# Australian species of Rhamnaceae published by Turczaninow, their types, current names and synonyms

Jürgen Kellermann<sup>a,b</sup>, Sergei L. Mosyakin<sup>c</sup>, Catherine Clowes<sup>d</sup> & Frank Udovicic<sup>e</sup>

<sup>a</sup> State Herbarium of South Australia, Botanic Gardens and State Herbarium, Hackney Road, Adelaide, South Australia 5000, Australia

Email: juergen.kellermann@sa.gov.au

<sup>b</sup> The University of Adelaide, School of Biological Sciences, Adelaide, South Australia 5005, Australia

<sup>c</sup> M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine, 2 Tereschenkivska Str., Kyiv 01601, Ukraine

<sup>d</sup> School of Biosciences, The University of Melbourne, Parkville, Victoria 3010, Australia

<sup>e</sup> National Herbarium of Victoria, Royal Botanic Gardens Victoria, Birdwood Avenue, South Yarra, Victoria 3141, Australia

**Abstract:** The typification of eight names of Australian taxa of Rhamnaceae published by Turczaninow is clarified. Of these, five names (*Cryptandra cordata* Turcz., *C. microcephala* Turcz., *C. villosa* Turcz., *Trymalium oligocephalum* Turcz., *T. polycephalum* Turcz.) are basionyms of currently accepted names, two (*C. pauciflora* Turcz., *T. thomasioides* Turcz.) are heterotypic synonyms of other species names, and one name (*C. parvifolia* Turcz.) is an illegitimate later homonym of an earlier validly published name. Holotypes or lectotypes of these names can be found in Turczaninow's personal herbarium (KW-TURCZ) at the National Herbarium of Ukraine (KW). Lectotypes are also designated here for the following names published by other botanists: *Spyridium denticuliferum* Diels, *S. kalganense* Diels, *S. subochreatum* var. *laxiusculum* J.M.Black, *Pomaderris hirsuta* Steud., *T. behrii* F.Muell. ex Reissek and *T. subochreatum* F.Muell. Modern descriptions, notes and illustrations are provided for all eight taxa treated in this paper: *C. minutifolia* Rye var. *minutifolia*, *S. cordatum* (Turcz.) Benth., *S. spadiceum* (Fenzl) Benth., *S. subochreatum* (F.Muell.) Reissek and *S. villosum* (Turcz.) Benth.

**Keywords:** Rhamnaceae, Pomaderreae, *Cryptandra*, *Spyridium*, Australia, Western Australia, South Australia, Victoria, typification, nomenclature

#### Introduction

Nicolai Turczaninow (1796–1863; also sometimes transliterated as Turczaninov, Turtschaninoff, Turchaninov, etc.) is a well-known 19<sup>th</sup> century botanist and taxonomist, who published names for a considerable number of Australian taxa (Marchant 1990). During his lifetime he amassed a large herbarium through purchase and exchange. The history of his collection has been briefly described by Mosyakin *et al.* (2019) and Mosyakin & de Lange (2019) (and references therein); it is currently housed as a separate collection (KW-TURCZ) at the National Herbarium of Ukraine (KW).

Eight species names of Australian Rhamnaceae were published by Turczaninow in one publication, namely in Part 2/2 of his *Animadversiones* series of papers (Turczaninow 1858), published between 19 September 1858 and 28 October 1858 (see details in Marchant 1990 and Mosyakin & Alford 2022). It is now generally agreed that "new taxa described by Turczaninow in *Animadversiones* were based, unless noted otherwise, on specimens from his personal herbarium" (Mosyakin & de Lange 2019: 169) and that "if there is just one corresponding specimen in KW-TURCZ, that specimen should be considered the holotype and that type designation is final (Art. 9.1 of the ICN)" (Mosyakin *et al.* 2019: 382).

Typifications of the names in this paper follow the guidelines of McNeill (2014) and Mosyakin *et al.* (2019). In the case of Rhamnaceae names published by Turczaninow and discussed below, in all but one case, he mentions only one collection and there is only one corresponding specimen at KW-TURCZ. When he indicated more than one specimen then the one listed in Marchant (1990) is regarded here to be the lectotype of the name, i.e. Marchant's use of the term "type" in his table of Turczaninow type specimens, as well as his statement in the text that the table lists "holotype specimens" of Australian taxa described by Turczaninow, is interpreted as an inadvertent lectotypification and is here corrected to "lectotype" (Art. 9.10; Turland *et al.* 2018).

All these names are based on specimens gathered by James Drummond in Western Australia (W.A.), mainly from his 5<sup>th</sup> collection from 1849 (Granite rocks or Mullean, i.e. Mts Stirling & Caroline, Stirling Range, Pallinup, Mt Barren Range, Cape Riche) and also his 4<sup>th</sup> collection with George Maxwell in 1847 (Albany, Stirling, Porongurups, Mt Manypeaks, Cape Riche, West Mt Barren, Moore River area) (Barker 2004).

While the KW-TURCZ specimens are generally the holotypes of these names, the status of the original material in other herbaria is not always clear, as Drummond did not use collecting numbers in the way they are generally used today (his numbers are more "taxon numbers"). In the past, specimens with the same number have been treated as isotypes and this practice is followed here. Drummond collections are distributed in many herbaria around the world.

Of these type specimens, JK and FU studied material from Australian herbaria, K and BM; SLM examined material at KW. Other type specimens were searched for and viewed online, either via aggregator websites (AVH, GBIF, JACQ, JSTOR Global Plants) or individual herbarium databases (A, BM, B, BR, CGE, E, FI, G, GH, K, KW, L, LD, LE, MEL, MO, NSW, NY, OXF, P, S, TCD, W; Barker 2004; see also Paul & Kellermann 2022: App. 2). However, few herbaria are fully digitised and available online, hence it is possible that some specimens have been missed. Herbarium acronyms follow Thiers (2008–).

Of the eight Turczaninow names discussed here, five are basionyms of currently accepted names, two are synonyms of other species, and one species-rank name was replaced by Rye (1995), as Turczaninow's name was an illegitimate later homonym of an earlier validly published name. In this paper we clarify the typification of these names, and provide concise current descriptions of the taxa, as well as some additional information. For most taxa, these are the first English language descriptions published since Bentham (1863); a recent detailed description of Cryptandra minutifolia subsp. minutifolia was published in Rye (1995b, 2007) and of Spyridium subochreatum in Walsh (1999). Identification keys to Rhamnaceae species in Western Australia can be found in Rye (2007), amended by Rye & Hislop (2020), for Cryptandra and Rye (1996), amended by Kellermann & Clowes (2022), for Spyridium.

# Taxonomy

# Cryptandra minutifolia Rye var. minutifolia

Nuytsia 10: 273 (1995). — Cryptandra parvifolia Turcz., Bull. Soc. Imp. Naturalistes Moscou 31(1): 459 (1858), nom illeg., non Cryptandra parvifolia (Hook.) Hook.f., Bot. Antarct. Voy. III. (Fl. Tasman.) 1: 73 (1855). — **Type citation:** "Nova Hollandia, Drum. IV. n. 156.". **Holotype:** Nova Hollandia, J. Drummond 4: 156 ["Drum IV n 156"] (KW001001109) (Fig. 1). **Isotypes:**  W.A., J. Dr.[ummond] 156 (MEL1618192); Swan River, Drummond  $4^{th}$  156  $(4^{th} coll^n)$  (K001096723, ex Herb. Benth.); Swan R., J. Drummond,  $4^{th}$  ser. No. 156 (K001096722, ex Herb. W.W. Saunders); Western Australia, 1847 [1840], James Drummond,  $4^{th}$  collection No. 156 (PERTH01599313, ex BM); W. Australia, 1848, Drummond  $4^{th}$  Coll. 156 (NSW654932, ex BM, received 20 Jan. 1915).

Evergreen shrubs, 0.2–0.6 (–0.9) m high, not spinescent; young stems with intertwined densely woollypubescent curved flexuose hairs over dense stellate hairs, soon ± glabrous. Leaves fasciculate: stipules c. 1-2.5 mm long, narrowly triangular to ovate, connate around the base of the petiole, with hairs on the adaxial (inner) surface; petiole 0.2-0.3 mm long (but leaves appearing sessile); lamina narrowly elliptic or elliptic, entire, 0.8-1.7 mm long, 0.6-0.8 mm wide, base obtuse, margins strongly revolute, apex strongly recurved, obtuse or apiculate, glabrous or tuberculate above. Conflorescence a terminal cluster or spike-like, of 2-5 axillary flowers; bracts broadly ovate to oblongelliptic, 2.5-3.5 mm long. Flowers white; pedicels 0.5-1 mm long. Hypanthium tube 1-2.8 mm long, c. 2-3 mm diameter, glabrous, pubescent towards top. Sepals 2.7-3.5 mm long, erect or spreading, with an indumentum of dense stellate and closely appressed simple hairs, especially towards apex. Petals cucullate, c. 1.1 mm long, distinctly clawed. Stamens 1-1.2 mm long. Disc inconspicuous, densely pubescent. Ovary semi-inferior; roof stellate-pubescent; style 2.5-3.6 mm long, glabrous, base densely hairy. Fruit ellipsoid, 2.3-2.5 mm long, brown; torus in the middle third. Seeds c. 1.7 mm long; aril whitish.

