

## *Tetratheca butcheriana* (Elaeocarpaceae), a new and rare species from the Pilbara bioregion of Western Australia

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### Abstract

Perkins, A.J., Reiffer, S. & Ajduk, H. *Tetratheca butcheriana* (Elaeocarpaceae), a new and rare species from the Pilbara bioregion of Western Australia. *Nuytsia* 27: 203–209 (2016). A new species of *Tetratheca* Sm., discovered while performing flora surveys along banded ironstone cliffs north-west of Tom Price in 2015, is described. It is named *T. butcheriana* A.J.Perkins in honour of Ryonen Butcher, a botanical researcher and well-published taxonomic expert on *Tetratheca* in Western Australia. This species is one of two species of *Tetratheca* geographically restricted to the Pilbara bioregion, both of which are of conservation significance. A taxonomic description of *T. butcheriana* is provided, along with photographs and a list of diagnostic features to aid in identification.

### Introduction

The genus *Tetratheca* Sm. (Elaeocarpaceae) is well-represented in Western Australia, with 33 of the 52 described species occurring in the state (Western Australian Herbarium 1998–). The vast majority of those are distributed in the south-west and many are known to be narrow-range endemics. Due to their edaphic specificity (often to particular types of banded ironstones) and the isolated nature of their distributions, 15 Western Australian taxa have been discovered and described in the past couple of decades (Alford 1995; Butcher & Sage 2005; Bull 2007; Butcher 2007a, 2007b, 2007c, 2008, 2009; Butcher & Cockerton 2012). All 15 taxa are conservation-listed including six that are recognised as Threatened (Jones 2015).

Interestingly, two species are distinctly geographically isolated to the north of the remaining taxa in Western Australia: *T. chapmanii* Alford by c. 520 km and *T. fordiana* R.Butcher by c. 700 km. *Tetratheca chapmanii*, first collected in 1993, grows on sandstone cliffs in the Carnarvon Range (Little Sandy Desert bioregion) and is characterised by having subtly ridged stems covered with tubercles and sparse glandular hairs, flowers borne from clusters of floral bracts and ovaries covered with glandular hairs (Alford 1995). In contrast, *T. fordiana* was first collected in 1987 from plants growing in the West Angelas area of the Hamersley Range (Pilbara bioregion) and is characterised by having glaucous stems that are densely and finely hispid and covered with spine-like setae (giving them a prickly appearance), relatively small leaves that are densely hispid, floral bracts in pairs, hispid peduncle and

calyx segments, and a hispid ovary with additional glandular hairs on the surface (Butcher & Sage 2005). Both species have small or reduced leaves, 5-merous flowers and two ovules per locule in the ovary.

There have been several *Tetralthea* discoveries in the Pilbara bioregion in recent years. In 2012, *T. fordiana* (Figure 1), which was known only from the type collection, was rediscovered in the West Angelas area growing on an ironstone cliff face and upper ridgeline. A second population of this species was subsequently found last year in a similar habitat some 35 km to the north-west. Additional serendipitous collections made in 2015 from north-west of Tom Price (Figure 2) revealed a distinct and novel species, formally described herein as *T. butcheriana* A.J.Perkins.



Figure 1. *Tetralthea fordiana*. A – habit of plant *in situ*; B – single flower showing petal coloration at base, anthers and style tip; C – developing fruits *in situ* showing hispid peduncles, hispid and glandular-hairy outer surface, and kinked style; D – flower-bearing branches showing hispid and setose stems, hispid leaves with recurved margins, and pendulous flowers *in situ* showing hispid peduncles and calyces. Photographs by A. Perkins in July 2012 from plants in the West Angelas area.

