

Reinstatement and revision of *Rinzia* Schauer (Myrtaceae, Leptospermeae, Baeckeinae)

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Abstract

Trudgen, Malcolm E. Reinstatement and revision of *Rinzia* Schauer (Myrtaceae, Leptospermeae, Baeckeinae). Nuytsia 5(3): 415-439 (1986). *Rinzia* Schauer is reinstated and a revision of the genus is presented. Twelve species are recognised for the genus which is endemic to south-western Western Australia. *Rinzia morrisonii* Trudgen, *R. rubra* Trudgen, *R. affinis* Trudgen, *R. communis* Trudgen and *R. sessilis* Trudgen are new species while *R. schollerifolia* (Lehm.) Trudgen, *R. carnososa* (S. Moore) Trudgen and *R. dimorphandra* (F. Muell. ex Benth.) Trudgen are new combinations. *Rinzia*'s closest relatives are considered to be *Baeckea* L. section *Euryomyrtus* and *Hypocalymma* Endl. *Rinzia*, section *Euryomyrtus* of *Baeckea*, *Hypocalymma* and a small number of related south-western and eastern Australian species are considered to form a natural group, all of whose species have reniform seeds which in some species (especially in *Rinzia*) have an aril. This appears to be the first record of an aril for a seed in Myrtaceae. Seeds of ten species and the flower of one species are illustrated.

Introduction

The Baeckeinae is a heterogeneous assemblage of species within the Myrtaceae; the species in it are held together as a group by the following characters: seed coats crustaceous, embryos consisting of a large radicle with small cotyledons on a slender neck, and leaves opposite. Within the group there is considerable variation in many characters including seed shape, the presence or absence of a growth (aril) attached to the testa, the shape of the cells in the testa, the degree of and mode of dehiscence of the fruit (i.e. the role of the different tissues in dehiscence of the fruit), the number and arrangement of the stamens, the morphology of the anthers and their mode of dehiscence and their attachment to the filaments, the shape and degree of fusion of the filaments, the shape and position of the connective gland, placentation, and life form which ranges from small trees to plants with prostrate stems bearing short erect shoots. It is not intended in this paper to discuss all this variation, rather to state that, within the group as a whole, three major subdivisions can be recognised and that *Rinzia* belongs in one of these, the species of which have reniform seeds (with or without an aril), anthers opening in slits and external filament glands.

Reinstatement of *Rinzia* Schauer

Rinzia was described by Schauer (1843) with the name honouring "*Sebastianus et Jacobus Rinz*, pater et filius, hortulani Francofurtenses, viri de plantarum exoticarum cultu in Germania eximie meriti." (Schauer 1843) and was based on one species: *Rinzia fumana* Schauer. He did not cite a type for *R. fumana* at the time, but the following year (Schauer 1844) provided an expanded description of the species and cited a specimen.

Bentham (1867) reduced the genus to a section of *Baeckea* L., a reasonable course of action at the time, as he was dealing with a smaller number of species than are now known and he had broader generic concepts than are now accepted. To a significant degree his generic limits were artificial, as is shown by the fact that he included *Rinzia* and some

of its close relatives in *Baeckea* while maintaining *Hypocalymma* Endl. as a distinct genus. *Hypocalymma* with its more numerous and exerted stamens with basifixed anthers is distinct, but its reniform seeds, anthers opening in slits, and fruit morphology, show that it is more closely related to *Rinzia* than *Rinzia* is to Bentham's sections *Harmogia*, *Babingtonia* and *Schidiomyrtus* of *Baeckea*.

Rinzia is reinstated here as the type species, *Rinzia fumana*, has been found to belong to a group of species which can be separated from their nearest relatives on the basis of the following combination of characters:

(1) Filaments flattened rather than terete and often with an emarginate apex (especially the filaments of the antepetalous stamens).

(2) Anthers attached (but only at the mid-point) to the adaxial surface of the filament (see terminology and morphology section below, and also Figure 1 parts 2 and 3) rather than dorsifixed and versatile (as in section *Euryomyrtus* of *Baeckea* L. and some related eastern Australian species) or basifixed (as in *Hypocalymma*), but see the note under *R. carnosa* which is an exception as it has dorsifixed, versatile anthers.

(3) Stamens 10 (or 12 when the flowers are 6-merous), or when less having one or more of the antesealous stamens missing.

(4) Flowers borne on a well developed anthopodium, but having only a rudimentary peduncle.

The first of these characters (flattened filaments) separates *Rinzia* from the other species of Baeckeeinae that have reniform seeds. There are parallel developments of flattened filaments in other groups of species within the Baeckeeinae but the species in these groups have different seeds, anther attachment and placentation. For example, *Baeckea drummondii* was included in section *Rinzia* by Bentham (1867), but while its stamens have broad filaments, its anthers, placentation and seeds indicate that it is not closely related to *Rinzia* as the genus is defined here. It is felt that the combination of characters given above quite adequately justifies the reinstatement of *Rinzia* to generic level.

Systematic Position of *Rinzia*

Rinzia was placed by Schauer (1843) in the Baeckeeae, while Bentham (1867) treated the genus as a section of *Baeckea* L. which he placed with *Hypocalymma*, *Scholtzia*, *Astartea* and *Balaustion* as a subtribe "Baeckeeae" of the tribe Leptospermeae. Niedenzu (1898) apparently recognised that the species placed in section *Rinzia* by Bentham were more closely related to *Hypocalymma* as he removed them from *Baeckea* and placed them in *Hypocalymma* (he perpetuated the error with *Baeckea drummondii* however). While this placement recognises the close relationship between the species placed in *Rinzia* and those in *Hypocalymma* it ignores the differences between them. Briggs and Johnson (1979) considered that *Baeckea* needed further study to determine whether or not its sections (including section *Rinzia*) deserved generic rank and placed it in a *Baeckea* suballiance of their *Chamelaucium* alliance, subsequently (Johnson and Briggs 1985) they have abandoned suballiances in the *Chamelaucium* alliance.

It is outside the scope of this paper to consider the relative merits of these placements above the genus level. The more recent system of Briggs and Johnson is not used because it has only been proposed informally.

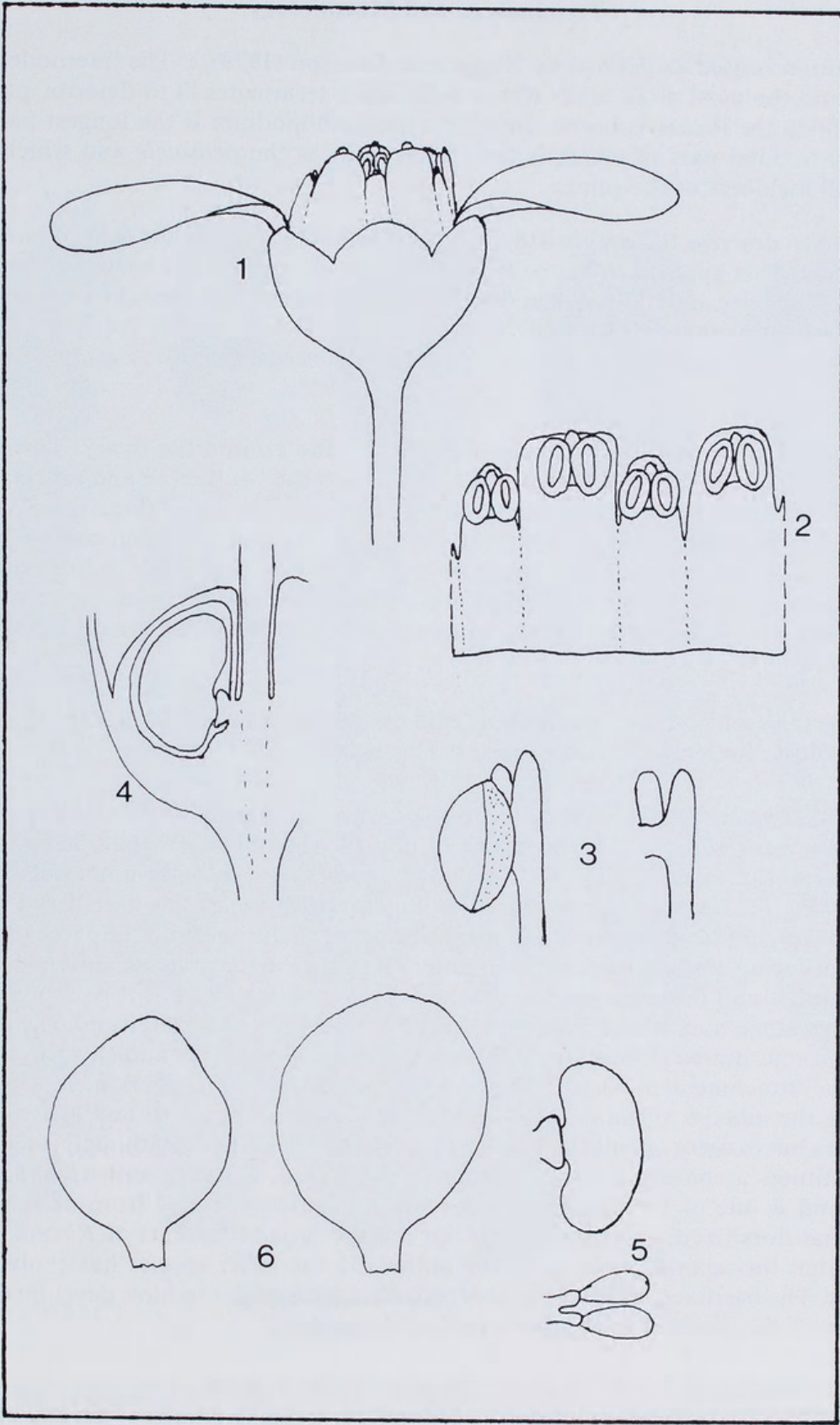


Figure 1. *Rinzia sessilis*. 1. Flower (x10, some petals removed). 2. Stamens, adaxial view (x20, flattened out). 3. Anther and tip of filament of antesepalous stamen from side and same with anther removed to show connective gland (x40). 4. Longitudinal section through the flower showing the insertion of the style into the ovary, the fusion of the ovary to the hypanthium and the placentation (x20). 5. Side view of ovule on placenta and cross section of placenta showing attachment of the two ovules (x30). 6. Two petals showing claw and irregular outlines (x10). (All from K. Newbey 1125).

Terminology and Morphology

Anthopodium is used as defined by Briggs and Johnson (1979), ("The internode between a flower and the most distal node of the axis that it terminates.") to describe part of the axis on which the flower is borne. In *Rinzia* the anthopodium is the longest part of this axis, the proximal part of which is here referred to as the *peduncle* and which is quite short in all members of the genus.

Aril is used to describe the outgrowth from the hilum which clasps the seed of most species of the genus. This appears to be the first time such a structure has been reported for the Myrtaceae. It is dry and quite thin in dried specimens but swells when the seeds are soaked in water, indicating that in fresh seeds it may be fleshy. No information is currently available as to what role it might play in the dispersal of the seeds. See photographs of seeds in Figure 2.

Hypanthium has been used to refer to the cup or tube around the ovary. This term has been widely used for this structure in the literature on the Myrtaceae and reflects its most probable origin which is a development of the receptacle. The term "floral tube" is rejected on the basis advanced by Briggs and Johnson (1979), i.e. that it is often confusing. Briggs and Johnson (1979) used the term "perigynium" but rejected it in a later publication (Briggs and Johnson 1985) in favour of hypanthium. Where the diameter of the hypanthium has been given it was measured at the base of the calyx lobes (this point usually has the largest diameter).

Flower size, which is quite valuable in differentiating between species, is given as the diameter of the circle that would include the petals (e.g. 5.0-8.0 mm across corolla).

