

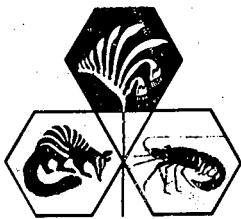
*S.D. Hepper*

RARE AND GEOGRAPHICALLY RESTRICTED  
PLANTS OF WESTERN AUSTRALIA

**10**

Geographically restricted plants  
of the northern sandplains  
between the Moore and Twin Rivers

E.A. GRIFFIN  
1981



DEPARTMENT OF  
FISHERIES AND WILDLIFE  
108 ADELAIDE TERRACE  
PERTH.

CONFIDENTIAL  
UNPUBLISHED REPORT

RARE AND GEOGRAPHICALLY RESTRICTED PLANTS OF WESTERN AUSTRALIA.

Restricted Species of the Northern Sandplain between  
the Moore and Irwin Rivers.

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DEPT. CONSERVATION &  
LAND MANAGEMENT  
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INTRODUCTION

The northern sandplains of Western Australia, centred on the Eneabba - Mt. Lesueur area have long been recognised as an important floristic region of Western Australia. This region has been reported as having a high species richness (George et. al. 1979) and high endemism (Hnatiuk and Hopkins in press, Speck, 1958).

In this report, the plant species restricted to this region are reported. Specimens held in Western Australia herbaria are recorded and their distributions mapped. The assessment of rarity, geographic restriction and conservation status of these species are presented. Important geographic areas within the region are identified and discussed in relation to vegetation systems (Beard 1976a, 1976b, 1979a, 1979b) and geomorphic regions (Baxter 1977) in another paper (Griffin and Hopper in prep.).



## METHODS

After investigation of the distributions of geographically restricted species presented in Marchant and Keighery (1979), the limits of the study area were set at the Moore and Irwin Rivers and the coast and the Great Northern Highway (Figure 1). The study area coincides with the Southern half of the Conservation Through Reserves Committee's System 5 (EPA 1975).

Specimens considered for this report included those reported by Marchant and Keighery (1979), Hopkins and Hnatiuk (1981), Rye and Hopper (1981), Rye (in press) and personal unpublished observations. Species which are included in this report are those which are exclusively (or almost so) restricted to the study area. Some taxa were not included as they were undergoing taxonomic revision. In the cases of Grevillea and Daviesia the specimens were on loan and unavailable and in Eremaea there was substantial revision in progress.

Collections recorded were lodged in the Western Australian Herbarium, Kings Park and Botanic Gardens Herbarium and the Herbarium of the University of Western Australia, Botany Department.

Distribution maps were prepared from the collection data as well as personal observations and those of S.D. Hopper (Conostylis).

Rarity, geographic restriction and occurrence in major conservation reserves was assessed (see Table 1).

Hnatiuk and Hopkins (in press), Griffin, Hopkins and Hnatiuk (in prep) Griffin, Hopper and Hnatiuk (in prep) have reported a large number of apparently undescribed taxa from the area. A list of apparently undescribed taxa from the Eneabba - Mt Lesueur area, including known distributions and habitat preferences was prepared.

## RESULTS

Table 1 provides a summary of the range, and an assessment of geographic restriction, rarity and occurrence in conservation Reserves for 84 taxa. The complete data are presented in Appendix 1.

Including nine species which have been gazetted Rare, under the Wildlife Conservation Act 1950-1979, there was a total of twenty-three species which are considered rare or possibly rare.

Of the 84 taxa reported here, as being restricted to the study area, only five species had ranges greater than 160 km. Twenty-four of the taxa have ranges less than 50 km (Very Geographically Restricted - VGR).

An additional 66 apparently undescribed taxa are reported from the Eneabba - Mt Lesueur Area (Appendix 2).

115° E

116° E

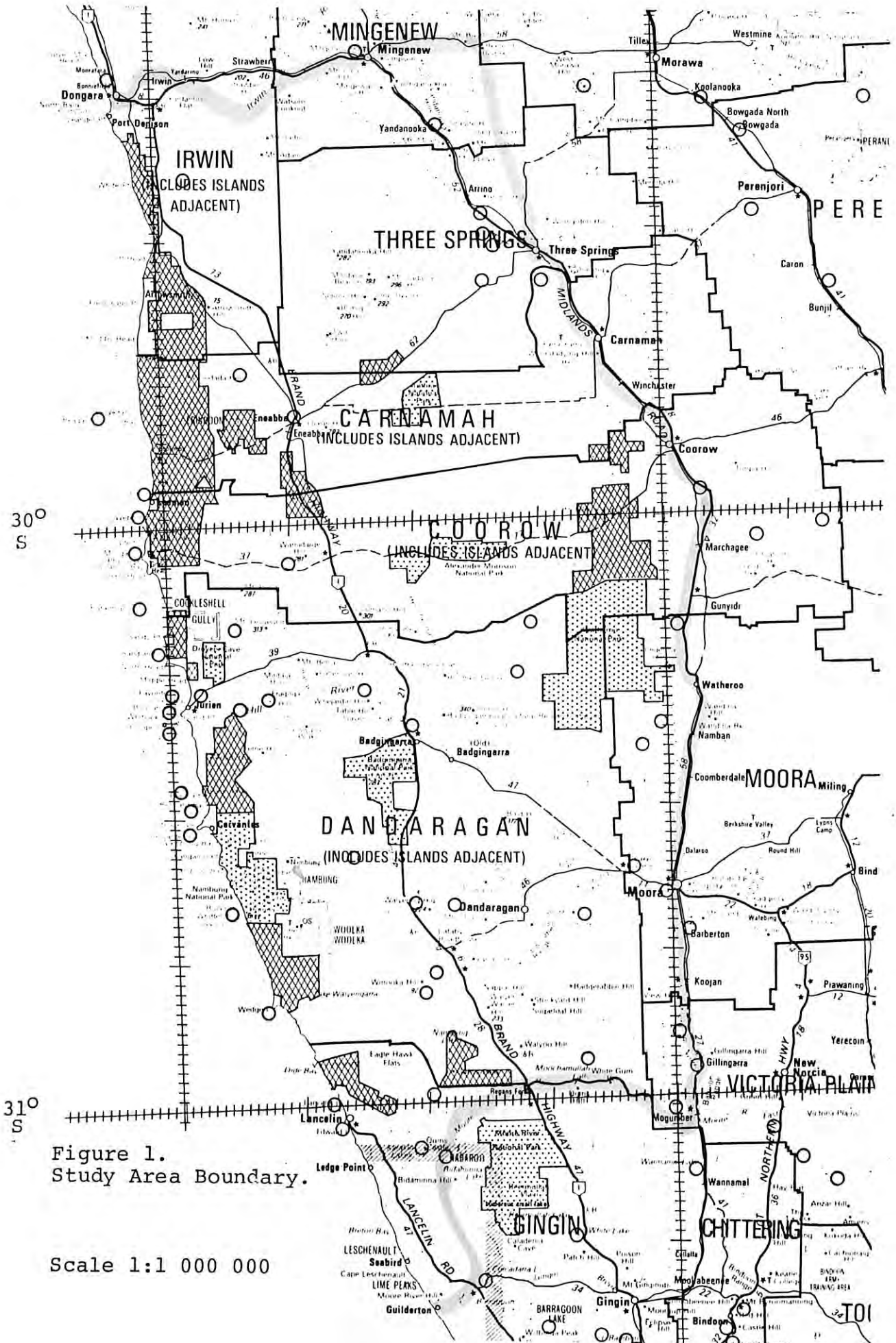


Figure 1. Study Area Boundary.

Scale 1:1 000 000

TABLE 1. RANGE, RARITY, GEOGRAPHIC RESTRICTION AND CONSERVATION STATUS OF PLANT SPECIES RESTRICTED TO STUDY AREA. (For explanation of Columns see end of Table).

SPECIES	APPROXIMATE GEOGRAPHIC RANGE						COLUMNS					
	1	2	3	4	5	6	1	2	3	4	5	6
<i>Acacia epacantha</i>				Dandaragan - Eneabba			-			GR	*	
<i>Acacia fagonioides</i>				Eneabba - Three Springs (Outlier at Toodyay)			-			GR	+	
<i>Acacia flabellifolia</i>				Watheroo - Yandanooka			-		?R	GR	?	3KC
<i>Acacia forrestiana</i>				Dandaragan - East of Mt Peron			C		?VR	GR	*	1X#
<i>Acacia plicata</i>				Cataby - Mt Lesueur area			F			GR	*	2V
<i>Acacia retrorsa</i>				Mt Benia - Cockleshell Gully			B		? VGR		*	2R
<i>Acacia volubilis</i>				Dandaragan - Cockleshell Gully			D		?R	GR	*	
<i>Adenanthos strictus</i>				Watheroo - Marchagee			D			GR	+	2VC
<i>Alexgeorgia subterranea</i>				Cataby - Eneabba			E			GR	++	
<i>Banksia burdettii</i>				Mogumber - Winchester			F			GR	+	2VC
<i>Banksia chamaephyton</i>				Mogumber - Eneabba			D			GR	++	
<i>Banksia grossa</i>				Cataby - Eneabba			-			GR	++	
<i>Banksia hookerana</i>				South Eneabba - Irwin River			E			GR	++	2VC
<i>Banksia lanata</i>				Badgingarra - West of Three Springs			B			GR	++	
<i>Banksia micrantha</i>				Badgingarra - Eneabba			-			GR	++	
<i>Banksia tricuspis</i>				Mt Lesueur area			+		B	R	VGR	* 2VC
<i>Caladenia crebra</i>				Eneabba - Irwin River			D			GR	*	2E
<i>Calothamnus longissimus</i>				Moora - Three Springs			E				++	2E
<i>Calytrix superba</i>				Eneabba			B			VGR	++	2EC
<i>Casuarina grevilliioides</i>				Mogumber - Winchester			E			GR	++	
<i>Casuarina ramosissima</i>				Mogumber - Eneabba			E			GR	+	2V
<i>Comesperma acerosum</i>				Badgingarra - Eneabba			D			GR	++	2K

## SPECIES

## APPROXIMATE GEOGRAPHIC RANGE

1 2 3 4 5 6

<i>Conospermum nervosum</i>	Badgingarra - Eneabba	E		GR	++	
<i>Conostylis aculeata</i> ssp. <i>breviflora</i>	Dandaragan - West of Three Springs	-		GR	++	
<i>Conostylis</i> sp. ( <i>angustifolia</i> )	Cataby - Three Springs	-		GR	++*	
<i>Conostylis aurea</i> var. ( <i>tomentosa</i> )	Eneabba - Arrowsmith River	-		VGR	?	
<i>Conostylis crassinervia</i>	Moora - Arrowsmith River	E		GR	++	
<i>Corynanthera flava</i>	Watheroo - East of Eneabba	-		GR	++	2VC*
<i>Cryptandra humilis</i>	Regans Ford - Three Springs	E			++	2K
<i>Darwinia helichrysoides</i>	Mt Benia - Eneabba	-		VGR	*	
<i>Darwinia neildiana</i>	Cataby - Three Springs (Outlier - Muchea)	-		GR	++	
<i>Darwinia sanguinea</i>	Badgingarra - Eneabba	-		GR	++*	
<i>Darwinia speciosa</i>	Badgingarra - Mt Adams (Outlier - Binnu)	-		GR	++	
<i>Diplolaena ferruginea</i>	Badgingarra - Mt Adams (Outlier - Burma Road)	E			++	2RC
<i>Dryandra nana</i>	Dandaragan - Coomallo Creek	E		GR	+	2V
<i>Dryandra sclerophylla</i>	Regans Ford - Eneabba	D		GR	++*	3K
<i>Dryandra subulata</i>	Badgingarra - Alexander Morrison National Park	-	?	GR	+	2V
<i>Dryandra tortifolia</i>	Cataby - Eneabba	-		GR	++	
<i>Dryandra tridentata</i>	Coomallo Creek - Irwin River	E		GR	++	2RC
<i>Eremophila microtheca</i>	Lake Logue plus Port Gregory	D	VR	#	?	
<i>Eriostemon pinooides</i>	Dandaragan - East of Eneabba	-		GR	++	2RC
<i>Eucalyptus johnsoniana</i>	South of Eneabba	+ D	VR	VGR	+	2E





## SPECIES

## APPROXIMATE GEOGRAPHIC RANGE

1 2 3 4 5 6

<i>Phlebocarya pilosissima</i>	Badgingarra - West of Winchester	D	GR	+	2V
<i>Physopsis spicata</i>	Moora - Carnamah (Outlier York)	-	? GR	+	
<i>Pityrodia viscida</i>	Three Springs - Mingenew	-	? GR	o	
<i>Scholtzia teretifolia</i>	Regans Ford - Alexander Morrison National Park	F	GR	++	
<i>Sphaerolobium macranthum</i> var. <i>pulchellum</i>	Badgingarra - Eneabba	-	GR	++	
<i>Stawellia dimorphantha</i>	Arrowsmith River - Irwin River	+	?R VGR	?	2E
<i>Strangea cynanchocarpa</i>	Badgingarra - Eneabba	E	GR	++	2RC
<i>Stylidium aeonoides</i>	Badgingarra - Mt Peron	D	VGR	++	2RC
<i>Stylidium inversiflorum</i>	Badgingarra - Eneabba	D	GR	++	2K
<i>Stylidium nonscandans</i>	Regans Ford - Alexander Morrison National Park	-	GR	+	
<i>Tetradthea remota</i>	Mt Lesueur area	D	?VR VGR	*	2E
<i>Thomasia formosa</i>	West of Three Springs	D	?R VGR	o	2K
<i>Thysanotus spiniger</i>	Regans Ford - Eneabba	D		++	2R
<i>Thysanotus vernalis</i>	Hill River - Cockleshell Gully	C	?R VGR	*	2V
<i>Urocarpus phebaloides</i>	Mt Lesueur - Cockleshell Gully area	+	R VGR	*	3V
<i>Verticordia patens</i>	Mogumber - Badgingarra	-	? GR	+	
<i>Xanthosia tomentosa</i>	Mt Lesueur - Cockleshell Gully area (Outlier Glen Forest)	E	VGR	*	2RC

\*\*\*\*\*

COLUMN 1. Gazetted Rare (Rye and Hopper 1981)

COLUMN 2. Categories of Marchant and Keighery (1979)

B - Rare (apparently rare and quite restricted distribution).

C - Represented in the Western Australian Herbarium only by a Type specimen.

- D - Poorly collected (less than five collections in the Western Australian Herbarium).
- E - Geographically restricted with a range less than 100 km.
- F - Geographically restricted with a range less than 160 km.
- - not included.

- COLUMN 3.** Definitions of Rarity and Geographic Restrictions (Rye 1980)
- VR - Very Rare - having less than a few hundred reproductively mature plants in natural populations.
  - R - Rare - having less than a few thousand reproductively mature plants in natural populations.
  - VGR - Very Geographically Restricted - having a maximum geographical range of less than 50 km.
  - GR - Geographically Restricted - having a maximum geographic range greater than 50 km but less than 160 km.
  - ? - Before either VR or R indicates uncertain knowledge of the abundance of this species, but is probably at least "Rare".
  - ? - Alone; information does not allow classification.
  - Blank indicates species probably not Rare.

- COLUMN 4.** Geographic Restriction Category (See Table 1).
- VGR - Very Geographically Restricted ( $< 50$  km)
  - GR - Geographically Restricted ( $> 50 < 160$  km)
  - # - Small populations from widely separated locations.
  - Blank range greater than 160 km.

**NOTE:** these categories exclude rare outlying occurrences.



COLUMN 5.

Conservation Status

Occurrences in Reserves > 2,000 ha for Conservation of Flora or Flora and Fauna.

o - Not known from Reserves with little opportunity remaining to be found in one.

? - Not known from Reserves but possibility exists to find such occurrences.

\* - Known from a proposed Reserve (EPA 1975).

+ - Known from existing Reserve.

++ - Known from two or more existing Reserves.

COLUMN 6.

Categories of Leigh et al. (1981) (added as an Addendum)

Distribution Categories.

1. - Type collection only.

2. - Very restricted distribution (< 100 km)

3. - Small populations, distribution > 100 km.

Conservation Status.

X - Presumed extinct.

E - Endangered.

V - Vulnerable.

R - Rare but not Endangered or Vulnerable.

K - Poorly known, inadequate field distribution information.

C - Known from conservation Reserve.

\* - Exploitation may adversely effect conservation status.

# - Species uncertain taxonomic status.

## DISCUSSION

A complete discussion of the data presented here will be provided in another paper (Griffin and Hopper in prep.).

The 84 taxa reported in detail here include two undescribed taxa (Conostylis spp.). The total number of taxa which are restricted to the study area appears to be much greater than the 82 described ones reported here. Most of the 66 apparently undescribed taxa in the Eneabba - Mt. Lesueur area are probably geographically restricted and there are likely to be many more, as this list does not include any from the Coorow area.

The twenty-three rare or probably rare taxa included nine Gazetted Rare species (Rye and Hopper 1981). This does not include all the known rare species of the area as some of the more widespread species which occur in the area have been Gazetted Rare (i.e. Eucalyptus rhodantha, Spirogardnera rubescens and Stachystemon axillaris). Many of the new species will probably also be proven as rare.

## ADDENDUM

Species were excluded from this report if their distribution was not confined to the study area. However some of the species are substantially confined to the study area. Most of such species are included in Appendix 3.

### ACKNOWLEDGEMENTS

This project was funded by the Department of Fisheries and Wildlife. I would like to thank the curators of the Western Australian Herbarium, Kings Park and Botanic Gardens Herbarium and University of Western Australia Botany Department Herbarium for their permission to examine the specimens in their control. I am especially grateful to the following for advice on the distribution of some taxa: Dr. S.D. Hopper, Mr. G.J. Keighery, Dr. N.G. Marchant, Mr. B.R. Maslin and Dr. B.L. Rye. To Mrs D. Reading, I extend my thanks for her patient typing.

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APPENDIX 1. Details For Each Species Included in this Report.

For each species there are Brief Descriptions; Distribution Maps and Specimens held in Herbaria.

Notes on Descriptions and References.

1. Reference cited first is the original description of the taxa.
2. + in front of the reference indicates the reference used in the description which follows.
3. Additional references which provide photographs or additional information.

Notes on Distribution Maps.

- ▼ Collections accurately located.
- ▽ Collections approximately located.
- Observations accurately located.

Some collections could not be located on a map.

Other symbols are from base map (Dept. Fisheries and Wildlife, Nature Reserves and National Parks 3.6.1980 scale 1:1 000 000.

Detailed map of the Mt Lesueur region is from 1:50 000 sheets Lesueur and Coomallo Creek (Department Lands & Survey) photo reduced to scale approximately 1:800 000.

Notes on Specimen Data Sheets.

1. KP indicates specimens' at Kings Park Herbarium.
2. UWA indicates specimens at Botany Department, Herbarium Uni. W.A.
3. Specimens not seen but given in type descriptions have been indicated.
4. Type specimens are indicated.

Acacia epacantha (Maslin) Maslin

+ Nuytsia 2:359(1979)

5. *Acacia epacantha* (Maslin) Maslin stat. nov.—based on *A. lasiocarpa* var. *epacantha* Maslin.

*Acacia lasiocarpa* Benth. var. *epacantha* Maslin, Nuytsia 1(5): 416, Fig. 6 I-J, Map 4 (1975)  
Type: 15 km S of Badgingarra towards Dandaragan, Western Australia, 3 Aug. 1973  
B. R. Maslin 3247 (holo: PERTH; iso: CANB, K, MEL, NSW, NY, PERTH).

Recent pollen studies by Ph. Guinet (pers. comm.) reveal significant differences from *A. lasiocarpa* Benth., which when combined with gross morphological features, seem to justify specific rank for this taxon. The pollen of *A. epacantha* is distinctive in that the central area of its central monad is divided into four parts whereas in *A. lasiocarpa* it is undivided. Other features distinguishing *A. epacantha* from *A. lasiocarpa* are its simple (not reduced racemose) inflorescences which are borne on the solitary axillary spines (not at their bases) and its slightly broader, curved to circinnate legumes (flat or undulate in *A. lasiocarpa*). In foliage characters *A. epacantha* is separated from *A. lasiocarpa* (excluding var. *bracteolata* Maslin) by a combination of the following attributes: pinnules consistently 2 pairs and normally 6–10 mm long, pinna rachis 1–2 mm long with an acute, normally dark brown apex which is 0.5–1.5 mm long. As noted previously (Maslin, l.c.) *A. epacantha* is related to *A. lasiocarpa* var. *bracteolata* by its foliage (a relationship supported by pollen morphology—Ph. Guinet, pers. comm.) but is distinguished, in addition to the characters noted above, by its branch indumentum, its longer, strigose peduncles, its non-mottled seeds and its hairy legumes.

Access to mature fruiting material permits the following seed description to replace the one I gave previously. This revised description is based on B. R. Maslin 4355, 24 Nov. 1976, 15 km S of Badgingarra towards Dandaragan (PERTH).

Seeds longitudinal in the legume, obloid to orbicular, somewhat compressed, 3–3.5 mm long, ca 2 mm wide, light brown to dark brown, glossy; *pleurogram* continuous or open towards the hilum, black; *areole* ca 2 mm long and 1 mm wide; *funicle* minute (ca 0.3 mm long) and filiform, reflexed below a clavate or sometimes once-folded, thickened, pale yellow aril.

*Acacia epacantha*, together with *A. megacephala* and three other species discussed below viz. *A. fagonioides*, *A. lasiocarpa* and *A. pulchella*, are the only members of the *Pulchellae* possessing axillary spines. As the present paper deals with major taxonomic changes involving most of these taxa, a key to them is provided.

Key to species of *Pulchellae* with axillary spines (N.B. spineless individuals occur in both *A. lasiocarpa* and *A. pulchella*—see key given in Maslin (1975) for these variants).

- 1a. Inflorescences borne on the solitary axillary spines ..... 2
- b. Inflorescences arising from branch at base of the axillary spines; spines 1–2 per node ..... 3
- 2a. Pinnules flat, glaucescent, 2–4 pairs, less than 6 mm long. (Toodyay and Éneabba districts) ..... *A. fagonioides*
- b. Pinnules revolute, dark green, 2 pairs, normally 6–10 mm long. (Dandaragan to Badgingarra) ..... *A. epacantha*
- 3a. Pinnules prominently recurved to revolute; branchlets and peduncles hairy; spines 1 per node. (Widespread in S.W. Western Australia; a variable species) ..... *A. lasiocarpa*
- b. Pinnules flat; branchlets and peduncles sometimes glabrous; spines 1–2 per node ..... 4
- 4a. Flowers 80–90 per head; peduncles 15–25 mm long; pinnules 3–6 x 1.5–3 mm; branchlets densely shortly pilose. (Geraldton district) ..... *A. megacephala*
- b. Flowers 10–40(50) per head; peduncles normally not exceeding 10 mm long ..... 5
- 5a. Hairs on branchlets and peduncles retrorse; peduncles ca 10 mm long; spines 1 per node; pinnules normally slightly recurved, 3–4 pairs, discolorous, = prominently 1-nerved below. (Geraldton to Murchison River) *A. lasiocarpa* var. *lasiocarpa*—variant
- b. Characters not combined as above. (Widespread in S.W. Western Australia; a variable species) ..... *A. pulchella*



3e. var. *epacantha* B. R. Maslin var. nov.—Figs. 6I-J

*Frutex* 30–50 (70) cm altus; *rami* antrorse puberuli ad strigosi. *Spinae* 10–20 mm longae. *Pinnae* unijugatae; *pinnulae* 2-jugae, (4·5) 6–10 mm longae, revolutae, glabrae ad sparsim antrorse puberulae. *Glans* stipitata, minuta. *Pedunculi* spinarum axillis bractearum summarum (raro infimarum) exorientes, antrorse strigosi. *Bracteolae* in alabastro prominentes. *Calyx* et corolla 5-nervosa. *Legumina* plerumque curva ad circinata, breviter pilosa. *Semina* (prope maturitas) in legume longitudinalia, ± orbicularia, complanata.

*Type*: 15 km S of Badgingarra towards Dandaragan, Western Australia, 3 Aug. 1973, B. R. Maslin 3247 (holo: PERTH; iso: CANB, K, MEL, NSW, NY, PERTH).

Rather dense, ± rounded *shrub*, 30–50 (70) cm tall, to 150 cm diam.; *branches* slightly flexuose, moderately antrorsely puberulous to strigose, brown. *Spines* 10–20 mm long, bracts 2 (inflorescence arising from axil of upper, rarely lower, bract). *Stipules* 1–2 mm long. *Petiole* less than 0·5 mm long; *terminal seta* 1–2 mm long, dark brown; *pinna rachis* 1–2 mm long, apex 0·5–1·5 mm long acute and normally dark brown; *pinnules* 2 pairs, (4·5) 6–10 mm long, glabrous to sparsely antrorsely puberulous. *Gland* minute. Inflorescences simple; *peduncles* arising from axil to uppermost (rarely also lowermost) bract on spine, 7–8 mm long, moderately antrorsely strigose; *flower heads* bright yellow, ca. 6 mm diam. at anthesis (10 mm in fresh state), with 23–26 flowers. *Bracteoles* prominent in bud, ca. 2·5 mm long, prominently inflexed, glabrous to sparsely puberulous; *claws* ca. 1 mm long; *laminae* narrowly ovate, ca. 1·5 mm long, brown. *Calyx tube* 5-nerved (nerves ± thickened); *petals* 2 mm long, 1-nerved (nerve thickened). *Legumes* normally curved to circinnate, 15–40 x (4) 5–7 mm, moderately to densely shortly pilose (hairs slightly inflated, ± transparent), dark brown. *Seeds* (near maturity) longitudinal in legume, ± orbicular and flattened, 3–3·5 mm diam., light brown.

*Distribution and habitat*: (Map 4) South-west Western Australia; restricted to an area from near Dandaragan to Badgingarra (about 200 km due north-northwest of Perth). This variety appears to favour lateritic loam or clay soils.

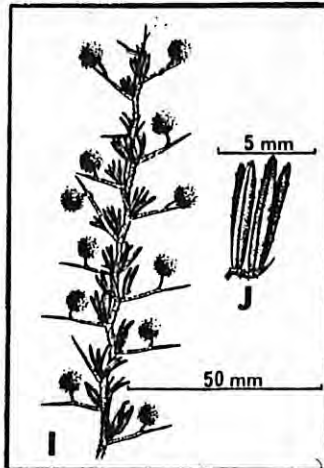
WESTERN AUSTRALIA: North of Dandaragan. C. A. Gardner 9285; 15 km N of Badgingarra, P. G. Wilson 3838 (AD, BRI, PERTH).

*Flowering and fruiting period*: Flowering specimens have been collected in August, while a fruiting specimen (with near-mature seeds) has been collected in November.

The peduncle arising from the axil of the uppermost bract on the spine readily distinguishes var. *epacantha* from the other infraspecific taxa of *A. lasiocarpa*. It is interesting to note that this same unusual inflorescence arrangement occurs also in *A. pulchella* R.Br. var. *fagonioides* (Benth.) Macbride.

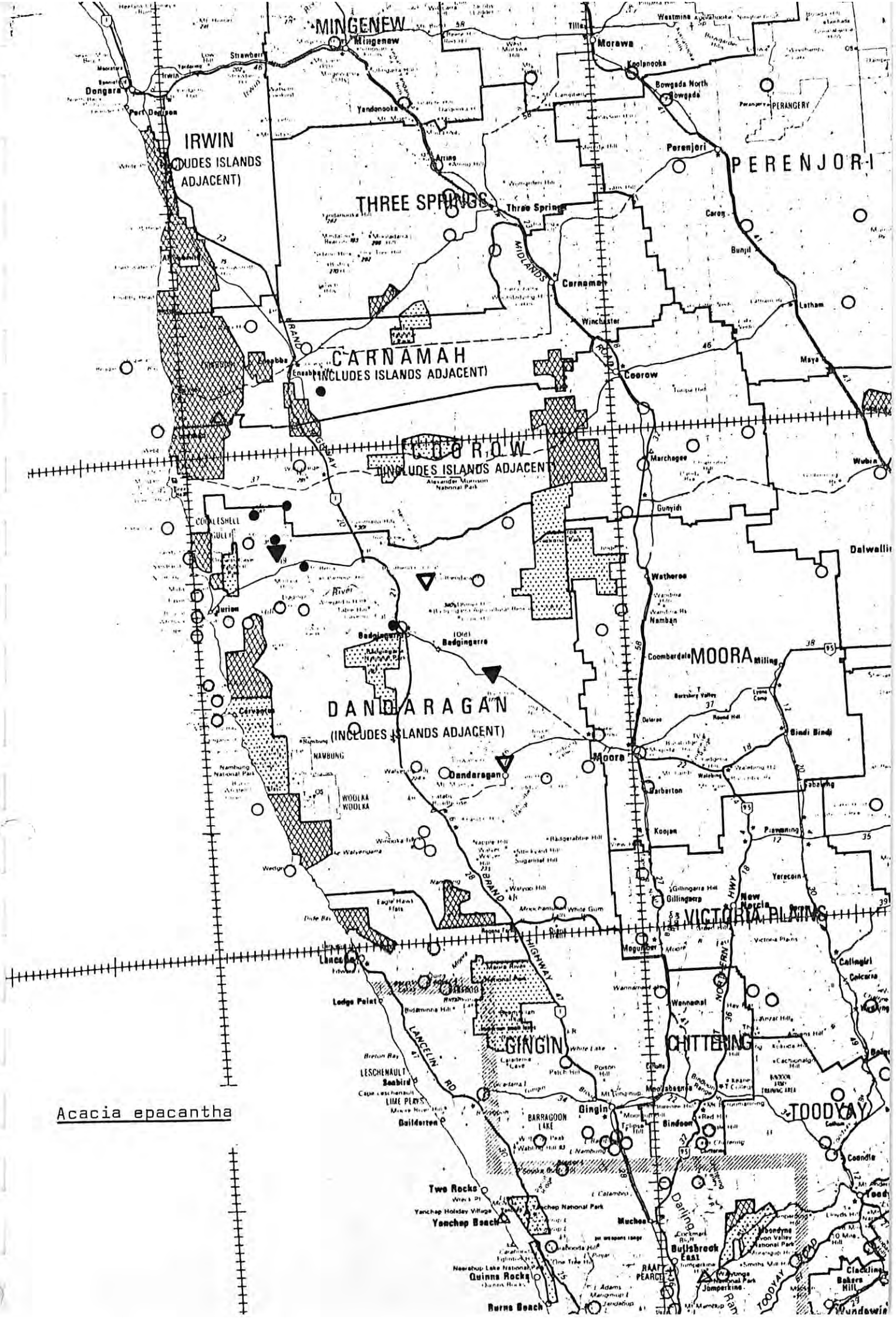
This variety appears to be most closely related to var. *bracteolata* B. R. Maslin. Both these taxa have similar pinnules as well as dark brown terminal setae and pinna rachis apices. In addition to its inflorescence arrangement, var. *epacantha* is distinguished from var. *bracteolata* by its branch indumentum, its longer, strigose peduncles, and its legume characters.

The varietal epithet refers to the fact that the inflorescence is positioned on the axillary spine.



I to J—var. *epacantha*: I—Portion of branch showing inflorescence positioned on spine. J—Pinna.

I-J from B. R. Maslin 3247 (the type);



Acacia epacantha

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Acacia spicantae* (Maslin) Maslin Family *Leguminosae* Date Recorded 13. 4. 1981

Speci. NO.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
Type locality	North of Dandaragan 15 km S of Badgingarra towards Dandaragan	Lateritic clay heath	19. 8. 79	Y	C.A. Gardner 9285
	5 km S of mt Lesueur, NE of Jurin	low open heath grey sand over lateritic duricrust	24. 11. 1976 5. 12. 1979	Bud Bud	B.R. Maslin 4355 E.A. Griffin 2662
Holotype	15 km N of Badgingarra 15 km S of Badgingarra towards Dandaragan	gravelly loam on hillside	2. 11. 1965 3. 8. 73	Bud + fruit Y	P.G. Wilson 3838 B.R. Maslin 3247

Acacia fagonioides Benth.

London J. Bot. 1:387 (1842)

+ Nuytsia 2:360 (1979)

#### 6. *Acacia fagonioides* Benth.

*Acacia pulchella* R. Br. var. *fagonioides* (Benth.) Macbride; Maslin (1975), Nuytsia 1(5): 405.

In the light of other rank changes given in the present paper and having now seen mature fruits of *A. fagonioides* I consider it best to treat this taxon as a distinct species rather than as a variety of *A. pulchella* as I had previously done. Access to mature fruiting material permits the following description to replace the one given previously; this description is based on *C. Chapman* s.n., Nov. 1976, Eneabba district (PERTH).

*Legumes* narrowly oblong, 30–80 mm long, 7–12 mm wide (size very variable), hard and brittle to  $\pm$  firmly chartaceous, flat, raised over seeds, dark brown, slightly pruinose, glabrous, sparsely reticulate, abruptly contracted at both ends; *margins* thickened, yellowish to light brown, not (or rarely) prominently contracted between seeds. *Seeds* variably placed in legume (longitudinal to oblique or sometimes transverse), ellipsoid to spheroid, turgid, 3–4 mm long, 3–3.5 mm wide, dark brown, shiny; *pleurogram* open towards the hilum; *areole* ca 2 mm long and 1 mm wide; *funicle* expanded into a clavate or once-folded aril.

*Acacia fagonioides* occurs in a small group of species distinguished from the other members of the *Pulchellae* by their axillary spines and stipitate glands. A key to the recognition of these species is given above. Within this group, *A. fagonioides* is most closely related to *A. pulchella* from which it differs in inflorescence arrangement, strigose branchlets (glabrous or with patent hairs in *A. pulchella* except sometimes in var. *subsessilis*) and wider legumes and seeds.

An interesting example of parallel evolution exists between *A. fagonioides* and *A. epacantha* (see above). These species are closely related to *A. pulchella* and *A. lasiocarpa* respectively from which they differ (among other characters) in the same important feature viz. their inflorescences are simple (not racemose) and are borne on the axillary spines instead of at their bases. Both species have restricted ranges in the northern sandheaths while *A. pulchella* and *A. lasiocarpa* are both widespread throughout the southwest of Western Australia. Interestingly Ph. Guinet reports (pers. comm.) that the pollen of *A. epacantha* is very different from that of *A. lasiocarpa* (see p. 362) but that of *A. fagonioides* is essentially the same as that of *A. pulchella*.



**1e. var. *fagonioides* (Benth.) Macbride, Contr. Gray Herb. Harv. New Series 59:8 (1919)—Figs. 4M-O**

*Acacia fagonioides* Benth., Lond. J. Bot. 1:387 (1842). Type: "Swan River, Drummond." (probable holo: K—photograph seen, see discussion below.)

Intricately branched *shrub* 0.5–1 m tall, to ca. 1 m diam.; *branches* yellowish to grey; *branchlets* moderately strigose (hairs antrorse or retrorse), sometimes spinescent, very obscurely ribbed, reddish to yellowish. *Spines* 1 per node, 3–12 mm long (inflorescence arising from axil of uppermost bract on spine). *Stipules* 0.5–1 mm long. *Petiole* minute; *terminal seta* 0.5–1 mm long; *pinna rachis* 2–6 mm long; *pinnules* 2–4 pairs, normally obovate, 2.5–5.5 x 1.5–3.5 mm, glaucous to subglaucous, glabrous to glabrescent, nerveless above, nerveless or 1-nerved below. *Gland* minute, not exceeding terminal seta. *Inflorescences* simple; *peduncles* arising from axil of uppermost bract on spine, 4–8 mm long, glabrous to strigose; *flower heads* 4–8 mm diam. at anthesis, with 13–25 flowers. *Calyx* ca.  $\frac{1}{2}$  length of corolla, tube glabrous and  $\pm$  nerveless; petals 1.5–2 mm long, 1-nerved (nerve  $\pm$  thickened). *Legumes* (nearly mature) 40–80 x 7–9 mm, glabrous; *margins* slightly (rarely prominently) contracted between seeds. *Seeds* (nearly mature) longitudinal in legume but proximal and distal seeds sometimes tending towards oblique, elliptic, 6 x 4.5 mm.

*Distribution and habitat:* (Map 1) South-west Western Australia: excluding the Drummond specimens (see below and also the type) for which no precise locality data is given, var. *fagonioides* is known only from two widely separated localities, i.e. near Toodyay and near Eneabba. It grows in both lateritic soil in Jarrah-Marri forest (Toodyay) and gritty sand in low sandplain scrub (Eneabba).

WESTERN AUSTRALIA: Western Australia, *J. Drummond* 2:154 (K—photo seen, MEL); West of Toodyay, Toodyay-Perth road, *N.T. Burbidge* 8034; Just south of the Arrowsmith River on Eneabba-Arrino road, *C. Chapman* s.n., 1 July 1973 (B, CANB, CBG, K, L, MEL, NSW, NY, PERTH), also 25 Oct. 1973; Near Eneabba, *C. Chapman* s.n., 24 June 1973.

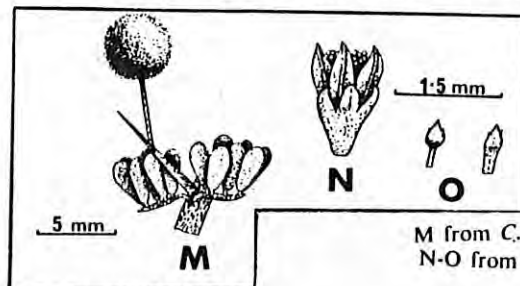
*Flowering and fruiting period:* Flowers in June and July; near-mature legumes have been collected in October.

In the original description of *A. fagonioides*, Bentham (1842) cited only one collection: "Swan River, Drummond." Meisner (1848, p.205) repeated Bentham's earlier description but cited "Swan River, Drummond coll. II:

No. 154." At Kew (K) there are three specimens of *A. fagonioides* all of which are labelled, Swan River, Drummond (photograph seen by the author). Two of these specimens are mounted together (sheet stamped "Herbarium Hookerianum, 1867") while the third is mounted separately (sheet presented to Kew by the Linnean Society, 1915)—the last sheet also bears the inscription (in a different hand), "2nd ser. (collection) no. 154." This last specimen, together with the right hand specimen on the Herbarium Hookerianum sheet, are probably part of the same collection; at Melbourne (MEL) there is a specimen labelled "154" which could also belong to this collection. As Drummond's Second Collection was not dispatched from the Swan River until January 1844 (two years after the publication of *A. fagonioides*), the collection labelled, Swan River, Drummond II: 154 cannot be the type. The specimen here regarded as the probable holotype of *A. fagonioides* is the left hand specimen on the Herbarium Hookerianum sheet referred to above. This specimen accords very well with Bentham's original description.

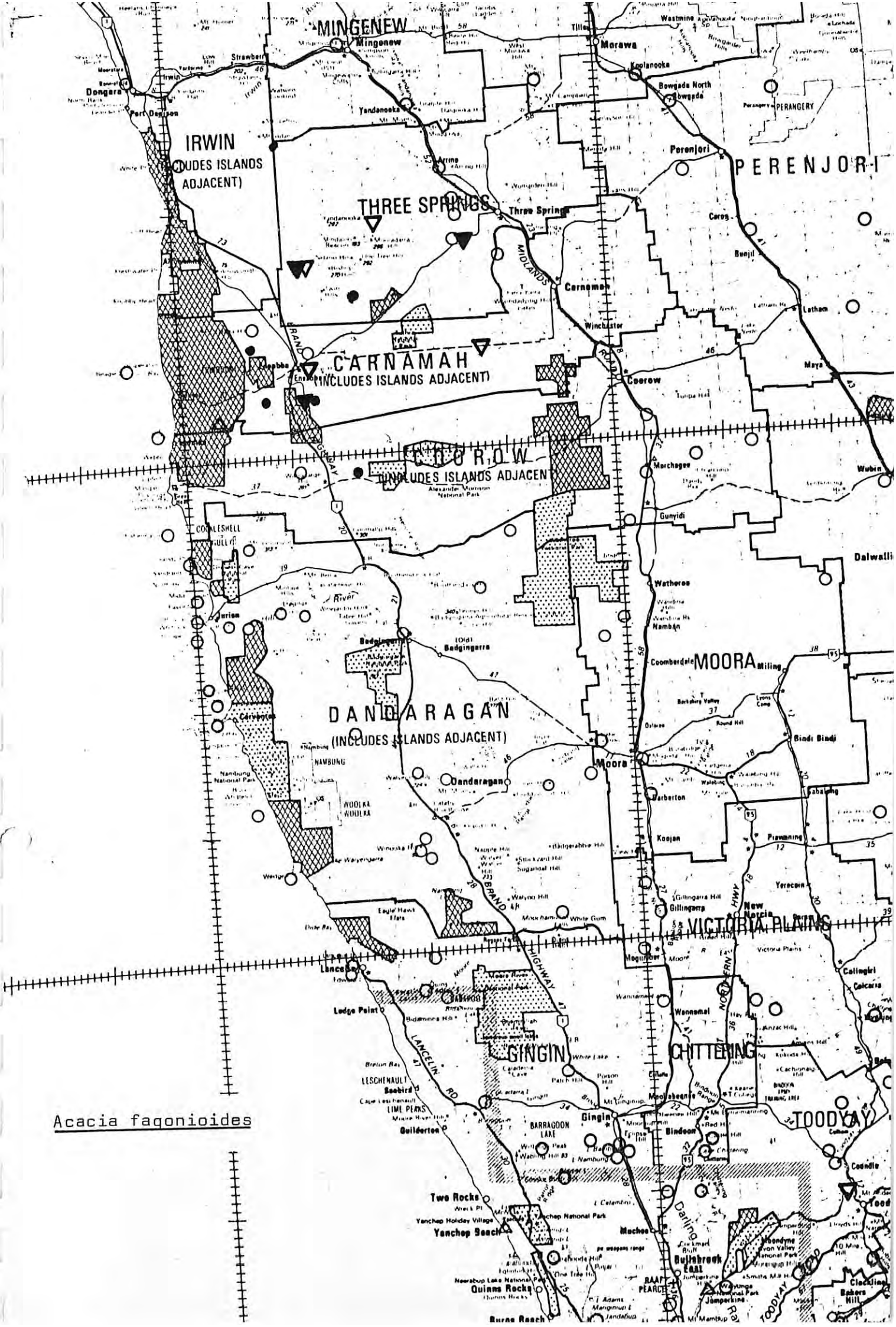
Although Bentham (1864) relegated *A. fagonioides* to synonymy under *A. pulchella*, Macbride regarded it as a variety of that species. It is Macbride's treatment which is followed here.

This variety is distinguished from the other infraspecific taxa of *A. pulchella* by its inflorescences being borne near the apex of the solitary axillary spines. It is interesting to note that this same unusual spine-inflorescence relationship occurs also in *A. lasiocarpa* Benth. var. *epacantha* B. R. Maslin. Other characters useful in recognizing var. *fagonioides* include its strigose branchlets and its few, normally obovate, glaucous to subglaucous pinnules.



M to O—var. *fagonioides*:  
M—Portion of branch, N—  
Flower, O—Bracteoles.

M from *C. Chapman* s.n., 24 June 1973;  
N-O from *J. Drummond* 2: 154;



Acacia fagonioides



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Acacia faganoides* Benth. .... Family *Leguminosae* ..... Date Recorded 1.5.81 .....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	24 m. west of Three Springs, S of Arrowsmith River		5.10.73	Fruit	C. Chapman. s.n.
	Near Eneabba		24.6.73	Y Flower	C. Chapman s.n.
	Just S of Arrowsmith R. on Eneabba - Arrino rd. WA	in gritty sandy soil in low sand plain scrub	1.7.73	Y	C. Chapman s.n.
	6-9 km from Arrowsmith R. crossing on (Bland Hwy) Dongara - Eneabba Rd - towards Three Springs	scrub, 0.3 m high	22.9.68	Fruit	E.M. Canning WA/68 3312
	1.9 km from turnoff to Perth on Nornalby Rd going E from Cervantes	1 m white sand	26.9.76	Fruit	M. Simmons 527a
	Carnamah Rd from Eneabba at Rd 15 turnoff	1 m white sand	24.9.76	Fruit	M. Simmons 511
	14.5 km W of Three Springs towards Eneabba Eneabba District	Yellow sand in low lying area	4.10.72	N	B.R. Maslin 3074
	W. of Toodyay, Toodyay to Perth Rd "Swan River"	Marri forest, drainage line	Nov 76	Fruit	C. Chapman s.n.
probable Isotype.	8 km S of Eneabba 29°53'S 115°16'E	low open heath, deep grey sand	10.1.72	N	N.T. Burbidge 8034 J Drummond II: 154
			16 9 77	Fruit	R J Thwaites 771110



Acacia flabellifolia W.V.Fitzc.

