The *Prostanthera cryptandroides–P. euphrasioides–P. odoratissima* complex (Labiatae)

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Abstract

Conn, B.J. (National Herbarium of New South Wales, Royal Botanic Gardens, Mrs Macquaries Road, Sydney NSW 2000, Australia) 1999. The Prostanthera cryptandroides–P. euphrasioides–P. odoratissima *complex (Labiatae).* Telopea *8(2): 265–272*. A morphological re-evaluation of this species complex supports the conclusion that it comprises a single species *P. cryptandroides* consisting of two subspecies, subsp. cryptandroides and subsp. **euphrasioides** (Benth.) B.J.Conn, comb. nov. A full description, key to subspecies, habitat and typification notes, distribution map and botanical illustration are provided.

Introduction

During the preparation of the Lamiaceae for the recent 'Flora of New South Wales' project (Conn 1992), a narrow view of *Prostanthera cryptandroides* and *P. euphrasioides* (Section *Prostanthereae*) was presented. However, the degree of morphological separation of these closely allied taxa was not discussed. This paper presents a morphological re-evaluation of these taxa, together with *P. odoratissima*, as part of the revision of *Prostanthera* section *Prostanthera* (Labiatae) for eastern Australia (earlier papers are Conn 1997, 1998).

Materials and methods

The taxonomic conclusions presented in this paper are based on field studies and herbarium material held at A, AD, BRI, C, CANB, E, K, L, MEL, MO, NSW, NY, P, PERTH, PRS, RSA, S, UC and W (herbarium abbreviations follow Holmgren et al. 1990). Morphological terminology follows Conn (1984), but that describing the inflorescence is as modified by Conn (1995).

Taxonomy

Prostanthera cryptandroides A.Cunn. ex Benth., *Lab. gen. et sp*. 453 (1834); Dietrich. *Syn. pl*. 3: 427 (1843); Walpers, *Rep.* 3: 767 (1844–5); Benth. in DC., *Prodr.* 12: 561 (1848); Benth., *Fl. austral.* 5: 105 (1870); F.Muell., *Syst. census Austral. pl.* 101 (1882); C.Moore, *Cens. pl. New S. Wales* 53 (1884); Woolls, *Pl. New S. Wales* 83 (1885); F.Muell., *Sec. syst. census Austral. pl.* 170 (1889); C.Moore, *Handb. fl. New S. Wales* 352 (1893); Briq. in Engl. & Prantl, *Nat. Pflanzenfam.* 4(3a): 220 (1895); Dixon, *Pl. New S. Wales* 232 (1906); Sulman, *Wild Fl. New S. Wales* 2: 154 (1914); Althofer, *Cradle of Incense* 102, 105, 107, 110, 111, 165 (1978).

Lectotype (here chosen): New South Wales, W branches, Hunter's River, *Cunningham 20*, April 1825 (K); *isolectotype* (fragmentary): On dry shelving sandstone hills on the N.W. branches of Hunter's River, *Cunningham 20*, April 1825 (NSW 422711).

P. odoratissima Benth. in T.Mitch., *J. trop. Austral*. 291 (1848); Benth. in DC. *Prodr*. 12: 700 (1848); Benth., *Fl. austral*. 5: 104 (1870); F.Muell., *Syst. census Austral. pl*. 101 (1882); Bailey, *Synop. Queensl. pl*. 389 (1883); F.Muell. *Sec. syst. census Austral. pl*. 169 (1889); Bailey, *Cat. indig. pl. Queensl*. 36 (1890); Bailey, *Queensl. fl*. 4: 1203 (1901); Bailey, *Compr. cat. Queensl. pl*. 392 (1913); Althofer, *Cradle of Incense* 33, 34, 92, 94, 100 (1978).

