



## A new species and new record of *Prostanthera* (Lamiaceae, Westringieae) from the north coast of New South Wales, Australia

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### Abstract

The new species *Prostanthera floydii* T.C.Wilson, Taseski & Sheringham (Lamiaceae) is described for the first time along with a report on the discovery of *P. spatulata* T.C.Wilson & B.J.Conn in New South Wales, Australia. *Prostanthera floydii* is distinctive from other known species by the combination of narrow ovate leaves with a recurved leaf margin and glabrous adaxial leaf surface, persistent prophylls longer than the calyx tube and a mericarp with a distinctively ridged surface. Combined with measurements, description and figures for *P. floydii*, a documentation of habitat and highly localised distribution is provided for both species.

### Introduction

*Prostanthera* Labill. is the largest genus of endemic Australian Lamiaceae with 106 species found across Australia (APC 2021; O'Donnell *et al.* 2023). *Prostanthera* are erect or scandent woody subshrubs to small trees associated with open, well-drained habitats including rocky outcrops (Conn 1984, 1988). Flowers are bilabiate and most species can be distinguished as having four functional anthers, each usually bearing a small appendage or extension derived from the staminal connective tissue (Conn 1984). This appendage can be integral with the pollination mechanism of many species and its morphological variability across the genus is useful for species identification (Wilson *et al.* 2012, 2017). Furthermore, the morphology of the connective combined with having four fertile stamens (*i.e.*, no staminodes) has been for the most part accurate with distinguishing it from its closest relatives in the Prostantheroideae (Harley *et al.* 2004; Zhao *et al.* 2021).

At least 16 species of *Prostanthera* are found within the North Coast region of New South Wales, and at least four of these are localised endemic species (Royal Botanic Gardens and Domain Trust 2024). The Clarence Sandstone Subregion of the North Coast New South Wales represents an area of exceptional high plant species biodiversity (NSW National Parks and Wildlife Service 2003) including *P. sejuncta* M.L.Williams, Drinnan & N.G.Walsh and *P. palustris* B.J.Conn (Conn 1997; Williams *et al.* 2006). Several other populations of *Prostanthera* have been recognised as unusual in the hinterland of the general area since the 1990s, including one population that has been variably identified as *P. phyllicifolia* F.Muell. or *P. lithospermoides* F.Muell. However, plants of this population can easily be distinguished from these taxa based on their narrow ovate leaves, prophylls

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distinctively longer than the calyx tube and Wet Sclerophyll Forest habitat (vs alpine forest or dry shrubland, respectively) (Mueller 1858; O'Donnell *et al.* 2023). It is worth noting that we refer to the more restricted application of the name *P. phyllicifolia* (O'Donnell *et al.* 2021) even though the broader concept applied earlier can similarly be distinguished by these morphological differences. This population was relocated and specimens collected by the third author (PS) during field work over the last five years in two separate populations at Yuraygir State Conservation Area and Sherwood Nature Reserve, New South Wales.

Coincidentally, during the same period, another population of *Prostanthera* with spatulate leaves not matching any previous records in New South Wales was also found in Yuraygir State Conservation Area. Although closely resembling the nearby locally endemic *P. palustris* (Conn 1997), it is an upright shrub with branchlets covered by patent trichomes and has undulate leaves less than 3.5 mm wide, which matches the Vulnerable *P. spathulata* T.C.Wilson & B.J.Conn known only from Tewantin National Park, Queensland (Commonwealth, Department of Climate Change, Environment, Energy and Water; Wilson & Conn 2015).

In this paper we provide the description of a newly recognised species, *P. floydii* T.C.Wilson, Taseski & Sheringham, and document the new record of *P. spathulata* in New South Wales. We also provide for both species images, discussion on conservation status, and a modification of the New South Wales key to species of *Prostanthera* (PlantNet 2024).

Materials and methods

Morphology of plants were examined in the field and specimens were consulted at the National Herbarium of NSW (NSW). Descriptive terminology follows Briggs & Johnson (1979) and Conn (1984), with an exception that we refer to pherophylls as ‘bracts’ on inflorescences. Specimens examined are listed according to botanical regions of New South Wales (Anderson 1961; Jacobs & Pickard 1981) and the defined areas based on the National Interim Biogeographic Regionalisation for Australia system IBRA v7 (Thackway & Cresswell 1995).