+ J. W. Austral. Nat. Hist. Soc. 1: 11-12 (1904)

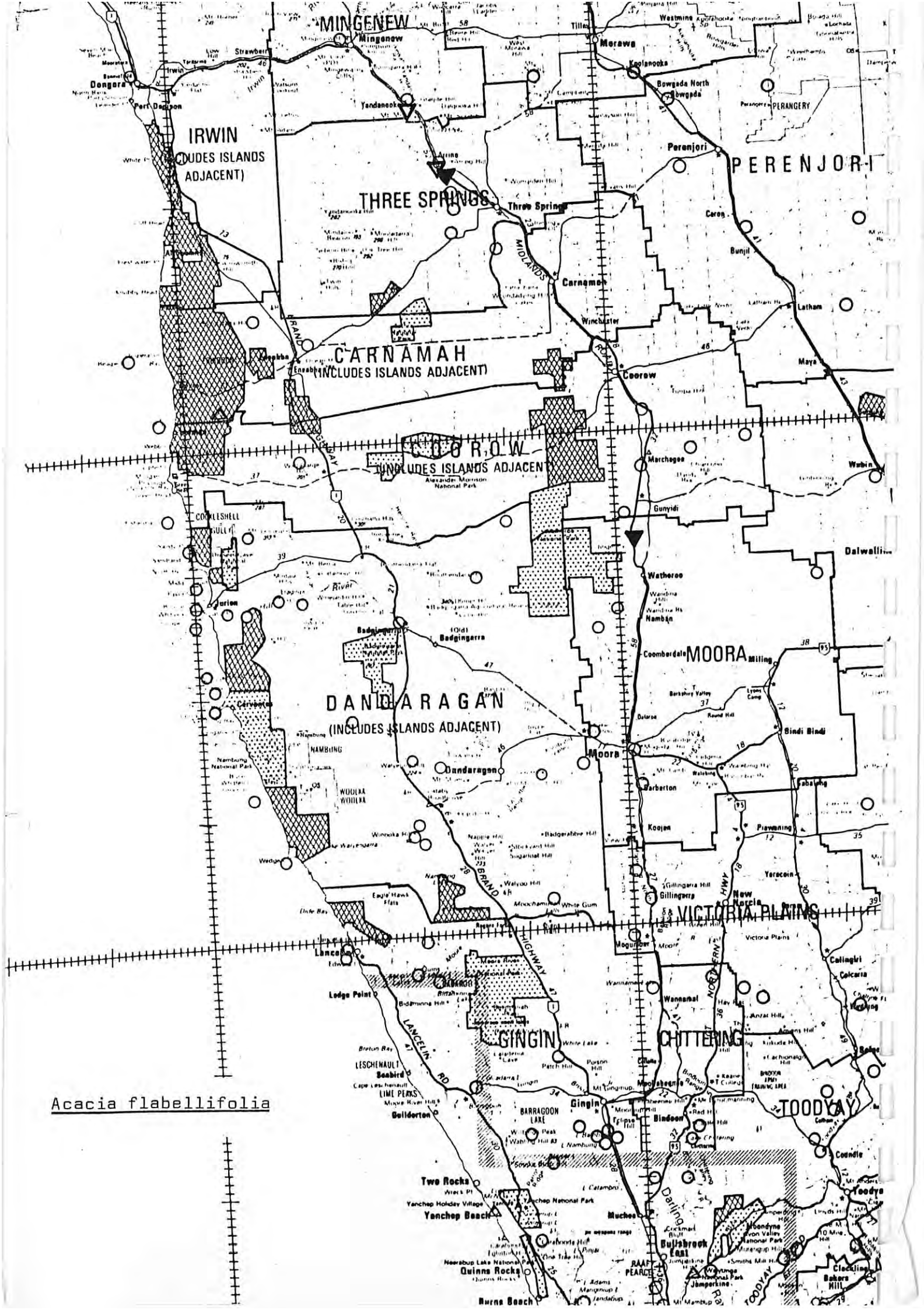
**ACACIA FLABELLIFOLIA, Sp. nov.—**

A rigid shrub of 1½ ft. high; branches divaricate, conspicuously striate, invested with coarse white hairs and often spinescent. Phyllodia broadly cuneate-triangular or flabelliform, rigid, undulate, mostly 3-6 lines long, and hardly as broad at the apex, the principal nerve slightly removed from the lower almost straight margin, and terminating in a slender pungent point, with several faint usually bifurcated nerves ascendant from the base, the upper angle rounded, rarely gland-bearing. Stipules setaceous or almost spinescent, hardly persistent. Peduncles usually solitary, ½ inch long, bearing each a globular head of 20 or more 5-merous flowers. Calyx turbinate, shortly and broadly lobed, ciliate, half as long as the petals. Petals free or shortly connate, glabrous, with prominent midribs. Pod (not mature) much twisted, glabrous, about 2 lines broad, constricted between the seeds; valves flat and thin.

*Locality.*—Arrino, Sept. 1903.—W.V.F.

*Remarks.*—Closely allied on the one side to *A. dilatata*, Benth., and on the other to *A. bidentata*, Benth., differing from both slightly in phyllodia, and essentially in the flowers. The latter are very near those of *A. acanthoclada*, F. v. M., differing in the comparatively shorter calyx, and usually free petals with apparent midribs.





*Acacia flabellifolia*



Acacia forrestiana E.Pritzel

+ in Diels & E.Pritzel, Bot. Jahrb. Syst. 35: 298 (1904)

**Acacia Forrestiana** E. Pritzel n. sp.

Frutex erectus ramosus, ramulis cum phyllodiis junioribus pedunculisque hirsutis. Phyllodiis erectis cuneatis triangularibus, ca. duplo longioribus quam latis, uninerviis, marginibus incrassatis, margine transversali integro vel ad apicem nervi mediani paulo emarginato in spinam phyllodio ca. duplo brevioribus sursum versam rectam excurrente, angulo superiore ca. rectangulari paulo rotundato, angulo inferiore acuto. Nervo medio saepe non omnino mediano sed margini superiori approximato. Pedunculis in axillis superioribus solitariis, quam phyllodia brevioribus vel vix subaequis. Capitulis globosis majusculis ca. 15—20-floris, bracteis subulatis, hirsutis, ex capitulis inapertis exsertis, floribus 5-meris, sepalis nullis vel minimis liberis truncatis longe hirsutis; corolla lobata, lobis tubo brevioribus vel aequilongis.

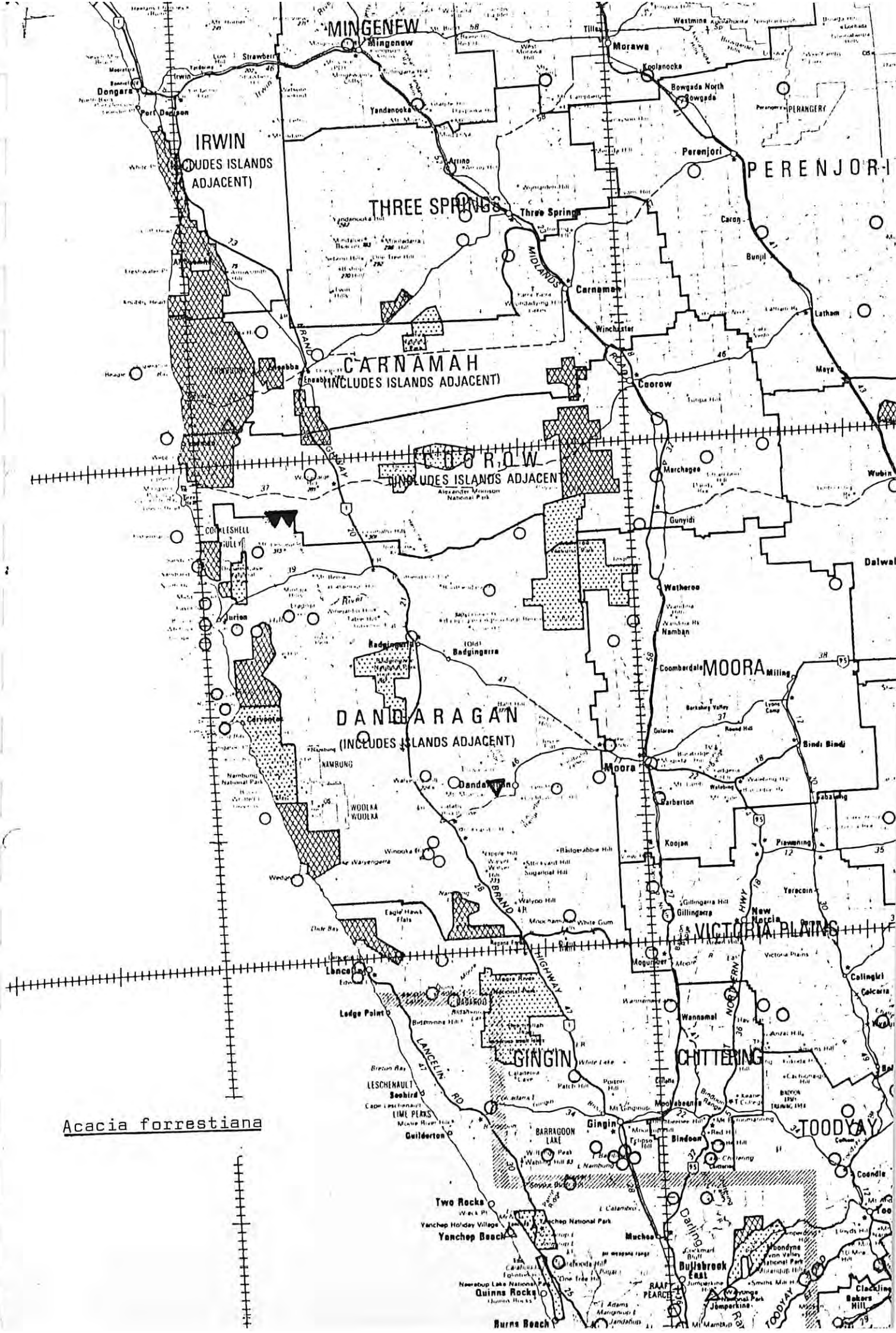
Fruticulus ca. 0,5 m altus. Phyllodia 1—2 cm longa, 0,5—1 cm lata (margine transversali), spina ca. 3—4 mm longa. Pedunculi 0,5—1 cm longi, capituli 0,5—1 cm diam.

Hab. in distr. Avon-septentrionali prope Dandaragan in collibus apertis glareosis, flor. m. Dec. (D. 5764).

Species structura florum *A. Huegelii* Benth. valde affinis, sed phyllodiis triangularibus dissimilis et sectioni *Triangulares* § *Uninerves* inserenda.

Note; This species may prove conspecific with  
A. Huegelii Benth. (B.R.Maslin pers. comm)





Acacia forrestiana





Acacia plicata Maslin  
 + Nuytsia 1: 451-453 (1975)

17. *Acacia plicata* B. R. Maslin sp. nov.—Fig. 22

*Frutex* 1-1.5 m altus; *rami* dense breviter pilosi; *spinae* axillares nullae. *Folio* bi pinnata; *rhachis* 4-13 (20) mm longa; *pinnae* (1) 2-3(4) jugae; *rhachis pinnarum* proximalium 2-5 mm longa, aliarum (5) 10-20 (25) mm longa; *pinnulae* pinnarum proximalium 1-2 jugae, aliarum 2-8-jugae, (4) 6-15 x 1-4 mm, parum recurvae ad revolutae. *Glans* sessilis, in pagina supera rhachidis posita; etiam glans minor in rhachidibus aliquot aut omnibus pinnarum infra insertionem 1-3 summorum pinnularum. *Pedunculi* 20-25 mm longi, puberuli ad glabrati. *Capitula* globulosa, 40-55-floribus. *Bracteolarum laminae* pilis prominentibus (ad 1.5 mm longis) patulis, eburneis, vestitae. *Florae* 5-merae; *calycis lobi* oblongi ad triangulares, ad apices pilis plerumque paucis prominentibus, patulis, eburneis, vestiti. *Legumina* plicata, 10-20 x 5 mm, modice ad dense hispidula. *Semina* in legumine obliqua, 3-4 x 2-3 mm.

*Type*: Green Range, Western Australia, 19 Aug. 1949, C. A. Gardner 9333 (holo: PERTH; iso: CANB, K, MEL).

Erect, openly branched *shrub*, 1-1.5 m tall; *branches* inconspicuously ribbed, dark greyish (epidermis often white on branchlets), densely shortly pilose; axillary spines absent. *Stipules* 2-2.5 x ca. 0.4 mm, scarious, ciliate on margin and below, glabrous above. *Leaves* bipinnate, indumentum as

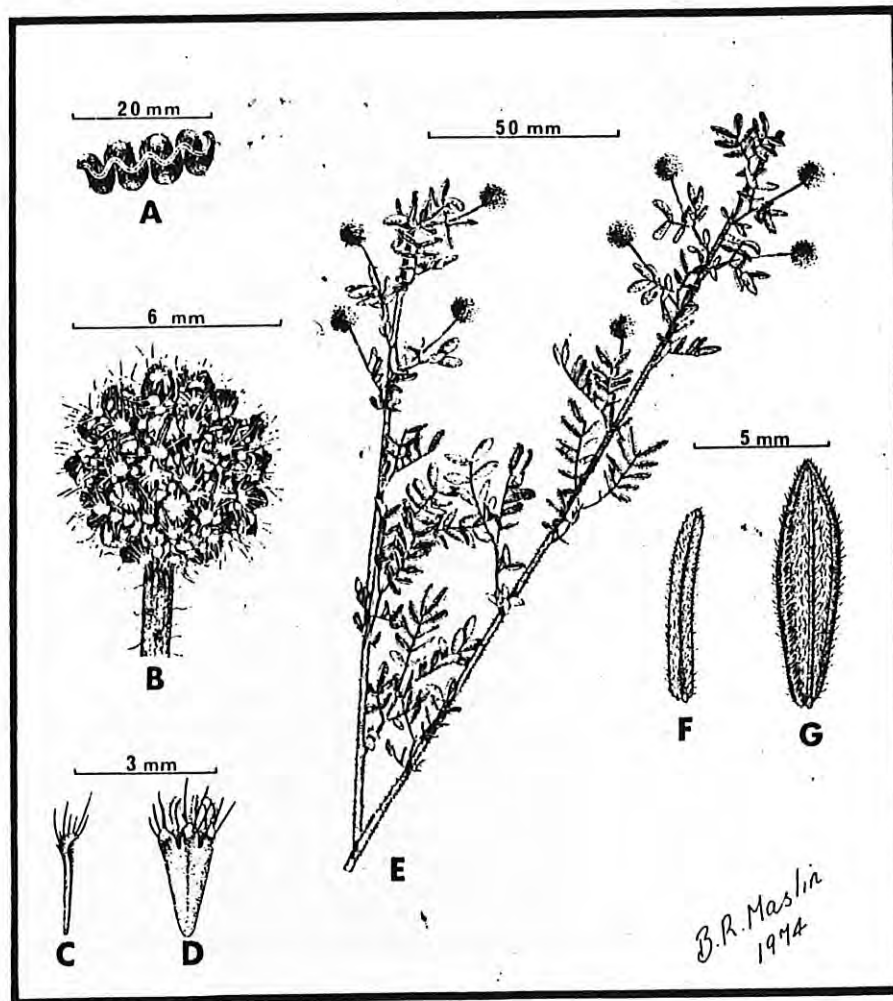


Figure 22—*Acacia plicata*. A—Plicate legume. B—Flower head. C—Bracteole (note conspicuous hairs on lamina) D—Flower (note conspicuous hairs on calyx lobes). E—Portion of branch system. F and G—Pinnule variation (lower surface). A and F from H. Demarz 1526; B-D from C. A. Gardner 9333 (the type); E from H. Demarz 1526; G from B. R. Maslin 1474.



on branches (hairs shorter on pinnules); *petiole* ca. 1 mm long; *rachis* 4–13 (20) mm long, commonly channelled above between first two pair of pinnae, narrower and ribbed above between subsequent pinnae; *terminal seta* linear to narrowly triangular, 1.5–3 mm long; *pinnae* (1) 2–3 (4) pairs; *pinna rachis* 2–5 mm long on proximal pinnae, (5) 10–20 (25) mm long on remaining pinnae, ribbed above, apex brown and 1–2 mm long; *pinnules* 1–2 pairs on proximal pinnae, 2–8 pairs on remaining pinnae, narrowly oblong to narrowly obovate, (4) 6–15 x 1–4 mm, slightly recurved to revolute, light green to yellow-green, densely puberulous, nerveless or obscurely 1-nerved above, 1-nerved below. *Gland* situated on upper surface of rachis, on 2-jugate leaves the gland is inserted below the distal pair of pinnae, it is subsequently present or absent if pinnae 3–4 pairs; a small gland occurs below insertion of uppermost 1–3 pairs of pinnules on some or all pinnae rachides; sessile, circular, 0.5 mm diam. or less, lip and orifice prominent. *Inflorescences* simple; *peduncles* solitary, 20–25 mm long, puberulous to glabrescent, base ebracteate at anthesis;

*flower heads* globular, 7–8 mm diam. at anthesis, with 40–55 flowers. *Bracteoles* 2 mm long; claws narrow, glabrous; laminae somewhat thickened, inflexed, bearing conspicuous (to 1.5 mm long) spreading white hairs abaxially. *Flowers* 5-merous; *calyx* 2/3–4/5 length of corolla, divided for 1/5–1/3 its length into oblong to  $\pm$  triangular slightly thickened lobes which normally bear a few conspicuous (ca. 0.5 mm long) spreading white hairs at the apex, readily separating into oblong-spathulate sepals, tube glabrous and obscurely 5-nerved; *petals* 2.5–3 mm long, connate for 2/3–4/5 their length, glabrous, 1-nerved; *ovary* glabrous to glabrescent. *Legumes* plicate with up to 8 conspicuous folds, 10–20 x 5 mm, prominently raised over seeds, moderately to sparsely puberulous, light to dark brown; *margins* not contracted between seeds, pale coloured. *Seeds* oblique in legume, broadly elliptic, 3–4 x 2–3 mm, dark brown to black, shiny; *Pleurogram*  $\pm$  obscure, open towards the hilum; *areole* 1.5–2 x 1–1.3 mm; *funicle* filiform, straight or with 1–2 short folds, abruptly expanded into a short straight thickened aril.

*Distribution and habitat*: (Map 8) South-west Western Australia: the Hill River district, about 200 km due NNW of Perth. As indicated from the areas sampled to date, *A. plicata* is not a particularly common species; it appears to grow only in loam or loamy clay where sedimentary rocks (sandstone and siltstone) occur. This species is typically found along watercourses in association with York Gums (*Eucalyptus loxophleba* Benth.) and Wandoo (*E. wandoo* Blakely).

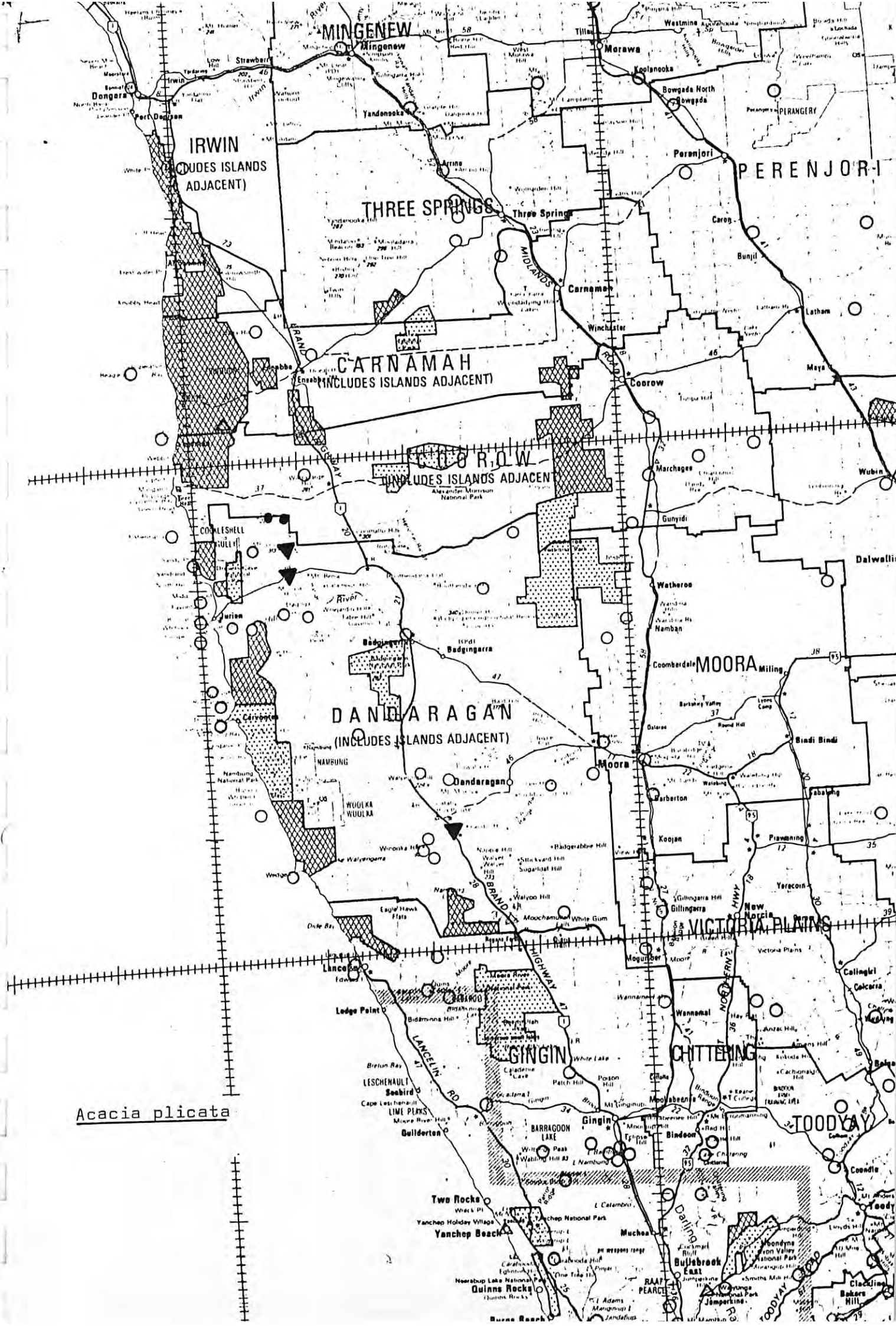
WESTERN AUSTRALIA: 100 mile post on Eneabba road, *H. Demarz* 1907 and 1526; Western Australia, *J. Drummond* s.n. (MEL 49692 and 49693); Jurien Bay district, *S. James* s.n., Aug. 1967 (UWA 1132); Cataby Brook (near 100 mi peg on Perth-Jurien Bay Road), *B. R. Maslin* 1474 and 2626 (B, BRI, PERTH); About 12 mi due E of Jurien Bay, *B. R. Maslin* 2624 (AD, NSW, PERTH).

*Flowering and fruiting period*: Flowers from August to October; young legumes appear in October and mature in mid-November (some bushes retain undehiscent legumes until March).

*Acacia plicata* is recognized by its densely hairy branches and leaves, its bracteole-laminae and calyx lobes bearing long, white, spreading hairs at their apices, and its plicate legumes. This species also has glands on its pinnae rachides, a character not particularly common in the *Pulchellae* (otherwise known only in *A. empelioclada* B. R. Maslin and *A. leioderma* B. R. Maslin, also sometimes in *A. gilbertii* Meisn., *A. lasiocarpa* Benth. var. *villosa* (E. Pritzel) B. R. Maslin and *A. luteola* B. R. Maslin.

The exact taxonomic position of *A. plicata* within this Series is uncertain. The ebracteate peduncles and  $\pm$  triangular calyx lobes indicate an affinity with *A. drummondii* Lindl. and its allies (see p. 394). However, the globular flower heads, eglandulose petioles, and plicate legumes distinguish *A. plicata* from this group. Its general leaf morphology, ebracteate peduncles, and globular flower heads suggest some affinities with *A. drewiana* W. V. Fitzg. subsp. *drewiana* and *A. preissiana* (Meisn.) B. R. Maslin. However, the decurrent leaves of the former, and the prostrate habit plus the flower morphology of the latter, readily distinguish these taxa from *A. plicata*.

The specific epithet alludes to the very distinctive pleated nature of the legumes.



Acacia plicata



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Acacia plicata* Maslin ..... Family *Leguminosae* ..... Date Recorded 13. 4. 1981 ....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	100 mile post Eneabba Rd. (N of Legans ford)		10.8.1969	Y	H. Demar 2 D1526
	100 mile p. bridge	gravel, sand	Nov 1969	Fruit	H. Demar 2 1907
	Cataby Brook, 100 miles on Perth-Jurien Rd	w/td Wandoo	14.3.1972	N	B.R. Maslin 2626
	12 miles E of Jurien	grey/brown, loamy/clay	14.3.1972	N	B.R. Maslin 2624
		Wandoo York gum near creek			
	Cataby Brook, 101 mile peg Eneabba-Gingin Rd	rocky, loamy soil near water course	21.10.1970	N	B.R. Maslin 1474
	Cataby Brook, 101 mile peg Eneabba-Gingin Rd	rocky, loamy soil near water course	21.10.1970	N (Fruit)	B.R. Maslin 1474a
	Cataby Brook, 100 mile peg Perth-Jurien Rd		2.10.1972	N	B.R. Maslin 2993
	Jurien Bay District			N	T.E.H. Aphin n.s.
	20 km due E of Jurien		24.11.1976	N	B.R. Maslin 4358
	Cataby River	Clay, Wandoo, winter wet	15.8.1976	Y	E. Withwer 1827
	Valley 1 km E of Mt Lesueur NE of Jurien	low open forest, Wandoo	5.9.1979	Y	E.A. Griffin 2140
		grey/brown sandy loam			
		over sandstone			
Holotype	Green Range		19 8 49	Y	C. Gardner 9333
	11-11 P...			Y	n. Ro. v. n. 144

A.S. OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Acacia plicata* Maslin ..... Family *Leguminosae* ..... Date Recorded 13.4.81  
 \* Specimens not seen, from Description of Maslin

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
*	Western Australia		Aug 1967		J Drummond - MELBOURNE 49692 STAMS (UWA 113)
*	Jurien Bay district				

Acacia retrorsa Meisn.

Bot. Zeitung (Berlin) 13: 10 (1855)

+ Benth. Fl. Austral. 2: 331

as variety of A. sphacelata Benth.

34. **A. sphacelata**, Benth. in Hook. Lond. Journ. i. 338. A rigid shrub, the branches not very stout, nearly terete, glabrous or pubescent. Phyllodia scattered, linear-subulate, erect or spreading, rigid and tapering into a pungent point, mostly  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, with 1 or rarely 2 prominent nerves on each side. Stipules minute. Peduncles mostly solitary, short, bearing each a small globular head of 15 to 20 or more flowers, mostly 5-merous. Sepals distinct, linear-spathulate, with dark tips, half as long as the corolla. Petals free, smooth. Pod not seen.—Meisn. in Pl. Preiss. i. 12.

**W. Australia**, Drummond, 1st Coll. n. 299; Mount Currie, Preiss, n. 985 (which I have not seen).

Var. *sessilis*. Branches woolly. Flower-heads almost sessile. Pod, according to Meisner, linear, straight, flat,  $1\frac{1}{2}$  in. long,  $1\frac{1}{4}$  lines broad, with thickened margins, woolly when young, at length glabrous.—*A. sessilis*, Benth. in Hook. Lond. Journ. i. 336; Meisn. in Pl. Preiss. i. 11, ii. 202.—Swan River, Drummond, 1st Coll., Preiss, n. 979, 980, 982; Murchison river, Oldfield.

Var. *retrorsa*. Phyllodia reflexed.—*A. retrorsa*, Meisn. in Bot. Zeit. 1855, 10.—Between Moore and Murchison rivers, Drummond, 6th Coll. n. 4.

Some specimens have almost the aspect of *A. striatula*, but differ in their 1- or rarely 2-nerved phyllodia, and very short peduncles.







Acacia volubilis F. Muell.

+ Fragm. Phyt. Austral. 10: 98 (1877)

LEGUMINOSÆ.

*Acacia volubilis.*

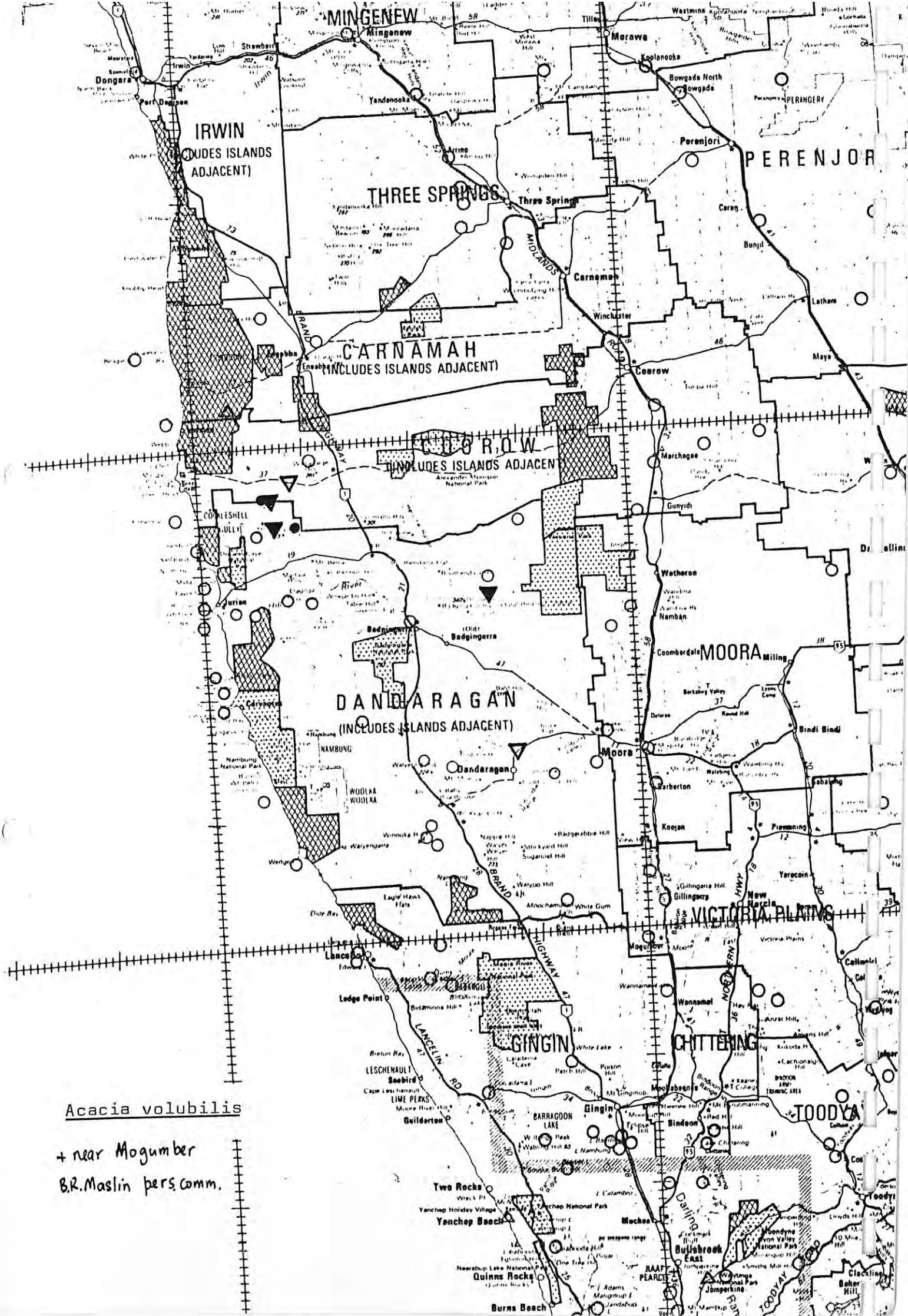
(Sect. Calamiformes.)

Primum breviter pilosula, ramis valde tortilibus sulcato-striatis glabrescentibus, phyllodiis brevibus tetragono-linearibus muticis articulate ramulo insertis, capitulis solitariis pedunculo perbrevis sericeo-pubescenti impositis plurifloris, bracteis lineari-lanceolatis extus margineque sericeis, calycis quinquefidi laciniis deltoideo-semilanceolatis ciliosis, petalis calyce saltem duplo longioribus striolatis infra medium connatis fere glabris.

Ad Boxvale trans urbem York; Julia Wells.

Ramuli circiter lineam crassi, irregulariter sed insigniter torti. Phyllodia 2-8" longa, circiter 1" crassa. Stipulae brevissimae, subulatæ, tarde deciduæ. Pedunculi  $1\frac{1}{2}$ -2" longi. Bractea vix lineam longæ, fere stipitata. Corolla rigidula, pæne  $1\frac{1}{2}$ " longæ. Stamina vix semiexserta. Legumen ignotum.

Species ab *A. spinoscente* propter præsentiam phyllodiorum, pedunculos evolutos atque calycum et bractearum formam longe diversa; ab *A. tetragonocarpa* phyllodiis nunquam valde elongatis, pedunculis brevioribus haud glabris, pluritate florum in capitulo, nec non bractearum et calycum indole jam absente fructu dividenda. Cum ulla congenero ex *A. collectioidis* serie neutiquam facile confundi possit.



Acacia volubilis  
 + near Mogumber  
 B.R. Maslin pers. comm.

ACACIAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Acacia volubilis* F. Muell. Family *Mimosaceae* Date Recorded 25.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	28 km S of Eneabba, 14.4 km W on Greenhead Rd C. Chapman Eneabba District	red gravel	late Sept 1976	Fruit	M. Simmons 514
	2.5 km NW of Mt Lesueur 30°10'S 115°11'E	low open heath, lateritic upland, grey sand	28 5 73	BY	C Chapman SN
	1 km ENE of Mt Percin 30°07'S 115°10'E	Mesa, grey sand over laterite low closed heath	30 8 79	N	EAGriffin 2072
	NE of Dandaragan	gravel soil	24 10 79	Fruit	EAGriffin 2437
	8 m E of Dinar Hill	hollow on Hill Rise, sand plain	24 5 79	Y	RJ Cranfield 1261
Isotype	Between Boxvale and York (location appears wrong, BR Moslin pers com)		1. 8. 57	Y	RT Lange 60 Julia wells



Adenanthos strictus George  
+ *Nuytsia* 1: 384-385 (1974)

*Adenanthos stictus* A. S. George sp. nov.

Derivation of epithet: Greek, *stictos*, spotted, in reference to the small glands over the leaf surface.

*Frutex* ramosus ad 5 m altus ramis erectis vel ascendentibus. *Folia* anguste-ad late-cuneata, 15-35 mm longa petiolis 5-10 mm longis, apicibus 3-6-lobatis lobis triangularibus obtusis 1-4 mm longis cum glandibus miniatis terminalibus; lamina plana, 5-25 mm lata, utrinque sericeo-pubescent tandem ± glabra, glandibus atro-rufis multis punctata.

*Flores* axillares, solitarii, in pedunculos 7-13 mm longos. *Bractea* ovatae 1-3 mm longae, sericeo-pubescentes, obtusae vel acutae, apicibus canaliculatis cum glandibus parvis. *Perianthium* 23-25 mm longum extus hirsutum intus glabrum, limbo 3-4 mm longo sub-acuto extus hirsuto intus post antheram sericeo. *Antherae* 3 mm longae connectivis brevibus. *Squamae hypogynae* cum perianthio pro 1.5 mm connatae, partibus liberis minus quam 1 mm longis, obtuse-lobatis. *Ovarium* breviter pubescens. *Stylus* 29-32 mm longus, ad basin glaber, supra breviter hirsutus, deinde glaber.

*Type*: ± 8 miles N of Marchagee on Geraldton Hwy, Western Australia—29°57'S, 116°04'E, 10 Sept. 1970, A. S. George 10379. Holo: PERTH, iso: AD, CANB, K, MEL, NSW, PERTH, RSA.

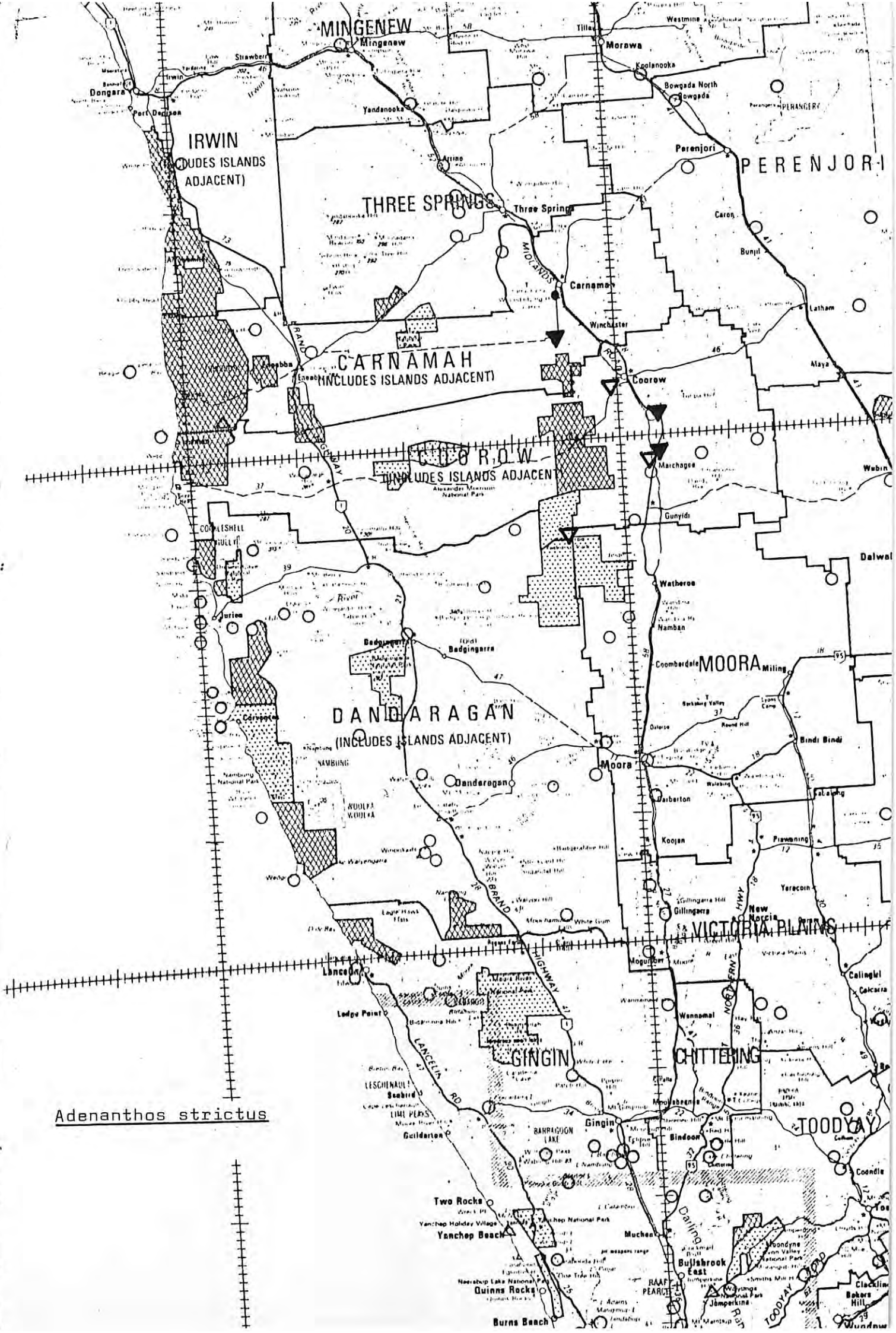
A much-branched, grey-green *shrub* to 5 m tall without a lignotuber, the branches erect ascending. *Branchlets* terete, densely pubescent with ± straight, appressed hairs, becoming glabrous. *Leaves* narrowly to broadly cuneate, mostly 15-35 mm long including the petiole of 5-10 mm; apex 3-6-lobed, rarely entire when small or with up to 9 lobes in seedling leaves, the lobes triangular, often unequal, 1-4 mm long, obtuse, terminating in a yellow-orange gland; lamina flat, 5-25 mm wide, silky-pubescent on both sides, at length ± glabrous, dotted with many small dark red-brown glands, more numerous on the upper surface; venation furcate.

*Flowers* dull reddish-pink and green, axillary, solitary, on slender peduncles 7-13 mm long, the latter bearing scattered, ovate bracts ± 1 mm long. *Involucral bracts* 4-6, ovate, 1-3 mm long, silky-pubescent, obtuse to acute, the apex canaliculate and tipped with a small orange-yellow gland. *Perianth* 23-25 mm long (including the limb of 3-4 mm), hirsute outside with rather spreading hairs, glabrous inside, the limb sub-acute, hirsute outside, silky inside behind the anther. *Anther* sessile, 3 mm long, connective shortly produced. *Hypogynous scales* united to perianth for 1.5 mm, the free part less than 1 mm long, obtusely lobed. *Ovary* shortly pubescent, the long basal hairs 4 mm long. *Style* 29-32 mm long, glabrous at base, shortly hirsute above, but glabrous towards apex; *pollen presenter* 2-2.5 mm long, scarcely thicker than style apex. *Fruit* 7-8 mm long, oblong but narrowed at apex, obtuse, smooth, sparsely and shortly pubescent, with a basal ring of straight, erect hairs.

*Distribution*: South-Western Australia, between Coorow and Marchagee, growing in deep sand on heath.

*Other collections*: W of Coorow, 25 Sept. 1962, J. S. Beard 1933; Marchagee, 14 Jan. 1931, C. A. Gardner s.n.; Watheroo National Park, 7 Oct. 1971, R. D. Royce 9695. (All at PERTH)

*Adenanthos stictus* is the equivalent on the heaths north of Perth of *A. cuneatus* Labill. on the south coastal heaths. The two are closely related and possibly form a vicarious pair. *A. cuneatus* differs in having a lignotuber; in its lower habit; in the leaves, having straight margins and shorter petioles, with a more silky and appressed indumentum which is also more persistent; in the very inconspicuous glands; in the denser, closer, indumentum of the flowers; and in the style having long, spreading hairs as well as short ones. The new growth of *A. cuneatus* is much more red than that of *A. stictus*, and the leaf surface does not wrinkle so much on drying.



Adenanthos strictus

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Adenanthos strictus* A.S. George. Family *Proteaceae* Date Recorded 1.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	West of Coorow	Sandheaths	25.9.62	Y	J.S. Beard 1933
	Marchagee	heaths	14.1.31	Y	C.A. Gardner
	Watheroo National Park,	Sandy soil	7.10.71	N	R.D. Royce 9695
	Marchagee Reserve 23601 10km N of Marchagee	yellow, fine sand	2.6.77	Y	B.G. Muir 535
Isotype + Holotype	8 m N of Marchagee, Geraldton Hwy	yellow sand with Banksia scrub	10.10.70	N	A.S. George 10379
	11 m W of Winchester	scrub heath on sand	3.10.74	Y	J.S. Beard 7329
	west of Coorow		29.8.73	N	E.C. Nelson 17095
	west of Coorow		29.8.73	N	E.C. Nelson 17094
	Watheroo National Park		19.8.73	N	E.C. Nelson 17066
KP	164 m.p. Highway to Three Springs		22.8.70	Y	P. Fairall 2572



Alexgeorgia subterranea Carlquist

+ Austral. J. Bot. 24: 283-284 (1976)

*Typus.*—*Alexgeorgia subterranea* (vide infra).

Perennial herbs, with a wiry creeping underground rhizome covered with imbricate whitish or brownish scale/leaves. Erect stems rigid, unbranched below ground level, with flexuose or variously twisted branchlets. Juvenile leaves (first leaves of the seedling) radical, basal, flat distally and sheathing below, usually 4 (3-5), lanceolate and obtuse, the upper (distal) photosynthetic portion of each pilose-margined, tending to lie on the soil surface. Leaves of the erect stems all reduced to convolute rigid mucronate sheaths, margins not connate; pilose; persistent or withering to short tubes. Erect stems terete and pilose below ground; thicker above ground, and bearing striate, variously glabrescent, variously twisted branchlets which are flattened and rounded depending on grouping and mutual compression, and are mucronate. Erect stems of female plants all vegetative; erect stems of male plants bearing inflorescences terminal on the branchlets. Male flowers borne in bracteate spikes, which are provided with dry brown bracts. Perianth segments in two series, 6, rarely reduced to 5 or 4, scarious, the lateral perianth segments longer and carinate, the dorsiventral segments flattened. Stamens in male flowers three, filaments filiform, anthers oblong, one-celled. Female inflorescences sessile in the axils of rhizome bract/leaves, occasional along the length of the rhizome and apparently only one per fertile rhizomatous stem formed per year. Inflorescence bracts cuneate (outer) to linear (inner), woolly, persistent. Female flower solitary, terminal in the inflorescence, sessile. Perianth segments apparently in a single series (at least in fruit), 6 (sometimes fewer), cuneate, subscarious. Styles three, connate at the base, filiform, very long, purple, the only portion of the female flower other than innermost bract tips to appear above the ground surface. Fruit large, dry, obpyriform, an indehiscent nut, round in transection or slightly compressed with three angles. One seed formed in each fruit, with thin papery testa adherent. Endosperm abundant, somewhat mealy. Embryo small. Plants of Western Australia. *Type.*—*Alexgeorgia subterranea* (see below). I have pleasure in naming this genus for Mr Alex S. George of the Western Australian Herbarium, Department of Agriculture, South Perth. Mr George kindly aided my travels and studies in Western Australia, as he has the botanical work of many others.