Type: 'On the top of the plateau' (Mitchell 1848, p. 290), south of Balmy Creek, [presumably on] 'sandstone' (*ibid*., p. 291), west of Mantuan Downs (refer *ibid*., map opposite p. 189), *T.L. Mitchell* [?*and W. Stephenson*] *s.n.*, '31st August' 1846 (Mitchell 1848, p. 290); possible type material: 'T.L.Mitchell 271 31 Aug 1846 Subtrop. N.H.' (K — not seen); 'Sir T.L.Mitchell, presented 1847. Mantian Down, Qld' (BM — not seen); 'Sir T.L. Mitchell, Australia' (TCD — one specimen on right of sheet).(refer Typification notes, below)

P. euphrasioides Benth. in T.Mitch., *J. trop. Austral*. 360 (1848); Benth. in DC., *Prodr*. 12: 700 (1848); F.Muell., *Fragm*. 6: 108 (1868); Benth., *Fl. austral*. 5: 104 (1870); F.Muell., *Syst. census Austral. pl.* 101 (1882); C.Moore, *Census New S. Wales* 53 (1884); Bailey, *Synop. Queensl. pl*. 389 (1883); Woolls, *Pl. New S. Wales* 83 (1885); F.Muell., *Sec. syst. census Austral. pl.* 169 (1889); Bailey, *Cat. indig. pl. Queensl.* 36 (1890); C.Moore, *Handb. fl. New S. Wales* 352 (1893); Briq. in Engl. & Prantl, *Nat. Pflanzenfam.* 4(3a): 220 (1895); Bailey, *Queensl. fl.* 4: 1203 (1901); Dixon, *Pl. New S. Wales* 232 (1906); Bailey, *Compr. cat. Queensl. pl.* 392 (1913); Althofer, *Cradle of Incense* 32–35 (1978).

Lectotype (here chosen): [*J.W. Drysdale for*] *T.L. Mitchell 513*, August 1846, 'Sub-trop. N.H. [Nova Hollandia], Camp 29 [near junction of Maranoa River and possibly Eastern Creek (26°14'54", 147°54'36"), Queensland]' (K); possible isolectotypes: 'Subtrop. N. Holl.' (K), 'Sir T.L. Mitchell, presented 1847, Queensland' (BM), 'Sir T.L. Mitchell, Australia' (TCD - two specimens on sheet). (refer Typification notes, below)

Spreading to divaricate shrub 0.5–1.2(–2) m high. *Branches* ± terete, rarely subquadrangular, usually densely glandular-pubescent throughout with 80–100 hairs/mm^2 with podiate glandular hairs (refer Notes, below), subsessile glands and non-glandular hairs present; non-glandular hairs ± straight, patent to spreading, or antrorse, 0.2–0.6 mm long, white; glands multicelled, 0.2–0.5 mm long. *Leaves* light green, viscid, strongly aromatic (when crushed); *petiole* absent or to 1 mm long; *lamina* ovate to elliptic, usually narrowly so, 5–9 mm long, 1–3 mm wide, with length 3.4–6(–8) times width, distance from base of maximum width 0.3–0.6 times total lamina length, usually densely covered with podiate glands, but, since glands are not always persistent, leaves sometimes appearing glabrescent or sparsely glandular; base cuneate to obtuse; margin with 2–4 obtuse lobes/teeth on each side, each lobe 0.2–0.6(–1) mm long, or margin occasionally subentire, rarely entire; apex obtuse; venation not visible, midrib slightly raised basally. *Inflorescence* a frondose racemiform conflorescence, 2–10-flowered; uniflorescence monadic. *Pherophylls* absent. *Podium* 1.5–4 mm long, densely covered with podiate glands, subsessile glands also present. *Prophylls* not persistent, inserted at base of calyx (propodium to anthopodium ratio at least 20), opposite, narrow, oblong or ovate or obovate, 4–5 mm long, 0.7–2 mm wide, with length 2.5–4 times width, and distance from base of maximum width 0.3–0.4 (when ovate) or 0.7–0.8 (when obovate) times total lamina length, densely covered with podiate glands; base cuneate; margin entire or 1–3 lobed on each side; apex ± obtuse; venation not visible. *Calyx* green; inner and outer surfaces sparsely to densely glandular-pubescent with 25–80 podiate glands/mm^2; podiate glands (0.1–)0.2–0.6 mm long, multicelled, white, glandular apex of trichome not always persistent; tube 2.2–3.5 mm long; *abaxial lobe* very broadly to broadly ovate, 1.8–3 mm long, 2.5–3 mm wide at base, with length 0.6–1 times width, apex rounded; *adaxial lobe* very broadly to broadly ovate, 2–3 mm long, 3.5–4.2 mm wide at base, with length 0.6–1 times width, apex rounded to slightly emarginate, sinus c. 0.2 mm long, 1.5–2 mm

