symon (AD); Stuart Hwy, 19 km S of Coober Pedy, 11 Jan. 2009, D.E. Symon 17392 & J. Symon (AD); Stuart Hwy, 94 km S of Coober Pedy, 160 km N of Glendambo, 11 Jan. 2009, D.E. Symon 17393 & J. Symon (AD); Camp 5, Arukalanda, W. Musgrave Ra., 26 June 1933, N.B. Tindale & C.J. Hackett s.n. (AD); SE end of Mt Caroline, Musgrave Ra., 11 Sep. 1978, J.Z. Weber 5596 (AD); Plain between Tomkinson and Mann Ra., c. 15.5 km by road NNE of turnoff on Pipalyatjara–Putaputa road, on road to Waltjitjara, 6 Sep. 1978, D. Whibley 6800 (AD, DNA); 5.6 km S of Amata, 21 Sep. 1990, P.G. Wilson 771 & R. Rowe (AD, CANB, NSW).

***Solanum osteocarpum* A.R.Bean, sp. nov.**

With affinity to S. petrophilum but differing by the larger stellate hairs on the lower leaf surface, the more slender prickles on all plant parts, the greater number of calyx prickles, and the longer style.

Type: South Australia. Amoorinya Hill, Everard Range, c. 26 km SW of Everard Park Homestead, 13 September 1963, H.J. Eichler 17480 (holo: AD; iso: CANB (ex CGE)).

Solanum petrophilum auct. non F.Muell.: D.E.Symon in Jessop (ed.), Fl. Central Austral. 318 (1981), pro parte; D.E.Symon, Rev. genus *Solanum* in Austral., J. Adelaide Bot. Gard. 4: 214 (1981), pro parte; R.W.Purdie et al. in A.S.George (ed.), Fl. Austral. 29: 149 (1982), pro parte; D.E.Symon in Jessop & Toelken (eds), Fl. S. Austral., ed. 4, 3: 1269 (1986), pro parte; W.R.Barker et al. (eds), J. Adelaide Bot. Gard. Suppl. 1: 124 (2005), pro parte; P.S.Short et al. (eds), Checkl. Vasc. Pl. N. Territory 71 (2011).

Erect rhizomatous perennial shrub, 0.2–0.7 m high. *Branchlets* terete or ridged, yellow, grey rusty or brown; prickles 9–28 per cm, straight and acicular, 2–9 mm long, 0.2–0.6 mm wide at base, 15–18 times longer than wide, glabrous; hairs stellate; stellate hairs very dense, 0.5–0.7 mm diameter, stalks 0–0.3 mm long, lateral rays 6–8, porrect or ascending, central ray 1.0–1.5 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; short glandular hairs absent. *Leaves* elliptical, 3.7–7.2 cm long, 1.4–3.4 cm wide, 2.1–3.1 times longer than broad, shallowly or deeply lobed throughout; lobes 4–6 on each side, obtuse or acute, lobing index 1.2–2.5; apex obtuse or acute, base cuneate or obtuse or cordate, oblique part 1.5–8 mm long, obliqueness index 3–13 percent; petioles 0.8–2.1 cm long, 14–35 % length of lamina, prickles present, indumentum not floccose. *Upper leaf surface* green, grey-green or grey; prickles present on midvein only or on midvein and lateral veins, 6–23, straight and acicular, 2–11 mm long; stellate hairs distributed throughout, moderately dense to very dense, 0.05–0.4 mm apart, 0.5–0.75 mm across, stalks 0–0.2 mm long; lateral rays 7–8, porrect or ascending; central ray 0.8–1.5 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; simple hairs absent; short glandular hairs absent. *Lower leaf surface* white to grey or greenish-white; prickles present on midvein and lateral veins, 16–36, straight and acicular. Lower leaf surface stellate hairs dense to very dense, not floccose, 0.05–0.2 mm apart, 0.65–0.8 mm diameter, stalks 0–0.3 mm long; lateral rays 7–8 (–13), porrect or ascending or rarely 2–3-tiered; central ray 0.8–1.5 times as long as laterals, not gland-tipped; simple hairs absent; short glandular hairs absent. *Inflorescence* supra-axillary, cymose (pseudo-racemose), common peduncle 15–39 mm long, rachis prickles present, 2–5 (–9)-flowered, with all flowers bisexual; flowers 5-merous; pedicels at anthesis 2.5–9 mm long, same thickness throughout, prickles absent or present. Calyx tube at anthesis 2–4 mm long; lobes attenuate, 6–11 mm long; prickles present, (35–) 40–90 per flower, 1–5.5 mm long; stellate hairs dense to very dense, white or transparent, 0.55–0.7 mm

