New and priority taxa in the genera *Spyridium* and *Trymalium* (Rhamnaceae) of Western Australia

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Abstract

Rye, B.L. New and priority taxa in the genera *Spyridium* and *Trymalium* (Rhamnaceae) of Western Australia. Nuytsia 10 (1) 119-140 (1995). The following new Rhamnaceae taxa are described and illustrated: *Spyridium glaucum* Rye, *S. minutum* Rye, *S. montanum* Rye, *S. mucronatum* Rye, *S. mucronatum* subsp. *multiflorum* Rye, *S. mucronatum* subsp. *recurvum* Rye, *S. riparium* Rye, *Trymalium densiflorum* Rye, *T. elachophyllum* Rye, *T. floribundum* subsp. *trifidum* Rye, *T. ledifolium* var. *lineare* Rye and *T. venustum* Rye. Half of these taxa are presently included on the Priority Flora List. Other species of *Spyridium* and *Trymalium* on this conservation priority list are also illustrated and two new combinations are made, namely *Spyridium majoranifolium* (Fenzl) Rye and *Spyridium polycephalum* (Turcz.) Rye.

Introduction

Most of the Rhamnaceae species of southern Western Australia have, at some stage, been placed in one or more of the five genera *Cryptandra*, *Pomaderris*, *Spyridium*, *Stenanthemum* and *Trymalium*. There is much uncertainty as to where the boundaries of these genera should fall, as well as problems in placing some species that do not fit readily into any of the existing genera. A detailed examination of the generic boundaries for Rhamnaceae throughout Australia, presently being undertaken by Kevin Thiele and Judy West (Australian National Herbarium, Canberra), may result in several new genera being recognized. To avoid further nomenclatural confusion, the publication of a paper (Rye in preparation) providing keys, distribution maps and other information for all the Western Australian Rhamnaceae will be delayed until the generic boundaries have been better established.

In the meantime, this paper deals with some Rhamnaceae species of clear generic affinity, with the aims of naming and describing the new taxa, indicating which taxa are most likely to be in need of conservation measures, and ensuring that illustrations are available to facilitate future work on the priority taxa. It covers only those *Spyridium* and *Trymalium* species having the vegetative characters, inflorescence, flower and fruit types that are typical of each genus. While they differ from one another in a number of morphological characteristics, *Spyridium* and *Trymalium* can be distinguished from other Rhamnaceae on the basis of some shared fruit characters. All of the species covered here differ from *Cryptandra* and *Stenanthemum* in having indehiscent fruitlets that are released with their enclosed

seed when the schizocarp dehisces, and they differ from *Pomaderris* in lacking a window on each fruitlet. In Western Australia, there are 15 such species in *Spyridium* and 11 in *Trymalium*. Most of these taxa are listed in this taxonomic treatment and the remainder are mentioned in relation to the listed species, except for *Spyridium tricolor* W.R.Barker & Rye, which was described and illustrated in an earlier paper (Barker & Rye 1993).

Materials and methods

Type specimens of *Spyridium* and *Trymalium* species were borrowed from LD, MEL, P and W and photographs of types housed at FI and KW were examined. Apart from these, all specimens cited in this paper were located at PERTH. Measurements, habitat information, flowering times and other data were obtained from herbarium specimens and entered into a DELTA database. Descriptions were generated through DELTA, then edited to a form suitable for publication. To avoid unnecessary repetition of characters in the descriptions of new taxa, a list of implicit characters was prepared, the individual descriptions only mentioning these characters if they differed from the usual state found in Western Australian members of their genus.

The conservation status of each taxon was assessed based on the available herbarium collections and some data from field surveys. Conservation codes were assigned according to the standards currently being used by the Western Australian Department of Conservation and Land Management for its Priority Flora List. Definitions of the conservation codes are provided at the end of this Nuytsia issue.

Results for *Spyridium* Fenzl

Implicit characters

Branchlets not spinescent. *Stipules* persistent, free. *Leaves* open (i.e. not conduplicate), entire, green on upper surface. *Inflorescence* cymose; bracts brown; flowers sessile or subsessile in close clusters. *Floral tube* adnate for most of its length but free for a short distance beyond the summit of the inferior ovary. *Disc* glabrous, either forming a rim at the summit of the floral tube or of apparently distinct lobes, distinctly lobed or undulate between the stamens. *Ovary* 3-celled. *Stigmatic lobes* 3. *Fruit* a schizocarp, splitting to release entire 1-seeded fruitlets; fruitlets inferior or largely inferior, membranous to chartaceous, white. *Seeds* with a dark base, uniformly coloured above, seated on a small aril; aril easily detached, succulent, entire (i.e. not lobed).

Spyridium glaucum Rye, *sp. nov.*

Bracteae indumento uniformi pilis brevibus adpressis. Flores pauci. Tubus floralis pilis persistentibus. Lobi disci triangulares.

Typus: Ravensthorpe Range, Western Australia, September 1979, *E.M. Bennett s.n.* (holo: PERTH 01542397).

Shrub erect or spreading, 0.5-1 m high. *Young stems* densely hairy; hairs appressed or antrorse, usually ferruginous at first but becoming white. *Petioles* 2-4 mm long. *Leaf blades* usually obovate,

sometimes oblong-elliptic, 12-16 x 5-9 mm, furrowed along the midvein on the upper surface, the margins recurved or revolute; lower surface pale green, with 4-6 lateral veins on each side of midrib, densely covered by fine appressed hairs; upper surface glabrous or subglabrous. *Involucral bracts* ovate, *c.* 3 mm long, shortly ciliate; outer surface uniformly hairy throughout, the hairs 0.1-0.2 mm long. *Flowers* few (usually 3-6), in clusters 3-6 mm wide. *Floral tube* 0.8-1 mm long, with a dense indumentum of ferruginous hairs *c.* 0.4 mm long. *Sepals* 0.5-0.8 mm long, densely hairy; hairs antrorse to spreading, 0.1-0.2 mm long. *Disc lobes* triangular. *Ovary summit* densely hairy; hairs 0.2-0.3 mm long. *Style* 0.7-1.2 mm long, stellate-hairy towards base. *Schizocarp c.* 2 x 1.6 mm, uniformly hairy; hairs antrorse to appressed, 0.4-0.5 mm long, ferruginous. *Seeds c.* 1.4 x 0.9 mm, dark red-brown. (Figure 1A-F)

Specimens examined. WESTERN AUSTRALIA: Ravensthorpe district, 11/1944, *C.A. Gardner*; Mt Short, 5/11/1968, *J.W. Wrigley* 68/5438 & 68/5451.

Distribution. Known only from the hills north-east of Ravensthorpe, southern Western Australia.

Habitat. Occurs in clay, no other details of the habitat recorded.

Flowering and fruiting period. September-November.

Derivation of name. From the Latin *glaucus* - bluish green or grey, referring to leaf colour. The leaves may vary in colour, but glaucous leaves are present on each specimen.

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 1. First included as a priority taxon in 1991, under the phrase name *Spyridium* sp. *Ravensthorpe* (*E.M. Bennett s.n.*). It has not been recorded on any nature reserves and appears to have a very restricted distribution, its known range being certainly less than 20 km, and probably less than 10 km, in extent.

Notes. Belongs in the group of *Spyridium* species having triangular disc lobes but appears not to have any very close relatives. *Spyridium glaucum* can be distinguished by the uniform indumentum of short appressed hairs on its bracts, its small number of flowers and the persistent hairs on its floral tube.

Spyridium majoranifolium (Fenzl) Rye, *comb. nov.*

Trymalium majoranifolium Fenzl in Endl., Fenzl, Benth. & Schott, Enum. Pl. Hueg. 24: 21 (1837). - *Spyridium spadiceum* var. *majoranifolium* (Fenzl) Benth., Fl. Austral. 1: 428-429 (1863). Type: New Holland [Western Australia], *F. Bauer* (W).

Pomaderris commixta Steud. in Lehm., Pl. Preiss. 1: 184 (1845). - *T. majoranifolium* var. *velutinum* Reissek in Lehm., Pl. Preiss. 2: 281 (1848). Type: Mt Clarence, [Western Australia], 30 September 1840, *L. Preiss* 1673b (MEL, W).

Pomaderris subretusa Steud. in Lehm., Pl. Preiss. 1: 183 (1845). - *Trymalium majoranifolium* var. *calvescens* Reissek in Lehm., Pl. Preiss. 2: 183 (1848). - *S. majoranifolium* var. (?) *calvescens* (Reissek) Benth., Fl. Austral. 1: 429 (1863). Type: Baldhead, [Western Australia], 16 October 1840, *L. Preiss* 1687 (MEL).

Conservation status. A widespread and variable species, not considered to be at risk.

Notes. Closely related to *Spyridium spadiceum* and *S. villosum*, differing in its usually shorter and more rounded leaves, more hairy bracts, smaller inflorescences and more uniform sepal indumentum.

Spyridium minutum Rye, *sp. nov.*

A *S. cordato* petiolis brevioribus adpressis, foliis minutis crassis, floribus paucioribus, indumento florum magis persistenti differt.

Typus: Nature reserve, 100 m E of Neds Rd on Rollands Rd, Western Australia, 12 September 1992, *G.F. Craig* 2085 (holo: PERTH 03243567; iso: CANB).