wide, with adaxial lobe length 1–1.1 times abaxial lobe length. *Corolla* 9–15 mm long, mauve, with yellow to cream-coloured markings abaxially in throat and maroon markings abaxially and laterally in throat, inner abaxial-median surface of tube with irregular row of yellow spots flanked by brownish spots or maroon-orange spots, and laterally with dark violet/purple dots; outer surface glabrous or sparsely to moderately hairy distally (particularly in bud) with up to c. 40 hairs/mm^2, hairs 0.1–0.4(–0.7) mm long, ± spreading; inner surface glabrous, except mouth and base of lobes sparsely hairy with 16–32 hairs/mm^2, hairs 0.6–1.1 mm long; *tube* 8–10 mm long; *abaxial median lobes* spathulate, 8–10 mm long, 5–6 mm wide, with length 1.6–1.7 times width, apex irregular and rounded, bilobed (sinus 0.8–1 mm long, 2–3 mm wide distally); *lateral lobes* broadly ovate to ovate, 4–4.3 mm long, 3.4–3.5 mm wide, with length 1–1.2 times width, apex rounded and slightly irregular; *adaxial median lobe-pair* ± depressed ovate, 4–6 mm long, 8–12 mm wide, with length 0.5–0.6 times width, apex rounded to subtruncate, slightly irregular, bilobed (sinus 1–1.5 mm long, 1.5–3 mm wide distally). *Stamens* inserted 2–3 mm above base of corolla; filaments 5.5–7 mm long; anthers 1–1.3 mm long, lobes ± cristate on basal dorsal surface (narrowly triangular trichomes to c. 0.1 mm long) and with small acumen basally, connective extended to form a basal appendage 1.4–2 mm long, terminating in 1–5 narrowly triangular trichomes 0.2–0.4 mm long. Disc c. 0.7 mm long. *Pistil* 9–10 mm long; *ovary* cylindrical obovoid, 0.4–0.6 mm long, diameter at base 0.7–1 mm, lobes 0.1–0.2 mm long; *style* 8–8.5 mm long; *stigma lobes* 0.4–0.5 mm long. *Fruiting calyx* not or only slightly enlarged; abaxial lobe 3–4.5 mm long, 3–3.5 mm wide and length 1–1.2 times width; adaxial lobe 3–5.5 mm long, 3–5 mm wide and length 1–1.2 times width; adaxial lobe length 1–1.4 times abaxial lobe length. *Mericarps* 2–2.5 mm long, distally 1–1.2 mm extended beyond base of style, distal diameter 2.3–2.8 mm; seeds ellipsoid-cylindrical, 2–2.4 mm long, c. 1 mm diameter. (Fig. 1).

Habitat: both subspecies occur on dry rocky, sandstone ridges and hillsides in open woodlands and low forests, commonly associated with *Callitris*, *Eucalyptus* (incl. *E. crebra*, *E. exserta*, *E. sideroxylon*, *E. trachyphloia*), *Acacia* (incl. *A. conferta*, *A. doratoxylon*, *A. longispicata*, *A. shirleyi*, *A. uncinata*) and the following understorey species: *Daviesia recurvata*, *Dodonaea filifolia*, *Hemigenia cuneifolia*, *Hovea*, *Jacksonia scoparia* and *Pultenaea*.