*Illustrations:* B.L. Rye, *Nuytsia* 10: 266, Fig. 3L–N (1995); B.J. Grieve, *How to Know W. Austral. Wildfl.* (2<sup>nd</sup> edn) 2: 603 (1998).

*Distribution & habitat.* The taxon is endemic to W.A., where it grows from Manmanning east to Chiddarcooping Hill and south-east to the Ravensthorpe Range, on plains, in mallee or shrubland vegetation on sandy or clayey soils, sometimes with laterite.

Phenology. Flowers: June–Oct.; fruits: Sep.–Nov.

**Note.** When Turczaninow published *Cryptandra parvifolia*, he created a later homonym and thus an illegitimate name, as *C. parvifolia* (Hook.) Hook.f. [current name: *Spyridium parvifolium* (Hook.) Benth.] had been published a few years earlier. Rye (1995) published the replacement name *C. minutifolia* for Turczaninow's taxon.

The typical subspecies differs from *C. minutifolia* subsp. *brevistyla* Rye in its longer style, fewer flowers per conflorescence, and shorter sepals and hypanthium tube. The indumentum on the sepals tends to have shorter simple hairs in subsp. *minutifolia. Cryptandra minutifolia* is closely related to *C. beverleyensis* Rye, which tends to have less hairy flowers.



**Fig. 1.** Holotype of *Cryptandra parvifolia* Turcz., current name *C. minutifolia* Rye var. *minutifolia* (KW001001109).

*Etymology.* From the Latin *minutus* (small) and *folium* (leaf), referring to the small leaves of the taxon.

# Selected specimens examined

WESTERN AUSTRALIA. Halfway between Newdegate and Lake Grace, 10 Aug. 1963, A.M. Ashby 206 (AD); Old Newdegate Rd, edge of Lake King Reserve (Res.), 5 Sep. 2010, G. Byrne 3952 (PERTH); Dragon Rocks Nature Res. No. 36128, E boundary, N of Pingaring-Varley Rd, 22 Aug. 1991, A.M. Coates 2590 (AD, PERTH); 12.3 km SW along Parmango Rd from junction of Balladonia Rd, 23 July 2002, R. Davies 10402 (AD, PERTH); c. 1 km E of Babkin, 18 Aug. 1979, L. Haegi 1829 (K, L, MEL, NSW, PERTH); Lake Hurlstone Nature Res., W of main rd, Hyden Lake King Rd, 26 Sep. 2001, J. Kellermann 360 (AD); 12.5 km by rd (c. E) from Pingrup on Pingrup-Ravensthorpe Rd, 11 Oct. 1975, G. Perry 369 (AD, PERTH); Manmanning town site, 9 Aug. 1986, B.H. Smith 684 (AD, CANB, HO, MEL); Avon Loc. 19405, 1 mile SW of Manmanning, 29 July 1989, B.H. Smith 1180 (AD, BRI, CBG, MEL); Unallocated Crown Land [Yilgarn Ranges Survey], 1 km E of Forrestania Southern Cross Rd, c. 6 km S of Mt Holland, 26 Sep. 2009, W.A. Thompson & J. Allen 1367 (PERTH).

# Spyridium cordatum (Turcz.) Benth.

Fl. Austral. 1: 430 (1863). — Cryptandra cordata Turcz., Bull. Soc. Imp. Naturalistes Moscou 31(1): 459 (1858). — Type citation: "Nova Hollandia, Drum. V. n. 230." Holotype: Nova Hollandia, J. Drummond 5: 230 ["Drum: coll: V n 230"] (KW001001107). Isotypes: S. Australia, Drummond 230 (K001096729); J. Drummond 230 (MEL2103313); Swan River to Cape Riche, Drummond (colln 5<sup>th</sup>) 230 (K001096728); 1849, Drummond 5<sup>th</sup> collection 230 (P06766742, ex BM); J. Drummond 5<sup>th</sup> coll. 230 (PERTH01179829, ex BM).

Evergreen shrubs, 0.05-0.45 m high, without spines, young stems covered with dense intertwined matted stellate hairs, first rusty then grey. Leaves alternate: stipules 1.1-2.1 mm long, narrowly triangular or triangular, free, pubescent; petiole 0.5-2.2 mm long; lamina broadly ovate or cordate, 1.6-4.5 mm long, 1.7-4.3 mm wide, base cordate or broadly obtuse, margins recurved, apex obtuse or emarginate, glabrous and tuberculate above, rarely smooth, or with sparse stellate hairs, below densely grey stellate-pubescent, with hairs rusty on midrib and along edge. Inflorescences comprising terminal or axillary heads, 3-4 mm long, 3-7 mm wide, with c. 13-30 flowers, without white felty floral leaves; bracts ovate, 1-2.2 mm long. Flowers 5-merous, bisexual, white or cream, sometimes pale pinkish, sessile. Hypanthium cup-shaped, tube 0-0.4 mm long, 0.7-1 mm diameter, ± densely woollypubescent with long stellate hairs. Sepals 0.8-1 mm long, spreading, medium to densely stellate-pubescent, grey or sometimes rusty. Petals cucullate, 0.4-0.6 mm long, distinctly but shortly clawed. Stamens 0.4-0.5 mm long, incurved to erect. *Disk* conspicuous, smooth, glabrous. Ovary almost inferior; roof stellatepubescent; style 0.4-1 mm long, glabrous with some hairs in bottom half. *Fruit* obovoid, 1.7–2 mm long, purple to dark reddish-brown; torus in upper third. *Seeds* 1.1–1.2 mm long, orange to brown with dark speckles; *aril* pale yellowish. **Fig. 2.** 

**Illustrations:** B.J. Grieve, *How to Know W. Austral. Wildfl.* (2<sup>nd</sup> edn) 2: 584 (1998).

**Distribution** & habitat. The species is endemic to W.A. and extends from west of Lake King east to Mt Ragged and south-west towards Gairdner, but most records are from the western part of the range, with disjunct occurrences in the vicinity of Mt Ragged in Cape Arid National Park (N.P.). It is mainly recorded in gravelly or stony to rocky sites with clay/loam or sandy soils, usually in shrublands or woodlands dominated by eucalypt species with a mallee habit (Rye 1996).

# Phenology. Flowers Aug.-May; fruits Sep.-Oct.

**Notes.** Following a molecular analysis of the genus (Clowes *et al.* 2022), Kellermann & Clowes (2022) published *Spyridium longicor* Kellermann & C.Clowes for a taxon that was previously regarded as comprising intermediates between *S. cordatum* and *S. microcephalum. Spyridium cordatum* differs from *S. longicor* in having shorter and broader leaves (usually as wide as long) with cordate bases, and smaller flower-heads with shorter flowers.

**Typification.** The holotype specimen in KW consists of two flowering twigs, showing the typical broad heart-shaped leaves. All plant fragments of the type specimen are at a similar stage of development, with older partly enlarging flower-heads.

*Etymology.* From the Latin *cordatus* (heart shaped), in reference to the shape of the leaves.

# Selected specimens examined

WESTERN AUSTRALIA. 16 km N of Moolyall Rocks on Hayes Rd, 25 Mar. 1983, M.A. Burgman 1028 & S. McNee (PERTH); 1.1 km along Elverdton Rd from the junction with Hopetoun Rd, 8 Sep. 2017, G. Byrne 6544 (AD, PERTH); Carney Rd, N of Cowalellup Rd, W rd res., old gravel/stockpile site, 13 Oct. 2017, C. Clowes CC 528 & M.W. Pratt (AD, MELU, PERTH); Bedford Harbour Rd, 400 m N of Jerdacuttup Rd, 17 Oct. 2017, C. Clowes CC 530 & M.W. Pratt (AD, MELU, PERTH); Dunn Rock Nature Res., c. 33 km SSW of Lake King townsite, 17 Oct. 1999, G.J. Keighery & N. Gibson 4182 (AD, PERTH); Disused gravel pit, off Hayes Rd, E of Lake King-Ravensthorpe Rd, 27 Sep. 2000, J. Kellermann 370 (AD, B, BAA, CANB, K, MEL, NY, PERTH); c. 8 km N of Ravensthorpe, c. 30 m along Archer Drive, N of Floater Rd, 11 Sep. 2000, B.J. Mole 446 & C. Mole (AD, B, MEL, NY); 37 km SE of Ongerup, 14 Apr. 1975, K. Newbey 4964 (AD, PERTH); c. 20 km by rd SSE of Ravensthorpe on Hopetoun Rd, 17 Sep. 1976, L. Haegi 1005 (AD, MEL, PERTH); At foot of W side of Mt Ragged, 1 Nov. 1968, J.W. Wrigley WA/68 5278 (CANB, PERTH).