*Key to the Species of Alexgeorgia*

- A. Rhizomatous stem with white scales, bearing erect stems singly; scales of the erect stems white; erect stems bearing shiny white scales below ground. Branchlets of the erect stems thickish, about 2 mm wide, prominently mucronate, mucro 2 mm long. Leaves of the erect stems 5-7 mm long, all distinctly mucronate, mucro 2-4 mm long. Male inflorescences relatively long (10 mm) and broad, bracts about 5-6 mm long, seta (2-3 mm) included. Sandy areas around Jurien Bay ..... 1. *A. subterranea*
- AA. Rhizomatous stems with brownish shiny scales, bearing erect stems typically in fascicles, more rarely singly. Scales of the erect stems brownish below ground. Branchlets of the erect stems slender, about 1 mm wide, minutely mucronate. Leaves of the erect stems 2-6 mm long, larger leaves at lower nodes, leaves at lower nodes mucronate, those of upper nodes barely or not mucronate. Male inflorescences relatively short (6 mm) and slender, bracts about 3 mm long, seta (c. 1 mm) included. Sandy areas near Perth ..... 2. *A. arenicola*

1. *Alexgeorgia subterranea* sp. nov.

Planta omnibus characteribus generis (vide supra). Rhizoma repens, subterraneum, squamis hyalinis, circa 8 mm longis obtectum. Caules erecti non fasciculati, 7-25 cm



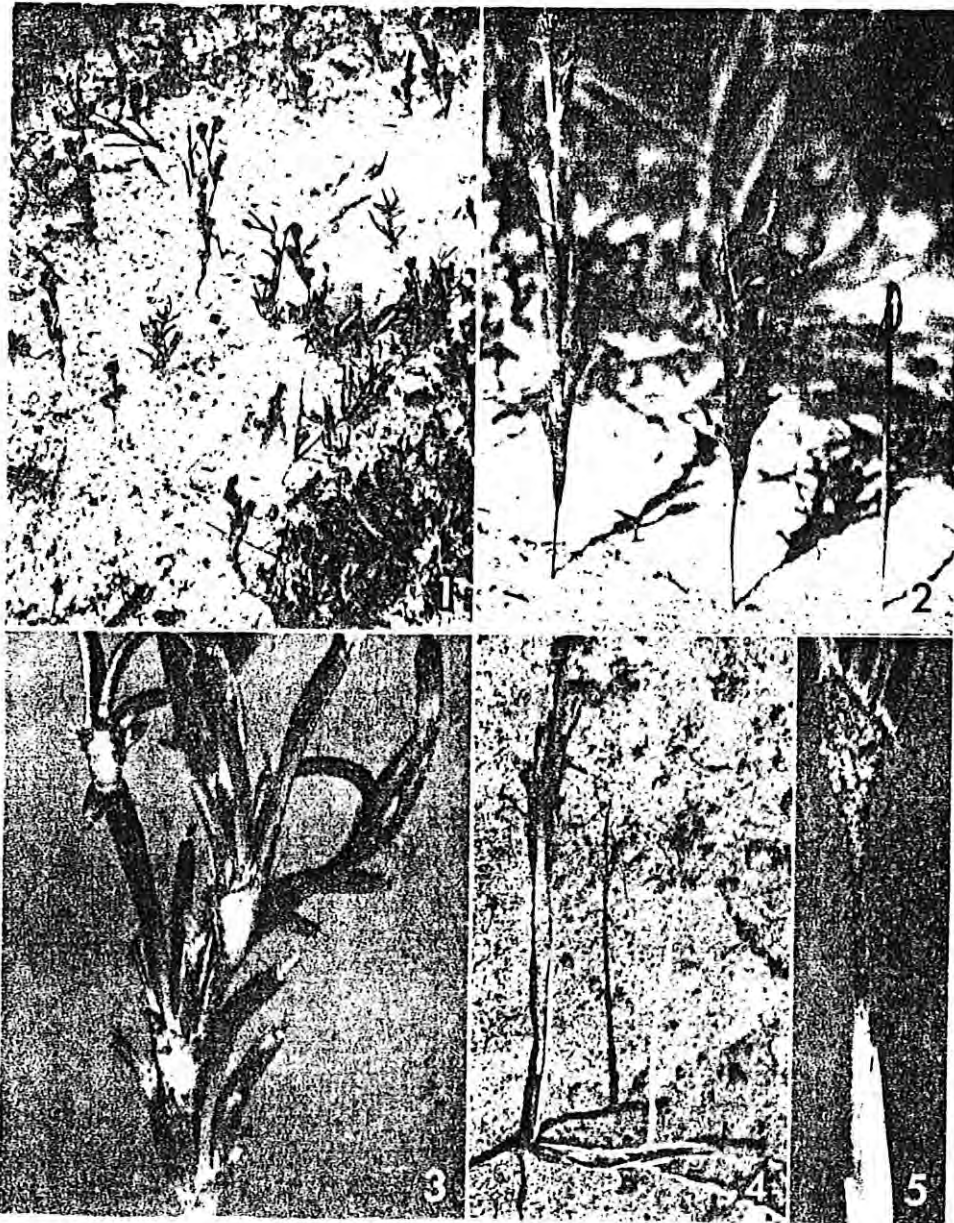
alti, basi squamis hyalinis 4-45 mm longis. Ramuli crassi, applanati, flexuosi vel recti, circa 2 mm lati. Folia caulium erectiorum acuta, circa 5-7 mm longa, distincte mucronata, mucrone 2-4 mm longa. Inflorescentia masculina capituliformis, bractee capitulorum 5-6 mm longae (setae inclusae), deltoideae; seta circa 3 mm longa, minute scabra. Perianthium circa 2 mm longum; filamenta circa 3 mm longa. Bractee inflorescentiarum foeminearum 2-80 mm longae, apicibus bractearum longissiorum purpureis. Styli circa 60 mm longi, 30 mm supra terrae protrudentes. Tepala deltoidei-lanceolata, acuta, in fructibus 12-15 mm longa. Fructus circa 15 mm longi, 6 mm lati.

All the characters as included in the generic description. Rhizomatous stems creeping below ground, covered with hyaline scales about 8 mm long. Erect stems borne singly at intervals along the underground rhizome, 7-25 cm tall, underground scales at bases of erect shoots hyaline, 4-45 mm long. Leaves of the erect branches all distinctly mucronate, 5-7 mm long (not including mucro), mucro 2-4 mm long. Male inflorescence a head about 10 mm long. Bracts of male heads 5-6 mm long, including setae, deltoid, seta about 3 mm long, minutely scabrous. Perianth of male flowers about 2 mm long, filaments about 3 mm long. Bracts of female inflorescences 2-80 mm long, the tips of the longer (inner) bracts purple where they emerge above the sand surface. Styles about 60 mm long, of which the above ground portions are about 30 mm long. Perianth segments of female flowers deltoid-lanceolate, acute, 12-15 mm long in fruit. Fruits about 15 mm long, 6 mm in diameter at widest point.

*Type.* Along road to Mt. Lesueur, about 10 km west of junction with Encabba-Gingin road, 3.x.1974, *Carlquist* 5925 (holotype: RSA; isotypes: PERTH, K, NSW, US).

*Other collections.* Along Cockleshell Gully road about 7 km north of junction with road to Jurien Bay, 29.viii.1974, *Carlquist* 5485 (RSA, PERTH), *De Buhr* 3408 (RSA); same locality, 31.viii.1974, *Carlquist* 5510 (RSA, PERTH, NSW, US, K, CANB, CAS), *De Buhr* 3448 (RSA); along the Coorow to Greenhead road, about 3 km east of junction with Cockleshell Gully road, 4.x.1974, *De Buhr* 3920 (RSA); also at type locality on 3.x.1974, *De Buhr* 3901 (RSA).

Illustrations of this species may be seen in Figs. 1-20.



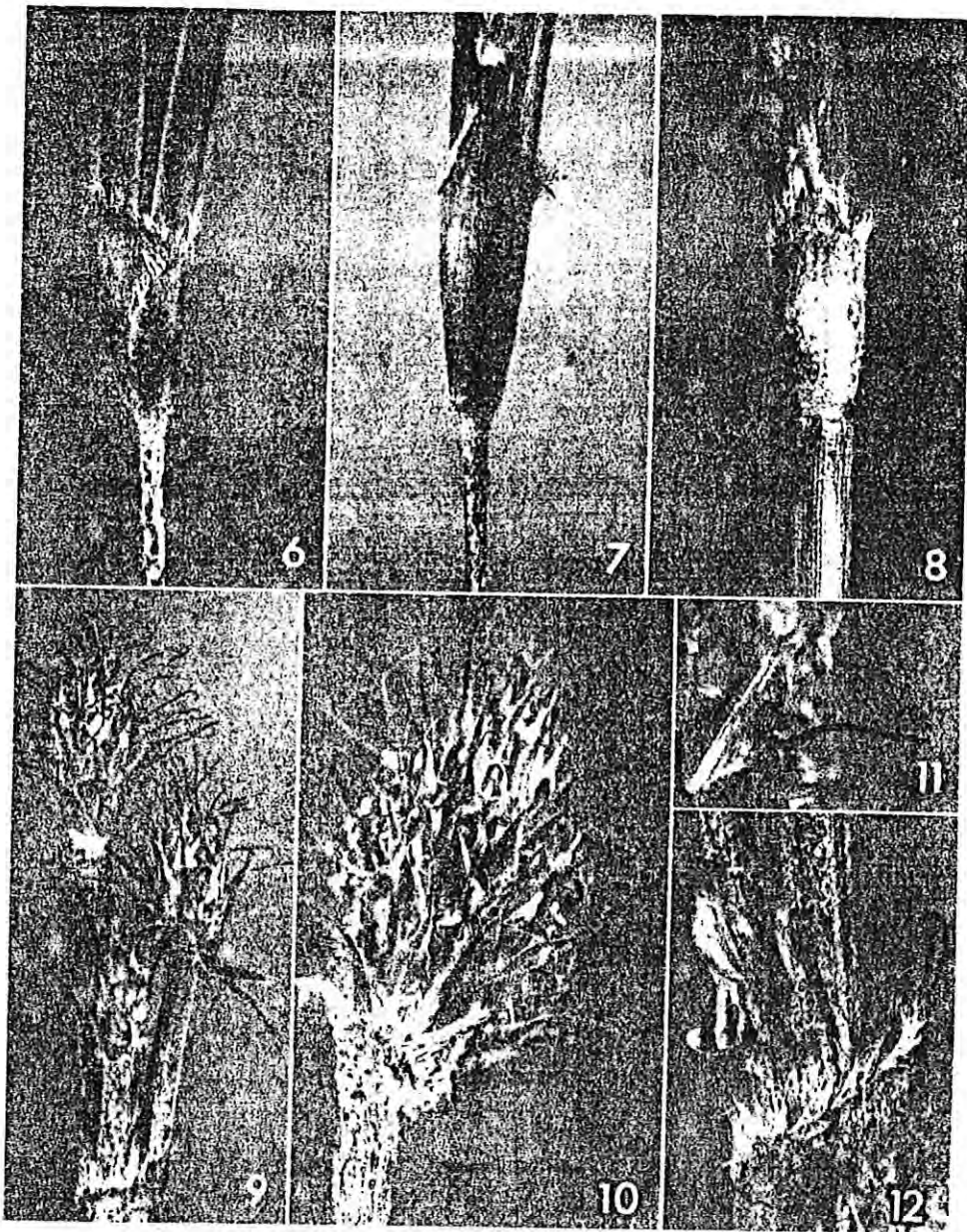
Figs. 1-5. *Alexygorgea subterranea* (Carlquist 5485).

Fig. 1. View of habit of a colony.  $\times 0.1$ .

Fig. 2. *Left to right*: male shoot, female vegetative shoot, female flower. In order to photograph the three together the female flower was removed from a plant and inserted into the sand here; under natural conditions the white portions of the bracts would be buried, and only the purplish tips of the uppermost bracts and the three styles would be visible above the sand surface.  $\times 0.5$ .

Fig. 3. Enlarged portion of a vegetative shoot from a female plant, showing angular nature of stems, mucronate stem tips, leaf sheaths and branching pattern.  $\times 2.0$ .

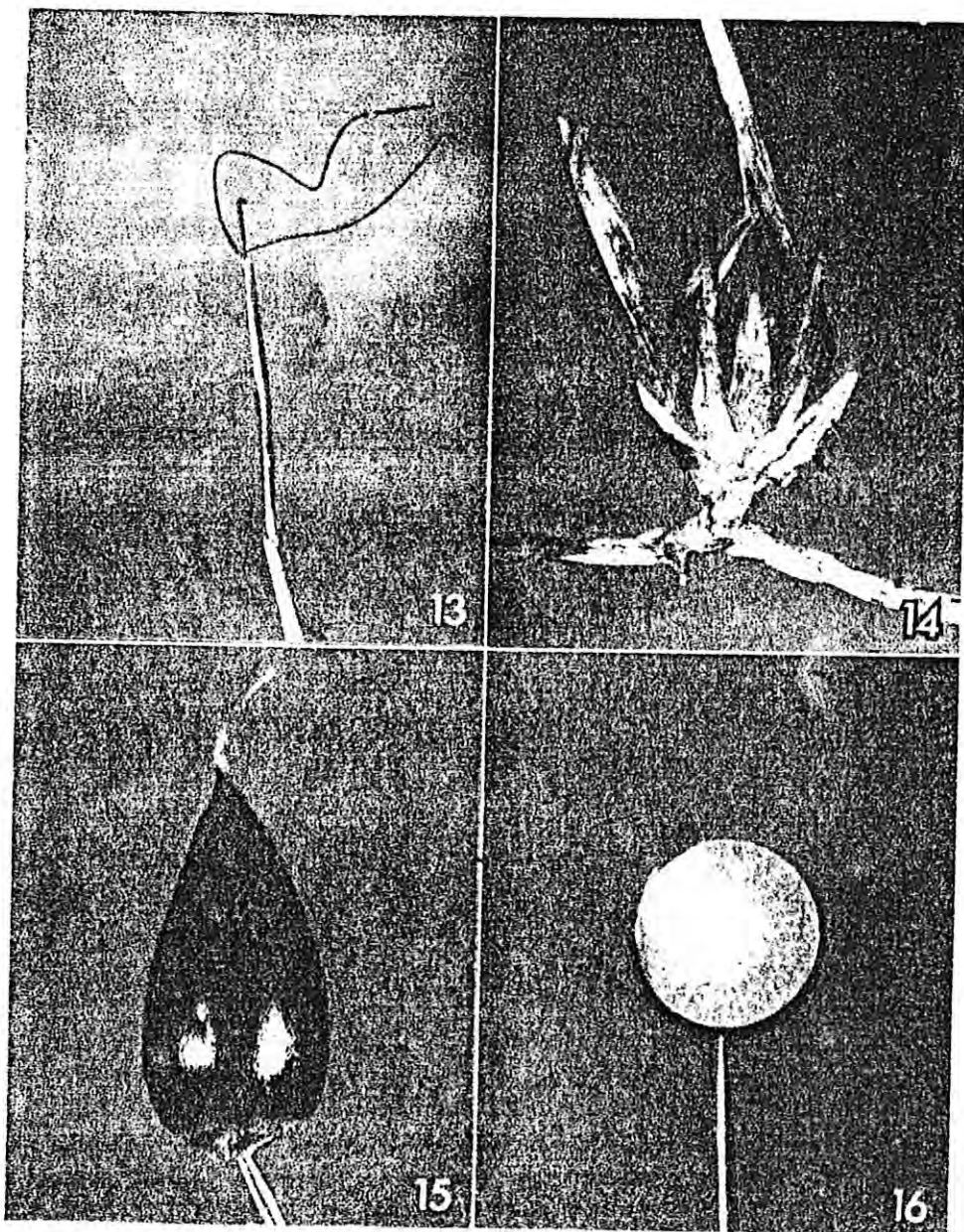
Figs. 4, 5. Unearthed portion of a female plant, showing horizontal stolon bearing a vegetative shoot and a flower respectively.  $\times 0.3$ .



Figs. 6-12. *Alexgeorgea subterranea* (Carlquist 5485), enlarged portions of a male plant.

- Fig. 6. First above-ground node, showing leaf sheath and sheath margins.  $\times 5.5$ .  
 Fig. 7. First above-ground node, showing back of sheath with mucronate tip.  $\times 5.5$ .  
 Fig. 8. Upper node, showing grooved nature of stem, sheath of leaf with mucronate tip.  $\times 5.5$ .  
 Fig. 9. Fascicle of male inflorescences; note conspicuously setose tips of bracts.  $\times 2.8$ .  
 Fig. 10. Single male inflorescence, with unilocular anthers scattered among the bracts.  $\times 5.5$ .  
 Fig. 11. Male flower dissected from the spike; two anther-bearing filaments, a carinate tepal and the setose tip of the bract associated with the flower are shown.  $\times 9.5$ .  
 Fig. 12. Male flower dissected from spike and placed (upper left) on a branchlet node; hairy margins and mucro of the leaf sheath may be seen, as well as the pilose nature of the stems (above).  $\times 7.0$ .





Figs. 13-16. *Alexgeorgea subterranea* (Carlquist 5485). Enlarged portions of female flower and fruits.

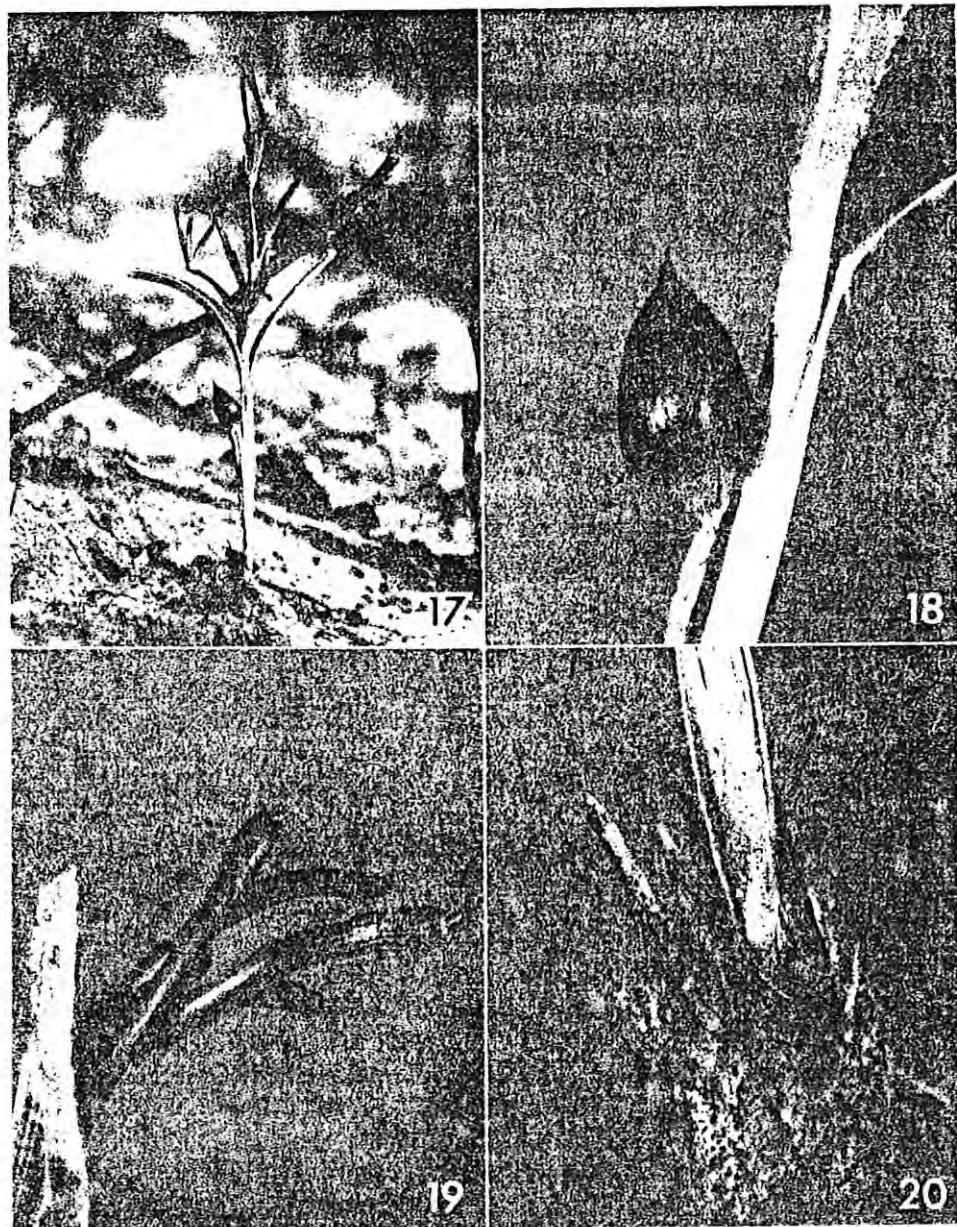
Fig. 13. Tip of female flower showing the three styles (two at left broken) emerging from the tubule formed by the inner bracts.  $\times 1.5$ .

Fig. 14. Fruit, surrounded by perianth segments and bracts, in its natural sessile position on the horizontal stolon.  $\times 1.8$ .

Fig. 15. Fruit, dissected from bracts and tepals, mounted on a needle.  $\times 3.0$ .

Fig. 16. Fruit transection mounted on a needle: thin nature of fruit wall is apparent; the endosperm of the single seed fills the fruit.  $\times 3.0$ .





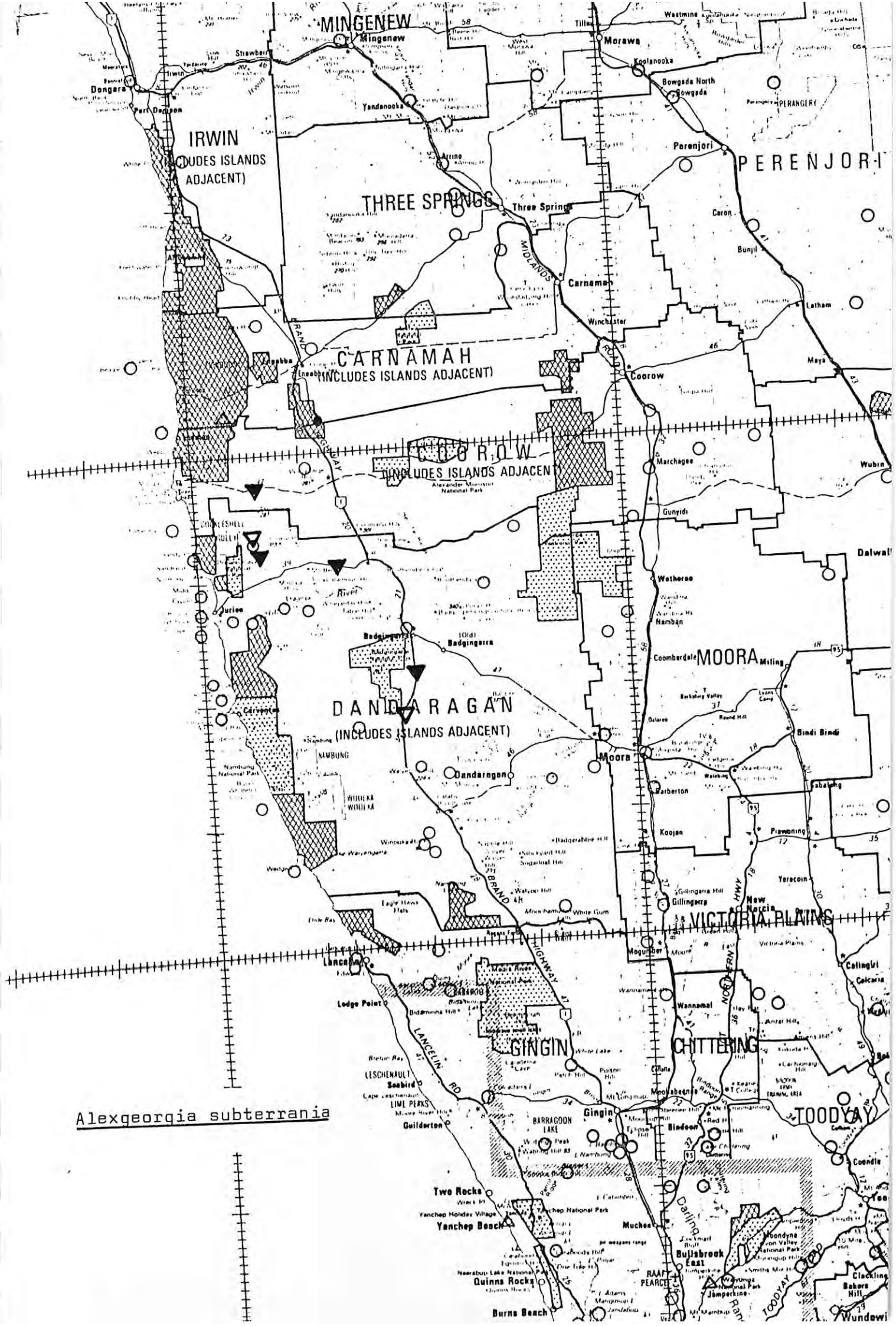
Figs. 17-20. *Alexgeorgea subterranea* (Carlquist 5925), seedling and enlarged portions of seedling.

Fig. 17. Unearthed seedling propped against a twig for photograph; when growing naturally the lower half of this plant (to the point where leaves bend outward) would be underground. Note cotyledon tipped by fruit at left; four juvenile leaves are present.  $\times 0.4$ .

Fig. 18. Portion of seedling enlarged, showing fruit remaining on tip of cotyledon. Portions of juvenile leaves and their sheaths can be seen.  $\times 1.8$ .

Fig. 19. Lamina (tip rounded) of hairy juvenile leaf (*left*) and mucronate tips of adult branches.  $\times 1.8$ .

Fig. 20. Base of seedling with persistent perianth parts and sheaths of juvenile leaf bases. A rhizome is beginning to grow out from the base of the seedling.  $\times 1.8$ .



Alexgeorgia subterranea

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Alexgeorgia subterranea* Carlquist Family *Restionaceae* Date Recorded !... 5.8/.....  
 \* Specimens not seen, taken from Carlquist description

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	2.4 km S of Mullering Brook, Bran Hwy 30°30'S 115°36'E	deep white sand	25.9.76	Y ♂	B. Briggs 6309
	2.4 km S of Mullering Brook, Brand Hwy 30°30'S 115°36'E	deep white sand	25.9.76	Y ♀	B. Briggs, 6310
K.P.	5 km S of Cockleshell Gully on Jurien Rd.	grey sand, Banksia woodland	7.9.79	Y ♂	G.J. Keighery 2546
K.P.	107 m N of Perth on Brand Hwy 30°45' 115°30' S	white sand, Banksia woodland	30.6.76	Y ♂	G.J. Keighery 796
Holotype*	10 km W of Brand Hwy, towards Jurien		3 10 74		Carlquist 5925
Isotype*	along Cockleshell Gully Rd, 7 km N th of Jurien Rd		29.8.74	Y	Carlquist 5485
*	Along Coorow - Green Head Rd, 3 m E of Junction with Cockleshell Gully Rd		4.10.74		De Buhr 3920



Banksia burdettii E.G. Baker

J. Bot. 72: 281 (1934)

+ Notes from the British Museum Herbarium ? : 281-282

**Banksia** (*Cyrtostylis*) **Burdettii** Bak. fil., sp. nov. *Frutex* 4-8-pedalis ad *B. Baueri* R. Br. accedens. *Rami* tomentosi. *Folia* linearia 5-15 cm. longa, 1.5-2 cm. lata, truncata, basi cuneata regulariter ± profunde serrata subtus albo-tomentosa. *Petioles* 1-1.5 cm. longi. *Spicae* crassae obovatae 10-11 cm. longae, 7 cm. latae. *Bractees* deltoideo-acuminatae tomentosae. *Perianthium* villosum basi glabrum incurvum erectum, tubo 22-25 mm. longo, lamina villosa obtusa 6-7 mm. longa. *Stylus* curvatus demum sursum curvatus. *Conus fructifer* obovatus 6-7 cm. longus, ± 5 cm. latus. *Folliculi* tomentosi ± prominentes 2-2.5 cm. lati, 10-12 mm. crassi. *Semina* 20-22 mm. longa, 6-7 mm. crassa, 1.7-2 mm. lata, alae 7-8 mm. latae.

The leaves have parallel transverse veins, are glabrous or sparsely tomentose above and more or less pilose on the midrib.

JOURNAL OF BOTANY.—VOL. 72. [OCTOBER, 1934.] x

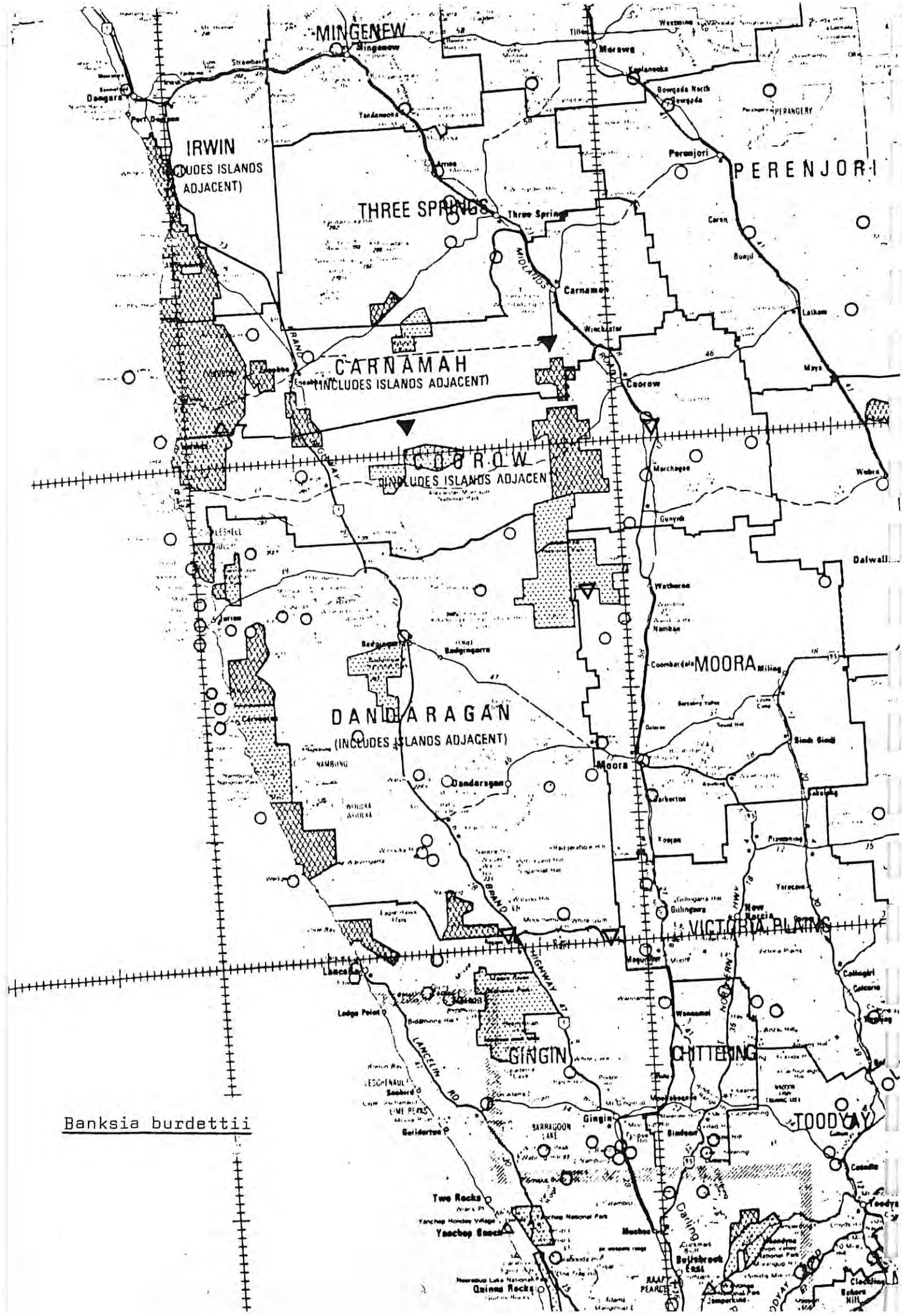
The style is arched and turns upwards after flowering; it is not hooked. The stigmatic end is small, not striate.

*Hab.* WEST AUSTRALIA: Watheroo, about 120 miles N.E. of Perth. *W. Burdett*, sine no. "The flowers when open are a rich buff-orange with a pink tinge due to the red central line; the unopened flowers are fringed with white hairs, with a red mid-line very conspicuous." (Herb. Mus. Brit.)

The specimen was grown at "Blackwood" from seeds collected at Watheroo.

Near *B. Baueri* R. Br., differing by the obtuse or subacute perianth-laminae, which are without the awn-like ends; it also differs in leaf-characters. Also near *B. prionotes* Liudl. and *B. Menziesii* R. Br., but differs from both in characters of the style and of the fruiting cone.—E. G. BAKER.





Banksia burdettii

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Danksia burdettii* EG. Baker Family Proteaceae Date Recorded 8 6 81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	on Willis Rd 17 km S of Eneabba - Carnarvon Rd	In sand	27.3.77	seedling	AS Gtorge 14425
	10m W of Watheroo		March 60	FY	CA Gardner sn.
	10m NW of Mogumber	in sand	26 8 64	N	K Newbey 1413
	10 km from Winchester to Eneabba 29°48'S 115°50'E	tall heath, yellow sand	25 1 79	Y	C Chapman + B Barnsley 915
	22m W of Mogumber Between Marchagee + Coorow	yellow sand over laterite	30 3 80	Y	T Hawkswood 224
			May 39	Y	Miss Frape

Banksia chamaephyton George

Nuytsia 3: 375-376 (1981)

A. S. George, *Banksia*

375

41. *Banksia chamaephyton* A. S. George sp. nov. (Figure 62)

*Banksiae gardneri* A. S. George affinis, a qua ramis subterraneis, foliis majoribus lobis longioribus, floribus cremeis et brunneis, et folliculis seminibusque majoribus, differt. Folia 20-50 cm longa lobis 2-8 cm longis. Folliculi 25-40 cm longi, 12-20 mm alti, 15-20 mm lati.

Allied to *Banksia gardneri* A. S. George, from which it differs in the underground stems, larger leaves with longer lobes, cream and brown flowers, and larger follicles and seeds. Leaves 20-50 cm long, the lobes 2-8 cm long. Follicles 25-40 mm long, 12-20 mm high, 15-20 mm wide.

Type: W of Mogumber township, Western Australia, in 31°02' S., 115°58' E., 15 Nov. 1971, A. S. George 11204. Holo: PERTH; iso: AD, BRI, CANB, K, MEL, NSW, PERTH.

*Derivation of name.* From the Greek *chamae-*, low-growing, and *phyton*, a plant, in reference to the prostrate habit.

*Cotyledons* (Fig. 8.35) cuneate, 20-21 mm long, 20-24 mm wide,  $\pm$  convex, dull green; upper margin slightly convex, crenulate; nerves  $\pm$  reticulate; auricles horizontal, obtuse, 1.5-2 mm long. *Hypocotyl* stout, short, glabrous, pale red. *Seedling leaves*  $\pm$  crowded immediately above cotyledons; first 2  $\pm$  obovate, obtuse, 2-2.5 cm long, divided into 2-3 lobes on each side; lobes obliquely triangular, obtuse, the distal edge 1.5-2 mm long, margins slightly recurved; lamina narrowed to petiole  $\pm$  1 cm long; upper side loosely hirsute with white hairs, lower hirsute on veins with pale ferruginous hairs and loosely woolly in interstices with curled white hairs; third and fourth leaves obovate, obtuse, 4-5 cm long, dentate with 6-8 lobes similar to those of first 2 leaves but up to 5 mm long; petiole 1-1.4 cm long; indumentum as in first 2 leaves; new growth pale brown.

*Mature plant* a shrub to 1 m across with prostrate stems. *Stems* underground, 8-12 mm diam., densely velvety with short curled and long straight ferruginous hairs, the latter wearing off. *Leaves* erect, 20-50 cm long, 4-16 cm wide; petiole 5-21 cm long; laminae pinnatipartite almost to midrib with 10-30 lobes each side, the sinuses U-shaped, 6-17 mm wide; apex obtuse to acute, rigid; lobes opposite to alternate, linear to narrowly triangular, curved gently upwards or straight, acute, set at 70°-85° to midrib, 2-8 cm long, 3-10 mm wide, those towards base of lamina shorter and narrower, those towards apex shorter and broader, flat to slightly concave; indumentum ferruginous; upper surface tomentose with short, curled hairs and loosely hirsute with straight hairs becoming glabrous; lower surface tomentose with short curled hairs and hirsute on nerves with long straight ones, all wearing off except for dense fine white wool in lacunae; each lobe with 3 main and several finer nerves, finely reticulate between on lower surface, the nerves scarcely evident on upper surface; petiole 1.5-3 mm diam., terete but with 2 very narrow ribs on adaxial side formed by decurrent lamina, tomentose-hirsute when young becoming closely tomentose and grey with short curled hairs, the long hairs persistent only at base. *Inflorescence* usually subtended by leaves. *Involucral bracts* linear-subulate from thick bases, 5-15 mm long,  $\pm$  acute, densely velvety-hirsute with ferruginous hairs, persistent and grey in fruit. *Axis* 6-12 cm long, 5-7 mm wide, 15-18 mm wide with common bracts, bearing flowers throughout or sometimes without flowers for a few mm at base. *Common bracts* linear, thick, 5-6 mm long, densely hirsute; exerted apex obtuse, flat, tomentose. *Floral bracts* similar but slightly smaller. *Flowers* cream with dark brown limb and pale-ferruginous to white indumentum, the apical buds pink, all becoming brown after flowering, then grey. *Perianth* 23-30 mm long including limb of 2.5-3 mm; claws filiform, 0.3-0.4 mm wide, long-hirsute outside, glabrous inside in lower half, sparsely hirsute above, the midrib prominent; limb narrowly elliptic, obtuse, hirsute when young with spreading hairs, a dense tuft at apex, but glabrous by anthesis or soon afterwards, with 3 shallow longitudinal grooves. *Anthers*  $\pm$  1.5 mm long on filaments of  $\pm$  0.5 mm, shortly and obtusely apiculate. *Hypogynous scales* linear, slightly tapering, obtuse, 1 mm long, free. *Pistil* 25-35 mm long, gently sigmoid with apex slightly upturned, slender, glabrous, narrowed and tetragonal below pollen-presenter; pollen-presenter narrowly ovoid, 0.5-0.75 mm long, obtuse; stigmatic groove lateral

at apex; ovary hirsute with long straight hairs at apex, glabrous below. *Infructescence* moderately large, the old perianths and styles persistent but follicles protruding. *Follicles* up to 15, elliptic in plan view, 25–40 mm long, 12–20 mm high, 15–20 mm wide; valves almost semi-orbicular, slightly off-set to stylar side; valves smooth, densely tomentose and hirsute with short curled and long straight hairs, pale ferruginous becoming grey with age; ridge broadly rounded; suture obscure, straight; follicles usually opening only with fire, when open up to 3 cm across, valves somewhat recurved, split from stylar point to leave prominent lateral beak; lips 1 mm wide, not enlarged laterally. *Seed*  $\pm$  broadly obovate, 27–36 mm long; seed body  $\pm$  cuneate with convex margins, 11–17 mm long, 14–22 mm wide, base obtuse to acute, upper margin with an acute ridge on inner side; inner face smooth, mottled brown and cream, outer deeply and irregularly pitted, grey-brown; wing strongly curved to stylar side, 22–35 mm wide, split to seed body from stylar point leaving an ovate secondary lobe. *Separator* similar to seed in outline and size, flat against seed body with a thick, overhanging ridge on each side above.

*Distribution.* (Fig. 60) South West Western Australia, near the west coast between Mogumber and Eneabba.

*Selected collections.* W of Winchester on Green Head road, early Dec. 1970, C. Chapman s.n. (AD, BRI, CANB, K, MEL, NSW, PERTH); Badgingarra W of (Dept. of Agriculture) Research Station, 19 Jan. 1962, C. A. Gardner s.n. (PERTH); 15 miles eastwards from Mount Peron, 26 Aug. 1949 (old fls.) F. A. Grigson s.n. (PERTH).

*Habitat.* In grey-white sand over laterite, in open-heath.

*Flowering period.* Late October to early December.

*Banksia chamaephyton* has as its closest relative *B. gardneri* var. *hiemalis*. It differs from that taxon in the underground stems, the larger leaves with longer lobes, the brown and cream perianth, a less dense indumentum on the perianth, the broader perianth limb, and the larger follicles and seeds. It is widely separated geographically from *B. gardneri* in all its three varieties, being the only prostrate *Banksia* in the heaths north of Perth. It is one of the rare species of the genus, known from only eight collections. Several of these localities have now been cleared for agriculture, while the species is not common at the others.

The species is somewhat variable in the size of the leaves and the length of the lobes but is otherwise fairly uniform.



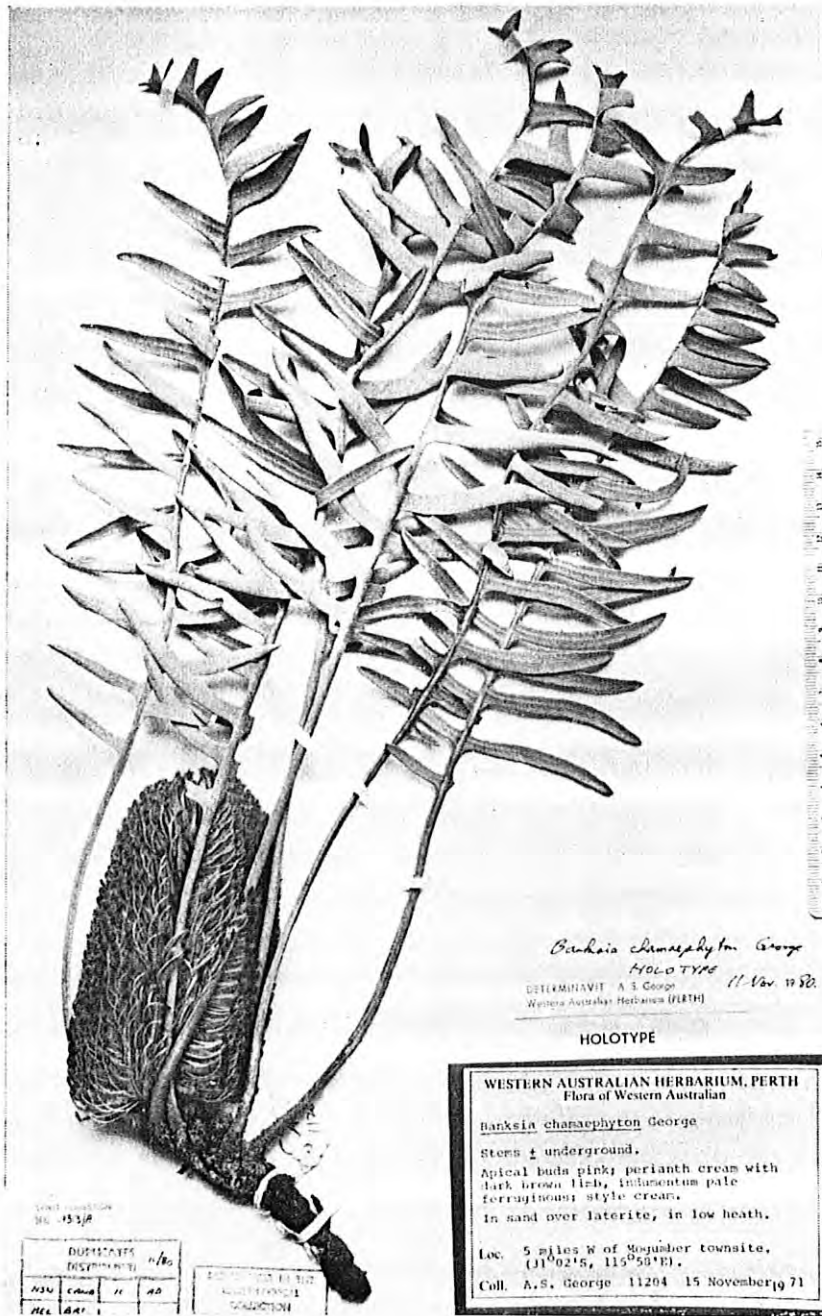


Figure 62. *Banksia chamaephyton*. Holotype, A. S. George 11204 (PERTH).