Taxonomy

*Prostanthera floydii* T.C.Wilson, Taseski & Sheringham, **sp. nov.**

**Diagnosis:** *Prostanthera floydii* resembles *P. nivea* A.Cunn. ex Benth. since it has narrow-ovate leaves, foliose inflorescences, stamens that translocate throughout anthesis and anther

appendages at least as long as the anther. It differs from *P. nivea* by its rounded branches (cf. moderately to strongly 4-ridged), leaves with a recurved lamina (cf. flat to involute), prophylls 5.2–15 mm long and longer than the flowering calyx tube (cf. up to c. 5 mm long and shorter than the flowering calyx tube), a flowering calyx tube 2.7–5.2 mm long (cf. < 2.5 mm long) and a mericarp strongly longitudinally ribbed (cf. reticulate) (Table 1).

**Type:** AUSTRALIA: NEW SOUTH WALES: Central Coast, Cultivated Mount Annan Botanic Gardens [from Bald Knob Tick Gate Road, c. 6.9 km E of Pacific Motorway, Yuraygir State Conservation Area. 5th November 2022], 12 Dec 2023, T.C. Wilson 1049 & R. Newett (holo: NSW 1138338; iso: CANB, BRI, MEL, K).

Open, straggling erect to woody shrub to 1.5(–2) m tall, lacking scent when crushed. *Stem* to c. 50 mm diam. near base of shrub. *Branchlets* rounded, green to often dark maroon, moderately to densely covered with antrorse, sometimes appressed, trichomes (0.2–0.6 mm long; 2–17 trichomes/mm<sup>2</sup>) that are lost with age, sessile glands absent; bark smooth and waxy, dark brown with vertical lenticel-like openings on lower stem and older branches. *Leaves* concolorous; petiole (0–)0.9–1.4 mm long; lamina linear, to very narrowly ovate or elliptic, 22–48 mm long, 1.2–3.4 mm wide, base shortly attenuate to truncate, margin entire and weakly to strongly recurved, apex acute or obtuse; abaxial surface slightly pale green, midvein partly distinct with antrorse appressed trichomes 0.1–0.6 mm long; adaxial surface mid-green, veins indistinct, glabrous. *Inflorescence* a frondose racemiform conflorescence, uniflorescence monadic; 1–8(–10)-flowered [per conflorescence]. *Pherophylls* not observed. *Podium* 2.9–4.3 mm long, propodium to anthopodium ratio 7–14. *Prophylls* usually persistent until fruiting, inserted opposite, lamina strongly narrow ovate, strongly narrow obovate or linear, 5.2–15 mm long, 0.4–1.1 mm wide; abaxial surface slightly pale green with antrorse appressed trichomes to 0.6 mm long; adaxial surface mid-green, glabrous. *Calyx* bilobed, margin entire, pale-green with raised nerves and veins dark maroon; inner surface glabrous; outer surface with patent trichomes 0.05–0.6 mm long, 3–22 trichomes/mm<sup>2</sup> on lateral and abaxial sides, glabrous on adaxial side; tube 2.7–5.2 mm long; abaxial lobe broadly ovate, 3.5–9.6 mm long, 3.1–4.7 mm wide, apex rounded to slightly retuse, base truncate; adaxial lobe ovate to broadly ovate, 7.7–9.9 mm long, 4.6–5.1 mm wide, apex rounded and obtuse. *Corolla* 16–27 mm long, pale lilac becoming white towards throat, tube with dark lilac veins, throat usually with central line of orange to yellow spots accompanied by a line of

Table 1. Comparison of selected morphological characters that can be used to distinguish between *P. floydii* and its most similar congeners.

| Characters           | <i>P. floydii</i>                  | <i>P. lithospermoides</i>     | <i>P. nivea</i>                             | <i>P. phyllicifolia</i>       |
|----------------------|------------------------------------|-------------------------------|---|-------------------------------|
| Stem and branchlets  | rounded                            | rounded                       | moderately to strongly 4-ridged             | rounded                       |
| Leaf length (mm)     | 22–48                              | 5–55                          | 5–55  | < 15                          |
| Leaf margin          | recurved                           | incurved                      | incurved to involute                        | recurved                      |
| Prophyll length (mm) | 5.2–15                             | <2.5                          | c. 5 mm                                     | <2.5                          |
| Calyx tube (mm)      | 2.7–5.2                            | <2.5                          | <2.5  | <2.5                          |
| Adaxial leaf surface | glabrous                           | hairy                         | glabrous to densely hairy                   | glabrous to hairy             |
| Corolla              | pale mauve with markings in throat | white with markings in throat | pale mauve or white with markings in throat | white with markings in throat |
| Mericarp surface     | Strongly longitudinally ribbed     | reticulate                    | reticulate                                  | reticulate                    |