Shrub erect or spreading, 0.1-0.25 m high. *Young stems* appressed-hairy but soon becoming glabrous. *Petioles* 0.3-0.5 mm long, appressed. *Leaf blades* appearing sessile, more or less touching the stem, broadly ovate or cordate, 1.3-1.6 x 1.1-1.6 mm, very thick, with the margins and apical region recurved; lower surface white owing to the dense white indumentum or hidden from view; upper surface tuberculate, hairy or glabrous. *Involucral bracts* almost circular, 1.5-2 mm long, prominently ciliate; outer surface hairy on midvein and base or sometimes with indumentum more widespread, the hairs *c.* 0.4 mm long. *Flowers* few (usually 2 or 3), in clusters 2-3 mm wide, white. *Floral tube* *c.* 1 mm long, very densely hairy; hairs 0.5-1 mm long, ferruginous or white. *Sepals* densely hairy; hairs antrorse to spreading, 0.2-0.5 mm long. *Disc lobes* triangular. *Ovary summit* densely hairy; hairs 0.3-0.4 mm long. *Style* *c.* 0.7 mm long, glabrous or with just a few basal hairs. *Schizocarp* 2.2-2.5 x 1.6-1.8 mm, with a fairly dense and uniform indumentum of long simple hairs. *Seeds* *c.* 1.4 x *c.* 1 mm, orange-brown, with black spots or markings. (Figure 1G-K)

Selected specimens examined. WESTERN AUSTRALIA: 529 miles Coolgardie-Esperance road [11 km S of Gibson], 15/5/1968, *E.M. Bennett* 2171; 5.2 km NE Melaleuca Rd on West Point Rd, 9/1984, *M.A. Burgman* 3891; nature reserve, 1.3 km SSW of Griggs Rd on Fields Rd, 14/9/1992, *G.F. Craig* 2125; 11 km N of Salmon Gums, 12/3/1980, *K.R. Newbey* 6718; 8 km SE of Mt Beaumont, 10/11/1980, *K.R. Newbey* 7931; 47 miles [75.7 km] from Esperance towards Norseman, 2/11/1968, *J.W. Wrigley*.

Distribution. Extends from the upper Young River east to near Mt Beaumont and north to the Salmon Gums area, southern Western Australia.

Habitat. Occurs on plains, usually recorded in sandy clay or sand over clay.

Flowering and fruiting period. March-May, September-November.

Derivation of name. From the Latin *minutus* - small, referring to the small size of the plant and all its parts.

Conservation status. Previously regarded as a priority species and listed in 1990 under the phrase name *Spyridium* sp. *Mt Beaumont* (*K.R. Newbey* 6718), but has been removed from the list as there are now known to be many populations, some of them very large and some on nature reserves (G.F. Craig pers. comm.).

Notes. Closely related to *Spyridium cordatum* (Turcz.) Benth., which has larger heart-shaped leaves with a more obvious petiole (0.7)1-3 mm long and more numerous flowers.

Spyridium montanum Rye, *sp. nov.*

A *S. globuloso* affinis sed caule juveni et floribus pilis ferrugineis ornatis, foliis supra semper pilosis differt.

Typus: The Arrows, near eastern end of Stirling Range, Western Australia, 11 October 1970, *A.S. George* 10425 (holo: PERTH 01533436; iso: CANB).

Shrub erect, 1-2.5 m high. *Young stems* with a dense indumentum of short white hairs, also with longer ferruginous hairs, which are common towards the apex but becoming more scattered below; ferruginous hairs spreading, 0.3-1 mm long. *Stipules* persistent but apex usually lost early, often before the leaves are shed. *Petioles* 5-12 mm long. *Leaf blades* elliptic or ovate (rarely narrowly so), 20-40 x 8-20 mm, the margins recurved; lower surface pale green, with 5 or 6 lateral veins on each side of midrib, often grey-green; upper surface densely hairy. *Involucral bracts* broadly ovate, 2-2.5 mm long; outer surface hairy throughout but much more densely so on base and midvein, with spreading simple hairs 0.8-1 mm long and much shorter stellate hairs. *Flowers c.* 10 to numerous, in a spreading branched terminal inflorescence 12-28 mm across, white or cream. *Floral tube* 1-1.2 mm long, densely hairy with simple spreading ferruginous hairs 0.6-1.2 mm long and minute white stellate hairs. *Sepals* 1-1.3 mm long, with a dense indumentum of white stellate hairs 0.2-0.4 mm long and longer simple ferruginous hairs. *Disc lobes* broadly oblong-elliptic, emarginate. *Ovary summit* with stellate hairs 0.1-0.2 mm long. *Style* 0.4-0.5 mm long. *Schizocarp* only seen when immature, densely hairy with a mixture of long ferruginous hairs and short white stellate hairs. (Figure 1L-O)

Specimens examined. WESTERN AUSTRALIA: Mt Toolbrunup, *anonymous*; Toolbrunup, 23/4/1923, *C.A. Gardner* 1428; Hopetoun [locality apparently inaccurate], 5/1924, *C.A. Gardner*; Ellens Peak, 22/7/1983 *G.J. Keighery* 6193.

Distribution. Restricted to Stirling Range, southern Western Australia.

Habitat. Recorded on sandstone or shale on mountains in the central and eastern part of the range, often in gullies high on the sides of the mountains.

Flowering period. April-July and October.

Derivation of name. From the Latin *montanus* - pertaining to mountains, referring to the species' restricted occurrence in a mountain range.

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 2. Known only from an area *c.* 30 km long in one large national park.

Notes. Spyridium globulosum (Labill.) Benth., a common species occurring along the coast of south-western Australia, is very closely related. It differs from *S. montanum* in having only white hairs (no ferruginous hairs) on the young stems and flowers, leaves nearly always glabrous on the upper surface, and usually larger inflorescences.

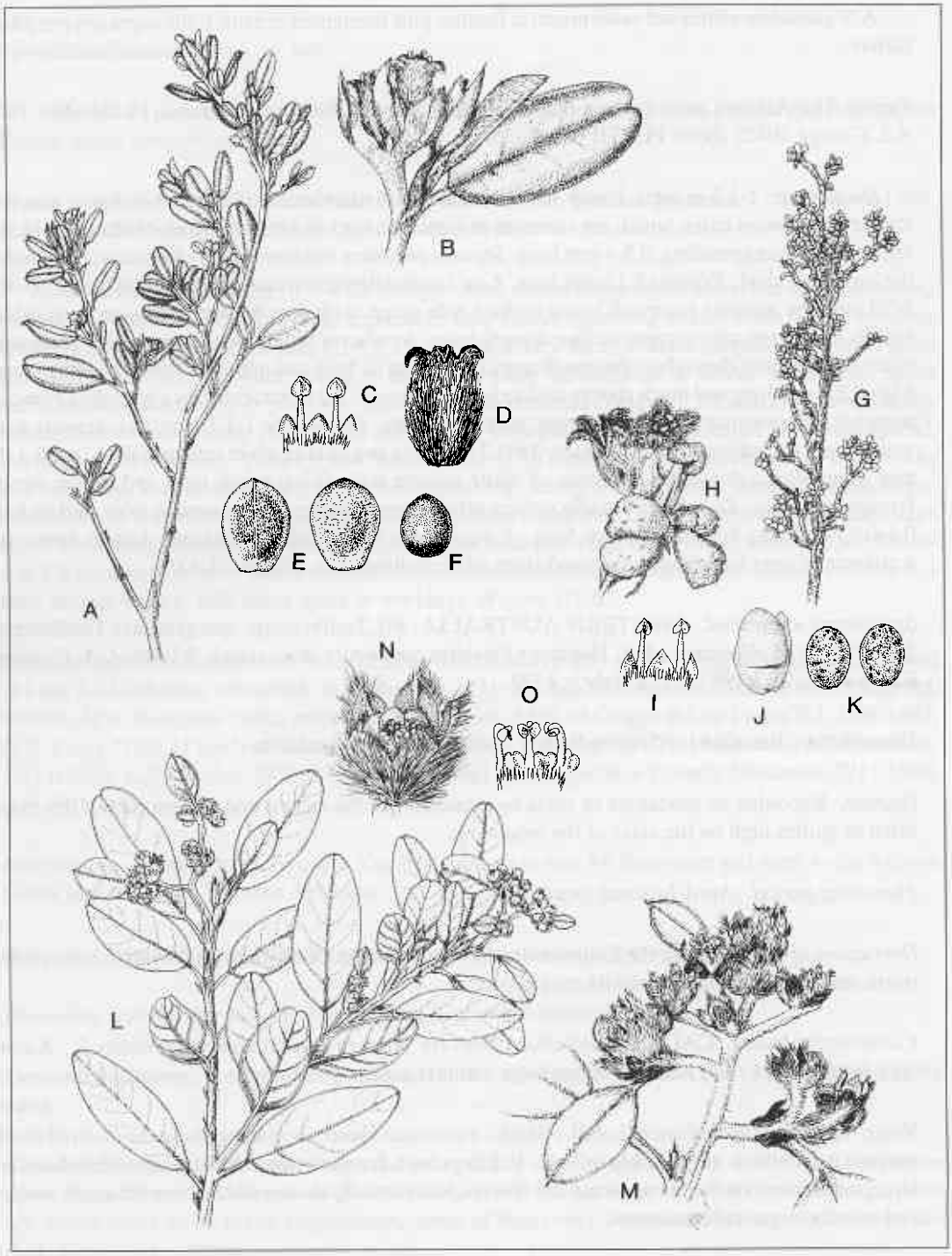

Figure 1.A-F *Spyridium glaucum* A - flowering branch (x1), B - flower cluster and leaf (x4), C - stamens and disc lobes (x10), D - schizocarp (x8), E - inner and outer surfaces of fruitlet (x8), F - seed (x8); G-K *S. minutum* G - flowering branch (x1), H - flower cluster and leaves (x7.5), I - stamens and disc lobes (x12), J - empty fruitlet (x6.5), K - inner and outer surfaces of seed (x6.5); L-O *S. montanum* L - flowering branch (x1), M - inflorescence (x2), N - flower (x5), O - stamens and disc lobes (x6). Drawn from *E.M. Bennett* 9/1979 (A-F), *G.F. Craig* 2081 (G-K) and *G.J. Keighery* 6193 (L-O).

