Thryptomene Endl.

ALA (https://bie.ala.org.au/species/https://id.biodiversity.org.au/taxon/apni/51440403) NSL [nom. cons.] (https://biodiversity.org.au/nsl/services/apni-format/display/77151)

Options

— Endlicher, S.F.L. (1838), *Stirpium Australasicarum Herbarii Hugeliani Decades Tres*: 192

Nomenclature

Council of Heads of Australasian Herbaria (2010), *Australian Plant Census* ()

Etymology

From the Greek *thryptomene* (broken or made small), perhaps referring to the small leaves or flowers.

Type

Thryptomene australis Endl.

Description

Prostrate to tall shrubs, rarely trees, glabrous. Young stems smooth (not tuberculate), white or pale grey, usually dotted with oil glands. Leaves opposite, decussate, small, shortly petiolate or (in *T. naviculata*) sessile. Peduncles 1–3 per axil, 1–3-flowered, but with most species having just a single 1-flowered peduncle per axil, usually dorsiventrally compressed. Bracteoles free, keeled, usually narrowly to broadly ovate. Pedicels ± absent in most species. Flowers primarily 5-merous or (in 2 species) 6- or 7-merous, actinomorphic. Hypanthium with a greater diameter than length in most species, longer than wide and/or dorsiventrally compressed in some species, longitudinally ribbed in about half the species, with varied other kinds of ornamentation less common; free part usually short. Sepals much shorter than to slightly longer than the petals, sometimes auriculate but auricles usually very small, persistent in fruit. Petals 5 (–7), broad, widely spreading in flower, white to deep pink or pink-purple or (in 1 species) yellow, in most species closed inwards in fruit; antipetalous colleters absent or minute. Staminodes rare or absent. Stamens inflexed in bud, 5–40, when very few then all antisepalous, when numerous then in 2 series with outer series longer, much shorter than the petals. Filaments free. Anthers dorsifixed, versatile or non-versatile, broader than long; thecae divergent at base, compact, dehiscent by a pore or slit, often globular, commonly brown, sometimes becoming deeply 2-lobed after dehiscence if the slits are long; connective gland free, dorsal-subterminal or terminal, large, either broad and truncate (cup-shaped) or narrower and curved-urceolate, releasing contents by a pore facing centre of flower. Ovary inferior, 1-locular; summit concave, in most species pale at first and turning deep pink or red with age; placenta near-basal or ± lateral; ovules erect (not pendulous), 2 and collateral or 4–10 in 2 rows. Style central and terminal (base not inset); stigma capitate. Fruits indehiscent, inferior (but often with a convex summit protruding

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upwards), broader than long in most species, all or mostly 1-seeded. Seeds transversely reniform or of other depressed shapes in most species, erect and longer than wide in a few species, the maximum dimension (length or more commonly the width) 1.2–2.1 mm long or across; testa membranous.

Diagnostic Features

Distinctive in its anther morphology, which includes two basally divergent thecae and a free, large connective gland. Other important characters: ovary inferior, 1-locular, with ovules erect on a near-basal or ± lateral placenta; style terminal; fruits indehiscent.

Chromosome Numbers

n = 9–11, with tetraploid numbers of *n* = 18 and *n* = 22 also recorded (Rye 1979).

Biostatus

Native.

Distribution

A genus of 54 formally named species and three phrase-named taxa, endemic to and widespread in Australia but with most species restricted to Western Australia and a marked concentration of them in the southwest.

Ecology

Flowers attract varied insect pollinators to readily accessible nectar. Wind-dispersal of the small, indehiscent fruits may be assisted by persistent widely spreading sepals and sometimes also petals, but most species lack obvious adaptations to wind dispersal. Fertile fruits are normally 1-seeded but occasional 2-seeded fruits have been reported in a few species. Sterile fruits are often far more common than fertile ones, but despite their lack of a seed may be larger and much harder than the fertile ones.