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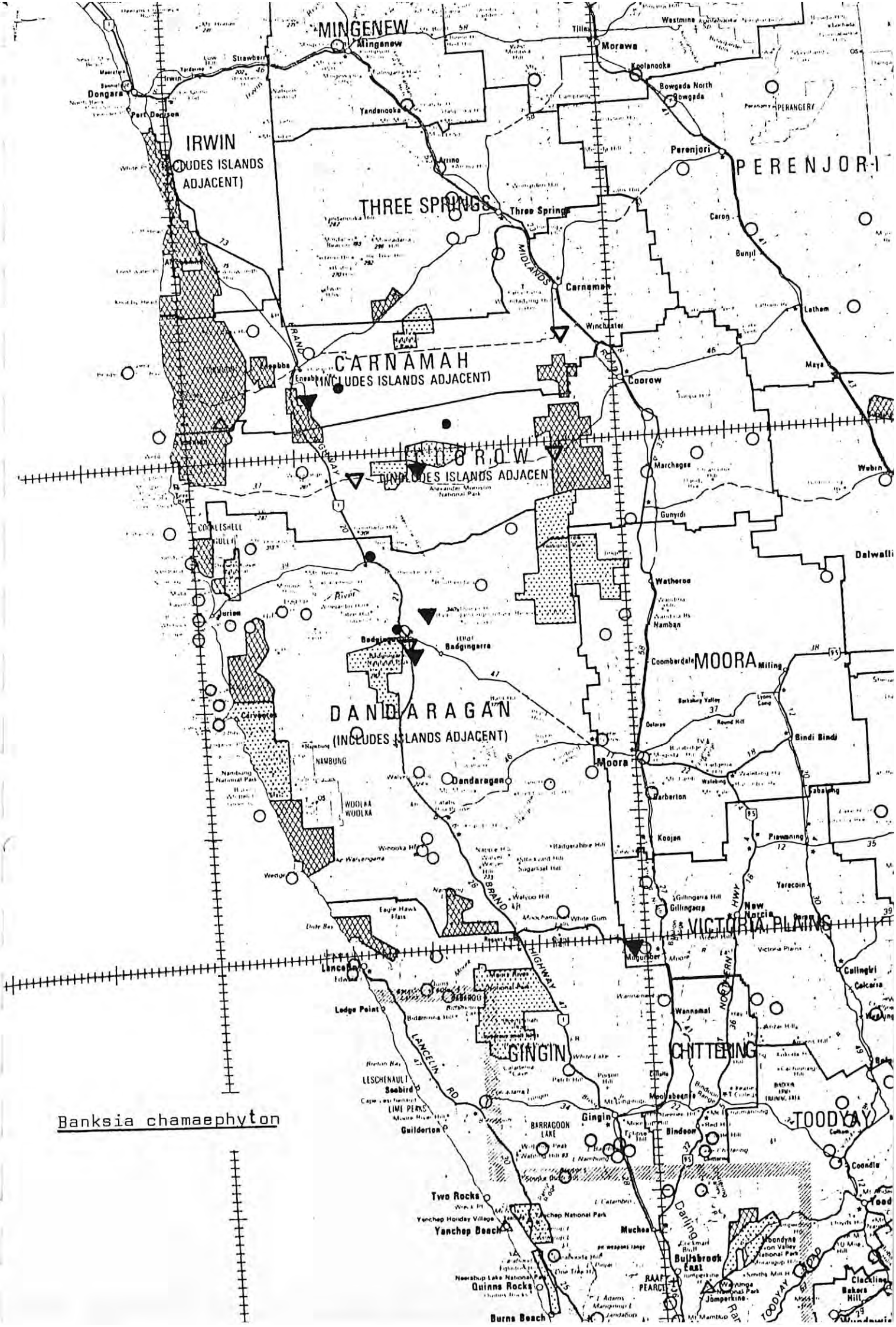
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Banksia chamaeophyton



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Banksia chamaephyton*. George...ms Family *Proteaceae*..... Date Recorded 1. 5. 81.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	7 km Sof Eneabba 29°53'S 115°16'E	shallow white sand over laterite, low open heath	3. 8. 77	Fruit	E Agrippin 975
	Badgingarra, west of research Station		19. 1. 62	old flower	C.A. Gardner n.s.
	15m East from mt Percan		26. 8. 49	✓	C.A. Gardner 9435
	30m W of Winchester on Greenhead Rd		Dec 70	Y	C. Chapman sn.
	W. Coorow reserve		14. 11. 71	Y	A.S. George 11190
	W. of Winchester		22. 11. 70	old flower	C. Chapman sn.
	Mogumber near mission	gravel, low scrub	12. 4. 64	N	A.S. George 6201
	2 km N of Coorow Greenhead Rd, along Willis Rd		27 3 77	N	A.S. George sn
	McNamara Rd Badgingarra	white sand/laterite gravel	19 7 78	N	R.S. Cranfield 107
	Badgingarra	lateritic sand	25 4 61	N	A.S. George 2345A
Holotype	5m W of Mogumber town site 31°02'S 115°58'E	low heath, sand over laterite	15 11 71	N	A.S. George 11204
UWA	Moore River mission Station		Aug 1958	Fruit	N.H. Britton sn.



Banksia grossa George

Nuytsia 3: 426-429 (1981)

59. *Banksia grossa* A. S. George sp. nov. (Figures 92 and 93)

*Frutex* ad 1 m altus cum lignotubero. *Folia*  $\pm$  sparsa, linearia, obtusa, 4-12 cm longa, (1)1.8-2.8 mm crassa, marginibus arcte revolutis. *Inflorescentia* 5-7 cm longa, 8-9 cm diam. sub anthesin. *Bracteae involucales* 5-7 mm longae. *Bracteae communes* 7-9 mm longae. *Perianthium* 35-45 mm longum limbo 5-6 mm long includens, extus et intus hirsutum; limbus hirsutus. *Pistillum* 38-48 mm longum, glabrum; pollinis praebitor 1 mm longus; ovarium glabrum. *Folliculi* elliptici, 20-45 mm longi, 10-18 mm alti, 10-18 mm lati; valvi laeves, hirsuti; sutura obtusa; flores et pistilla in fructu persistentia,  $\pm$  appressa. *Semina* late obovata, 28-39 mm longa; seminis corpus anguste-cuneatum, 14-18 mm longum, 4-9 mm latum; ala 27-33 mm lata.

*Type*: 45 miles (76 km) north of Regans Ford on Brand Hwy, Western Australia, 14 May 1969, A. S. George 9316. *Holo*: PERTH; *iso*: CANB, K, NSW.

*Derivation of name*. From the Latin *grossus*, coarse, in reference to the appearance of the leaves, flowers and fruit which are more coarse than other species of the *Abietinae*.

*Cotyledons* (Fig. 9.54) obovate, 16-22 mm long, 9-12 mm wide, convex or concave,  $\pm$  recurved, 3-nerved,  $\pm$  bright green; auricles obtuse, descending, 2 mm long. *Hypocotyl* moderately stout, short, loosely pilose, pale red. *Seedling leaves*: first two 6-8 mm above cotyledons,  $\pm$  opposite, broadly linear, obtuse, 14-16 mm long, margins revolute but not concealing lower surface; upper surface hirsute with white spreading hairs, lower surface white-woolly; next leaves also in  $\pm$  opposite pairs, similar but longer. *Seedling stem* reddish, hirsute.

*Mature plant* a shrub 70 cm to 1 m tall with many erect stems arising from a lignotuber. *Stems* with flaky pale brown bark. *Branchlets* hoary-tomentose with short crisped hairs and scattered longer ones, the latter soon deciduous; prophylls at base of branchlet few or none, terete, tomentose, soon deciduous. *Leaves* erect, straight or slightly curved or flexuose, obtuse but the midrib shortly produced as a hard, obtuse apex; 4-12 cm long, (1)1.8-2.8 mm broad, thick; lamina closely pubescent above with short crisped hairs, becoming glabrous; margins closely revolute against midrib, the latter flat, prominent, not or slightly sunken, pubescent with short crisped hairs becoming glabrous; petiole 3-5 mm long, pubescent. *Inflorescence* on short, thick, lateral branchlet usually towards the base of the stem, occasionally terminal, usually cylindrical, 8-9 cm diam. at anthesis; a few leaves close below inflorescence. *Axis* 5-7 cm long, 7-9 mm wide, 21-24 mm with common bracts. *Involucral bracts* covering  $\pm$  5 mm of branchlet below spike, subulate

from swollen bases, 4-7 mm long, closely tomentose with short, crisped, hairs, grey to pale grey-brown. *Common bracts* linear-subulate, 7-9 mm long; exerted apex conical, grey, slightly upturned. *Floral bracts* similar but slightly shorter, apex ferruginous. *Flowers* ferruginous to golden brown, the styles usually dark red to purple where exposed. *Perianth* 34-45 mm long including limb of 5-6 mm; claws filiform, hirsute outside with long coarse straight to flexuose hairs, hirsute inside with straight ferruginous hairs, densely so near base; limb narrowly elliptic, obtuse, densely hirsute with  $\pm$  straight hairs. *Anthers* narrowly elliptic,  $\pm$  navicular, 2 mm long, connective shortly produced. *Hypogynous scales* oblong,  $\pm$  2 mm long, acutely and unevenly 2-4-lobed, cohering to perianth for  $\pm$  1 mm. *Pistil* slightly curved, then strongly so towards apex, 38-48 mm long, stout, glabrous; pollen-presenter  $\pm$  ovoid,  $\pm$  1 mm long; stigmatic groove lateral at apex; style slightly constricted below pollen-presenter; ovary glabrous. *Infructescence*  $\pm$  ellipsoidal, 6-10 cm long, 4-8 cm wide; old perianths persistent, the styles curling stiffly against follicles; common and floral bracts slightly enlarged and indurated. *Follicles* (20-)25-35(-45) mm long, 10-18 mm high, 10-18 mm wide; valves semicircular, convex, smooth, very hirsute with straight, spreading hairs eventually wearing off exposed areas; ridge obtuse; suture scarcely evident; follicles opening usually with fire, 3-11 mm at widest, not recurving; lips  $\pm$  1 mm wide, dark brown. *Seed* unequally obovate, 28-39 mm long; seed body narrowly cuneate, base acute, apex obliquely acute to rounded, 14-18 mm long, 4-9 mm wide, dark grey-brown and flecked on inner surface, pale brown and flecked on outer surface; wing 27-33 mm wide, decurrent on side opposite style, dark brown with large pale flecks on inner face, brown and slightly flecked on outer face. *Separator* similar to seed in size and shape, concave next to the seed body, dark brown, the wings recurved.

*Distribution*. (Fig. 91) South West Western Australia, between Eneabba and Regans Ford.





Figure 93. *Banksia grossa*. Inflorescence x 3. Drawn from A. S. George 6750.

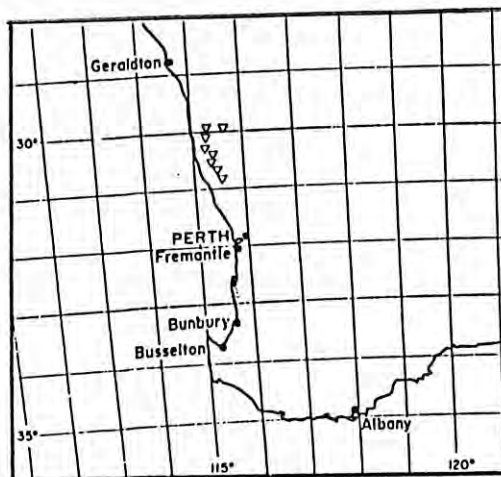
*Selected collections.* 8 km S of Eneabba, 27 April 1977, R. J. Hnatiuk 770025 (PERTH); NE of Mt. Lesueur, 27 March 1977, A. S. George 14429 (PERTH); Coorow Reserve, 30 June 1967, C. Chapman s.n. (AD, BRI, CANB, K, MEL, NSW, PERTH); Cadda Road, 5 miles (8 km) from Badgingarra, 30 May 1965, F. W. Humphreys s.n. (PERTH); 3 km S of Cataby Brook, Brand Hwy, 26 March 1977, A. S. George 14406 (PERTH).

*Habitat.* In shallow white or grey sand over laterite, sometimes in deeper sand, in open-heath, low shrubland or in tall shrubland.

*Flowering period.* March to September, with the peak in winter.

*Banksia grossa* is a recent discovery, the first collection being that of F. W. Humphreys in 1965. Although the opening of the region to agriculture made it more accessible, it is surprising that the species was not collected by earlier visitors, but perhaps they were diverted by its similarity to *B. leptophylla* and *B. sphaerocarpa*. The overall character of the species is captured in its name, for in the thick leaves, large perianths, and prominent follicles, the last enclosed by the thick styles, it has a coarse aspect not seen in the other species of the *Abietinae*. The flaking bark is also unusual, for the only other species with similar bark is *B. nutans* in which, however, the layers are papery and of various shades of dull red and brown. The seeds are the largest of the *Abietinae*.

The plants typically produce inflorescences on short branchlets lateral to the main stems near their base, but occasionally terminal inflorescences are produced. The flowers produce copious nectar. The leaves, as indicated above, are usually wider than in all other *Abietinae* except the short, broad-leaved variant of *B. sphaerocarpa* from the Porongurups, but several collections have more slender leaves about 1 mm wide, e.g. Cockle-shell Gully, A. C. Burns 153 (PERTH).



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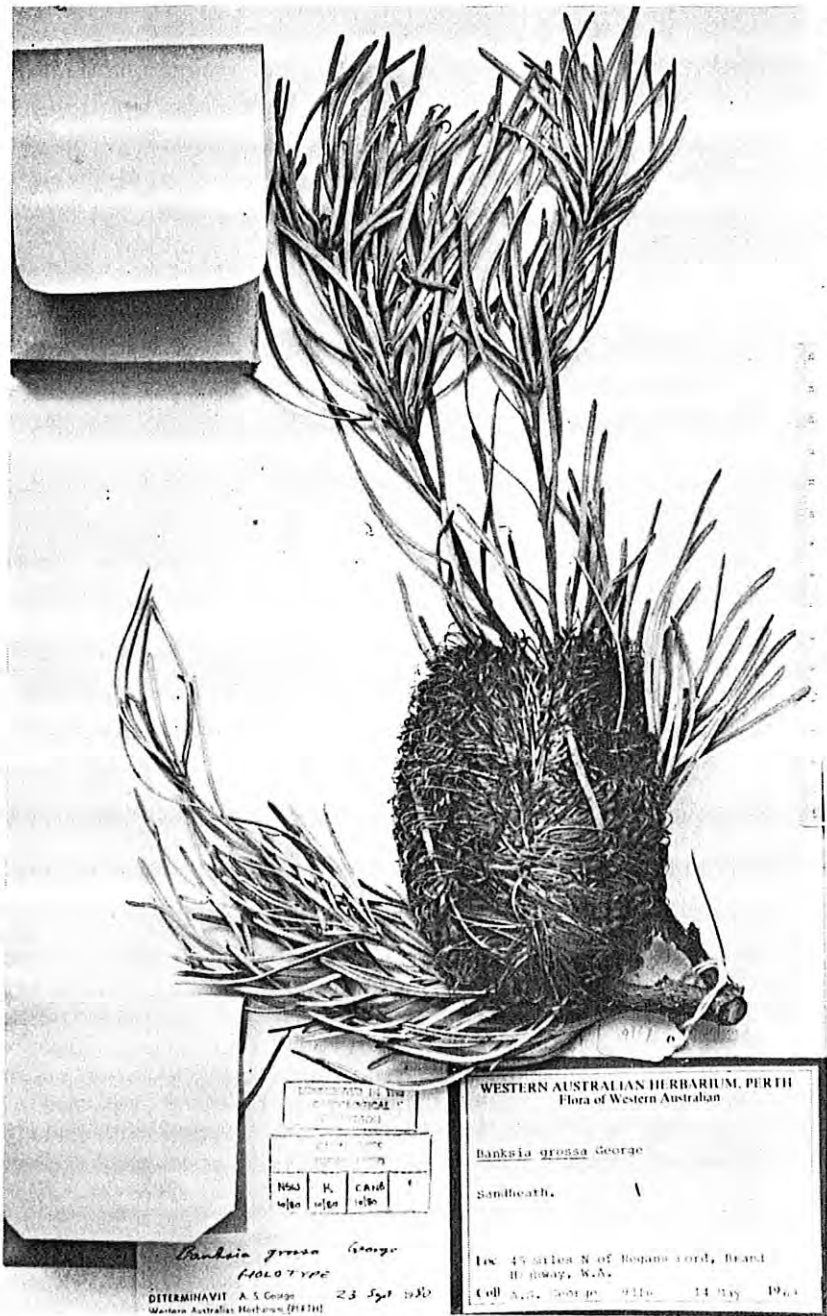
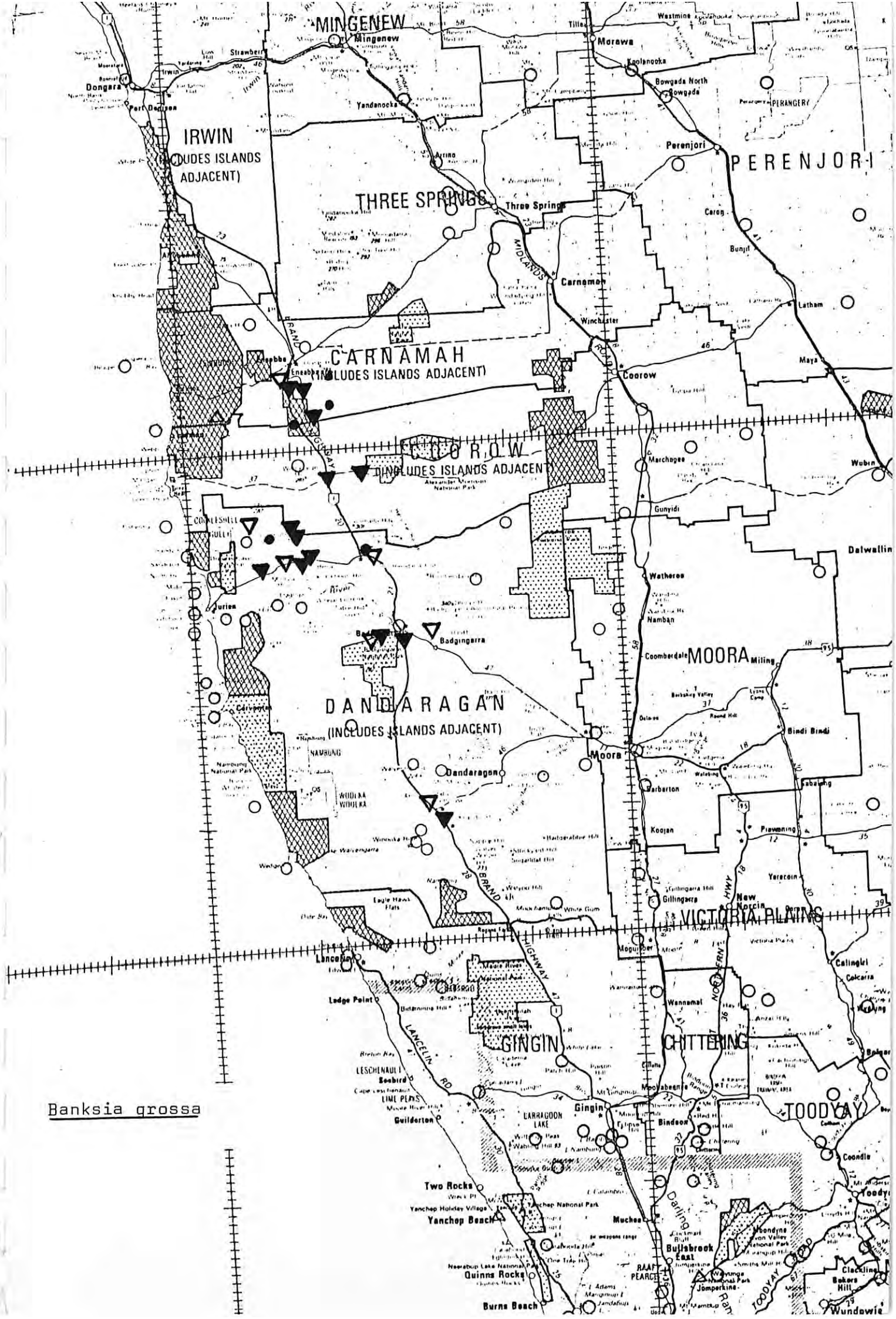


Figure 92. *Banksia grossa*. Holotype, A. S. George 9316 (PERTH).



Banksia grossa



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Banksia grossa* George ..... Family *Proteaceae* ..... Date Recorded 5.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	8km S of Eneabba 29°53'S 115°16'E	low open heath, <sup>+ gravel</sup> greysand	1 10 77	N	RJHnatick 771510
	15km SE of Eneabba 29°59'S 115°18'E Coorow Reserve	white sand	5 7 79	Y	RJHnatick 1266
	Coomaloo Dewar Creek Rd		30 6 67	Y	C Chapman sn
	8km S of Eneabba 29°52'S 115°16'E	low open heath, grey sand	30 5 72	N	SJJ Davies sn
	SW of Eneabba		27 4 77	Y	RJHnatick 770025
	N of Badgingarra	low scrub, sand	2 9 66	Y (old)	AS George 7834
	6m SW of Badgingarra	sand over laterite	13 8 65	Y	AS George 6750
	150m N of Eneabba Rd		30 4 70	Y	TEH Aplin 3140
	Hill River - Mt Lesueur WA		?	N	E. Parkin sn
	Coorow - Green Head Rd, 1.5 km W of Rose Rd		24. 3 76	N	R. Garstone 2
	19m N of Legans Ford		15 8 78	N	J. Scott sn
	SW of Badgingarra		16 5 69	N	A.S. George sn.
	5m from Badgingarra		29 4 67		F.W Humphreys sn.
	8km S of Eneabba 29°53'S 115°16'E	low closed heath grey sand	23. 9 65	Y	F.W Humphreys sn
	3m S of Cataby Brook on Brand Hwy	over sandy gravel	1. 10 77	N	R.JHnatick 771510
	N of Mt Benia 30°09'S 115°16'E	sandy loam	26 3 77	Y	AS George 14406
		low open heath, grey sand over duricrust laterite	21. 9 79	N	E.A. Griffin 2303



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Banksia grossa* George ..... Family *Proteaceae* ..... Date Recorded *5.5.81* .....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Intersection Brand Hwy + Green Head Rd 30°03'S 115°20'E	sand over laterite heath	24 1 79	N	B Barnsley 847
	8 km S of Eneabba 29°53'S 115°16'E	coarse grey sand	27 4 78	N	R S Hartink 77549
	NE of Mt Lesueur	laterite, heath	27 3 77	Y	A S George 14429
	Cockleshell Gully		8 10 71	old	A C Burns 153
	1 m N of Jurien Rd, along Cockleshell Gully Rd 115°10'E 30°14'S		15 11 71	old	A S George 11194
	Mt Benia, E of Jurien	lateritic sand	3 8 71	old	N G Marchant 71/314
	Cadda Rd, 5 m from Badgingarra		30 5 65	N	F W Humphries sn
Holotype	45 m N of Regans Ford, Brand Hwy	Sand heath	14 5 69	N	A S George 9316
KP	Near Watheroo observatory 30°50'S 116°00		26 11 66	Y	J S Berg 4591
KP	1 km NE Mt Benia	lateritic sand, low heath	14.7.71	Y	G J Keighery 2806
			v	v	v 2805
UWA	along Mt Benia Rd	low scrub, white sand	18 5 71	Y	A M Baird sn
UWA	~ 5 km S of Eneabba	yellow sand	23 3 76	Y	A H Barbridge 2289

Banksia hookerana Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 119 (1855)

+ Benth. Fl. Austral. 5: 558

Erickson et al. (1973) p 97.

35. **B. Hookeriana**, Meisn. in Hook: Kew Journ. vii. 119, and in DC. Prod. xiv. 458. A shrub of 5 or 6 ft., with densely tomentose branches. Leaves linear-cuneate, 4 to 8 in. long, 4 to 5 lines broad near the end, tapering into a short petiole, divided nearly half-way to the midrib into numerous broadly triangular teeth or lobes, minutely tomentose underneath, the veins inconspicuous. Spikes oblong, very thick, 4 to 5 in. long. Perianth curved upwards, nearly  $1\frac{1}{2}$  in. long, the limb about 3 lines long, densely hirsute with long spreading hairs. Style rigid, incurved at the base, then erect and straight, with a slender furrowed stigmatic end.

**W. Australia.** Between Tea-tree swamp and Irwin river, Drummond, 6th coll. n. 202.



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Banksia hookeriana* Meisn. Family *Proteaceae* Date Recorded 5.5.81  
 \* Miniature forms.

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
*	4 km SW of Eneabba	deep sand	14 8 72	Y	AS George sn.
	Eneabba Coorow	sand heath	24 9 62	Y	JS Beard 1917
	Allanooka		25 8 65	Y	A Kessel
	S of Arrowsmith River		10. 9 67	Y	AC Burns 70
	N of Arrowsmith Lake	sand plain	6 10 69	Y	AS George 9776
*	Eneabba		29. 6. 72	Y	H. Mc Donald-Smith
	NE from lake Logue	yellow sand, open heath	27 8 48	Y	CA Gardner
	4.5 m S of Eneabba School		5 8 62	Y	W Chapman sn
	NE of Lake Logue		sept 48	Y	CA Gardner 7113
	8 km S of Eneabba - 29°53'S 115°16'E	shrubland, deep sand	27 4 78	old	R. J. Hartink 780085
	2 m SE of Irwin	yellow sand	26 8 65	Y	K Newbey 2114
	Three Springs (SW of Eneabba)		1. 10. 60	Y	T. Muir sn
	Arrowsmith River			Fruit	E Parkin
	13 m SW of Eneabba		2 9 66	N	AS George sn
Isotype	Between Tea-tree Swamp and Irwin River				J Drummond VI 202
KP	40 m S of Dongara 29°50'S 115°15'E		3. 1. 65	Y (old)	F. Lullwitz 4367
UWA	Lake Logue			Y	NH Speck sn



61. *Banksia lanata* A. S. George, sp. nov. (Figure 94)

*Frutex* nanus ad 1 m altus sine lignotubero. *Folia* anguste-lineararia, acuta, 3-10 cm longa, supra hirsuta deinde glabra vel minute scabrida, marginibus arcte revolutis. *Ramuli* tomentosi. *Inflorescentiae* sphaericae, 3-5 cm longae, 7-10 cm latae sub anthesi. *Bracteae involucales*  $\pm$  confertae, subulatae, 5-10 mm longae, villosa-tomentosae. *Bracteae communes* lineares, 7-9 mm longae pilis albis dense hirsutae, apicibus acutis sursum curvatis. *Perianthium* cremeum, 32-38 mm longum limbo 3-4.5 mm includens, utrinque breviter hirsutum; limbus dense hirsutus. *Pistillum* 38-48 mm longum, glabrum; pollinis praebitor anguste conicus, 1 mm longus. *Folliculi* elliptici, 12-30 (35) mm longi, 4-11 mm alti, 6-12 mm lati, laeves, dense hirsuti; bracteae communes induratae,  $\pm$  pungentes; flores et pistilla in fructu persistentia. *Semina* obovata, 17-25 mm longa; seminis corpus late falcatum, 9-13 mm longum; 5-6 mm latum; ala 18-27 mm lata.

*Type*: E of Eneabba on Winchester road, Western Australia, in 29°48'S, 115°27'E, 14 Nov. 1971, A. S. George 11191. *Holo*: PERTH; *iso*: CANB, NSW.

*Derivation of name*. From the Latin *lanatus*, woolly, in reference to the white hairs of the common and floral bracts.

*Cotyledons* (Fig. 9.56) narrowly obovate, gently curved, 13-17 mm long, 5-7 mm wide, nerveless (3-nerved towards base when dry), bright green, spreading; auricles spreading or descending, acute, 3 mm long. *Hypocotyl* slender,  $\pm$  1 cm long, pubescent becoming glabrous, reddish. *Seedling leaves* at first in pairs or scattered, upper ones scattered; first 3-6 leaves 4-6 mm above cotyledons, linear to narrowly lanceolate, obtuse, 12-20 cm long, sparsely hirsute above with spreading hairs, white-woolly below; margins only slightly recurved; next few leaves up to 4 cm long, narrowly linear, the margins more revolute, otherwise similar; higher leaves crowded, very narrow, acute, 6-7 cm long, the margins tightly revolute, moderately densely hirsute above. *Seedling stem* above cotyledons sparsely hirsute, higher up hirsute and densely tomentose.

*Mature plant* a shrub to 1 m tall without a lignotuber, much-branched and spreading; branchlets densely leaved and usually concealing flowers and fruits. *Branchlets* densely white-tomentose with curled hairs and scattered long straight hairs; base of branchlet with persistent, subulate, tomentose prophylls 5-15 mm long. *Leaves* crowded, narrowly linear, usually curved, acute to acuminate but scarcely pungent, 3-10 cm long, 0.75-1 mm wide; upper surface hirsute with short and long straight hairs becoming glabrous and very slightly scabrid; midrib hirsute below becoming glabrous; margins tightly revolute, concealing white-woolly undersurface; petiole 3-4 mm long, tomentose; new leaves deep pink. *Inflorescence* usually on short lateral leafy branchlet from a stem 2-4 years old, spherical, 7-10 cm across at anthesis; branchlet for 1-3 cm below inflorescence with subulate bracts on thickened bases, 5-10 mm long, woolly at base, tomentose above. *Axis* 3-5 cm long, 4-5 mm wide, 19-22 mm wide with common bracts. *Involuclal bracts* similar, crowded, persistent. *Common bracts* linear, 7-9 mm long, densely hirsute with creamy white (rarely pale brown) hairs; exerted apex conical but narrowed to acute up-turned point, densely tomentose. *Floral bracts* linear, 6-7 mm long, densely hirsute, obtuse. *Flowers* pale cream, sometimes pale brown, the styles purple. *Perianth* 32-38 mm long including limb of 3-4.5 mm,  $\pm$  straight with reflexed limb; claws filiform,  $\pm$  0.5 mm wide tapering upwards, shortly hirsute on both sides with  $\pm$  spreading white or pale brown hairs; limb narrowly elliptic, densely hirsute especially at apex. *Anthers* 1.5 mm long on short filaments, the connective shortly and obtusely produced. *Hypogynous scales* oblong, obtusely lobed, 2 mm long, adhering to perianth. *Pistil* 38-48 mm long, gently sigmoid, the apical 3-4 mm recurved through 90°-130°, glabrous; pollen-presenter narrowly conical, 1 mm long, slightly swollen near base, lower half dark, upper pale; stigmatic groove transverse at apex; ovary glabrous. *Infructescence* spherical, 4.5-6 cm diam., old perianths and styles persistent; common bracts somewhat enlarged, indurated,  $\pm$  pungent, greyish. *Follicles* up to 50, elliptic in plan view, 12-30(35) mm long, 4-11 mm high, 6-12 mm wide; valves semi-elliptic, smooth, convex, densely hirsute with spreading hairs, the exposed parts becoming glabrous; ridge obtuse; suture fine; follicles opening usually with fire, to 18 cm across, valves gently recurved; lip  $\pm$  1 mm wide; inner surface brownish black. *Seed* broadly obovate, 17-25 mm long; seed body broadly falcate to almost semi-circular, 9-13 mm long, 5-6 mm wide, obtuse at base, apex produced to beak on stylar margin which is concave, the other margin very convex; both surfaces  $\pm$  flat, brownish grey; wing 18-27 mm wide, brown. *Separator* similar to seed in shape and size.

*Distribution.* (Fig. 97) South West Western Australia: confined to an area between Arrowsmith Lake, Coomallo Creek and Tathra National Park.

*Selected collections.* Between Lake Logue and Arrowsmith River, 27 Aug. 1948, C. A. Gardner 9114 (PERTH);  $\pm$  41 miles (65 km) SW of Three Springs, 16 Dec. 1964, F. W. Humphreys s.n. (PERTH); SW of Encabba, 17 Oct. 1969, A. S. George 9794 (PERTH); Coomallo Creek, in 30°11'S, 115°23'E, 15 Dec. 1976, R. Huatiuk 761397 (PERTH).

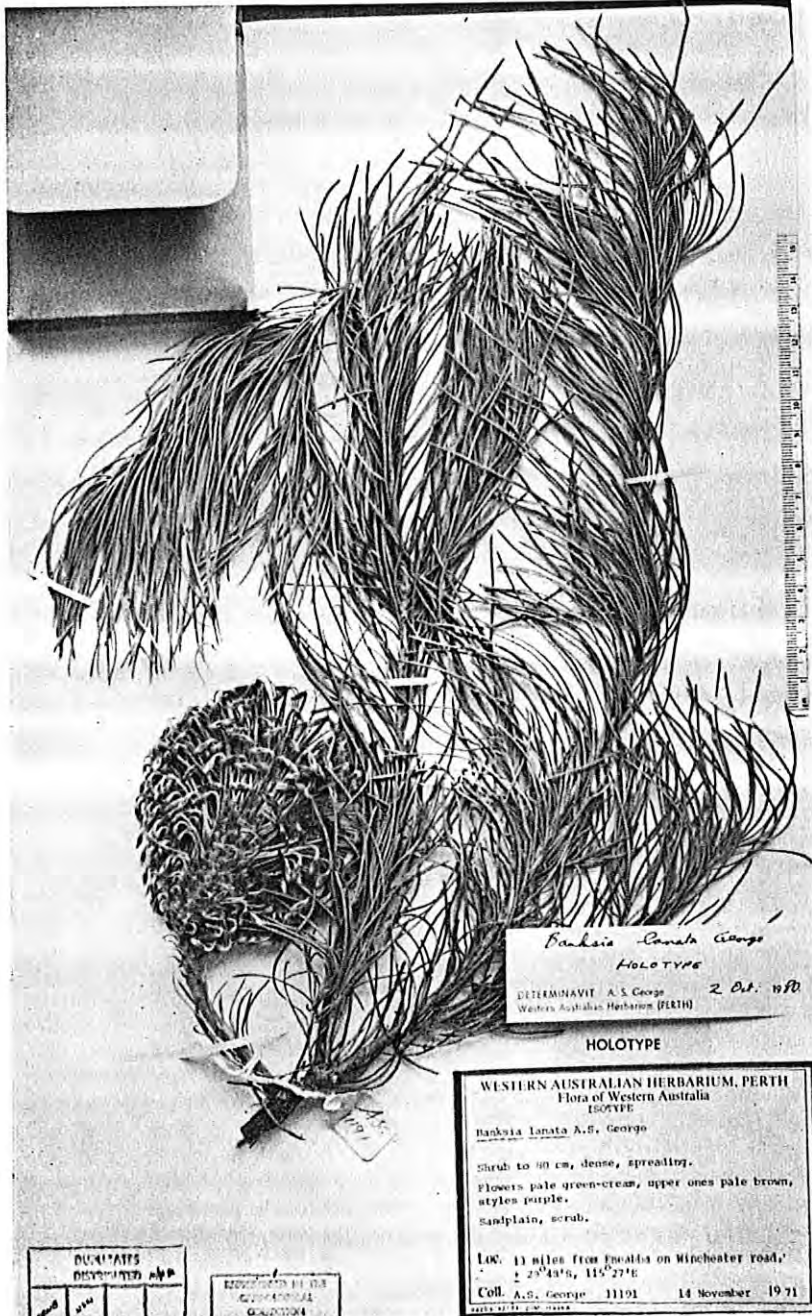
*Habitat.* In deep white sand, sometimes over laterite, in closed or open heath.

*Flowering period.* Late October to January.

*Banksia lanata* is closely related to *B. scabrella* A. S. George and *B. leptophylla* A. S. George but can be distinguished from both by the low bushy habit, the deep pink new leaves and the white (rarely pale brown) hairs of the common and floral bracts. From *B. scabrella* it is further differentiated by the longer leaves, the upturned shorter apices of the common bracts, the larger pollen-presenter and the more rounded sutures of the follicles. Additional differences from *B. leptophylla* are the cream and purple flowers, the usually more prominent follicles and the  $\pm$  pungent enlarged common bracts of the infructescence.

The species is locally common over its range, usually growing on the lower slopes of the gently undulating hills of the region. Although its occurrence is within that of *B. leptophylla* the latter usually occupies a slightly different habitat lower down the slopes and on the valley floors.

have pale flowers and pale brown indumentum of the floral bracts, e.g. George 14412 from the lower Hill River; Cranfield s.n., near Drovers Cave National Park. The late-spring flowering season of *B. lanata* differs from that of small-flowered *B. leptophylla*. *Banksia telmatiaea* is usually distinguished by its short leaves, its cylindrical inflorescences, its shorter golden-brown perianth and its thinner follicles. A collection, in fruit and very early bud, which appears intermediate is George 14414 from near the lower Hill River, in which the leaves are 2-4 cm long and the follicles 4-7 mm wide.



*Banksia lanata* George  
HOLOTYPE  
DETERMINAVIT A. S. George 2 Oct. 1970  
Western Australian Herbarium (PERTH)

HOLOTYPE

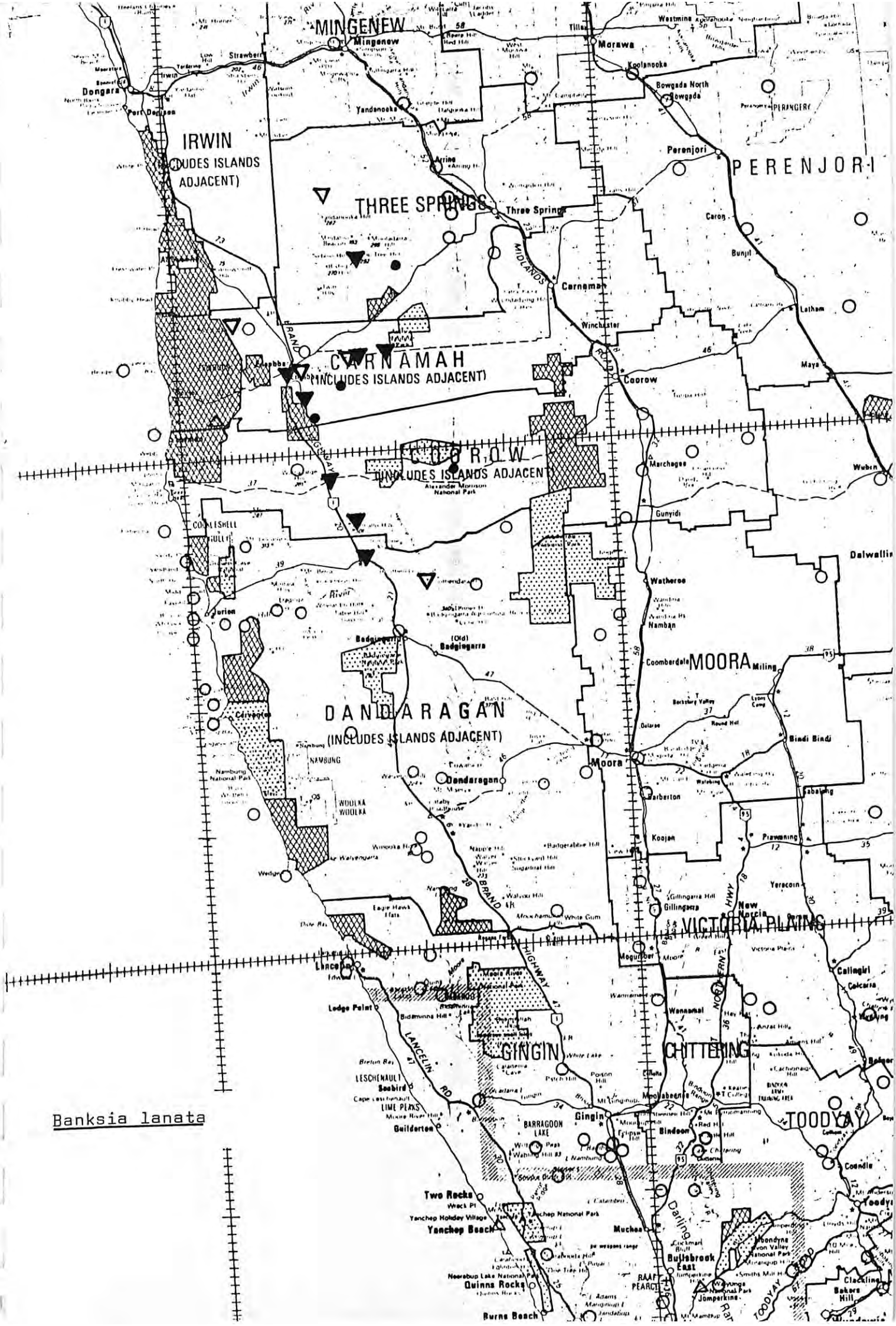
WESTERN AUSTRALIAN HERBARIUM, PERTH  
Flora of Western Australia  
HOLOTYPE  
*Banksia lanata* A.S. George  
Shrub to 80 cm, dense, spreading.  
Flowers pale green-cream, upper ones pale brown,  
styles purple.  
Sandplain, scrub.  
LOC. 11 miles from Eneabba on Winchester road,  
27°49'S, 115°27'E  
Coll. A.S. George 11191 14 November 1971

DUPLICATE  
DISCONTINUED APP

REPRODUCED BY THE  
GOVERNMENT OF  
WESTERN AUSTRALIA

Figure 94. *Banksia lanata*. Holotype, A. S. George 11191 (PERTH).





Banksia lanata



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Banksia lanata* George...ms... Family *Proteaceae*..... Date Recorded .....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	41 m SW of Three Springs		16.12.64	Y	F. Humphreys
	25 m SW of Eneabba	Below W. side of lateritic hill	2.9.66	Bud	A.S. George 7836
	8 km SSE of Eneabba 29°53'S, 115°19'E	grey sand with massive outcropping laterite low open heath	8.11.78	Y	E. Griffin 1505
	Between C. Logue & Arrowsmith River	Sand heath	27.8.48	Bud	C.A. Gardner 9114
	5 km E of Brand Hwy on Toothardi Rd	sand over laterite heath	27.3.77	Fruit	A.S. George 14428
	W of one tree hill, NE of Eneabba		15.8.77	Bud	J. Scott
	~32 km W of Arriine		30.8.77	?Fruit	C. Chapman s.n.
	17.5 km E of Eneabba on Carnamah Rd	in Sand with E. toditiana	27.3.77	?Fruit	A.S. George 14421
	17 km N of Badgingarra	Valley below lateritic knoll	13.8.65	?Fruit	A.S. George 6753
	1 km E of Brand Hwy on Coorow Rd 30°03'S 115°21'E	grey sand over laterite low open heath	19.10.78	Y	R.J. Hnatiuk 780275
	Eneabba		31.1.66	Y	F. Humphreys
	32 m west of Winchester on Eneabba - Carnamah Rd		24.8.65	Y	A.C. Braunguhle 12182
	2 m SW of Eneabba 115°15'E 29°50'S	On Sand heath	17.10.69	Y	A.S. George 9794
	8 km S of Eneabba 29°53'S 115°16'E	deep sand, low open heath	27.4.78	Fruit	R.J. Hnatiuk 771569
	Coomallo Creek 30°11'S 115°23'E	lateritic gravel low open heath	15.12.76	Bud	R.J. Hnatiuk 761397



Banksia micrantha George  
Nuytsia 3: 422-426 (1981)

58. *Banksia micrantha* A. S. George, sp. nov. (Figures 88, 89 and 90)

*Frutex* ad 60 cm altus cum lignotubero; rami saepe primum rhizomatosi. *Folia*  $\pm$  conferta, linearia, pungentia, 1-3 cm longa, marginibus arcte revolutis. *Inflorescentia* 2-3 cm longa, 3.5-5 cm diam. sub anthesin. *Bractee involucrales* 2-4 mm longae. *Bractee communes* 3-4 mm longae. *Perianthium* 17-20 mm longum limbo 2-3 mm longo includens, extus et intus pubescens. *Pistillum* 19-24 mm longum apice recurvo; pollinis praebitor 0.6-0.7 mm longus. *Folliculi* ovati ad elliptici, 23-27 mm longi, 7-15 mm alti, 20-23 mm lati,  $\pm$  applanati sed cum porca suturali,  $\pm$  laeves, pubescentes; flores et pistilla in fructu persistentia. *Semina* late obovata, 20-24 mm longa; seminis corpus obovatum, 12-14 mm longum, 7-9 mm latum, ala 17-23 mm lata.