across, stalks 0–0.2 mm long, lateral rays 7–8, central ray 0.8–1.2 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; simple hairs absent; short glandular hairs absent. Corolla purple, 17–26 mm long, rotate; outer surface with or without prickles, prickles 0–25; inner surface glabrous. Anthers 4.9–6.1 mm long; filaments 1–1.5 mm long; ovary glabrous; functional style 11–12 mm long, erect or slightly off-centre near its base then recurved towards apex, glabrous. Fruiting calyx lobes exceeding mature fruit, prickles 2.5–6.5 mm long. Mature fruits 1–6 per inflorescence, globular, c. 14 mm diameter, yellow or white, pericarp 1–1.5 mm thick, pedicels 8–10 mm long. **Figs. 1D, 9, 11.**

Distribution & habitat. *Solanum osteocarpum* extends from the Marshall Bore (near Harts Range) NE of Alice Springs (N.T.), south to the Cheesman Junction area and the Everard Ranges of northern S.A. (Fig. 7). It grows on or adjacent to granite, sandstone or quartzite hills and ranges, on skeletal or sandy soil. It is apparently absent from the Tomkinson, Mann, and Musgrave Ranges of far northern South Australia.

Notes. *Solanum osteocarpum* has a shallowly lobed leaf with moderately dense to very dense indumentum on the upper leaf surface. It typically has a rather short inflorescence with 2–5 flowers, though it can have up to 9 flowers. The fruits have a very thick pericarp, and over-mature fruits are very “bony”. In the great majority of collections, 2–3-tiered stellate hairs are lacking, but they can be found on the lower leaf surface in a few collections.

Solanum osteocarpum differs from *S. lobatum* by the leaves being not as deeply lobed, with a moderately dense to very dense indumentum on the upper surface, and the individual stellate hairs of the upper surface mostly smaller. Its corolla is larger and the style is longer.

Etymology. The epithet is from the Greek *ostion* (bone) and *carpos* (fruit), and refers to the thick hard ‘bony’ outer layer of the fruit found in this species and others of the complex.

Specimens examined:

NORTHERN TERRITORY: Kathleen Springs, along boardwalk, Watarrka N.P., 11 Oct. 2005, K.S. Baker & R.B. Brown 19 (K, NT); 7 miles [11 km] S of Kulgera Hmsd, 5 Aug. 1954, G. Chippendale 155 (CANB, DNA); near Ulambaura Spring, Haast Bluff, 23 Aug. 1956, G. Chippendale 2604 (BRI, DNA); Gorge near Mt Liebig, 23 July 1957, G. Chippendale 3536 (DNA); Old Huckitta Hmsd, 20 July 1970, P.K. Latz 665 (DNA); Mt Olga Gorge, 22 Sep 1971, P.K. Latz 1745 (NT); Bendstead Ra., 27 July 1972, P.K. Latz 3135 (NT); Mt Cavenagh Stn, 1 May 1974, P.K. Latz 5215 (DNA); Glen Thirsty, 58 km SW of Kings Canyon, 14 Oct 2004, P.K. Latz 20612 (NT); 6 km NE of Kings Ck, E George, Gill Ra., 16 Sep. 2014, P.K. Latz 29702 (DNA, NT).

SOUTH AUSTRALIA: Kathleen Waterhole, Todmorden Stn, 25 June 1992, F.J. Badman 5452 (AD); 1 km E of Marys Well, De Rose Hill Stn, 22 Aug. 1992, F.J. Badman 6066 (AD); c. 26 km by road due W of Cheesman Junction, c. 0.5 km W of first hill



Fig. 10. Representative specimen of *S. pallidifolium* (D.J. Whibley 6480, AD).



Fig. 9. Holotype of *Solanum osteocarpum* (Hj. Eichler 17480, AD).