Nomenclature and Typification

Thryptomene Endl., *Stirpium Herbarii Hügeliani* 3: 192 (1838), *nom. cons.*; *Tryptomene* F.Muell., *Fragmenta Phytographiae Australiae Occidentalis* 1(1): 11 (1858), *orth. var.* Type: *Thryptomene australis* Endl.

Gomphotis Raf., *Sylva Telluriana*: 103 (1838), *nom. rej.* Type: *Gomphotis saxicola* (A.Cunn. ex Hook.) Raf. [= *Thryptomene saxicola* (A.Cunn. ex Hook.) Schauer].

Paryphantha Schauer, *Linnaea* 17: 235–236 (1843); *Thryptomene* sect. *Paryphantha* (Schauer) Kuntze in T. Post & O. Kuntze, *Lexicon Generum Phanerogarum* 559 (1903). Type: *Paryphantha mitchelliana* Schauer, *nom. illeg.* [= *Thryptomene calycina* (Lindl.) Stapf].

Astraea Schauer, *Linnaea* 17: 238 (1843), *nom. illeg.*, *nom. superfl.*; *Thryptomene* sect. *Astraea* (Schauer) Stapf., *Curtis's Botanical Magazine* 149: t. 8995 (1924). Type: *Astraea saxicola* (A.Cunn. ex Hook.) Schauer. [= *Thryptomene saxicola* (A.Cunn. ex Hook.) Schauer].

Bucheria Heynh., *Nomenclator Botanicus Hortensis* 2: 80 (1846), *nom. illeg.*, *nom. superfl.* Type: *Bucheria saxicola* (Hook.) Heynh., *nom. illeg.* [= *Thryptomene saxicola* (A.Cunn. ex Hook.) Schauer].

Taxonomic Notes

Thryptomene was previously considered to be very closely related to *Micromyrtus* Benth. and to the species that have been transferred from *Thryptomene s. lat.* into *Aluta* Rye & Trudgen; however, *Thryptomene s. str.* is now treated as the sole member of subtribe Thryptomeninae based on molecular evidence (Rye *et al.* 2020). The three genera are readily distinguished by their anther morphology, which is illustrated in Green (1980) for one species of *Aluta* (as *T. maisonneuvei*) and for several species of *Micromyrtus* and *Thryptomene*.

Thryptomene was divided into the following five sections by Stapf (1924): sect. *Euthryptomene* Kuntze, *nom. inval.* (= sect. *Thryptomene*), sect. *Astraea* (Schauer) Stapf., sect. *Oligandron* Stapf, sect. *Paryphantha* (Schauer) Kuntze, and sect. *Thryptocalpe* Stapf. This infra-generic classification needs to be revised to reflect the broader range of morphological characters found in species published since then and the molecular evidence.

One unusual character found in about eight species, including *T. calycina*, is the presence of two or three peduncles in many of the leaf axils. Where this occurs, the peduncles are highly dorsiventrally compressed and stacked one above the other in an axil. Another unusual character, found in many Western Australian species, is the occurrence of 10 almost equidistant stamens, all positioned in the gaps between the sepals and petals (described here as 'alternating with the sepals and petals'). In many such cases the stamens are actually in five pairs opposite the sepals although the paired stamens are widely spaced as they are situated close to each margin of a sepal. The anthers may become deeply 4-lobed after dehiscence, as in all members of sect. *Thryptocalpe*.

To facilitate future work, brief descriptions are provided of the distinctive species *T.* sp. Missionary Plain (A. Schubert 267) from central Australia in the Northern Territory, and two poorly known Western Australian entities known as *T.* sp. Coolgardie (E. Kelso *s.n.* 1902) and *T.* sp. Warburton (M. Henson & M. Hannart 32433).

A key to taxa is available in Rye (2024), https://www.biodiversitylibrary.org/page/64192973. (https://www.biodiversitylibrary.org/page/64192973.)