Anther attachment: Except in *R. carnos*a the anthers in *Rinzia* are attached at their mid-point to the adaxial surface of the filaments (see Figure 1.1) rather than being dorsifixed and versatile (i.e. attached at the tip of the filament to the mid-point) as in section *Euryomyrtus* of *Baeckea* or basifixed as in *Hypocalymma*. The dorsifixed, versatile condition with terete filaments is the most widespread in the natural group to which *Rinzia* belongs, occurring in species groups with different stamen arrangements, different sized and coloured seeds and different mechanisms of fruit dehiscence, and as it is also widespread in the Myrtaceae as a whole is considered to be the primitive condition. The condition in *Rinzia* is interpreted as developing through the extension of the filaments from the point behind the attachment point to give the appearance that the anthers have moved from the tip to the adaxial surface, with the filaments appearing not to end at the centre of the anthers but to carry on, often extending past the top of anthers. Although still dorsifixed this constitutes a character state different to dorsifixed, versatile anthers and basifixed anthers and is one of the character states which separates *Rinzia* from its relatives. *R. carnos*a has dorsifixed, versatile anthers but has the broad filaments of *Rinzia*. This may indicate that the adaxial position of the anthers in the other species has evolved within the genus. The basifixed attachment in *Hypocalymma* appears to have developed through the fusion of the filament to the lower part of the anthers.

Stamen arrangement: As noted above the stamens are typically very regularly arranged, with one opposite each petal and sepal, although there are variations. Johnson and Briggs (1985, Figure 8) have proposed a schematic outline of trends in androecial evolution in the Myrtaceae, with the development being from fascicles opposite the petals to single stamens opposite the sepals, or irregularly spaced, in the *Baeckea* suballiance (Johnson and Briggs 1985, Figure 8, J-M). The typical arrangement in *Rinzia* could be viewed as part way down this "sequence" with the occasional pair of stamens opposite the sepals

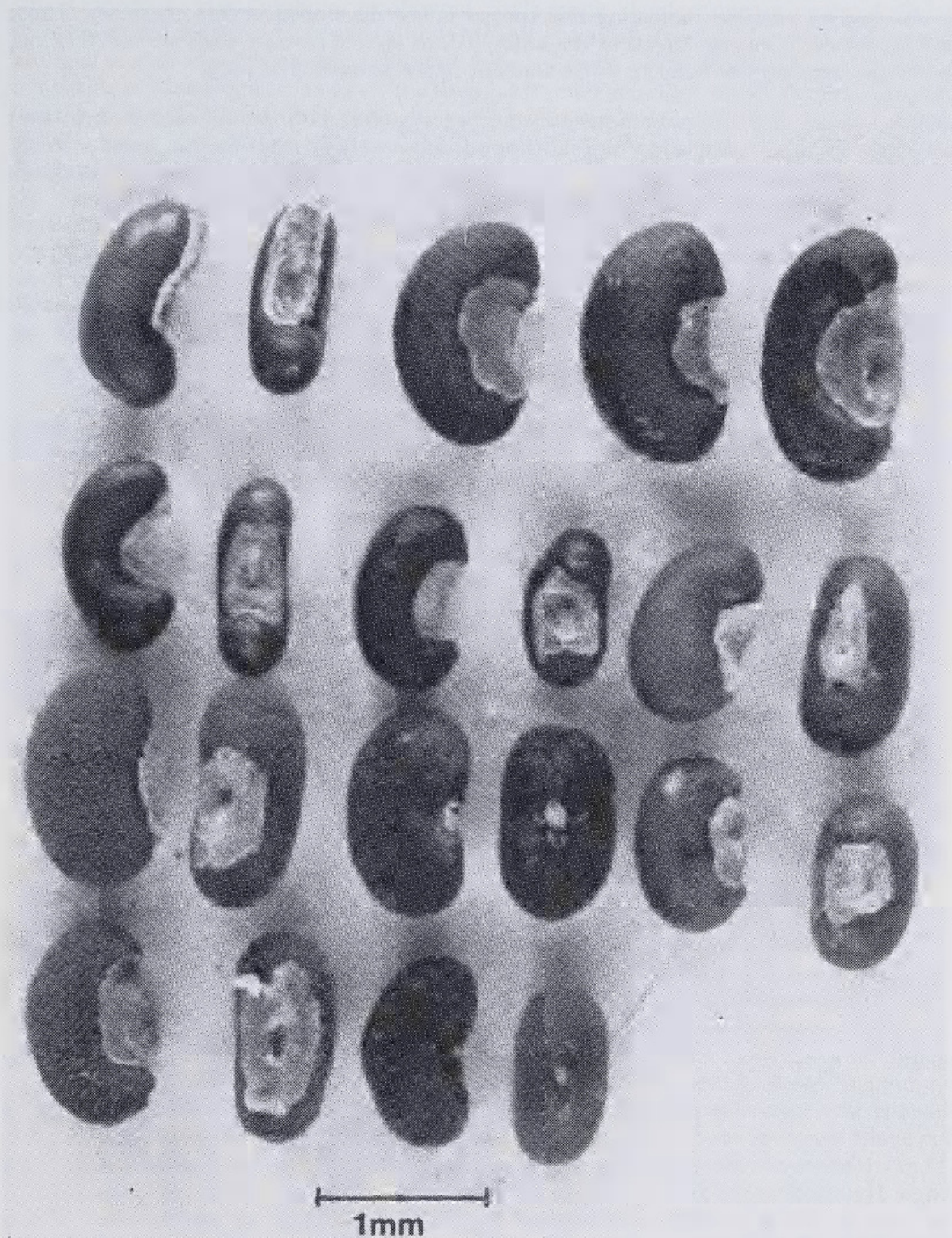


Figure 2. Seeds of *Rinzia* species. Left to right from top left hand corner. Top row: *R. affinis* (2 seeds, from C.A. Gardner 13845, Tarin Rock), *R. communis* (3 seeds, from M.E. Trudgen 1463, 18 miles east of Lake King post office). Second row: *R. dimorphandra* (2 seeds, from H. Demarz 6304, Duke of Orleans Bay road), *R. fumana* (2 seeds, from M.E. Trudgen 1883, Albany Highway just south of Gordon River), *R. morrisonii* (2 seeds, from G.J. Keighery 1119, lower northern slopes of Hostelliers, Stirling Range). Third row: *R. oxycoccoides* (2 seeds, from A.S. George 7141, Thumb Peak Range), *R. rubra* (2 seeds, from M.E. Trudgen 1765, 1.3 km E of 90 Mile Tank, Lake King to Salmon Gums), *R. schollerifolia* (2 seeds, from R.D. Royce 3728a, Lower Kalgan). Bottom row *R. crassifolia* (2 seeds, from M.E. Trudgen 2195, 9 km SW of Calingiri) and *R. carnosa* (2 seeds, from F.M.C. Schock 421, Westonia). Scale bar is 1 mm.

in *R. carnos*a possibly indicating this species is less developed in this character. Those species which lose some or all of the antesealous stamens would indicate a divergence in *Rinzia* from the trend to single stamens opposite the sepals only.

Inflorescence: The most common inflorescence structure is a monad with a very short peduncle and a relatively long anthopodium. Metaxxytriads occur rarely in *R. dimorphandra* which usually has dichasia, the two flowers of which appear to be at different stages of development. The latter situation also occurs in *R. affinis*.

Testa surface terminology follows Murley (1951) as given in Stearn (1973).

Processes: Hair-like structures found at the base of the abaxial side of the antepetalous filaments of some species (e.g. *R. sessilis*). They may be vestigial staminodia.

Materials and Methods

This paper was based on the study of the gross morphology of herbarium material borrowed from Australian herbaria supplemented by observations and collections made in the field of nine of the twelve species (*R. carnos*a, *R. longifolia* and *R. oxycoccoides* were not observed in the field by the author).

The material examined included type specimens of all the previously described species.

The specimens cited were selected to cover the geographical ranges of the species, with preference being given to collections with duplicates lodged in more than one institution.

The measurements given for the parts of flowers were made on material that had been boiled in water with a small amount of detergent in it. The measurements of leaves refer to dry material.

Rinzia Schauer

J. C. Schauer, Linnaea 17: 239 (1843).-*Baeckea* section *Rinzia* (Schauer) Benth, Flora Austral. 3: 74 (1867). Type: *Rinzia fumana* Schauer.

Subshrubs low and straggling to erect, or with prostrate branches, rarely entirely prostrate. Glabrous except for one species. Leaves opposite, appressed to spreading, shortly petiolate or sessile (one species), linear to orbicular, ovate or obovate, flat or margins recurved, or variously thickened (plano-convex or concavo-convex, abaxial surface shallowly convex to semi-terete or semi-elliptic), entire, rarely with hairs on the margins, glandular dotted, occasionally discoloured. Flowers 1-12 near the tips of the branchlets, or along them, small to medium (3-19 mm diameter), solitary or 2-3 on a common peduncle in axils of upper leaves; peduncles very short with a pair of terminal bracteoles; anthopodia each with a pair of bracteoles at the base when more than one flower on a peduncle, 0.8-2.7 mm long; bracteoles elliptic to cymbiform, persistent, often coloured or with a coloured edge. Hypanthium obconical to hemispherical or shortly cylindrical. Calyx lobes half to as long as the hypanthium, triangular, deltoid, semi-circular or semi-elliptic. Petals suborbicular to obovate, or angular. Stamens 5-12, usually 10 with one opposite each petal and calyx lobe, when less than 10 all or some of the antesealous missing, 12 when flowers 6-merous, or occasionally (*R. carnos*a) two stamens opposite some calyx lobes. Filaments all flattened, the antepetalous broad, the antesealous narrower, the antepetalous longer than the antesealous and fused to them from shortly (near base) to up to their whole length, sides straight or incurved, apices truncate, rounded, or emarginate, antesealous sometimes pointed. Anthers usually attached to the adaxial surface of the filaments, dorsifixed and versatile in one species; loculi parallel, opening in straight or rarely curved

slits. Connective gland globular to obovoid. Style terete, slender to stout, inserted shortly to deeply into the ovary; stigma capitate or not enlarged. Ovary 3- or rarely 4-locular, globular to obovoid, depressed around base of style. Placentation axile; placentas consisting of raised elliptic areas on the floral axis, only attached near their centre in some species, but not stalked, longitudinally slit. Ovules reniform, one end pointed in some species, rarely the abaxial edge straight, 2-9 per loculus, collateral or \pm in two rows or rarely almost radially arranged, attached to the placenta on either side of the longitudinal slit. Fruit a globular or cylindrical capsule, \pm equal to the calyx lobes, fused to hypanthium only near the base, pendent. Dehiscent fruit: valves rounded, opening widely (until almost at right angles to the fruit axis); hypanthium flattened or saucer-shaped, the underneath often turned in at the centre. Seeds reniform, arillate (except in *R. carnos*a and *R. rubra*); hilum in centre of the concave side; testa crustaceous, smooth to papillose, brown to dark brown. Embryo filling seed; cotyledons small on a slender neck, flattened parallel to the plane between them, cotyledons and neck folded back onto, or wrapped around the massive radicle. Aborted ovules thin, translucent, not developing as "chaff".

Distribution. Twelve species, all endemic to the south west corner of Western Australia.

Key to the species

1. Leaves flat or margin slightly to prominently recurved, occasionally arched from midrib, discolorous; anthopodia 4-27 mm long (greater than 7 mm except in some specimens of *R. schollerifolia*).
2. Ovules 4 or 5 per loculus; flowers 5-8 mm across corolla; petals usually not spreading widely; seeds 1.3-1.4 mm long.....1. *R. schollerifolia*
2. Ovules 5-12 per loculus; flowers 8-19 mm across corolla; petals spreading; seeds 1.5-1.8 mm long.
3. Ovules 8-12 per loculus; leaf margins prominently recurved; seeds 1.7-1.8 mm long.....4. *R. oxycoccoides*
3. Ovules 5-8 per loculus; leaves almost flat to margins recurved, or leaves arched from midrib; seeds 1.5-1.6 mm long.
4. Plants with main stems prostrate and branchlets erect, short, usually densely leaved; antepetalous stamens 1.9-2.4 mm long. 3. *R. longifolia*
4. Plants variable in form (including prostrate) but otherwise not as above; antepetalous stamens 1.6-1.8 mm long.2. *R. morrisonii*
1. Leaves plano-convex or concavo-convex, concolorous; anthopodia 0.8-4 mm long except for *R. rubra* (2.5-5.5 mm) and *R. crassifolia* (1.2-6.5 mm).
5. Flowers in pairs in leaf axils.
6. Hypanthium obconical, smooth and chartaceous in fruit; leaves usually overlapping next pair by $\frac{1}{5}$ - $\frac{1}{2}$; flowers white less commonly pink; seeds 1.4-1.5 mm long.8. *R. affinis*
6. Hypanthium hemispherical to shortly cylindrical, rarely almost obconical, minutely pitted and fairly thick in fruit; leaves just overlapping next pair; flowers pink or rarely white; seeds 1.1-1.3 mm long.7. *R. dimorphandra*
5. Flowers solitary in leaf axils.
7. Ovules 4-9 per loculus; seeds not arillate.
8. Leaves spreading, plano-convex; flowers 7.5-11 mm across; seeds c. 1.5-1.7 mm long.6. *R. rubra*
8. Leaves appressed, concavo-convex; flowers 5.5-7.5 mm across; seeds c. 1.4-1.5 mm long.5. *R. carnos*a
7. Ovules 2 per loculus; seeds arillate.