joined pale mauve spots on each side, outer surface with trichomes 0.1–0.3 mm long, glabrous or 1–3 trichomes/mm<sup>2</sup>, margin weakly undulate or erose; tube weakly campanulate and 6.9–10.1 mm long, throat with lanate trichomes up to 6 mm long; abaxial median lobe spatulate, 5.9–10.5 mm long, from 2.8–4.1 mm wide at base to 5.4–9.5 mm wide at apex, apex emarginate to weakly bilobed; lateral lobes ovate to obovate, 5.5–8.5 mm long, 5.5–6.5 mm wide, apex obtusely rounded; adaxial lobes not fused into an adaxial median-lobe pair, each lobe depressed ovate, 2.3–4.5 mm long, 3.8–4.2 mm wide, apex obtuse, undulate or weakly crenate. *Stamens* didynamous, pollen sacs divergent, inserted 1.9–4 mm above corolla base, white; abaxial stamens filament 2.8–3.6 mm long and c. 0.3 mm wide, anther 0.8–1.3 mm long and 0.4–0.6 mm wide; adaxial stamens filament 1.4–2.3 mm long and c. 0.3 mm wide, anther 0.7–1.2 mm long and 0.2–0.7 mm wide; connective on all anthers extended to form a basal appendage 0.7–1.4 mm long and terminating in deltoid trichomes up to 0.12 mm long. *Gynoecium* ovary 0.5–1 mm long and 0.8–2 mm wide, disc 0.5–0.8 mm long; style 5.4–7.6 mm long; stigma lobes 0.5–0.6 mm long. *Fruiting calyx* beige or golden brown when senesced, not accrescent; tube 3–5.1 mm long; abaxial lobe 6–8.2 mm long and 3.5–6 mm wide; adaxial lobe 7–10.9 mm long and 5.9–8 mm wide. *Mericarps* 3.3–3.7 mm long, 1.3–1.5 mm wide, oblong, surface strongly longitudinally ribbed, dark brown. Figs 1, 2.

**Other specimens examined:** NEW SOUTH WALES: North Coast: Sherwood Nature Reserve, 6 Sep 1980, A.G. Floyd (COFFS 6577); Sherwood Nature Reserve, 4 Sep 1993, G.J. Harden 93019 & D. Hardin (NSW 430958); below Huntleys Knob, 600 m N of Upper Corindi Road, 12 Mar 1997, P. Sheringham s.n. (NSW 414439); Newfoundland State Forest, Pigeon Gully, 30 Mar 2004, F. Forest (COFFS 31218); Sherwood Cliffs, 5 Dec 2005, S. Clemeshea (COFFS 31132); Yuraygir State Conservation Area, c. 100 m in from Bald Knob Tick Gate Road, just past Pigeon Gully Bridge, 24 Feb 2022, L. Watts & L. Mickaill s.n. (NSW 1119548); Bald Knob Tick Gate Road, c. 6.9 km E of Pacific Motorway, 5 Nov 2022, G. Phillips & G. Errington (NSW 1115556).

**Recognition:** The combination of narrow ovate leaves with a recurved margin and glabrous adaxial surface, persistent prophylls longer than the calyx tube, makes *P. floydii* distinct from other species of *Prostanthera*. In addition to being very similar to *P. nivea*, this species has been confused with *P. lithospermoides* and *P. phyllicifolia* based on their similar habits, narrow ovate leaf and calyx shape. *Prostanthera floydii* can be distinguished from both species by its longer prophylls (> 5 mm long vs < 2.5 mm long), flowering calyx tube (>2.6 mm long vs <2.5 mm long) and mericarp surface (longitudinally ribbed vs reticulate). It can also be distinguished from *P. lithospermoides* by having mostly glabrous leaves with trichomes on midvein and a recurved margin (vs sericate indumentum on both sides with incurved margin), longer prophylls (>5 mm long vs <2 mm long), and from *P. phyllicifolia* by its longer leaves (>20 mm long vs <15 mm long). Table 1 summarizes the characters that distinguish *P. floydii* from these other species.