Fig. 11. Cultivated plant of *Solanum osteocarpum* at Alice Springs Desert Park (ex King's Canyon). Photo: A.R. Bean.

encountered, 29 Aug. 1978, *W.R. Barker 3010* (AD); Everard Park, ESE of Mt Illbillie, 27 June 1968, *A.C. Beauglehole 25464* (AD); Betty's Ck Gorge, Everard Ra., 4 Oct. 1974, *C.D. Boomsma 56* (AD); 1.4 km NW from Carmeena Well, 0.9 km direct SSE of Mt Carmeena, 19 Sep. 1992, *P.D. Canty & P.B. Copley BS23-20866* (AD); Piltadi, Mann Ra., 21 Aug. 1954, *J.B. Cleland s.n.* (AD); Between Officer Ck and Everard Ra., 1 Sep. 1954, *J.B. Cleland s.n.* (AD); Tjatamangka Rockhole, c. 18 km by road SE of Cheesman Junction, beside road to Emu, 27 Aug. 1978, *N.N. Donner 6374* (AD); Everard Ra., gorge N of Victory Well, 12 Sep. 1963, *Hj. Eichler 17431* (AD); Everard Ra., 1 June 1891, *R. Helms s.n.* (AD); Lower foothills, Mt Illbillie, Everard Ra., 5 Sep. 1968, *D.N. Kraehenbuehl s.n.* (AD); Valley above Victory Well, Everard Ra., 23 May 2000, *P.J. Lang BS23-30022* (AD); About 80 km SE of Cheesman Peak, anno 1966, *R.B. Major 31* (AD); c. 6 km by vehicle cross-country NE of Moolalpinna Hill E end, c. 6 km S of Ampeinna Hills, 26 Aug. 1978, *J.Z. Weber 5258* (AD); c. 1.75 km WNW of summit of Mt Poondinna Rockhole, 29 Aug. 1978, *D.J. Whibley 6435* (AD, DNA).

***Solanum pallidifolium* A.R.Bean, sp. nov.**

With affinity to S. petrophilum but differing by the more slender prickles, the presence of 2–3-tiered stellate hairs on most plant parts, and the longer central ray of the stellate hairs on the branchlets and leaves.

Type: Northern Territory: Larapinta Trail, Standley Chasm area, c. 40 km W of Alice Springs, 1 August

2006, *A.R. Bean 25450 & D.E. Albrecht* (holo: BRI; iso: CANB, NT).

Solanum petrophilum auct. non. F.Muell.: D.E.Symon in Jessop, (ed.), Fl. Central Austral. 318 (1981), pro parte; D.E.Symon, Rev. genus *Solanum* in Austral., J. Adelaide Bot. Gard. 4: 214 (1981), pro parte; R.W.Purdie et al. in A.S.George (ed.), Fl. Austral. 29: 149 (1982), pro parte; D.E.Symon in Jessop & Toelken (eds), Fl. S. Austral., ed. 4, 3: 1269 (1986), pro parte; W.R.Barker et al. (eds), J. Adelaide Bot. Gard. Suppl. 1: 124 (2005), pro parte; P.S.Short et al. (eds), Checkl. Vasc. Pl. N. Territory 71 (2011).

Illustration: Symon (1981: 217), as *S. petrophilum*.

Sprawling or erect rhizomatous perennial shrub, 0.3–0.6 m high. *Branchlets* terete, white, grey or brown; prickles 6–26 per cm, straight and acicular, 1–9 mm long, 0.2–0.6 mm wide at base, 10–18 times longer than wide, glabrous or with 3–8 stellate hairs at base; stellate hairs very dense, 0.5–0.7 mm diameter, stalks 0–0.3 mm long, lateral rays 8–25, porrect, ascending or 2–3-tiered, central ray 1.2–1.8 times as long as laterals, not gland-tipped; short glandular hairs absent. *Leaves* ovate to broadly ovate, 3.5–9.0 cm long, 1.6–5.0 cm wide, 1.6–2.4 times longer than broad, shallowly lobed throughout; lobes 4–7 on each side, obtuse, lobing



Fig. 12. *Solanum pallidifolium* plant on the Larapinta Trail, near Standley Chasm (A.R. Bean 25450 & D.E. Albrecht). Photo: A.R. Bean.

