Recognition and distribution of *Solanum hoplopetalum* and *S. hystrix* (Solanaceae) in Australia

Solanum hoplopetalum Bitter & Summerh. and *S. hystrix* R. Br. are two closely related species of *Solanum* subgenus *Leptostemonum*. The first named taxon, *Solanum hystrix*, was described by Brown (1810) from plants he collected in South Australia, to which the species is confined. Early collections of a related taxon endemic to Western Australia were initially also treated as *S. hystrix* (e.g. Black 1926), prior to their recognition as a distinct species (*S. hoplopetalum*) by Bitter & Summerhayes (1926). However, Bitter & Summerhayes' new taxon was apparently overlooked or ignored by later workers (e.g. Grieve & Blackall 1975, Meadly 1960 and Parsons 1967), who continued to treat Western Australian populations as *S. hystrix*. A recent revision of *Solanum* in Australia (Symon 1981) clarified the status of these taxa, but it is apparent that, at least in Western Australia, some degree of confusion still exists as to the recognition of the two species, and on a wider scale, their occurrence outside their respective 'natural' ranges.

Both taxa are also among the very few indigenous solanums that could be considered (minor) agricultural weeds (Parsons & Cuthbertson 1992, Symon 1981), so accurate identification of the species involved is important.

Recognition of the species

The main character separating *S. hoplopetalum* and *S. hystrix* is indumentum of the mature vegetative parts, this best observed on the abaxial leaf surface. Hairs are also present on reproductive structures in both taxa, but are not so useful for identification. *S. hoplopetalum* and *S. hystrix* are unusual in that their indumentum is composed of apparently simple hairs, as most members of subgenus *Leptostemonum* have an indumentum comprised of characteristic stellate hairs. The simple hairs in *S. hoplopetalum*, *S. hystrix* and some other unrelated taxa of subgenus *Leptostemonum* are probably derived from stellate hairs, where the lateral rays have been gradually reduced to the point of being 'lost' altogether, or are very poorly developed (i.e. reduced-stellate hairs); the phylogenetic significance of these hairs is discussed in Lepschi & Symon (in press).

Leaf dimensions and distribution also aid in identification, but are not exclusive. The two taxa may be distinguished by the following key:

1 Abaxial leaf surface conspicuously hairy (this often discernible with the unaided eye), with simple glandular hairs 0.05-0.3 mm long, overlaid with much longer, occasionally glandular, reduced-stellate hairs 0.5-2 mm long, these most frequent on the veins and generally lacking short lateral rays. Leaves 4-15 cm long. Drier parts of south-western Western Australia (Figure 1C, D) ..... **S. hoplopetalum**

1: Abaxial leaf surface largely glabrous, indumentum restricted to major leaf veins, consisting of scattered, short to minute, simple glandular hairs (often reduced to ± sessile glands) 0.05-0.15 mm long, overlaid with mostly non-glandular, reduced-stellate hairs 0.15-0.8 mm long, these mostly on the veins and frequently with short lateral rays. Leaves 3-7 (-8) cm long. Eyre Peninsula region, South Australia (Figure 1A, B) ..... **S. hystrix**

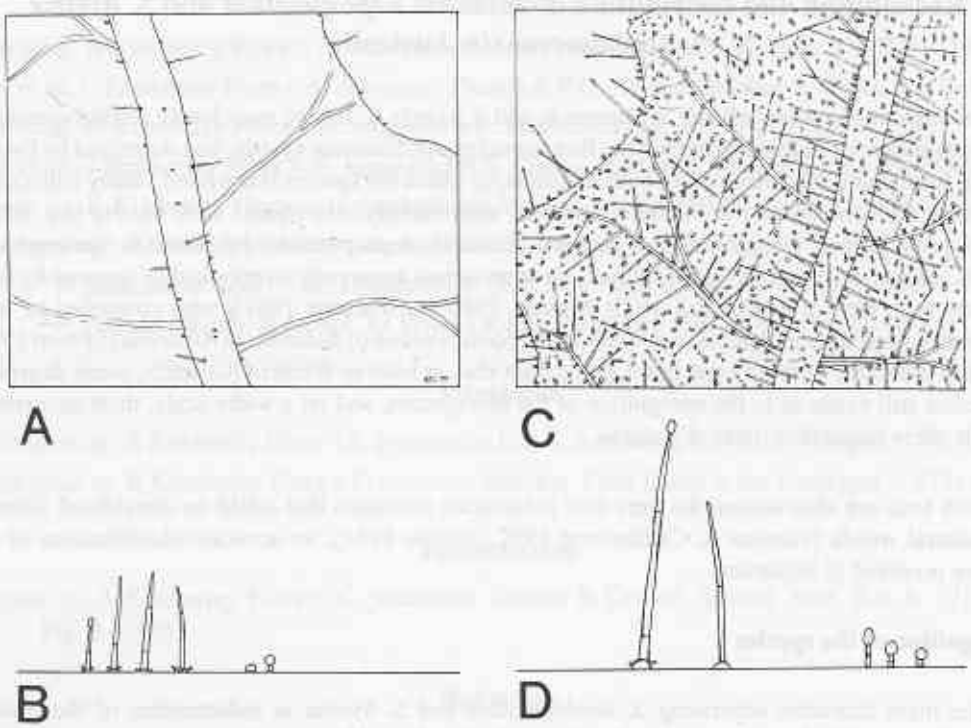

Figure 1. A-B *Solanum hystrix*. A - indumentum on abaxial leaf surface (x10), B - simple (reduced stellate) hairs (left), and simple glandular hairs (right) (x330). C-D *Solanum hoplopetalum*. C - indumentum on abaxial leaf surface (x10), D - simple (reduced stellate) hairs (left), and simple glandular hairs (right) (x330). Drawn from *Lepschi & Lally* 1735 (A-B) and *Keighery* 4363 (C-D).