**Notes:** The use of mericarp morphology as a diagnostic for species recognition is rare in *Prostanthera*. Our demonstration

that the mericarp assists with the identification of *P. floydii* provides further traction towards a renewed call for describing morphology of the mericarp in future species diagnoses and its inclusion in keys (O'Donnell *et al.* 2023). It is worth noting that *P. sejuncta* is another localised endemic species of the North Coast region of New South Wales that can have slightly longitudinally ribbed mericarp (Williams *et al.* 2006).

Flowering has been recorded from August to March. Flowers are dichogamous as reported in some other *Prostanthera* species (Wilson *et al.* 2017) with an early phase where anthers are positioned next to the inner adaxial surface of the corolla and the style is positioned above (Fig. 1g), and a later phase where senesced stamens are repositioned laterally (Fig. 1i) and the style becomes incurved with the stigma lobes parted (not shown).

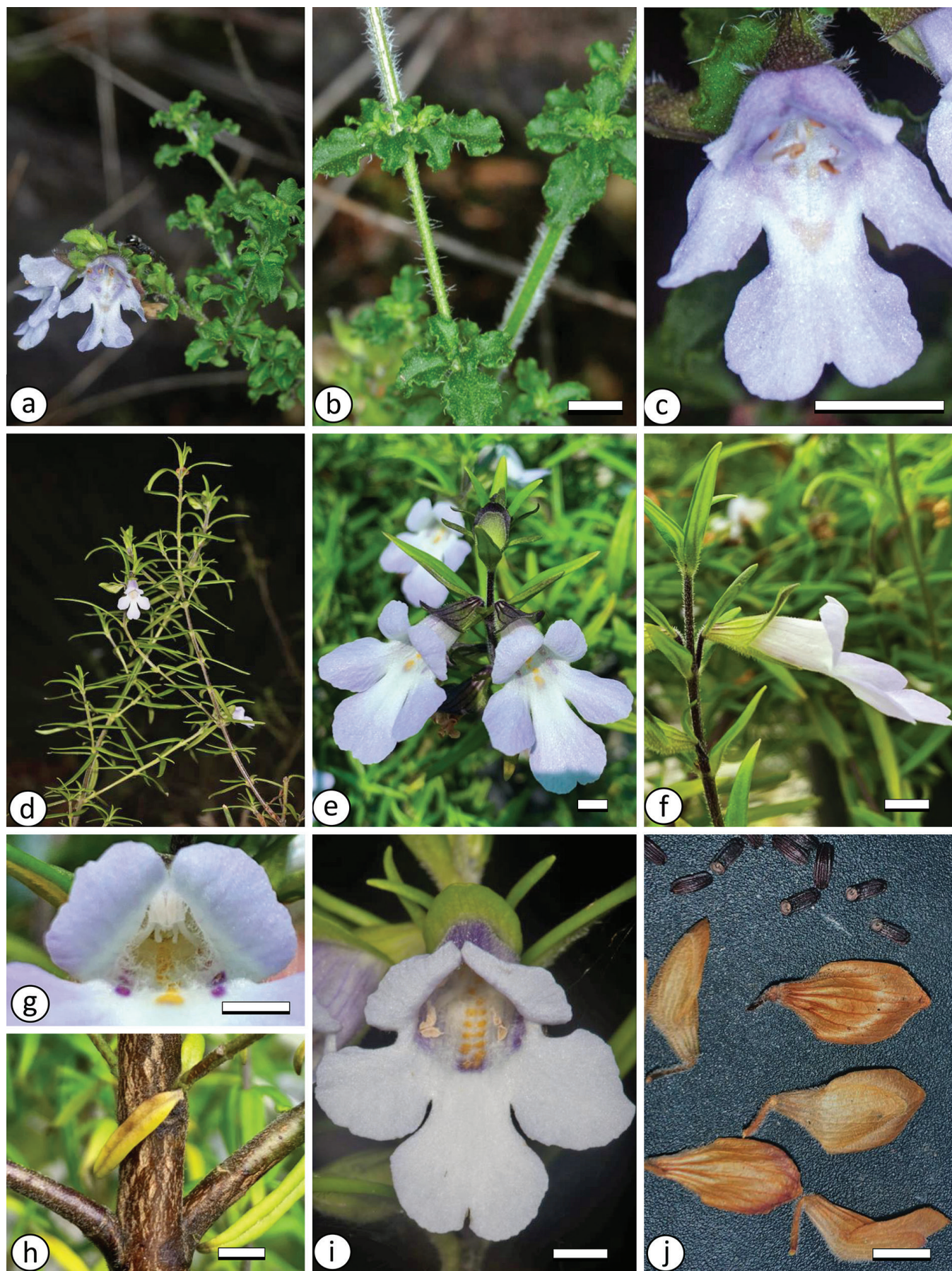
Pollinators are unknown although it can be inferred from floral characters that the pollinators are likely a variety of insects, especially bees (Wilson *et al.* 2017). Like many other species of *Prostanthera*, anther appendages of this species partially obstruct the passage through the corolla tube (Figs 1g, 2g) and thereby increase the likelihood of contact between anthers and visitors. Disruption of the paired anthers allows pollen to be released on a visitor below them.