index 1.2–1.8; apex obtuse, base obtuse, oblique part 2–4 mm long, obliqueness index 3–6 percent; petioles 0.9–3.3 cm long, 23–42% length of lamina, prickles present, indumentum often floccose. *Upper leaf surface* grey-green or grey; prickles present on midvein and lateral veins, 8–16, straight and acicular, 1–8.5 mm long; stellate hairs distributed throughout, moderately dense to very dense, 0.05–0.4 mm apart, 0.4–0.7 mm across, stalks 0–0.2 mm long; lateral rays 6–18, porrect or ascending or 2–3-tiered; central ray 1.0–2.0 times as long as laterals, not gland-tipped; simple hairs absent; short glandular hairs absent. *Lower leaf surface* greenish-white to white; prickles present on midvein and lateral veins, 8–25, straight and acicular. Lower leaf surface stellate hairs dense to very dense, often floccose, 0.05–0.25 mm apart, 0.5–0.8 mm diameter, stalks 0–0.4 mm long; lateral rays 8–23, porrect or ascending or 2–3-tiered; central ray 1.0–2.0 times as long as laterals, not gland-tipped; simple hairs absent; short glandular hairs absent. *Inflorescence* supra-axillary, cymose (pseudo-racemose), common peduncle 15–28 mm long, rachis prickles present, 1–5-flowered, with all flowers bisexual; flowers 5-merous; pedicels at anthesis 1–4.5 mm long, same thickness throughout, prickles absent or present. Calyx tube at anthesis 1.5–3.5 mm long; lobes

attenuate, 3–10 mm long; prickles present, 15–100 per flower, 1–6 mm long; stellate hairs very dense, white or transparent, 0.5–0.6 mm across, stalks 0–0.3 mm long, lateral rays 8–18, porrect, ascending or 2–3-tiered; central ray 1.0–1.5 times as long as laterals, not gland-tipped; simple hairs absent; short glandular hairs absent. Corolla purple, 9–18 mm long, rotate; outer surface with or without prickles, prickles 0–15; inner surface glabrous. Anthers 3.3–4.0 mm long; filaments 0.5–1.2 mm long; ovary with short glandular hairs only; functional style 7.5–10 mm long, erect or slightly off-centre near its base then recurved towards apex, glabrous or with short glandular hairs only. Fruiting calyx lobes more than half length of mature fruit or exceeding mature fruit, prickles 1–5 mm long. Mature fruits 1–3 per inflorescence, globular, 10–14 mm diameter, yellow or white, pericarp 1–2.5 mm thick, pedicels 2.5–8 mm long. **Figs. 1E–F, 2, 10, 12.**

Distribution & habitat. *Solanum pallidifolium* is found on a number of ranges and mountains in southern Northern Territory, south from Mt Leichhardt, in Western Australia eastwards from Warburton, and on the Birksgate, Mann and Everard Ranges of South Australia (Fig. 8). It grows on rocky slopes or in rock

Fig. 13. Representative specimen of *Solanum petrophilum* (B.J. Blaylock 482, AD).

crevices on granite inselbergs and outcrops, on quartzite mountaintops and ranges, and sometimes on sandy soils adjacent to these ranges. Altitudes are above 650 metres in S.A. and W.A., and above 900 metres in N.T. This species has a broad distribution on hills and mountains in central Australia, though apparently absent from the Musgrave Ranges.

Notes. *Solanum pallidifolium* is distinguished from other species in the complex by its short anthers and rather broad leaves with pale to silvery indumentum and 4–7 pairs of shallow lobes. The tomentum on the lower leaf midrib and the petiole is often floccose, and 2–3-tiered stellate hairs are present on both the lower and upper side of the leaves. Specimens from the Macdonnell Ranges frequently have fewer calyx prickles (15–40) per flower, while specimens from elsewhere have between 30 and 100 calyx prickles.

Incomplete specimens of *S. pallidifolium* are sometimes difficult to distinguish from *S. osteocarpum*, particularly those from around Ronald Bore in the Everard Ranges. *S. pallidifolium* has many 2–3-tiered stellate hairs on the underside of the leaves, rachises and calyces, while *S. osteocarpum* has few or none. In addition, *S. pallidifolium* has an ovate to broadly ovate lamina, a shorter style and shorter anthers.