Key to species and subspecies

1. Ovules 4–10, in 2 rows. Hypanthium with 9–16 irregular, closely packed, longitudinal ribs

2. Stamens 15–40 in 2 series

3. Mature peduncles 0–0.4 mm long. Sepals 2–3.3 mm long. Ovules 5–10. Mature style 2.5–3.5 mm long (Yaringa Station–near Congo Creek–Lee Steere Range–Leonora area, W.A.) ..... **T. decussata**

3: Mature peduncles 0.7–1.4 mm long. Sepals c. 1.4 mm long. Ovules 4. Mature style c. 0.7 mm long (Binnu area, W.A.) ..... **T. duplicata**

2: Stamens 5–13 in 1 series

4. Leaves more than half as thick as wide and sometimes slightly thicker than wide, 0.5–1.5 mm wide and 0.4–1.2 mm thick

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5. Leaves almost terete with an adaxial groove, 2.4–4.5 mm long, with a subterminal point 0.8–1.5 mm long. (Menzies–Pinjin Stn, W.A.) ..... **T. eremaea**

5: Leaves triangular or indented-triangular in TS towards the apex and tending to be more flattened below, 3–7 mm long, tapered at apex to a terminal point 0.5–1 mm long

6. Stamens almost reaching style when pressed inwards; filament 0.7–1.1 mm long. Mature style 0.6–0.8 mm long (Near Kalannie–Mt Cooke–Frank Hann NP–Lort River, W.A.) ..... **T. australis** subsp. **australis**

6: Stamens well separated from style when pressed inwards; filament 0.4–0.6 mm long. Mature style 0.35–0.6 mm long (SE Coolgardie–Cape Arid NP, W.A.) ..... **T. australis** subsp. **brachyandra**

4: Leaves dorsiventrally compressed such that they are less than 1/3 as thick as wide, 0.9–2.6 mm wide

7. Leaf apical point (0.7–) 1–2 mm long (where best developed). Ovules 6–9. Recorded on granite outcrops and in other rocky habitats (N of Cue–Wongan Hills area–Tallering Peak–near Menzies, W.A.) ..... **T. costata**

7: Leaf apical point absent or up to 0.5 mm long. Ovules 4–6. Recorded mostly around low-lying winter-wet sites or on drainage lines but the habitat of *T.* sp. Coolgardie unknown

8. Stamens 5–7, never consistently 7, with 1 or 2 opposite each sepal. Mature style 0.35–0.4 mm long (Mt Holland area–Emu Rock area, W.A.) ..... **T. salina**

8: Stamens 7–10, never consistently 7, often 10 with 1 opposite each sepal and petal. Mature style 0.6–0.8 mm long

9. Rapidly growing young stems not winged. Occurring north of Geraldton

10. Hypanthium ribs flattened and tightly pressed together giving a striate appearance. Leaves narrowly to broadly obovate to almost circular; apical point 0–0.1 mm long. Stamens usually 10, rarely 9 (Kalbarri NP–W of Binnu, W.A.) ..... **T. striata**

10: Hypanthium ribs rounded to almost acute and separated by v-shaped sinuses. Leaves obovate to almost circular; apical point 0.2–0.5 mm long. Stamens 7–9 (Kalbarri NP, W.A.) ..... **T. johnsonii**

9: Rapidly growing young stems narrowly 4-winged. Occurring south of Geraldton

11. Leaf blades narrowly to broadly obovate, 2–7 × 0.9–2.1 mm; apical point absent or up to 0.3 (–0.5) mm long. Occurring less than 200 km from the coast (Wilroy–Gingin–Ejanding, W.A.) ..... **T. mucronulata**

11: Leaf blades very broadly obovate, 2–3 × 1.8–2.3 mm; apical point 0.4–0.5 mm long. Occurring more than 500 km inland (Coolgardie area, W.A.) ..... **T.** sp. **Coolgardie**

1: Ovules 2, collateral. Hypanthium with a rugose to almost smooth surface or with more regular, spaced ribs

12. Flowers all or mostly 6- or 7-merous, with 6–8 stamens

13. Leaves with a petiole 0.6–0.8 mm long. Sepals 0.8–1.3 mm long, ± entire. Occurring in central and eastern Australia (Palm Valley, N.T. & N of Charleville, Qld–near Dubbo, N.S.W.) ..... **T. hexandra**