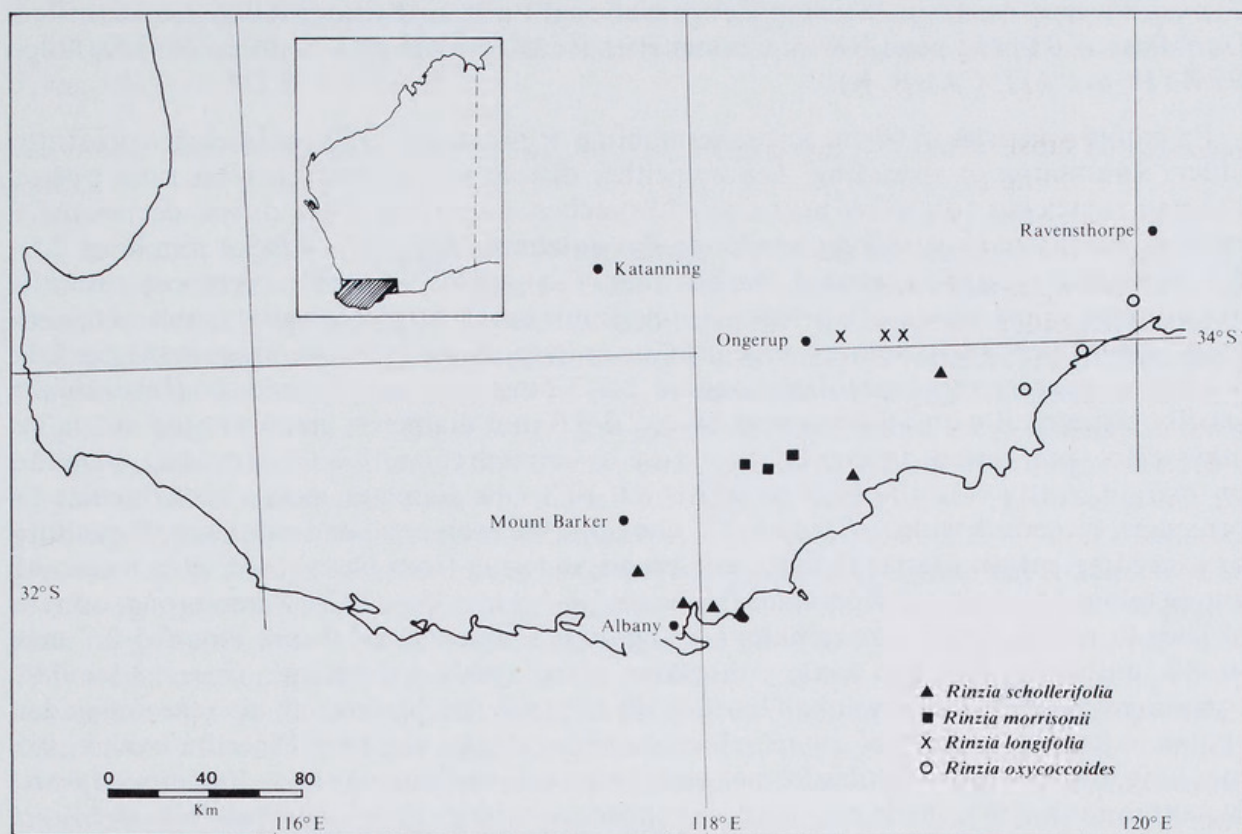
- 9. Flowers 1-12, not clustered near ends of branchlets; seeds verrucose or with ends somewhat pointed; leaves not regularly four ranked (i.e. not quadrifarious).
- 10. Seeds verrucose, ends rounded; corolla 7.5-11.0 mm across.....12. *R. crassifolia*
- 10. Seeds smooth to colliculate, ends somewhat pointed; corolla 6.0-7.5 mm across.....9. *R. fumana*
- 9. Flowers 1-5 clustered near ends of branchlets; seeds neither verrucose nor with ends pointed; leaves regularly four ranked (i.e. quadrifarious).
- 11. Hypanthium hemispherical; petiole absent or indistinct.....11. *R. sessilis*
- 11. Hypanthium shortly cylindrical or rarely broadly hemispherical; leaves definitely petiolate.....10. *R. communis*

1. ***Rinzia schollerifolia*** (Lehm.) Trudgen, comb. nov.-*Baeckea schollerifolia* Lehm., Pl. Preiss. 2: 369 (1848). *Type*: Seven Mile Bridge, Plantagenet, Western Australia, Preiss 2015 (iso: MEL).

Subshrub to 20 cm tall and 60 cm across, *stems* spreading to procumbent, or scrambling, or lower ones, or all, prostrate. *Leaves* distant, spreading to divaricate, or occasionally twisted towards each other; lamina lanceolate, acute 3-10 mm long, 1-2.5 mm wide, almost flat to margins recurved, smooth, discolorous (pale below), often reddish, especially near tips of shoots, oil glands rarely visible. *Flowers* 1-4 on a shoot, solitary in axils of upper leaves, erect; anthopodia 4-16 mm long; bracteoles narrow elliptic, concave, acute, 1.8-3.0 mm long, often reddish. *Hypanthium* obconical, 1.7-2.4 mm wide, green or reddish; calyx lobes erect, not keeled, semi-circular to oblong, 1.0-1.7 mm long, petaline at least on margin, pink to white then with reddish blotches, entire to lacerated. *Corolla* bright deep pink to white, 5.0-8.0 mm across; petals sub-orbicular to orbicular, clawed, not spreading widely. *Stamens* 10, one opposite each petal and calyx lobe, or rarely up to three antesealous stamens missing; antepetalous filaments broad, flat, tapering slightly from base, adnate to the claws of the petals and just equalling the calyx lobes, 1.2-1.7 mm long, 0.6-0.8 mm wide, shortly united to the antesealous filaments; antesealous filaments flattened but not much broader than thick, c. 0.8-1.1 mm long; anthers 0.3-0.4 mm long; connective gland small, globular to shortly cylindrical. *Ovary* 3-locular, $\frac{2}{3}$ length of hypanthium, lower $\frac{3}{4}$ fused to hypanthium. Style fairly stout, reaching to between antesealous and antepetalous anthers; stigma capitate. Placentas oval, c. 0.4 mm long and 0.3 mm wide. Ovules 4-5 per loculus. *Undehisced fruit*: hypanthium hemispherical; capsule equaling calyx lobes. *Dehisced fruit*: hypanthium almost flat (disc shaped) with a short cylindrical edge; calyx lobes erect; valves opening very widely, obtuse. *Seeds* reniform to stoutly reniform, 1.3-1.4 mm long, 0.7-0.8 mm broad, arillate; testa dark brown, neither dull nor shiny, minutely colliculate. *Embryo* filling seed, radicle massive, cotyledons small on a slender neck, both appressed to the radicle.

Selected specimens. WESTERN AUSTRALIA: Near King Georges Sound, 1884, Miss Franklyn (MEL 76374); 5 miles (8 km) S of Narrikup on the Albany road, *R. Melville* 4397 (K, MEL, NSW, PERTH); King Georges Sound, *J.R. Muir* (MEL 76316); Gardiner River road, 34° 21'S, 119° 23'E, *G. Perry* 205 (PERTH); Ledge Point road, 34° 59'S, 117° 58'E, *D. Whibley* 5165 (AD, PERTH).

Distribution. Endemic to the area from Albany to Bremer Bay, Western Australia. Map 1.



Map 1. Distribution of *Rinzia schollerifolia*, *R. morrisonii*, *R. longifolia* and *R. oxycoccoides*.

Habitat. Jarrah (*Eucalyptus marginata*) scrub and forest (and probably other vegetation types) on sand, sandy clay with surface laterite, lateritic soil, and sandy peat.

Notes. *Rinzia schollerifolia* is closely related to *R. morrisonii* and *R. longifolia* and the choice of specific (rather than subspecific) rank was made only after careful consideration of the variation within and between them. *R. schollerifolia* and *R. morrisonii* are both quite variable while *R. longifolia* is only known from a few specimens, making its variability difficult to assess. The small, yet constant, differences in morphology between the three taxa was felt to justify specific rank. The characteristic habit of *R. longifolia* (prostrate with dense erect stems arising from the prostrate ones) adds to its distinctiveness.

Conservation status. *Rinzia schollerifolia* is found in at least one reserve (Two Peoples Bay Nature Reserve) so its conservation status is probably satisfactory.

2. *Rinzia morrisonii* Trudgen, sp. nov.

Fruticulus effusus vel prostratus. Folia modice disposita, patentia vel divaricata, anguste oblonga vel lanceolata, acuta; lamina 4.0-9.4 mm longa, 1.0-2.3 mm lata, discolor, margine plerumque recurvo. Flores solitarii, 1-6 secus ramulos positi; anthopodium 7-10 mm longum. Hypanthium breviter cylindraceum, 2.5-3.0 mm diam., basi obconica. Corolla rosea vel alba, 8.0-10.8 mm diam. Stamina 10, petala aequantia vel eis longiora; filamenta antepetalina pro $\frac{1}{4}$ longitudine connata; filamenta antepetalina gradatim angustata, apicibus emarginatis, 1.6-1.8 mm longa. Ovarium 3-loculare, parte inferiore ad hypanthium connatum; ovula 5-8 per loculum. Fructus: hypanthium breviter cylindraceum, ovario calyce-lobum aequanti. Semina reniformia vel crasso-reniformia, arillata; testa laevis vel minute colliculata, fusca.

Typus: Western Australia, Stirling Range National Park, on Stirling Range Drive to Red Gum Pass, c. 9 km by road NW of Chester Pass Road turn off, *E.N.S. Jackson* 3329 (holo: PERTH; iso: AD, CANB, K).

Perennial subshrub to 60 cm across scrambling or prostrate, or lower branches prostrate others scrambling or spreading. *Leaves* neither distant nor crowded (except near tips of shoots), somewhat spreading near tips of branches, divaricate lower down, occasionally twisted, lamina narrow oblong to oblong-lanceolate or lanceolate, 4.0-9.4 mm long, 1.0-2.3 mm wide, usually rounded (rather than flat), acute, margins recurved, smooth, discolorous, older leaves often reddish, oil glands small but frequently visible. *Flowers* erect, 1-4 (6) per shoot, solitary in leaf axils; anthopodium 7-19 mm long; peduncle 0.1-0.2 mm long; bracteoles lanceolate, concave, 2.2-3.2 mm long usually reddish. *Hypanthium* shortly cylindrical with an obconical base, 2.5-3.0 mm diameter, green or reddish; calyx lobes erect, not keeled, triangular to obtuse or semi-circular, 1.4-1.6 mm long, petaline on margin, entire. *Corolla* pink to white, 8.0-10.8 mm diameter; petals suborbicular to orbicular, spreading widely. *Stamens* 10, one opposite each petal and calyx lobe, equalling or exceeding petals; filaments flattened, broad, tapering from base, fused to $\frac{1}{4}$ length of antepetalous filaments, antepetalous filaments 1.6-1.8 mm long, 0.7-0.8 mm broad, adnate at base to petals, apices emarginate; antesealous filaments 1.2-1.3 mm long 0.5-0.7 mm broad; anthers c. 0.4 mm long; connective gland small, cylindrical. *Ovary* 3-locular, equalling staminophore, lower half fused to the hypanthium. Style stout, not tapering under stigma, equalling anthers of antepetalous stamens; stigma capitate. Placenta oval, c. 0.5 mm long, 0.4 mm wide. Ovules 5-8 per loculus in two interlocking rows. *Undehisced fruit:* hypanthium shortly cylindrical, ovary expanded, equalling calyx lobes; pendent. *Dehisced fruit:* valves opening very widely. Seeds reniform to stoutly reniform c. 1.5 mm long, arillate; testa dark brown, neither dull nor shiny, smooth to minutely colliculate. *Embryo* similar to *R. schollerifolia*.