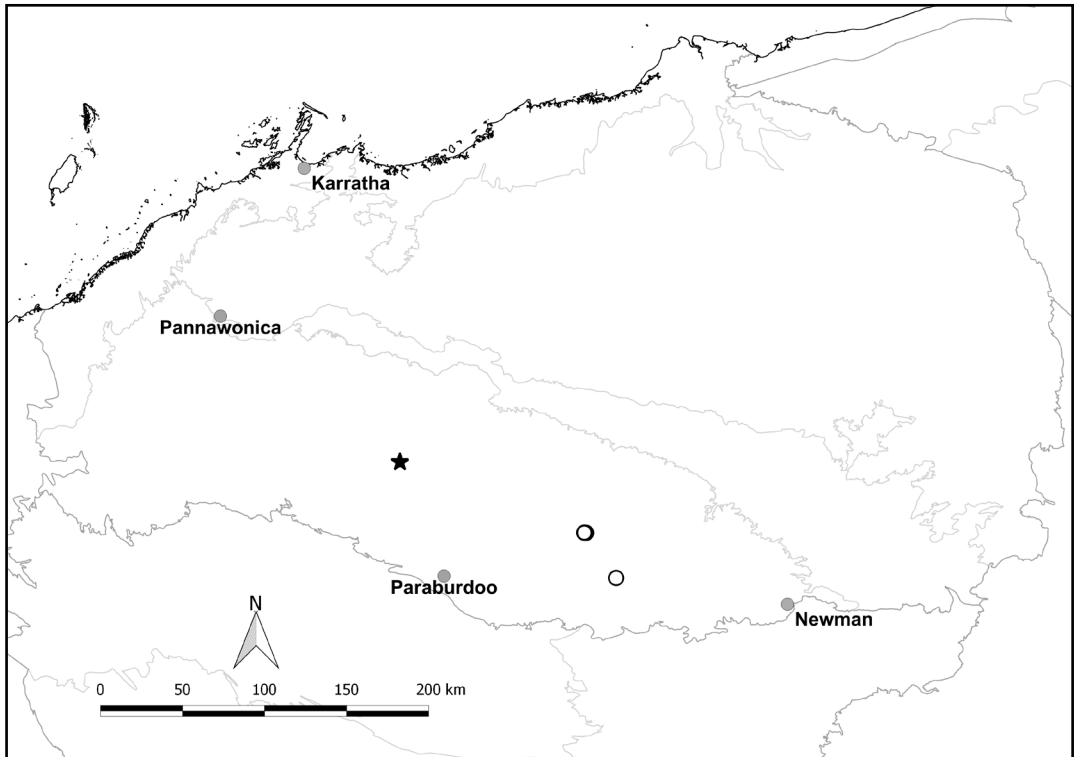


Figure 2. Distribution of *Tetralthea butcheriana* (★) and *T. fordiana* (○) populations in the Pilbara bioregion of Western Australia.

### Methods

The description of *T. butcheriana* is based on the examination of fresh material, photographic images taken of plants *in situ* and six voucher specimens, including the type. Morphological comparisons were made with voucher and type material of other Western Australian species of *Tetralthea* held at the Western Australian Herbarium (PERTH).

### Taxonomy

***Tetralthea butcheriana*** A.J.Perkins, *sp. nov.*

*Type*: north-west of Tom Price, Western Australia [precise locality withheld for conservation reasons], 14 July 2015, H. Ajduk & S. Reiffer HA-TET03 (*holo*: PERTH 08729328; *iso*: AD, CANB, DNA, MEL, NSW).

Erect to sprawling *sub-shrub*, 15–80 cm high, 15–50 cm wide. *Stems* numerous from base, erect to sprawling becoming pendulous (with age), with predominantly alternate branching, elongate, terete, straight, terminating in a slender, blunt, brown point on leafless stems, 1.0–1.5(–2.0) mm wide in flowering region with sparse, patent, glandular hairs (0.1–0.3 mm long) in the lower 1/3, glabrous along the remainder; juvenile stems pale yellowish green, surface smooth and glaucous; mature leafy stems light green; mature leafless stems dull brown, minutely rugulose. *Leaves* alternate, occasionally sub-opposite, erect at an acute angle to the stem, subsessile (with short yellowish green petioles,