**Fig. 2.** *Spyridium cordatum*, variants with totally glabrous and smooth leaves, N of Ravensthorpe (A, B), and with tuberculate leaves with a few stellate hairs, near Gairdner (C) and E of Ravensthorpe (D), W.A.: **A** habit; **B**, **C** flowering branches; **D** close-up of flowerhead. — A, B *J. Kellermann 370*; C *C. Clowes 528 & M.W. Pratt*; D *CC 530 & MWP*. Photos by J. Kellermann (A, B) & C. Clowes (C, D).

#### Spyridium microcephalum (Turcz.) Benth.

*Fl. Austral.* 1: 434 (1863). — *Cryptandra microcephala* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 31(1): 458 (1858). — **Type citation:** "Nova Hollandia, Drum. V. n. 234". **Holotype:** Nova Hollandia, *J. Drummond 5: 234* ["*Drum. coll: V n 234*"] (KW001001108). **Isotypes:** W.A., 1849, *J. Drummond, 5<sup>th</sup> collection, 234* (PERTH01173634, ex BM); Swan River, *Drummond 234* (K001096734); W. Australia, *Drummond 234* (P06766733, ex BM). **Excluded specimens:** W.A., *J. Dr.[ummond] 234* (MEL2290282); W.A., *J. Dr.* [*ummond*] (MEL98612).

Spyridium denticuliferum Diels in Diels & Pritzel, Bot. Jahrb. Syst. 35(2–3): 355 (1904). — **Type citation:** "in distr. Eyre pr. Hammersley River in fruticetis apertis arenosis flor. m., Oct. (D. 4929)". **Holotype** or syntypes: B (destroyed). Lectotype (designated here): Hamersley River, 12 Oct. 1901, L. Diels 4929 (PERTH01179810, ex B).

Evergreen *shrubs*, 0.1–1.5 m high, without spines, young stems covered with dense stellate hairs, first rusty then grey, soon  $\pm$  glabrous. *Leaves* alternate or fasciculate: *stipules* 1.7–2.6 (–4) mm long, narrowly triangular or triangular, free, sparsely pubescent; *petiole* 0.7–1.6 mm long; *lamina* narrowly ovate to narrowly elliptic or ovate to elliptic or linear, 4–7.5 (–10) mm long, 0.9–2 (–2.6) mm wide, base cuneate or obtuse,

margins recurved or revolute, apex acute or obtuse or apiculate, sometimes with a small mucro, smooth or sometimes tuberculate above, usually glabrous, rarely with sparse stellate hairs, below densely grey stellatepubescent. Inflorescences comprising terminal or axillary heads, 3–5 mm long, 3.5–9 mm wide, with usually 10-20 flowers, without subtending felty floral leaves; bracts ovate, 1.3-2.3 mm long. Flowers 5-merous, bisexual, white, cream or yellow; pedicel 0-3.5 mm long. Hypanthium cup-shaped, tube 0.4 (-0.6) mm long, 0.8-1.3 mm diameter, densely stellate-hairy, base also with dense flexuose simple hairs. Sepals 0.8-1 mm long, erect or slightly spreading, woolly-pubescent with dense stellate hairs, greyish or rusty. Petals cucullate, 0.4-0.7 mm long, distinctly clawed. Stamens 0.4-0.6 mm, erect. *Disk* conspicuous, smooth, glabrous. Ovary almost inferior; roof stellate-pubescent; style 0.8-1.1 mm long, glabrous, with stellate hairs at base. Fruit obovoid, 2-2.2 mm long, purple to dark reddishbrown; torus in upper third. Seeds 1.3-1.4 mm long, orange to reddish-brown, uniformly coloured; aril pale vellowish. Fig. 3.

*Illustrations:* B.J. Grieve, *How to Know W. Austral. Wildfl.* (2<sup>nd</sup> edn) 2: 585 (1998).

**Distribution & habitat.** Spyridium microcephalum is endemic to W.A., extending from Dongolocking



**Fig. 3.** *Spyridium microcephalum* near Lake Grace (A, B) and W of Gairdner (C–E), W.A.: **A** habit; **B** flowering branch; **C** fascicle of leaves; **D**, **E** close-up of flower-heads. — A, B *J. Kellermann 333*; C–E *C. Clowes 527 & M.W. Pratt.* Photos by J. Kellermann (A, B) & C. Clowes (C–E).

Res. east to the Great Australian Bight and south-east to Fitzgerald River N.P. It occurs in sand or clay, sometimes on hills or with limestone, in the west often in gravelly or granitic soils, in the east often on limestone, commonly in heathland or shrubland vegetation dominated by mallee.

Phenology. Flowers Mar.-Nov.; fruits Mar.-Nov.

**Typification of Cryptandra microcephala.** The two Drummond specimens at MEL (MEL2290282 and MEL98612) seem to have been collected from a different location from the types, as they have much shorter and thinner leaves compared to the holotype and the other isotypes, listed above. As such, they are excluded from the type series.

**Typification of Spyridium denticuliferum.** Diels & Pritzel (1904–1905) stated in the introduction of *Fragmenta phytographiae Australiae occidentalis* that Diels' own collections were all deposited in the Berlin herbarium, in contrast to the specimens by his fellow traveller Pritzel, who collected several sets which are distributed in many different herbaria. However, it is not clear from the protologue how many duplicates (if any) of the type gathering of *S. denticuliferum* were deposited in Berlin. If there was just one specimen, it was the holotype; if several, those were syntypes. In any case, the holotype (or syntypes) of *S. denticuliferum* at

B was (were) destroyed during World War II (R. Vogt, pers. comm, Feb. 2006; for general information, see also: Pilger 1953; Hiepko 1987).

However, C.A. Gardner, Government Botanist in W.A., visited Berlin in 1937 and received fragments of many of Diels' types, which he removed with Diels' permission. Diels and Gardner subsequently continued to exchange specimen. Since the originals were later destroyed, these fragments and duplicates at PERTH are the only remaining original material of many of Diels' names (Underwood 2011). A fragment of the original collection of *S. denticuliferum* at PERTH is here designated as the lectotype.

**Etymology.** From the Greek μικρο- (*micro*-; little, small) and κεφαλη (*cephale*; head), on account of the small flower-heads of the species.

#### Selected specimens examined

WESTERN AUSTRALIA. E fence line of Kent Location 1910 nr Roberts Rd, 9 Nov. 2004, *S. Barrett 1302* (PERTH); On the Nyabin-Kukerin Rd, 1 Sep. 2016, *G. Byrne 5922* (AD, PERTH); Carney Rd, N of Cowalellup Rd, W rd res., old gravel/stockpile site, 13 Oct. 2017, *C. Clowes CC 527 & M.W. Pratt* (AD, MEL, MELU); 9 miles E of Rabbit Proof Fence gate (E of W Mt Barren) on tk to Fitzgerald River, 9 Mar. 1970, *A.S. George 9483* (AD, PERTH); Unvested res. 31425, Twertatup, 28 Apr. 1983, *S.J. Hancock 04019* (PERTH); 10 km N Eyre, 4 Apr. 1984, *G.J. Keighery 7215* (CANB, K, PERTH); Big res. on N side of Dumbleyung-Lake Grace Rd, 7.22 km W of Tarin Rock Rd South intersection, 25 Sep. 2001, *J. Kellermann 333* (AD, B, E, K, NY); Unnamed Nature Res., 2.4 km N of Dualling Rd on Kukerin Rd, c. 4 km N of Nyabing, 21 Sep. 1996, *B.J. Lepschi & T.R. Lally BJL 3033* (AD, BRI, CANB, MEL, PERTH); c. 27.36 km W of Lake Grace township on rd to Kukerin, 12 Sep. 2000, *B.J. Mole 465 & C. Mole* (AD, B, BAA, MEL); 20 km W Mt Ragged, 16 Nov. 1976, [*E.*] *Wittwer W.1895* (PERTH).