13: Leaves sessile. Sepals 1.8–2.5 mm long, deeply denticulate-laciniate. Occurring in W.A. (near Jigalong–Karlamilyi NP–near Gibson Desert NR, W.A.) ..... **T. naviculata**

12: Flowers all or mostly 5-merous, with 5–16 stamens, but most species primarily with either 5 or 10 stamens

14. Stamens 5 in all or most flowers. Sepals slightly shorter than to distinctly longer than the petals. Mature style 0.25–0.5 (–0.6) mm long

15. Sepals and petals yellow. Leaf blades as broad as or broader than long (1.5–2.2 mm long, 1.5–2.5 mm wide); apical point recurved, up to 0.2 mm long. Occurring in N.T. (Missionary Plain, N.T.) ..... **T.** sp. **Missionary Plain**

15: Sepals and petals white or pink. Leaf blades narrower than long in most species, always differing in some respects from above choice. Occurring in W.A., S.A. or eastern Australia

16. Hypanthium broad at the base and usually becoming saccate (pouched on each side of the peduncle). Outermost sepal strongly ridged, sometimes shortly horned (Ilkurlka area, Great Victoria Desert, W.A.–Wynbring, S.A.) ..... **T. elliottii**

16: Hypanthium narrow where the peduncle is attached, not saccate. Outermost sepal not strongly ridged

17. Sepals somewhat longer than the petals

18. Leaves narrowly obovate-elliptic to linear in outline, 0.7–1.2 mm wide, 0.3–0.5 mm thick (Kangaroo Island & Eyre Peninsula, S.A.) ..... **T. ericaea**

18: Leaves narrowly elliptic or narrowly obovate to broadly obcordate, 1–4 mm wide, not very thick

19. Petals 0.5–0.8 mm long

20. Petioles 0.8–1.7 mm long. Leaf blades narrowly obovate, 1.8–2.6 mm wide. Hypanthium prominently 10-ribbed (Eyre Peninsula, S.A.–eastern Tas.) ..... **T. micrantha**

20: Petioles 0.4–0.7 mm long. Leaf blades narrowly obovate, 1–1.3 mm wide. Hypanthium somewhat irregularly ribbed (Suttor River, Qld–near N.S.W. border) ..... **T. parviflora**

19: Petals 0.8–1.4 mm long

21. Leaf blades 5–12 mm long. Peduncles 1–3 per axil, 1.3–2.5 mm long, 1–3-flowered. Occurring in Victoria (Grampians area, Vic.) ..... **T. calycina**

21: Leaf blades 1.7–5 mm long. Peduncles 1 per axil, 0.4–1 mm long, 1-flowered

22. Leaves broadly or very broadly obovate, 1.7–3 mm long; apical point absent or fairly erect. Sepals and petals erect in fruit (Eurardy Stn–Yuna area & Mt Singleton, W.A.) ..... **T. pieroniae**

22: Leaves narrowly obovate, 3.5–4.5 mm long; apical point with a strongly recurved, 0.15–0.2 mm long. Sepals widely spreading and petals closed inwards in fruit (Jaurdi Station–Parker Range, W.A.) …… **T. interzonensis**

17: Sepals somewhat shorter than the petals

23. Shrub or tree up to 10 m high. Hypanthium 1–1.5 mm long. Fruits broader than long (Cape York Peninsula & Lizard & Palfry Islands, Qld) …… **T. oligandra**

23: Hypanthium 1.5–2.6 mm long. Fruits longer than broad

24. Leaves very thick, almost terete, with a prominent apical point 0.2–1.5 mm long. Occurring in southeastern W.A. and western S.A.