0.1–0.2 mm long), leaves along the lower 1/3 of stems glabrescent with glandular hairs (0.1–0.3 mm long), remaining leaves glabrous; blade elliptic to oblong, 3.0–10.1 mm long, 0.9–3.6 mm wide; apex acute; margin entire, flat to shallowly convex; adaxial surface light green, flat; abaxial surface paler light green, often with pale crimson colouration along the margin and raised midrib. *Flowers* axillary (on leafy stems only), solitary, pendulous. *Bracts* absent. *Peduncles* gently curved, lengthening as flowers develop, 5.0–11.1 mm long, 0.2–0.5 mm wide, crimson to purple-red, dull, glabrous, tapering gradually along length then expanding into a shallowly ridged, angular, glabrous receptacle 0.9–1.1 mm wide. *Calyx* segments 5, inserted on edge of receptacle rim, deciduous, narrowly ovate to elliptic, 3.0–3.4 mm long, 1.9–2.1 mm wide, shallowly concave in T.S.; apex acute; margin flat; outer surface greenish crimson, dull, glabrous; inner surface tomentose with fine, simple hairs inside the margin, gradually becoming less so towards centre and base; mid-vein thickened. *Petals* 5, deciduous, broadly obovate, 10.0–14.5 mm long, 5.5–8.8 mm wide with the widest point at 7.3–10.9 mm (*c.* 1/4 from the apex), uniformly pink (in some individual plants) or pink with a crimson area at the base. *Stamens* 10, 4.0–5.0 mm long, shortly fused into pairs at base; filaments thick, compressed, obliquely angled, 0.2–0.3 mm long, red, glabrous; anther bodies with 3 distinct raised ridges (2 dorsal, 1 ventral), 2.2–2.7 mm long, dark crimson-purple, glabrous, apices gradually transitioning into anther tubes; anther tubes incurved along their length, 1.4–2.0 mm long, dark magenta, smooth, glabrous; orifices narrow, ovular, oblique. *Ovary* compressed-obovate, narrow at base, 1.5–2.0 mm long, 1.0–1.2 mm wide, yellowish green, glabrous, apex gradually tapering into style base, glabrous inside loculi; *style* straight, thicker at base, tapering towards apex, 2.5–3.0 mm long, pale crimson basally, yellowish green to cream at apex, glabrous; *stigma* simple, minutely papillose; *ovules* 4, 2 in each locule, attached towards the apex of the septum by small, colourless placentas. *Fruit* compressed-obovoid to -ellipsoid, 7.2–10.6 mm long, 5.0–5.7 mm wide, greenish yellow to crimson, dull, glabrous, sunken along axis; rim of receptacle prominent and persistent, gently angled; style persistent. Commonly 1 seed per locule (2 per fruit reach maturity, remaining 2 ovules often abort). *Seed* obliquely obloid to narrowly obovoid, the proximal end obtuse, the distal end truncate, 3.9–4.3 mm long, 1.2–1.6 mm wide, cream-yellow to pale crimson, with erect to loosely appressed, fine, white, simple hairs; *elaiosome* prominent, irregularly coiled beyond the seed in 3 coils, 2.4–3.1 mm long in coiled state, cream to tan, terete at base, becoming flattened and rugulose from half-way through the first coil, with spreading to erect, fine, white, simple hairs. (Figure 3)

*Diagnostic features.* *Tetrateca butcheriana* is distinguishable from all other species of *Tetrateca* by the following combination of characters: stems leafy, terete and straight, with the surface smooth, glaucescent and glandular-hairy in the lower 1/3; leaves flat to shallowly convex; flowers axillary, borne singly on leafy portion of stem; floral bracts absent; ovary with 2 ovules per locule; peduncles, outer calyces, ovary and fruit glabrous.

*Other specimens examined.* WESTERN AUSTRALIA: [localities withheld for conservation reasons] 14 July 2015, H. Ajduk & S. Reiffer HA-TET01 (PERTH); 14 July 2015, H. Ajduk & S. Reiffer HA-TET02 (PERTH); 14 July 2015, S. Reiffer & H. Ajduk SRe-Op04 (PERTH); 14 July 2015, S. Reiffer & H. Ajduk SRe-Op05 (PERTH); 14 July 2015, S. Reiffer & H. Ajduk SRe-Op06 (PERTH).

*Phenology.* This species was collected in mid-July 2015 with buds, flowers, developing fruit and recently open fruit present simultaneously on plants. It can be inferred that plants flower and fruit from at least June to August. Flowers were only observed in leaf axils on ‘leafy’ portions of the stems, indicating that they are only borne on the current season’s vegetative shoots. As for *T. chapmanii* and *T. fordiana*, it is likely that the timing of the flowering season for this species is linked to significant local rainfall events.