Etymology. The epithet is from the Latin *pallidus* (pale) and *folius* (leaf), and refers to the conspicuously grey or even silvery appearance of the leaves of this species.

Specimens examined:

WESTERN AUSTRALIA: Petermann Ra., W of N.T.-W.A. border, 22 Sep. 1978, *A.C. Beaglehole* 60530 & *E.G. Errey* 4230 (PERTH); Base of Schwerin Mural Crescent near Gill Pinnacle, 17 June 1977, *A.A. Burbidge* 49/77 & *P.J. Fuller* (PERTH); Just S of Camp 1 at Townsend Ridges, 42 km SE of Warburton, 6 May 2000, *D.J. Edinger* 1891 *et al.* (PERTH); Camp 2, N Jameson Ra., 113 km ENE of Warburton, 30 Apr. 2001, *D.J. Edinger* 2335 (PERTH); Cavenagh Ra., 7 July 1963, *A.S. George* 4773 (PERTH); Pass of the Abencerrages, Rawlinson Ra., 9 July 1963, *A.S. George* 4914 (PERTH); c. 3 miles [5 km] W of Blackstone Mining Camp, Blackstone Ra., E section, 11 July 1958, *R. Hill* & *T.R. Lothian* 923 (DNA).

NORTHERN TERRITORY: Mt Leichhardt, upper S slope, 25 Aug. 2005, *D.E. Albrecht* 11681 & *P.K. Latz* (NT); Garden of Eden, 50 metres from main pool, Watarrka N.P., 24 Aug. 2002, *J.S. Barnetson* 131 (NT); Petermann Ra., 22 Sep. 1978, *A.C. Beaglehole* 60712 & *E.G. Errey* 4412 (DNA); Trepchina Gorge, c. 50 miles E of Alice Springs, 5 Aug. 1957, *G. Chippendale* 3585 (NT); Mt Cockburn, 17 Jan. 1972, *N. Henry* 373 (DNA); Mann Ra., 31 miles [50 km] ENE of Mt Davies camp, 25 59'S 129 40'E, 31 Oct. 1970, *P.K. Latz* 896 (DNA); 6 miles [10 km] SW of Mt Liebig bore, 6 Apr. 1972, *P.K. Latz* 2286 (DNA); Dean Ra., 26 Aug. 1973, *P.K. Latz* 4189 (DNA); Pulca Carrinya rockhole, Mt Wedge Stn, 3 Sep. 1976, *P.K. Latz* 6602 (AD, DNA, NT); Spencer Gorge, Chewings Ra., 26 May 1977, *P.K. Latz* 7110 (DNA); Mt Gurner, 48 km W of Newhaven Hmsd, 9 June 2002, *P.K. Latz* 18677 (NT); Pulca Carrinya waterhole, central Mt Wedge area, 26 Apr. 1988, *G. Leach* 1880 & *M. Barret* (DNA); Standley Chasm, c. 49 km W of Alice Springs, 14 July 1968, *A.E. Orchard* 838 (AD, NT); Gill Ck, Mt Winter, 27 Apr. 1987, *B.G. Thomson* 1678 (DNA, NT); Chewings Ra., 27 Feb. 1990, *B.G. Thomson* 3419 (DNA, NT).

SOUTH AUSTRALIA: Ronald Well area, Everard Ra., Everard Park, 25 June 1965, *A.C. Beauglehole 10182* (AD); 5 km S of Victory Well on road to Teeta Bore, Everard Ra., 7 Sep. 1985, *P.D. Canty 1294* (AD); 3.5 km W from Ronald Bore, 22 Mar. 1993, *P.D. Canty & J.S. Gillen BS23-21286* (AD); 5.6 km W (271 deg.) from Mt Hoare, 23 Sep. 2001, *P.D. Canty BS23-38957* (AD); Camp 15, [Near Mt Watson, Birksgate Ra.], 6 July 1891, *R. Helms s.n.* (AD); Mt Lindsay, at base of SE side, Birksgate Ra., 29 Aug. 1980, *P. Horton 210* (AD); 1.8 km SW from Mt Lindsay, 3.2 km direct NNE of Mt Holder, 18 Oct. 1996, *P.J. Lang & P.D. Canty BS23-26593* (AD); 0.5 km direct NNW of Wartaru, 19 Oct. 1996, *P.J. Lang et al. BS23-26673* (AD); Mt Illillinna, APY Lands, 0.9 km direct ENE of Mt Illillinna, 13 June 1997, *D.E. Murfet BS23 27433* (AD); Above Watarunya Rockhole, head of the valley on S side of Mt Lindsay, 30 Aug. 1978, *K. Stove 307* (AD); 4 miles NW of Everard Park, 17 June 1953, *D.E. Symon s.n.* (AD 98571318); Mt Lindsay, 6 Aug. 1962, *D.E. Symon 2551* (AD); c. 1.45 km WNW of summit of Mt Poondinna rockhole, 29 Aug. 1978, *D.J. Whibley 6422* (AD); SE slopes of large hill, c. 2.5 km direct NW of summit of Mt Poondinna, 29 Aug. 1978, *D.J. Whibley 6480* (AD); Mt Moulden, E facing slopes towards the base, 1 Sep. 1978, *D.J. Whibley 6666* (AD).

