

## ***Granitites*, a new genus of Rhamnaceae from the south-west of Western Australia**

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### **Abstract**

Rye, B.L. *Granitites*, a new genus of Rhamnaceae from the south-west of Western Australia. Nuytsia 10 (3): 451-457 (1996). *Granitites*, a new monotypic genus in the family Rhamnaceae, is described. It is restricted to granite outcrops in the south-west of Western Australia but has a number of characteristics in common with tropical members of the family.

### **Introduction**

The new genus described in this paper is a monotypic member of the family Rhamnaceae and is endemic to the south-west of Western Australia. Its single species has been named twice, first under the genus *Pomaderris* and later under the genus *Cryptandra*, both times from incomplete material. It is only recently that the unique features of this species have been elucidated and the need for separate generic placement recognized.

All measurements, habitat information, flowering times and other data were obtained from PERTH herbarium specimens.

### **Taxonomy**

***Granitites*** Rye, gen. nov.

Flores 1 vel 2 in quoque axilla folii positi, per bracteas verticillatas plus minusve sessiles subtenti, longe pedicellati. Antherae appendicis duabis basalibus adaxialibus ornatae. Discus prominens, latus, horizontalis, ad apicem ovarii et tubum floralem discretum adnatus. Schizocarpus valde auctus, cum strato farinoso tenui infra exocarpium nigrum. Semina uniformiter colorata; arillus grandis, fere truncatus, coloratus.

*Type: Granitites intangendus* (F. Muell. ex F. Muell.) Rye

*Shrubs* with spinescent branchlets. *Stipules* small, free, persistent. *Leaves* alternate. *Inflorescence* of long-pedicellate flowers borne in several adjacent subterminal axils, either with distinct gaps between the leaf axils or condensed into a leafy cluster, with 1 or 2 flowers in each axil, each pedicel subtended by a whorl of several small basal bracts. *Sepals* 5, widely spreading at maturity. *Petals* 5, long-clawed; lamina hooded and enclosing an anther. *Stamens* 5; anther with two small adaxial appendages, one at the base of each cell. *Disc* very prominent, broad, horizontal, covering the summit of the ovary and adnate to the free floral tube to the insertion of the sepals and other floral whorls, with a narrow free margin, circular and slightly 5-lobed at margin with a central opening for the style. *Ovary* inferior at anthesis, 3-celled. *Style* simple, terminating in 3 short spreading stigmatic lobes. *Fruit* apparently a cocccarium, greatly enlarged, one-third to half inferior, with a distinct rim (formed by the outer margin of the disc and floral tube) demarcating the inferior and superior portions, shortly beaked at summit, with a thin outer casing comprised of a leathery to chartaceous outer layer and mealy inner layer; fruitlets 3, crustaceous, with a small basal hole and a prominent longitudinal suture the full length of the adaxial surface, dehiscing by the adaxial suture and over the summit to about half way down the centre of the abaxial surface. *Seeds* uniformly coloured; *aril* basal, large, colourful, succulent.

*Distribution.* Restricted to the south-west of Western Australia, occurring in the South-west Botanical Province and South-western Interzone as defined by Beard (1980).

*Etymology.* From the modern word *granite* combined with the Greek *ites*, in the nature of (in mineral terms), in reference to the granite habitat to which the taxon is restricted.

*Affinities.* This genus is typical of the family Rhamnaceae. Some characteristics not mentioned in the generic description because they are found in all or most members of the family are as follows: leaves petiolate, simple; flowers small; sepals valvate in bud, petal-like, with a central longitudinal ridge on adaxial surface; petals shorter than the sepals and alternating with them; stamens opposite the petals, the anther dehiscing by 2 longitudinal slits; ovules and seeds 1 per cell.

*Granitites* has no close relatives in south-western Australia, its affinities apparently lying more with tropical genera. It is distinguished from all other genera by the combination of the following characters: flowers one or two in each leaf axil, subtended by a more or less sessile whorl of bracts, long-pedicellate; anthers with two basal adaxial appendages; disc prominent, broad, horizontal at anthesis, adnate to the ovary summit and free floral tube; fruit greatly enlarged, with a thin mealy layer below the black exocarp; seed body uniformly coloured; aril large, almost truncate, coloured.