25. Leaves almost globular, 1.5–2.3 mm long. Flowers solitary, with a pedicel 0.5–3 mm long as well as a peduncle (Queen Victoria Spring NR, W.A.–near Wyola Lake & Maralinga, S.A.) …… **T. biseriata**

25: Leaves almost narrowly oblong in outline, 3–4 mm long, Flowers 1–3 per peduncle, if solitary then sessile but secondary axes bearing lateral flowers sometimes present (Talleringa area, S.A.)…… **T. longifolia**

24: Leaves flat to very thick but not terete, apical point absent or not more than 0.2 mm long. Occurring in W.A.

26. Peduncles 1–3 per axil, very dorsiventrally compressed. Anthers dehiscent by pores or short slits that are much shorter than thecae; connective gland curved-urceolate

27. Leaf blades narrowly obovate to obovate, 5–9.5 mm long, 2–3.5 mm wide (E of Warburton, W.A.) …… **T.** sp. **Warburton**

27: Leaf blades linear to narrowly obovate in outline, 3–16 mm long, 0.6–1.3 mm wide

28. Leaves not clustered, 3–5 mm long, 0.4–0.5 mm thick (Leinster–Neale Junction, W.A.) …… **T. nealensis**

28: Leaves tending to be densely clustered near the ends of branchlets, 6–16 mm long, fairly flat or up to 0.3 mm thick (Karijini NP–Carnarvon Range–Mt Augustus, W.A.) …… **T. wittweri**

26: Peduncles 1 per axil, somewhat compressed. Anthers dehiscent by slits that are about as long as the thecae; connective gland broad-truncate

29. Leaves broadly or very broadly obovate, wider than thick; apical point minute or absent. Hypanthium tending to develop a whitish bloom. (Queen Victoria Rocks–Kambalda–near Norseman, W.A.) …… **T. planiflora**

29: Leaves obovate to linear in outline or clavate, about as thick as wide or thicker than wide; apical point usually 0.2–1.4 mm long but often ± absent in *T. urceolaris*. Hypanthium lacking a bloom

30. Leaves 4–11 mm long. Hypanthium distally free for 0.2–0.35 mm

31. Leaves with an apical point 0.7–1.4 mm long. Petals 1–1.3 mm long. Flowers 3–4.5 mm diam. (Mullewa–Beacon–Merredin–Kondinin, W.A.) …… **T. cuspidata**

31: Leaves with an apical point 0.4–0.6 mm long. Petals 1.7–2.3 mm long. Flowers 5–7 mm diam. (N of Hyden–near Jilbadji NP, W.A.) …… **T. jilbadji**

30: Leaves 1.4–3.5 (–4) mm long. Hypanthium distally free for 0.5–0.8 mm

32. Mature leaves with abaxial and adaxial surfaces distinctly delimited, 2–4 mm long; apical point recurved, 0.3–1 mm long. Peduncles 0.5–2 mm long. Flowers 2.5–4 mm diam. (Coalseam Conservation Park–Cadoux–Norseman area, W.A.) …… **T. kochii**

32: Mature leaves clavate, often without a clear separation of the abaxial and adaxial surfaces, 1.4–2.5 mm long; apical point erect or absent, up to 0.2 mm long. Peduncles 0.3–0.5 mm long. Flowers 4–5.5 mm diam. (Diemals Stn–Yindi Stn, W.A.) …… **T. urceolaris**

14: Stamens 7–14 (–16) in all or most flowers, except sometimes 5 or 6 in *T. denticulata* (which has sepals much shorter than the petals). Sepals much shorter than the petals in most species, but almost as long as the petals in *T. orbiculata* and *T. racemulosa*. Mature style 0.5–1.7 mm long or (in *T. pinifolia*) c. 0.3 mm long

33. Stamens 10, with one opposite each sepal and petal. Sepals with a thick herbaceous midrib and a definite white petaloid margin, the outer ones with a horn up to 0.3 mm long (Arnhem Land, N.T.) …… **T. remota**

33: Stamens 5–16, when 10 then in pairs opposite the sepals or alternating with the sepals and petals. Sepals varied, sometimes with broad petal-like margins but without a definite white margin, not horned except sometimes in *T. hubbardii*

34. Leaves long-linear in outline, almost as thick as wide; apical point recurved, 0.75–1.75 mm long (Kalbarri NP, W.A.) …… **T. pinifolia**

34: Leaves depressed ovate or circular to linear, much wider than thick; apical point absent or up to 0.2 mm long.