Spyridium mucronatum Rye, *sp. nov.*

A *S. microcephalo* affinis sed foliis et inflorescentiis parvioribus, tubi florali pilis persistentibus ornato differt.

Typus: Nature reserve, 2.9 km W of Fields Rd on Griffiths Rd, Western Australia, 14 September 1992, *G.F. Craig* 2133 (holo: PERTH 03243753; iso: CANB).

Shrub erect or spreading, 0.15-0.6 m high. *Young stems* densely stellate-hairy or sometimes with a mixture of stellate and simple hairs. *Petioles* 0.5-1.3 mm long. *Leaf blades* usually narrowly oblong, rarely ovate, 2.5-4.3 x 0.6-1.6 mm, almost terete, the revolute margins usually meeting below except towards base of leaf, the apical mucro 0.1-0.3 or rarely less than 0.1 mm long; lower surface densely white-hairy but largely hidden; upper surface commonly minutely papillose, often minutely stellate-hairy or with simple patent hairs or a whitish coating, rarely glabrous although generally appearing so. *Involucral bracts* broadly ovate, 1-2 mm long, with prominent cilia 0.3-0.4 mm long; outer surface appearing glabrous but often with minute hairs concentrated along the midvein. *Flowers* in dense head-like clusters, usually 4-12 per cluster, white to yellow. *Floral tube* 0.9-1.3 mm long, densely or very densely hairy; hairs 0.5-1.2 mm long. *Sepals* 0.6-0.7 mm long, densely hairy; hairs antrorse to spreading. *Disc lobes* triangular. *Ovary summit* densely hairy. *Style* 0.5-0.7 mm long. *Schizocarp* 2-2.3 x 1.5-1.7 mm, with long spreading simple hairs and minute stellate hairs. *Seeds* 1.2-1.5 x 0.9-1.2 mm, pale brown or orange-brown.

Distribution. Extends from Borden east to Cape Arid National Park, not reaching the south coast, the northernmost locality being Frank Hann National Park.

Habitat. Occurs in mallee vegetation, on sandy soils or sand with clay.

Flowering and fruiting period. September-March.

Derivation of name. From the Latin *mucronatus* - pointed, referring to the shortly pointed leaves.

Notes. Related to *Spyridium microcephalum* (Turcz.) Benth., which differs in having deciduous hairs on the floral tube and longer ovary hairs. *S. mucronatum* has small leaves and few flowers per head. Three subspecies are recognized, each apparently with a distinct geographical area.

Spyridium mucronatum Rye subsp. **mucronatum**

Leaf blades narrowly oblong to ovate, 3-4.3 x 0.8-1.2 mm, the apical mucro 0.1-0.3 mm long; upper surface usually papillose, sometimes minutely stellate-hairy or simple-hairy, rarely glabrous but always appearing glabrous to the naked eye, rarely whitish. *Involucral bracts* 1.5-2 mm long. *Flowers* few (usually 3-6), in clusters 3-5 mm wide. *Sepals* with hairs 0.2-0.4 mm long. *Ovary summit* with hairs 0.2-0.3 mm long. (Figure 2A-C)

Selected specimens examined. WESTERN AUSTRALIA: 24.3 km due SSE of Peak Eleanora, 28/9/1984, *M.A. Burgman* 3827; 35 km due ENE of Muckinwobert Rock, 29/9/1984, *M.A. Burgman* 3897; 10.1 km N of Rollands Rd on Fields Rd, 13/9/1992, *G.F. Craig* 2104; Truslove Nature Reserve, 22/9/1992, *G.F. Craig* 2172; 30 km WSW Ponier Rock, 11/12/1990, *G.J. Keighery* 12644; Frank Hann

National Park, 3/8/1978, *D. Monk* 117; 3 km ENE Salmon Gums, 6/3/1980, *K.R. Newbey* 6672; 38 km NNE of Mt Ridley, 8/3/1980 *K.R. Newbey* 6688; 12 km SW of Mt Buraminya, 8/11/1980, *K.R. Newbey* 8212.

Distribution. Extends from Frank Hann National Park east to north of Cape Arid National Park, southern Western Australia.

Habitat. Occurs in mallee woodlands, often in the shade beneath *Eucalyptus uncinata* trees.

Conservation status. Previously regarded as a priority species and listed in 1990 under the phrase name *Spyridium* sp. *Frank Hann* (*K.R. Newbey* 6688), but a recent survey by G.F. Craig (pers. comm.) has shown that the taxon is reasonably common and widespread, including populations on nature reserves, so it has been removed from the list.

Spyridium mucronatum subsp. **multiflorum** Rye, *subsp. nov.*

A *S. mucronato* subsp. *mucronato* affinis sed foliis latioribus apice minus manifeste acuto, floribus multi numerosi differt.

Typus: About 15 miles [24.2 km] SW of Mt Ragged, Western Australia, 12 January 1966, *A.S. George* 7391 (holo: PERTH 01538675; iso: CANB, MEL).

Leaf blades ovate or narrowly so, 3-4.3 x 1.4-1.6 mm, the apical mucro *c.* 0.1 mm long; upper surface hairy or glabrous, sometimes white-scurfy. Involucral bracts 1.5-2 mm long. *Flowers* 7-14, in clusters 4-7 mm wide. *Sepals* with hairs *c.* 0.3 mm long. *Ovary summit* with hairs *c.* 0.3 mm long. (Figure 2D, E)

Specimens examined. WESTERN AUSTRALIA: 15 km S of Scadden, 13/11/1976, *Wittwer* 1869; 2 km NE of Bebenorin Rd on Muntz Rd, Reserve 32784, 10/1984, *M.A. Burgman* 4292.

Distribution. Known from three scattered collections, extending from north of Gibson east to near Mt Ragged, Cape Arid National Park, southern Western Australia. These localities are located south of the eastern part of the area where *S. mucronatum* subsp. *mucronatum* occurs.

Derivation of name. From the Latin *multus* - much and *floris* - flower, referring to the more numerous flowers than are found in the other two subspecies.

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 2. This taxon is known from only three collections, but has a wide range of *c.* 160 km, with one of the known populations on a large national park and another on a nature reserve. Still, it appears to be the least common of the three subspecies and no populations have been located during a recent survey (Craig & Coates in preparation) of priority taxa in the region.

Notes. Distinguished from *Spyridium mucronatum* subsp. *mucronatum* mainly by the greater flower number per cluster, also tending to have broader leaves with a less pronounced apical point.

Spyridium mucronatum subsp. **recurvum** Rye, *subsp. nov.*

A *S. mucronato* subsp. *mucronato* affinis folius angustioribus apice manifeste recurvo, sepalis et ovario summo pilis brevioribus differt.

Typus: Borden, Western Australia, 2 October 1928, *C.A. Gardner* 2107 & *W.E Blackall* (holo: PERTH 01517066; iso: CANB).

Leaf blades narrowly oblong to ovate, 2.5-4.1 x 0.6-0.8(1) mm, apex distinctly recurved, the apical mucro *c.* 0.1 mm long; upper surface usually white-scurfy at least in younger leaves. *Involucral bracts* 1-1.5 mm long. *Flowers* 3-6, in clusters 2-5 mm wide. *Sepals* with hairs 0.1-0.2 mm long. *Ovary summit* with hairs 0.1-0.2 mm long. (Figure 2F-H)

Specimens examined. WESTERN AUSTRALIA: 19 km SW of Ravensthorpe on Moir Rd, 31/10/1992, *G.F. Craig* 2495; 39 miles [62.8 km] E of Pingrup, 5/11/1965, *A.S. George* 7323; 14 miles [22.5 km] SSW of Ravensthorpe, 3/11/1965, *A.S. George* 7265; 5 km N of Kybulup Pool, 21/10/1977, *K.R. Newbey* 5097.

Distribution. Occurs from Borden east to the Ravensthorpe area, southern Western Australia, occurring west of the range of *S. mucronatum* subsp. *mucronatum*.

Derivation of name. From the Latin *recurvus* - curved backwards, referring to the recurved leaf apex.

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 3. A poorly collected taxon, known from three, rather widely separated areas, with a total of four or five populations. It is common in an area close to Ravensthorpe (G.F. Craig pers. comm.), but other parts of its range have not been surveyed.

Notes. Distinguished from *Spyridium mucronatum* subsp. *mucronatum* by its narrower leaves with a distinctly recurved apex and shorter hairs on the sepals and ovary summit.

Spyridium oligocephalum (Turcz.) Benth., Fl. Austral. 1: 433 (1863). - *Trymalium oligocephalum* Turcz., Bull. Soc. Imp. Naturalistes Moscou 31: 460 (1858). Type: New Holland, [Western Australia], 1849, *J. Drummond* 5th coll. 236 (PERTH 01179802, KW photo seen).

Spyridium kalganense Diels in Diels & E.Pritzel, Bot. Jahrb. Syst. 35: 356 (1904). Type: Kalgan River, 4 October 1901, *L. Diels* 4607 (PERTH 01174045).

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 3. Apart from the two type specimens cited above, the species is known from three collections, all made in 1970-72 from an area 30 km long in Fitzgerald River National Park. This species needs to be surveyed to determine whether it is more common than the few available collections would suggest and also to determine whether more than one variant should be recognized. (Figure 2I-N)

Notes. Bentham (1863: 433) cites the type locality of the Drummond specimen as Cape Riche, but no exact locality is specified in the Turczaninow's original description or on the type specimens examined. The Kalgan River type specimen appears to be the same species but may be of a distinct variant.

Spyridium polycephalum (Turcz.) Rye, *comb. nov.*

Trymalium polycephalum Turcz., Bull. Soc. Imp. Naturalistes Moscou 31: 460 (1858). Type: [Western Australia], *J. Drummond* 5th coll., suppl. 91 (KW photo seen, MEL).

Conservation status. A widespread, apparently common species.