#### Spyridium oligocephalum (Turcz.) Benth.

Fl. Austral. 1: 433 (1863). — Trymalium oligocephalum Turcz., Bull. Soc. Imp. Naturalistes Moscou 31(1): 460 (1858). — **Type citation:** "Nova Hollandia Drum. V. n. 236". **Holotype:** Nova Hollandia, J. Drummond 5: 236 ["Drum: coll; V n 236"] (KW001001112). **Isotypes:** Swan River to Cape Riche, Drummond 236 (5<sup>th</sup> coll<sup>n</sup>) (K000732093, ex Herb. Benth.); Swan River, Drummond 236 (K000732094, ex Herb Hook.); Western Australia, Cape Riche, 1849, J. Drummond 5<sup>th</sup> Collection 236 (PERTH01179802, ex BM); W.A., J. Dr.[ummond] 236 (MEL2104245)

Spyridium kalganense Diels in Diels & Pritzel, Bot. Jahrb. Syst. 35(2–3): 355 (1904). — **Type citation:** "in distr. Stirling in planitiebus rivi Kalgan superioris in arenosis fruticulosis flor. M. Oct. (D. 4607)". — **Holotype or syntypes:** B (destroyed). **Lectotype** (here designated): Humus soil, Kalgan River, 4 Oct. 1901, L. Diels 4607 (PERTH01174045, ex B).

Evergreen shrubs, 0.6-1.2 m high, without spines, young stems with dense stellate hairs, grey or rusty (especially on young shoots). Leaves alternate: stipules (2.2-) 2.5-4 (-5) mm long, broadly ovate or ovate, connate behind the petiole for most of their length, with a few stellate hairs along the midrib; petiole 1.4–2.3 mm long; *lamina* narrowly ovate or (very) narrowly elliptic, 6–13 mm long, 1–2 mm wide, base cuneate, margins revolute, apex obtuse straight, smooth and glabrous above, below with dense grey or rarely rusty stellate hairs. Inflorescences comprising terminal heads, 3-5 mm long, 5-8 mm wide, with up to 20 flowers, with floral leaves covered in a dense white felty indumentum of stellate hairs; bracts ovate, 1.5-2.5 mm long, sparsely pubescent in middle. Flowers 5-merous, bisexual, white or cream, covered with dense stellate hairs; *pedicels* 0–1.5 mm long. *Hypanthium* cup-shaped, tube 0.2–0.4 mm long, 1.2–1.4 mm diameter, some hairs at base also rusty. Sepals 0.9-1.1 mm long, erect. Petals cucullate, 0.5-0.7 mm long, distinctly but shortly clawed. Stamens 0.4-0.6 mm long, incurved. Disk conspicuous, smooth, glabrous. Ovary almost inferior to semi-inferior; roof pubescent with stellate hairs; style 0.5-0.6 mm long, glabrous. Fruit obovoid, c. 2 mm long, grey to reddish-brown; torus in upper third. Seeds c. 1.1 mm long, brown or yellowish with dark speckles; *aril* pale yellowish. Fig. 4A–C.

*Illustrations:* B.L. Rye, *Nuytsia* 10: 129, Fig. 2I–N (1995); B.J. Grieve, *How to Know W. Austral. Wildfl.* (2<sup>nd</sup> edn) 2: 586 (1998).

**Distribution & habitat.** The taxon is endemic to W.A. and ranges from near the Kalgan River east to Fitzgerald River N.P. It occurs in sandy soils or sandy clay and is recorded either in heathlands or in shrublands dominated by eucalypt species with a mallee habit.

Phenology. Flowers and fruits: Mar., July-Oct.

**Note.** Spyridium oligocephalum can be distinguished from the closely related *S. subochreatum* by its orange-brown bracts and stipules and long hairs on the sepals (vs dark red-brown stipules and bracts and short hairs on sepals). It occurs on non-calcareous rock, while *S. subochreatum* prefers limestone and sandy soils.

Rye (1996) placed the species into the *Spyridium oligo-cephalum* group, which also includes *S. polycephalum* and *S. subochreatum*. The group is characterised by large, papery stipules, which are fused for more than half of their length, an undulate annular disk, and flowers that are arranged in head-like condensed cymes.

*Conservation status.* Listed as a Priority 3 taxon in W.A. (TSSC 2022).

*Typification of* **Spyridium kalganense.** As with *S. denticuliferum*, above, the holotype (or syntypes) at B was (were) destroyed, but a fragment of the original specimen is available in PERTH and here designated as the lectotype.

*Etymology.* From the Greek  $o\lambda i\gamma o\zeta$  (*oligos*; few) and  $\kappa \epsilon \varphi \alpha \lambda \eta$  (*cephale*; head), because of the apparently low numbers of flower-heads in the taxon.

## Selected specimens examined

WESTERN AUSTRALIA [precise locality withheld for conservation reasons]. E of Fitzgerald River Inlet, Sep. 1970, *T.E.H. Aplin 3678* (CANB, PERTH); Hopetoun, 18 Oct. 2017, *C. Clowes CC 536* (AD, MEL, MELU); Dempster Inlet, 16 July 1970, *A.S. George 10069* (PERTH); S of Whoogarup Range, 17 Mar. 1972, *A.S. George 11291* (PERTH); S of Pingrup, 9 Jan. 1975, *K. Newbey 4948* (PERTH); Fitzgerald Inlet, Fitzgerald River N.P., 22 July 1971, *A.S. Weston 6396* (CANB, PERTH).

## Spyridium polycephalum (Turcz.) Rye

Nuytsia 10: 128 (1995). — Trymalium polycephalum Turcz., Bull. Soc. Imp. Naturalistes Moscou 31(1): 460 (1858). — Type citation: "Drum. Coll. V. n. 91 et forte n. 235 (specimen floribus non evolutis)". Lectotype: Nova Hollandia, J Drummond 5: 91 ["Drum: coll: V n 91"] (KW001001113), fide N.G.Marchant in P.S.Short, Hist. Syst. Bot. Australas. 124 (1990), as "holotype". Isolectotypes: S.W. Australia, 1856, J. Drummond no. 91 Suppl. to 5<sup>th</sup> Coll. (K000732097, ex Herb. Hook.); W.A., J. Dr.[ummond] 91 (MEL 227045); S.W. Australia, Drummond 91 (Suppl: to 5<sup>th</sup> coll:) (GH00048669, ex K). Residual syntypes: Nova Hollandia, J. Drummond 5: 235 ["Drum: coll: V n 235"] (KW); S.W. Australia, Drummond



**Fig. 4.** A–C *Spyridium oligocephalum* near Hopetoun, W.A.: A habit; B flower-heads subtended by white pubescent floral leaves; C young shoots. D, E *S. polycephalum*, E of Jerramungup (D) and N of Ravensthorpe (E), W.A.: D habit; E infructescences and young shoots. — A–C *C. Clowes CC 536*; D *C. Clowes 525 & M.W. Pratt*; E *CC 535 & MWP*. Photos by C. Clowes.

235 (K000732095, ex Herb. Hook., mounted with K000732096); Swan River to Cape Riche, *Drummond 235 (5<sup>th</sup> coll<sup>n</sup>)* (K000732096, ex Herb. Benth., mounted with K000732095); W.A., 1849, *J. Drummond, V 235* (PERTH1636170).

Evergreen shrubs, 0.3-1 m high, without spines, young stems with grey or rusty stellate hairs. Leaves alternate: stipules (2.3-) 3-5 (-7) mm long, narrowly to broadly ovate, connate behind the petiole for c. 80% of their length, sparsely to moderately pubescent especially along midrib; petiole 0.5–1.5 (–3) mm long; lamina narrowly ovate or (very) narrowly elliptic, 4-14 (-16) mm long, 0.9-2 (-3.2) mm wide, base narrowly cuneate or cuneate, margins revolute or sometimes recurved, apex obtuse, pubescent with sparse to dense stellate hairs above and at least some leaves tuberculate or papillose below with dense grey or sometimes rusty stellate hairs. Inflorescences comprising terminal heads, 4-8 mm long, 6-12 mm wide, with usually 20-30 flowers, each head usually subtended by 2-5 whitish felty-hairy floral leaves; bracts ovate, 1.5-3 mm long, moderately pubescent, especially in the middle. Flowers 5-merous, bisexual, white or cream, densely woolly-pubescent with flexuose grey and rusty simple and stellate hairs. Hypanthium cup-shaped and shortly tubular, 0.2-0.4 mm long, 1-1.3 mm diameter. Sepals 0.8-1.1 mm long, erect. Petals cucullate, 0.5-0.7 mm long, distinctly clawed. Stamens 0.3–0.7 mm long, incurved. *Disk* conspicuous, smooth, glabrous. *Ovary* almost inferior; roof pubescent with dense stellate hairs; *style* 0.5–0.8 mm long, glabrous. *Fruit* obovoid, 2–2.5 mm long, densely covered in hairs, grey; torus in upper third to apical. *Seeds* 1.1–1.8 mm long, orange to brown or reddish-brown, uniformly coloured or rarely spotted; *aril* pale yellowish. **Fig. 4D, E.** 

*Illustrations:* B.J. Grieve, *How to Know W. Austral. Wildfl. (2<sup>nd</sup> edn)* 2: 586 (1998).