35. Sepals widely spreading or with distal half widely spreading in fruit, more than half as long as to slightly exceeding the petals

36. Young leaves denticulate to ciliolate on margins; apical point up to 0.2 mm long. Sepals with a herbaceous, oil-dotted keel and scarious margins. Stamens c. 1/3 as long as the petals (East Yuna NR–Indarra Springs NR, W.A.) …… **T. hubbardii**

36: Young leaves entire to denticulate on margins; apical point ± absent. Sepals without an obvious keel, rather petaloid. Stamens 1/2–2/3 as long as the petals

37. Mature peduncles 4–8 mm long. Hypanthium minutely papillose (East Yuna NR–Bindoo Hill NR, W.A.) …… **T. velutina**

37: Mature peduncles 1–3 mm long. Hypanthium not papillose

38. Leaves very narrowly to broadly obovate, rarely almost circular, the broadest ones 1–2.5 mm wide. Flowers 3.5–6 mm diam. Stamen filaments 0.7–1.3 mm long (N of Geraldton–Kulin, W.A.) …… **T. racemulosa**

38: Leaves broadly ovate to depressed-obovate, often ± circular, the broadest ones 2.3–3.3 mm wide. Flowers 5–8 mm diam. Stamen filaments 1.2–1.6 mm long (East Yuna NR–E of Walkaway, W.A.) …… **T. orbiculata**

35: Sepals fairly erect to tightly closed inwards in fruit, much shorter than the petals in most species but more than half the length of the petals in a few species

39. Flower buds with apex concave to almost flat. Bracteoles mostly persistent in mature fruit and sepals closed in almost horizontally in fruit

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40. Leaves 5–12 times longer than wide, not keeled. Hypanthium pitted in fruit

41. Leaves with 2 or 3 main rows of oil glands on each side of the midvein; glands 20–40 per row. Sepals glossy (Murchison House Stn–Kalbarri NP, W.A.) …… **T. calcicola**

41: Leaves with 1 or 2 rows of oil glands on each side of the midvein; glands 8–15 per row. Sepals dull (Chapman River area, W.A.) …… **T. stenophylla**

40: Leaves ranging from slightly wider than long to 4 times longer than wide, often strongly keeled. Hypanthium smooth in fruit or with irregular wrinkles and bumps, sometimes also with some pits

42. Hypanthium smooth in fruit (Near Irwin River–Mingenew–Arrino, W.A.) …… **T. nitida**

42: Hypanthium rugose in fruit

43. Hypanthium rugose with numerous low rounded bumps at least distally. Occurring in hilly terrain on various rock types including laterite (Ogilvie area–Oakajee NR, W.A.) …… **T. baeckeacea**

43: Hypanthium with longitudinal wrinkles. Occurring on limestone and coastal dunes

44. Mature leaves keeled only near the apex on abaxial surface (Baudin Island–Tamala Stn, W.A.) …… **T. maritima** subsp. **freycinetensis**

44: Mature leaves mostly keeled for more than a quarter to the whole of their full length on abaxial surface

45. Leaves with a petiole 0.5–1.2 mm long; blade usually 3–6.5 mm long, with 6–12 oil glands in the two central rows, i.e. closest to the midvein on each side, on the abaxial surface. Petals 2–3 mm long

46. Peduncles borne at 1–8 consecutive nodes, 0.6–2 mm long. Recorded in crevices in sandstone or limestone and on sand dunes, usually in low coastal shrubland (N of Kalbarri–Yardanango NR, W.A.) …… **T. maritima** subsp. **maritima**

46: Peduncles borne at 5–14 consecutive nodes, 0.1–0.7 (–1) mm long. Recorded in gullies and gorges, usually with *Acacia* and spinifex (Cape Range, W.A.) …… **T. dampieri** subsp. **capensis**