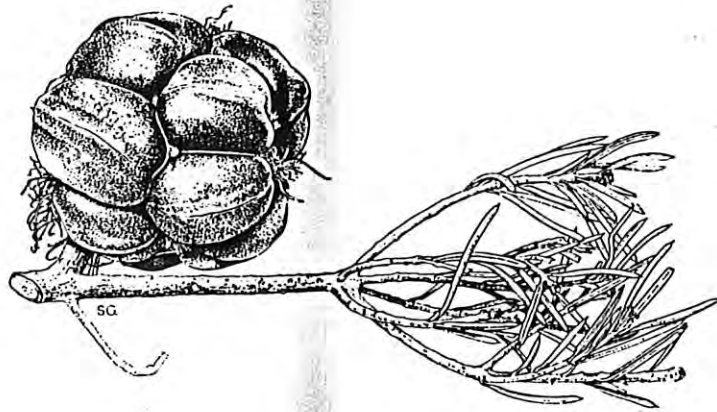
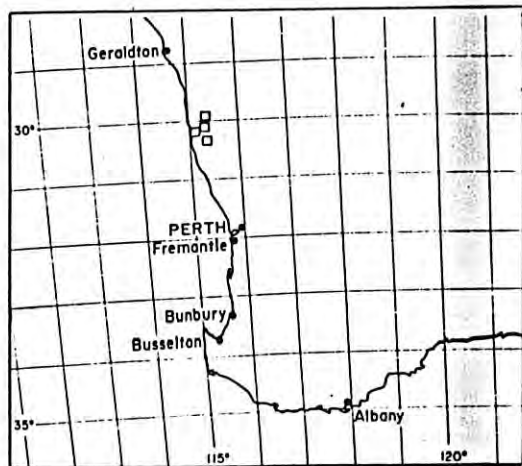


Figure 90. *Banksia micrantha*. Inflorescence  $\times \frac{1}{2}$ . Drawn from A. S. George 14415.



*Type:*  $\pm$  5 km west of Mt. Lesueur, Western Australia, 27 March 1977, A. S. George 14415. *Holo:* PERTH; *iso:* K, NSW, PERTH.

*Derivation of name.* From the Greek *micros*, small, and *anthos*, flower, in reference to the flowers.

*Cotyledons* (Fig. 9.53) obovate, slightly oblique, widely spreading, 18–20 mm long, 11–15 mm wide, 3-nerved towards base,  $\pm$  bright green, margin entire to slightly crenulate; auricles  $\pm$  spreading, obtuse, 1.5–2 mm long. *Hypocotyl* very short, thick, glabrous or loosely hirsute, green. *Seedling leaves* crowded; first two opposite,  $\pm$  5 mm above cotyledons, linear, acute, 7–8 mm long, 2–2.5 mm wide, margins recurved, upper surface and midrib below loosely hirsute, lower surface white-tomentose; later leaves becoming narrower, at length 1 mm wide, to 25 mm long, margins tightly revolute, otherwise similar. *Seedling stem* loosely hirsute.

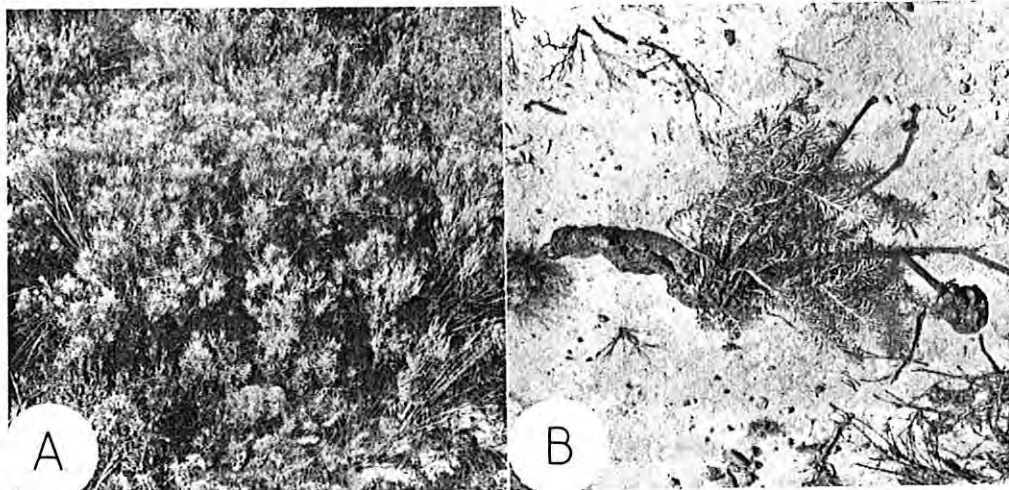


Figure 88. *Banksia micrantha*. A—Habit,  $\pm$  40 cm tall (W of Mt. Lesueur). B—Part of a plant showing underground stems, aerial stems, regrowth following fire, and old infructescence (Near Mt. Peron, W.A.).

*Mature plant* a shrub up to 60 cm tall and 1.2 m diam. with lignotuber. *Stems* erect or spreading, often rhizomatous in the soil for a short distance from the lignotuber, the underground parts with filiform, hirsute bracts 2–5 mm long. *Branchlets* pubescent with short, crisped hairs. *Leaves*  $\pm$  crowded, erect, linear, 1–3 cm long, 1–1.5 mm wide, pungent; margins tightly revolute, leaving midrib exposed; lamina sparsely hirsute or almost glabrous above when young becoming glabrous; new leaves bright green. *Inflouescence* terminal or on lateral branch, the peduncle leafy or with subulate deciduous bracts, 3.5–5 cm across after anthesis. *Axis* 1.5–3 cm long, 3–4 mm wide, 11–13 mm with common bracts. *Involucral bracts* subulate from thick bases, 2–4 mm long, closely pubescent. *Common bracts* linear, 3–4 mm long, densely ferruginous-hirsute; exerted apex conical, obtuse, upturned, shortly tomentose, white to grey. *Floral bracts* slightly shorter, with smaller exerted apex. *Flowers* pale yellow, sometimes purplish, in bud greenish-pink or -mauve with green limb. *Perianth* 17–20 mm long including limb of 2–3 mm; claws filiform, 0.2–0.3 mm wide, shortly appressed-pubescent outside, appressed-pubescent inside except glabrous midrib; limb narrowly elliptic, obtuse, thick, appressed-pubescent at apex and base and sometimes on margins, otherwise glabrous. *Anthers*  $\pm$  1.5 mm long, connective shortly produced. *Hypogynous scales* linear, often lobed, 1.5 mm long. *Pistil* 19–24 mm long, gently curved, glabrous, apex bent down at  $\pm$  90°; pollen-presenter 0.6–0.7 mm long,  $\pm$  ovoid, brown; stigmatic groove transverse at apex; ovary glabrous. *Infructescence* 4–6 cm across; old perianths and styles persistent. *Follicles* up to 25, in plan view ovate-elliptic, 23–27 mm long, 7–15 mm high, 20–23 mm wide, somewhat flattened on top but with a low ridge along the suture; valves rhombic-hemispherical,  $\pm$  smooth,



pubescent with short straight hairs becoming glabrous, when young bright green; follicles opening usually with fire, to 12 mm across, the valves slightly recurved; lips  $\pm 0.5$  mm wide. Seed broadly obovate, 20–24 mm long; seed body obovate, 12–14 mm long, 7–9 mm wide, stilar side straight and beaked to stilar point; inner face slightly convex, outer flat, dark brown, slightly mottled; wing slightly offset to stilar side, 17–23 mm wide, decurrent on side opposite style, mottled brown. Separator similar to seed in shape and size, thin.

*Distribution.* (Fig. 91) South West Western Australia, restricted to an area between Eneabba and Cervantes.

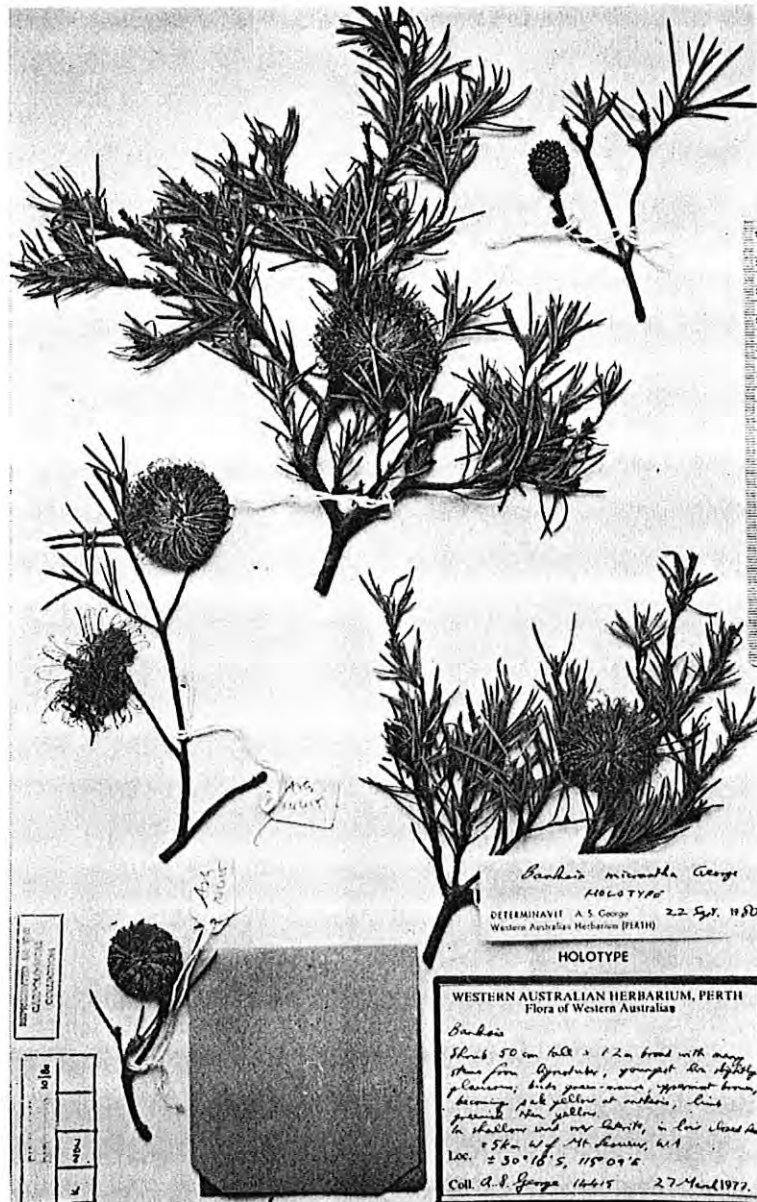


Figure 89. *Banksia micrantha*. Holotype, A. S. George 14415 (PERTH).

Figure 90. *Banksia*

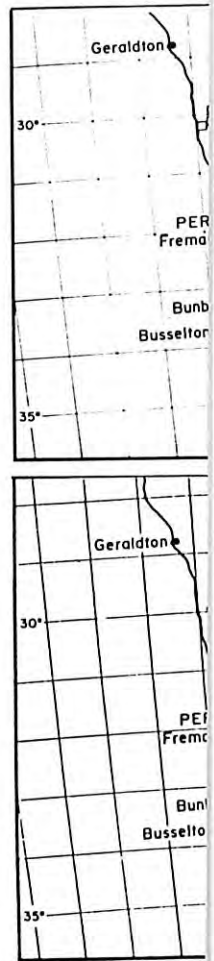


Figure 91. Distributions of *B. micrantha* (■), *B. sphaerocarpa*

*Selected collections.* South of Eneabba, 9 March 1974, A. S. George 11782 (PERTH); Between Cockleshell Gully and Mt. Lesueur, August 1938, W. E. Blackall 3611 (PERTH); Mt. Lesueur, Hill River, January 1940, C. A. Gardner s.n. (PERTH).

*Habitat.* In shallow grey or white sand over laterite, in low shrubland or open-heath.

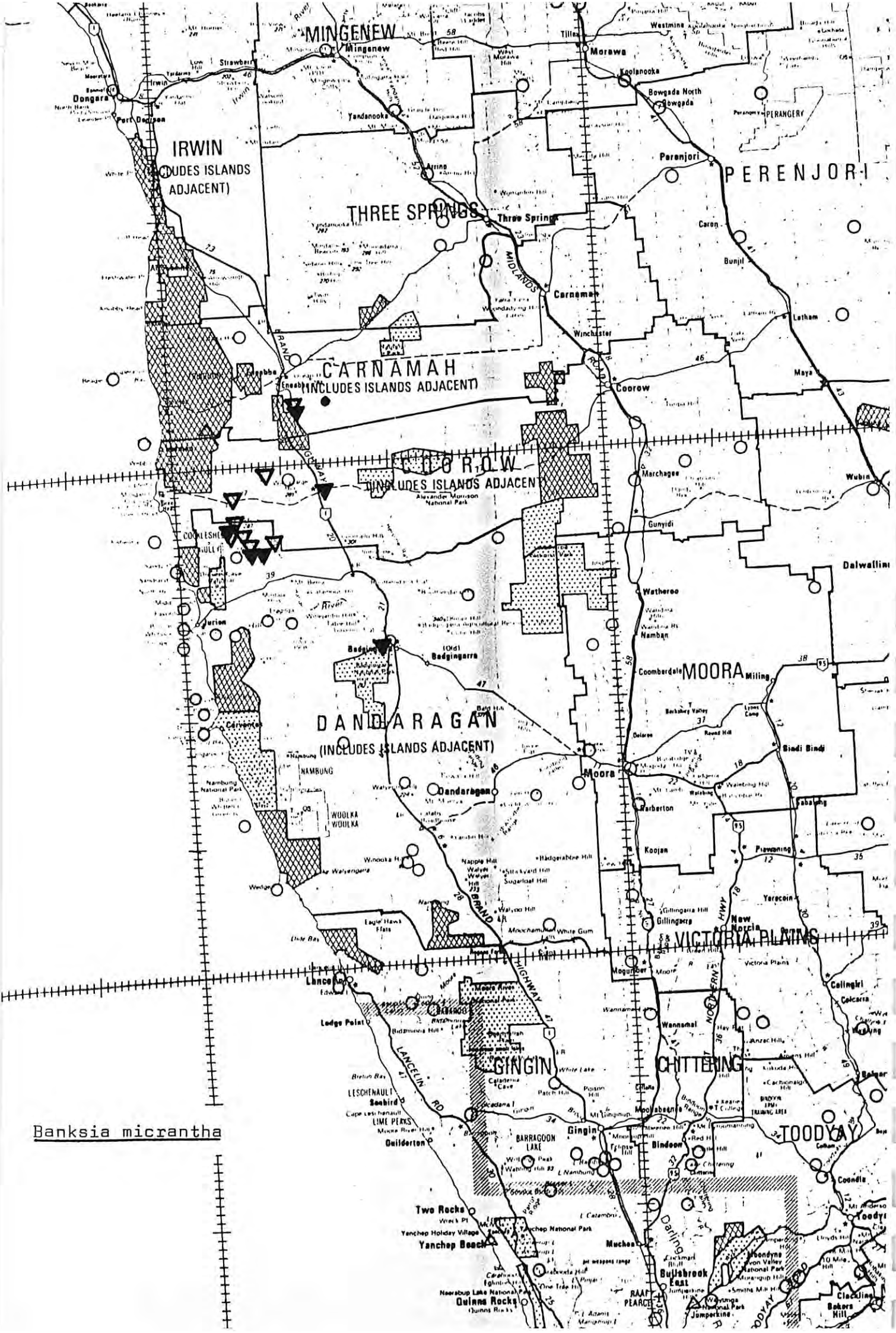
*Flowering period.* January to May, with a few inflorescences as late as September.

*Banksia micrantha* is closely related to *B. sphaerocarpa*, especially its northern populations, but is distinct enough to be given specific status. The principal differences of *B. micrantha* are its sprawling habit, very pungent leaves, small appressed-pubescent perianth, almost glabrous perianth limb, and large follicles with a close indumentum of short, appressed straight hairs. It is also related to *B. incana* A. S. George from which it can most readily be distinguished by the pubescent inner surface of the perianth, the infructescence with persistent old flowers, and the slightly shouldered brown follicles which are sparsely pubescent with straight hairs.

*Banksia micrantha* has the most restricted distribution of the species in the series *Abietinae*. It is centred around Mt. Lesueur, an area proposed as a nature reserve but not yet declared as such and currently threatened by proposed open-cast coal mining. It is not yet generally in cultivation as it is not well known.

Although the specific characters are consistent, there is variation in some features, especially in the size of the follicles.

In its low, sprawling habit the species shows a tendency towards the prostrate state. In particular some of the lateral branchlets at first develop underground for up to 60 cm before emerging to continue as aerial branchlets. Where underground they are covered with linear-subulate bracts giving them a rhizomatous aspect.



Banksia micrantha



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Banksia micrantha* George ..... Family *Proteaceae* ..... Date Recorded 8.5.81 .....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	5km W of Mt Lesueur 30°16'S 115°09'E	Sand over laterite, low closed heath	27.3.77	Y	AS George 14417
	North of Cocksleshell Gully on Green Head Rd W of Mt Lesueur		Feb 63	Y	? C A Gardner sn
	W of Mt Peron, 30°06'S 115°07'E	Sand heath, laterite	17 6 77		AS George sn
	Cocksleshell Gully W of Mt Lesueur		15 11 71		AS George 11197
	East of Jurien		12 9 68		C Brindley sn
	Old Rd to Eneabba, Nth of Gorow-Greenha, Rd		25 3 76	Fruit + Y	R Gardner 1
	NW of Mt Lesueur	sand and laterite	Feb 65	Y	? C A Gardner
	5km W of Mt Lesueur	sand over laterite, low heath	24 3 77	Y	C Chapman sn
	2m from Brand towards Cervantes		9 3 79	Y	R J Cranfield 1245
	South of Eneabba		27 3 77	Y	AS George 14416
	2m N of Cocksleshell Gully	Sand / laterite, heath	12 9 68	Y old	C Brindley sn
	Between Cocksleshell Gully + Mt Lesueur		9 3 74	Y	AS George 11782
	Mt Lesueur 30°11'S 115°12'E	shallow sand over laterite	Jan 40	Y	C A Gardner sn
		low open heath	1 9 68	Y old	C Brindley sn
			Aug 38	Y old	W E Blackall 3611
			17 7 79	Y old	E A Griffiths 1928





Banksia tricuspis Meisn.

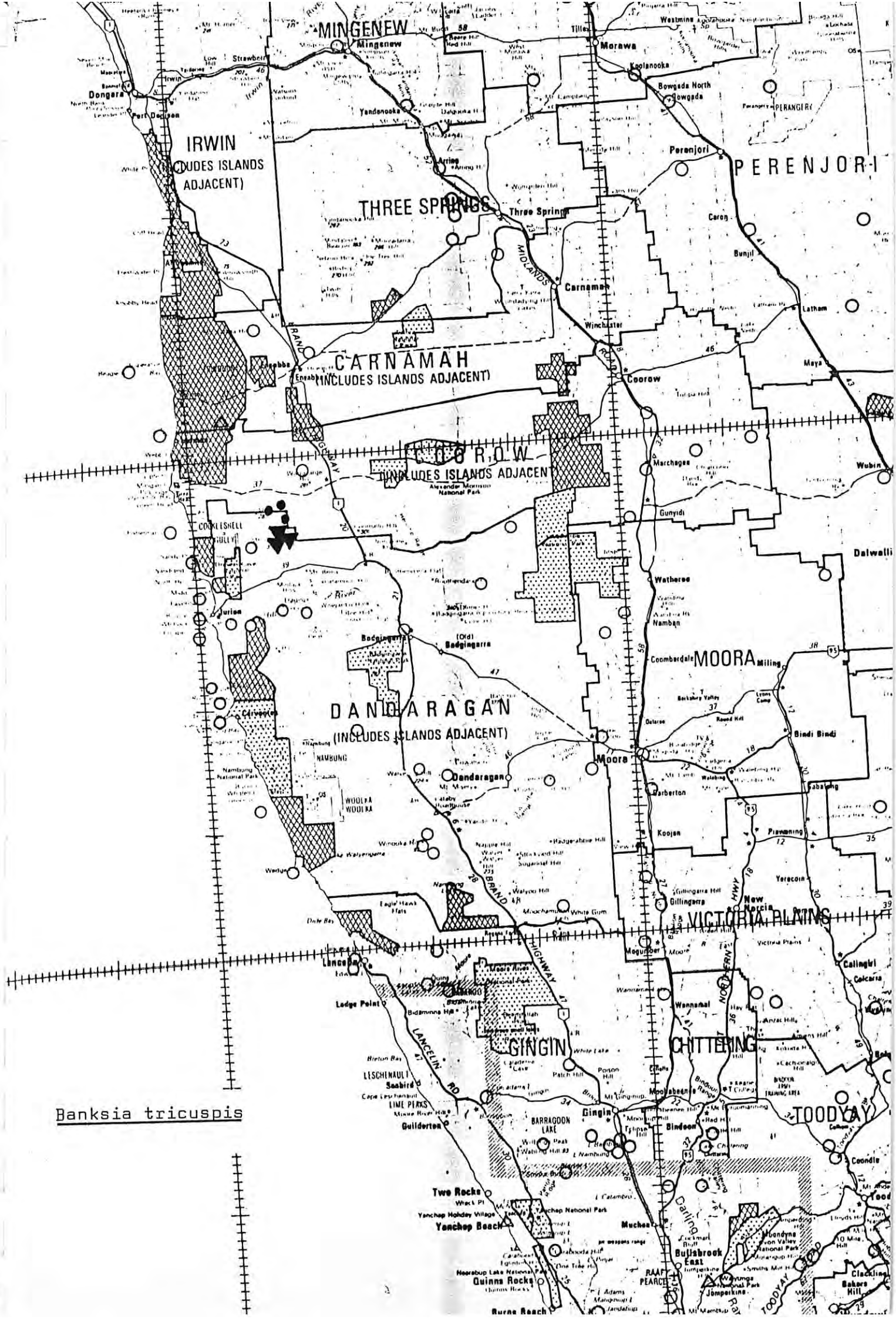
Hooker's J. Bot. Kew Gard. Misc. 7: 118 (1855)

+ Benth. Fl. Austral. 5:546

5. **B. tricuspis**, Meissn. in Hook. *Kew Journ.* vii. 118, and in *DC. Prod.* xiv. 453. Branches rather slender, glabrous or very slightly hoary. Leaves narrow-linear, truncate or almost notched, with a small callous point, the margins entire and closely revolute, 2 to 4 in. long. Spikes oblong-cylindrical, 5 to 6 in. long. Bracts obtuse, fulvous-villous. Perianths silky-villous but all withered and revolute in our specimens. Style above  $1\frac{1}{2}$  in. long, hooked, with a very small ovoid stigmatic end. Fruiting cone with very closely imbricate obtuse bracts; capsules very prominent, not thick, becoming glabrous, 9 to 10 lines broad.

**W. Australia.** Mount Lesueur and Gardner's Range, Drummond, 6th coll. n. 205.

see also Rye & Hopper (1981) p 52  
Holliday & Watton (1975)



Banksia tricuspis



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Banksia tricuspidis* Meisn. Family Proteaceae Date Recorded 1.5.81  
 \* not seen see Meisner

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Mt Lesueur 30°16'S 115°11'E	Lateritic hill	March 75	Y	A. S. George & C. E. Rasser
	Mt Lesueur ?		14.2.40	N	C. A. Gardner sn.
	15km W of Brand Hwy, 30°11'S, 115°14'E E of Mt Lesueur	Lateritic hill top, open woodland	2.6.78	Y	W. E. Blackall 3624
	Mt Lesueur	Lateritic soil, heath	4.6.71	Y	E. A. Griffin 1028
	Mt Lesueur	rocky gravelly soil	May 31	Y	G. J. Keighery 698
	NW of Mt Lesueur	on side of hill, lateritic soil	9.4.79	Y	A. G. Herbert sn.
	Mt Lesueur		25.8.38	Y	W. E. Blackall 3624
	Mt Lesueur	lateritic soil	10.6.31	Y	C. A. Gardner sn.
	Mt Lesueur		July 31	Y	C. A. Gardner sn.
	Jurien Bay			N	E. Parkin
	NE of Mt Lesueur	sandstone ridge	27.3.77	N	A. S. George sn.
	Mt Lesueur	edge of breakaway slope	13.10.74	N	A. S. George 12900
UWA	Mt Lesueur		18.5.71	Y	A. M. Baird sn.
type *	Mt Lesueur + Gardner's Range				J. Drummond 17205



Caladenia crebra George

+ Nuytsia 1:160-162 (1971)

see also Erickson et al p.109

**Caladenia crebra** A. S. George sp.nov. (Figure 2)

Planta gracilis 25-45 cm alta. Folium lineare,  $\pm$  20 cm longum, utrinque hirsutum. Caulis hirsutus, bracteis duobus acutis 17-25 mm longis. Flores 1-2, flavido-virides et atro-rubri. Perianthium extus glanduloso-hirsutum, etiam intus versus basin. Sepala 25-45 mm longa; dorsale erecto-incurvum, lineare, acuminatum, non clavatum; lateralia patentia, lanceolata-acuminata marginibus inferioribus saepe parum undulatis, apicibus non clavatis sed atro-glandulosis. Petala patentia, linearifalcata, acuminata, 25-35 mm longa. Labellum late rhombeum ad transverse ovatum,  $\pm$  15 mm longum, 10-12 mm latum (sine fimbriis), apice acuto recurvo; margines fimbriis filiformibus subtiliter scabridis ad 6 mm. longis antice brevioribus interdum uncinatis ornati; apex  $\pm$  integer, nudus; calli atro-rubri, zona lata ex ungue confertissimi, lineares, parum uncinati, 4 mm longi, antice breviores. Columna 15-18 mm longa, ad basin fere horizontalis anguste-alata, deinde sursum valde curvata late-alata; ad basin glandulis duobus flavis. Anthera 4-5 mm longa, mucronata. Stigma late-ovatum. Ovarium dense glanduloso-hirsutum.

Type: 24 miles south of Dongara, W.A., in sandy soil with *Eucalyptus erythrocorys* and scrub A. S. George 9621, Aug. 30, 1969--holo.: PERTH, iso.: K, MEL, NSW.

A slender plant 25-45 cm tall. Leaf linear,  $\pm$  20 cm long, hirsute on both sides. Stem hirsute, with two acute bracts 17-25 mm long. Flowers one or two, yellow-green and dark red. Perianth glandular-hirsute outside, and inside towards the base. Sepals 25-45 mm long; dorsal sepal erect-incurved, linear, acuminate, not clubbed; lateral sepals spreading, lanceolate-acuminate, lower margins often slightly undulate, apices not clavate but covered with short dark glands. Petals spreading, linear-falcate, acuminate, 25-35 mm long. Labellum broadly rhombic to transversely ovate,  $\pm$  15 mm long, 10-12 mm broad (without the fringe), with an acute, recurved apex; margins fringed with filiform, finely scabrid fimbria up to 6 mm long, the fimbria becoming shorter anteriorly, sometimes uncinately; apex  $\pm$  entire, bare; calli dark red, very crowded in a broad band from the claw, linear, somewhat uncinately, 4 mm long, shorter anteriorly. Column 15-18 mm long, almost horizontal and narrowly winged at the base, then strongly curved upwards and broadly winged; two yellow glands at the base. Anther 4-5 mm long, mucronate. Stigma broadly ovate. Ovary densely glandular-hirsute.

This species belongs to the Section *Calonema* and is at once distinguished from all other species of the Section by the very dense band of linear calli. It is also unusual to find the apices of the lateral sepals covered with glands while the dorsal sepal is not; in other species the sepals are either all glandular-clubbed or all smooth. The closest affinity appears to be with *Caladenia radiata* Nicholls, which has a longer, narrower labellum and thicker, less crowded calli. The only other species of the Section with crowded, linear calli is *C. lobata* R. Fitzg., but even there they are thicker and much less dense than in *C. crebra*, while the flower is larger, with upturned lateral sepals, and the labellum has large lateral lobes.

*Caladenia crebra* was discovered by Mrs. E. Summers of "Green Grove" south of Dongara, and was brought to my attention by Mr. A. C. Burns of Geraldton. It is known from a relatively small area but is locally common and may be found in similar habitats along this coastal strip. The specific epithet, meaning "close, pressed together", refers to the dense calli on the labellum.

Other collections examined: Arrowsmith River area, south of Dongara, W.A., A. C. Burns, Sept. 10, 1967; loc. id. Sept. 15, 1968; loc. id. Aug. 28, 1969 (all at PERTH).

Caladenia crebra A. S. George  
 (1970) Sp. Pl. 107, t. 1, f. 1  
 Pl. J. 107, t. 1, f. 1

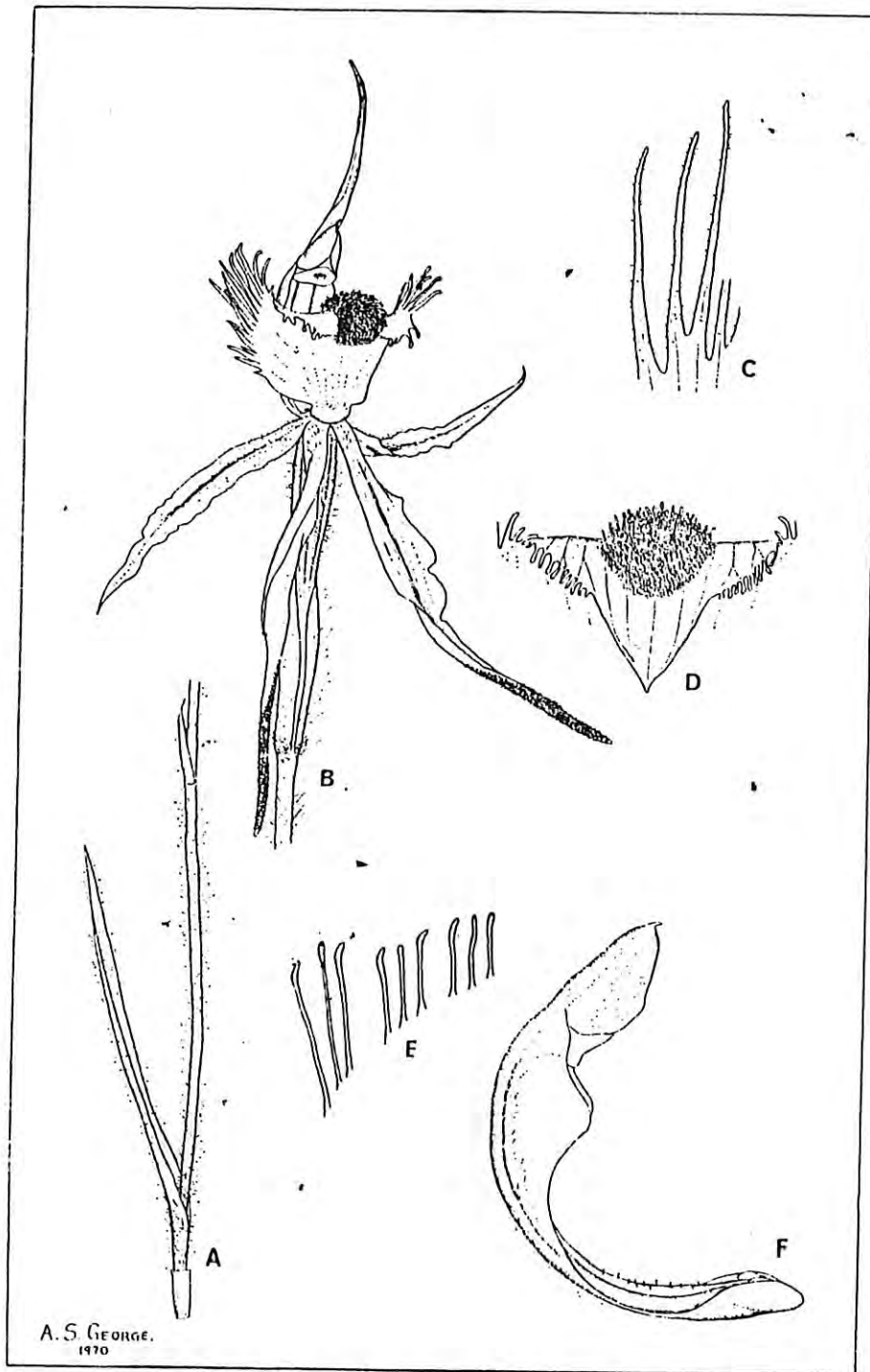
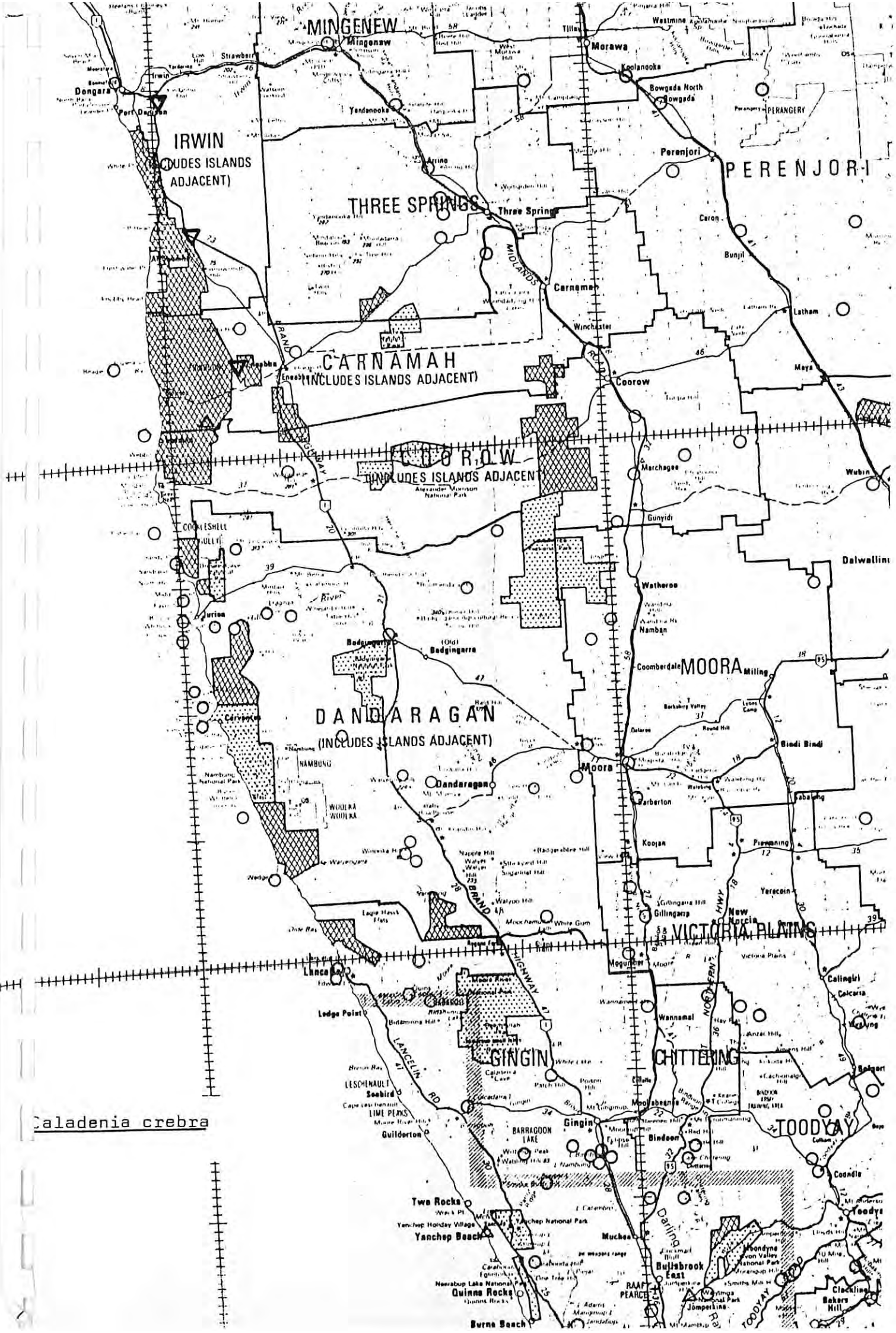


Figure 2—*Caladenia crebra* sp. nov. A—Leaf and base of stem, x 0.6. B—Flower, x 1.5  
 C—Marginal fimbria of labellum. D—Apex of labellum. E—Calli, x 4. F—Column, x 3.  
 All from George 9621.







Calothamnus longissimus F. Muell.

Fragm. Phyto. Austral. 3: 112 (1862)

+ Benth. Fl. Austral. 3: 174

2. **C. longissimus**, *F. Muell. Fragn. iii. 112.* A low shrub, the thick more or less corky branches softly but shortly pubescent. Leaves terete, slender but rigid, acute, 6 in. to above 1 ft. long, glabrous but scabrous. Flowers large, 4-merous, few in globular or ovoid more or less unilateral spikes. Calyx-tube villous, immersed in the swollen pubescent corky rhachis; lobes 1 to 1½ lines long. Petals fully 3 lines long. Staminal bundles unequal, the 2 upper claws often nearly 1 in. long, broad and petal-like, with 15 to 30 short filaments, not so crowded at the end as in *C. pachystachyus*, the 2 lower claws narrow, undivided, acute, without anthers. Fruiting-calyx entirely immersed or nearly so, 2 to 3 lines long, with 2 thick connivent lobes, the 2 others obliterated.

**W. Australia**, *Drummond, 2nd Coll. n. 74; 3rd Coll. n. 54.* Sandy plains near Cujong, Oldfield.



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Calothamnus longissimus* F. Muell.

Family *Myrtaceae*

Date Recorded 5.5.81

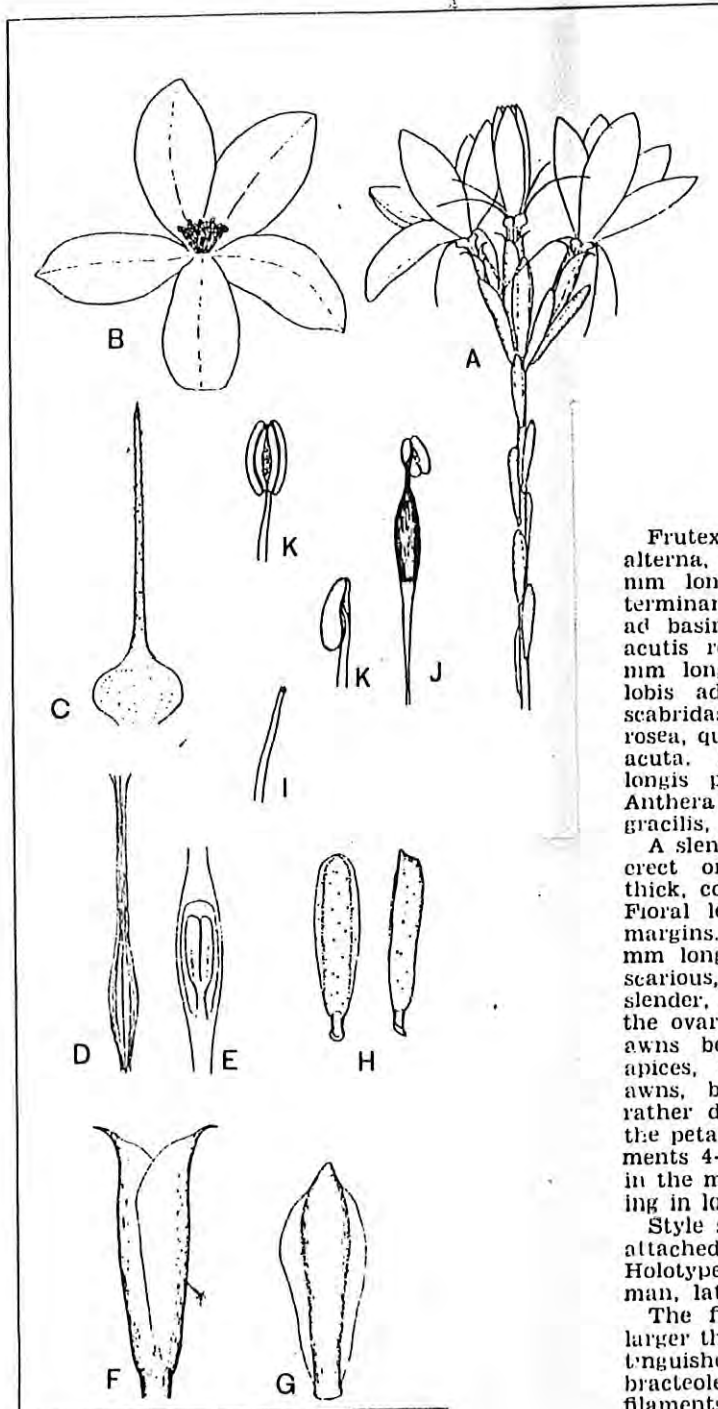
Speci. NO.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Eneabba Creek		27.8.48	Y	CAGardner 9126
	North of Eneabba on Rd to Dongara		7.9.69	Y	A.MAshby 3030
	30 m West of Three Springs		Sept 40	Y	WBlackall 4877
	5 m West of Arrina		30 8 65	Y	KNewbey 2244
	5 m West of Moora	In sand heath	23 9 62	Y	JSBeard 1841
	Eneabba Creek		Sept ?	Y	CAGardner 9301
	Dandaragan		Sept 53	Y	H Smith sn
	5 m E of Moora		11 9 32	Y	WBlackall 2533
	Badgingarra		Sept 65	Y	F.G.Smith 1837
	8 km S of Eneabba	lateritic gravel, low open heath	13 Sept 77	Y	RJHnatiuk 770917
	Cooraw	Sand heaths	29 8 41	Y	CAGardner sn
	19 km E of Eneabba towards Three Springs	closed heath, lateritic	12 9 78	Y	R.J.Hnatiuk 780136
	29°48'S lat 115°19'E long	gravel			
	35 km NE of Eneabba towards Three Springs	low closed heath, lateritic	27 4 77	old flower	R.J.Hnatiuk 770012
	29°39'S lat 115°34'E long	gravel			
	7 km SSE of Eneabba	laterite, low open heath	4 8 77	Y	EAGriffith 993
WA	63 mile tank	Sand plain	22 9 53	Y	NH Speck sn
WA	Hill River	laterite & sand plain low scrub	22 9 51	Y	NH Speck sn

*Calytrix superba* C.A.Gardner & George

† J. Roy. Soc. W. Austral. 46: 134 (1963)

see also Erickson et al (1973) p 107

& Blackall & Grieve (1980) plate IV



*Calytrix superba*, sp. nov.

Fig. 4, A-K

Frutex ramis erectis. Folia erecta vel appressa, alterna, oblongo-linear, crassa, concava, 4-8 mm longa, breviter petiolata. Flores ramos terminantes. Bracteoli 10-12 mm longi, fere ad basin liberi, marginibus scariosis, apicibus acutis recurvis. Tubus calycis gracilis, 11-14 mm longus, 10-sulcatus, supra ovario solidus, lobis ad basin orbiculatis in setas minuter scabridas productis, 11-15 mm longis. Petala rosea, quam lobis calycis longiora, late elliptica, acuta. Stamina ca. 30 filamentibus 4-8 mm longis purpureis luteisque, in medio crassis. Anthera oblonga, glandula parva. Stylus gracilis, 5-6 mm longus. Ovuli 2, recti.

A slender shrub with erect branches. Leaves erect or appressed, scattered, oblong-linear, thick, concave, 4-8 mm long, shortly petiolate. Floral leaves similar but with white scarios margins. Flowers terminal. Bracteoles 10-12 mm long, free almost to base, margins broad, scarios, apices acute, recurved. Calyx tube slender, 11-14 mm long, 10-ribbed, solid above the ovary; lobes orbicular at base with slender awns becoming finely scabrous towards the apices, 11-15 mm long. Petals longer than awns, bright pink, broadly elliptical, acute, rather deciduous, the stamens remaining after the petals have fallen. Stamens about 30, filaments 4-8 mm long, purple and yellow, swollen in the middle. Anthers versatile, oblong, opening in longitudinal slits, connective gland small.

Style slender, 5-6 mm long. Ovules 2, erect, attached basally on a short lateral placenta. Holotype and Syntypes: Eneabba, C. Chapman, late December, 1961.