***Granitites intangendus*** (F. Muell. ex F. Muell.) Rye, comb. nov.

*Pomaderris intangenda* F. Muell. ex F. Muell. (Mueller 1876: 52-53). *Type:* Between Esperance and Fraser Range, *Dempster* (*lecto:* MEL 55233, here designated; *isolecto:* MEL 55234 *p.ptc*).

*Cryptandra petraea* S. Moore (Moore 1899: 184). *Type:* Donkey Rocks, between Goongarrie and Mt Margaret (*n.v.*).

*Shrub* varying from semi-prostrate to erect and up to 2 m high, pungent; indumentum of simple hairs. *Young stems* with spreading hairs, the larger ones 0.2-0.5 mm long. *Stipules* ovate or narrowly ovate, 0.7-1.5 mm long, acute, hairy throughout or just on the margins and midvein. *Petioles* 0.3-1 mm long, glabrous or hairy. *Leaf blades* linear to narrowly obovate or elliptic, 4-13 x 1-4 mm, entire to deeply toothed, with recurved margins, glabrous or with patent or antrorse hairs. *Bracts* similar to the stipules but often shorter. *Pedicels* 1.7-4.5 mm long, usually glabrous, sometimes with antrorse hairs. *Flowers* usually white, sometimes described as pink or a combination of white with pink to red portions (one label indicating that the sepals and disc were red and the petals white), usually glabrous, sometimes with antrorse hairs outside mainly on floral tube. *Sepals* widely spreading, ovate or broadly ovate, 1.5-2.5 mm long. *Petals* with a slender claw 0.4-0.5 mm long and lamina 0.7-0.8 mm long. *Anthers* 0.3-0.5 mm long, on a longer curved filament; basal appendages much shorter than the cells, dark in colour like the interior of the dehiscent cells, the exterior of the cells pale. *Disc* 0.5-0.7 mm wide, glabrous. *Style* 0.7-1.5 mm long; stigmatic lobes 0.2-0.4 mm long. *Fruit* 7-8 x c. 5 mm, becoming black at maturity, the beak c. 1 mm long. *Seeds* 3.5-4 x 2.3-2.5 mm, dull grey-brown; *aril* 1.3-1.5 x c. 2 mm, red-brown, shallowly cupped at summit around the extreme base of seed, almost truncate but extended slightly higher on each side of seed and also at the centre of each surface of the seed. (Figure 1)