Conservation status: although this widespread species is not considered to be endangered, neither subspecies is common and subsp. *cryptandroides* has a very restricted distribution.

Typification

1. Prostanthera cryptandroides. Cunningham refers to two plants of *Prostanthera* from the Mt Dangar area of the Upper Hunter Valley (Cunningham 1825). On 17 April 1825, Cunningham records that 'an intelligible [sic] servant' (Cunningham 1825) collected 'a Prostanthera without flowers, ...' for Cunningham from about '10 miles' ESE of Mount Dangar (near present-day Denman). On 22 April 1825, Cunningham collected *Prostanthera* on the southern approaches to the summit of Mount Dangar. He states: 'on a Pine or *Callitris* range, I gathered the following species — a delicate Prostanthera, …'. Since the type collection is a flowering specimen, the former collection can not be considered as type material. In his 1825 specimen list, he describes a specimen of *Prostanthera* (*Cunningham 20*) as having 'floribus axillaribus solitariis'. In this list, he records the habitat of this plant as occurring 'on shelving Sandstone rocks …', which matches the label of the type material at NSW that states 'On dry shelving sandstone hills on the NW branch of Hunter's River'.

2. Prostanthera euphrasioides. Although *Mitchell 513* (K) is here chosen as the lectotype of the name of this taxon, there is a possibility that some of the collections regarded as possible type material may be referrable to *P. odoratissima*. Unfortunately, information about the type material of this name and that of *P. odoratissima* (see below) is not sufficiently specific to make an unambiguous choice. As for *P. odoratissima* (see below), Bentham's (1848: 700) non-specific citation of the type of this taxon as 'In Australiâ orientali subtropicâ (Mitchell!)' makes it difficult to assign all the type material to this name.

John Waugh Drysdale, who was described as 'the store-keeper' (Mitchell 1848: 6, 359), collected this species for Mitchell 'In August' (*l.c.*).

3. Prostanthera odoratissima. The type of this name is unknown. Bentham (1848: 700) cited the type of this name as 'In Australiâ orientali subtropicâ (Mitchell)' (cf. *P. euphrasioides*, above). Unfortunately, none of Mitchell's collections can be definitely identified from this generalised locality. One collection at TCD, with 'Australia Sir T.L. Mitchell' hand-written (middle right) and 'Prostanthera odoratissima' hand-written (lower right) is referable to the type. J. Carrick (*in adnot*.) refers the type of this name to the following collections: 'T.L.Mitchell 271, 31 Aug 1846 Subtrop. N.H.' (K) and 'Sir T.L.Mitchell, presented 1847. Mantuan Downs, Qld' (BM). Unfortunately, I have not examined these collections. However, the former should be considered as potential lectotype material as Carrick's unpublished description of this material matches the protologue. Although the protologue (Bentham, in Mitchell 1848: 291) does not cite a type collection, it does describe the plant as 'viscoso-puberula', a feature more typical of subsp. *euphrasioides* than subsp. *cryptandroides*. Therefore, this name is here regarded as more likely to be synonymous with the former subspecies.

It is here concluded that this species was probably jointly collected by Stephenson and Mitchell because Mitchell records (1848: 290) that 'we found a plateau of flowering shrubs chiefly new and strange, so that Mr Stephenson was soon loaded like a market gardener'. W. Stephenson was described as 'Surgeon and Collector of objects of Natural History' (Mitchell 1848: 6).