**Etymology:** The specific epithet (*floydii*) honours the late Australian botanist, Alexander Floyd (OAM) who first collected this species in 1980. Floyd had an unsurpassed knowledge of Australian Rainforests, having worked in the Department of Forestry in Papua New Guinea followed by an extensive service within the Forestry Commission of New South Wales, which included secondment to the National Parks and Wildlife Service where he undertook his conservation assessment of NSW rainforests. He also made several species discoveries in non-rainforest communities, including *Homoranthus floydii* Craven & S.R. Jones in the Clarence Sandstones subregion. Later in life, Floyd was active in establishing the Coffs Harbour Regional Botanic Herbarium and was awarded the Medal of the Order of Australia for this, his research on rainforest plants, conservation and environmental education.

**Distribution:** Endemic to the Clarence Sandstones subregion of the South East Queensland Bioregion. It is known from two localities, Pigeon Gully in Yuraygir State Conservation Area and an area near Huntleys Knob, Sherwood Nature Reserve and the adjacent freehold property.

**Habitat:** The species occurs on steep rocky slopes, below sandstone cliffs of Kangaroo Creek Sandstone between an altitude of 100–310 metres. At Yuraygir State Conservation Area and Sherwood Nature Reserve it is found in Wet Sclerophyll, as well Tall Open Forest in the former population. The Wet Sclerophyll of Yuraygir State Conservation Area has a canopy of *Eucalyptus microcorys* F.Muell, *Lophostemon confertus* (R.Br.) Peter G.Wilson & J.T.Waterh. and *Syncarpia glomulifera* A.T.Lee; and a dense understory of *Backhousia myrtifolia* Hook. & Harv., *Ceratopetalum gummiferum* Sm., *Cyclophyllum longipetalum* S.T.Reynolds & R.J.F.Hend., *Halfordia kendak* Hook. & Harvey and *Leptospermum petersonii* F.M.Bailey.





**Figure 1.** Plate field photographs of *P. spathulata* (a–c) and *P. floydii* (d–j). a. habit and inflorescence; b. branchlets and leaves exhibiting indumentum; c. corolla, front view showing relative position of stamens and style; d. habit and inflorescence; e. inflorescence; f. flower, lateral view showing prophylls, calyx and corolla; g. corolla, front view showing relative position of stamens in throat during male phase of anthesis; h. bark on stem and older branchlets; i. corolla, front view showing relative position of stamens during female phase of anthesis; j. dark brown mericarps (above) and senesced calyces (below). Scale bar 4 mm. Photographs by P. Sheringham (a–d, i) and T.C. Wilson (e–h, j).





**Figure 2.** *Prostanthera floydii* a. habit and inflorescence; b. stem node detail; c. leaf, abaxial view; d. leaf, adaxial view; e. flower, dorsal view; f. flower, lateral view showing prophylls, calyx and corolla; g. corolla, front view showing relative position of stamens and style in corolla throat; h. stamen, lateral view; i. stamen, adaxial view; j. stamen, abaxial view; k. fruiting calyx, lateral view; l. mericarp, adaxial view; m. mericarp, lateral view. Scale bar: a = 26.7 mm; b = 5 mm; c, d = 20 mm; e–g = 13.3 mm; h–j, l, m = 3.2 mm; k = 10 mm. Voucher: a–j from T.C. Wilson 1049; k–m from T.C. Wilson 1127. Illustrations: C.Wardrop.