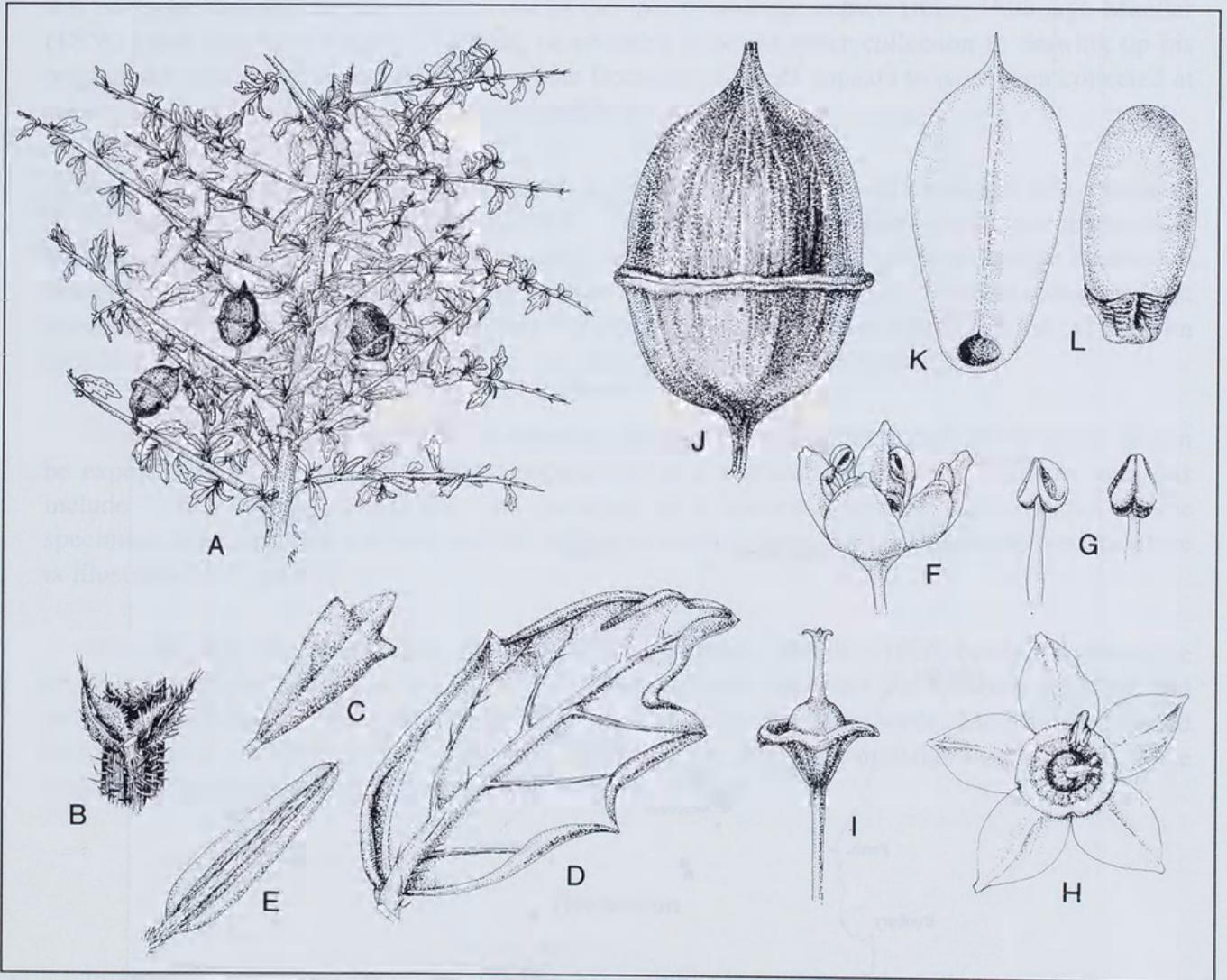


Figure 1. *Granitites intangendus* A - fruiting branch (x1), B - stipules (x10), C - toothed leaf from a spinescent branchlet (x7), D - toothed leaf from main stem showing undersurface (x7), E - entire leaf (x7), F - young flower opening (x6), G - two views of stamen (x16), H - old flower (x6), I - very young fruit (x6), J - mature fruit (x6), K - fruitlet (x6), L - seed and aril (x6). Drawn from M.E. Trudgen 1482 (A-D, J-L), R.J. Cranfield 7812 & P. Spencer (E, H-I) and H. Pringle 2330. (F, G).

*Selected specimens examined.* WESTERN AUSTRALIA: Near Bencubbin, 2/6/1922, C.A. Gardner 1709; Ularring Rock, Credo Station, 16/6/1988, R.J. Cranfield 7074; 4 km N of Yanneymooning Rock, 12/9/1989, R. Cranfield 7812 & P. Spencer; Billycatting Hill Reserve, 2/9/1977, B.G. Muir 366; Bates Cave, Hyden, 9/7/1987, C. Searles; Donkey Rocks, Mendleyarri Station, 8/6/1989, H. Pringle 2330; Mt Ridley, 25/10/1975, M.E. Trudgen 1482; Nungarin Rock, 13/8/1972, E. Wittwer 854; Eaglestone Hill, Lake Brown, 13/8/1972, E. Wittwer 855.