Selected specimens. WESTERN AUSTRALIA: Stirling Range, National Park, *A.M. Ashby* 3681 (AD, PERTH, NY, TI); Stirling Range National Park, Lower northern slopes of Hosteliers, *G. Keighery* 1119 (PERTH); Stirling Range National Park, Pillenorup fire break, behind Bluff Knoll, *M.E. Frudgen* 1730 (PERTH, NSW) east from Solomon's Well, Stirling Range, 28 September, 1902, *A. Morrison* (PERTH).

Distribution. Endemic to the Stirling Range, Western Australia. Map 1.

Habitat. Found in mallee heath with *Eucalyptus* (including *E. marginata*, Jarrah), *Allocasuarina*, *Xanthorrhoea*, *Dryandra*, Restionaceae, and Cyperaceae on lower hillslopes with dun coloured sandy or clayey sandy soils.

Notes. *Rinzia morrisonii* is closely related to *R. longifolia* and *R. schollerifolia* (see discussion under the latter species).

Due to crowding from the larger antepetalous stamens (which converge to form a cone around the style) the tops of the antesealous stamens are pushed inwards towards the style. Adventitious roots have been observed on prostrate branches of one collection of *R. morrisonii* (*M. E. Frudgen* 1730).

Conservation status. *Rinzia morrisonii* is apparently not uncommon in the Stirling Range National Park. It has been observed there in several areas with different fire histories including areas that had been unburnt for 3-5 and greater than 15 years. Consequently, the species is probably secure and needs no special attention for its conservation.

Etymology. The species was named for Alexander Morrison (1849 to 1913) who made many collections of plants from the Stirling Range in the early years of this century.

3. ***Rinzia longifolia*** Turcz., Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg ser. 2, 10: 331(1852). *Type*: Swan River Colony [South-western Australia], *J. Drummond* coll. 5, no. 121 (iso: MEL, PERTH).

Baeckea schollerifolia auct. non Lehm.: Benth., Fl. Austral. 3: (1867), as to *Drummond* coll. 5, no. 121.

A subshrub to 40 cm or more (? 80 cm) across with long prostrate *stems* which bear short (to 8 cm), erect branchlets. *Leaves* distant on prostrate stems and crowded on erect stems, moderately spreading to divaricate; lamina linear to oblong or oblong lanceolate, acute, 2.5-9.0 mm long, 1.0-2.1 mm wide, almost flat to margins recurved, or arched from the midrib, smooth, discolorous (paler below), often reddish especially near tips of shoots, oil glands small (visible at x10). *Flowers* 1-4 (or more ?) per shoot, erect, solitary in axils of upper leaves; anthopodium 7.5-18.5 mm long; peduncle 0.2-0.5 mm long; bracteoles elliptic to elliptic-obovate, concave, acute, 2.0-3.2 mm long, almost hyaline, green or pinkish. *Hypanthium* shortly cylindrical with an obconical base, 2.8-3.7 mm diameter, green or reddish; calyx lobes almost erect to spreading, shallowly triangular to semicircular to oblong and obtuse, 1.0-2.1 mm long, petaline at least on margin, entirely pink, or centre pink or greenish with a white edge, entire, not keeled. *Corolla* pale pink or white, 9.5-13.2 mm diameter; petals sub-orbicular to orbicular, clawed, spreading. *Stamens* 10 or less commonly 11-12, one opposite each petal and one or two opposite each calyx lobe; antepetalous filaments oblong, adnate to the claws of the petals, exceeding calyx lobes, shortly or to $\frac{1}{3}$ united to the antesealous filaments, 1.9-2.4 mm long, 0.6-0.8 mm wide; antesealous filaments oblong or tapering slightly from base, 1.3-1.8 mm long, 0.4-0.6 mm wide; anthers 0.4-0.5 mm long; connective gland small, globular. *Ovary* 3- (or rarely 4-) locular, $\frac{3}{4}$ length of hypanthium, lower $\frac{1}{2}$ fused to hypanthium. Style equalling anthers of antepetalous stamens; placentas oval, c. 0.6 mm long, 0.5 mm wide, ovules 6-8 per loculus in two interlocking rows. *Undehisced fruit*: hypanthium shortly cylindrical, base obconical, ovary expanded but not equalling calyx lobes. *Dehisced fruit*: hypanthium becoming flat; valves opening widely, obtuse. *Seeds* stoutly reniform, arillate, 1.5-1.6 mm long, 0.8-0.9 mm broad; testa dark brown, shiny, minutely colliculate. *Embryo*: radicle massive, cotyledons small on a slender neck which is twisted around the radicle.

Selected specimens. WESTERN AUSTRALIA: 9 miles (14.5 km) east of Ongerup, *A.S. George* 6872 (PERTH); 2 miles (3.2 km) west of Jerramungup, *K. Newbey* 1351 (PERTH); 24 miles (28.5 km) east of Ongerup, 13 Oct 1961, *J.H. Willis* (MEL, PERTH); Ongerup, 26 August 1964, *F. Lullfitz* 3635 (PERTH).

Distribution. Known only from the vicinity of Ongerup and Jerramungup in the south-west of Western Australia. Map 1.

Habitat. "... in clay with mallee scrub..." (*A. S. George* 6872).

Notes. The habit of this species, prostrate with short erect stems, is unique in the genus and indeed in the subtribe Baeckeeinae. Due to its prostrate habit and attractive flowers *R. longifolia* may be a useful species for cultivation as a groundcover in gardens. And, while cultivation is a poor substitute for the conservation of plant species in the wild, there may be a need to introduce this species into cultivation to protect it from extinction.

Conservation status. *Rinzia longifolia* is known only from the type and four other collections, none of which is very recent. As the area from which it is known has been extensively cleared, this species must be considered endangered and in need of surveying to enable protection of any remaining populations.

4. **Rinzia oxycoccoides** Turcz., Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg ser. 2, 10: 331 (1852). *Type: Drummond*, 5th coll. no. 120 (holo: KW (n.v.); iso: K (n.v.), MEL, PERTH, NSW). *Baeckea oxycoccoides* Benth., Fl. Austral. 3: 75 (1867). nom. illeg.

Perennial subshrub to 60 cm across, diffuse, sprawling or procumbent. *Leaves* close together to distant, spreading to divaricate or slightly recurved; lamina sub-orbicular, ovate or broad to narrow oblong, obtuse, 2-8 mm long, 1.3-3 mm wide, strongly recurved, thick, markedly discolorous; petiole c. 0.5 mm long. *Flowers* erect, 1-5 on a shoot, solitary in axils of upper leaves; anthopodium 8-27 mm long, peduncle c. 0.1 mm long; bracteoles linear to elliptic to oblanceolate, concave, 1.7-3.5 mm long. *Hypanthium* obconical to hemispherical, pitted over oil glands, 2-4.2 mm diameter; calyx lobes erect, triangular to semi-circular to obtuse, 1.0-1.5 mm long, reddish with an entire or lacerated petaline margin, not keeled. *Corolla* pale to deep rose pink, 9.0-19.0 mm diameter; petals sub-orbicular to obovate, clawed, spreading. *Stamens* 10, one opposite each petal and calyx lobe, exceeding calyx lobes; filaments flat, broad, very shortly united at the base, antepetalous almost oblong (tapering slightly), 2.2-2.5 mm long, antesepalous tapering from base, 1.8-2.0 mm long; anthers c. 0.5 mm long; connective gland small, globular. *Ovary* 3-locular, equal in length to hypanthium, lower $\frac{1}{2}$ - $\frac{2}{3}$ fused to the hypanthium. Style stout, tapering to stigma, equalling antesepalous anthers; stigma small, capitate. Placentas oval, ovules 8-12 per loculus, approaching radially arranged. *Undehisced fruit*: hypanthium hemispherical to shortly cylindrical; *capsule* globular, exceeding calyx lobes. *Seeds* reniform, arillate; testa brown to dark brown, dull, minutely colliculate.

WESTERN AUSTRALIA: Middle Mt Barren, *C.A. Gardner* 291 (PERTH); Thumb Peak Range, *A.S. George* 7141 (AD, PERTH); Mt. Bland, Nov. 1932, *H. Steedman* (PERTH); South east ridge of Annie Peak, Eyre Range, *A.S. Weston* 12797 (PERTH); Annie Peak, Eyre Range, *A.S. George* 7252 (PERTH); Thumb Peak, Fitzgerald River National Park, *R.D. Royce* 9254 (PERTH).

Distribution. Known only from the Fitzgerald River National Park on the south coast of Western Australia. Map 1.

Habitat. Found in proteaceous-myrtaceous heath on hillslopes with stony soils.

Notes. Turczaninov and Bentham apparently described this taxon independently, from duplicates of the same collection, both applying the same specific epithet.

Rinzia oxycoccoides is the largest flowered species in the genus and, whereas the flowers of most species are not conspicuous, the flowers of this species are quite striking. It has a large ovule number and as a consequence the ovules are not arranged in rows but around the placenta. However, they are not neatly radially arranged as in sections *Babingtonia* and *Harmogia* of *Baeckea* L.

Conservation status. The conservation status of *R. oxycoccoides* must be considered as excellent as it occurs in a large National Park and, from collection records, is apparently not uncommon there.

5. **Rinzia carnosa** (S. Moore) Trudgen, comb. nov.-*Baeckea carnosa* S. Moore, J. Linn. Soc. Bot. 45: 175 (1920). *Type: Bruce Rock, W.A., Stoward* 315 (holo: BM n.v.; iso: MEL).

Baeckea minutifolia E. Cheel, J. and Proc. Roy. Soc. W. Austral. 10: 5 (1923). *Type: Westonia, W. A., April 1918, F.M.C. Schock* (holo: NSW).

Woody subshrub to 1.3 m tall, much branched with slender (often long) branchlets. *Leaves* appressed, just overlapping or rarely crowded or distant; lamina sub-orbicular to

elliptic and obtuse, shallowly concave above and deeply convex (semi-circular) to very deeply convex below, 0.5-2.5 mm long, 0.5-1.0 mm wide, rough due to pits over oil glands; petiole minute. *Flowers* 1-4 clustered at or near tips of branchlets, erect, solitary in leaf axils; anthopodium 0.5-2.5 mm long; peduncle 0.1-0.2 mm long; bracteoles lanceolate, shallowly to deeply cymbiform, 1-1.2 mm long. Hypanthium hemispherical to shortly cylindrical, 2.2-2.8 mm diameter; calyx lobes erect, semi-circular to triangular, 0.5-1.0 mm long, reddish with a narrow white petaline edge, not keeled, entire. *Corolla* white to rose pink, 5.5-7.5 mm across; petals sub-orbicular to almost oblong, spreading. *Stamens* 10, or rarely 12, one opposite each petal and one or two opposite each calyx lobe; filaments flattened, tapering towards apex, curved inwards, shortly united at base, crowded to somewhat distant from each other, antepetalous markedly exceeding calyx lobes, not adnate to claw of petals 1.3-2.3 mm long, 0.5-0.7 mm wide, antesepalous 0.5-0.7 mm long, 0.3-0.5 mm wide; anthers dorsifixed 0.3-0.4 mm long; connective gland small, globular. *Ovary* 3-locular, almost equal in length to hypanthium, lower third fused to hypanthium. Style stout, tapering, equalling antepetalous anthers; stigma scarcely capitate. Placenta oval, c. 0.4 mm long; ovules 4-6 per loculus in two interlocking rows. *Undehisced fruit*: hypanthium shortly cylindrical, chartaceous, capsule just equalling calyx lobes. *Dehisced fruit*: capsule not opening very widely. *Seeds* reniform, not arillate, c. 1.4-1.5 mm long; testa closely and finely granulate, dark brown.