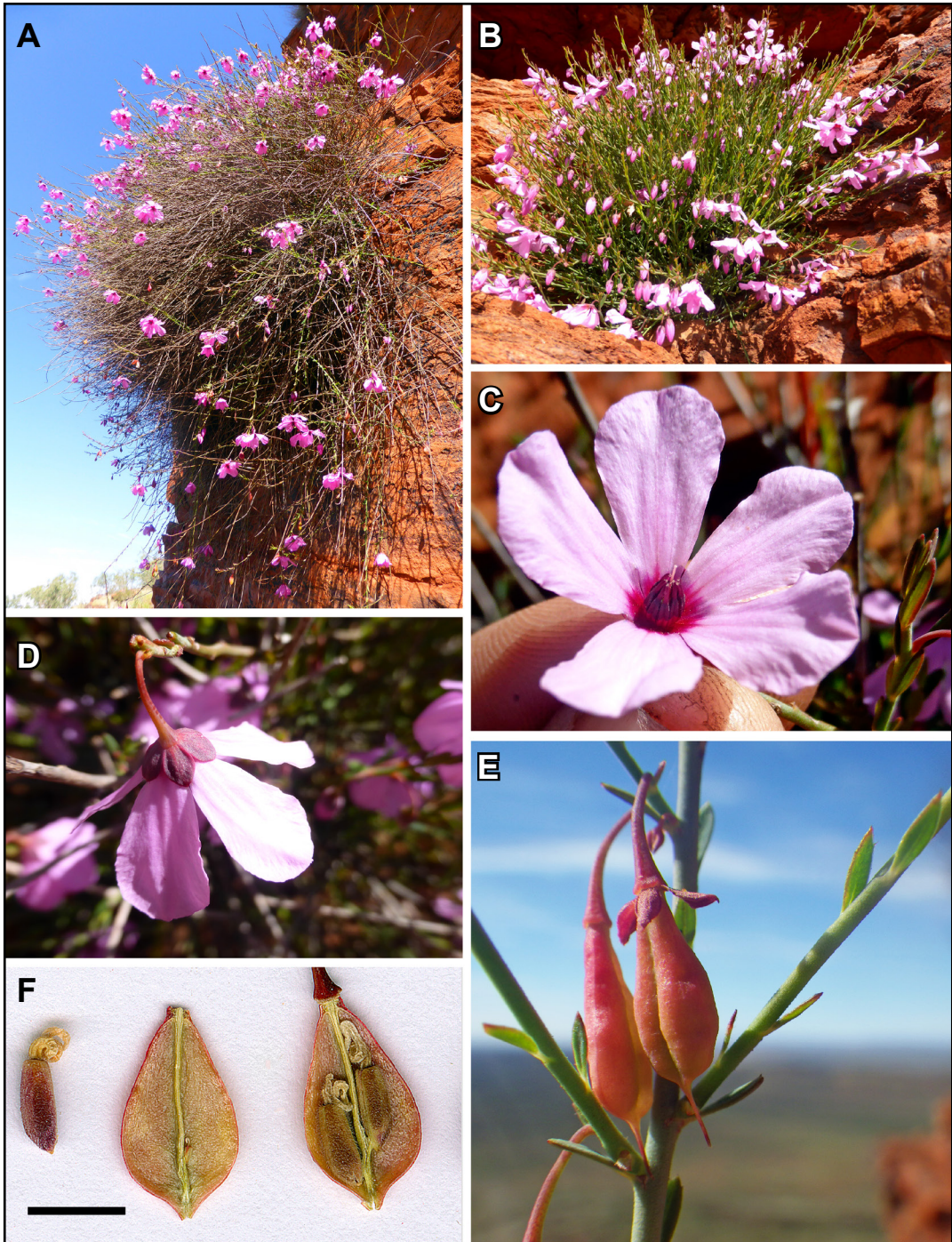


Figure 3. *Tetratheca butcheriana*. A – flowering plant *in situ* showing hanging stems; B – erect habit of a smaller plant; C – single flower showing ventral surface of pink petals, anthers and style tip; D – pendulous flower *in situ* showing glabrous peduncle and calyx segments; E – fruit-bearing branches showing alternate leaves with short, yellow petioles and ascending, flat laminas, as well as near-mature, obovoid fruits with longitudinal indentation, glabrous outer surface and straight styles; F – open fruit showing one mature seed removed (left), small, aborted ovule attached to septum (middle), and remaining two mature seeds in separate locules (right). Scale = 5 mm (E). Photographs by H. Ajduk (A–D), S. Reiffer (E) and A. Perkins (F).

*Distribution and habitat.* This species is restricted to the Hamersley subregion of the Pilbara bioregion in Western Australia (Figure 2) where it is known only from a 500 m stretch of ironstone cliffs and breakaways. The surrounding vegetation consists of scattered low trees of *Corymbia deserticola* and *Eucalyptus leucophloia* over scattered shrubs of *Astrotricha hamptonii*, *Senna glutinosa* subsp. *glutinosa* and *Acacia pruinocarpa* over open hummock grassland of *Triodia wiseana* over scattered tussock grasses of *Cymbopogon ambiguus* and bunch grasses of *Eriachne mucronata*.

*Conservation status.* To be listed as Priority One under Department of Parks and Wildlife Conservation Codes for Western Australian Flora (M. Smith pers. comm.). *Tetralthea butcheriana* is currently only known from a single population of 170 plants and is in need of further survey.

*Etymology.* Named in honour of Ryonen Butcher (1972–), a botanical researcher at PERTH and well-published taxonomic expert on *Tetralthea* in Western Australia (Butcher & Sage 2005; Butcher 2007a, 2007b, 2007c, 2008, 2009, 2010; Butcher & Cockerton 2012). The common name of Butcher's *Tetralthea* is here suggested.

*Affinities.* *Tetralthea butcheriana* has a distinct suite of diagnostic characters and its precise affinities are unclear in the absence of molecular phylogenetic data. *Tetralthea fordiana*, the only other species of *Tetralthea* in the Pilbara bioregion, can be readily differentiated from *T. butcheriana* by its hispid stems covered with hard, red-brown setae, hispid leaves with recurved margins, paired floral bracts, hispid peduncles and outer calyces, and hairy ovary with kinked style (Figure 1).

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