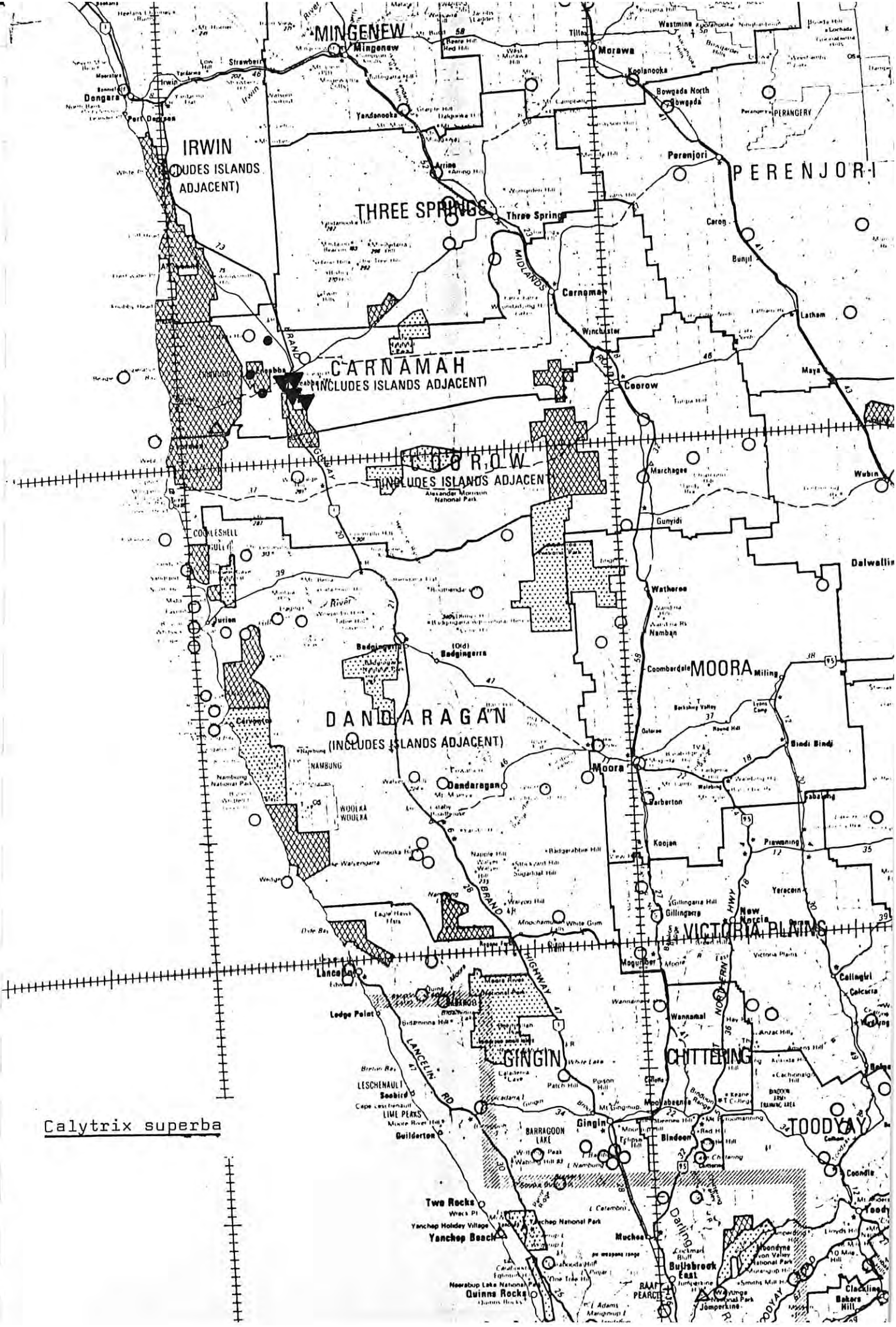
The flowers of *Calytrix superba* are much larger than in any other species. It is also distinguished by the scarios margins of the bracteoles, the swollen, bi-coloured staminal filaments and the extremely small connective of the anther.

Fig. 4-

*Calytrix superba*, sp. nov.

A.—Flowering branch, natural size; B.—Corolla,  $1\frac{1}{2}$  X natural size; C.—Calyx tube, 3 X natural size; D.—Calyx tube, 3 X natural size; E.—Ovary in vertical section, enlarged; F.—Bracteoles, 3 X natural size; G.—Floral leaf,  $3\frac{1}{2}$  X natural size; H.—Leaves,  $3\frac{1}{2}$  X natural size; I.—Style end, enlarged; J.—Stamen, 10 X natural size; K.—Anthers, enlarged. (All from C. Chapman, Eneabba, late December 1961.)





Calytrix superba



Casuarina grevilleoides Diels

+ in Diels & E.Pritzl, Bot.Jahrb. Syst. 35:130 (1904)

*Casuarina grevilleoides* Diels n. sp. — Fig. 11 J—M.

Frutex humilis ramosissima caulibus erectis, ramis ramulisque confertis quaternato-verticillatis 2—3-articulatis, membro ramulorum infero perbrevis in dentes quatuor breves saepe marcescentes desinente, supero inarticulato elongato folium teres tenuissime-sulcatum interdum leviter falcatum imitante, internodiis novellis albo-lanuginosis (Fig. 11 K) omnibus pubescentibus; internodiis amentigeris valde abbreviatis; amentis ♂ in axillis dentium congestis saepe quaternis brevibus (Fig. 11 J), amentorum internodiis brevissimis levissime inflatis squamis subovatis pubescentibus; strobilo perfecto non viso.

Frutex quam 25 cm vix altior; membrum foliaceum  $1,5 \times 0,07$  cm; amenta ♂ usque ad 5 mm long., articula circ. 4,5 mm long.

Hab. in distr. Avon ad Moore River in collium quos vocant Babilon Hills cacumine quodam rupestri-lapidoso fruticetis humillimis occupato flor. m. Aug. exeunt. (D. 4019).

Strobilo maturo non viso ut affinitatem perspicias fieri non potest. Tamen *C. grevilleoidem* ob ramificationis structuram insignem nulli magis quam *C. acuriam* F. v. M. accedere existimamus, a qua ramulis amentisque pubescentibus amentorumque brevissimorum squamis subovatis praeter minora differre videtur.





Casuarina grevilleoides



Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Casuarina grevilleoides* Diels... Family *Casuarinaceae*..... Date Recorded 1.5.81.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	North West Rd, 10.8 km E of Brand Hwy 30°27'S, 115°035'E	lateritic gravel & sandy 10cm	27.1.81	Fruit	R.J. Hnatiuk 810500
	Babilion Hills, Mogumber near Cockleshell Gully		Jan 34	Y ♀	C.A. Gardner sn
	7 m SE Badgingarra	gravel at 18"	8.1.66	Fruit	W.E. Blackall sn.
	Moore River		Aug 1901	N	K. Newbey 2384
	Quartz Hill, Mogumber		Jan 36	Fruit	Diels + Pritzel
	Between Dandaragan + Hill River		23.8.48	N	C.A. Gardner 9016
	Tathra National Park Reserve 29802	lowheath, Sand & laterite	11.11.78	Y ♀	E.A. Griffin 1573
	Mogumber	stoney Quartz, hill	25.9.34	Y ♀	C.A. Gardner sn
	6 m E of Brand Hwy, on Dandaragan Rd		29.10.66	Y ♀	C.A. Gardner
	Winchester on Geraldton Hwy	laterite and white clay	March 70	N	E.M. Scrymgeour 1657
	N of Badgingarra	shallow sand over laterite	13.8.65	Y ♀	C. Chapman sn
	Mogumber		19.11.22	Fruit	A.S. George 6747
	North West Rd, 10.8 km E of Brand Hwy	lateritic gravel + sandy loam	27.1.81	Y ♀	C.A. Gardner sn.
✓ P.	20 m W of Coorow towards Eneabba 29°50'S 115°40'E		5 9 69	Y ♀	R.J. Hnatiuk 810500 E. Withler W 809

Casuarina ramosissima C.A.Gardner  
+ J.Roy.Soc. W. Austral. 47: 54 (1964)

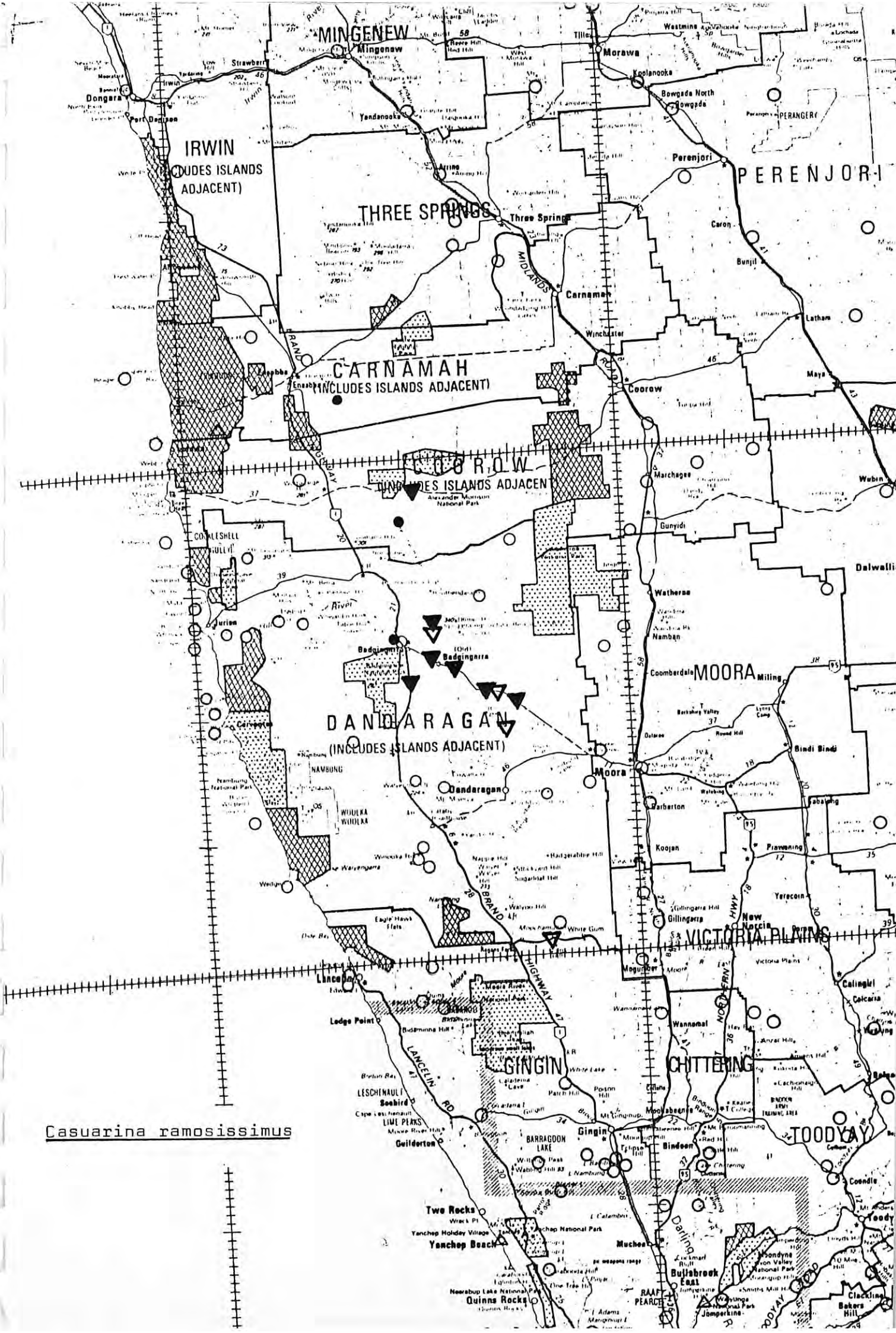
CASUARINACEAE

*Casuarina ramosissima* C. A. Gardn. sp. nov.

Frutex probabiliter dioicus, usque 1 m. altus, ramis ramulisque subconforibus, numerosis, verticillato-ramosis, ramulis 2-3-articulatis, cinereo-tomentosis, fere rigidis, patentibus, glaucis, profunde sulcatis demum glabris; internodia (basalia excepta) 1-2 cm. longa, dentes 4, erecti, deltacei, obtusi, ciliati, apice nigri. Amenta mascula ignota. Strobilis sessilis, verticillatis vel oppositis, breviter cylindricis vel ovoideo-cylindricis, basi truncatis, circ. 1.5 cm. longis et 1 cm. latis; bractea magna late ovata, dorso rufo-tomentosa, apicem versus in appendicem contracta, apice late ovata, atro-fusca marginibus fimbriolata; bracteolae basi connatae, vix exsertae, dorso lato verrucosae areolatae et dense fibroso-pilose; achaenia atrofusca, crassa vel turgida et breviter pilosa, ala obliqua, vix scariosa.

Hab. in distr. Avon prope Dandarragan, in arenosis glareosis in fruticulosis, Gardner 9013. (TYPUS).

In its compound branchlets this species is related to *C. microstachya* Miq. and *C. Drummondiana* Miq., all the remaining species having undivided branchlets. From *C. microstachya* it differs in its taller stature, longer ashy-tomentose branchlets, very different bracts, and sulcate, not tetragonal internodes. From *C. Drummondiana* it can be distinguished by the much longer, not glabrous internodes, larger fibrous-hairy bracteoles and darker coloured, less hairy and shorter winged achenes.



Casuarina ramosissima



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Casuarina ramosissima* Gardner Family *Casuarinaceae* Date Recorded 4.5.81.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	N of Badgingarra	top of lateritic breakaway	13 8 65	Y ♀+♂	AS George 6761
	6m N of Dandaragan		9 10 51	Y ♀	CAGardner 10518
	8m SE of Badgingarra		26 9 64	Y ♀+♂	AS George, 6428
	14.8m N of Dandaragan		6 6 66	Y ♀+♂	EM & Mrymgeour 506
	6m E of Brand Hwy, 10.8km N of Regans Ford	on laterite with white clay	29 10 66	Y ♀+♂	EM & Mrymgeour 1656
	10.8km E of Brand Hwy on North West Rd <sup>Badgingarra</sup>	open shrubland, lateritic gravel	14 11 78	Y ♀	RJHnatiuk 780338
	8m SE of Badgingarra		19 6 61	Y ♀	AS George 2595
	15m N of Dandaragan	clay loam	23 8 68	Y ♀	K Newbey 2783
	Alexander Morrison NP, 3002'S 115030'E	grey sand over laterite	10 11 78	Y ♂	EAGriffin 1551+1552
		low open heath			
	11 km SE of Badgingarra on Moora Rd	low heath	2 10 79	Y ♀+♂	K.L. Wilson 2707, 2708
	9m N from Dandaragan		19 8 49	Y ♀	CAGardner 9280
	10.8km E of Brand Hwy on North West Rd <sup>Badgingarra</sup>	lateritic gravel	27 1 81	Y (old) ♂	RJHnatiuk 810501
	5m SE of Badgingarra	In mallee	19 9 76	Y ♀	J.S Beard 7893
	10.8km E of Brand Hwy on North West Rd	lateritic gravel	27 1 81	N ♀	R.JHnatiuk 810502
	9m N of Dandaragan		23 8 48	Y ♀	CAGardner 9013

Holotype





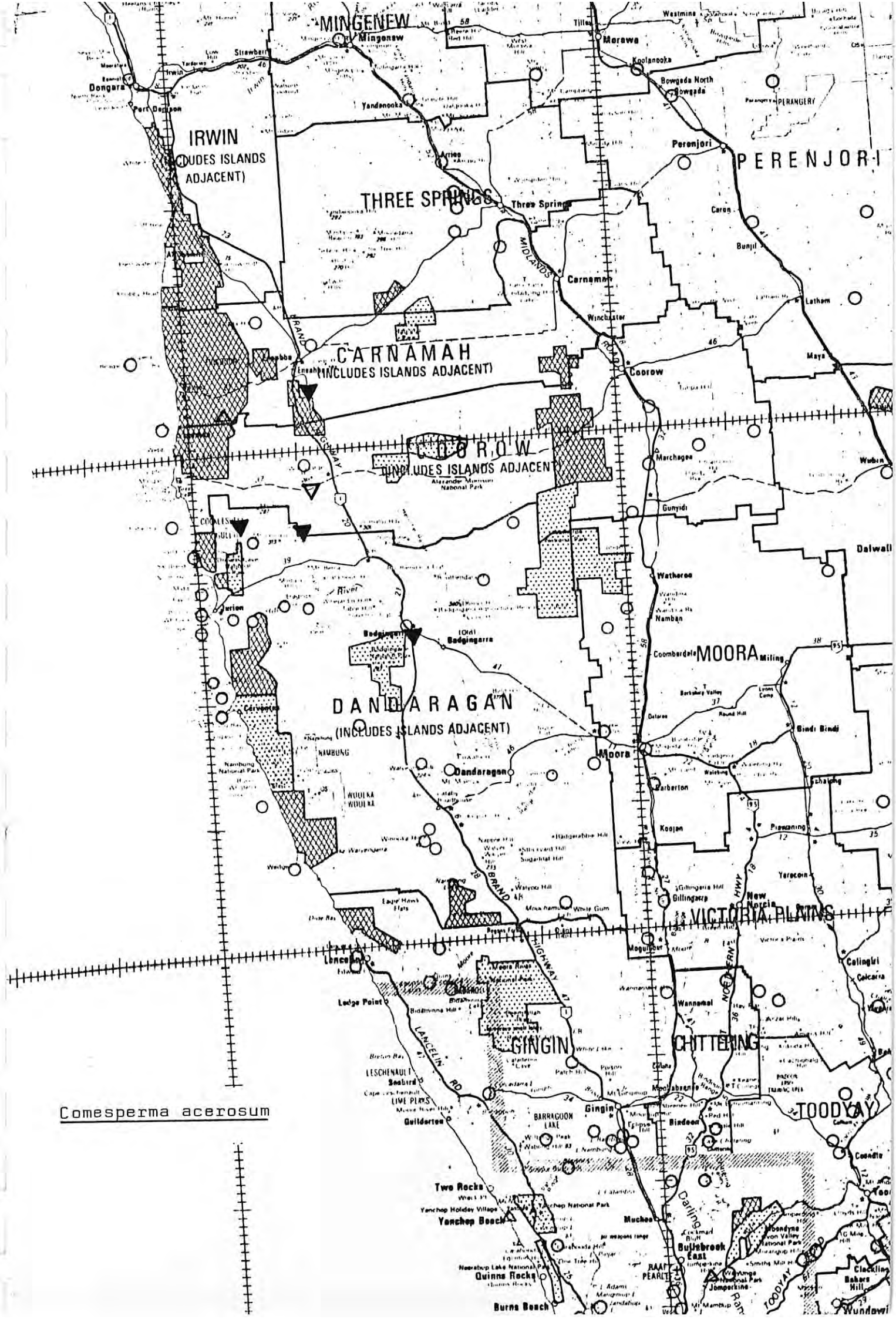
Comesperma acerosum Steetz.

in Pl. Preiss. 2: 299 (1848)

+ Benth. Fl. Austral. 1: 146

12? **C. acerosum**, Steetz, in *Pl. Preiss.* ii. 299. Glabrous, rigid, erect, and little branched from a hard, almost woody base, 1 to 1½ ft. high. Leaves linear, erect, rigid, with a short usually pungent point, not above ½ in. long, strongly keeled. Racemes rather dense, 1 to 2 in. long, pedicels 1 to 1½ lines. Outer sepals 3, nearly equal, all free, very broad and obtuse, not 1 line long; inner petaloid sepals obovate, about 3 lines. Keel-petal with a horn-like appendage on the back as in *C. virgatum*. Capsule about 3 lines long, truncate or slightly 3-toothed at the top, narrowed into a stipes about as long as the broad part. Seeds comose, with a very short membrane at the chalazal end.

**W. Australia.** Swan River, *Drummond*, n. 431, and *Coll.* 1843, n. 492, mixed with *C. virgatum*, which this species closely resembles in almost all characters excepting the outer sepals, which are all free.



Comesperma acerosum

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Comesperma acerosum* Steetz... Family *Polygalaceae*..... Date Recorded 29 5 81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	26 km SE Coomaloo ckr on Brand Hwy 30°23'S 115°31'E	low closed heath	15 12 76	Y	RJHnatiuk 761375
	Cockleshell Gully 30°09'S 115°08'E	low closed heath, sand + laterite over duricrust	22 10 79	Y	EAGriffin 2426
	N of Mt Benia, 30°09'S 115°15'E	low open heath, sand + laterite over duricrust	19 10 79	Y	EAGriffin 24168
	19 m E of Greenhead on Cockleshell Gully Rd 30°04'S 115°07'E	heath on white sand	28 11 74	Y	TATHalliday 143
	8 km S of Eneabba 29°53'S 115°16'E	low open heath, sand over clay calcification	20 10 76	Y	EAGriffin 676



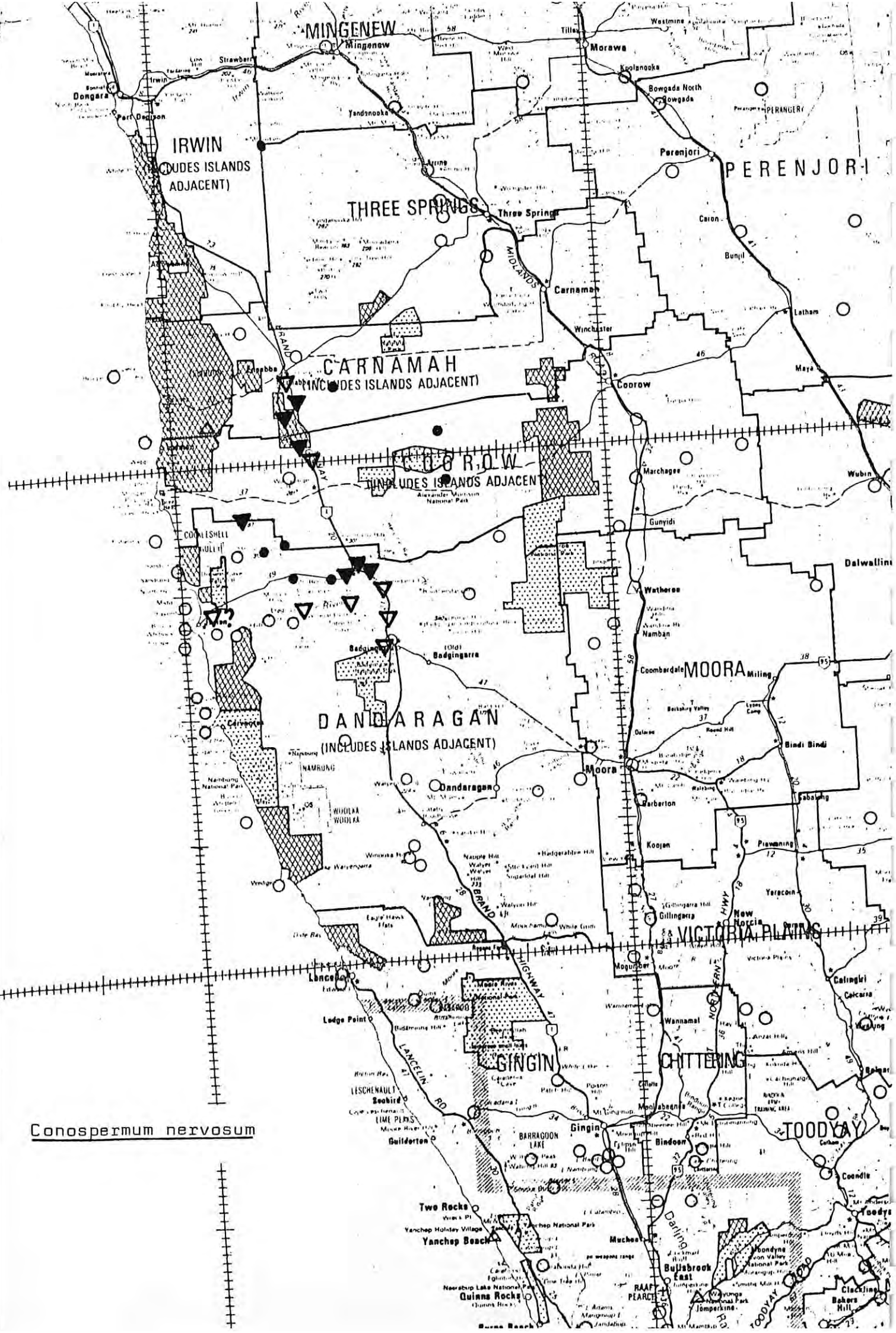
Conospermum nervosum Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 71 (1855)

+ Benth. Fl. Austral. 5: 366

7. **C. nervosum**, Meisn. in Hook. Kew Journ. vii. 71, and in DC. Prod. xiv. 321. Stems leafy, simple at the base, paniculately branched in the upper part and minutely hoary-tomentose. Leaves oblong, obtuse or with a small recurved point, the lower ones several in. long and contracted into a rather long petiole, the others nearly sessile and mostly under 1 in. long, all rigid, veined and with an intramarginal nerve conspicuous on the under side. Spikes short, nearly globular, shortly pedunculate in the upper axils and shorter than or scarcely exceeding the leaves. Bracts broad, acuminate, shorter than the perianth-tube, shortly ciliate and sparingly pubescent as well as the rhachis. Perianth about  $3\frac{1}{2}$  lines long, the tube slightly pubescent, the limb as long as the tube, the upper segment or lip concave with recurved margins, the lower about as long and shortly 3-lobed.

**W. Australia.** Between Moore and Murchison rivers, Drummond, 6th coll. n. 175. The two varieties mentioned in the Prodrromus may both be found on one specimen.



Conospermum nervosum

ATL OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Conospermum nervosum* M. S. N.

Family Proteaceae

Date Recorded 4.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	26 km S of Eneabba 29°57'S 115°19'E	lateritic sand and gravel	10 8 79	Y	RJ Cranfield
	near Eneabba		7 9. 69	Y	AM Ashby 3004
	M+Peron	in lateritic soil	16 Oct 46	Y	CA Gardner 8473
	Hill River	Stony hills	Feb 40	? Y old flowers	CA Gardner sn.
	Hill River		15. 1. 31	? Y ✓	CA Gardner
	Watheroo	sandy soil	4 11. 54	Y	R.D Royce 4950
	Jurien Bay	sandy soil	3. 11. 62	Y	R.D Royce sn
	98 m NW of Jurien	sand heath	2 11 70	Y	TEH Alphin + R Goveny 3187
	Hill River	lateritic hills	21 7 34	Y	CA Gardner
	16 m NW of Badgingarra	gravel	8. 1. 66	Y	K. Newbey 2378
	Coomaloo Creek, E of Jurien	low closed heath, lateritic gravel	26 4 77	Y	R.J Hnatiuk 770005
	20 km S of Eneabba 30°11'S 115°19'E	low open shrubland, laterite	16 12 76	Y	RJ Hnatiuk 7614586
	1 m E along Marchagee Track, off Brand Hwy		9 10 78	Y	RJ Cranfield 851
	8 km S of Eneabba	low open heath, white sand over lateritic gravel	12 11 76	Y	EAGriffith 799
	Hill River	Sand heath gravelly laterite	24 8 48	Y	CA Gardner 9065
Isotype	8 km S of Eneabba 29°53'S 115°16'E	low open heath lateritic gravel	1 10 77	Y	J Drummond VI 175 RJ Hnatiuk 771498





Conostylis aculeata R.Br. ssp. breviflora S.D.Hopper  
Nuytsia 2: 261-262 (1978)

**Conostylis aculeata** R.Br. ssp. **breviflora** Hopper ssp. nov. (Figures 2 and 5)

Ab subspecibus aliis *C. aculeatae* R.Br. floribus minoribus 6-9 mm longis, differt.

Differs from other subspecies of *C. aculeata* R.Br. in the smaller flowers 6-9 mm long.

*Type*: 11.4 km S of Hill River bridge on Brand Highway, in *Xanthorrhoea* heath and roadside ditches about 500 m S of laterite-capped flat top hill, 15 September 1976, S. D. Hopper 222 (holo: PERTH).

*Herb* growing in tufts up to 50 cm in diameter, proliferously branched with stolons up to 18 cm long. *Leaves* green distichous, equitant, conduplicate at the base, flat and linear for most of their length, maximum length 13 cm on average (up to 18 cm), 1-3 mm broad; *marginal spines* 3-8 mm apart, rigid, pungent, indurate, glabrous, 1-3 mm long. *Inflorescence* a capitulate cyme on a simple or once divided scape up to 20 cm high, equal to or longer than the leaves. *Flowers* yellow, (6) 7.5 (9) mm long; *perianth* tomentose outside, glabrous within, the lobes 3-6 mm long and exceeding the tube; *stamens* uniseriate, filaments 0.5-1.0 mm long, anthers 1-2 mm long; *style* 3-5 mm long, the stigma  $\pm$  level with the anthers; *placenta* covered all over with numerous ovules; *ovary* scarcely enlarging in fruit. *Seeds* not seen. *Chromosome number*  $n = 8$ .

*Distribution and habitat*: (Figure 2). The south-west of Western Australia, within 70 km of the coast from Dandaragan to the Arrowsmith River. *C. aculeata* ssp. *breviflora* is common in winter-wet flats, swamps, depressions and roadside ditches (Figure 5) in sandy soil throughout the Mt. Lesueur-Eneabba heathlands.

*Selected specimens examined*. Cockleshell Gully, 24 August 1938, W. E. Blackall 3572; 5 miles N of Hill River (Solley's Farm), 27 September 1957, D. M. Churchill 691 (UWA); Hill River bridge, Brand Highway, 8 July 1975, S. D. Hopper 688; 20 km SSW of Badgingarra, 15 June 1975, S. D. Hopper 690; 14.6 km E of Brand Highway along Green Head-Coorow Rd, 17 June 1975, S. D. Hopper 691; 26 km W of Arrino, 6 August 1975, S. D. Hopper 692; 9.5 km W of Eneabba, 24 June 1976, S. D. Hopper 694; 22 km SW of Three Springs, 4 August 1975, S. D. Hopper 689; Hill River bridge on Jurien-Cervantes Rd, 15 September 1976, S. D. Hopper 225; 2.3 km N of turn-off to Drummond's Crossing on Eneabba-Mingenew Rd, 6 August 1975, S. D. Hopper 697; Brand Highway, 19 km N of Eneabba, 6 August 1975, S. D. Hopper 693; 52 miles N of Regans Ford, 7 October 1967, W.A. Loneragan 67.124 (UWA); 13 miles N of Cockleshell Gully, 8 October 1967, W.A. Loneragan 67.125 (UWA); Dandaragan, 3 December 1965, F. Lullfitz L4478.

*Conostylis aculeata* ssp. *breviflora* is closely allied to but occupies a distinct geographical range from other subspecies of *C. aculeata*. It is readily distinguished from these by its smaller flowers, (averaging 7.5 mm long in comparison with 9-11 mm for the other subspecies) and by its shorter leaves.

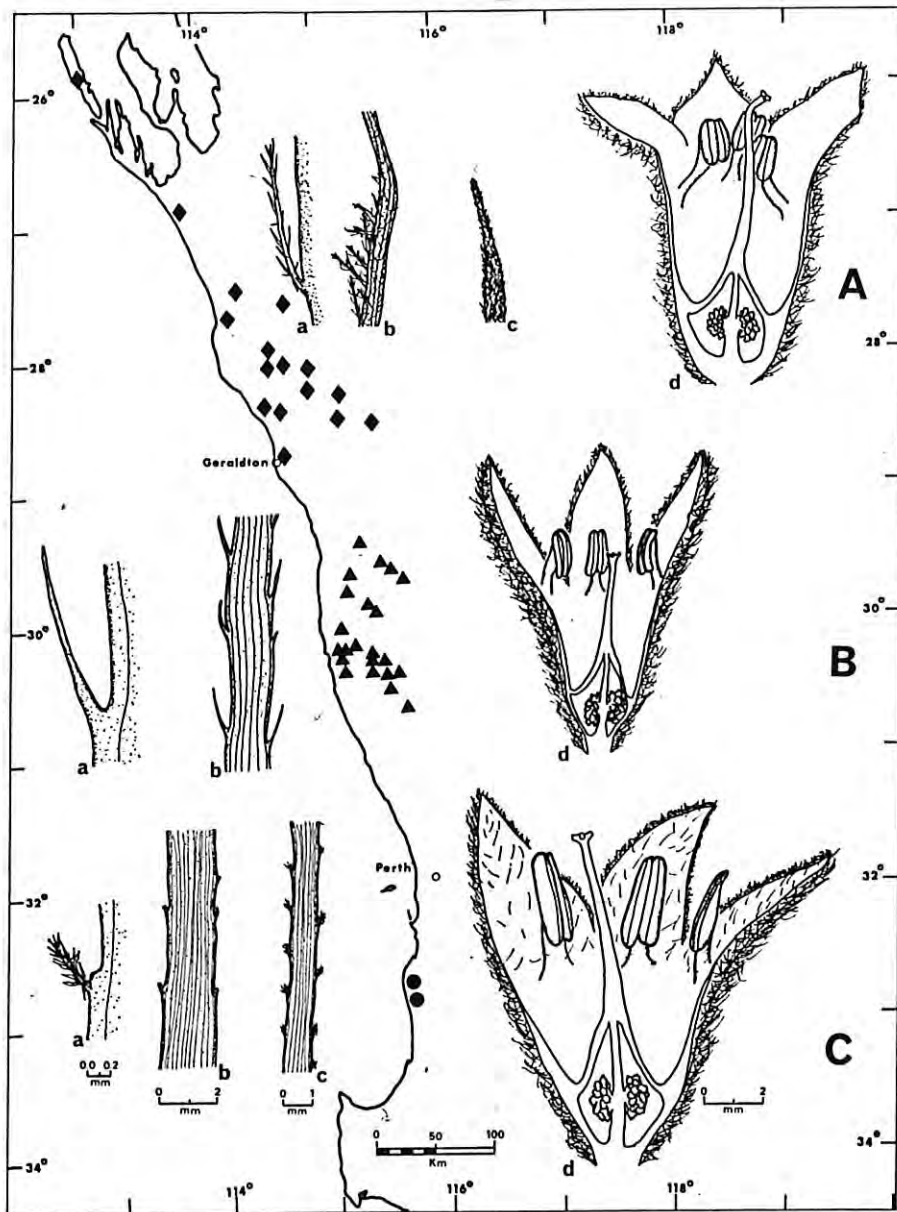


Figure 2. Geographical distributions, half flowers and leaf morphology of (A) *Conostylis stylioides* F. Muell., (B) *C. aculeata* ssp. *breviflora* sp. nov., and (C) *C. pauciflora* sp. nov. Camera lucida drawings of fresh material. Comparable organs of the three taxa are at the same scale. a, marginal spine; b, mature leaf; c, young leaf; d, half flower.

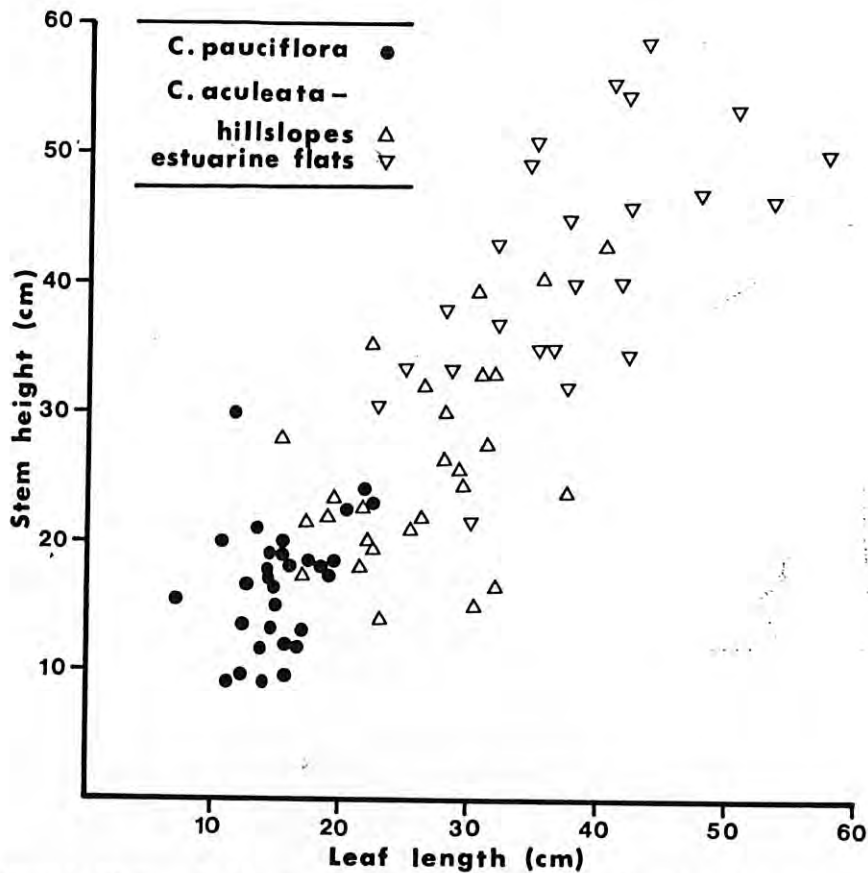


Figure 4. Maximum leaf length and stem height of a population sample of *C. pauciflora* sp. nov. and two of *C. aculeata* ssp. *aculeata* (Spearwood Dune hillslopes and Harvey Estuary flats) from the Dawesville region of the Swan Coastal Plain. Data from Hopper (1977).

Collections of small-flowered, short-leaved plants of *C. aculeata* have been obtained north of the Murchison River (e.g. W of Nerren Nerren, 20 October 1974, *J. S. Beard* 7101), but these differ from *C. aculeata* ssp. *breviflora* in having unusually long marginal spines and narrower leaves. Their status must remain obscure until detailed field studies have been carried out.

Hybrids of *C. aculeata* ssp. *breviflora* and *C. candicans* are known from Cockleshell Gully and the Hill River bridge on the Jurien—Cervantes road (Figure 5). At both localities the new taxon occupies low-lying alluvial flats while *C. candicans* occurs on adjacent drier hill slopes. Hybrids are confined to narrow zones of overlap where the two species grow intermixed.

Specimens collected 13 km S of the Hill River on the Jurien Bay—Cervantes road (*S. D. Hopper* 115) and 18 km SSW of Three Springs (*S. D. Hopper* 221) have features intermediate between *C. aculeata* ssp. *breviflora* and *C. aculeata* ssp. *aculeata*, suggesting that these two taxa hybridize where their distributions overlap.

The subspecific epithet refers to the characteristic short flowers of the new taxon.

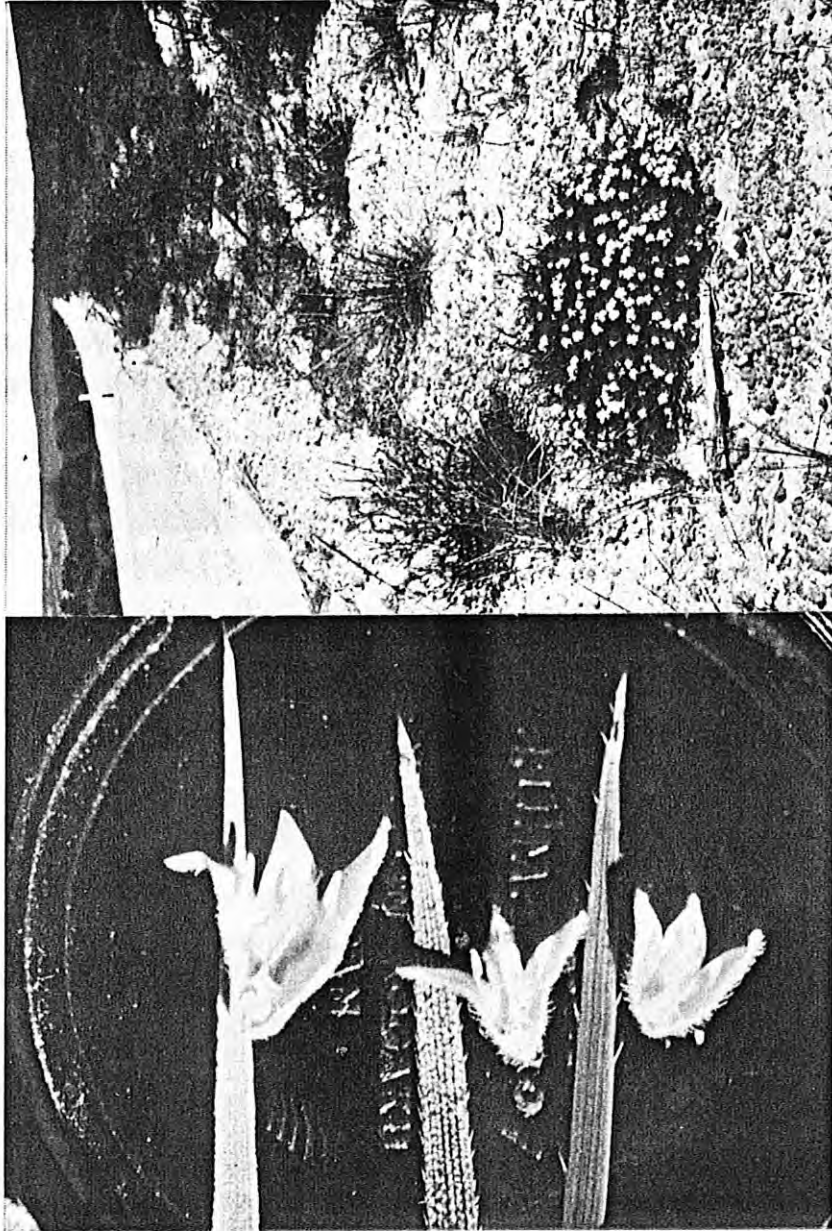
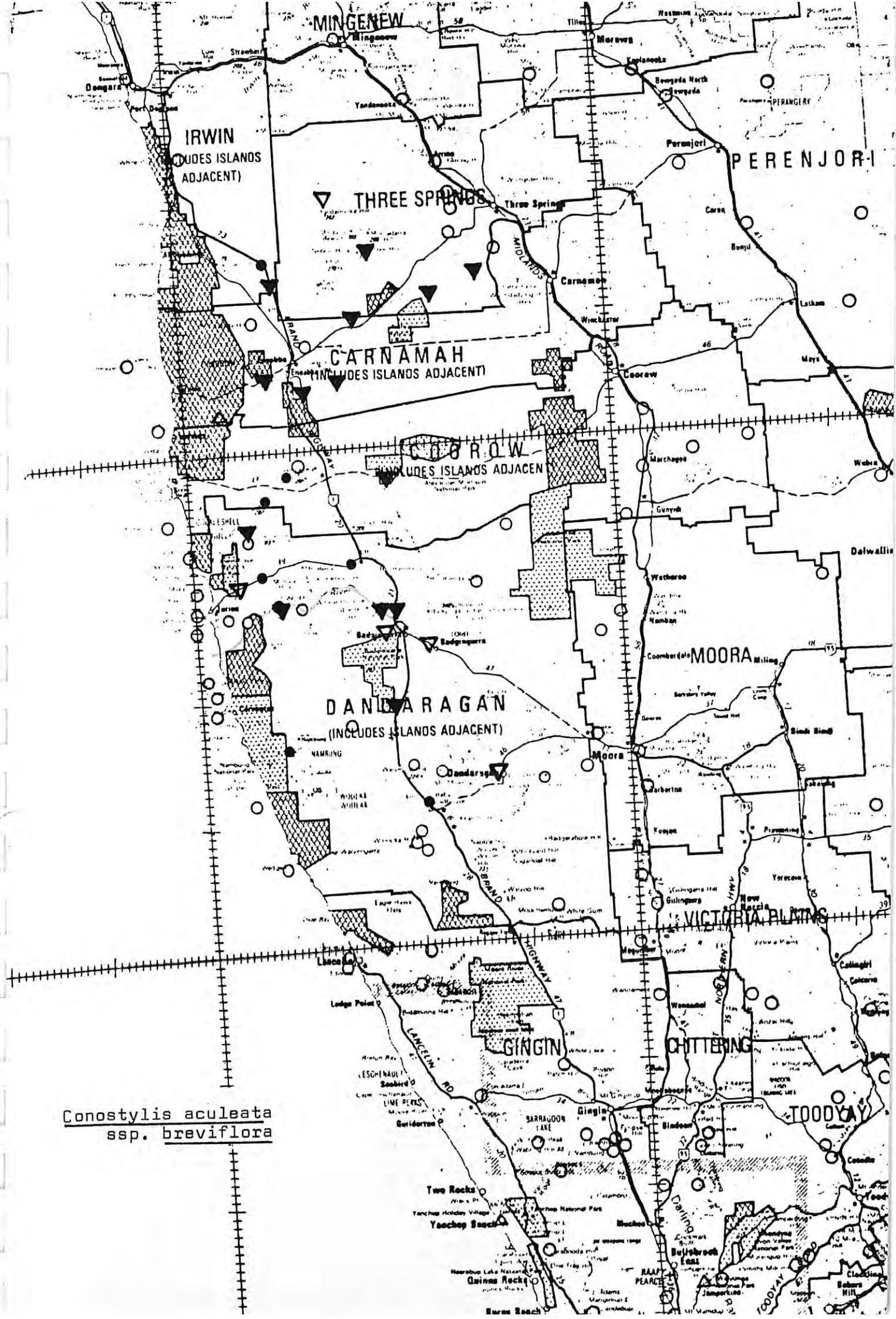


Figure 5. Top—*C. aculeata* ssp. *breviflora* ssp. nov. growing in a roadside ditch on Brand Highway near the Hill River. Bottom—leaves and half flowers of (left to right) *C. candicans*, a hybrid and *C. aculeata* ssp. *breviflora* from the Hill River bridge on the Jurien Bay—Cervantes road.