Solanum petrophilum F.Muell.

Linnaea 25: 433 (1853). **Type:** South Australia: Near Cudnaka [Kanyaka], October 1851, *F. Mueller s.n.* (lecto: MEL 12107, here designated; isolecto: MEL12106).

Illustration: Symon (1981: 215).

Sprawling or erect rhizomatous perennial shrub, 0.2–0.6 m high. *Branchlets* terete, yellow, rusty or brown; prickles 2–12 per cm, straight and acicular, 6–18 mm long, 0.6–1 mm wide at base, 8–20 times longer than wide, glabrous; hairs stellate; stellate hairs very dense, 0.4–0.55 mm diameter, stalks 0–0.1 mm long, lateral rays 7–8, porrect or ascending, central ray 0.5–1.1 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; short glandular hairs absent. *Leaves* elliptical or ovate, 2.3–8.1 cm long, 1.3–4.1 cm wide, 1.6–3.0 times longer than broad, shallowly or deeply lobed throughout; lobes 2–5 on each side, obtuse, lobing index 1.5–2.3; apex obtuse, base cuneate or obtuse or cordate, oblique part 0–7 mm long, obliqueness index 0–10 percent; petioles 0.6–2.4 cm long, 15–37 % length of lamina, prickles present, indumentum not floccose. *Upper leaf surface* green or grey-green; prickles present on midvein only or on midvein and lateral veins, 2–9, straight and acicular, 3–16 mm long; stellate hairs distributed throughout, sparse to moderately dense, 0.25–0.6 mm apart, 0.4–0.65 mm across, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray 0.5–1.0 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; simple hairs absent; short glandular hairs absent. *Lower leaf surface* greenish-white to grey, or yellow to rusty; prickles present on midvein only or present on midvein and lateral veins, 2–18, straight and acicular. Lower leaf surface stellate hairs dense to very dense, not floccose, 0.1–0.25 mm apart, 0.4–0.65 mm diameter, stalks 0–0.1 mm long; lateral rays 7–8, porrect; central ray 0.5–1.1 times as long as laterals,

not gland-tipped, 2–3-tiered hairs absent; simple hairs absent; short glandular hairs absent. *Inflorescence* leaf opposed or supra-axillary, cymose (pseudo-racemose), common peduncle 7–17 mm long, rachis prickles absent or present, 3–5 (–7)-flowered, with all flowers bisexual; flowers 5-merous; pedicels at anthesis 3.5–10 mm long, same thickness throughout, prickles absent or present. Calyx tube at anthesis 2.5–3.5 mm long; lobes attenuate, 5–10 mm long; prickles present, 10–35 per flower, 3–8 mm long; stellate hairs dense to very dense, white, rusty or transparent, 0.4–0.5 mm across, stalks 0–0.15 mm long, lateral rays 7–8, central ray 0.5–1 times as long as laterals, not gland-tipped, 2–3-tiered hairs absent; simple hairs absent; short glandular hairs absent. Corolla purple, 14–20 mm long, rotate; outer surface without prickles; inner surface glabrous. Anthers 3.8–6.0 mm long; filaments 1–2.2 mm long; ovary glabrous or with short glandular hairs only; functional style 7.5–10.5 mm long, strongly bent near its base and then recurved towards apex, glabrous or with short glandular hairs only. Fruiting calyx lobes more than half length of mature fruit or exceeding mature fruit, prickles 3–5 mm long. Mature fruits 1–3 per inflorescence, globular, 13–15 mm diameter, yellow or white, pericarp 1–1.5 mm thick, pedicels 7–10 mm long. **Figs. 1B, 13.**