**Distribution** & habitat. Endemic to W.A., from near Harrismith east to Mt Arid in Cape Arid N.P. It occurs mainly in sandy soils, often on rocky hills, and is recorded from heathlands or shrublands, the latter commonly dominated by mallee.

Phenology. Flowers and fruits: Apr.-Nov.

**Note.** The species is related to *Spyridium subochreatum* and *S. oligocephalum*, sharing with them the large stipules, which are fused for more than half of their length. *Spyridium polycephalum* can be distinguished by the very hairy flowers, in particular the long hairs on the sepals, and seeds that are usually uniformly coloured.

*Typification of* Trymalium polycephalum. The lectotype of the name *Trymalium polycephalum* Turcz. was inadvertently designated by Marchant (1990; see Art. 9.10, Turland *et al.* 2018). The second specimen (syntype) cited by Turczaninow in the protologue as "n. 235 (specimen floribus non evolutis)" has been found recently among the unmounted specimens in KW-TURCZ, following an email request by J. Kellermann to S. Mosyakin. It was not initially recognised as part of the original material, because it is not annotated by Turczaninow.

**Etymology.** From the Greek πολυ- (*poly*-; many) and κεφαλη (*cephale*; head), because of the numerous flower-heads in the holotype specimen.

#### Selected specimens examined

WESTERN AUSTRALIA. Regenerating disused gravel pit off Hayes Rd, 500 m from Lake King Rd, 10 Jan. 1999, M. Bennett 427 (PERTH); Old Newdegate Rd, W of Millsteed Rd, 26 Feb. 2011, G. Byrne 4081 (AD, PERTH); Park Rd, S rd res., 6.3 km from Diagonal Rd, 13 Oct. 2017, C. Clowes CC 525 & M.W. Pratt (AD, MEL, MELU); Hayes Rd, 500 m E from Newdegate-Ravensthorpe Rd, c. 300 m N of Hayes Rd, past the old gravel pit, 17 Oct. 2017, C. Clowes CC 535 & M.W. Pratt (AD, MEL, MELU); W side of Mt Arid, Cape Arid N.P., 30 June 1976, A.S. George 14304 (PERTH); SE side and base of Mt Arid, Cape Arid N.P., 23 Nov. 1985, M. Hardie 09 (NSW, PERTH); c. 18 km NNW of Young River crossing on Ravensthorpe-Esperance main rd, 16 Dec. 1968, E.N.S. Jackson 1447 (AD); Near W border of Shire of Esperance, Location 1110, c. 40 km ENE of the coast at Stokes Inlet, 16 Oct. 1968, A.E. Orchard 1581 (AD, CANB, K, NBG, PERTH); 48 km by rd (c. E) from Pingrup on Pingrup-Ravensthorpe Rd, 11 Oct. 1975, G. Perry 401 (AD, PERTH); Site 1, Park Rd, 600 m W of Jerramungup Shire boundary, NE of Ongerup, 21 June 2004, L. Strahan 228 (CANB, PERTH).

#### Spyridium spadiceum (Fenzl) Benth.

*Fl. Austral.* 1: 428 (1863). — *Trymalium spadiceum* Fenzl in Endl. *et al.*, *Enum. Pl.* 26 (1837). — *Cryptandra spadicea* (Fenzl) F.Muell., *Syst. Cens. Austral. Pl.* 61 (1882). — **Type citation:** "King Georges Sound. (Hügel.)". **Holotype:** King Georges Sound, Hügel (W0046837).

Trymalium thomasioides Turcz., Bull. Soc. Imp. Naturalistes Moscou 31(1): 459 (1858). — Type citation: "Nova Hollandia, Drum. V. n. 231". Holotype: Nova Hollandia, J. Drummond 5: 231 ["Drum: coll: V n 231"] (KW001001114). Isotypes: Western Australia, 1849, J. Drummond 5<sup>th</sup> collection no. 231 (PERTH01534971, ex BM); S. Australia, Drummond 231 (5<sup>th</sup> Coll.) (K000732105); Western Australia, J. Drummond 231 (MEL2104156); W. Australia, Drummond 231 (P06766706, ex BM).

*Pomaderris hirsuta* Steud. in Lehm., *Pl. Preiss.* 1(2): 184 (1845). — **Type citation:** "In rupestribus ad tergum montis Clarence, 30 Sept. 1840. Herb. Preiss. No. 1673a". **Lectotype (here designated):** In rupestribus ad tergum montis Clarence, N. Holl. Occ. Austr., *L. Preiss 1673a* (P06766704, ex Herb. Steudel). **Isolectotypes:** In rupestribus ad tergum montis

Clarence, Sem. Num. 402, Septembr. 3 40, *L. P.[reiss]* 1673 (LD1099226); In rupestribus montis Clarence, 30 Sept. 40, *L. Preiss* 1673a (MEL2290880).

Evergreen *shrubs*, 0.5–3 m high, without spines, young stems densely pubescent with greyish stellate and rusty long flexuose simple hairs. Leaves alternate: stipules 3.5-6 mm long, narrowly ovate or ovate, free, sparsely pubescent at base and middle; *petiole* 2-5 mm long; lamina narrowly ovate or ovate, 9-30 (-45) mm long, (5-) 7-12 (-15) mm wide, base obtuse, margins recurved, apex obtuse, medium to densely pubescent with small stellate hairs (occasionally also short simple hairs) and scattered long simple hairs above, below pubescent with dense white to grey stellate hairs and longer rusty simple hairs. Inflorescences comprising terminal head-like clusters, 5-25 mm long, 10-30 mm wide, with c. 15–17 or more flowers, subtended by several floral leaves, usually slightly smaller than the vegetative leaves and covered in a dense white felty indumentum of stellate hairs. Flowers 5-merous, bisexual, white or cream, covered in medium to dense greyish stellate and simple hairs; *pedicels* 0–1.5 mm long. *Hypanthium* cupshaped with no apparent tube, 1–1.4 mm diameter, hairs denser at base. Sepals 1-1.1 mm long, spreading. Petals cucullate, 0.6-0.8 mm long, distinctly clawed. Stamens 0.5–0.6 mm long, incurved to erect. *Disk* conspicuous, smooth, glabrous. Ovary almost inferior to semi-inferior; roof pubescent with stellate hairs; style c. 0.4 mm long, glabrous. Fruit obovoid, 1.5-2 mm long, grey to black; torus in upper third. Seeds 1-1.3 mm long, brown to reddish brown, with some faint darker spots; aril pale yellowish. Fig. 5.

**Illustrations:** B.L. Rye, *Nuytsia* 10: 131, Fig. 3A–D (1995); B.J. Grieve, *How to Know W. Austral. Wildfl.* (2<sup>nd</sup> edn) 2: 583 (1998).

**Distribution & habitat.** The species occurs on granitic hills in Porongurup Range and at Albany, one record describing the vegetation as a thicket and another as *Eucalyptus megacarpa* woodland.

Phenology. Flowers and fruits: Oct.-Feb.

*Conservation status.* The species is listed as Priority 4 in W.A. (TSSC 2022).

*Typification of* **Trymalium spadiceum.** Only one specimen of *S. spadiceum* collected by Hügel is known from W, where Fenzl worked; as such this is accepted as the holotype of the name. The mention of F.L. Bauer as collector in the JACQ database is in error.

**Typification of Pomaderris hirsuta.** It is quite possible that Steudel saw several collections of *Preiss 1673a*, but only retained one in his private herbarium (now in P). The Preiss collections in LD are generally regarded as the "top set", but the specimen in Steudel's own herbarium is preferable as the lectotype. The LD & P specimens have annotations in the same handwriting, presumably Steudel's, i.e. he has seen both collections.



Fig. 5. Spyridium spadiceum near Albany, W.A.: A flowering branch, with inflorescences subtended by white pubescent floral leaves; B-D inflorescences. — A-C C. Clowes CC 520 & M.W. Pratt; D CC 524 & MWP. Photos by C. Clowes.