45: Leaves with a petiole 0.2–0.7 mm long; blade usually 1.3–3 mm long (rarely up to 5 mm long in *T. dampieri* but still with a short petiole), usually with 2–6 oil glands in the two central rows, i.e. closest to the midvein on each side, on the abaxial surface. Petals 1.3–2 (–2.3) mm long

47. Peduncles borne at 7–17 consecutive nodes. Petals 1.3–1.7 mm long (near Leeman–Lancelin, W.A.) …… **T. butleri**

47: Peduncles borne at 2–8 consecutive nodes. Petals 1.5–2 (–2.3) mm long (Exmouth area–Dirk Hartog Island–Hamelin Pool, W.A.) …… **T. dampieri** subsp. **dampieri**

39: Flower buds with apex usually convex to conic or flat in most species, but flat to concave in *T. podantha*. Bracteoles caducous to persistent, if persistent then sepals fairly erect or only loosely closed inwards in fruit

48. Hypanthium ribbed to smooth in flower, becoming smooth or almost smooth in mature fruit, if not fully smooth then with a distinct pedicel as well as a peduncle

49. Bracteoles persistent after fruits fall. Petals 3–3.5 mm long. Stamen filaments 1.5–1.7 mm long. Fruits with a peduncle less than 0.3 mm long and no pedicel (Eneabba area, W.A.) …… **T. spicata**

49: Bracteoles shed in bud or flower. Petals 2–2.5 mm long. Stamen filaments 0.6–0.8 mm long. Fruits with a peduncle 0.5–1.5 mm long and a pedicel 1–1.4 mm long (Meadow Stn–near Yuna, W.A.) …… **T. podantha**

48: Hypanthium variously ornamented in flower, not becoming smooth in fruit, the pedicel ± absent or less than 0.3 mm long

50. Bracteoles caducous or shed in flower. Sepals folded and with an acute apex

51. Sprawling coastal dune plant, rooting at nodes of prostrate stems. Mature style c. 1.3 mm long, almost as long as the petals (Dirk Hartog Island & Steep Point, W.A.) …… **T. repens**

51: Erect to widely spreading shrub, without adventitious roots, occurring inland or near the coast but not on dunes. Mature style 0.4–0.8 mm long, much shorter than the petals

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52. Hypanthium somewhat ribbed at first, becoming smoother in fruit or the ribs more rounded (Zuytdorp NR–Meadow Stn–Pindar, W.A.) …… **T. strongylophylla**

52: Hypanthium densely blistered in bud, densely tuberculate in fruit

53. Longest sepals 1–1.5 mm long. Flowers with a conic apex in late bud, mostly with 10 stamens (Zuytdorp Cliffs–Kalbarri NP) …… **T. conica**

53: Longest sepals 0.4–0.8 mm long. Flowers with a convex apex in late bud, mostly with 7–9 stamens

54. Flowers deeply convex in late bud, 5–6 mm diam. when fully open. Sepals (0.5–) 0.6–0.8 mm long, fairly erect (near Hamelin Pool, W.A.) …… **T. caduca** subsp. **caduca**

54: Flowers shallowly convex in late bud, 3.5–4 mm diam. when fully open. Sepals 0.4–0.6 mm long, strongly incurved (Tamala Stn–Coburn Stn area–Murchison House Stn, W.A.) …… **T. caduca** subsp. **incurva**

50: Bracteoles mostly persistent in fruit, if caducous then sepals with a rounded apex

55. Hypanthium (in flower) rugose with wrinkles or ridges as well as pits. Outer sepals distinctly auriculate

56. Mature peduncles 0.5–2.5 mm long. Sepals distinctly keeled, denticulate to laciniate; margins often recurved or flat, not markedly incurved (Zuytdorp NR–Wongan Hills, W.A.) …… **T. denticulata**

56: Mature peduncles ± absent, 0–0.3 mm long. Sepals not keeled, ± entire; margins incurved

57. Leaves mostly with the apex (including dorsal ridge) recurved. Bracteoles with the midrib not very prominent (near Wannoo, W.A.) …… **T. wannooensis**