Distribution & habitat. *Solanum petrophilum* is widespread in central and eastern parts of South Australia, including the Gawler Ranges, northern Eyre Peninsula, Flinders Ranges, the Olary district, and inland to Tarcoola and Marree. It also extends to the Broken Hill area of New South Wales, and there is a disjunct occurrence in the Goldfields region of Western Australia, eastward from Kalgoorlie (Fig. 14). It grows on a wide variety of sites, including creek-banks and plains, but usually on stony hills.

Typification. Symon (1981: 214) referred to two specimens at MEL that are original material, saying that MEL12107 “should perhaps be nominated holotype” of *S. petrophilum*. As there are two specimens, and no way of knowing whether two gathering are involved, the term holotype is inadvisable or incorrect, and under Article 9.9 (McNeill et al. 2012), Symon’s use of the term “holotype” is correctable to “lectotype”. However, Symon did not make a definitive statement, and it is doubtful whether his suggestion constitutes a valid lectotypification. Therefore I have here formally designated the specimen suggested by Symon (MEL 12107) as the lectotype of the name.

Notes. *Solanum petrophilum* sens. str. is highly variable, but is recognisable by the relatively few lobes on the leaves, the stout prickles 0.6–1 mm wide at the base, and the comparatively few (10–35) prickles on the calyces. Morphological differences exhibited between *S. petrophilum* specimens from the Gawler Ranges, Eyre Peninsula, Flinders Ranges, Goldfields of Western Australia, etc., are deemed too inconsistent and too minor to warrant taxonomic recognition.

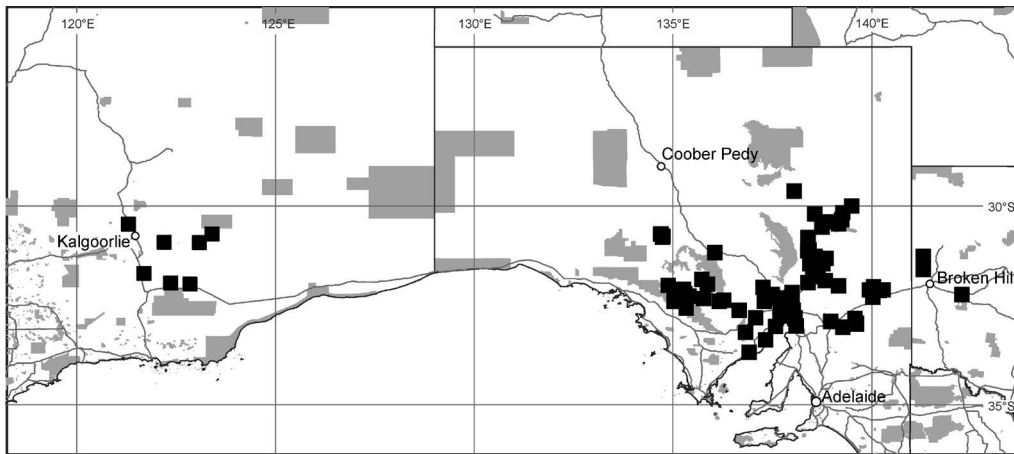


Fig. 14. Distribution of *Solanum petrophilum*.

Specimens with sparse hairs on the upper leaf surface may be confused with *S. lobatum*, but the latter species has larger stellate hairs (0.6–1.1 mm diameter) on the upper leaf surface, usually a greater number of lobes per leaf, and many more prickles on the calyx. *S. petrophilum* is the only species of the complex that consistently lacks prickles on the corolla.

Specimens examined:

WESTERN AUSTRALIA: Bineronca Nature Res., N of Higginsville on a track E of the Norseman to Widgemooltha Rd, 2 July 2006, *G. Byrne 2166* (AD, PERTH); 32 miles [51 km] E of Karonie, trans-line, 9 Nov 1963, *A.S. George 5952* (PERTH); Buldania Rocks, c. 28 km by road ENE of Norseman, c. 200 m N of Eyre Hwy to Balladonia, 24 Sep. 1977, *E.N. Jackson 3484* (AD); 81 km WNW of Balladonia on road to Norseman, 13 Oct. 1994, *B.J. Lepschi & T.R. Lally 1667* (AD, BRI, CANB, PERTH).