Other sheets labelled *Preiss 1673b* (LD1068029, HBG510058, S-G-10550, P06766707, P06766708 ex Herb. Steudel) or only *Preiss 1673* in some herbaria (BR0000013470081, M0211890, K000732103, K000732103, P06766703) are types of a different taxon: *Pomaderris commixta* Steud. [current name: *Spyridium majoranifolium* (Fenzl) Rye].

*Etymology.* From the Latin *spadiceus* (date-coloured, bright brown; see Stearn 1983), possibly on account of the dark reddish-brown inflorescence bracts of the species (as displayed by the holotype), or because of the conspicuous rusty indumentum on young branches.

## Selected specimens examined

WESTERN AUSTRALIA [precise localities withheld for conservation reasons]. W of the Great Australian Bight, 29 Jan. 1919, Anon. (AD, ex Herb. J.M. Black); Gull Rock N.P., 9 Oct. 2017, C. Clowes CC 520 & M.W. Pratt (AD, MELU, PERTH); Mt Clarence, 12 Oct. 2017, C. Clowes CC 524 & M.W. Pratt (AD, MELU, PERTH); Mt Clarence, King George Sound, 6 Nov. 1927, C.A. Gardner s.n. (PERTH); Porongurups, 11 Dec. 1964, A.S. George s.n. (PERTH); Porongurup Range, 30 km NNW of Albany, 17 Nov. 1986, G.J. Keighery 11729 (AD, PERTH); Porongurup Range, 4 Feb. 1992, G.J. Keighery 12707 (PERTH); Gull Rock N.P., 7 Sep. 2001, E.M. Sandiford EMS 602 (PERTH); NE of Albany, 5 Sep. 2008, E.M. Sandiford & D.A. Rathbone 1653 (PERTH).

#### Spyridium subochreatum (F.Muell.) Reissek

Linnaea 29: 287 (1858). — Trymalium subochreatum F.Muell., Defin. Austral. Pl. 42 (1855). — Cryptandra subochreata (F.Muell.) F.Muell., Syst. Cens. Austral. Pl. 61 (1882). — Spyridium subochreatum (F.Muell.) Benth. var. subochreatum: J.M.Black, Trans. Proc. Roy. Soc. S. Austral. 49: 273 (1925). — **Type citation:** "In the desert-scrub on the Murray River." **Lectotype (here designated):** In the Murray desert, F. Mueller s.n. (MEL 710602). **Residual syntypes:** Murray Desert, F. Mueller s.n. (BR0000013470104); Murray Scrub, F. Mueller s.n. (MEL710601A); Ad fl. Murray, Murray River, Oct. 1848, F. Mueller s.n. (MEL710603A). **Possible syntypes:** Murray River [, F. Mueller s.n.] (L0552319 = L.2327579); Australia felix [, s.coll.] (U.1541278, top middle and bottom left & middle branch).

*Trymalium behrii* F.Muell. ex Reissek, *Linnaea* 29: 274 (1858). — **Type citation:** "Murray-Scrub (Dr. F. Mueller)". **Lectotype (here designated):** Murray Scrub, *Dr. Behr* (MEL710601B). **Residual syntype:** Ad fl. Murray, Murray River, Oct. 1848, *F. Mueller s.n.* (MEL710603B).

*Pomaderris subochreata* F.Muell. ex Reissek, *Linnaea* 29: 287 (1858), *nom. inval. pro syn.* 

Cryptandra pauciflora Turcz., Bull. Soc. Imp. Naturalistes Moscou 31(1): 458 (1858). — Spyridium pauciflorum (Turcz.) Benth., Fl. Austral. 1: 432 (1863). — Type citation: "Nova Hollandia, Drum. V. n. 233". Holotype: Nova Hollandia, J. Drummond 5: 233



**Fig. 6.** *Spyridium subochreatum* on Eyre Peninsula, S.A. (A, F), the South Australian mallee (B, C, E) and near the Little Desert, Victoria (D): **A** habit; **B–C** young branches, variants with sparsely hairy leaves (B) and densely stellate-pubescent leaves (C); **D** flowering branches; **E–F** inflorescences. — A *J. Kellermann 760 & F.J. Nge*; B *JK 841 & FJN*; C *JK 785 & FJN*; D *JK 939 & FJN*; E *JK 634*; F *JK 761 & FJN*. Photos by J. Kellermann.

["Drum: coll: V n 233"] (KW001001110). Isotypes: Swan River to Cape Riche, Drummond 233 (5<sup>th</sup> coll<sup>n</sup>) (K000732098, ex Herb. Benth.); W. Australia, Drummond 233 (P06766714, ex BM); Drummond V 233 (BM, n.v., fide J.G. West, pers. comm.).

Spyridium subochreatum var. laxiusculum J.M.Black, Trans. Proc. Roy. Soc. S. Austral. 49: 273 (1925). — **Type citation:** "Keith; Wirrega". **Lectotype (here designated):** Keith (cemetery), 23 Nov. 1917, [J.M. Black s.n.] (AD98132267, two large branches, with a cover sheet with annotations and drawings; Fig. 7D). **Residual syntypes:** Keith, 23 Nov. 1917, [J.M. Black s.n.] (AD98132267, two separate branches and a fragment of an inflorescence; Fig. 7A–C); Keith (90 mile desert), 23 Nov. 1917, J.M. Black s.n. (K000618744, "Flora of S. Australia No. 6"; MEL710600); Wirrega, 1 Oct. 1916, [T.G.B. Osborne s.n.] (AD97611498); Wirrega, T.G.B. Osborne s.n. (AD98132267, several flowers and small part of inflorescence; Fig. 7E).

Evergreen *shrubs*, 0.2–1.5 m high, without spines, young stems covered in stellate hairs, mostly grey, sometimes rusty. *Leaves* alternate: *stipules* 1.4–5 mm long, narrowly triangular or triangular or narrowly ovate or ovate, connate behind the petiole for more than half of their length, glabrous or moderately hairy in middle; *petiole* 0.7–2 mm long; *lamina* 

narrowly ovate to narrowly obovate or ovate or elliptic, (3–) 4–15 (–19) mm long, 0.9–4 (–6.2) mm wide, base narrowly cuneate or cuneate or obtuse, margins revolute or sometimes recurved, apex acute or obtuse, smooth and glabrous or sometimes tuberculate above, or glabrescent or covered with stellate hairs, below covered with a dense stellate indumentum. Inflorescences comprising terminal or axillary dense to lose cymose panicles, 4-18 mm long, 6-14 mm wide, with c. 10-50 flowers, without white felty floral leaves; bracts ovate to orbicular, 1-3.5 mm long. Flowers 5-merous, bisexual, white or cream, medium to densely stellate-pubescent; pedicels 0-3 mm long. Hypanthium cup-shaped with no apparent tube, 1-1.7 mm diameter. Sepals 1.1-1.8 mm long, spreading, more densely hairy towards tips. Petals cucullate, 0.6-1 mm long, ± distinctly clawed. Stamens 0.6–0.9 mm long, incurved. *Disk* conspicuous, smooth, glabrous. Ovary almost inferior; roof pubescent with dense stellate hairs; style 0.4-0.7 mm long, glabrous. Fruit obovoid, 2.2-3.2 mm long, grey; torus in the upper third. Seeds 1.2-2.1 mm long, reddish brown, faintly spotted; aril pale yellowish. Fig. 6.

*Illustrations:* J.P. Jessop & H.R. Toelken, *Fl. S. Austral.* 2: 818, Fig. 430D (1986); B.J. Grieve, *How to Know W. Austral. Wildfl.* (2<sup>nd</sup> edn) 2: 583 (1998); N.G. Walsh & T.J. Entwisle, *Fl. Victoria* 4: 118, Fig. 20g (1999).



Fig. 7. Type sheet of *Spyridium subochreatum* var. *laxiusculum* J.M.Black (AD98132267): A Keith, 23 Nov. 1917, [*J.M. Black s.n.*] (broad-leaved specimen); B Keith, 23 Nov. 1917, [*J.M. Black s.n.*] (small part of inflorescence); C Keith, 23 Nov. 1917, [*J.M. Black s.n.*] (narrow-leaved specimen); D Keith (cemetery), 23 Nov. 1917, [*J.M. Black s.n.*] (two narrow-leaved specimens, designated as the lectotype in this paper); E Wirrega, [1 Oct. 1916,] *T.G.B. Osborne s.n.* (several flowers and small part of inflorescence). Insets: Drawings of buds and flowers from specimen cover page.