57: Leaves with the apex (of the dorsal ridge) incurved. Bracteoles with the keel forming a prominent compressed ridge (Kalbarri NP–near Eurardy Stn–Mullewa, W.A.) .. **T. globifera**

55: Hypanthium pitted. Outer sepals not or scarcely auriculate

58. Peduncles solitary or 2 superposed in the axils, 1–3-flowered. Occurring near the south coast, mainly on granite (Augusta–Bremer Bay; Esperance area–Cape Arid NP–Middle Island, W.A.) ..... **T. saxicola**

58: Peduncles solitary in the axils, all 1-flowered or rarely a few of them 2-flowered. Occurring north of Perth, mainly on sand or laterite

59. Leaf blades 1.2–2.2 mm long. Mature peduncles 1.3–2 mm long. Bracteoles persistent (Carnamah area–near Watheroo–Dalwallinu area, W.A.) ..... **T. shirleyae**

59: Leaf blades (2.5–) 3–8 mm long. Mature peduncles 3–11 mm long. Bracteoles usually caducous or shed in flower

60. Hypanthium (in mature fruit) with large deep pits, not papillose. Occurring south of Geraldton (Tardun area–near Regans Ford, W.A.) ..... **T. hyporhytis**

60: Hypanthium (in mature fruit) with numerous small shallow pits, sometimes also papillose. Occurring north of Geraldton (Howatharra–near Chapman River, W.A.) ..... **T. stapfii**

Illustrations

J.W. Green, *Nuytsia* 3(2): 186, figs 12–19 (1980), https://www.biodiversitylibrary.org/page/53144077 (https://www.biodiversitylibrary.org/page/53144077); 189, figs 20–39, https://www.biodiversitylibrary.org/page/53144080 (https://www.biodiversitylibrary.org/page/53144080); 191, figs 40-57, https://www.biodiversitylibrary.org/page/53144082 (https://www.biodiversitylibrary.org/page/53144082); 194, figs 58–66, https://www.biodiversitylibrary.org/page/53144085 (https://www.biodiversitylibrary.org/page/53144085); T.D. Stanley & E.M. Ross (eds), *Flora of south-eastern Queensland* 2: 126, fig. 16D (1986), https://www.biodiversitylibrary.org/page/46703269 (https://www.biodiversitylibrary.org/page/46703269); B.L. Rye & M.E. Trudgen, *Nuytsia* 13(3): 515, fig. 1 (2001), https://www.biodiversitylibrary.org/page/53424768 (https://www.biodiversitylibrary.org/page/53424768); G.J. Harden (ed.), *Flora of New South Wales. Revised edn* 2: 215 (2002); B.L. Rye, *Nuytsia* 24: 278, fig. 1, https://www.biodiversitylibrary.org/page/60020671 (https://www.biodiversitylibrary.org/page/60020671); 287, fig. 5, https://www.biodiversitylibrary.org/page/60020680 (https://www.biodiversitylibrary.org/page/60020680); 297, fig. 8, https://www.biodiversitylibrary.org/page/60020690 (https://www.biodiversitylibrary.org/page/60020690); 301, fig. 9, https://www.biodiversitylibrary.org/page/60020694 (https://www.biodiversitylibrary.org/page/60020694) (2014); B.L. Rye, *Nuytsia* 35: 103, fig. 1, https://www.biodiversitylibrary.org/page/64192974 (https://www.biodiversitylibrary.org/page/64192974); 111, fig. 2, https://www.biodiversitylibrary.org/page/64192966 (https://www.biodiversitylibrary.org/page/64192966); 124, fig. 5, https://www.biodiversitylibrary.org/page/64192953 (https://www.biodiversitylibrary.org/page/64192953); 130, fig. 8, https://www.biodiversitylibrary.org/page/64192947 (https://www.biodiversitylibrary.org/page/64192947); 131, fig. 9, https://www.biodiversitylibrary.org/page/64192946 (https://www.biodiversitylibrary.org/page/64192946) (2024).

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