Selected specimens. WESTERN AUSTRALIA: Tandegin Siding, NE of Bruce Rock, October 1932, *E.T. Bailey* (PERTH); ca 35 km, WSW of Coolgardie, *N.N. Donner* 4555 (AD, PERTH); 8 miles (12.9 km) N of Bencubbin, *C.A. Gardner* 2746 (CANB, HO, K, PERTH); Queen Victoria Rocks, SW of Coolgardie, *A.S. George* 8035 (CANB, MEL, PERTH); Golden Valley, 1888, *E. Merrall* (MEL); 4 miles (6.4 km) W of Coolgardie, *M.E. Phillips* W.A./62-612 (CBG, L, PERTH); Westonia, October 1918, *F.W.C. Schock* (NSW, PERTH).

Distribution. Found from the Kalgoorlie area west to Kellerberin and Burakin, Western Australia. Map 2.

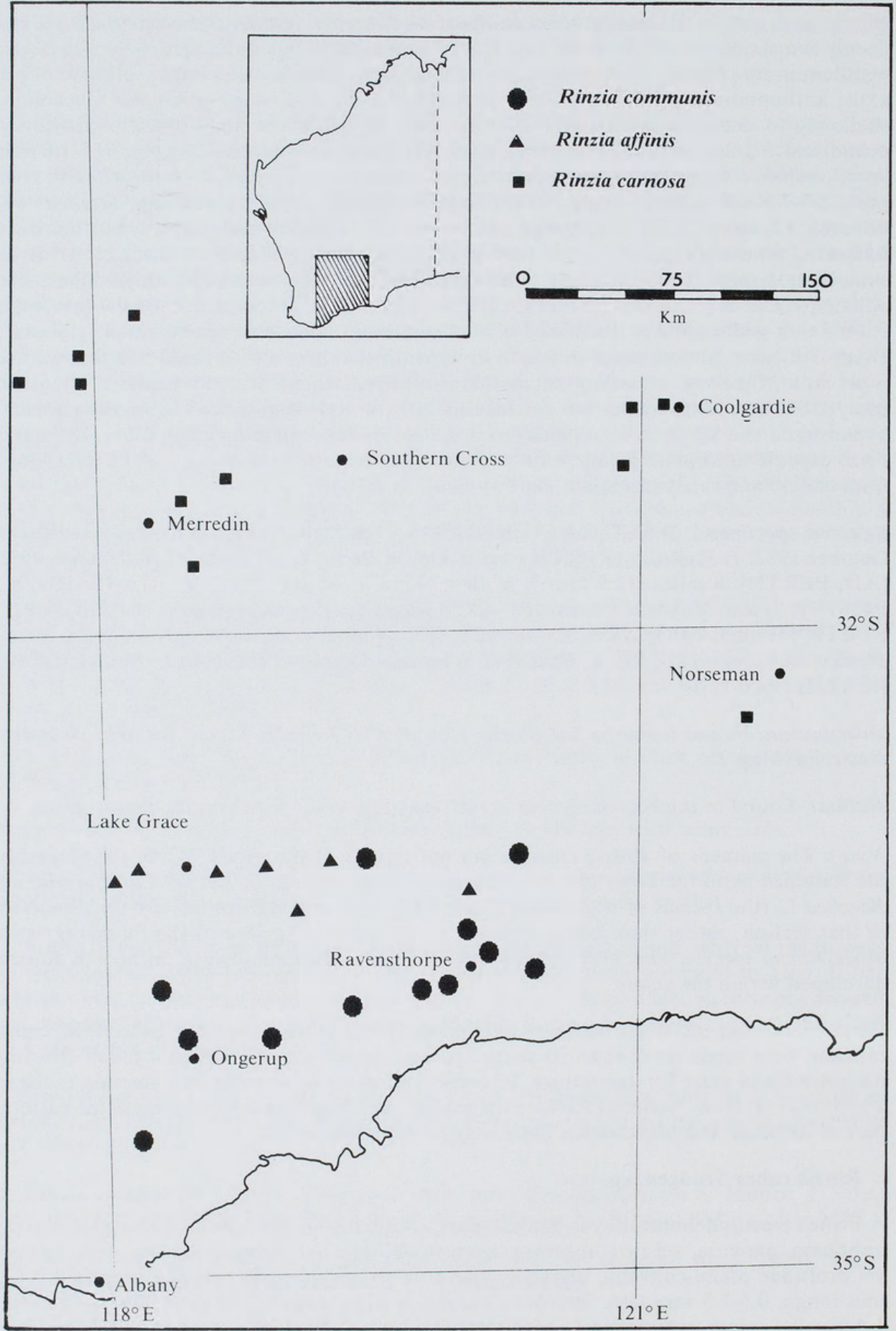
Habitat. Found in thickets of *Acacia* 'scrub' growing on loam or granitic loamy sands.

Notes. The stamens of *Rinzia carnosa* are not typical of the genus. While the filaments are flattened as in the other species, they taper to the end as in section *Euryomyrtus* of *Baeckea* L. (the species of which have terete filaments) and the anthers are dorsifixed as in that section, rather than being attached to the adaxial surface of the filaments as in other *Rinzia* species. This may indicate that the adaxial attachment of anthers in *Rinzia* developed within the genus.

Conservation status. While *R. carnosa* is known from at least fourteen collections, most of these were made more than 20 years ago and came from areas where much clearing has since taken place for agriculture. Its conservation status is therefore uncertain as there are no records from National Parks. Fortunately there has been less clearing in the eastern part of its range and populations there may be relatively secure.

6. *Rinzia rubra* Trudgen, sp. nov.

Frutex erectus demum effusus, ramulis parvis numerosis dense foliatis. Folia quadrifaria, imbricata, patentia, vel raro appressa, anguste oblonga vel anguste obovata, semi-teretia vel profunde plano-convexa, adaxialis interdum leviter convexa, obtusa; lamina 0.7-4.3 mm longa, 0.6-1.3 mm lata, interdum glandibus prominentibus ornata. Flores solitarii, 1-4 versus apices ramulorum positi; anthopodium 2.5-5.5 mm longum. Hypanthium breviter cylindraceum, 2.0-2.5 mm diam., basi obconica. Corolla alba, 7.5-11 mm diam.



Map 2. Distribution of *Rinzia communis*, *R. affinis* and *R. carnosa*.

Stamina 10, petalis longiora; filamenta usque ad $\frac{2}{3}$ altitudinum filamentorum antesepalorum connata; filamenta antepetalina gradatim angustata, apicibus emarginatibus, 1.5-2.0 mm longa. Ovarium 3-loculare, basi ad hypanthium connatum; ovula 4-9 per loculus. Fructus: hypanthium prope basim tumidum, basi profunde excavata. Semina reniformia, non arillata, c. 1.5-1.7 mm longa; testa subtiliter granulata, brunnea.

Typus: 1.3 km east of 90 Mile Tank on the Lake King to Salmon Gums road Western Australia, 3 November 1976, *M.E. Trudgen* 1765 (holo: PERTH; iso: CANB, K, MEL, NSW).

Shrub to 70 cm tall and 100 cm across, erect when young, sprawling and open when mature with numerous densely leaved small branchlets from the main stems. *Leaves* quadrifarious, overlapping, divergent c. 45 degrees from stem, rarely appressed (on quick growing shoots); lamina narrow-oblong to narrow-obovate, or when very small orbicular, obtuse, 0.7-4.3 mm long, 0.6-1.3 mm wide, flat or shallowly concave above, deeply to very deeply convex below, oil glands visible on abaxial surface only, smooth or rarely with raised oil glands. *Flowers* 1-4 shortly below the tip of a branchlet, solitary in leaf axils, erect; anthopodium 2.5-5.5 mm long; peduncle 0.2-0.3 mm long; bracteoles elliptic to lanceolate, cymbiform, 0.9-1.9 mm long. *Hypanthium* shortly cylindrical with a small obconical base, 2.0-2.5 mm diameter, surface smooth, usually a deep dull red; calyx lobes erect to spreading, deltoid, acute to obtuse, dull red, keeled (but not strongly), edges thin. *Corolla* white, 7.5-11 mm diameter; petals oblong to sub-orbicular, clawed, spreading. *Stamens* 10, one opposite each petal and calyx lobe, exceeding petals, forming a cone around the style; antepetalous filaments flattened, broad, tapering slightly, sides straight or shallowly concave, 1.5-2.0 mm long, apices emarginate but not extended past attachment to anthers; antesepalous filaments slightly to markedly flattened, oblong 1-1.4 mm long, apices acute to obtuse, edges of filaments fused for $\frac{1}{2}$ to $\frac{2}{3}$ length of the antepetalous filaments; anthers c. 0.5 mm long, attached to adaxial surface of filaments; connective gland small, curved. *Ovary* 3-locular, half the length and diameter of hypanthium, lower third to half fused to hypanthium. Style tapering slightly towards stigma, equalling antepetalous anthers; stigma a rounded tip to the style. Placentas oval, only attached to ovary wall near their centres, divided longitudinally. Ovules 4-9 per loculus, attached to placentas in two interlocking rows. *Undehisced fruit* pendent on recurved anthopodium, calyx lobes and stamens persistent; hypanthium thin, chartaceous, broadened at base, otherwise cylindrical. *Dehisced fruit* not seen. *Seeds* reniform, c. 1.5-1.7 mm long, not arillate; testa brown, closely and finely granulate.

Selected specimens. WESTERN AUSTRALIA: 14.4 miles (23.2 km) from Southern Cross toward Bullfinch, *E.M. Canning* W.A./68-2526 (CBG); 1 km south west of 90 mile tank, Norseman (or Salmon Gums) to Lake King road, *K. Newbey* 6859 (NSW, PERTH); 20 km south west of Coolgardie, *K. Newbey* 5675 (PERTH).

Distribution. Endemic to Western Australia, known from near Coolgardie, Southern Cross and east of Lake King. Map 3.

Habitat. Known from various vegetation types including *Eucalyptus* spp. woodland, *E. transcontinentalis* very open shrub mallee, low open heath with emergent mallees and *Allocasuarina* scrub on gently undulating plains. Soils include orange brown clayey sand, shallow sand over sandy clay and pink-brown sand over grey sand.

Notes. The specimens from Southern Cross and Coolgardie differ from those at the type locality in appearance, the degree of fusion of the filaments and the size of the flowers; further collections are needed to assess the significance of this variation.

Conservation status. *Rinzia rubra* is known from only a few collections, and most of these are from a small area near the 90 Mile Tank on the Lake King to Salmon Gums road. The area from there north and east to Southern Cross and Coolgardie is not well collected and, as areas of suitable habitat occur, may well contain additional populations of *Rinzia rubra*. However, until such populations are found the conservation status of *R. rubra* must be considered unsatisfactory.