**Distribution & habitat.** One of the main components of dune-mallee and mallee-heath vegetation in northwestern Victoria and south-eastern South Australia, usually in ± deep sand (white, brown or red). Also occurs in similar habitat on Yorke Peninsula and Eyre Peninsula in S.A., with a few records from around Toolinna in

*Phenology.* Flowers May–Dec.; fruits recorded in May, July, Sep.–Jan.

south-eastern W.A. on limestone-derived soils.

*Note.* The species is very variable, e.g. the upper leaf surface can vary from glabrous to somewhat pubescent, to densely hairy. Specimens with a lax inflorescence and slightly smaller leaves were until recently recognised as var. *laxiusculum* (Canning & Jessop 1986; Barker *et al.* 2005). However, when examining specimens over the whole area of distribution, these characters grade into one another and distinct varieties cannot be recognised.

A recent molecular phylogeny of *Spyridium* (Clowes *et al.* 2022) showed one sample of *S. subochreatum* from W.A. to be separate from the remaining samples from eastern Australia in both cpDNA and nrDNA trees. The distinctness of this sample and other W.A. collections should be examined with molecular and morphological methods. In the meantime, however, *S. subochreatum* is recognised as one variable taxon for the *Flora of Australia* (Kellermann *et al.* 2022–).

*Conservation status.* The species is not threatened in the eastern States, but listed as a Priority 2 taxon in W.A. (TSSC 2022).

The identity of Cryptandra pauciflora. Rye (1996) only examined a photograph of the holotype of C. pauciflora and concluded that it belonged to the Spyridium oligocephalum group or to S. spadiceum. Examination of the specimen (and better-resolution images of KW001001110 and of duplicates at K and P, available online) clearly place it into synonymy with S. subochreatum: the specimen has large, fused stipules (S. spadiceum has free stipules), flowers covered in short hairs (S. polycephalum and S. oligocephalum have longer hairs) and leaves of the same size as recently collected W.A. specimens of S. subochreatum. While today, the taxon is only found near Toolinna on limestone, it seems to have been more widely distributed in W.A. in Drummond's time. The type was collected on his 5<sup>th</sup> collecting expedition, during which he also visited the Albany-Mt Barren-Ravensthorpe area, where there are several known limestone and lime sand deposits (Abeysinghe 1998).

**Typification of Trymalium subochreatum** and **T. behrii.** Mueller (1855) described *T. subochreatum* from specimens collected in the "desert" (i.e. mallee vegetation) near the Murray River. In the protologue he stated that the leaves were "above scabrous or scantily velutinous". Reissek (1858) described plants that had a hairy upper leaf surface as *T. behrii* and restricted *Spyridium subochreatum* to specimens with glabrous (albeit rough or scabrous) leaves.

There are several specimens available at MEL and other institutions that were collected by Mueller near the Murray River. Some sheets are mixed specimens, containing two original labels and branches with both leaf variations (listed as "A" and "B"). A specimen with glabrous leaves is designated as the lectotype of *Trymalium subochreatum*.

While Reissek stated that the type of *T. behrii* was collected by Mueller, the epithet "*behrii*" indicated that the specimens had in fact been collected by Hans Hermann Behr. The only specimen with a collecting label by Behr and annotated with that epithet is designated as the lectotype of *T. behrii*.

Typification of var. laxiusculum. When publishing Spyridium subochreatum var. laxiusculum, Black (1925) listed two localities in the protologue: Keith and Wirrega. His own herbarium at AD contains one copiously annotated sheet (AD98132267) with five collections (Fig. 7): (A) a broad-leaved specimen from "Keith"; (B) a small part of an inflorescence, collected in "Keith"; (C) a small twig from "Keith" with narrower leaves; (D) two branches from "Keith (cemetery)"; (E) some flowers and part of an inflorescence from "Wirrega", collected by T.G.B. Osborne. While A-D do not have a collector indicated, the collecting date for all of them is 23 Nov. 1917, the same date as two specimens in K and MEL, both of which have J.M. Black listed as collector (labelled in his own hand). We assume that all these specimens were collected by Black on the same day during a trip to Keith. His herbarium also contained a sheet with a collection by Osborne from Wirrega (AD97611498).

The two long branches from "Keith (cemetery)" on sheet AD98132267 (Fig. 7D), which have the glabrous leaves mentioned in the protologue, are selected as the lectotype, as they are the best-preserved branches of the specimens and come from Black's own herbarium.

*Etymology.* From the Latin *sub-* (somewhat) and *ochrea* (a sheath round a stem formed by the cohesion of two or more stipules), on account of the large fused stipules of the species.

#### Selected specimens examined

WESTERN AUSTRALIA [precise localities withheld for conservation reasons]. Toolinna Cove, 6 Sep. 2007, E.D. Adams 21/0907 (CANB, PERTH); Toolinna Cove, SW Caiguna, 17 Oct. 1985, G.J. Keighery & J.J. Alford 1043 (PERTH); Toolinna Cove, 26 Apr. 1988, G.J. Keighery & J.J. Alford 1936 (PERTH); Toolinna Cove, 5 May 1992, P.J. Spencer & A.S. George T1 (K, PERTH).

SOUTH AUSTRALIA. Eyre Peninsula: Hundred [Hd] of Dixson, c. 80 km NNE of Pt Lincoln, main Hwy, 18 May 1964, *C.R. Alcock 10A* (AD, MW, NY, US); 10 km E of Carapee Hill, 14 July 1993, *R. Bates 33561* (AD, CANB,

MA, RSA); W side of Coompana Water Res., 9 km W of Mangalo, then 3.4 km N on rd to Carpie Puntha Hill, then 1.5 km W on rd through res., 20 Oct. 1983, J.D. Briggs 1399 (AD, CANB, MEL); Intersection of Bell / Broadbent / Hen and Chicken / Wilke Rds, 23 Oct. 2018, J. Kellermann 760, 761 & F.J. Nge (AD, K, MEL; AD, BM, NSW); 6.4 km direct ENE of Mt Bosanquet, Hd Jamieson, Sect. 22, 23 Oct. 1998, S.D. Kenny & V.C. Hagan BS103-4158 (AD, B, KUN); N roadside of Rudall-Cleve rd, c. 500 m E of Ruddall on bend in rd, 6 Oct. 1995, F. Udovicic 282 (AD, CANB, E, MEL, PERTH, SI); c. 25 km W of Pinkawillinie Hall, c. 2 km in ungrazed Crown Land, 11 Oct. 1981, J.Z. Weber 7176 (AD, PE, TI, SIU). Flinders Ranges: Quorn School, Nov. 1926, Anon. [Plant Survey of S.A., Field Naturalists' Section] 2788 (AD); Mt Remarkable, 6 Sep. 1976, R. Bates s.n. (AD). Northern Lofty: Between Gawler and Mallala, 5 Sep. 1953, J.B. Cleland s.n. (AD); Scrub W of Hoyleton, 11 July 1884, S. Dixon s.n. (AD, ex Herb. Tate); Snowtown Rd near Bute, 15 Aug. 1967, M.P. Hewton s.n. (AD). Murray: 25 km E of Tailem Bend on Pinnaroo Rd, 3 Sep. 1985, N.N. Donner 10630 (AD, AK, BRI, GZU, H, I, OSA, PTBG, UTEP, WRSL, WS); Chauncey's Line Res., c. 800 m N of Chauncey's Line on first ridge of white sand near the rd to Monarto South, 23 Sep. 1958, H. Eichler 14956 (AD, B, L, M, NSW, PE, RSA, TAIF, UC, W); Karte Conservation Park (C.P.), 22 Aug. 1998, T. Hall 473 (AD); Scorpion Springs C.P., 7 Oct. 1977, E.N.S. Jackson 3526 (AD, SBSC, ZT); Monarto C.P., S part of loop tk, 1 Oct. 2018, J. Kellermann 635 (AD, B, KW); Jim Jolly Rd, W of Billiatt, large dune on W side of rd, base of dune, 26 Aug. 2019, J. Kellermann 785 & F.J. Nge (AD, MO); Dog Lake Rd, Langhorne Creek, 27 Sep. 1998, R.L. Taplin 821 (AD, MEL); Monarto C.P., 12 Oct. 1995, F. Udovicic 323 (AD, CANB, MEL). Yorke Peninsula: c. 6 km SSE of Moonta, 23 Sep. 1967, B.J. Blaylock 788 (AD, B, C, COLO); Sandhill c. 10 km N of Bute on Pt Broughton Rd, E side of rd, 8 May 1966, B. Copley 269 (AD, CAL, E). Southern Lofty: c. 5 km S of Reeves Plains, 6 Aug. 1963, N.N. Donner 813 (AD, G, NSW); Cox's Scrub Res., near Ashbourne, 16 Aug. 1970, D. Hunt 3235 (AD, UC); 9 km E of Two Wells, Hd of Pt Gawler, Section 640, 5 Nov. 1997, P.J. Lang BSOP-49 (AD, US, SI). South Eastern: Mt Rescue summit, [Ngarkat C.P.,] 10 Sep. 1985, N.N. Donner 10773 (AD, GZU, HO, MA, MEL, SYD, TAI, TEX); Viewpoint on sand dune [c. 1 km] E of Carcuma C.P., 4 Sep. 1985, E.N.S Jackson 5673 (AD, BISH, GH, LZ, MEL, W); Messent C.P., rd on S side of park, c. 3 km W of park corner, c. 50 m from rd, 29 Aug. 2019, J. Kellermann 841 & F.J. Nge (AD); Mt Shaugh C.P., 2 Oct. 1977, D.E. Symon 10719 (AD, MO); Tauragat Hill on Coonalpyn-Lameroo rd, 14 km NE of Coonalpyn, on W side of rd, 12 Oct. 1995, F. Udovicic 324 (AD, CANB, MEL, PERTH); Meningie, c. 10 km E on the rd to Coonalpin, 7 Jan. 1968, J.Z. Weber 647 (AD, G, NSW); c. 25 km NW of Lucindale, 8 Oct. 1982, J.Z. Weber 7416 (AD, PH, PRE, RSA); Desert Camp, between Keith & Naracoorte, 10 Oct. 1984, D.J.E Whibley 9385 (AD, BAA, CHR, E, HO, NY, PERTH).