Notes. Closely related to *Spyridium oligocephalum* and *S. subochreatum*, differing from both in its longer sepal indumentum, also differing from the former in bract colour and the latter in leaf characters. Judging from the few available specimens with mature seeds, *S. polycephalum* has uniformly orange-brown seeds, whereas the other two species have yellow-brown seeds with obvious dark spots or other small dark markings. Seed colouration sometimes varies within species of Rhamnaceae, so further material is needed to confirm the reliability of this character difference.

Spyridium riparium Rye, *sp. nov.*

Folia anguste ovata, 4-8plo longiora quam latiora, acuta. Lobi disci lati, emarginati.

Typus: Mitchell River, Western Australia, 18 August 1993, *B.G. Hammersley* 921 (holo: PERTH 03908542; iso: CANB, MEL).

Shrub erect, 1-1.5 m high. *Young stems* densely hairy with a mixture of numerous minute stellate hairs and more scattered simple patent hairs 1-1.5 mm long. *Petioles* 1.5-2 mm long. *Leaf blades* usually narrowly ovate, 8-17 x 1.5-3.5 mm, usually acute, the margins recurved; lower surface white to pale green, densely and minutely stellate-hairy, also with spreading simple hairs *c.* 1 mm long; upper surface glabrous (or with some minute simple hairs). *Bracts* transversely broadly elliptic, *c.* 1.2 mm long, glabrous outside, with cilia *c.* 0.5 mm long. *Flowers* fairly numerous, in branched spreading terminal inflorescences 10-18 mm across and in smaller groupings in the upper axils, white or cream. *Floral tube c.* 1.2 mm long, densely hairy; hairs 0.5-0.8 mm long. *Sepals c.* 1.2 mm long, rather densely hairy with minute stellate hairs over most of outside surface and with long simple hairs *c.* 0.4 mm long towards apex and on midvein. *Disc lobes* broadly oblong-elliptic or transversely so, emarginate. *Ovary summit* with hairs 0.2-0.3 mm long. *Style* 0.4-0.5 mm long. *Schizocarp c.* 1.5 x 1.3 mm, with long antrorse to spreading simple hairs and minute stellate hairs. *Seeds* not seen at maturity. (Figure 2O-S)

Specimens examined. WESTERN AUSTRALIA: White Gum Bridge, Denbarker Rd, 28/9/1984, *E.J. Croxford* 3892; White Gum Creek, Denbarker Rd, 12/9/1989, *E.J. Croxford*; Northumberland Rd, near Kent River, 23/8/1993 & 3/8/1994, *B.G. Hammersley* 934 & 1082.

Distribution. Occurs from Kent River east to Mitchell River, southern Western Australia.

Habitat. Grows on the banks of rivers, recorded mainly in sandy or gravelly soil overlying laterite.

Flowering and fruiting period. July-October.

Derivation of name. From the Latin *ripa* - the bank of a stream, referring to the habitat of the species.

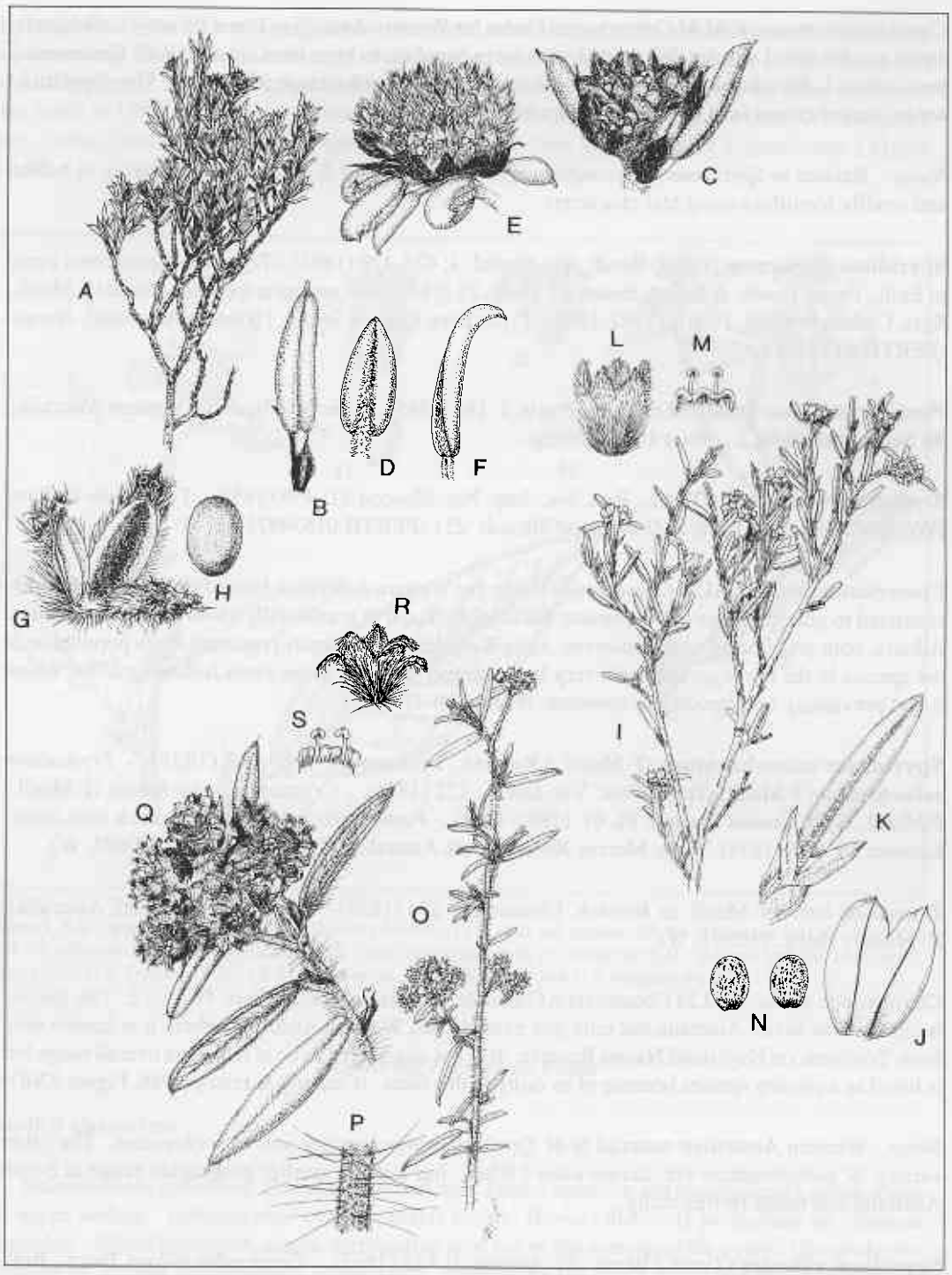

Figure 2. A-C *Spyridium mucronatum* subsp. *mucronatum* A - flowering branch (x1), B - leaf and stipules (x6), C - flower cluster (x6); D,E *S. mucronatum* subsp. *multiflorum* D - leaf (x6), E - flower cluster (x6); F-H *S. mucronatum* subsp. *recurvum* F - leaf (x6), G - dehisced schizocarp (x8), H - seed (x8); I-N *S. oligocephalum* I - flowering branch (x1), J - connate stipules (x7), K - lower surface of leaf (x4), L - flower (x7), M - stamens and disc (x8), N - inner and outer surfaces of seed (x4); O-S *S. riparium* O - flowering branch (x1), P - portion of stem (x4), Q - flower cluster and leaves (x3), R - flower (x6), S - stamens and disc lobes (x10). Drawn from *G.J. Keighery* 12644 (A-C), *M.A. Burgman* 4292 (D,E), *C.A. Gardner* 2107 & *W.E. Blackall* (F-H), *A.S. Weston* 6396 (I-N) and *E.J. Croxford* 3892 (O-S).

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 2. Originally listed as a Priority 1 species, but recently two more populations have been located (B.G. Hammersley pers. comm.). Now known from populations on three rivers, with a range of *c.* 30 km. The populations are on vacant crown land but not on nature reserves.

Notes. Related to *Spyridium majoranifolium*, *S. spadiceum* and *S. villosum*, but differing in habitat and readily identified using leaf characters.

Spyridium spadiceum (Fenzl) Benth., Fl. Austral. 1: 428-429 (1863).- *Trymalium spadiceum* Fenzl in Endl., Fenzl, Benth. & Schott, Enum. Pl. Hueg. 21 (1837). - *Cryptandra spadicea* (Fenzl) F.Muell., Syst. Census Westral. Pl. 61. (1882-1883). Type: King George Sound, [Western Australia], *Huegel* (PERTH 01534971).

Pomaderris hirsuta Steud. in Lehm., Pl. Preiss. 1: 184 (1845). Type: Mt Clarence, [Western Australia], 30 September 1840, *L. Preiss* 1673b (MEL).

Trymalium thomasioides Turcz., Bull. Soc. Imp. Nat. Moscou 31: 459 (1858). Type: New Holland [Western Australia], 1849, *J. Drummond* 5th coll. 231 (PERTH 01534971).

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 2. Apparently restricted to granite slopes in Porongurup National Park and to granite hills 35-40 km further south at Albany, both areas being nature reserves. Greg Keighery (pers. comm.) reported that a population of the species in the Porongurups had a very large number of plants in the years following a fire, where it had previously been much less common. (Figure 3A-D)

Spyridium subochreatum (F.Muell.) Reissek, Linnaea 29: 287-288 (1858). - *Trymalium subochreatum* F.Muell., Trans. Proc. Vic. Inst. 1: 122 (1855). - *Cryptandra subochreata* (F.Muell.) F.Muell., Syst. Census Westral. Pl. 61. (1882-1883). - *Pomaderris subochreata* Reissek *nom inval.*, Linnaea 29: 287 (1858). Type: Murray River, [South Australia], *F. Mueller* (MEL 710602, W).