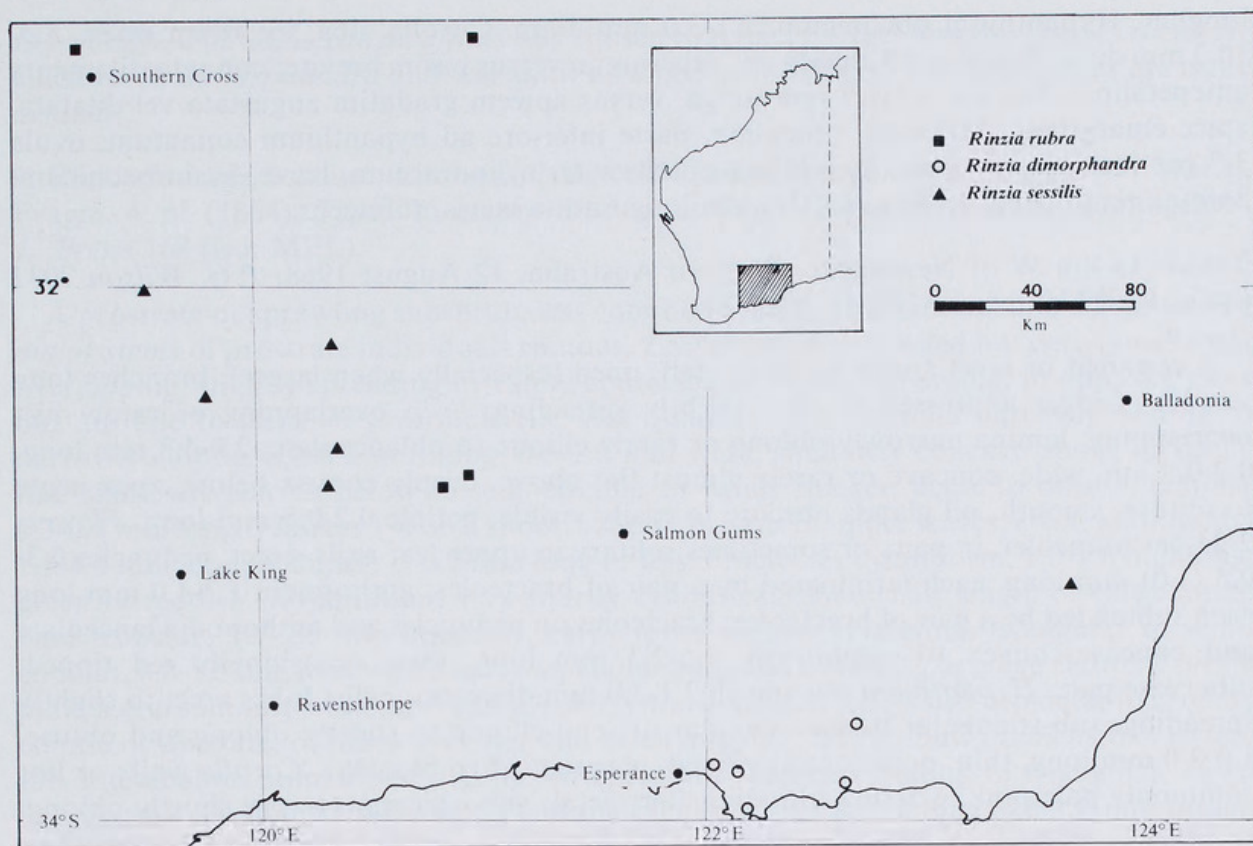
Etymology. The specific epithet alludes to the dull reddish colour of the hypanthium and calyx lobes. While some other species occasionally have these parts reddish, it is pronounced and apparently constant in *Rinzia rubra*.

7. *Rinzia dimorphandra* (F. Muell. ex Benth.) Trudgen, comb. nov. - *Baeckea dimorphandra* F. Muell. ex Benth. Fl. Austral. 3: 74 (1867). *Type:* Sandy places near Cape le Grand, Maxwell (holo: MEL; iso: MEL).

A rounded subshrub to 25 cm tall and 30 cm across, fairly open; branches long, very slender. *Leaves* appressed to very slightly spreading, not quite to just overlapping or rarely up to half of length overlapping; lamina narrow-elliptic to elliptic or rarely obovate, acute to obtuse, 1.5-3.9 mm long, 0.5-0.8 mm wide, deeply convex below, shallowly to moderately concave above, smooth, oil glands small; petiole 0.2-0.4 mm long. *Flowers* 1-8 clustered at or just below the tips of the branchlets, rarely spread along branchlets, in pairs on a common peduncle or less commonly solitary, erect; peduncles 0.2-0.3 mm long, terminated by a pair of bracteoles; anthopodia 1.0-2.4 mm long, each subtended by a pair of bracteoles; bracteoles on peduncles and anthopodia elliptic-lanceolate and shallowly concave to cymbiform, 0.8-2.2 mm long. *Hypanthium* shortly cylindrical to hemispherical or obconical, tapering into the anthopodium, 2.0-2.3 mm diameter; calyx lobes erect or slightly spreading, triangular or sub-triangular to semi-elliptic 1-1.5 mm long, entire. *Corolla* pink or rarely pale pink to white, 6.0-9.0 mm diameter; petals sub-orbicular to very broadly elliptic, or outline quite angular, spreading. *Stamens* 10, one opposite each petal and calyx lobe; antepetalous filaments oblong, or slightly dilated at apex, 1.2-1.7 mm long, 0.6-0.7 (1.0) mm wide, shortly or to lower one quarter fused to filaments of antesealous stamens, equalling or slightly exceeding sepal lobes, apex emarginate; antesealous filaments flattened, tapering, 0.7-1.3 mm long 0.3-0.5 mm wide, apex acute to obtuse and not equalling top of anthers; anthers c. 0.3-0.4 mm long; connective gland small, narrow-obovoid. *Ovary* three locular, not or just equalling staminophore, lower $\frac{1}{2}$ fused to hypanthium. Style tapering or fusiform, reaching between anthers of antepetalous and antesealous stamens; stigma not or scarcely capitate. Placentas circular, slightly raised, c. 0.4 mm diameter. Ovules 3-4(5) per loculus. *Undehisced fruit:* hypanthium shortly cylindrical, base truncate, capsule expanded but not equalling calyx lobes. *Dehisced fruit:* hypanthium hemispherical or shallower. *Seeds* reniform 1.1-1.3 mm long, arillate, aril large; testa, smooth, mid brown, shiny. *Embryo:* cotyledons small on a slender neck coiled on the end of the massive radicle.

Selected specimens. WESTERN AUSTRALIA: 3 km south east of Hill 49, Cape Le Grand National Park, *R.J. Cranfield* 1375 (CANB, K, MEL, NSW, PERTH); 12 km south of Howick Hill, ca. 75 km ENE of Esperance, *N.N. Donner* 2749 (AD, L, OSH, PERTH, Z); 8.5 km WSW of Howick Hill, *Hj. Eichler* 19861 (AD, CANB, K, PERTH); 1.8 miles (2.9 km) along the road to Wittenoom Hills from the Esperance to Cape Arid road, *M.E. Trudgen* 1475 (BRI, MEL, NSW, PERTH).

Distribution. Endemic to Western Australia, found from Esperance east to Howick Hill. Map 3.



Map 3. Distribution of *Rinzia rubra*, *R. dimorphandra* and *R. sessilis*.

Habitat. *Rinzia dimorphandra* grows in *Banksia speciosa* scrub, low shrublands or heath with taller shrubs of *Banksia speciosa*, *Lambertia* sp. and *Nuytsia floribunda*, on white, grey and yellow sands.

Notes. *Rinzia dimorphandra* is closely related to *Rinzia affinis* with which it has been confused in the past. However, they are disjunct and there are constant differences of habit, morphology and habitat preference. *Rinzia dimorphandra* is a finely branched shrub to 25 cm tall while *Rinzia affinis* reaches c. 75 cm and is more erect. Both species have appressed leaves but those of *Rinzia affinis* are generally larger, though the range of leaf sizes overlaps. In the same way, while the range of flower size overlaps, *Rinzia affinis* usually has larger flowers. While *Rinzia affinis* has white or pale pink corollas *Rinzia dimorphandra* has pink or only rarely pale pink to white corollas. *Rinzia dimorphandra* grows on sands in vegetation dominated by Proteaceae but *Rinzia affinis* grows in loams or sands with lateritic gravel in vegetation dominated by *Eucalyptus* spp.

The pair of flowers on a common peduncle, although apparently in the same relative position, are at different stages; e.g. one may be at anthesis while the other is still in bud. The peduncle apex occasionally continues growth as a vegetative shoot.

Conservation status. *Rinzia dimorphandra* is found in at least one conservation reserve (Cape Le Grand National Park), so its conservation status is probably satisfactory.

8. *Rinzia affinis* Trudgen, sp. nov.

Frutex rotundatus vel erectus. Folia appressa vel subappressa, plus minusve imbricata, anguste oblonga vel oblanceolata, interdum elliptica, infra profunde convexa, supra concava vel fere plana, acuta vel obtusa; lamina 2.0–4.3 mm longa, 0.7–0.9 mm lata. Flores binati vel solitarii, 2–24 versus apices ramulorum aggregati; anthopodium 1.3–4.0 mm

longum. Hypanthium obconicum, 2.1-3.0 mm diam. Corolla alba, interdum rosea, 8.5-10.3 mm diam. Stamina 10, petala nec superantia, versus basim breviter connata; filamenta antepetalina oblonga, 1.5-1.9 mm longa, versus apicem gradatim angustata vel dilatata, apice emarginato. Ovarium 3-loculare, parte inferiore ad hypanthium connatum; ovula 3-7 per loculum. Fructus: hypanthium perbreviter cylindraceum, laeve, basi obconicum. Semina reniformia, arillata, 1.4-1.5 mm longo; testa laevis, rufescens.

Typus: 14 km W of Newdegate, Western Australia, 12 August 1968, *P.G. Wilson* 7032 (holo: PERTH; iso: CANB, K, NSW).

A rounded or erect shrub to 70 cm tall, open (especially when larger), branches long slender. *Leaves* appressed to very slightly spreading, $\frac{1}{5}$ - $\frac{1}{2}$ overlapping or rarely just overlapping; lamina narrowly oblong or rarely elliptic to oblanceolate, 2.0-4.3 mm long, 0.7-0.9 mm wide, concave or rarely almost flat above, deeply convex below, apex acute to obtuse, smooth, oil glands obscure to easily visible; petiole 0.2-0.5 mm long. *Flowers* 2-24 per branchlet, in pairs or sometimes solitary in upper leaf axils, erect; peduncles 0.3-0.5 (1.0) mm long, each terminated by a pair of bracteoles; anthopodia 1.3-4.0 mm long each subtended by a pair of bracteoles; bracteoles on peduncles and anthopodia lanceolate and concave-convex to cymbiform, 1.5-2.3 mm long, thin, occasionally red tipped, otherwise pale. *Hypanthium* obconical, 2.1-3.0 mm diameter; calyx lobes erect to slightly spreading, sub-triangular to semi-circular or semi-elliptic to shortly oblong and obtuse, 1.0-2.0 mm long, thin, occasionally ribbed, maroon (often blotchy). *Corolla* white or less commonly pale pink, 8.5-10.3 mm diameter; petals suborbicular to very shortly oblong, spreading. *Stamens* 10, one opposite each petal and calyx lobe; filaments of antepetalous stamens oblong, slightly tapering or dilated near apex, 1.5-1.9 mm long, 0.6-0.9 mm wide, shortly fused to antesealous filaments at base, exceeding calyx lobes, apex emarginate; antesealous filaments flattened, tapering from base 0.8-1.3 mm long, 0.3-0.5 mm wide, apex acute and not equalling top of anthers; anthers c. 0.3-0.4 mm long; connective gland small, globular to obovoid. *Ovary* 3-locular, not quite equalling staminophore, lower $\frac{1}{3}$ - $\frac{1}{2}$ fused to hypanthium. Style slender, fusiform, reaching to between anthers of antepetalous and antesealous stamens; stigma barely capitate. Ovules 3-7 per locus. *Undehisced fruit*: hypanthium very shortly cylindrical with an obconical base, rather dry and chartaceous; capsule not quite equalling calyx lobes; calyx lobes thin, erect. *Dehisced fruit* not seen. *Seeds* reniform, arillate, 1.4-1.5 mm long; aril large and extending to one end of seed; testa smooth shiny, mid brown (a little reddish); *embryo* with small cotyledons on a long neck wrapped around radicle.

Selected specimens. WESTERN AUSTRALIA: Halfway between Newdegate and Lake Grace, *A.M. Ashby* 189 (AD); 25 km S of Newdegate, *B.R. Maslin* 3859 (NSW, PERTH); 100 miles N of Stirling Range, 1879, *Muir* (MEL); ca. 25 km W of Lake Grace near Tarin Rock, *D.J.E. Whibley* 5300 (AD, PERTH).

Distribution: Endemic to Western Australia, found from the Lake King area west to Kukerin. Map 2.

Habitat. Found in a variety of vegetation types including open heath with *Eucalyptus* spp. high shrubland (ie. two strata) and low dense sandplain scrub with *Eucalyptus tetragona*, on a range of soils including yellow sand, loam with lateritic pebbles, sand with lateritic pebbles over laterite and sandy clay over laterite.