SOUTH AUSTRALIA: "Pine Hill Res.", Lincoln Hwy, Cowell to Whyalla Rd, N of Cowell, 22 Dec. 1965, *C.R. Alcock 877* (AD); Lincoln Hwy, between Pt Augusta and Whyalla, 11 Feb. 1967, *C.R. Alcock 1325* (AD); 11 km N of Thurlga Stn Hmsd, Gawler Ra., 8 Oct. 1972, *C.R. Alcock 4227* (AD); 13 km ESE of Tarcoola, Wilgena Stn, 5 Sep. 1995, *F.J. Badman 8438* (AD); Pualco Ra. and Levi Ra., 3 June 1989, *R. Bates 18574* (AD); 99 miles [160 km] SE of Lake Hart, on road 42 miles NW of Pt Augusta, 5 Oct. 1966, *A.C. Beauglehole 20002A* (AD); Hiltaba Stn, c. 2 km W of Hiltaba Hmsd, 6 Sep. 1972, *B.J. Blaylock 1959* (AD); 27 miles [43 km] from Iron Knob, towards Pt Augusta, 28 Aug. 1968, *E.M. Canning 2091* (CANB); 5.3 km direct WNW of Grindell Hut, Gammon Ra. N.P., 23 Nov. 1998, *P.D. Canty & T.J. Hudspith BS104-798* (AD); Mt Saint Mungo, 40 km NW of Yardea, 2 Oct. 1969, *J. Carrick 2397* (AD); Marree, 15 Sep. 1956, *J.B. Cleland s.n.* (AD); Oak Park c. 32 km S of Yunta, 2 Oct. 1971, *N.N. Donner 3719* (AD); Fire track along the top of The Battery, Mambray Ck, Mt Remarkable N.P., 6 Aug. 1974, *N.N. Donner 4884* (AD); Koondoolka, 19 June 1977, *N.N. Donner 5798* (AD); Environs of Loch Ness Well (upper Balcanoona Ck), Gammon Ra., 23 Sep. 1956, *Hj. Eichler 12899* (AD); Rd from Parachilna Gorge to Parachilna, 14 July 1955, *R. Hill 2* (AD); Warren Gorge, 15 km NW of Quorn, 14 Oct. 1974, *V. Jaegermann 412* (AD); Grounds of Shoreline Caravan Park, Pt Augusta, 25 Sep. 2010, *R.A. McKenzie RAM10/147* (AD, BRI); NW end of Uno Ra., Uno Stn, 35 km W of Iron Knob, 10 Mar. 1981, *F. Mollenmans 47* (AD); Woman in White Mine area, Old Boolcoomata Stn, N of Olary, 11 Feb.

1968, *R.C. Nash s.n.* (AD 96825042); Near exit road to Iron Knob on Pt Augusta-Kimba road, 12 Sep. 1983, *R.D. Pearce 339* (AD, CANB, MO, L, US); 5.7 km direct SSW of Mt Fitton, Mt Freeling property, 18 Nov. 1998, *A.C. Robinson BS104-1245* (AD); near Tommie Bore, Outalpa Stn, 8 Oct. 1989, *A.G. Spooner 11744* (AD); About Aroona ruins, Aroona Valley, Oraparinna N.P., 18 Sep. 1971, *D.E. Symon 7522* (AD); Main road a little S of Pt Augusta and N of Mambray Ck, s.dat., *D.E. Symon 13932* (AD); Stuart Hwy, 74 km N of Pimba, 12 Jan. 2009, *D.E. Symon 17397 & J. Symon* (AD); Pichi Richi Pass at creek flat near Saltia, 11 Oct. 1959, *D.J. Whibley 528* (AD).

NEW SOUTH WALES: Mt Robe, 4 Sep. 1921, *A. Morris 697* (BRI); Big Cave Ck, Mootwingee Historic Site, 86 miles (138 km) NE of Broken Hill, 28 Oct. 1972, *A.J. Sikkes & I.R. Telford 289* (AD).

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