Notes: although Bentham originally described the leaves of *Prostanthera odoratissima* as 'paucidentatis' (Bentham, in Mitchell 1848: 291), he later described them as 'entire' (Bentham 1870: 104). This latter circumscription was frequently used to distinguish this taxon from *P. cryptandroides* (*s. str.*). However, Carrick's unpublished description of the K material (as referred to above) describes the leaves as 'entire or with one or two short blunt lobes'. I have found that specimens of both subspecies (as recognised here) occasionally have subentire or rarely entire leaves (these are cited below, under each subspecies).

Pedicellate glandular hairs, as used by myself in previous papers on *Prostanthera*, are here referred to as podiate glandular hairs, using the terminology of Conn (1995). This is a nomenclatural change only.

Key to subspecies

1a. Calyx and branches not appearing glandular because podiate glands <0.02 mm long; calyx with inner surface glabrous or with an occasional hair and gland (visible by 10× magnification); adaxial calyx lobe with apex rounded to 3-lobed .... **1.** subsp. **cryptandroides**

1b. Calyx and branches distinctly glandular, podiate glands (0.1–)0.2–0.6 mm long; calyx with inner surface glandular (visible by 10× magnification); adaxial calyx lobe rounded to slightly emarginate ..... **2.** subsp. **euphrasioides**

1. subsp. **cryptandroides**

Branches usually not distinctly hairy. *Calyx* appearing glandular but not distinctly hairy (with 10 × hand lens); outer surfaces sparsely to densely glandular with 25–80 podiate glands/mm^2; podiate glands <0.02 mm long; inner surface glabrous or with an occasional hair and gland; *abaxial calyx lobe* with apex rounded to subtruncate or slightly emarginate (then sinus to 1 mm long and 1–1.2 mm wide); *adaxial lobe* with apex rounded to 3-lobed (then lateral lobes 0.4–1 mm long; median lobe to 1 mm long). (Fig. 1 a–c).

Distribution: this subspecies is confined to New South Wales, occurring in the Central Tablelands and Central Western Slopes. (Fig. 2 d).

Selected specimens with 2–4-lobed/toothed leaves (18 examined): New South Wales: Central Tablelands: Ridge near Green Gully, Glen Davis, *Coveny 9280 & Hind*, 24 Apr 1977 (A, AD 97814337, K, L, NSW 233715, MO, PRE, RSA); Sir John's Point, Mount Gundangaroo, *Constable 7224*, 28 Oct 1966 (K, NY); c. 40 km NNE of Lithgow, 1.5 km SSW of Glen Davis, *Telford 5008 & Crisp*, 25 Oct 1976 (AD 97709816). Central Western Slopes: Bumberry, Harvey Ranges, *Boorman s.n.*, Jun 1914 (NSW 128461).

Specimens with entire or subentire leaves: New South Wales: Central Western Slopes: Upper Baerami Valley, c. 40 km from Sandy Hollow, *Gibson & Miller s.n.*, without date (MEL, NSW 228914, PERTH); Crescent Hill Ridge, c. 40 km from Sandy Hollow, *Gibson & Miller s.n.*, 17 Jul 1988 (NSW 228915, PERTH, MEL, MO, E, BRI); Denman, *Heron s.n.*, Jan 1909 (NSW 233709).

2. subsp. **euphrasioides** (*Benth.) B.J.Conn*, **comb. nov.**

P. euphrasioides Benth. in T.Mitch., *J. trop. Austral*. 360 (1848)

P. odoratissima Benth. in T.Mitch., *J. trop. Austral*. 291 (1848) (*pro parte*, probably including type; refer Typification notes, above).

Branches distinctly hairy. *Calyx* appearing distinctly hairy (with 10× hand lens), with inner and outer surfaces sparsely to densely glandular with 25–80 podiate glands/mm^2; podiate glands (0.1–)0.2–0.6 mm long; *abaxial calyx lobe* with apex rounded; *adaxial lobe* with apex rounded to slightly emarginate (then sinus c. 0.2 mm long, 1.5–2 mm wide). (Fig. 1 d, e).