*Conostylis aculeata*  
ssp. *breviflora*

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Sonchastylis... gracilior... R.Br.*  
 ssp. *presiliacea*

Family *Hamamelidaceae*..... Date Recorded *JANU.. 1977*

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
1	9.5 km W of Enaabba on road to Coolimba	In heath, winter-wet depression between two hills, white sand.	24/6/76		S.D. Hopper 694
2	4.0 km W of Bawal Hwy along Hill River Rd.	Growing in heath with <i>Banksia</i> - <i>Eucalyptus todtiana</i> emergents at base of hill in winter-wet depression. <del>sp</del>	15/9/76	✓	S.D. Hopper 223
3	8 km from Jurcen Bay, towards Moora	Mr water filled depression	24/9/68	✓	E.M. Canning M. Johnston D. Gordon
4	22 km SW of Three Springs: 7.6 km S of Three Springs	In heath with scattered <i>Nyctelia</i>	4/8/75	✓	S.D. Hopper 689

Survey on *Eucalyptus* Rd - 1 km road for *tothiana*?  
 Rd. No. 38  
 Mat. sand plain

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Conostylylis subsp. nov.* R.Br. Family *Hamamelidaceae* Date Recorded JAN. 1977.  
 See below here

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
10.	2.8 km NE of Eneabba 2.3 km N of T.O. to Diamonds crossing on Eneabba - Pringleton Rd		6/8/75	✓	S.D. Hopper 697.
11.	~ 18 km SE of Eneabba 8.2 km S of Eneabba Carnamath Rd along Rose Rd.	In heath with scattered Neybica, Euc toothana	17/6/75	✓	SD Hopper 696.
12	Mull River Bridge - Turwin - Ceriantes Rd.	River flats, 20m S of river on W side of bridge	23/6/76		S.D. Hopper 695.
13	Off Cadala Rd, Badgingarra		31/10/66	✓	F.W. Humphries 70.
14.	W of Nerran - Nerran.	Sand plain.	20/10/74	✓	J.S. Beard. 7101.
15.	to <del>beeb</del> 26 km W of Arripa: 5.1 km S of Arripa - Donjarra Rd along road to 'Swatharra'	In heath, white sand, hillslope below a breakaway	6/8/75		S.D. Hopper. 692.



Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Scaevola turgida* A.C. Sm. & S. O. Scaevola R.Br. Family *Hamamelidaceae* Date Recorded J.A.M. 1979  
*ssp. bracteata*

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
5.	18 km SSW of Three Springs 12.5 km S of Ennaberg Three Springs Rd along first road west of Yarric Yarric Lakes	Growing in heath in winter wet depression at bottom of subdued valley.	17/9/76	✓	S.D. Hopper 221.
6.	Badgingara		Oct. 1960	✓	L. Stanburn Mrs Kelly
7.	15 km ESE of Taree Bay Hill Bridge on road to Cervantes	Narrow river flats.	15/9/76	✓	S.D. Hopper 225.
8.	19 km N of Ennaberg along Barend Hwy.	In heath around a track bay.	6/8/75	✓	S.D. Hopper 693
9	~ 33 km WSW of Three Springs. 2 km SW of One Tree Hill	Growing in Acacia heath, wet flats, on sandy to am.	17/9/76	✓	S.D. Hopper 224.



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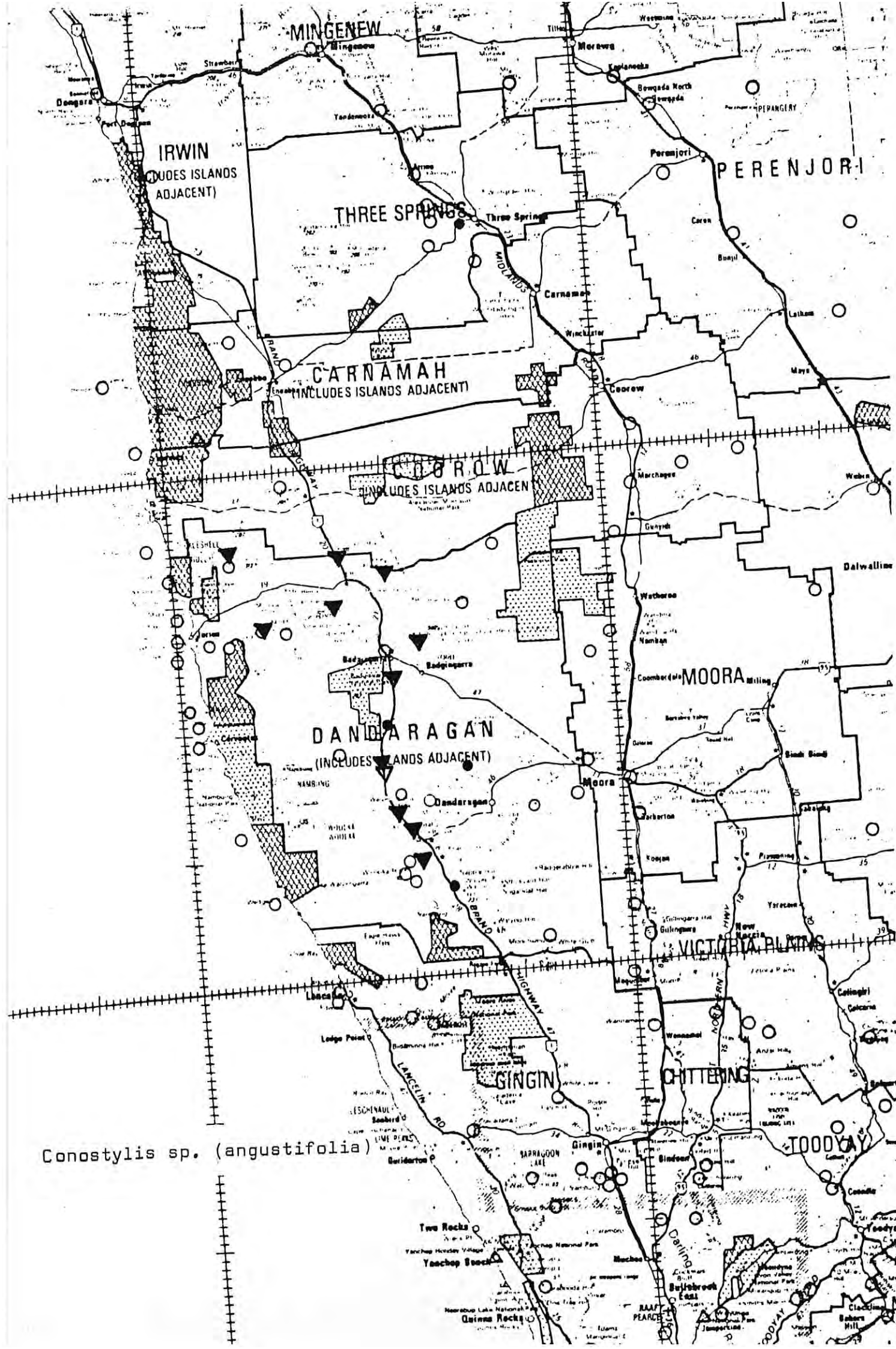
Taxon *Sarcocolla aculeata* R.Br. ... Family *H. glandulifera* ... Date Recorded JANU... 1979.  
 sp. *beni-clara*

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
16.	Cockleshell Gully		25/8/38.		W.E. Blackall 3603.
17.	Doodangarra		3/12/65.		Dullitt 4472. 4478.
18.	14.6 km E of Brand Hwy along Green Head-Cooraw Rd	In heath with <i>Euc. tootiana</i> , <i>Banksia</i> spp., near small area of wandoo woodland.	17/6/75.		S.D. Hepper. 691.
19.	~ 20 km SSW of Badgingarra along Brand Hwy	In heath	15/6/75.		S.D. Hepper. 690
	22 km S of Stratmann Rd with scattered <i>Banksia</i> spp. white sand				
20.	~ 2 km N of Hill River Bridge on Brand Hwy	In wicker - wet river flats community.	8/7/75.		S.D. Hepper. 688.
21.	Cockleshell Gully with in 2 mls of headland		24/8/38.	✓	W.E. Blackall 3572



Conostylis sp.

m.s. angustifolia S.D. Hopper



*Conostylis sp. (angustifolia)*



ter sus lid vil fe ea Co re at: ee or ci: s a he ste Au ali...  
 Taxon .. *Conostylis angustifolia* ..... Family .. *Haemadriaceae* ..... Date Recorded Dec. 79. (T.F)

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
5	11.4 km S of Hill River Bridge on Broad Hwy.	In blackberry heath on hill slope ~ 500m S. of lentic Flat topped hill	15-9-76	✓	S.D. Hopper 275
6	6 mls Northwards from Dandaragan.		<del>6-10-76</del>	✓	C.A. Gardner 10229
7	~ 40km E.N.E. of Junien Bay: 4.3km S along Broad Hwy from Toofbandi Rd. intersection	In low heath, white sand, Flat hill top, 100m N of Hwy D sign	17-9-76	✓	S.D. Hopper 245
8	Minyolo Brook: 45.3 km S of Hill River, 4.2 km N of Cataby roadhouse on Broad Hwy.	In <i>Banksia</i> woodland, white sand, S.E. side of bridge	15-9-76	✓	S.D. Hopper 276
9	11 km S of Hill River along Cockleshell Gully - Nambury Rd. (at cross roads)	White sand, road verge	17-8-75		S.D. Hopper 123

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon ... *Conostylis angustifolia* .....

Family ... *Haemodorumaceae* .....

Date Recorded Dec. 79 ..... (T.F.)

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
1.	22 km N. of Cataby roadhouse on Broad Hwy.	In white sand at intersection with Strathmore Rd.	8-7-75		S.D. Hopper 270
2.	~ 28 km E. of Mt Lesueur: 6.4 km N.E. of Broad Hwy. along Hill River - Marchagee Rd.	In Low <i>Banksia</i> - <i>Adenanthos</i> dominated heath on hillslope 300 m S of a breakaway	17-6-75		S.D. Hopper 273
3.	17.1 km N. of Cataby roadhouse, 6.4 km N. of Mullering Brook on Broad Hwy.	In open, low <i>Banksia</i> woodland, white sand, Flat sandplain	15-9-76	✓	S.D. Hopper 280
4.	~ 16 km E. of Mt Lesueur: 4.3 km S. of Toofbordi Rd. along Broad Hwy.	In low heath on white sand, Flat <del>at</del> hilltops, 100m N of Hwy 1 sign, E road verge.	17-9-76	✓	S.D. Hopper 277

Taxon ... *Cenosteus angustifolia* .....

Family ... *Haemodorum* .....

Date Recorded Dec. 79:...(T.F.)

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
10.	9.3 km N. of Cataby Roadhouse on Broad Hwy, at turn off to Coowarloo.	In <i>Eucalyptus tereticornis</i> Banksia dominated heath, white sand, flat topography.	28-10-76	-	<del>S.D. Hopper</del> S.D. Hopper <del>278</del> 278
11	~ 14 km W. of Hill River Bridge (Broad Hwy) on road to S. of river running to Gardner Range • 9 km E. of intersection with Catalini Rd.	In heath between two hills, winter wet sand.	17-8-75	-	S.D. Hopper 281.
12.	Minyolo Brook: 4.5.3 km S. of Hill River along Broad Hwy: 4.2 km N. of Cataby roadhouse.	In <i>Banksia</i> woodland, on white sand, S.E. side of bridge	24-6-76	-	S.D. Hopper 274.
13.	~ 8 km S.W. of Cataby roadhouse: 6.2 km S.W. of Broad Hwy along Minnegarra Rd.	In <i>Banksia</i> dominated heath on white sand, small valley on sandy rise	28-10-76	-	S.D. Hopper 279.







Conostylis aurea Lindl.

Sketch Veg. Swan Riv. Col. 44 (1840)

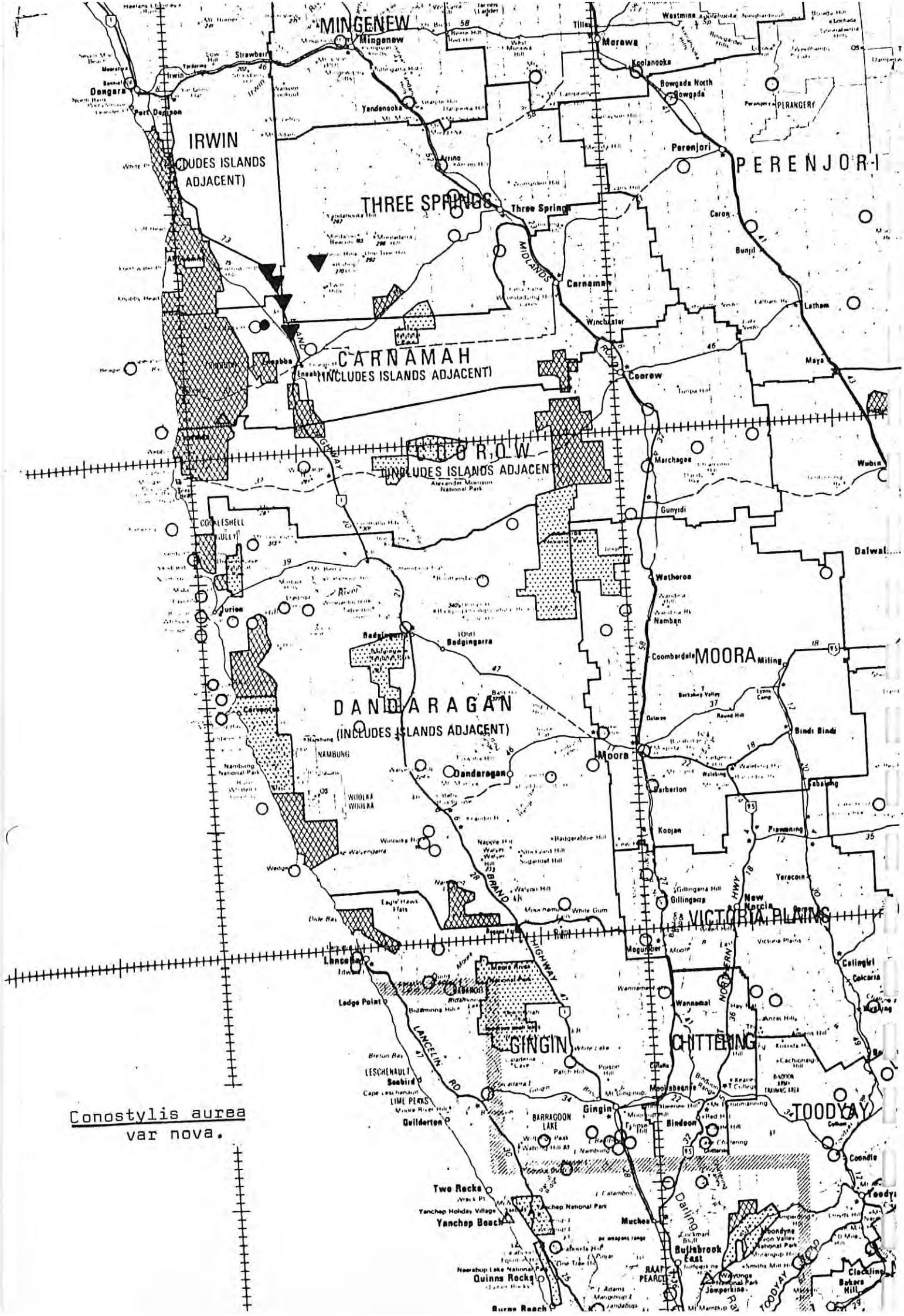
+ Benth. Fl. Austral. 6: 432 (1873)

5. *C. aurea*, Lindl. *Swan Riv. App.* 44. Stem or rhizome short. Leaves flat, rigid, prominently veined, often 1 ft. long, 2 to 3 lines broad, glabrous but bordered by short rigid marginal cilia usually numerous. Scapes shorter than the leaves, densely covered with a loose plumose wool, with a linear-lanceolate silky-woolly bract usually about the middle. Flowers in a dense globular head of 1 to 1½ in. diameter, the short bracts entirely concealed. Perianth 6 to 7 lines long, of a thicker consistence than in most species, densely covered outside with a plumose wool of a golden-yellow or rarely pale-coloured, quite glabrous inside, the adnate portion very short and turbinate; the lobes narrow and thick, rather longer than the free portion of the tube. Anthers linear, rather long, attached by the centre to very short filaments. Ovary more than half or almost entirely superior, the placentas attached in the free portion, stipitate and dilated, with many ovules reflexed from the under side. Styles slender.—Endl. in Pl. Preiss. ii. 17; *C. sulphurea*, Endl. l.c.

**W. Australia.** Swan river, *Drummond*, 1st coll. n. 750, 759, *Preiss*, n. 1381, 1382, and others; *Toodyay* and *Cape Naturaliste*, *Oldfield*.

Undescribed variety or closely related species  
which has very tomentose leaves.

m s. tomentosa S.D. Hopper



Conostylis aurea  
var nova.



Conostylis crassinervia J.W.Green

+ Proc. Linn. Soc. N.S.Wales 85:361-362 (1961)

18. *CONOSTYLIS CRASSINERVA*, sp. nov.

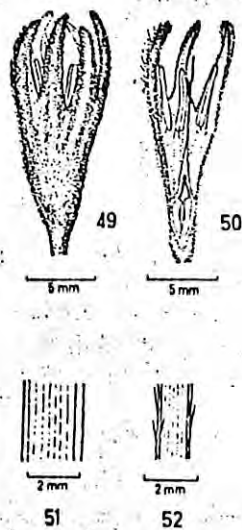
*Holotype*.—Top of Mount Lesueur, N. H. Speck (PERTH).

Caespitosa, caulide brevi; folia usque ad 15 cm. longa, ferme 3 mm. lata, marginibus conspicuis fibratisque glabris, aut setas mollior appressas ferentibus; scapi longitudine foliis aequae aut breviores, inflorescentia capitata, bracteum longum foliaceum prope basim et dua breviora plus minusve foliacea inflorescentiam subtendentia ferentes; perianthus luteus aut subruber 10-12 mm. longus, tomentum laxum capillarum ramosarum et prope basim capillarum complurium longiorum minute denticularum extra ferens et intra breviter laneus, lobis 5-6 mm. longis; stamina lobaeque perianthi uniseriatae aut minime biseriatae; filamenta brevissima ferme 1 mm. longa, antheras lineares 5 mm. longas dorsali convexo sub medio ferentia; stylus tenuis et plus minusve longitudine staminibus aequus; placentae in parte ovarii adnatae dispositae, quaeque non multa infra reflexa ovula ferentes; fructus et semina inobservata.

Caespitose, stem short; leaves up to 15 cm. long and about 3 mm. broad, the margins prominent and fibrous, glabrous or with softly appressed hairs; scapes as long as or shorter than the leaves, the inflorescence capitate; scape bearing a long leaf-like bract, near the base with two shorter,  $\pm$  leaf-like bracts subtending the inflorescence; perianth yellow or reddish, 10-12 mm. long, covered outside with a loose tomentum of branched hairs with a few longer, minutely denticulate hairs near the base, shortly woolly inside, the lobes 5-6 mm. long; stamens and perianth lobes uniseriate or very slightly biseriata, filaments very short, about 1 mm. long, bearing long linear anthers 5 mm. long on a dorsal connective just below the middle; style slender and  $\pm$  equal to the stamens; placentas in the adnate portion of the ovary bearing several reflexed ovules from the under-side. Fruits and seeds not seen. Chromosome number unknown. (Plate x, fig. 11; Figs 49-52, 89.)

*Specimens examined*. Solley's Farm, about 5 miles N. of Hill River, Churchill 69.0, 9.1957; Approximately 7 miles SE. of Mount Lesueur, Churchill 95.2, 9.1957; Hill River, Speck, 9.1951 & 9.1953 (PERTH).

Although known from only a few localities, in the Hill River district, this species appears distinct from its nearest relative, *C. setigera* R.Br. It differs from that species in the prominent leaf margins which do not bear long marginal setae, and in the stamens and perianth lobes, which are  $\pm$  uniseriate.



Figs 49-51.—49, *C. crassinerva*, sp. nov., flower; 50, half flower; 51-52, leaf surfaces (all from Hill River, N. H. Speck).





Taxon *Conostylis crassirivis* J.W.Green Family Haemodoraaceae..... Date Recorded 5.5.71.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	2.8 km E of Mt Lesueur, 8.3 km S of Footbardi Rd along road through Herschel Range	white sand, heath	17.6.75	Y	SD Hopper 385
	0.8 km N of Hill R bridge on Brand Hwy	low heath, white sand	8.7.75	Y (buds)	SD Hoppers 384
	3.5 km SE of Eneabba, 7.9 km N of Coorow - Green Head Rd along Rose rd.	heath, with Euc toadflaxia grey-white sand	17.6.75	Y (buds)	SD Hopper 389
	4.3 km S of Footbardi Rd on Brand Hwy	heath, white sand	17.9.76	old	SD Hopper 379
	Brand Hwy, T.O to Mt Lesueur	heath, white sand	24.6.76	Y (buds)	SD Hopper 387
	6.2 km W of Brand Hwy along Coorow - Green Head Rd	heath, with Euc toadflaxia	18.8.75	Y	SD Hopper 388
	2.0 km E of Brand Hwy along Footbardi Rd	heath, white sand	17.9.76	old	SD Hopper 380
	7.9 km N of Coorow - Green Head rd, on Rose rd.	heath, grey white sand	6.8.75	Y	SD Hopper 390
	3.7 km E of Brand Hwy, on Coorow - Green Head Rd	heath, white sand	6.8.75	Y	SD Hopper 393
	9.0 km E of Brand Hwy on Coorow - Green Head Rd	heath, wet flats, sand	6.8.75	Y	SD Hopper 392
	2.6 km N of Coorow - Green Head Rd on Rose Rd	wet depression	6.8.75	Y	SD Hopper 394
	Intersection of Brand Hwy with Coorow - Green Head Rd	heath, white sand	18.8.75	Y	SD Hopper 391
	14.5 km E of Brand Hwy, along Coorow - Green Head Rd	low heath with Euc toadflaxia	17.6.75	Y	SD Hopper 395
	6.5 m NNW of Gingin	white sand heath	2.9.70	old	TEHAPlin + R Gwyn 3159
	8.6 km S of Hill River Bridge on Jurin - Grants Rd	wet flats, sand	23.6.76	buds	S.D. Hopper 386
Holotype	Top of Mt Lesueur			Y	NH Speek

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Gonostylis crassinervis* J.W.Green...

Family *Haemodorum*

Date Recorded 5.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	12.3 km S of Hill R bridge on Brand Hwy	heath, white sand	8.7.75	Y	SD Hopper 407
	8 km SSE of Eneabba 29°53'S 115°19'E	low closed heath, grey sand	4 8 77	Y	EAGriffin 987
	3 km ✓ 29°50'	low open heath, white sand	2 8 77	Y	EAGriffin 943
	3 km ✓ 29°50'	open shrubland, white sand	10 7 77	Y	EAGriffin 907
	8 km ✓ 29°53'	open woodland, white sand	10 7 77	Y	EAGriffin 906
	28 m S of Dongara Turnoff to Eneabba 29°35'S 115°15'E	low open heath, white sand	20 10 76	old	EAGriffin 681
		Sand heath	16 5 68	Y	H Demar D95
UWA	5 m W of Moora	Sandplain	21. 9 52	Y	NH Britton 52/25
UWA	Hill River		21 9 51	Y	NH Speck sn
UWA	Solley's farm 5 m N of Hill River	low heath, deep sand	27 9 57	Y (old)	DM Churchill 69.0
UWA	Hill River	lateritic heath	27 9. 53	Y (old)	NH Speck sn
UWA	? Mt Lesueur			Y	NH Speck sn
UWA	7 m SE of Mt Lesueur	in swamp	27 9 57	Y	DM Churchill 95.2

Corynanthera flava J.W.Green  
+ Nuytsia 2/6: 371-372 (1979)



By J. W. Green  
(Western Australian Herbarium)

Abstract

*Corynanthera flava* J. W. Green gen. et sp. nov. is described and discussed. Its trisporangiate, unilocular anthers are distinctive and possibly unique. It is further characterised by the filaments produced into stiptitate, terminal appendages, the stamens alternately dimorphic, the flowers zygomorphic and the inflorescence a ± terminal, spike-like raceme of yellow flowers. It is most closely related to *Micromyrtus* Benth. and is endemic in a small area 200 km north of Perth, Western Australia.

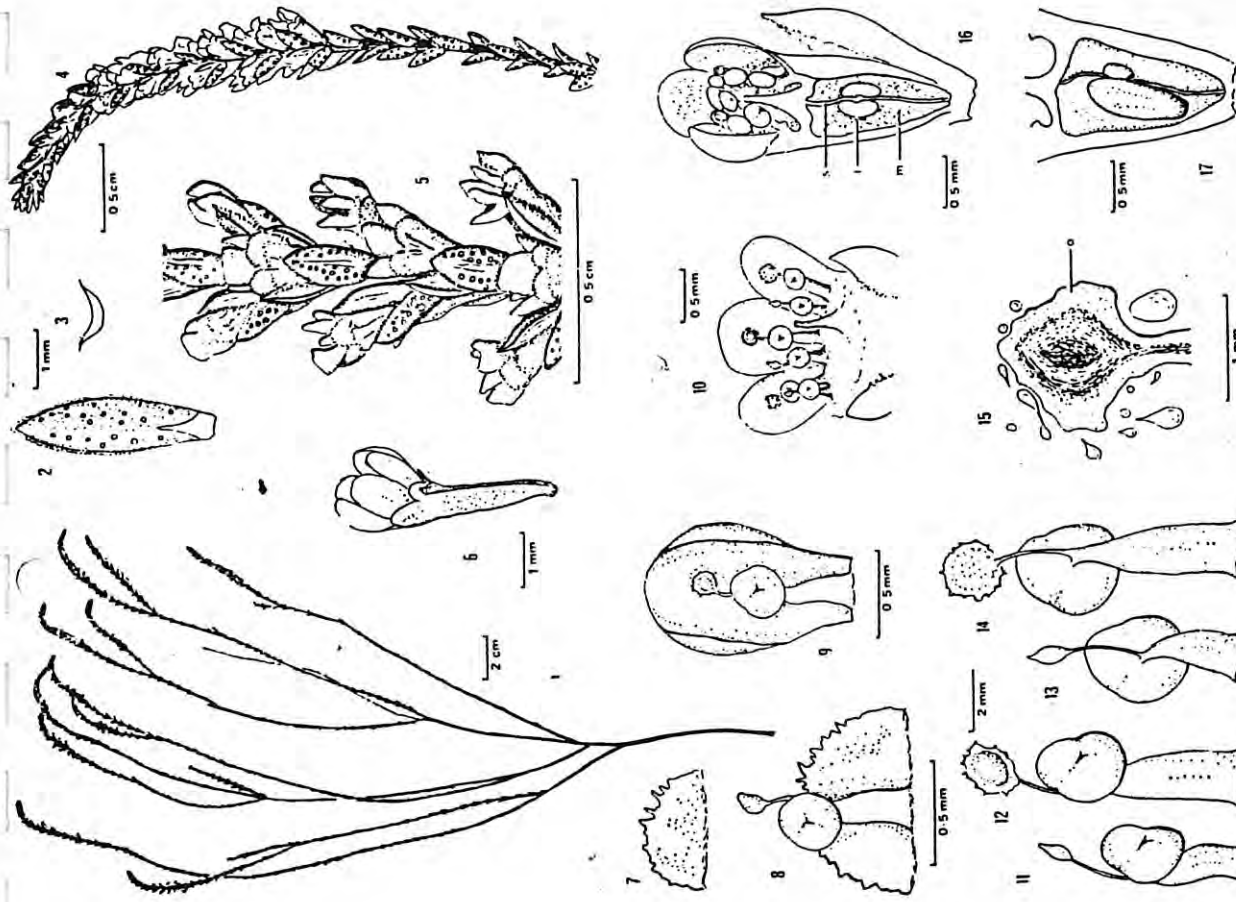
*Corynanthera* J. W. Green gen. nov.

*Frutex* racemis terminalibus spiciformibus. *Folia* opposita decussata. *Flores* solitarii, axillares, zygomorphi, tubo dorsiventraliter compresso. *Stamina* 10; filamentum in stiptite filiformi producto glandem terminaliter ferente. *Antherae* uniloculares poro uno dehiscentes, microsporangii 3 in uno plano dispositi. *Ovarium* uniloculare. *Ovulus* 2, ad venam stylarem posticam in parte ovarii tertia collateraliter affixi.

*Type species*: *C. flava* J. W. Green, the only known species. The generic name refers to the club-like appendages associated with the anthers.

*Shrub* with small, stipulate, decussate leaves. *Inflorescence* a terminal or sub-terminal spike-like raceme. *Flowers* solitary, in the axils of the upper leaves, subtended by two persistent bracteoles, zygomorphic; *floral tube* dorsiventrally compressed, the free part inclined towards the axis; *sepals* 5, the anterior 2 larger and the posterior smaller than the other 2; *petals* 5, exceeding the sepals. *Stamens* 5 + 5, in two scarcely distinguishable whorls, the outer, antepetalous stamens with the filament produced into a filiform stipe bearing a large, irregularly-shaped or ± globular appendage above the anther; the inner, antepetalous stamens with a shorter filament and a smaller, ellipsoidal, appendage level with the outer anthers. *Anthers* versatile, sub-globular (somewhat dorsiventrally compressed), uniplanar, trisporangiate, unilocular, with one microsporangium above and two below, introrse, dehiscing by a central pore. *Ovary* inferior, the wall consisting of a thin, fibrous, glandular, outer layer, a broad ± aerenchymatous middle zone and a fragile, membranous inner layer; locule 1, small, in the upper half or third. *Placenta* lateral within the ovary, attached to the stylar vein which passes just inside the outer layer on the posterior side. *Ovules* 2, ellipsoidal, collaterally attached above the middle. Aerenchyma and membrane breaking down, presumably after fertilization, their place apparently eventually becoming occupied by the single seed. *Seed* not seen mature.

Within the Chamelaucieae, which are distinguished by a unilocular ovary with a single placenta and indehiscent, dry fruit with 1-2 seeds (Bentham 1867), *Corynanthera* falls into a small group of genera containing *Thryptomene* and *Micromyrtus*, most species of which have 5 or 10 free stamens, regularly opposite sepals or petals, without staminodia. *Corynanthera*, while sharing these characteristics with *Thryptomene* and *Micromyrtus*, is distinguished from both genera by its trisporangiate, unilocular anthers, the associated, dimorphic appendages and the spike-like inflorescence of closely-appressed, yellow flowers.



Figures 1-17. *Corynanthera flava*. 1. Habit, upper half of one branch; 2-3. Leaf, lower view and T.S.; 4-5. Inflorescence; 6. Flower, lateral view showing compressed floral tube; 7-8. sepals; 9. Petal; 10. Androecium, showing dimorphic stamens *in situ*; 11-14. Stamens, 11 & 13 antepetalous, 12 & 14 antepetalous; 15. Gland showing irregular fringe with outer layer of oil-secreting cells (o); 16. Ovary showing stylar vein (s), inner wall layer (l) and middle layer (m); 17. Developing seed (1-10, 16-17 from A. Chapman, 18 miles W of Winchester; 11-15 fresh material from the same area).

**Corynanthera flava** J. W. Green sp. nov.—Figures 1–27.

*Fruite* gracilis, erectus, 30 cm altus. *Folia* angustioelliptica, 1.5–4 mm longa. *Inflorescentia* 2–7 cm longa. *Bracteolae* persistentes. *Fliores* sessiles, 2.5–3 mm longi. *Tubum florale* leviter costatum. *Sepala* semicircularia inaequalia, 0.25–0.5 mm longa, 1 mm lata. *Petala* late-elliptica, 1.5 mm longa, flava. *Stamina* exteriora ± 1 mm longa, stipite 0.3 mm longo in glande irregulariter globulosa terminanti; interiora breviora glande parviore ellipsoidea. *Stylus* 0.5 mm longus.

**Type:** 34.6 km W of Winchester, Western Australia, J. W. Green 4918, 6 Dec. 1978 (holo: PERTH; iso: CANB, K, PERTH).

Slender, erect shrub, few-stemmed near the base, spreading above, 30–175 cm high, leaves usually confined to the upper branches, the branch endings sometimes decurved. *Leaves* sessile, narrow-elliptic, concave above, convex

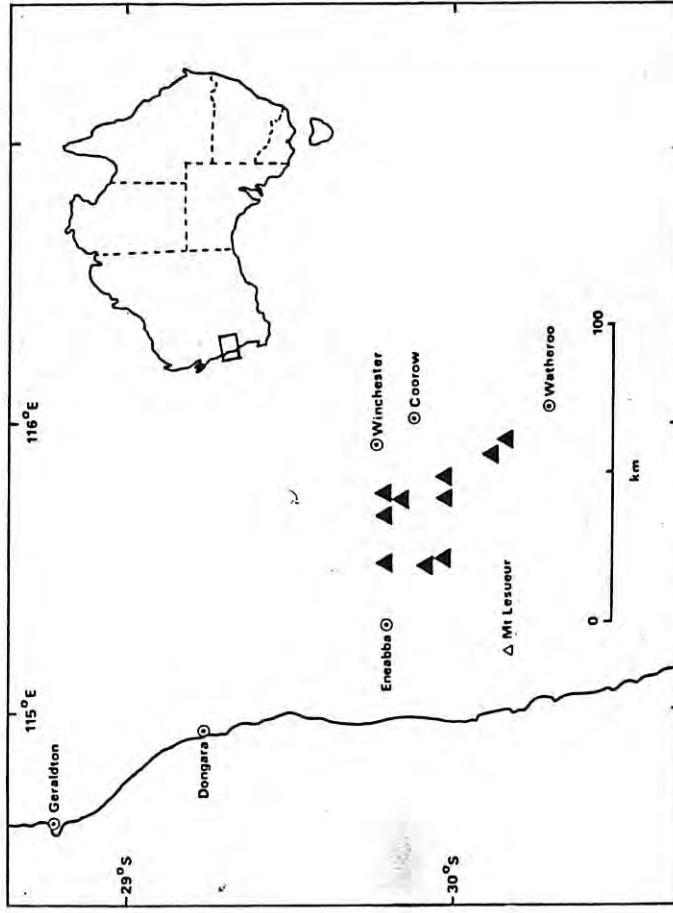
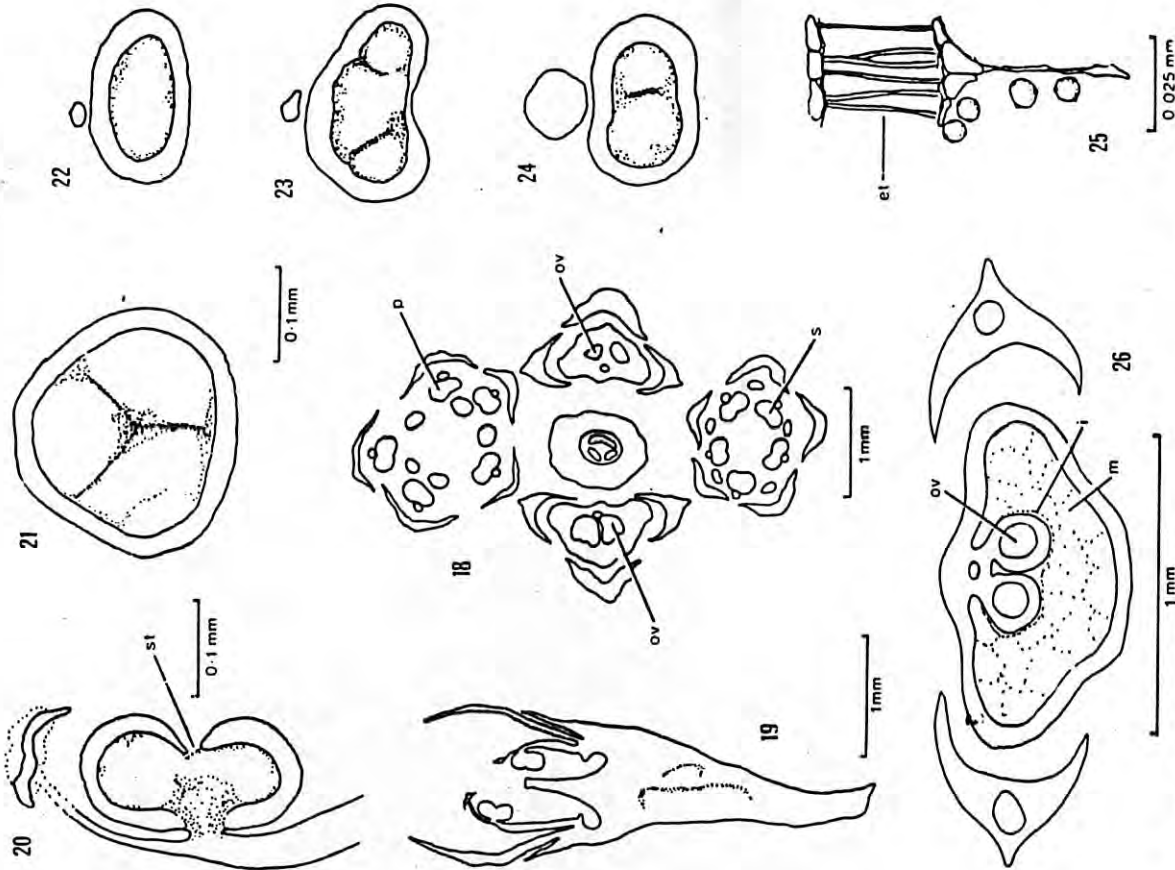


Figure 27. Distribution of *Corynanthera flava*.

or ± keeled below, 1.5–4 mm long, usually appressed, imbricate on the younger branches, margins minutely ciliate or sometimes entire, oil-glands several to many, large and prominent. *Inflorescence* 2–7 cm long. *Bracteoles* conduplicate, keeled, as long as the floral tube at maturity, yellowish and petaloid except for the broad, scarious, ciliate margins. *Flowers* sessile, 2.5–3 mm long. *Floral tube* narrowly triangular in anterior view, with five faint, longitudinal ribs opposite the sepals, the surface somewhat rough from the presence of numerous small, pale yellow oil glands. Anterior *sepals* erect, semicircular, 0.5 mm long and 1 mm broad, yellowish-petaloid to scarious near the ciliate to faintly denticulate margins; posterior sepal somewhat spreading, about half as long as the anterior; lateral sepals erect, intermediate in length. *Petals* broadly elliptic, 1.5 mm long, lamina yellow, slightly hooded, clavate; stamens about 2/3 as long. *Filaments* broadly compressed-terete,



Figures 18–26. *Corynanthera flava*. 18, T.S. Inflorescence, showing central axis, antepetalous anthers (p) (upper), antepetalous anthers (s) (lower), floral tube at two levels of ovules (ov) (left and right); 19, Flower, L.S. showing antepetalous stamen (st), antepetalous stamen (right) and developing seed; 20, Antepetalous anther and gland, L.S. showing stomium (st) after dehiscence; 21–25, Anther—21, tangential L.S. showing three microsporangia—22, T.S. upper sporangium—23, T.S. above stomium showing three sporangia—24, T.S. below stomium showing two sporangia—25, T.S. showing fibrous-banded endothecium (et), junction of two sporangia and pollen grains; 26, Floral tube and bracteoles, T.S. showing ovary, including ovules (ov), inner wall layer (i) and middle layer (m) (all from Green 4917).



0.5 mm long, the stigma at maturity level with the inner anthers.

**Selected specimens (all PERTH):** 35 miles (56 km) W of Winchester, C. Chapman, 14 Nov. 1975; 25 km W of Winchester, J. W. Green 4917, 6 Dec. 1978; 30 km WSW of Winchester, J. W. Green 4920, 6 Dec. 1978; 43 km SW of Winchester, J. W. Green 4919, 6 Dec. 1978; 39 miles (62 km) W of Coorow, C. Chapman, 15 Jan. 1967; Within 24 miles (38 km) W of Coorow, C. Chapman, 4 Jan. 1976; N end of Watheroo National Park, J. S. Beard 7880, 18 Sept. 1976; E boundary of Watheroo National Park, R. D. Royce 9721, 7 Oct. 1971.

**Conservation Status:** Density ranges from sparse to locally abundant. Populations occur in three National Parks. Because of the very small area of occurrence, however, and because the species has already proved attractive to the cut flower trade, it should be protected from commercial exploitation in the wild. Efforts are being made to bring it into cultivation.

**Distribution:** an elliptical area some 70 km long, extending from Tathra National Park to Watheroo National Park, about 200 km north of Perth, Western Australia (Figure 27).

**Habitat:** heaths and shrublands where it is frequently associated with *Xylomelum angustifolium*, *Eucalyptus toditiana* and *Eucalyptus eudesmoides* on pale, grey-brown, somewhat loamy sands over laterite. Annotated voucher specimens of the associated species are deposited in the Western Australian Herbarium (PERTH).

**Flowering period:** September to February.

**Discussion**

The anther of *Corynanthera* may be described, using the terminology of Green (1980), as trisporangiate and unilocular (Figures 20-25). This is in sharp contrast with the remainder of the Myrtaceae which are only known to have tetrasporangiate anthers (Davis 1966), apparently always bilocular. The sporangia are uniplanar, as described by Prakash (1969) in *Darwinia micropetala*.

Two of the above characteristics of *Corynanthera* appear to be unique in the angiosperms. No record has been found in the literature of a trisporangiate anther. Eames (1961, p.114) noted that anthers with more than four sporangia were uncommon or rare, except in forked or branched stamens, and that the larger number was nearly always eight, even this sometimes resulting from connation. He regarded a smaller number, "nearly always two", as representing a reduction from the basic four, giving several examples of bisporangiate families and genera. The only example given of any other reduced number was *Arceuthobium* (Viscaceae) which has a single sporangium "with some trace of a second". It seems reasonable to speculate that the apparently trisporangiate anther of *Corynanthera* may be tetrasporangiate in origin, the appendage having arisen from a fourth, sterile sporangium.

Another apparently unique feature of *Corynanthera* is the single, porate, posterior stonium (Figures 8-9, 11-12, 20), through which pass the contents of the three microsporangia (Figure 21) at anthesis. Thus the remaining vestiges of three microsporangial compartments are here interpreted as comprising a single loculus (Green 1980). Further embryological study may reveal the pore to be morphologically terminal, which would be unusual in the angiosperms but not unique.

Also of considerable interest is the supinate appendage which arises as a filament beyond the apex of the connective (a term somewhat difficult to apply to the usual structure of *Corynanthera*) occur sporadically through the angiosperms (Kerner & Oliver 1902), a fringed structure having been found, for example, in a single species of *Conostylis* (Haemodioraceae), *C. aurra* (Green 1961). In many cases such appendages have been interpreted as staminal nectaries (Fahn 1952, 1974) but the structure in *Corynanthera*, at least in the antepetalous stamens, appears to be an oil gland, judging by immiscible droplets which were extruded by gently squashing an aqueous, microscopic whole mount (Figure 15). While many members of the Myrtaceae possess an enlarged gland on the connective, only in *Veritcordia* is this greatly enlarged into what might be termed an appendage; according to Benthams (1867), seven species have variously thickened, often concave appendages. The most extreme is probably *V. grandiflora*, in which the "two long horn-like points" project well above the anther in a manner somewhat reminiscent of *Corynanthera*.

The dimorphic nature of the stipitate appendage of *Corynanthera* is also noteworthy, the appendage of the antepetalous, larger stamens being irregularly globular and that of the anteseptalous, smaller stamens much smaller, ellipsoidal and discrete in shape, lacking the ragged irregular fringe of the others (Figures 11-14). This characteristic appears to have no parallel, especially as the anteseptalous stamens appear equally fertile and are in no sense like staminodia.

The ovary of *Corynanthera* closely resembles that of a group of species of *Micromyrtus* having 10 stamens and two ovules, suggesting a very close relationship. Upon dissection, the ovules may sometimes be found enclosed within a fragile membrane which is here interpreted as the innermost layer of the ovary wall (Figures 16, 26). Outside this membrane (when present) occurs a broad layer of aerenchyma consisting of a convoluted network of narrow, thin-walled, parenchymatous cells with large intercellular spaces (Figures 16, 26). This middle zone has scarcely been mentioned in taxonomic descriptions, possibly because of its fragile nature and eventual disappearance in many specimens. An apparently identical structure has been described and illustrated in *Thryptomene elliotii* by Black (1952, Figure 859-16). Alternatively, this layer may be what Esau (1965) calls *stigmatoid tissue* (also known as conducting tissue) which facilitates the progress of the pollen tube through the ovary. This explanation, however, would negate the present interpretation of the aerenchyma as being outside the ovary loculus.