*Distribution.* Occurs mainly in the Merredin and Hyden areas, where there is an abundance of suitable granite outcrops, but also known from Credo and Mendleyarri Stations to the north-east and Mt Ridley in the south-east. (Figure 2)

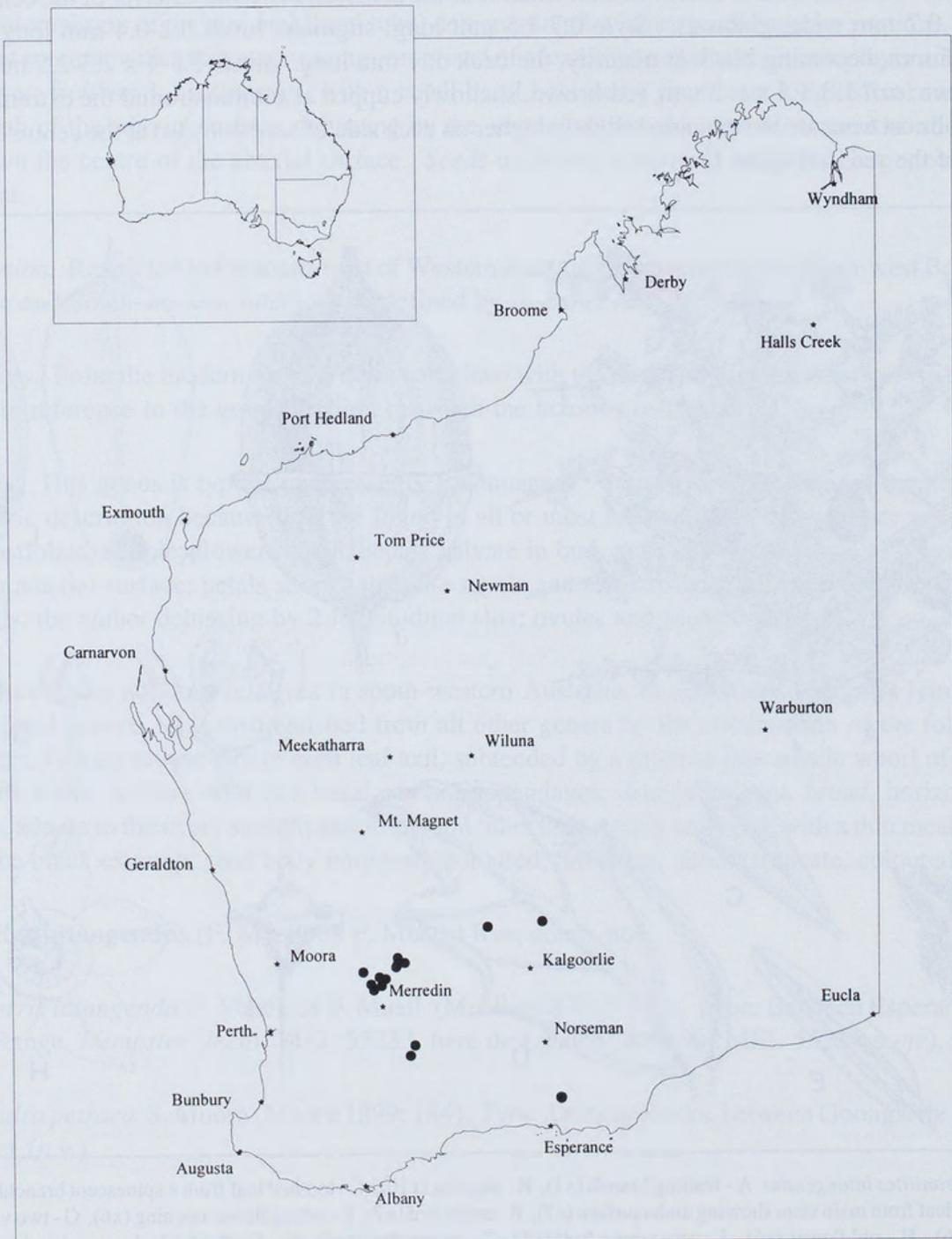


Figure 2. Geographical distribution of *Granitites intangendus*.