Distribution: this subspecies extends from the Leichhardt region of Queensland (with one collection from North Kennedy) to northern New South Wales (North Western Slopes and North Western Plains). (Fig. 2).

Notes: the branches and calyx of this subspecies tend to be much hairier and more distinctly glandular than those of subsp. *cryptandroides*.

One collection from the border region of New South Wales (Northern Tablelands) and Queensland (viz. *Boorman s.n.*, July 1904, Wallangarra [NSW 128463]) and one from the North Western Slopes (New South Wales) (viz. *Boorman s.n.*, June 1904, Howell [K, UC 437605]) have features that are intermediate between the two subspecies. These specimens have branches which are glandular-pubescent and the inner surface of the calyx is hairy (both features typical of subsp. *euphrasioides*); however, the outer surface is almost devoid of podiate glands (a feature typical of subsp. *cryptandroides*).

Selected specimens with 2–4-lobed/toothed leaves (100 examined): Queensland: North Kennedy: Cape River, *Anon.* [*Bowman*] *s.n.*, without date (MEL 43152). Leichhardt: W of Moura, *Jones 2915*, 25 Nov 1964 (CANB 189273 & 189274); 11 miles SW of Moura Township, *Lazarides 6916*, 6 Jul 1963 (BRI 051480, CANB 123592, MEL 43143, NSW 233195); Carnarvon Range between Roma & Springsure, *White 9484*, 26 Oct 1933 (A, BRI 162696). Port Curtis: Broad Sound, *Anon.* [*Bowman*] *s.n.*, without date, (MEL 43146). Burnett: 'Rocky bar', Hawkwood, *Hamilton s.n.*, Oct 1930 (BRI 162694); Eidsvold, *Bancroft s.n.*, Dec 1911, (BRI 162698). Maranoa: Bollan, *Gauba s.n.*, 5 Jun 1959 (AD 97512121). Darling Downs: near Drillham, *Blake 19168*, 26 Mar 1953, (NSW 232913);