The Tall Open Forest has a canopy of *Corymbia intermedia* (R.T.Baker) K.D.Hill & L.A.S.Johnson, *E. pilularis* Sm., *S. glomulifera*; a mid-layer of *Acacia terminalis* (Salisb.) J.F.Macbr., *Boronia hapalophylla* Dureto, F.J.Edwards & P.G.Edwards, *Banksia collina* R.Br., *Banksia serrata* L.f., *C. gummiferum*, *Doryanthes excelsa* Corrêa and *Lambertia formosa* Sm.; and a ground layer of *Austromyrtus glabra* N.Snow & Guymer, *Platysace ericoides* (Sieber ex Spreng.) C.Norman. and *Sticherus lobatus* N.A.Wakef.

The habitat of the latter site includes a sandstone substrate with a canopy of *Angophora costata* (Gaertn.) Britten, *Banksia serrata* L.f. and *Eucalyptus pilularis* Sm.; shrub layer of *Acmena smithii* (Poir.) Merr. & L.M.Perry, *Ceratopetalum gummiferum*, *Trochocarpa laurina* (Rudge) R.Br., *Persoonia strabrookensis* Domin and *Xanthorrhoea johnsonii* A.T.Lee; and a ground layer of *Olearia stillwelliae* Blakely, *Pteridium esculentum* (G.Forst.) Cockayne and *Zieria smithii* Jacks.

**Conservation status:** A conservation status of Endangered is recommended for *P. floydii* based on IUCN conservation guidelines (2024). The species qualifies under Criteria 2- B1 and B2- very restricted geographic distribution and only known from two locations in NSW, and Criteria 3 c 2i- less than 250 mature individuals. The first locality in Yuraygir State Conservation Area comprises two sub-populations totalling 194 plants. The second location at Sherwood Nature Reserve and adjoining private property has 10 plants.

***Prostanthera spathulata*** T.C.Wilson & B.J.Conn, *Telopea* 18: 259–263 (2015).

**Type:** Queensland: Wide Bay: NNE slope of Mount Tinbeerwah, near summit, 29 Aug 2013, T.C. Wilson 497, A.E. Orme, M.A. Bedoya-Perez & M.A.M. Renner (holo: NSW 979126; iso: AD, BRI, CANB, NSW 845690 (spirit), PERTH 9541276).

**Distribution:** Known from two locations. The type location is the Mount Tinbeerwah area, West of Tewantin, Wide Bay region of Queensland, Australia. Only known from one population in Yuraygir State Conservation Area of the New South Wales North Coast.

**Habitat:** The Queensland population is found on cracks and fissures in steep north-facing volcanic pavements, in loam or skeletal soils derived from trachyte and from tall eucalypt forest or open shrubland. In New South Wales, it grows on sandstone rock outcrops associated with Clarence Sandstones, in shrublands and open woodlands with *Angophora woodsiana* F.M.Bailey, *Baeckea diosmifolia* Rudge, *Calytrix tetragona* Labill., *Eriachne pallescens* R.Br., *Eucalyptus pachycalyx* subsp. *waajensis* L.A.S.Johnson and K.D.Hill, *Eucalyptus planchoniana* F.Muell., *Gaudium microcarpum* (Cheel) Peter G.Wilson, *Leptospermum polygalifolium* Salisb. and *Xanthorrhoea johnsonii*. Altitudes range between 100–200 m.

**Notes:** Flowering has been recorded at the Queensland site between February and October, and at the New South Wales site during May and June.

**Conservation status:** This species is known only from two small populations, Tewantin National Park, Queensland and Yuraygir State Conservation Area, New South Wales. Each are found in less than a 5 km<sup>2</sup> area. It was listed as Vulnerable on the EPBC Act 1999 based on sole knowledge of the single Queensland population, whose number has not been estimated (DEWHA 2008). The Yuraygir State Conservation Area population comprises 30 plants and has been nominated to the NSW Threatened Species Scientific Committee (2016) for listing. The Commonwealth conservation assessment advice for *P. spathulata* should be reviewed and updated to include the NSW occurrence. Regarding the Endangered category under the Red List of Threatened Species (IUCN 2024), it is not known at more than five locations.

**Specimens examined:** NEW SOUTH WALES: North Coast: Yuraygir State Conservation Area: c. 1.3 km North of Bald Knob, 16 May 2020, P. Sheringham 33 (UNSW); c. 1.3 km North of Bald Knob, 8 Jun 2024, P. Sheringham s.n. & J. Edwards (NSW).