VICTORIA. Big Desert, 27.5 km S of Walpeup on rd to Patchewollock & 1–2 km S of Griggs junction, 1 Oct. 1980, *M.G. Corrick 6673, P.S. Short & B.A. Fuhrer* (AD, MEL); Little Desert N.P. near Dimboola, Desert Discovery Walk between starting point at River Tk (to Ackle Bend) and Eagle Swamp Tk, 28 Sep. 2017, *N.G. Karunajeewa 1598* (BRI, MEL); Big Desert, 30 m W of Murrayville-Nhill Rd, c.

16 km S of Murray Hwy, on top of large dune, 6 Oct. 2019, J. Kellermann 919 & F. Nge (AD, E); Nhill-Edenhope Rd, 13.4 km S from Hwy, W side of rd in remnant bushland, 7 Oct. 2019, J. Kellermann 939 & F. Nge (AD, B); Hattah-Kulkyne N.P., NW edge of Lendrook Plain, at end of tk 1.2 km from old Calder Hwy, 0.5 km past tk going off to S, Sep. 1986, G.R. Lucas 239 (CANB, MEL); c. 13 miles N of Ouyen on Calder Hwy, 17 Aug. 1960, T.B. Muir 1191 (AD, MEL); Wyperfeld N.P., Gunners Tk, c. 4 km S from N park boundary, 28 Nov. 2014, R.W. Purdie 9653 (CANB, MEL); On S.A.-Vic. border, c. 12 [miles] SE of 'Bunns Springs' homestead, c. 14 miles (in direct line) due N of Adelaide-Melbourne Hwy, 28 Aug. 1959, R.V. Smith 59/173 (CANB, MEL); McCrackens Rd, 9.1 km W of Murrawong Rd, c. 22.5 km NNW of Lillimur, 12 Oct. 2003, N.G. Walsh 5858 (MEL).

## Spyridium villosum (Turcz.) Benth.

*Fl. Austral.* 1: 432 (1863). — *Cryptandra villosa* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 31(1): 458 (1858). — **Type citation:** "Nova Hollandia, Drum. V. n. 232." **Holotype:** Nova Hollandia, *J. Drummond 5: 232* ["*Drum: coll: V n 232"*] (KW001001111) (Fig. 8). **Isotypes:** West Australia, *J. Drummond coll. n. 232* (PH00022346, ex BM); West Australia, 1849, 5<sup>th</sup> collection, 232 (PERTH01671979, ex BM). W.A., *J. Dr.[ummond] 232* (MEL705389); Swan River, *Drummond 232 5th coll.* (K000618740, ex Herb. Bentham); S. Australia, *Drummond 232* (K000618741, ex Herb. Hooker).

Evergreen low twiggy shrubs, 0.1-0.4 m high, without spines, young stems covered with dense grey stellate and sparse to medium dense flexuose rusty or brown simple hairs. Leaves alternate: stipules 1.8-3 (-5) mm long, triangular or ovate, apex acute or attenuate when young, free but overlapping near the base, moderately pubescent mostly along midrib; petiole 1-2.2 mm long; lamina narrowly elliptic or linear or oblong, 8-22 mm long, 1.5-2.5 (-6) mm wide, base obtuse, margins recurved, apex obtuse with a very short hairy mucro, tomentose with greyish dense very short simple and stellate hairs above, below densely white to grevish stellate-pubescent with fewer long simple hairs. Inflorescences comprising terminal or axillary heads, 5-8 mm long, 4-13 mm wide, with c. 8-30 flowers, with floral leaves covered in a dense white felty indumentum of stellate hairs; bracts ovate to orbicular, 1.4–2.5 mm long, sparsely pubescent in middle. Flowers 5-merous, bisexual, white or cream, with a dense grey stellate indumentum and longer flexuose spreading simple hairs; pedicels 1.2-4 mm long. Hypanthium cupshaped with no apparent tube, c. 1 mm diameter. Sepals 1–1.2 mm long, widely spreading and almost recurved, with more hairs towards tip. Petals cucullate, 0.8-0.9 mm long, distinctly clawed. Stamens 0.6-0.8 mm long, incurved. *Disk* conspicuous, smooth, glabrous. Ovary almost inferior; roof pubescent with dense stellate hairs; style 0.4–0.5 mm long, glabrous. Mature fruit and seeds not seen; fruit body obovoid; torus in upper third.



**Fig. 8.** Holotype of *Cryptandra villosa* Turcz., current name *Spyridium villosum* (Turcz.) Benth. (KW001001111).

*Illustrations:* B.L. Rye, *Nuytsia* 10: 130, Fig. 3E–H (1995); B.J. Grieve, *How to Know W. Austral. Wildfl.* (2<sup>nd</sup> edn) 2: 587 (1998).

*Distribution & habitat.* Endemic to W.A., only known from the Stirling Range, growing in sand over sandstone in heathland and shrubland, with an atypical specimen recorded from Ongerup in sandy soil (Rye 1996).

*Phenology.* Flowers May–Dec.; fruits recorded in May, July, Sep.–Jan.

**Note.** The species is closely related to *S. spadiceum*, but differs in its linear to narrowly elliptic, densely hairy leaves (vs ovate leaves that become glabrous in *S. spadiceum*) and habitat on sandy soils over sandstone (vs granite).

*Conservation status.* The species is listed as a Priority 2 taxon in W.A. (TSSC 2022).

*Etymology.* From the Latin *villosus* (villous), on account of the species' densely hairy upper leaf surface.

## Selected specimens examined

WESTERN AUSTRALIA [precise localities withheld for conservation reasons]. Donnelly Peak, Stirling Range N.P., 19 Oct. 2001, *S. Barrett 950* (PERTH); S of Pyungoorup, Stirling Range N.P., 5 Aug. 2008, *S. Barrett 1796* (PERTH); N of East Pillenorup Tk, Stirling Range N.P., 13 Sep. 2012, *S. Barrett 2130* (PERTH); Misery Hill, Stirling Range N.P., 11 Mar. 2014, *S. Barrett 2200* (PERTH); near Ongerup, 10 Oct. 1992, *E.J. Coxford 6644* (PERTH); Wedge Hill, Stirling Range, 4 Nov. 1987, *G.J. Keighery s.n.* (PERTH).

# Acknowledgments

The project "A new phylogeny of the Australian Rhamnaceae, revision of Cryptandra and Spyridium, and completion of the Flora of Australia treatment of the family", with Jürgen Kellermann as Principal Investigator, is supported through funding from the Australian Government's Australian Biological Resources Study (ABRS) National Taxonomy Research Grant Programme. Catherine Clowes was supported by a Holsworth Wildlife Research Endowment (The Ecological Society of Australia), and the Hansjörg Eichler Scientific Research Fund (Australasian Systematic Botany Society). The specimens from KW cited in this article have been digitized with support from the Andrew W. Mellon Foundation (USA) in the course of three digitization projects at the National Herbarium of Ukraine, and this generous support is gratefully acknowledged. We are grateful to Natalia M. Shiyan (Head Curator, KW) and Svitlana I. Antonenko (M.G. Kholodny Institute of Botany, Kyiv, Ukraine) for facilitating herbarium research of Sergei Mosyakin at KW.

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