*Habitat.* Occurs on granite outcrops, either in crevices or depressions on the rock or around the margins of the outcrop.

*Phenology.* Flowers June-September. Fruits recorded September-October.

*Conservation status.* *Granitites intangendus* has a wide range, occurring in isolated, but relatively protected, localities on scattered granite outcrops. The species was listed twice on the 1990 Priority Species List, under the names *Cryptandra petraeum* and *Pomaderris intangenda*, with priority codes of 1 and 3 respectively. Both names have been removed from the list, the former because it was a synonym and the latter because further populations were located and the species no longer considered to be at risk.

*Typification.* There are two sheets at MEL bearing type material of *Granitites intangendus* collected by Dempster. Both specimens are in a poor condition, with the flowers and fruits all apparently lost except for one immature fruit attached to the specimen (MEL 55233) chosen as the lectotype. The other sheet (MEL 55234) has material from two collections, with the isolectotype mounted on the sheet and loose material from a different unspecified collection contained in an envelope. The material in this envelope matches the northern variant of the species and has mature fruits. Although Mueller (1876) cited only the Dempster material, he probably used the other collection in drawing up his original description of the mature fruits, as the Dempster material appears to have been collected at an earlier reproductive stage with flowers and immature fruits.

*Notes.* A very variable species, particularly in habit, indumentum and leaf shape and size. Some of the leaf variability is evident from Figure 1C-E. The very isolated Mt Ridley population differs from the northern populations in its semi-prostrate stems and also tends to have longer spinescent branchlets (Figure 1A) and leaves more prominently toothed (Figure 1C,D). There have been at least three collections made from Mt Ridley, and this might well be the type locality as it is the only known location in the area cited for the type, i.e. between Esperance and Fraser Range.

There is also considerable variation between specimens in the northern part of the range, as can be expected in a species with scattered populations in a restricted habitat. The northern locations include Donkey Rocks, where the type specimen of *Cryptandra petraea* was collected. Some specimens have only entire leaves, and one with a particularly hairy petiole and lamina undersurface is illustrated in Figure 1E.

When he described this species as *Pomaderris intangenda*, Mueller (1876) based the new name on his manuscript name *Cryptandra intangenda* F. Muell. ms. and noted that the species had hooded petals like *Cryptandra*. He apparently saw full-sized fruits but no mature seeds. Moore (1899) based his description of the species, as *Cryptandra petraea*, on flowering material alone, so was quite unaware of its unusual fruit and seeds.

## Discussion

In its fruit characters, *Granitites* (Figure 1J) is unlike any of the other Rhamnaceae in southwestern Australia but resembles the predominantly tropical genus *Alphitonia*. The similarities between the two genera were brought to my attention by Kevin Thiele (pers. comm.), who was revising Australian members of *Alphitonia*. In *Alphitonia* specimens from the Kimberley region of Western

Australia, the outer casing of the mature fruit, consisting of a leathery outer layer and a thick mealy inner layer, splits and is shed in an irregular manner. Inside are three dry fruitlets, which separate from one another (the bases remaining close but the apices diverging) and dehisce both along the adaxial suture and down the distal half of the abaxial surface to expose the seed. This type of fruit has often been described as a drupe (e.g. Braid 1925) but is classed as a coccarium in the much more precise terminology adopted by Spjut (1994).

Although one or two specimens of *Granitites* appear to have fully mature seeds, none has dehisced fruits, hence the uncertainty in the description as to the type of dehiscence of the fruits and fruitlets. However, when pressure is applied to the schizocarp and its fruitlets, they split as described for *Alphitonia* species. Apart from this similarity, the fruits of the two genera have in common their large size, black colour and presence of a mealy layer. Large black fruits also occur in some other northern Australian genera, but these lack the mealy layer.