QUEENSLAND: Wide Bay: Mount Tinbeerwah, W of Tewantin, 20 Apr 1984, I.R. Telford 9694 (BRI n.v., CBG n.v., NSW); loc. cit., 7 Oct 1997, D. Halford Q3421 & P. Sharpe (BRI n.v., NSW); loc. cit., 27 Oct 1997, D. Halford Q3500, L. Hucks & G. Thomas (BRI n.v., CANB n.v., NSW).

**Key to species:** A section of the key to the New South Wales species of *Prostanthera* is here amended to incorporate *P. floydii* and *P. spathulata*. For the key we refer to trichomes as 'hairs' to correspond with the existing key.

Couplet 40 is reached when identifying *P. floydii* because it does not have spines and has unequal calyx lobes, flowers arranged in leafy botryoids (thereby appearing axillary), narrow ovate leaves with a recurved margin and a leaf lamina with a glabrous adaxial surface and hairy abaxial surface. The modification of the key by Wilson et al. (2019) provided two additional couplets (40a and 40b) to couplet 40 that have not yet been included in the Flora of NSW, and hence require further modification with the addition of another couplet to include *P. floydii*. *Prostanthera floydii* lacks tuberculate hairs on its leaves, has a leaf lamina longer than 20 mm, a calyx longer than 2.5 mm, and anther appendages longer than the cell, which thereby distinguishes it from *P. crocodyloides* T.C.Wilson, *P. decussata* F.Muell., and *P. howelliae* Blakely at couplet 40.

Couplet 47 is reached when identifying *P. spathulata* because it has unequal calyx lobes, flowers arranged in leafy botryoids (thereby appearing axillary), leaves flat or slightly incurved, lacks glandular hairs, its branchlets are hairy, and its branchlets moderately to densely hairy. Couplet 47 needs to include *P. spathulata* by changing the first option to include plants with antrorse trichomes in addition to patent or spreading trichomes. Couplet 47a requires to distinguish *P. spathulata* from *P. makinsonii* by its spatulate leaf shape (vs ovate), ± glabrous leaf (vs abaxial surface hairy), and anther appendage at least as long as the anther cell (vs anther appendage shorter than anther cell).



## Additional leads at couplet 40:

40. Leaves > 22 mm long, without tuberculate hairs, calyx tube > 2.6 mm long ..... *P. floydii*
- 40: Leaves < 22 mm long, with tuberculate hairs, calyx tube < 2.6 mm long ..... 40a
- 40a. Leaves 8–20 mm long; calyx with glandular hairs ..... *P. crocodyloides*
- 40a: Leaves 4–10 mm long; calyx without glandular hairs ..... 40b
- 40b. Stems densely hairy; leaves hairy on adaxial surface ..... *P. decussata*
- 40b: Stems sparsely to moderately hairy; leaves with adaxial surface glabrous ..... 40c
- 40c. Leaves not clustered in axils; flowers axillary and with dark spots in corolla throat ..... *P. howelliae*
- 40c: Leaves clustered in axils; flowers usually in racemose inflorescences (rarely axillary) and without markings in corolla throat ..... *P. denticulata*

## Additional leads at couplet 47:

47. Branchlets moderately to densely hairy, with hairs patent, slightly spreading to antrorse (sometimes appressed) ..... 47a
- 47: Branchlets appearing sparsely hairy or with hairs restricted to opposite decussate bands ..... 48
- 47a. Leaves ovate and sparsely to moderately hairy; anther appendages shorter than the anther cell ..... *P. makinsonii*
- 47a: Leaves spatulate and ± glabrous; anther appendages as long as anther cell ..... *P. spathulata*