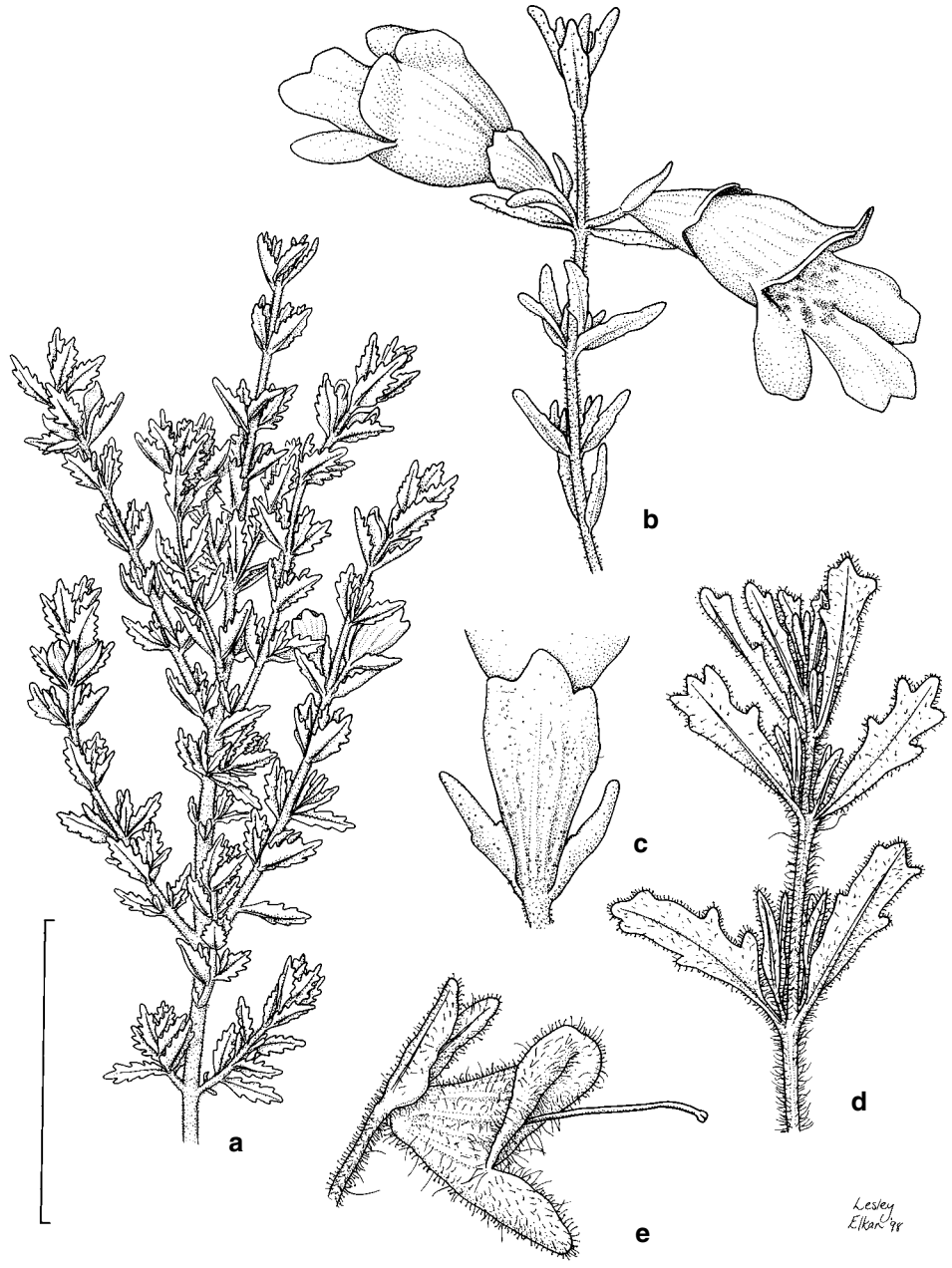

Fig. 1. *Prostanthera cryptandroides* A.Cunn. ex Benth. subspecies *cryptandroides* **a,** Branchlet with flower buds; **b,** detail of flowers and branchlet of entire/subentire leaf variant, showing short hairs; **c,** detail of base of flower, showing prophylls, adaxial calyx lobe with apex 3-lobed, and base of corolla. *P. cryptandroides* A.Cunn. ex Benth. subspecies *euphrasioides* (Benth.) B.J.Conn **d,** Branchlet, showing distinct glandular-pubescent indumentum; **e,** detail of calyx, style and prophylls, showing glandular-pubescent inner calyx surface and adaxial calyx lobe with rounded apex. (a & c from *Constable 7224*; b from *Gibson & Miller s.n.*, 17 July 1988; d & e from *Moore 8787*). Scale bar: a = 30 mm; b & d = 15 mm; c & e = 10 mm.