Conservation status. None of the collections of this species is from a conservation reserve, and as it is known from only 11 collections and occurs in an area heavily cleared for agriculture, its conservation status must be considered unsatisfactory.

Etymology. The name *Rinzia affinis* was chosen to reflect the fact that this species is closely allied to *R. dimorphandra* and was until now confused with it. The two species are quite distinct.

9. ***Rinzia fumana*** Schauer, *Linnaea* 17: 239 (1843).-*Baeckea fumana* (Schauer) F. Muell., *Fragm.* 4: 68 (1864). *Type*: 'In interioribus Sinus Regis-Georgei III., distr. Plantagenet', *L. Preiss* 164 (iso: MEL).

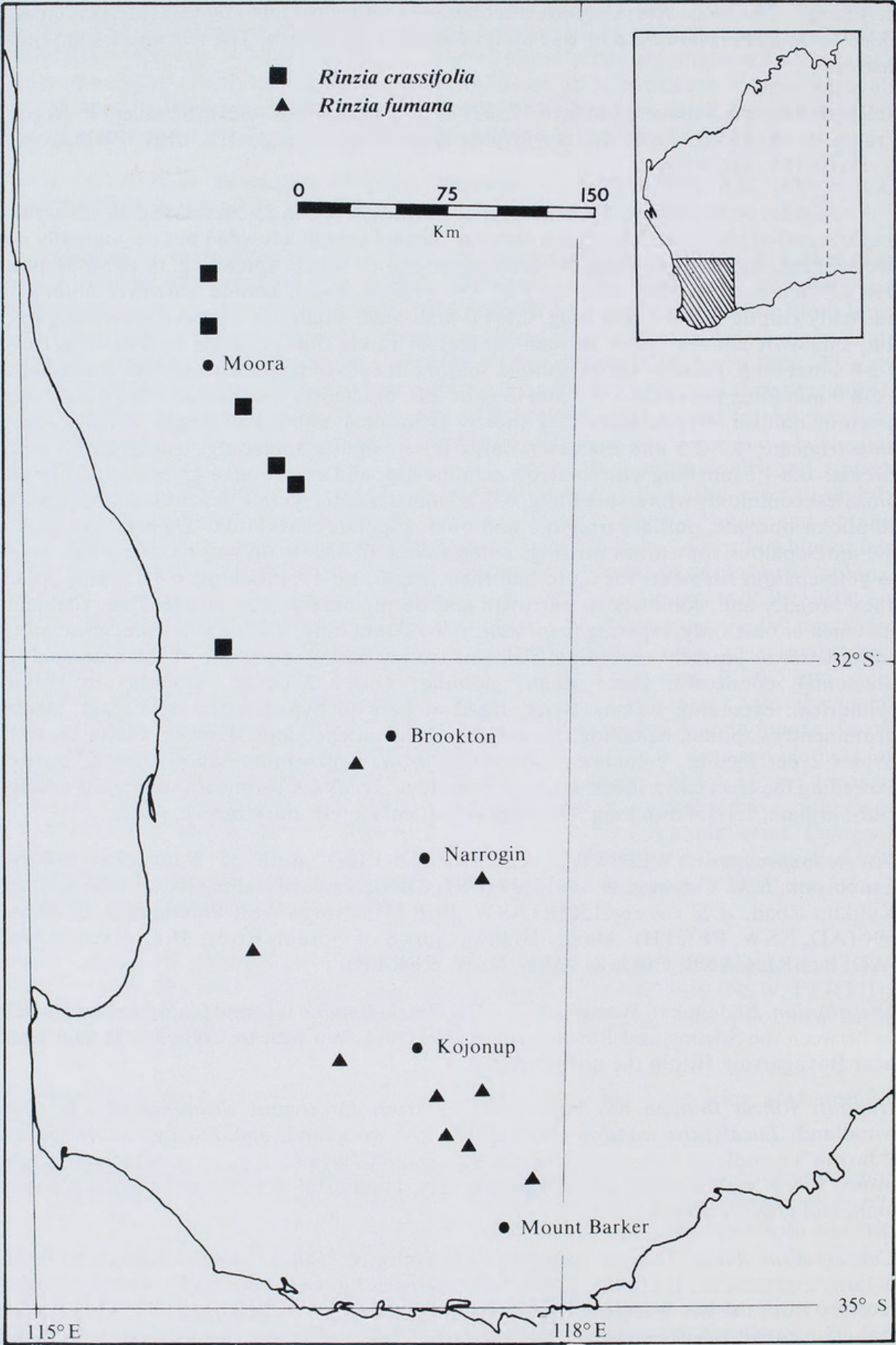
A prostrate or sprawling subshrub, less commonly erect, to 25 cm tall and 60 cm across, *major stems* of prostrate individuals sinuous. *Leaves* usually crowded but occasionally not overlapping, slightly spreading or rarely appressed or widely spreading, in opposite pairs but attitude to stem very variable (i.e. not quadrifarious); lamina narrowly oblong to narrowly elliptic, 2.0-8.2 mm long, 0.5-1.0 mm wide, shallowly concave above or rarely flat, shallowly convex below to semi-circular or rarely thicker, acute to obtuse; petioles 0.3-0.4 mm long. *Flowers* 1-4 on a shoot, solitary in axils of upper leaves, erect; anthopodia 1.5-4.0 mm long; peduncle c. 0.2 mm long or less; bracteoles cymbiform, 1.0-1.6 mm long, green or reddish. *Hypanthium* very shortly cylindrical, about half length of calyx lobes, base truncate, 1.7-2.5 mm diameter, calyx lobes slightly spreading, triangular to semi-circular, 0.8-1.5 mm long with a narrow petaline edge and a maroon or green centre. *Corolla* pink, less commonly white, spreading, 6.0-7.5 mm diameter; petals sub-orbicular to broadly elliptic or obovate, outlines irregular and often angular, claws stout. *Stamens* five to ten, the antesealous sometimes missing; antepetalous filaments oblong to triangular, fused to antesealous filaments for up to half their length, 1.0-1.8 mm long, 0.8-1.0 mm broad, apex broadly and shallowly to narrowly and deeply emarginate; antesealous filaments flattened at base only, tapering from base, 0.9-1.0 mm long, 0.4-0.5 mm wide, apex acute; anthers not or scarcely exceeding filaments (rarely absent from one of the antesealous filaments); connective gland small, globular. *Ovary* 3-locular, globular to shortly cylindrical, exceeding staminophore, fused at base to hypanthium; style stout; stigma prominently capitate, equalling the anthers of the antepetalous stamens. Placentas oval; ovules 2 per loculus, collateral. *Undehisced fruit*: hypanthium saucer-shaped, *capsule* exceeding the erect calyx lobes, stamens persistent. *Seeds* reniform with somewhat pointed ends, arillate, 1.1-1.4 mm long; testa smooth to colliculate, dark brown, shiny.

Selected specimens. WESTERN AUSTRALIA: Just south of Broomehill towards Cranbrook, *E. M. Canning*, WA68/6137 (BRI, CBG); N side of Ualling Bk., on Moodiarup-Kulikup Road, *A. S. George* 15058 (NSW, PERTH); North West Plantagenet, *E. Pritzel* 694 (AD, NSW, PERTH); Albany Highway just S of Gordon River, *M. E. Trudgen* 1883 (AD, B, BRI, CANB, CBG, K, MEL, NSW, PERTH).

Distribution. Endemic to Western Australia. *Rinzia fumana* is found from Brookton south to between the Stirling and Porongurup Ranges and then west to Collie in the south and near Boyagarring Hill in the north. Map 4.

Habitat. *Rinzia fumana* has been collected from *Eucalyptus drummondii* low open woodland, *Eucalyptus wandoo* ("Wandoo") low woodland, and *Eucalyptus marginata* ("Jarrah") woodland with *Dryandra*, *Casuarina*, and *Daviesia* spp. on soils including light brown loams with lateritic gravel, lateritic clay, loamy soil at the edge of granite, sandy loam and gravel (lateritic).

Conservation status. Though not commonly collected, *Rinzia fumana* appears to occur in fairly extensive areas of State Forest (the Northern Jarrah Forest) and has been recorded recently from the Mt Westdale Nature Reserve north-east of Brookton. Its conservation status is probably fairly secure. There is one old record from the Stirling Range National Park.



Map 4. Distribution of *Rinzia crassifolia* and *R. fumana*.

10. *Rinzia communis* M.E. Trudgen, sp. nov.

Fruticulus effusus. Folia quadrifaria, imbricata, patentia vel interdum appressa, linearia vel anguste oblonga, interdum lanceolata vel oblanceolata, semiteretia vel profunde planoconvexa, obtusa; lamina 0.8-5.3 mm longa, 0.5-0.9 mm lata. Flores solitarii, 1-5 versus apices ramulorum aggregati; anthopodium 1.5-4.0 mm longum. Hypanthium breviter cylindraceum vel late hemisphaericum, 2.0-2.6 mm diam. Corolla pallide rosea vel alba, 5.8-9.0 mm diam. Stamina 10, petala nec superantia; filamenta breviter connata vel usque ad altitudinis filamentorum anteseptalorum connata; filamenta antepetalina anguste oblonga, 1.4-2.0 mm longa, apice emarginata. Ovarium 3-loculare, parte inferiore ad hypanthium connatum; ovula 2 per loculum. Fructus: hypanthium breviter cylindraceum, basi profunde excavato, ovario calyce-lobum leviter superanti. Semina reniformia, arillata, 1.5-1.7 mm longa; testa minute colliculata, fusca.

Typus: Mount Madden, SE of Lake King, W.A., 29 July 1976, *M.E. Trudgen* 1700 (holo: PERTH; iso: CANB, K, MEL, NSW).

Subshrub to 30 cm tall and 40 cm across rounded to rather spreading and straggly. *Leaves* quadrifarious, overlapping, spreading (c. 30 degrees from stem) or rarely appressed; lamina linear to narrow oblong or rarely lanceolate or oblanceolate, obtuse, 0.5-5.3 mm long, 0.5-0.9 mm wide, flat or occasionally shallowly concave or grooved above, deeply convex to very deeply convex below. *Flowers* erect, solitary in axils of upper leaves, 1-5 on a shoot; anthopodia 1.5-4.0 mm long; peduncles 0.1-0.3 mm long; bracteoles elliptic to narrowly obovate, shallowly concave to cymbiform, 0.5-1.4 mm long. *Hypanthium* shortly cylindrical with a flat base to broadly hemispherical, 2.0-2.6 mm diameter, surface smooth; calyx lobes erect, deltoid, acute to obtuse (even on one flower), keeled and with a narrow petaline edge. *Corolla* white to pale pink, 5.8-9.0 mm diameter; petals rhomboidal to oblong to irregularly orbicular, spreading. *Stamens* 10, one opposite each petal and calyx lobe; antepetalous filaments slightly exceeding to twice length of calyx lobes, narrowly oblong, or sides concave, 1.4-2.0 mm long, apex emarginate and equalling top of anthers; anteseptalous filaments flattened but scarcely wider than thick, 0.9-1.6 mm long, shortly or almost whole length fused to filaments of antepetalous stamens, acute; connective gland globular to obovoid. *Ovary* 3-locular, globular, equalling or slightly exceeding staminophore but not filling hypanthium, lower $\frac{1}{4}$ fused to hypanthium. Style stout, subulate with the stigma as a rounded tip, reaching to between anthers of antepetalous and anteseptalous stamens. Placentas oval, attached to axis for much of their area, slit down centre. Ovules 2 per loculus, collateral, reniform, 0.5-0.6 mm long. *Undehisced fruit*: hypanthium shortly cylindrical, capsule slightly exceeding calyx lobes, stamens persistent. *Dehisced fruit*: valves obtuse, opening very widely, base of hypanthium sunken. *Seeds* reniform, 1.5-1.7 mm long, arillate; testa minutely colliculate, dark brown; *embryo* filling seed, radicle massive, cotyledons small on a slender neck, twisted around radicle.