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## References

- Anderson RH (1961) Introduction. *Contributions of the New South Wales National Herbarium* **1–18**, 1–15. [DOI](#)
- Australian Plant Census (2021) APC: *Prostanthera*. In 'The Australian National Species List: Vascular Plants'. APC (version 51411005). (Council of Heads of Australasian Herbaria) [URL](#) Accessed 31 October 2024.
- Briggs BG, Johnson LAS (1979) Evolution in the Myrtaceae – evidence from inflorescence structure. *Proceedings of the Linnean Society of New South Wales* **102**, 157–256. [URL](#)
- Conn BJ (1984) A taxonomic revision of *Prostanthera* Labill. section *Klanderia* (F.v. Muell.) Benth. (Labiatae). *Journal of the Adelaide Botanic Gardens* **6**, 207–348. [URL](#)
- Conn BJ (1988) A taxonomic revision of *Prostanthera* Labill. section *Prostanthera* (Labiatae). 1. The species of the Northern Territory, South Australia and Western Australia. *Nuytsia* **6**, 207–348. [DOI](#)
- Conn BJ (1997) Four rare and/or threatened new species of *Prostanthera* Section *Prostanthera* (Labiatae) from New South Wales. *Telopea* **8**, 231–244. [URL](#)
- Conn BJ, Wilson TC (2015) Two new species of *Prostanthera* (Lamiaceae) in New South Wales. *Telopea* **18**, 463–474. [DOI](#)
- DEWHA (Department of the Environment, Water, Heritage and the Arts) (2008) Approved Conservation Advice for *Prostanthera* sp. Mt Tinbeerwah (C.Sandercoe C1256) [PDF](#). Accessed 16 September 2024.
- IUCN (2024) *The IUCN Red List of Threatened Species. Version 2024-1*. [URL](#). Accessed 16 September 2024.
- Harley RM, Atkins S, Budantsev AL, Cantino PD, Conn BJ, Grayer RJ, Harley MM, de Kok R, Krestovskaja T, Morales R, Paton AJ, Ryding O, Upson T (2004) Labiatae. Pp. 167–275 in Kadereit JW (ed.) *The families and genera of vascular plants. Flowering plants. Dicotyledons*, vol. 7. (Springer: Berlin)
- Jacobs SWL, Pickard J (1981) *Plants of New South Wales*. (D West, Government Printer: Sydney)
- Mueller, FJH von (1858) *Prostanthera phyllicifolia*. In *Fragmenta Phytographiae Australiae*, vol. 1. Pp. 19. (Auctoritate Gubern: Melbourne) [DOI](#)
- NSW National Parks and Wildlife Service (2003) *Chapter 14 The North Coast Bioregion*. In *The Bioregions of New South Wales their biodiversity, conservation and history*. Pp. 171–178. (NSW National Parks and Wildlife Service: Hurstville) [PDF](#)
- O'Donnell R, Wilson TC, Andrew RL, Telford IRH, Taseski GM, Zimmer H, Bruhl JJ (2021) Molecular phylogenetic analysis of the *Prostanthera phyllicifolia* (Lamiaceae) assemblage resolves relationships of the 'Critically Endangered' *P. gilesii* and other putative new species. *Telopea* **24**, 359–376. [DOI](#)
- O'Donnell R, Bruhl JJ, Telford IRH, Wilson TC, Zimmer H, Taseski GM, Andrew RL (2023) Molecular and morphological analyses support recognition of *Prostanthera volucris* (Lamiaceae), a new species from the Central Tablelands of New South Wales. *Australian Systematic Botany* **36**, 1–20. [DOI](#)
- PlantNET (2024) *The NSW Plant Information Network System*. Royal Botanic Gardens and Domain Trust, Sydney. [URL](#). Accessed October 30, 2024.
- Thackway R, Cresswell ID (1995) *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves, Version 4.0*. (Australian Nature Conservation Agency: Canberra)
- Threatened species Committee (2016) [PDF](#). Accessed 16 September 2024.
- Williams ML, Drinnan AN, Walsh NG (2006) Variation within *Prostanthera spinosa* (Lamiaceae): evidence from morphological and molecular studies. *Australian Systematic Botany* **19**, 467–477. [DOI](#)
- Wilson TC, Conn BJ, Henwood MJ (2012) Molecular phylogeny and systematics of *Prostanthera* (Lamiaceae). *Australian Systematic Botany* **25**, 341–352. [DOI](#)

- Wilson TC, Conn BJ (2015) Two new species of *Prostanthera* (Lamiaceae) from southeastern Queensland. *Telopea* **18**, 255–263. [DOI](#)
- Wilson TC, Conn BJ, Henwood MJ (2017) Great expectations: Correlations between pollinator assemblages and floral characters in Lamiaceae. *International Journal of Plant Sciences* **178**, 170–187. [DOI](#)
- Zhao F, Chen Y-P, Salmaki Y, Drew BT, Wilson TC, Scheen A-C, Celep F, Bräuchler C, Bendiksby M, Wang Q, Min D-Z, Peng H, Olmstead RG, Li B, Xiang C-L (2021) An updated tribal classification of Lamiaceae based on plastome phylogenomics. *BMC Biology* **19**, 1–27. [DOI](#)