Trymalium behrii F.Muell. ex Reissek, Linnaea 29: 274 (1858). Type: Murray, [South Australia], *F. Mueller* (MEL 710601, W).

Conservation Status. CALM Conservation Codes for Western Australian Flora: Priority 2. This species is common in South Australia but only just extends into Western Australia, where it is known only from Toolinna, on Nuytsland Nature Reserve. It is not considered to be at risk in its overall range but is listed as a priority species because of its rarity in this State. (Canning & Jessop 1986, Figure 430D)

Notes. Western Australian material is of *Spyridium subochreatum* var. *subochreatum*. The other variety, *S. subochreatum* var. *laxiusculum* J.Black, has a much smaller geographic range in South Australia and needs further study.

Spyridium villosum (Turcz.) Benth., Fl. Austral. 1: 432 (1863). - *Cryptandra villosa* Turcz., Bull. Soc. Imp. Nat. Moscou 31: 458 (1858). Type: New Holland [Western Australia], 1849, *J. Drummond* 5th coll. 232 (PERTH 01671979).

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 1. Previously listed with a Priority 2 coding and its range given as the Mount Barker area as well as Stirling Range,

but specimens from the former region have now been redetermined as *Spyridium riparium*. *S. villosum* is known only from the type collection of unspecified locality and a single locality in the eastern part of Stirling Range National Park, where it occurs in sand over sandstone. When the latter collection was made in 1987, the species was rare, but the area had not been burnt for some time (G.J. Keighery pers. comm.) and it is possible this species is favoured by fires like its relative *S. spadiceum*. (Figure 3E-H)

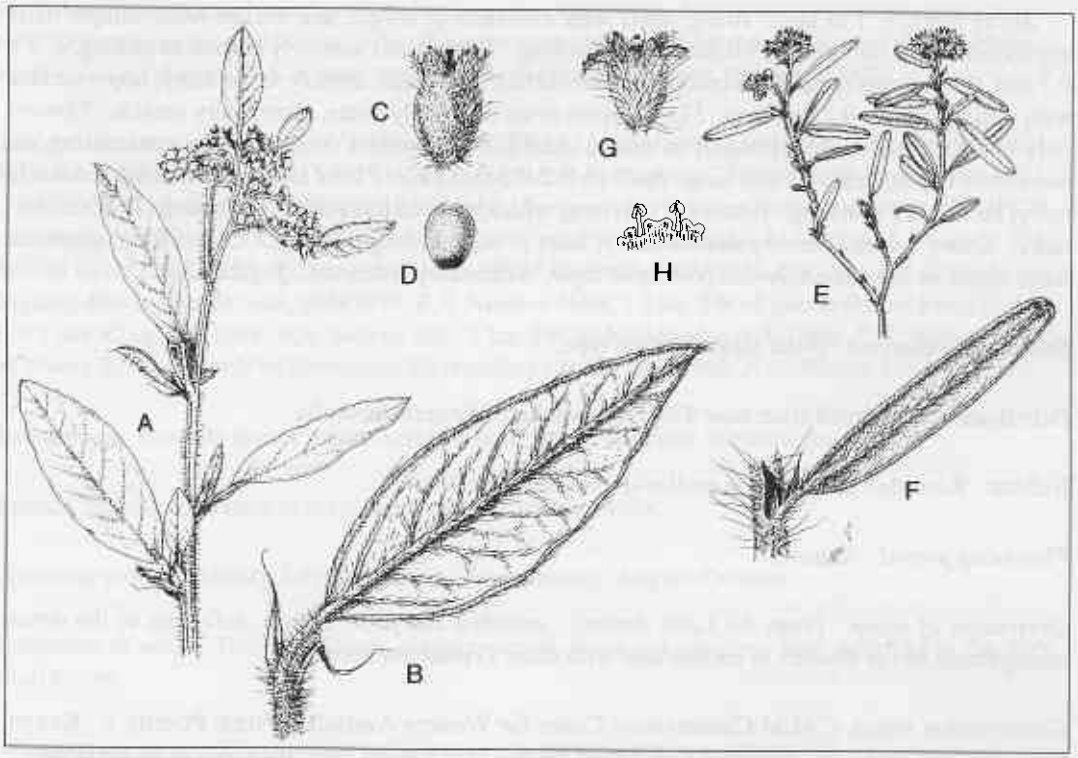

Figure 3. A-D *Spyridium spadiceum* A - flowering branch (x1), B - leaf and stipules (x2), C - schizocarp (x7), D - seed (x7); E-H *S. villosum* E - flowering branch (x1), F - leaf and stipules (x4), G - flower (x7), H - stamens and disc lobes (x10). Drawn from *G.J. Keighery* 12707 (A,B), *A.S. George* 11/12/1964 (C,D) and *G.J. Keighery* 4/11/1987 (E-H).

Results for *Trymalium* Fenzl

Implicit characters

Branchlets not spinescent. *Stipules* persistent, free. *Leaves* open (i.e. not conduplicate), entire, green on upper surface. *Inflorescence* cymose; bracts brown; flowers distinctly pedicellate on elongate 'panicles'. *Floral tube* short, adnate, terminating at or below the summit of the ovary. *Disc* glabrous, forming an annular thickened rim immediately surrounding the ovary, distinctly lobed or undulate between the stamens. *Ovary* 3-celled. *Stigmatic lobes* 3, spreading. *Fruit* a schizocarp, splitting to release entire 1-seeded fruitlets; fruitlets inferior or partially inferior, patterned and brown on inner surface. *Seeds* with a dark base, uniformly coloured above, seated on a small aril; aril easily detached, succulent, entire (i.e. not lobed).

Trymalium densiflorum Rye, *sp. nov.*

Pedicelli brevi. Flores dense fasciculati. Discus et ovarium stellato-pubescentes.

Typus: 8 km E of Trayning, Western Australia, 18 August 1974, *P.S. Valentine* T3 (holo: PERTH 01514075).

Shrub erect, *c.* 1 m high. *Young stems* with a mixture of simple and stellate hairs; simple hairs appressed, *c.* 0.4 mm long. *Petioles c.* 0.3 mm long. *Leaf blades* narrowly elliptic to oblong, *c.* 3 x 0.7 mm, the margins recurved to revolute; lower surface pale green, densely white-hairy; upper surface with stellate hairs *c.* 0.2 mm long. *Floral bracts* ovate or broadly ovate, acute, hairy outside. *Flowers* only shortly pedicellate, arranged in dense, usually 6-8-flowered clusters, those terminating the branchlets in panicles 7-13 mm long. *Pedicels* 0.2-0.3 mm long. *Floral tube c.* 0.5 mm long, densely hairy; hairs *c.* 0.2 mm long. *Sepals c.* 1 mm long, with appressed hairs 0.1-0.2 mm long. *Disc* stellate-hairy. *Ovary summit* densely stellate-hairy; hairs *c.* 0.2 mm long. *Style c.* 0.5 mm long; stigmatic lobes about as long as undivided portion of style. *Schizocarp* unknown. (Figure 4A-C)

Specimens examined. None other than the type.

Distribution. Recorded from near Trayning, southern Western Australia.

Habitat. Recorded in red soil in mallee-dominated vegetation.

Flowering period. August.

Derivation of name. From the Latin *densus* - crowded and *flos* - flower, referring to the dense arrangement of the flowers in comparison with other *Trymalium* species.

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 1. Known from only one collection apparently on a road verge. This species urgently needs to be surveyed.

Notes. Similar to *Trymalium angustifolium* Reissek and *T. daphnifolium* Reissek in having small narrow leaves and a hairy ovary, but distinguished from these and other *Trymalium* species by its shorter pedicels and more compact inflorescence. It is also the only member of the genus that has stellate hairs on the disc, although *T. angustifolium* has a densely tuberculate disc.

Trymalium elachophyllum Rye, *sp. nov.*

Ramuli interdum spinescentes. Indumentum ex pilis simplicibus constans. Ovarium glabrum. Fructi dehiscentia regularis.

Typus: 5 km E of Ravensthorpe, Western Australia, 5 October 1966, *P.G. Wilson* 5529 (holo: PERTH 01528998; iso: CANB).

Shrub erect or spreading, 0.3-1.5 m high. *Branchlets* sometimes spinescent. *Young stems* with simple antrorse hairs 0.2-0.4 mm long. *Petioles c.* 0.5 mm long. *Leaf blades* usually elliptic or obovate, rarely linear, 1.7-4(5) x 0.7-1.4 mm, prominently recurved at apex, the margins recurved or revolute;

lower surface white or pale green, densely hairy; upper surface glabrous. *Floral bracts* dark red-brown to almost black, ovate or broadly ovate, acute, hairy or subglabrous outside. *Flowers* few (usually 5-10), in panicles 5-12 mm long, usually white to yellow, sometimes greenish. *Pedicels* 0.5-1.5 mm long. *Floral tube c.* 0.5 mm long, sparsely or densely hairy; hairs 0.2-0.3 mm long. *Sepals* 0.7-0.9 mm long, sparsely hairy or glabrous; hairs appressed, 0.2-0.3 mm long. *Ovary summit* glabrous. *Style* 0.3-0.4 mm long; stigmatic lobes prominent but shorter than remainder of style. *Schizocarp* three-fifths to three-quarters inferior, 1.9-2.2 x 1.4-1.6 mm, sparsely hairy on inferior portion, glabrous above, regularly dehiscent into 3 equal portions held together at the base. *Fruitlets* coriaceous to crustaceous; outer surface smooth, pale brown with red-brown spots; inner surface reticulate, medium red-brown. *Seeds c.* 1.3 x 0.8 mm, dark orange-brown with pale brown margins. (Figure 4D-G)

Selected specimens examined. WESTERN AUSTRALIA: Mt Short, 31/8/1968, *E.M. Bennett* 2500; Dunn Rock Nature Reserve, 15/4/1984, *D.J. Backshall* 8; Pingrup, 21/9/1933, *W.E. Blackall* 3021; 13.5 km NE of Muckinwobert Rock, 8/1983, *M.A. Burgman* 2070; lower Fitzgerald River, 12/7/1970, *A.S. George* 9924; *c.* 13 km NW of Newdegate on road to Lake Biddy, 21/9/1976, *L. Haegi* 1074; Phillips River, 30/8/1957, *E. Lindgren*; 16 km NE of Ongerup, 16/6/1974, *K.R. Newbey* 4210; Jacup, Ongerup-Ravensthorpe road, 28/9/1977, *K.R. Newbey 5086*; 3.2 km SW of gate in Rabbit Proof Fence, E of Lake King, 7/8/1968, *R.A. Saffrey* 333; 2 km SW of Mt Madden, 6/8/1968, *P.G. Wilson* 6816; by Young River, 4 km N of Esperance-Ravensthorpe road, 28/9/1968, *P.G. Wilson* 8034.