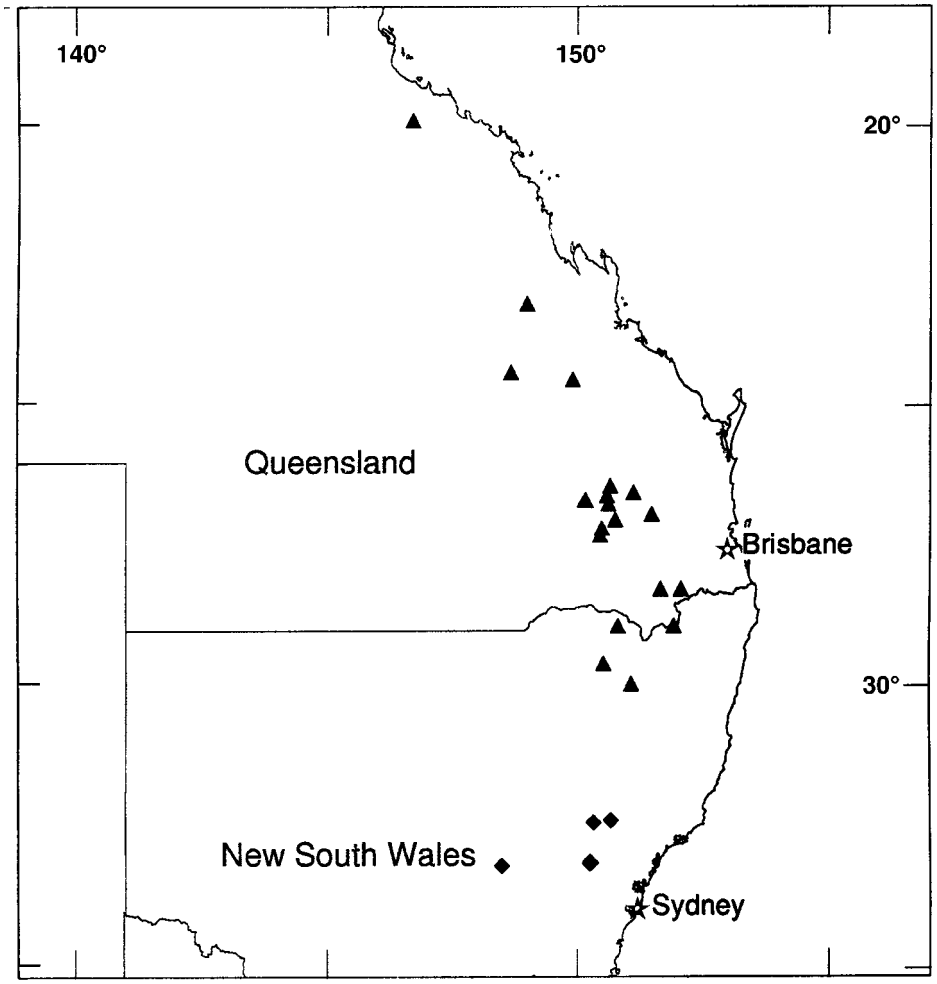

Fig. 2. Distribution of *Prostanthera cryptandroides* (in Queensland and New South Wales); subsp. *cryptandroides* (u); subsp. *euphrasioides* (s).

Auburn–Chinchilla road, 36.2 km by road N of Chinchilla, *Coveny 6812 & Hind*, 29 Aug 1975, (BRI, MEL, NSW 233776); 1 mile W of Goonalah, 8.5 miles W of Miles, *Melville & Blake s.n.*, 26 Mar 1953 (BRI 236046, MEL 537658, NSW 233774); 44 km N of Warrego Highway on Auburn Road, *Rodd 4163 & Hando*, 27 Nov 1984 (NSW 199230).

New South Wales: North Western Slopes: Warialda, *Davis s.n.*, May 1955, (AD 95809066); 2 miles E of Warialda, *Johnson s.n.*, 6 Nov 1951 (NSW 17510); Warialda, *Boorman s.n.*, Oct 1914, (NSW 128462). North Western Plains: Bruxner Highway, 4.9 km E of Yetman, *Coveny 11641 & Wilson*, 1 Nov 1983 (NSW 233716).

Specimens with entire or subentire leaves: Queensland: Leichhardt: Blackdown above Rockland Spring, *Gittins 1187*, Jul 1966, (BRI 068974, NSW 233708); Planet Creek, c. 30 miles NE of Rolleston Township, *Story & Yapp 293*, 30 Sep 1962 (BRI 051325, CANB 115533, NSW 233705). Darling Downs: Tara, *Althofer s.n., anno* 1947, (NSW 233707); *Althofer 25*, [received at NSW] Dec 1949 (NSW 233706); Weranga, *Gordon 22*, 13 Dec 1947 (BRI 162756).

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