Species treatments

Recent morphological descriptions and notes on the nomenclature of both taxa can be found in Purdie *et. al* (1982) and Symon (1981), and a description of *S. hystrix* is also in Symon (1986). For information on the weed biology of *S. hoplopetalum*, see Meadly (1960) and Paterson (1967), and for both taxa Parsons & Cuthbertson (1992).

Solanum hoplopetalum Bitter & Summerh.

Distribution. Occurs mainly in the drier parts of south-western Western Australia, from at least Wiluna, south to Lake Grace and Newdegate, east to Queen Victoria Springs and Caiguna, and westwards to Coorow, Toodyay and Wagin, with sporadic introduced occurrences in the more humid regions of the far south-west corner, e.g. Perth metropolitan area (G.J. Keighery pers. comm.) and Ludlow. Meadly (1960) reports the species from Geraldton and Borden, but no specimens have been seen. This species has almost certainly benefitted from agricultural expansion in Western Australia during this century (*cf.* Bitter & Summerhayes 1926), and it is not known whether some populations at the extremes of the distribution represent natural occurrences or more recent introductions.

An isolated introduced population has been recorded from South Australia, but has not persisted.

Selected specimens examined. Natural distribution: WESTERN AUSTRALIA: Cundelee, 1967, *P. Boswell* R11 (PERTH); Tammin sand plain, 2/1953, *B.J. Grieve s.n.* (PERTH); 8.5 km E of Caiguna Roadhouse, 17/2/1995, *B.J. Lepschi & T.R. Lally* 1741 (AD, CANB, PERTH); 4 km N of Koolyanobbing on road to Helena & Aurora Ranges, 29/9/1995, *B.J. Lepschi* 2084 (CANB, NSW, PERTH); 10 km SE of Ardath, 28/9/1977, *R.D Pearce* 119 (AD).

Adventive occurrences. SOUTH AUSTRALIA: Coombe Siding, 1/1951, *leg. ign.* and Coombe Station, 2/1940, *E.S. Alcock s.n.* (AD mixed sheet); Coombe Siding, 7/2/1941, *E.S. Alcock s.n.* (AD). WESTERN AUSTRALIA: Ludlow, 27/12/1994, *G.J. Keighery* 13341 (PERTH).

Habitat. *S. hoplopetalum* occurs most frequently in disturbed sites such as roadsides, railway lines and grazing land, although it also inhabits open woodland, mallee and scrub communities, frequently on heavier soils (e.g. loam, clay-loam) rather than pure sands. As with many other *Solanum* species, it responds well to fire, and it can be common in recently burnt areas.

Solanum hystrix R. Br.

Distribution. Eyre Peninsula region of South Australia, extending from the eastern margin of the Nullarbor Plain, about 40 km west-north-west of Yalata Roadhouse, east to near Iron Knob, north to at least the Transcontinental Railway Line and south to the coast (including offshore islands). Like *S. hoplopetalum*, *S. hystrix* may have benefited from agriculture and land clearance. Recorded once from south-eastern South Australia, New South Wales and Western Australia, but not persisting.

Selected specimens examined. Natural distribution: SOUTH AUSTRALIA: South Australian Railway Line, 1 mile [*c.* 2 km] N of Cummins, 19/3/1969, *C.R. Alcock* 2660 (AD, CANB, G, H, IBSC, MA); St Peters Island, Nuyts Archipelago, 19/10/1988, *L. Jansen* NPIS965 (AD); 64.5 km NE of Kimba on road to Iron Knob, 15/2/1995, *B.J. Lepschi & T.R. Lally* 1735 (AD, CANB, NSW, PERTH); 8.5 km WNW of Yalata Roadhouse on road to Nullarbor Roadhouse, 16/2/1995, *B.J. Lepschi & T.R. Lally* 1737 (AD, CANB); Gawler Range, NW of Minnipa in vicinity of Scrubby Peak Homestead, 4/10/1972, *D.E. Symon* 8366 (AD).

Adventive occurrences: SOUTH AUSTRALIA: 5 km S of Port Wakefield, 4/12/1981, *R. Majury s.n.* (AD 98570418).
WESTERN AUSTRALIA: 100 miles [*c.* 160 km] E of Norseman, 20/12/1968, *G. Howard s.n.* (AD, CANB, PERTH).

Habitat. Similar to that described for *S. hoplopetalum*, although *S. hystrix* also occurs in coastal (littoral) sites and sandy soils (Symon 1981).

Occurrence as introduced plants

Neither species is known to be established as an alien outside of its respective state. *S. hoplopetalum* appears to have persisted at Coombe in South Australia for eleven years (1940-1951), unless there were repeated introductions which seems unlikely. Searches by D.E. Symon at this site in recent years have failed to relocate it (see also Symon 1986).

The single records of *S. hystrix* from northern New South Wales (Conn 1992; Symon 1981), south-eastern South Australia (Purdie *et al.* 1982) and Western Australia (Symon 1981) all appear to have been chance introductions, none of which appears to have established a permanent population.

Of course, given the somewhat weedy nature of both species, and increased rail and road traffic across the continent, it is quite possible either taxon could become naturalized elsewhere in the future. Some other indigenous Australian solanums have been recorded in self-sustaining populations from outside their usual ranges, e.g. *S. aviculare*, *S. capsiciforme*, *S. cinereum*, *S. laciniatum*, *S. oligacanthum*, *S. sturtianum* (Symon 1976, 1981, 1994 and pers. comm.) and *S. linearifolium* (B.J. Lepschi unpubl.). Notably, most taxa only persist at a locality for a few years without spreading far from the site of initial colonization, and then disappear. An exception is *S. cinereum* which has established naturalized populations.

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