Other *Granitites* characteristics matching *Alphitonia* are the presence of appendages at the base of the anther (Figure 1G), the very prominent horizontal disc (Figure 1H,I) and the uniformly coloured seed (Figure 1L). All other south-western genera lack appendages to the anthers and have seeds with the base darkened. Among these genera, the disc takes a great variety of forms and is sometimes absent, but rarely approaches the type of disc found in *Granitites*.

Differences between *Granitites* and *Alphitonia* are quite striking, as the latter genus has a much larger habit, leaves and inflorescences. In *Alphitonia* the axillary inflorescences are loosely branched, many-flowered cymes, whereas the cymes of *Granitites* are reduced to one or two pedicellate flowers in a more or less sessile cluster of axillary bracts. In *Alphitonia* the stipules are caducous and the seeds tend to remain attached to the plant by an obvious, rather hard gynophore after the fruitlets are shed. *Granitites* has persistent stipules (Figure 1B), the seeds are readily detached from a very reduced gynophore and are probably either released from the more persistent fruitlets or shed at the same time as the fruitlets. The fruitlets are thicker and more woody in *Alphitonia* than in *Granitites*. Both genera have a uniformly brown-coloured seed body and bright red or reddish aril, but the aril in *Alphitonia* forms a thin dry casing surrounding the seed body whereas in *Granitites* the aril is a large succulent structure at the base of the seed body (Figure 1L).

Although *Granitites* occurs in the drier eastern parts of the south-west of Western Australia, it is restricted to a relatively humid habitat associated with granite outcrops. Runoff from the granite results in an accumulation of moisture and, to a lesser extent, nutrients around the margins of the rock and in soil pockets. Granite outcrops also provide some protection against fire. A number of the more mesic areas in the south-west, including scattered ranges and monadnocks, are believed to have acted as refuges for some taxa during periods of aridity (Marchant 1973). In view of its affinities to tropical members of the family, *Granitites* may well be a relictual taxon, surviving in a much drier rainfall belt by virtue of the more mesic conditions offered by its granitic habitat. Despite its apparently relictual characteristics, *Granitites* has diverged considerably from the tropical taxa and is a very distinctive genus.

#### Acknowledgements

I would like to thank Paul Wilson for preparing the Latin diagnosis and advice on taxonomic matters, Margaret Pieroni for the illustration, Amanda Spooner for preparing the distribution map and Kevin Thiele and Neville Walsh for advice relating to generic characters in the Rhamnaceae.

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### Abstract

Rye, B.L. and Trudgen, M.E. *Tetragonia coronata*, a new species of Arzoaceae from Western Australia. *Nyctasia* 10 (3): 459-462 (1996). A new species, *Tetragonia coronata* Rye & Trudgen, is described and illustrated. It is restricted to a small area in the vicinity of Haulgin Station, near Shark Bay and is the rarest of the seven species of *Tetragonia* native in Western Australia.

### Introduction

The new species described here was first collected in 1970 by T.E.H. (Ted) Aplin. In 1991, it was placed on the Priority Flora List of the Western Australian Department of Conservation and Land Management under the phrase name *Tetragonia* sp. *Hemelin* (M.E. Trudgen 3000), after being recognized as a separate taxon during the preparation of a flora list for the Shark Bay World Heritage Area (Trudgen & Keighery 1993).

It was independently recognized as a new species by Max Gray (pers. comm.), who is currently naming another new *Tetragonia* species from inland Australia. These two new taxa will bring the total number of *Tetragonia* species recorded for Western Australia to seven native and one introduced species, three of which are endemic. A further two introduced species occur in other states of Australia but no additional native species. Previously-named species are described in Prescott (1984).

### Taxonomy

*Tetragonia coronata* Rye & Trudgen, sp. nov.

A *Tetragonia* *crinita* Pers: 5-meris. et fructo coronata, a *T. tetragonoides* fructo grandiore cum acuminis papillarum longioribus stamin-dignoscenda.

*Type*: S of Overlander Roadhouse (precise locality withheld) on Great Northern Highway, Western Australia, September 1989. M.E. Trudgen 3000 (holo: PERTH 01607117; iso: CANB, MEL).



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