Distribution. Extends from Pingrup east to Young River, southern Western Australia.

Habitat. Recorded mainly in clay, sandy clay or gravelly soils.

Flowering period. Mainly July-September. Fruits mainly August-October.

Derivation of name. From the Greek *elachys* - small, short and *phyllon* - leaf, referring to the very small leaves.

Conservation status. This appears to be a common species, not currently at risk.

Notes. This species sometimes has spinescent branchlets, a characteristic unknown in other members of the genus except for one atypical specimen of *Trymalium myrtillus* S.Moore. Other relatively unusual characteristics of *T. elachophyllum* are the exclusively simple stem hairs and regularly dehiscent schizocarp.

Trymalium floribundum subsp. **trifidum** Rye, *subsp. nov.*

Differt a subsp. *floribundo* in floribus pluribus vel omnibus apice styli 3-lobo et ovario 3-cellulari, folius plerumque grandioribus acutioribus, sepalis plerumque magis pubescentibus.

Typus: Napier Creek, *c.* 22 km NNE of Albany, Western Australia, 19 September 1964, *P.G. Wilson* 3337 (holo: PERTH 01518968; iso: AD).

Shrub or tree erect, 1-9 m high. *Young stems* with a dense mixture of simple and stellate hairs; simple hairs antrorse or patent, 0.5-1.5 mm long, white or ferruginous. *Stipules* deciduous or shed about the same time as the leaves. *Petioles* 3-35 mm long. *Leaf blades* usually ovate to very broadly ovate, rarely narrowly ovate or circular, 30-130 x 9-80 mm, the margins flat or recurved; lower surface

pale green, with 3-7 lateral veins on each side of midrib, with a dense indumentum of simple patent hairs 0.5-1 mm long; upper surface usually glabrous but with a row of hairs along the impressed midvein and usually also along the lateral veins. *Flowers* usually white to pale yellow, rarely greenish. *Floral tube* hairy. *Sepals* densely to sparsely hairy. *Ovary* 3-celled. *Stigmatic lobes* 3. (Figure 4H, I)

Selected specimens examined. WESTERN AUSTRALIA: Porongurup Range, 20/10/1962, *T.E.H. Aplin* 2148; near Napier River, Porongurup-Albany road, 14/9/1966, *E.M. Bennett* 1046; 27 km N of Augusta on Boranup Drive, 26/10/1983, *M.G. Corrick* 8929; Pemberton, 28/11/1984, *H. Demarz* 10428; near Collie, 17/10/1962, *A.R. Fairall* 770; Mt Manypeaks, 5/9/1935, *C.A. Gardner* 3316; 200 yards W of Boggy Lake, 2/12/1956, *J.W. Green* 1107; 10 km S of Witchcliffe, 14/5/1980, *T.J. Hawkeswood* 205; William Bay National Park, 12/10/1989, *B.G. Hammersley* 214; 9 km SE of Yornup, 11/9/1981, *G.J. Keighery* 4012; 8 km W of Harvey, 3/8/1985, *G.J. Keighery* 7758; Mt Clare, Walpole, 12/11/1969, *V. Mann & A.S. George* 889; Ellens Peak, Stirling Range, 21/10/1900, *A. Morrison*; S of Princess Royal Harbour, Albany, 10/1966, *S.P. Pfeiffer* 1; Warren River Crossing, Wheatly Coast Rd, 10/11/1985, *A.N. Rodd* 4918 *& G. Fensom*; Catterick, Bridgetown district, 26/9/1948, *R.D. Royce* 2703; near Walpole, 17/9/1952, *F.W. Went* 121; near Waroona Dam, 15/10/1965, *P.G. Wilson* 3734.

Distribution. Extends from Waroona Dam south to Augusta and Mt Manypeaks, southern Western Australia.

Habitat. Occurs in varied soils, commonly in *Eucalyptus* forests, often along watercourses.

Flowering period. July-October. Fruits recorded September-December.

Derivation of name. From the Latin *trifidus* - three-cleft, referring to the 3 stigmatic lobes.

Conservation status. Common, not at risk.

Notes. The other subspecies, *Trymalium floribundum* Steud. subsp. *floribundum*, is atypical of the genus in having only 2 stigmatic lobes and ovary cells. One specimen, collected from Dwellingup (*A.P.Hansen* 4/10/1984) is intermediate between the two subspecies, having about equal numbers of 2-celled and 3-celled flowers.

In subsp. *trifidum*, the sepals tend to be more hairy than in subsp. *floribundum*, but vary from sparsely and shortly hairy to densely hairy, in some cases with hairs up to 0.6 mm long protruding from the apex. The leaves are also very variable, but are usually larger and more acute than in subsp. *floribundum* and are often serrate. Some specimens, especially in the Donnelly River-Denmark area, have small rounded hairy leaves, which may be juvenile or perhaps of a distinct variant.

Trymalium ledifolium var. **lineare** Rye, *var. nov.*

Differt a var. *rosmarinifolio* in foliis angustioribus, marginibus plus recurvis.

Typus: Off Dryandra Rd, Tutanning Flora and Fauna Reserve, Western Australia, 9 August 1966, *K.F. Kenneally s.n.* (holo: PERTH 01524240; iso: CANB).

Shrub erect, 0.4-2 m high. *Young stems* with a mixture of simple and stellate hairs or glabrous; simple hairs appressed or antrorse, 0.2-0.5 mm long. *Stipules* persistent or shed about the same time as the leaves. *Petioles* 0.5-1.5 mm long. *Leaf blades* linear, 14-38 x 0.7-2.5 mm, the margins revolute; lower surface hairy but often completely hidden by the recurved margins; upper surface glabrous but usually with a row of hairs along the impressed midvein. *Flowers* white or cream. (Figure 4J, K)

Selected specimens examined. WESTERN AUSTRALIA: W of Calingiri, 14/7/1960, *T.E.H. Aplin* 756; 5 miles [8 km] E of Wickepin, 18/9/1971, *R.A. Congdon* 31.1; Ferguson Farm road, 2/11/1976, *H. Demarz* 6216; about 9 km E of Popanyinning, 15/9/1984, *D.B. Foreman* 720; St Ronans Reserve, 18 km W of York, 27/7/1985, *G.J. Keighery* 7706; Wongamine Nature Reserve, 24/11/1983, *S. Patrick*; Dryandra State Forest, 3/8/1987, *D. Rose* 100.

Distribution. Extends from near Calingiri south-southeast to near Wickepin, southern Western Australia.

Habitat. Mainly recorded on gravelly soils or on lateritic ridges, but sometimes associated with granite.

Flowering period. July-October. Fruits recorded September-November.

Derivation of name. From the Latin *linearis* - of a line, referring to the leaf shape.

Conservation status. Does not appear to be at risk at present.

Notes. All varieties of *Trymalium ledifolium* Fenzl have an irregularly dehiscent inferior schizocarp with exceptionally hard fruitlets. The fruitlets are ferruginous to dark red-brown and very deeply pitted on the inner surface and pale brown with an undulate pattern of lines or shallow furrows on the outer surface.

T. ledifolium var. *lineare* differs from the two previously named varieties, var. *ledifolium* and var. *rosmarinifolium* (Steud.) Benth., only in its narrower leaf shape, but this gives it a striking difference in appearance. The differences between the three taxa seem too minor to warrant subspecies rank and are only evident because they are found in distinct geographical areas. Var. *lineare* is the variant occurring furthest inland.

Trymalium litorale (Diels) Domin, Vestn. Kral. Ceske Spolecn. Nauk. Tr. Mat.-Prir. 1921-1922, 2: 63 (1923). - *Trymalium billardierei* var. *litorale* Diels in Diels & E.Pritzel, Bot. Jahrb. 35: 352 (1904). Type: near Cape Riche, Western Australia, July 1901, *L. Diels* 3481 (n.v.).

Conservation Status. CALM Conservation Codes for Western Australian Flora: Priority 1. Recorded from Cape Riche in 1901 and Bremer Bay in 1957 on coastal granite, the two localities being *c.* 65 km apart. A poorly known species urgently in need of further study. (Figure 5A)

Notes. Closely related to *Trymalium floribundum*, differing in its leaves being densely hairy and whitish above and the flowers having a more uniform indumentum on the sepals and floral tube. Although the type specimen of *T. litorale* has not been found, a specimen with both the type locality and date, *L. Diels & E. Pritzel* 448 (PERTH 01518437), matches the description and presumably was collected either from the same population as the type or one very close by.