Selected specimens. WESTERN AUSTRALIA: Stirling Range, September 1927, *C.A. Gardner* (PERTH); 18 miles (28.9 km) E of Lake King post office on road to Salmon Gums, *M.E. Trudgen* 1463 (AD, BRI, CANB, K, NSW, PERTH); 30.4 km E of Ravensthorpe *M.E. Trudgen* 707 (MEL, PERTH); 9.7 km N of Ongerup on Fosters Road, *M.E. Trudgen* 736 (NSW, PERTH); Fitzgerald R. below Roes Rock 33° 59' S, 119° 25' E *A.S. George* 10017 (PERTH); Mt. Madden, SE of Lake King, *M.E. Trudgen* 1700 (AD, K, MEL, PERTH); 2 miles West of Jerramungup, *K. Newby* 1350 (PERTH); Mt. Short, N of Ravensthorpe, *A.S. George* 5202 (PERTH, CANB); about 22 km SE of Nyabing along Rabbit Proof Fence, 33° 41' S 118° 23' E, *A.S. George* 14288 (PERTH).

Distribution. Found from the Stirling Range E to Ravensthorpe, N to Katanning and NE to the Johnston Lakes, Western Australia. Map 2.

Habitat. *Rinzia communis* is known from a wide range of habitats, including open (?*Eucalyptus*) woodland, low mallee heath, mallee scrub with *Melaleuca uncinata*, *Eucalyptus redunca* low mallee heath and tall shrubland, on soils including orange-brown sand, light brown sand, sandy loam, sandy gravel (lateritic) and laterite.

Conservation status. *Rinzia communis* is the most widespread and common species in the genus and would appear to have a reasonably secure conservation status as it has been recorded from Frank Hann, Fitzgerald River and Stirling Range National Parks. However, it is not common in either of the latter two National Parks and extensive clearing of native vegetation is occurring, or is proposed, within its range.

Etymology. The specific name refers to the widespread and common occurrence of the species.

11. *Rinzia sessilis* Trudgen, sp. nov.

Fruticulus humilis, effusus, vel interdum rotundatus. Folia quadrifaria, imbricata vel interdum distantia appressaque, oblonga, elliptica, vel suborbicularia, raro lanceolata, supra concava, infra convexa, obtusa vel interdum acuta, sessilia; lamina 0.6-3.2 mm longa, 0.4-0.8 mm lata, glabra, vel margine gossypina. Flores solitarii, 1-5 versus apices ramulorum aggregati; anthopodium 0.8-2.2 mm longum. Hypanthium hemisphericum, 1.7-2.6 mm diam. Corolla pallide rosea vel fere alba, 5-9 mm diam. Stamina 10, petalis longiora; filamenta versus basim connata; filamenta antepetalina oblonga, versus apicem gradatim angustata vel leviter dilatata, apicibus truncatis emarginatis vel obtusis. Ovarium 3-loculare, parte inferiore ad hypanthium connatum; ovula 2 per loculum. Fructus: hypanthium hemisphaericum, ovario calyce-lobum superanti. Semina reniformia, arillata, c.1.5 mm longa; testa minute colliculata, brunnea.

Typus: 10 km North of Lake Cronin, c. 84 km E of Hyden, W.A., 13 September 1981, K. Newbey 8798; (holo: PERTH; iso: CANB, K, MEL, NSW).

Low, spreading, or sometimes rounded, subshrub to 50 cm tall and 60 cm across; branchlets slender to thick, woody. *Leaves* sessile, quadrifarious, overlapping, or rarely distant and appressed; lamina oblong to elliptic or suborbicular, rarely lanceolate, obtuse or rarely acute, 0.6-3.2 mm long, 0.4-0.8 mm wide, shallowly concave above and convex to deeply convex (semi-circular) below, glabrous or with few to many white, short to long and tangled, hairs on margins. *Flowers* 1-5 near tips of branchlets, solitary in axils of upper leaves, erect; anthopodium 0.8-2.2 mm long; peduncle 0.1-0.4 mm long; bracteoles cymbiform 0.8-1.7 mm long, glabrous or margins produced into long tangled white hairs. *Hypanthium* hemispherical, 1.7-2.6 mm diameter; calyx lobes slightly spreading to spreading, triangular to semi-circular to obtuse, 0.7-1.2 mm long, glabrous or the margins produced into tangled white hairs. *Corolla* light pink to almost white, 5.0-9.0 mm across; petals suborbicular to broad-elliptic or almost square, clawed, spreading. *Stamens* 10, one opposite each petal and calyx lobe. Filaments of antepetalous stamens oblong or tapering, rarely dilated near apex, 1.2-1.7 mm long by 0.6-0.9 mm wide, apices emarginate, truncate or obtuse, not exceeding anthers; antesepalous filaments oblong to narrow oblong or tapering, 0.9-1.2 mm long by 0.4-0.5 mm wide, fused to antepetalous filaments for half to three quarters of their length, apices acute to obtuse; anthers c. 0.25-0.3 mm long, opening in parallel slits; connective gland globular to shortly cylindrical. *Ovary* 3-locular, top level with staminophore, lower quarter to half fused to hypanthium. Style stout, tapering, reaching to half way between antepetalous and antisealous anthers, or rarely exceeding antepetalous anthers; stigma barely capitate to capitate. Placentas oval. Ovules 2 per loculus, collateral. *Undehisced fruit:* hypanthium hemispherical; capsule expanded, exceeding calyx lobes. *Dehisced fruit:* hypanthium becoming flat; valves opening widely.

Fruit pendent. *Seeds* reniform, c. 1.5 mm long, arillate; testa mid brown, shiny, minutely colliculate. Figure 1.

Selected specimens. WESTERN AUSTRALIA: 57 km S of Marvel Loch, *K. Newbey* 8793 (MEL, NSW, PERTH); 16 km E of Lake Cronin Crossroads, E of Hyden on Norseman Road, *N.G. Marchant* 72/747 (PERTH); 30 km NE of Swallow Rock, Frank Hann National Park, c. 73 km ENE of Lake King, *K. Newbey* 6836 (NSW, PERTH); 13 km SW of Mt. Day, c. 130 km W of Norseman, *K. Newbey* 5295 (AD, PERTH); 42 km W of Mt. Glasse, Bremer Range, *K. Newbey* 5573 (AD, PERTH); 31 km W of Ponier Rock, c. 75 km SSW of Balladonia Motel, Eyre Highway, *K. Newbey* 7323 (PERTH).

Distribution. Endemic to Western Australia, found from south and east of Marvel Loch to Mt Holland, the Johnston Lakes and Frank Hann National Park, and one record from near Ponier Rock, c. 75 km SSW of Balladonia Motel. Map 3.

Habitat. *Rinzia sessilis* has been collected in *Eucalyptus concinna* low open woodland, *Eucalyptus* spp. very open shrub mallee, *E. transcontinentalis* open shrub mallee, *Eucalyptus falcata* very open shrub mallee, *Acacia* scrub, *Callitris* open scrub, mixed low scrub and heathland with *Grevillea excelsior* and *Triodia*. The soils include white sands, granitic loamy sands, deep aeolian sands and gravelly loamy sand. The species has been collected in a variety of habitats, including a slight slope into a salt lake, gentle undulating plains, a low lateritic ridge, a colluvial flat and a slope above a freshwater claypan. The broad range of edaphic, topographic and vegetation types in which this species occurs is somewhat puzzling, given its fairly limited distribution.

Notes. A number of specimens of this species have white hairs along the margins of the leaves, bracteoles and calyx lobes. These hairs are exceptional in the genus and the subtribe Baeckeinae, they are considered to represent a recent development rather than to indicate an affinity to species elsewhere in the Myrtaceae (i.e. outside the Baeckeinae) which have hairs.

Hair-like processes, which occur in small groups at the base of the adaxial surface of the antepetalous stamens, may be vestigial stamens.

The embryo has not been described since only one seed was seen and this was not dissected.

Conservation status. Known from only one National Park (Frank Hann National Park), at the southern end of its known distribution, where it seems to be not very common. Its conservation status is therefore unsatisfactory.

Etymology. The specific epithet refers to the sessile leaves, in which *R. sessilis* is unique in the genus.

12. *Rinzia crassifolia* Turcz., Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg ser. 2, 10: 331 (1852). *Type:* Drummond 5th collection number 122, South West Australia (holo: KW (n. v.) iso: MEL, PERTH).-*Baeckea platystemona* Benth, Fl. Austral. 3: 74 (1867). *Type:* Drummond 5th colln. no. 122, (lecto (here selected): K (n. v.); isolecto: MEL, PERTH).

Prostrate or spreading to erect subshrub, to 20 cm tall and 40 cm across. *Leaves* slightly spreading to divaricate, rarely appressed, distant to crowded; lamina straight or slightly recurved, linear to narrow-oblong, occasionally oblong or narrow-elliptic, obtuse, 2.0-9.5 mm long, 0.5-1.5 mm wide, shallowly to deeply plano-convex, smooth; petiole c. 0.1 mm long. *Flowers* 1-6 (12) on a shoot, solitary in leaf axils; anthopodium 1.2-6.5 mm long;

peduncle 0.2-0.4 mm long; bracteoles narrow-elliptic to oblong; almost flat to cymbiform 1.6-3.8 mm long, green or reddish. *Hypanthium* hemispherical to shortly cylindrical, 2.2-3.5 mm diameter; calyx lobes erect, triangular to obtuse, 1.3-2.1 mm long (longer than hypanthium), green or reddish-brown with petaline margin. *Corolla* white, less commonly pink, 7.5-11.0 mm diameter; petals suborbicular to broadly ovate with a stout claw. *Stamens* 10, or rarely 12, in a cone around the style, one opposite each petal and calyx lobe, crowded, not to slightly exerted, shortly fused at the base; antepetalous filaments oblong, emarginate, 1.2-2.2 mm long, 0.8-1.2 mm wide; antesepalous filaments tapering, 0.9-1.3 mm long, 0.5-0.6 mm wide; anthers 0.3-0.5 mm long, equalling or exceeding filaments, opening in parallel slits; connective gland small, globular. *Ovary* 3-, or rarely 4-locular, globular to shortly cylindrical, equalling staminophore, lower quarter (or less) fused to hypanthium; style stout, equalling anthers; stigma capitate. Placentas oval; ovules 2 per loculus, collateral. *Undehisced fruit*: hypanthium saucer-shaped, ovary expanded and exceeding calyx lobes. *Dehisced fruit*: hypanthium almost flat; valves obtuse, opening very widely. *Seeds* reniform, 1.5-1.9 mm long, arillate; testa mid to dark brown, dull, verrucose. *Embryo* filling seed; radical massive, cotyledons on a slender neck and appressed to radicle.

Selected specimens. WESTERN AUSTRALIA: Gooseberry Hill, Kalamunda, *R.J. Cranfield* 1353/80 (PERTH); Youndegin, 1890, *Alice Eaton* (MEL 76194); 9 km SW of Calingiri, *M.E. Trudgen* 2195 (AD, CANB, MEL, NSW, PERTH); 3 miles N of Watheroo then 2 miles W, *M.E. Trudgen* 2199 (CANB, PERTH); Watheroo, *C.A. Gardner* 1948 (PERTH); Between Bolgart and Calingiri, *S. Paust* 1004 (PERTH).

Distribution. Endemic to Western Australia and found only from Watheroo south to the Darling Range near Perth and eastwards to near Meckering. Map 4

Habitat. Known from heaths, *Allocasuarina* thickets and Wandoo (*Eucalyptus wandoo*) woodland. Usually from areas with lateritic soils (sand or clay) but also from one location with sandy soil over chert.

Notes. The habit of *Rinzia crassifolia* is quite variable, ranging in form from totally prostrate to a small shrub.

The verrucose seeds are quite distinctive in the genus. Although somewhat similar testa surfaces are found in some species of related genera, these species differ in a range of characters including other seed characteristics and the number and type of stamen.

Occasional plants are 6-merous, their flowers having 6 petals, 6 calyx lobes, 12 stamens and 4 ovary loculi, otherwise these plants seem perfectly normal.

Conservation status. *Rinzia crassifolia* has not been recorded from any conservation reserve and is not a common plant, so its conservation status must be considered uncertain at this stage. There are areas of State Forest within its range where it may occur.

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