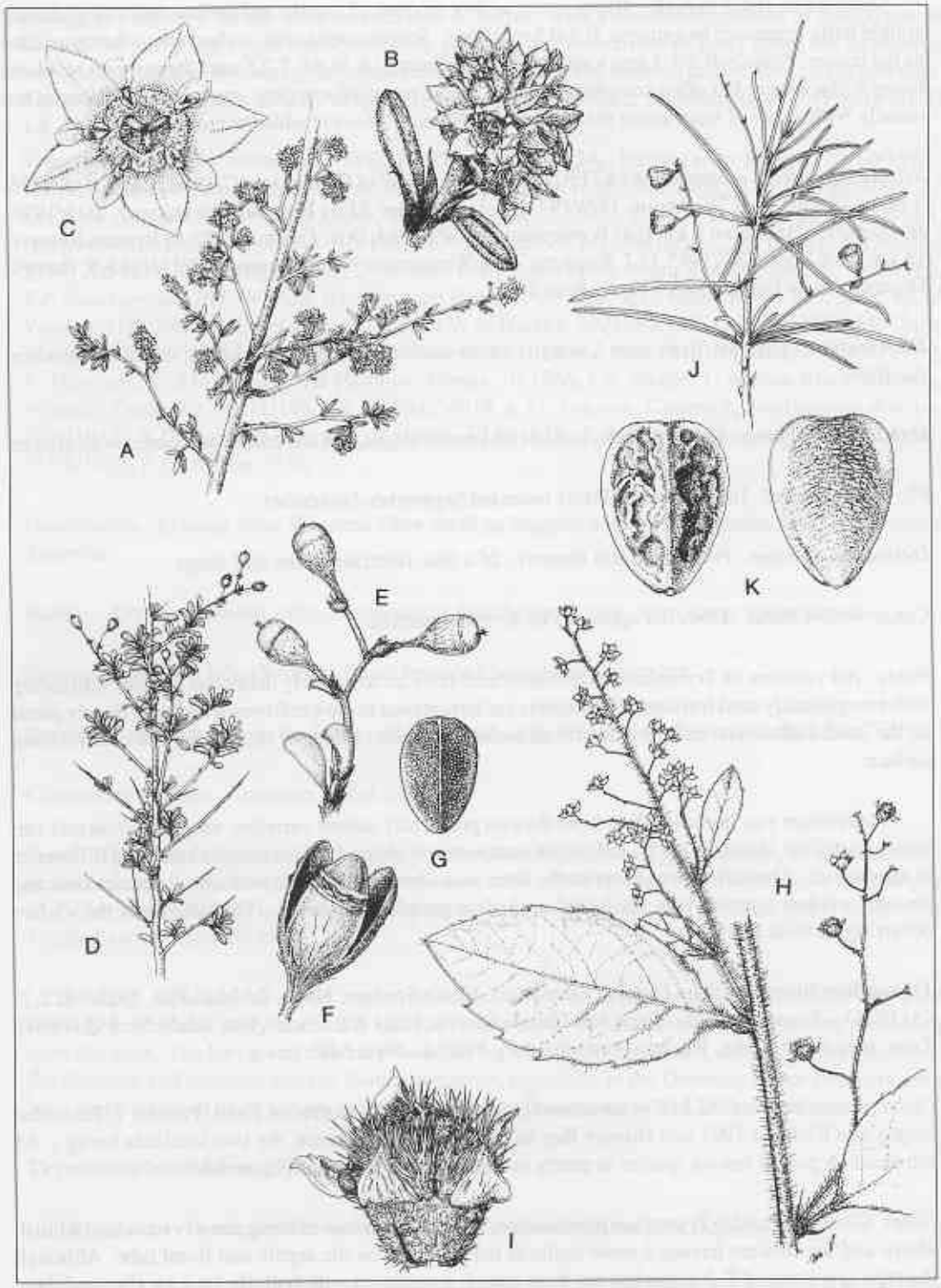

Figure 4. A-C *Trymalium densiflorum* A - flowering branch (x1), B - condensed cyme and uppermost leaves (x6), C - top view of flower (x18); D-G *T. elachophyllum* D - fruiting branch (x1), E - fruiting cyme and leaves (x4), F - dehisced schizocarp (x10), G - inner surface of fruitlet (x4); H,I *T. floribundum* subsp. *trifidum* H - flowering and fruiting branch (x1), I - dehiscing schizocarp (x9); J,K *T. ledifolium* var. *lineare* J - fruiting branch (x1), K - inner and outer surfaces of fruitlet (x10). Drawn from *P.S. Valentine* T3 (A-C), *P.G. Wilson* (D,E,G), *A.S. George* 9924 (F), *T.A. Halliday* 230 (H,I) and *H. Demarz* D6216 (J,K) .

Trymalium urceolare (F.Muell.) Diels in Diels & E.Pritzel, Bot. Jahrb. Syst. 35: 353-354 (1904). - *Trymalium billardierei* var. *urceolare* F.Muell., Fragm. Phyt. Austral. 9: 135 (1875). Type: near Toodyay, Western Australia, August 1901, *L. Diels* 3974 *(n.v.)*; [Western Australia], *J. Drummond s.n.* (MEL 56158).

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 2. This species was included in the 'presumed extinct' category in Leigh *et al.* (1984: 318), which gives a photograph of the type specimen. *T. urceolare* was rediscovered in the Bindoon area by Sue Patrick (pers. comm.) in 1986 and subsequent surveys have shown it to extend for *c.* 30 km, occurring in clayey soils, often with lateritic gravel. It has been recorded from more than 5 populations, at least one with over 200 plants, but is not known from any nature reserves. (Figure 6). Also illustrated in Diels & Pritzel 1904, Figure 44H, J.

Notes. A unique feature of this species is its urceolate fruit, with the neck consisting of a short free tube between the disc and the inferior ovary.

Trymalium venustum Rye, *sp. nov.*

A *T. floribundo* affinis sed foliis infra magis pubescenti, sepalis omnino villosis cum pilis terminalibus longis differt.

Typus: SE of Manjimup on South West Highway opposite Adam Rd, Western Australia, 6 July, 1979, *N.G. Marchant* 79/58 (holo: PERTH 01527517; iso: CANB).

Shrub erect, 1.5-4(6) m high. *Young stems* with a dense indumentum of simple and stellate hairs; simple hairs antrorse or patent, 1-1.5 mm long, white or ferruginous (the young stems always ferruginous). *Stipules* deciduous, densely ferruginous-hairy. *Petioles* 4-9 mm long. *Leaf blades* ovate, 35-65 x 12-35 mm, acute, very discolorous, the margins slightly recurved; lower surface pale green or ferruginous, with 5-9 lateral veins on each side of midrib, with a very dense long indumentum; upper surface glabrous but often with a row of hairs along the impressed midvein. *Floral bracts* deciduous, narrowly ovate to subulate, sparsely hairy outside. *Flowers* in small cymes arranged in terminal panicles 50-130 mm long and shorter panicles or racemes in the upper axils, with numerous flowers per panicle, white or creamy white. *Pedicels* 1.5-3 mm long, densely hairy; hairs patent, the largest ones 0.4-0.7 mm long. *Floral tube c.* 0.5 mm long, very densely hairy; hairs 0.4-0.6 mm long. *Sepals* 1-1.4 mm long, with a very dense white indumentum and often with one or more extra-large ferruginous hairs on each sepal apex; indumentum antrorse, the largest hairs 0.6-1.5 mm long. *Ovary summit* densely hairy; hairs 0.2-0.3 mm long. *Style* 0.3-0.6 mm long; stigmatic lobes prominent but shorter than remainder of style. *Schizocarp* only seen when immature. (Figure 5B-D)

Selected specimens examined. WESTERN AUSTRALIA: Ocean Beach Rd near bridge, 18/7/1979, *E.J. Croxford* 477; Kent River, 9/1936, *C.A. Gardner*; Parker Rd, 7.5 km N of South Coast Highway, 28/8/1994, *B.G. Hammersley* 1113; 10 km along Mt Shadforth Rd, W of Denmark, 31/8/1994, *B.G. Hammersley* 1115; *c.* 15 km NNW of Denmark on Stans Rd, 29/1/1987, *B. Hollingworth*; Owingup Creek, 31/7/1953, *R.D. Royce* 4286; Mitchell River, on Denmark-Mount Barker road, 30/7/1969, *J.A. Thompson* 7; Walpole-Nornalup National Park, 10 km E of Walpole, 21/8/1988, *G. Wardell-Johnson* D77.

Distribution. Extends from north-east of Northcliffe east to Denmark and Mitchell River, southern Western Australia.

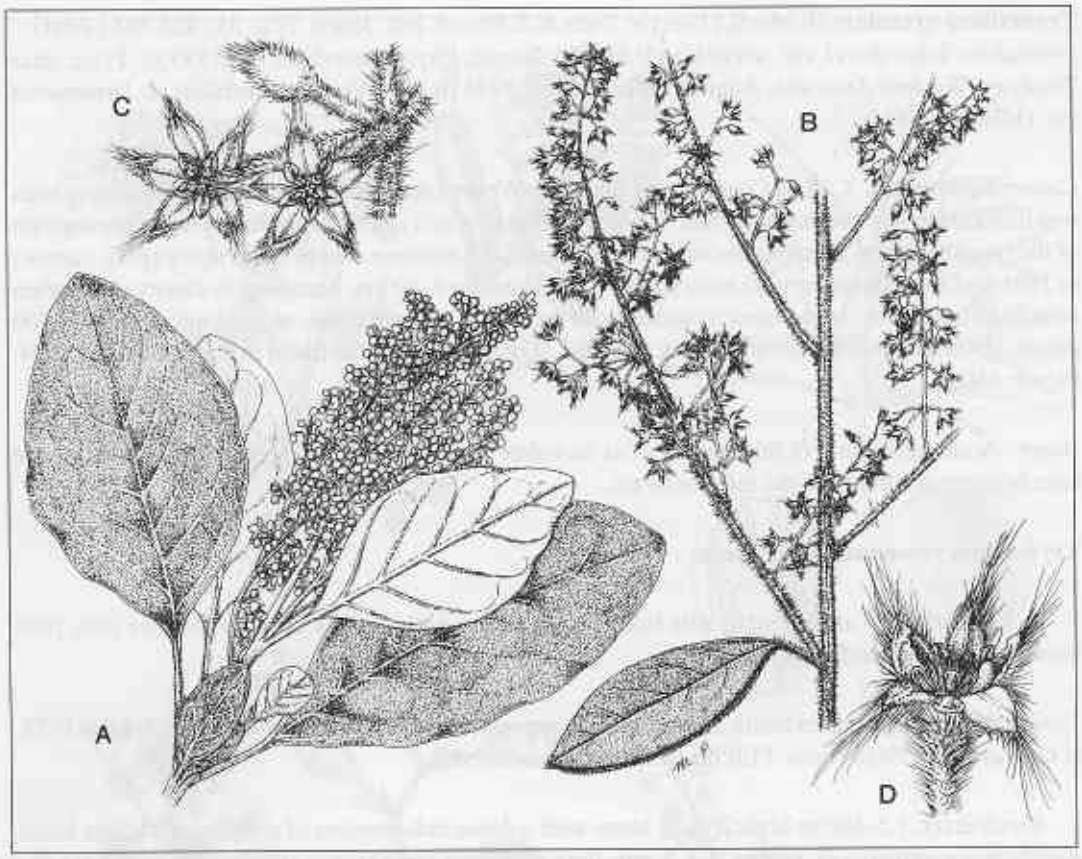

Figure 5. A *T. litorale* flowering branch (x1); B-D *Trymalium venustum* B - flowering branch (x1), C - flower bud and open flowers (x7), D - immature schizocarp (x10). Drawn from *Diels & Pritzel* 448 (A) and *D. Myers* 8/1913 (B-D)

Habitat. Occurs in sandy soil, often on laterite or with lateritic gravel, in Jarrah or Marri forest or sometimes Karri forest, often along watercourses.

Flowering period. Mainly July-September, also recorded January-February. Fruits recorded August.

Derivation of name. From the Latin *venustus* - elegant, graceful, beautiful, referring to the attractive white sprays of flowers.

Conservation status. Listed as a Priority 2 species in the 1994 Priority Flora List, under the manuscript name *T. villosum* ms. However, it is now known from more populations, including some in national parks, and has been removed from the priority list. It has a distribution extending *c.* 130 km, and is more common in the eastern part of its distribution.

Notes. Closely related to *Trymalium floribundum*, which differs in its leaf indumentum, with most specimens having a very short dense stellate indumentum on the leaf undersurface, and shorter hairs on the sepals. There are also some specimens of *T. floribundum* with long hairs on both surfaces of the leaves, the short stellate hairs on the lower surface still visible. In *T. venustum* the leaves have virtually no hairs on the upper surface except along the midvein depression but are very densely hairy on the lower surface, and there are no obvious short stellate hairs on the lower surface. *T. floribundum* also tends to have more yellowish flowers than *T. venustum*.

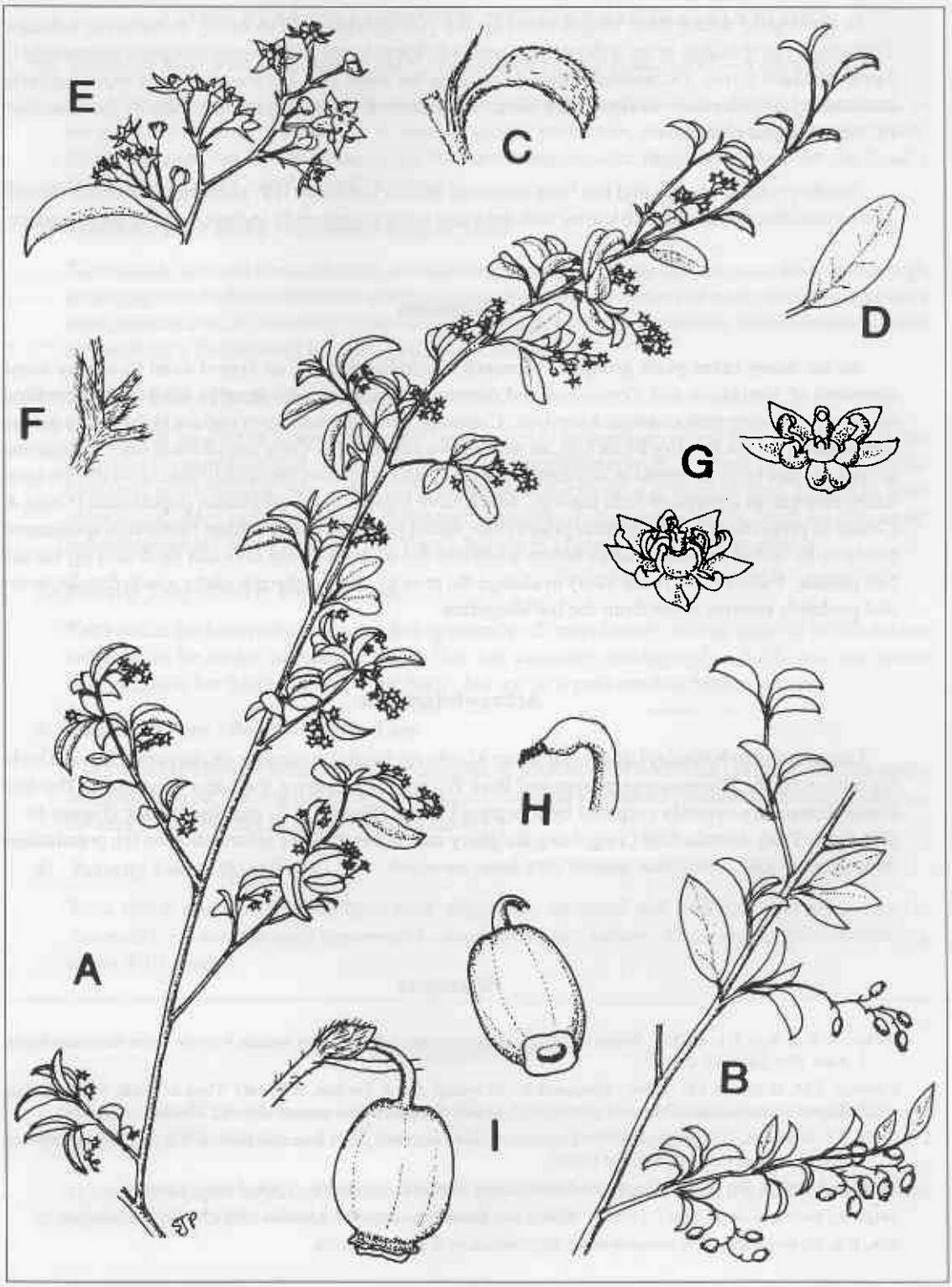

Figure 6. *Trymalium urceolare* A - flowering branch (x1), B - fruiting branch (x1), C - stipule and lower surface of folded leaf (x5), D - upper surface of leaf (x2), E - inflorescence (x4), F - bracts subtending branches of inflorescence (x15), G -flower, with and without stamens released from petals (x10), H - pollen release from enclosed stamen (x30), I - two views of schizocarp (x10). Drawn from the type specimen, *J. Drummond*, MEL 56158 (B,C & I) and from fresh material represented by *S. Patrick* 306 (A,D-H).

In the region where their ranges overlap, the two species tend to occur in different habitats, *Trymalium floribundum* as an understorey species in Karri forest and *T. venustum* more commonly in Jarrah or Marri forest. Occasionally they do occur in the same area, but are apparently reproductively isolated by a difference in flowering time, *T. venustum* flowering earlier than *T. floribundum* (T. Annels pers. comm.).

Another related species that has been confused with *T. venustum* is *T. spatulatum* (Labill.) Ostenf. The latter differs in its obovate leaves with the veins more prominently indented on the upper surface.

Discussion

As for many other plant groups in Western Australia, there is an urgent need to survey some members of *Spyridium* and *Trymalium* and determine which taxa are most in need of conservation measures to ensure their continued survival. Currently, 38% of the western species in these two genera are included on the Priority Flora List, as well as two subspecies. Only one of these taxa, *Trymalium urceolare*, has been surveyed in any detail. Two *Spyridium* species previously placed on the list have been removed as a result of field surveys, which have located many additional populations (Craig & Coates in preparation). The present priority list, based primarily on data from herbarium specimens, needs to be tested by field studies before a reliable list of endangered taxa can be drawn up for the two genera. Future surveys are likely to change the priority coding of some of the newly listed species and probably remove some from the list altogether.

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References

Barker, W.R. & Rye, B.L. (1993). *Spyridium tricolor* (Rhamnaceae), a disjunct new species from the Great Australian Bight. J. Adel. Bot. Gard. 15: 153-157.

Canning, E.M. & Jessop, J.P. (1986). Rhamnaceae. *In* Jessop, J.P. & Toelken, H.R.(eds) "Flora of South Australia. Part II. Casuarinaceae - Euphorbiaceae." pp. 807-821. (South Australian Government Printing Division: Adelaide.)

Craig, G.F. & Coates, D.J. (in preparation). Declared rare flora and other plants in need of protection in the Esperance district. A.N.C.A. & Dept CALM Published Report.

Diels, L. & Pritzel, E. (1904). "Fragmenta Phytographiae Australiae Occidentalis." (Engelmann: Liepzig.)

Leigh, J., Boden, R. & Briggs, J. (1984). "Extinct and Endangered Plants of Australia." (MacMillan: Melbourne.)

Rye, B.L. (in preparation). A synopsis of the Rhamnaceae of Western Australia.