The hard, outer wall of the floral tube doubtless consists of the outer carpellary layer and the tube formed from either the fused calyx and corolla or an upgrowth of the receptacle but developmental studies in other genera have not provided the means of identifying the separate contributions made by each of these tissues. Pending an elucidation of this matter it is probably best to use a neutral term when describing the combined structure.

At odds with the above interpretation of the ovary is the concept of a "filiform placenta extending from the base to the top of the cavity" in *Micromyrtus* (Benthams 1867), which appears to have arisen from his examination of flowers in which the aerenchymatous layer has broken down. This "filiform placenta" is probably the fused ventral bundles of a single carpel, contributing to the vasculature of both the ovary and the style (Figures 16-17), the placenta being very short, within the innermost ovary wall layer. In describing *Thryptomene*, Benthams (1967) referred to "the cavity usually small near the top of the calyx-tube" (consistent with my interpretation of *Corynanthera* and related species of *Micromyrtus*) but then went on to say "or rarely the cavity occupies the greater part of the tube", a situation which can

certainly be found in some flowers, including those of *Conostylis*, (Figure 17), but seems more plausibly explained as a post-fertilization stage of floral development resulting from partial breakdown of the ovary wall.

Evidence that the spongy aerenchyma may sometimes persist in older flowers or fruits is contained in the original description of *Micromyrtus sulphurea*, in which Fitzgerald (1904) noted "fruiting calyx somewhat spongy within."

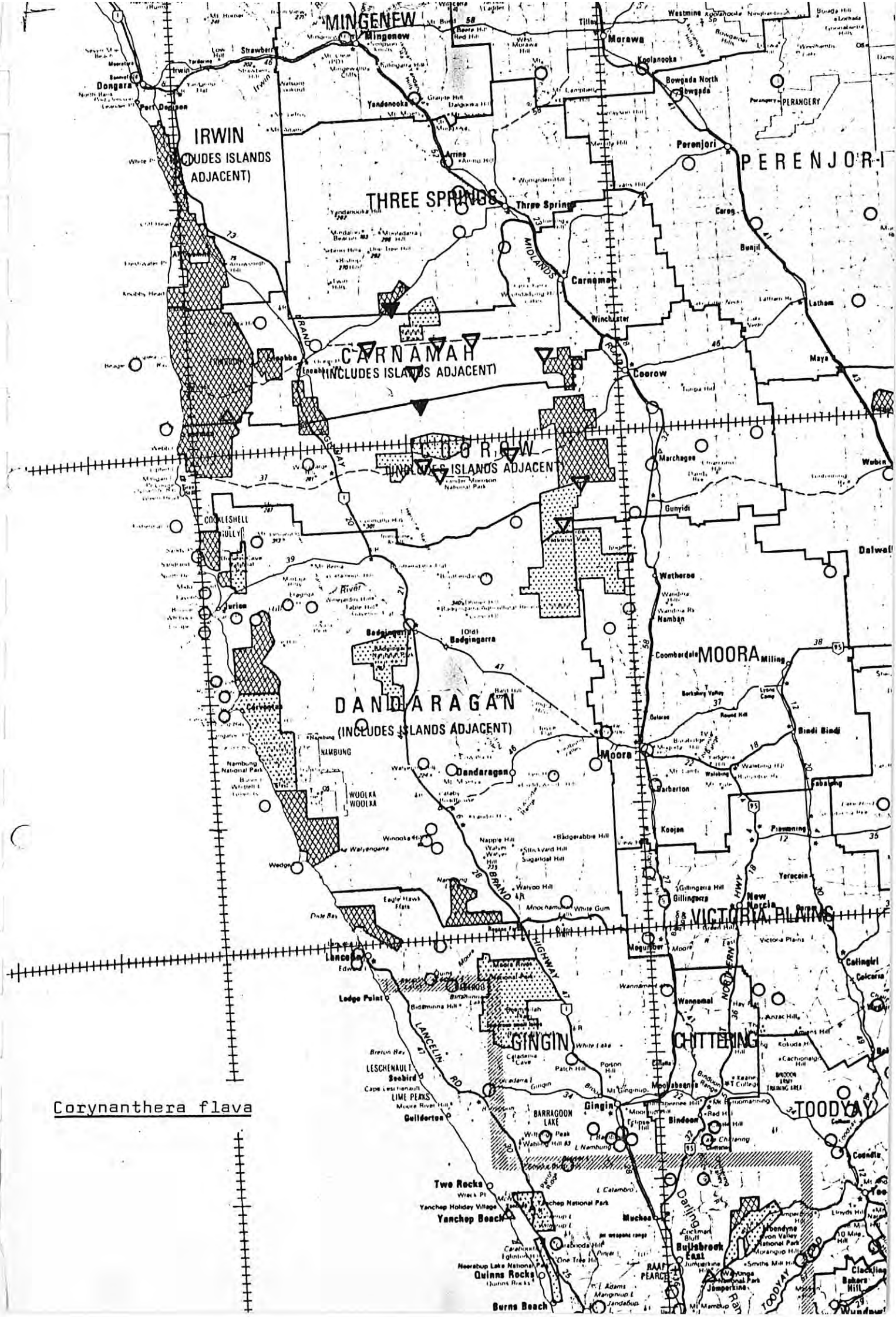
#### Acknowledgments

I am indebted to my colleagues for helpful discussion and to Mr. C. Chapman of Winchester, W.A. for collecting specimens and assisting me to locate occurrences in the field. Mr. P. G. Wilson read the manuscript and Mr. A. S. George provided the Latin diagnoses. Mrs. J. W. Lee-Frampton is thanked for technical assistance.

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Corynanthera flava

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Corynanthera flava* J.W.Green..... Family *Myrtaceae*..... Date Recorded 5.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
HT	34.6 km W of Winchester, 8.1 km E of Tathra N.P. 29°48'S 115°40'E	open heath	6 12 78	Y	JWGreen 4918
	Watheroo NP		7 10 71	Bud	RD Royce 9721
	15 m N of Jurien <small>doubtful locality (Jurien)</small>		21 10 66	Y	Fw Humphries
	38 km from Three Springs along Rd to 29°43'S 115°29'E Eneabba	whitesand over laterite heath	25 1 79	Y	MCrisp 5461
	39 m W of Coorow on Greenhead Rd.		15 1 67	Y	C Chapman
	43 km SW of Winchester, 1.6 km N of Coorow Greenhead Rd on Clarke Rd 29°58'S 115°46'E	palesand over laterite open heath	6 12 78	Y	JWGreen 4919
	25 km W of Winchester on Rd to Eneabba 29°48'S 115°45'E	palesand over laterite low open shrubland	6 12 78	Y	JWGreen 6917
	30 km SSW Winchester, 6 m S of Eneabba	pale sand over laterite	6 12 78	Y	JWGreen 6920
	Winchester Rd on Clarke Rd 29°40'S 115°46'E	low open woodland			
	15 km S of Tathra N.P. 29°55'S 115°30'E	White sand low open heath	2 1 79	Y	E Griffiths 1807
	13 m SW of Winchester		21 2 79	Y	C Chapman sn
	12 km S of Winchester Eneabba Rd.		4 1 76	Y	C Chapman sn
	24 m from Coorow, Coorow Greenhead Rd		4 1 76	Y	C Chapman sn
	Winchester - Eneabba Rd		4 1 76	Y	C Chapman sn



Cryptandra humilis (Benth.) F. Muell.

Syst. Census Austral. Pl. 61 (1882)

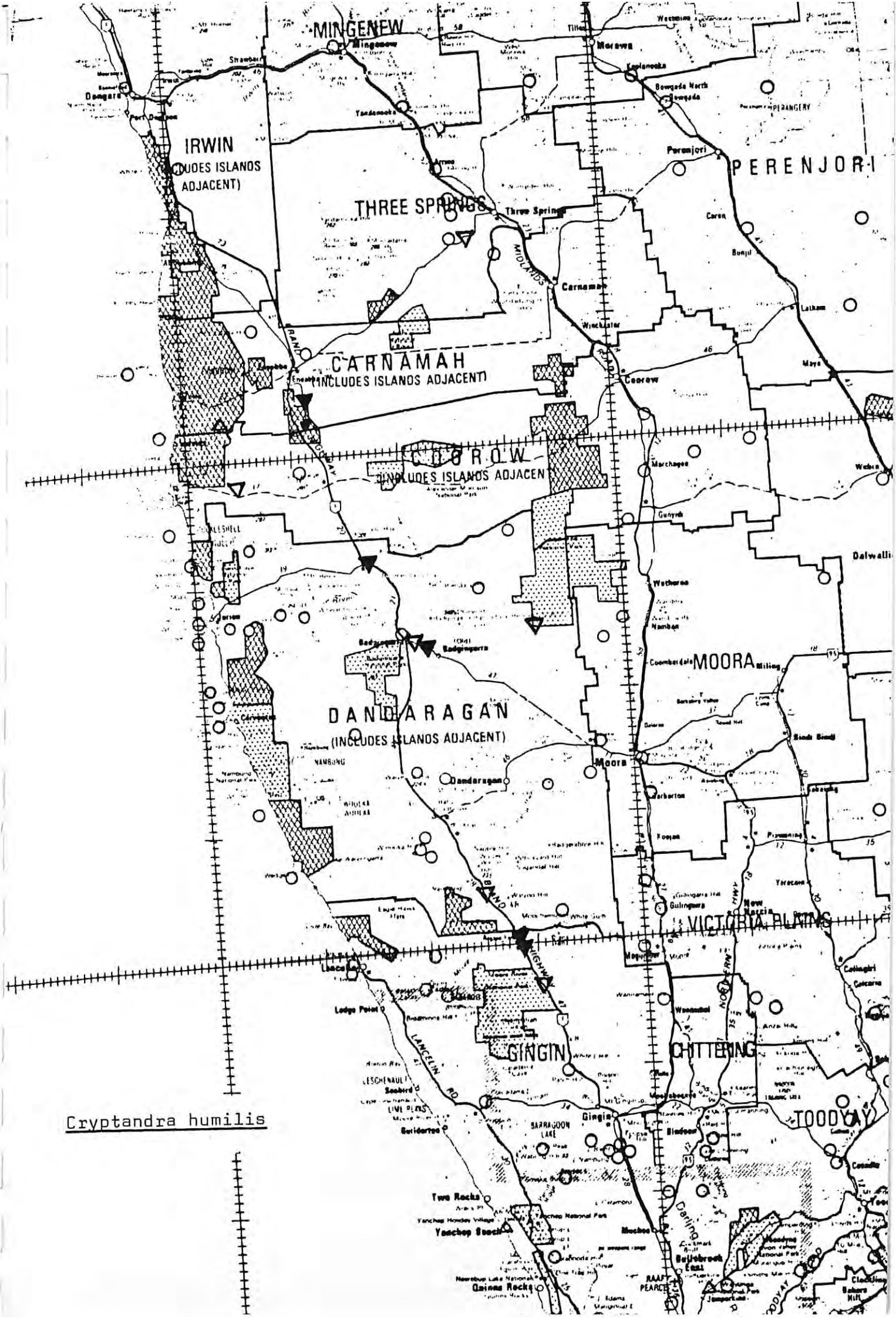
+ Benth. Fl. Austral. : 436

as Stenanthemum humile Benth.

5. **S. humile**, *Benth.* Stems 2 or 3 in. high, bare below, the flower-heads and leaves closely crowded in the upper part. Leaves narrow-linear, seldom  $\frac{1}{2}$  in. long, the margins closely revolute, nearly glabrous above, tomentose and with a few long woolly hairs underneath. Heads few-flowered, almost sessile amongst the leaves. Brown bracts very broad, obtuse or the midrib ending in a fine point. Calyx slender, 2 lines long, densely hispid with long white woolly hairs.

**W. Australia.** Between Moore and Murchison rivers, *Drummond*, n. 91 (the same number as *Spyridium polycephalum*, but probably from a different set).





Cryptandra humilis

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Cryptandra humilis* (Benth.) F. Muell. Family *Rhamnaceae* Date Recorded 8 6 81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Coomallo Ck 30°11'S 115°23'E	open forest Eucalydoo deep loamy clay	12 9 77	Y	RJ Hnatic 770893
	Hill River near Watheroo		29 9 61	Y	CA Gardner sn.
	2m SE of Regans Ford		22 11 60	Y	AS George 1703
	Badgingarra		Sept 64	Y	E Humphreys sn
	Badgingarra		19 10 60	Y	L Steenbohm sn
	SW corner of Watheroo NP.	sandy soil	4 10 71	Y	RD Royce 9582
	Moone River N.P.	Sandy soil	2 10 71	Y	RD Royce 9496
	132 mp Brand Hwy		4 10 71	Y	AC Burns 150
	44 m S of Regans Ford		23 9 66	Y	EM Bennett 1315
	10 m SW of Three Springs to Eneabba	yellow sand	30 10 66	N	EM Bennett 1414
	7 km S of Eneabba 29°53'S 115°16'E	low open heath, white sand over laterite	3 8 77	Y	EA Griffin 963
KP	5 km S.E. of Badgingarra	sand at edge of breakaway	10 9 79	Y	GJ Keighery 2556
KP	124 mp Brand Hwy near Badgingarra	Scrub heath	21 5 68	Y	J.S. Beard 5472
KP	Nth of Regans Ford	gravelly sand	19 11 67	Y	E. Wittwer 620
KP	6.5 m from Juran Bay Turnoff		16 10 66	Y	F. Cullifitz 6526



Darwinia helichrysoides (Meisn.) Benth.

J. Linn. Soc. 9: 179 (1865)

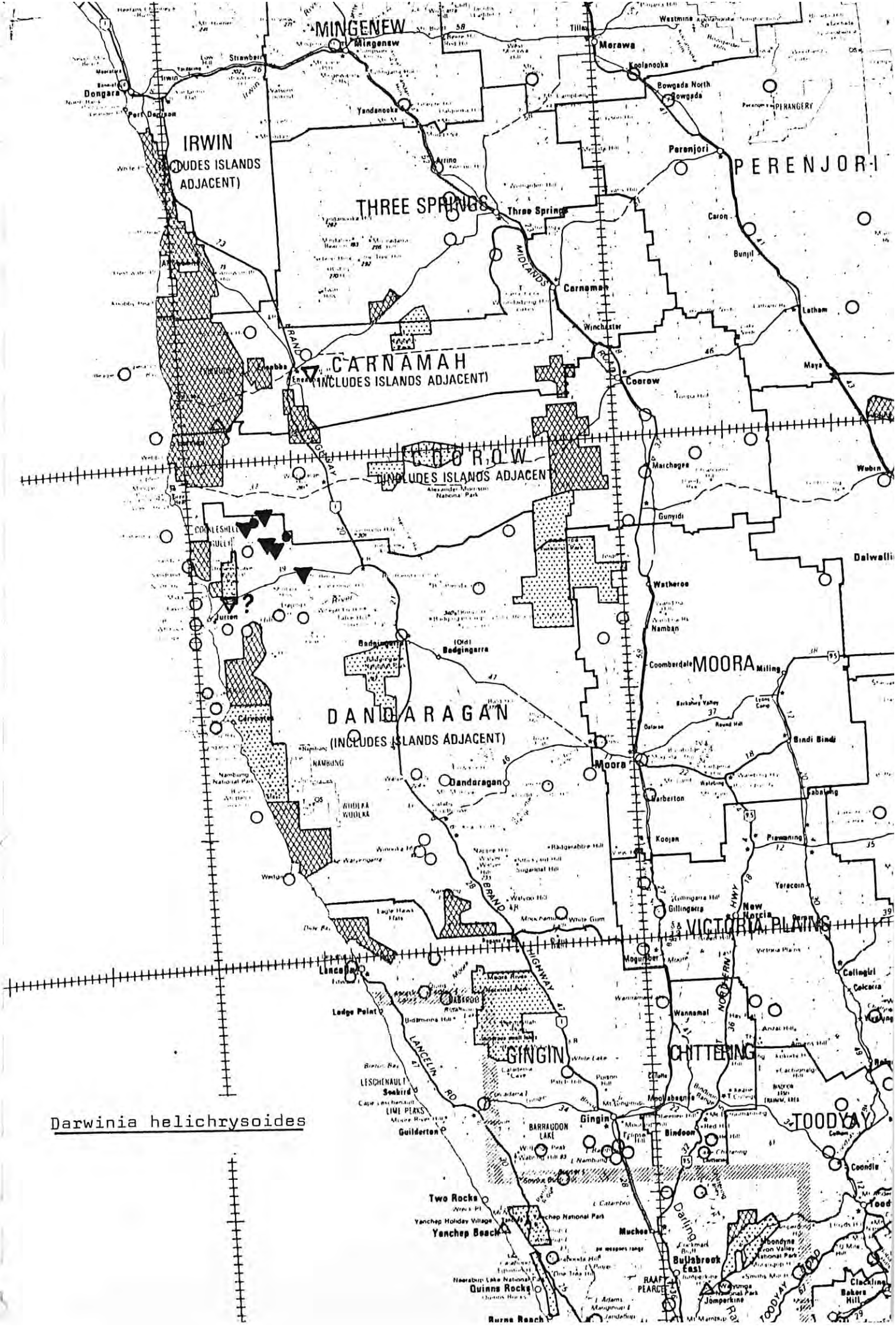
+ Benth. Fl. Austral. 3: 10

2

6. **D. helichrysoides**, Benth. in *Journ. Linn. Soc.* ix. 179.—Slender and erect, often under 1 ft. high. Leaves scattered, rather crowded, linear-triangular or semiterete, spreading, 2 to 3 lines long. Involucres narrow, nearly 1 in. long; bracts numerous, ovate-lanceolate, acute, mostly with a prominent midrib, the inner ones coloured, passing gradually into the short broad outer ones. Flowers about 4 in the head. Bracteoles very broadly orbicular. Calyx above 3 lines long, the adnate part without prominent ribs, but the surface granular; lobes broad, very obtuse, thicker than in any other species, streaky, and half as long as the petals. Petals about 1 line long. Stamens rather thick, capitate.—*Genetyllis helichrysoides*, Meisn. in *Journ. Linn. Soc.* i. 37.

**W. Australia.** Between Moore and Murchison rivers, *Drummond*, 6th Coll. n. 35.





Darwinia helichrysoides

A. LAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Darwinia helichrysoidea* (Meisn.) Benth.  
 \* not seen

Family *Myrtaceae*

Date Recorded 8 5 81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Mt Lesueur Summit		4 11 02	Y old	R. Royce 7726
	4m E of Juren	limestone	16 9 76	Y	J. S. Beard 7813a
	Eneabba 29°48'S 115°18'E		4 6 73	N	B. L. Powell 73020
	Mt Lesueur	laterite	25 8 48	Y	C. A. Gardner 9089
	Mt Benia 30°14'S 115°16'E	shallow sand over laterite	15 9 79	Y	E. A. Griffini 2242
	Mt Benia 30°14'S 115°16'E	low open heath			
	Mt Benia 30°14'S 115°16'E	shallow sand over laterite	13 9 79	Y	E. A. Griffini 2217
	Cockleshell Gully 30°08'S 115°09'E	low open heath			
	Cockleshell Gully 30°08'S 115°09'E	grey sand over laterite	23 10 79	Y	E. A. Griffini 2434
	Hill 1 km E of Mt Peron 30°07'S 115°09'E	low open heath			
	Hill 1 km E of Mt Peron 30°07'S 115°09'E	grey sand over laterite	31 10 79	Y	E. A. Griffini 2455
	Hill 1 km NW of Mt Lesueur 30°10'S 115°11'E	low closed heath			
	Hill 1 km NW of Mt Lesueur 30°10'S 115°11'E	grey sand over laterite	27 8 79	Y	E. A. Griffini 1985
	Slopes of Mt Lesueur	open shrubland			
UWA	Slopes of Mt Lesueur			Y	NH Speck sn
UWA	Hill River		21. 9. 51	Y	NH Speck sn
type *					J. Drummond VI 35

Darwinia neildiana F. Muell.

+ Fragm. Phyt. Austral. 9: 177-178 (1875)

*Darwinia Neildiana.*

(Sect. Genetyllis.)

Humilior, *foliis brevibus trigono-linearibus* glabris patentissimis valde confertis margine recurvatis, floralibus sensim latioribus, *bracteis involucrantibus pluri-seriatis lanceolatis tenui-acuminatis molliter fimbriato-ciliatis*, floribus in receptaculo amplo planiusculo numerosis sessilibus, bracteolis longis linearibus ciliosis, *calycis lobis semilanceolatis fimbriolatis petala acuta ciliolata fere semiquantibus*, staminodiis spathulatis, stylo perbrevis, fructu leniter 5-angulato.

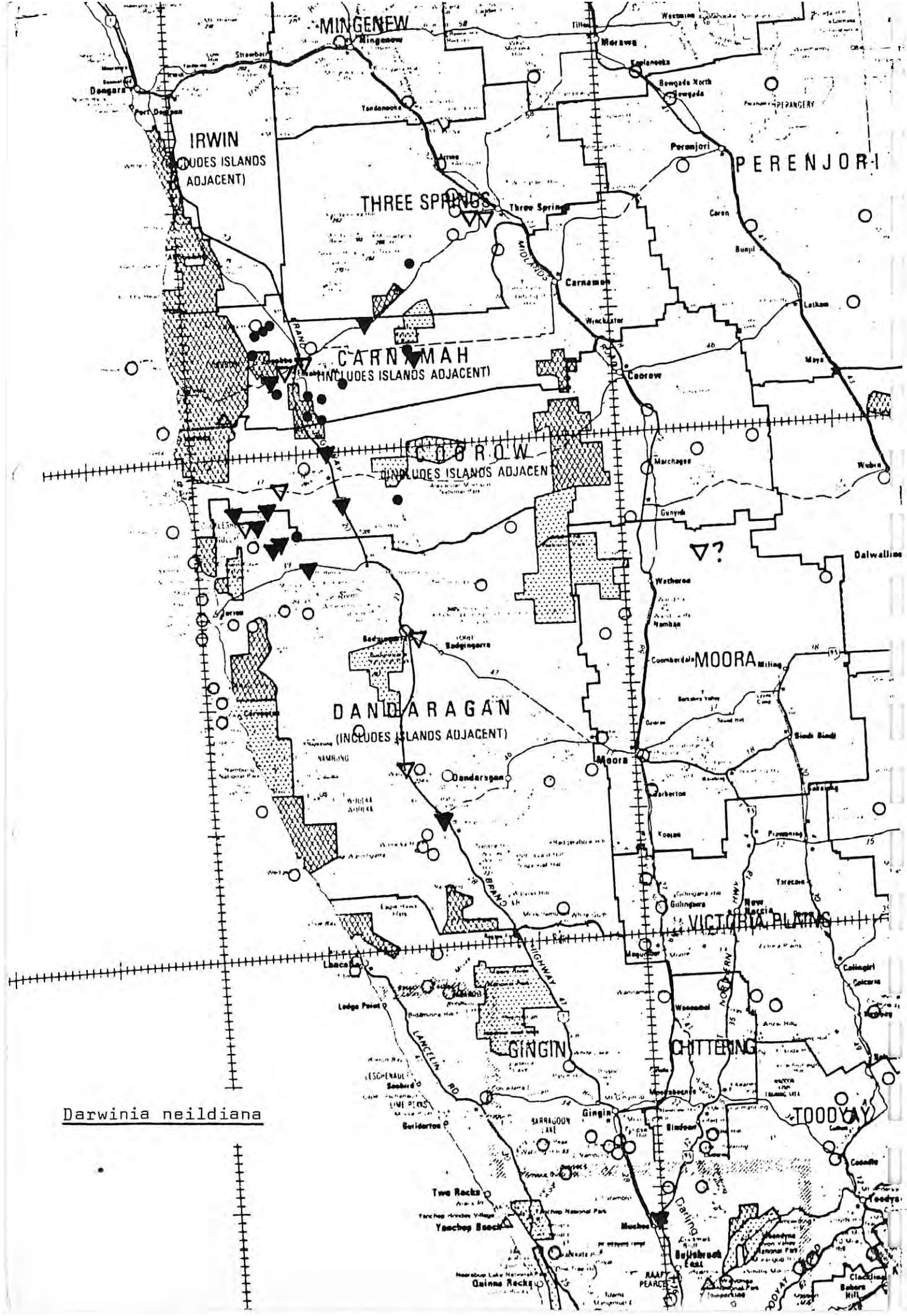
In Australia occidentali forsitan prope flumen Murchisoni legit Drummond, qui plantam cum suis aliis non distribuit.

Fruticulus spithamæus usque ulnaris, nisi altior. Ramuli pallidi, dense cicatrisati et angulosi. Folia sparsa, glaucescentia,  $1\frac{1}{2}$ -5" longa, interdum apicem versus hispidulo-ciliolata. Capitula circiter uncialia, foliis floralibus cincta. Bracteæ exteriores virentes, interiores præsertim sursum erubescentes. Bracteolæ floribus longiores. Tubus calycis circiter sesquilinearis. Petala lineam longa, semilanceolata. Staminodia minutissima. Antheræ globosæ. Styli apex barbellatus non nisi forsitan ætate exsertus. Fructus monospermus.

Species transitum ad Verticordias mediat. Inter congeneres D. cæderoidi externe simillima; bracteæ autem latiores et ciliis longioribus mollioribusque fere plumosæ, calycis lobi nec rotundati nec glabri, petala acutiora et ciliolata. Capitula omnium exemplarium analysi subjectorum ictibus insectorum deformata erant, structuram vero supra expositam florum semper exhibuunt.

Appellatio specifica sit tributum bene meritum J. Eduardo Neild, M.D., societatis medicorum coloniae Victoriae secretario, commentariorum, "Australian Medical Journal" dictorum per multos annos editori medicinam forensem in Melbournensi Universitate literarum docenti.





Darwinia neildiana



Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Darwinia nilobiana* F. Muell. .... Family *Myrtaceae* ..... Date Recorded 8. 6. 81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Diamond of the Desert Springs 10m N of Jura on Turnoff on Brand Hwy 0.75m N of Muckee Cross Roads	Sandy soil	26 8 48 25 6 78 28 10 60	Y N Y	CA Gardner 9094 BLRye 78003 AS George 1693
	5km E of Lake Indoon 29°50'S 115°12'E Reserve 1906, 15km E of Erubba 29°45'S 115°25'E	low closed heath, grey sand low open heath, lateritic ground on hill top	14 9 77 9 11 78	Y Y	RI Mathiule 771010 EAGriffin 1522
	1km W of Brand Hwy on M. negarra Rd Mt Lesueur	low closed heath, grey sand	3 8 76 16 10 46	Y Y	RI Mathiule 76008 CA Gardner 8457
	Base of Mt Lesueur Ogilvie cliff head	in rocks	Dec 35 2 10 59	Y (Yield) Y	H Stedman sn W H Butler sn
	Green Range (Near Mt Lesueur) Cockleshell Gully 30°09'S 115°08'E	low closed heath, sand + ground over lateritic duricrust	19 8 44 22 10 79	Y Y	CA Gardner 9334 EAGriffin 2422
	Hill 11km ENE of Mt Person 30°07'S 115°10'E	low closed heath, sand + ground <del>over</del> lateritic upland	24 10 79	Y	EAGriffin 2440
	Cockleshell Gully 30°08'S 115°09'E	border Euc. marginate on slope of brecciating	23 10 79	Y	EAGriffin 2433
	valley 5km E of L. Lesueur 30°11'S 115°13'E	low open heath, grey brown granular sand over	5 1 19	Y	

Taxon .. *Dorstenia neilghiana* F. Muell. Family ..... Myrtaceae Date Recorded .. 8.6.81.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
25	5 km S of Eneabba	white sand	8.9.79	Y	RJ Cranfield 1288
	Badgingarra		23.9.62	Y	JS Beard 1862
	Cockleshell Gully		26.9.71	Y	AC Burns 140
	Eneabba - Coorow	sand heath	24.9.62	Y	JS Beard 1921
	4.5 km SW of Three Springs	in sand	30.8.65	Y	KN Newberg 2279
	Eneabba - Badgingarra Rd		21.9.66	Y	S Chambers 158
	Badgingarra		Sept 65	Y	FA Smith 1835
	Three Springs		24.9.40	Y	WE Baskell 4909
	Eneabba		26.8.65	Y	JS Beard 4419
	1.5 km along Weber Rd near Three Springs		23.9.68	Y	ME Phillips sn
	West Rd to Snag Island (Coorow - Green Head)		4.12.65	Y	FL Liffitz 4510
	MT Benia 30°14'S 115°15'E	low open heath, shallow sand over lateritic duricrust	13.9.79	Y	EA Gillin 2218
	MT Benia 30°14'S 115°16'E	low open heath, shallow sand over lateritic <sup>inland</sup>	16.9.79	Y	EA Gillin 2243
	MT Benia 30°14'S 115°16'E	low open heath, shallow sand over lateritic upland	16.9.79	Y	EA Gillin 2244
	Mullering Brook		29.9.69	Y	AI Cough 388



Darwinia sanguinea (Meisn.) Benth.

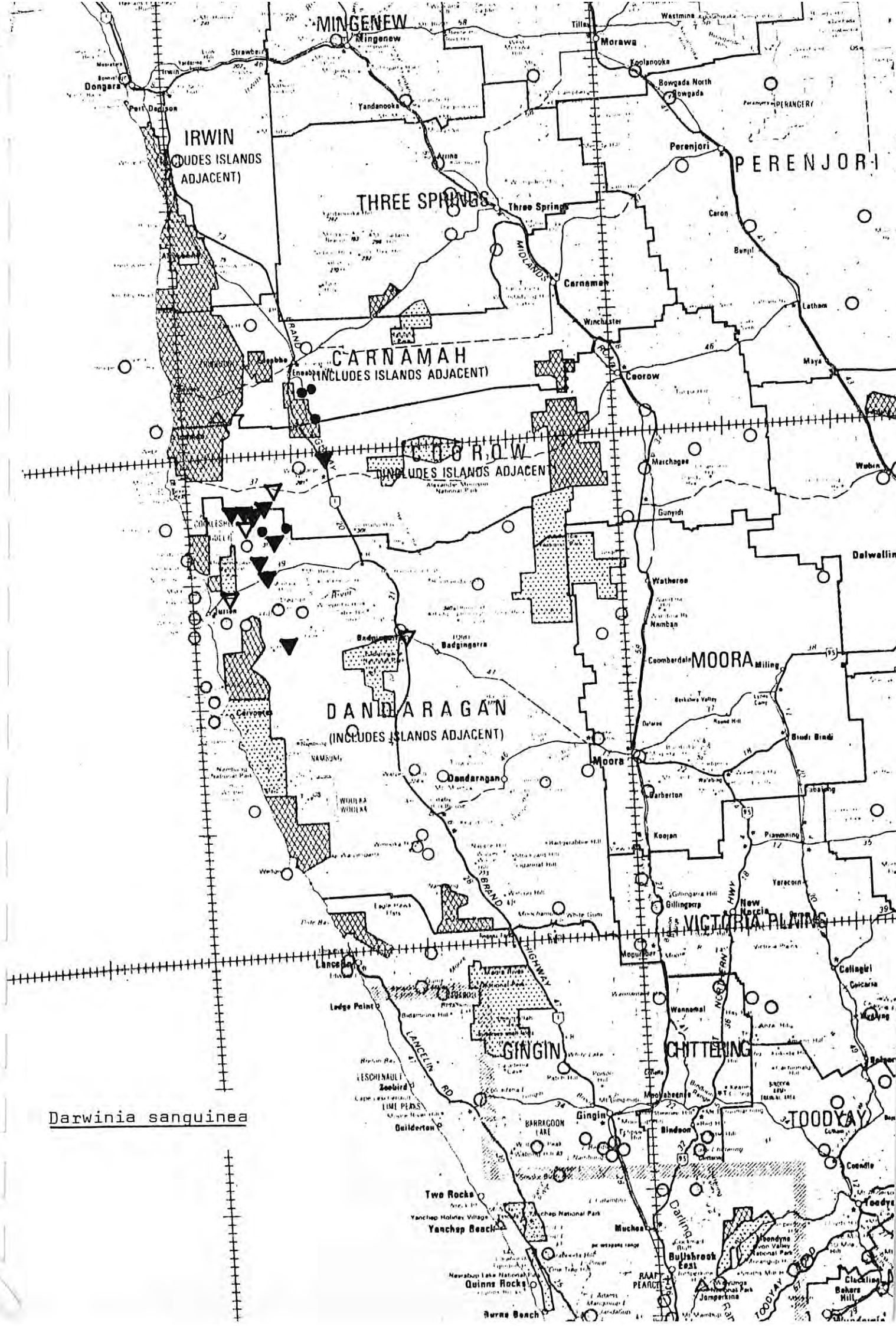
J. Linn. Soc. 9: 181 (1865)

+ Benth. Fl. Austral. 3: 14

19. **D. sanguinea**, Benth. in *Journ. Linn. Soc.* ix. 181. Apparently diffuse. Leaves opposite, often crowded, linear-oblong or lanceolate, 2 to 3 lines long, with rather thin recurved ciliolate margins. Flowers crowded in a dense terminal hemispherical compound head of  $\frac{1}{2}$  to 1 in. diameter, consisting of several partial heads of about 4 flowers each. Bracts or floral leaves ovate, usually coloured, but shorter than the flowers. Bracteoles very broad, mucronulate, shorter than the calyx. Calyx about 3 lines long, the adnate part prominently 5-ribbed and granular-tuberculate between the ribs; lobes cordate-ovate, nearly 1 line long. Petals ovate, about as long as the calyx-lobes. Stamens lanceolate.—*Genetyllis sanguinea*, Meisn. in *Journ. Linn. Soc.* i. 38.

**W. Australia.** Between Moore and Murchison rivers, *Drummond, 6th Coll. n. 36.*





Darwinia sanguinea



Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Darwinia sanguinea* (Mearns) Benth Family *Myrtaceae* Date Recorded 29 5 81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	1.5 km N of Jurien Rd along Cockleshell Gully Rd 115°10'E 30°14'S	on sand heath	15 11 71	Y	AS George 11195
	6.5 km S of Cockleshell Gully	sand	1 9 66	Y	AS George 7813
	Cockleshell Gully		28 3 78	Y	RJ Cranfield 154
	mont's Lesueur and latum septentrionalis		June 66	Y	CAGardner
	25 km S of Eneabba 30°10'S 115°25'E		10 8 79	Y	RJ Cranfield 1307
	1 km ENE of Mt Peron 30°07'S 115°10'E	low closed heath, sand	24 10 79	Y	EAGriffin 2441
	1 km S of Mt Peron, 30°07'S 115°09'E	+ gravel, lateritic upland	31 10 79	Y	EAGriffin 2456
	Hill River	low closed heath, sand	Dec 1935	Y	H Steedman sn
	Jurien Bay	gravel, lateritic upland	3 11 62	Y	RDRoyce 7705
	Munbinger Rd Turn off, Jurien Rd	sandy soil	7 10 78	Y	RJ Cranfield 1824
	Mt Lesueur	white sand	12 10 51	Y	CAGardner 10585
	3m E of Diamond of the Desert Springs	gravel	8 1 66	Y	K Newbey 2365
	near Cockleshell Gully		25 8 38	Y	WE Blackall 13561
	4.5 km N of Cockleshell Gully 30°08'S 115°07'E	sand plain	3 10 73	Y	BL Ryce (Powell) 7320

A. AS OF THE WESTERN AUSTRALIAN F. JRA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Darwinia sanguinea* (M. E. S. N.) Benth Family *Myrtaceae* Date Recorded 29.5.81.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
Isotype	37 m from moora towards Jurun Cocksshell Gully	gravelly sandy heath	25 10 38	Y	WE Blackall 3561
uWA	Between Moore + Murchison Rivers Hill River		15 10 46	Y	CAGardner 8425
uWA	4.4 m N of Cocksshell Gully	white sand, heath	21.9.51	Y	J Drummond v136
uWA	Lesueur Rd (Cocksshell Gully)		8 10 67	Y	NH Speck
uWA	5 m S of Hill River on Mumbinea Rd		Oct 71	Y	WALoveregan 67,099
KP	2 m N of Jurun Bay turnoff (off where)		9 10 68	Y	NH Speck
KP	West rd to Snag Island (Coorow-Green Head Rd)	Sand heath	4 12 65	Y	S James
KP	Eneabba - Coorow	Sand heath	24 9 62	Y	H. Demar 2 D426
					FLullifitz 64516
					J.S. Beard 1919

Darwinia speciosa (Meisn.) Benth.

J. Linn. Soc. Bot. 9:179 (1865)

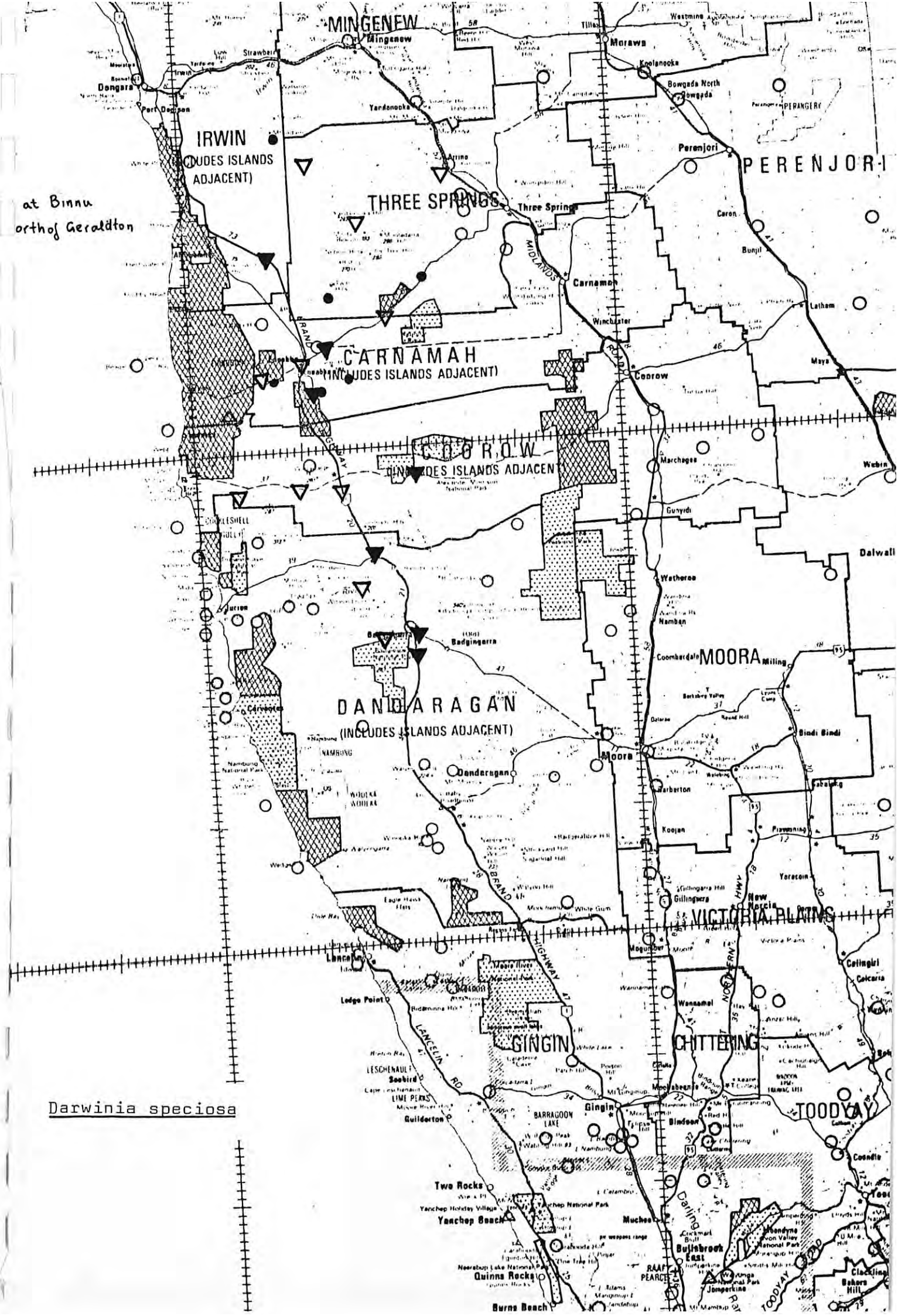
+ Benth. Fl. Austral. 3: 9

†. **D. speciosa**, Benth. in Journ. Linn. Soc. ix. 179.—A small shrub with numerous short ascending or erect branches, not above 6 in. in our specimens. Leaves all opposite, erect, narrow-oblong, obtuse, concave, 2 to 3 lines long, or rather more on the main stems. Involucres ovoid, above 1 in. long, apparently red; inner bracts ovate-oblong, entire, a few outer ones much shorter, but not squarrose. Bracteoles lanceolate, shorter than the calyx. Calyx 2 to 2½ lines long, the adnate part prominently 5-ribbed; lobes lanceolate or acuminate, often nearly half as long as the petals. Petals 1 to 1½ lines long. Staminalia small.—*Genetyllis speciosa*, Meisn. in Journ. Linn. Soc. i. 36.

**W. Australia.** Between Moore and Murchison rivers, Drummond, 6th Coll. n. 34.



at Binna  
north of Geraldton



Darwinia speciosa



Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Darwinia speciosa* (Meisn.) Benth. Family *Myrtaceae* Date Recorded 29.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	36km W of Arrino 29°21'S 115°54'E		3 10 73	3 to 7 Y	BL Powell (Rye) 73123
	Cadda Rd 12km E of Catherine Rd, opposite Badgingarra NPB	sand plain	21 9 77	Y	BL Rye 77030
	prope Binnu (28°02'S 114°40'E)		Jan 1959	Y	CA Gardner sn
	Hill River		10 J 1959	Y	CA Gardner 12161
	19m N of Eneabba 29°30'S 115°15'E	low heath grey sand	4 8 76	Bud	RJ Hnatick 760236
	Eneabba		May 865	Y	CA Gardner sn
	5km S of Badgingarra	tanberchia heath, sand + gravel	9 9 79	Y	GJ Keighery 2522
	Coorow - Green Head Rd, Cnr Willis Rd	Sand plain	27 11 77	Y	BL Rye 77036
	N of Diamond of the Desert Springs	Sand heath	16 10 46	Y	CA Gardner 8483
	27m SW of Three Springs	Sand plain	1 10 61	Y	AS George 3070
	near Arrino		1 10 26	Y	CA Gardner 1924
	Cnr Brand Hwy + Juruen Rd	coarse sandy loam	3 8 76	Y	RJ Hnatick 760101
	Eneabba - Coorow	Sand heath	24 9 62	Y	JS Beard 1922
	20m W of Three Springs		Sept 1940	Y	WE Blackall 4906
	near Hill River Springs		Oct 1935	Y	H Steedman sn
	Badgingarra West	Sandy gravel	15 12 62	Y	FL Hufitz 1925
	Eneabba		89 66	Y	G Clover sn

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Darwinia speciosa* (Meisn.) Benth.

Family *Myrtaceae*

Date Recorded 29.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	147 to 148 mp on Eneabba Rd		1 10 68	Y	AC Burns 82
	17 m E of Green Head towards Coorow	Shrub vegetation	28 8 71	Y	RY Berg 101A
	8 km S of Eneabba 29°53'S 115°16'E	low open heath, grey over yellow sand	25 10 78	Y	EAGriffin 1167
WVA	Lake Logue	Sand plain		Y	NH Speck 238/4
WVA	Dandaragan - Jurua Bay Rd	clayey sand	oct 58	Y	D Churchill
WVA	Hill River	laterite + Sand plain	22 9.51	Y	NH Speck
WVA	38 m NE of Eneabba towards Three Springs		8 10 67	Y	WALoneragan 67.097
KP	Badgingarra west	Sandy gravel	15 10 62	Y	F. Lullfitz 1925
KP	Eneabba - Coorow	Sand heaths	24 9 62	Y	JS Beard 1922

Diplolaena ferruginea P.G.Wilson

+ Nuytsia 1: 198 (1971)

**Diplolaena ferruginea** P. G. Wilson sp. nov.

Folia late elliptica ca 2 x 1 cm, supra levia, glanduloso-punctata, glabra vel glabrescentia, subtus pallida velutina. Capitula ca. 2 cm lata; bracteae ferrugineo-tomentosae, externae anguste-triangulares, ca. 12 mm longae, internae lineari-acuminatae; petala bracteis paulo breviora, linearia, tomento denso, pallido-ferrugineo.

Type: C. A. Gardner 8459, shrub 2 ft., styles crimson; eastern gullies, Mt. Lesueur, 16.x. 1946 (holo.:PERTH, iso.:K).

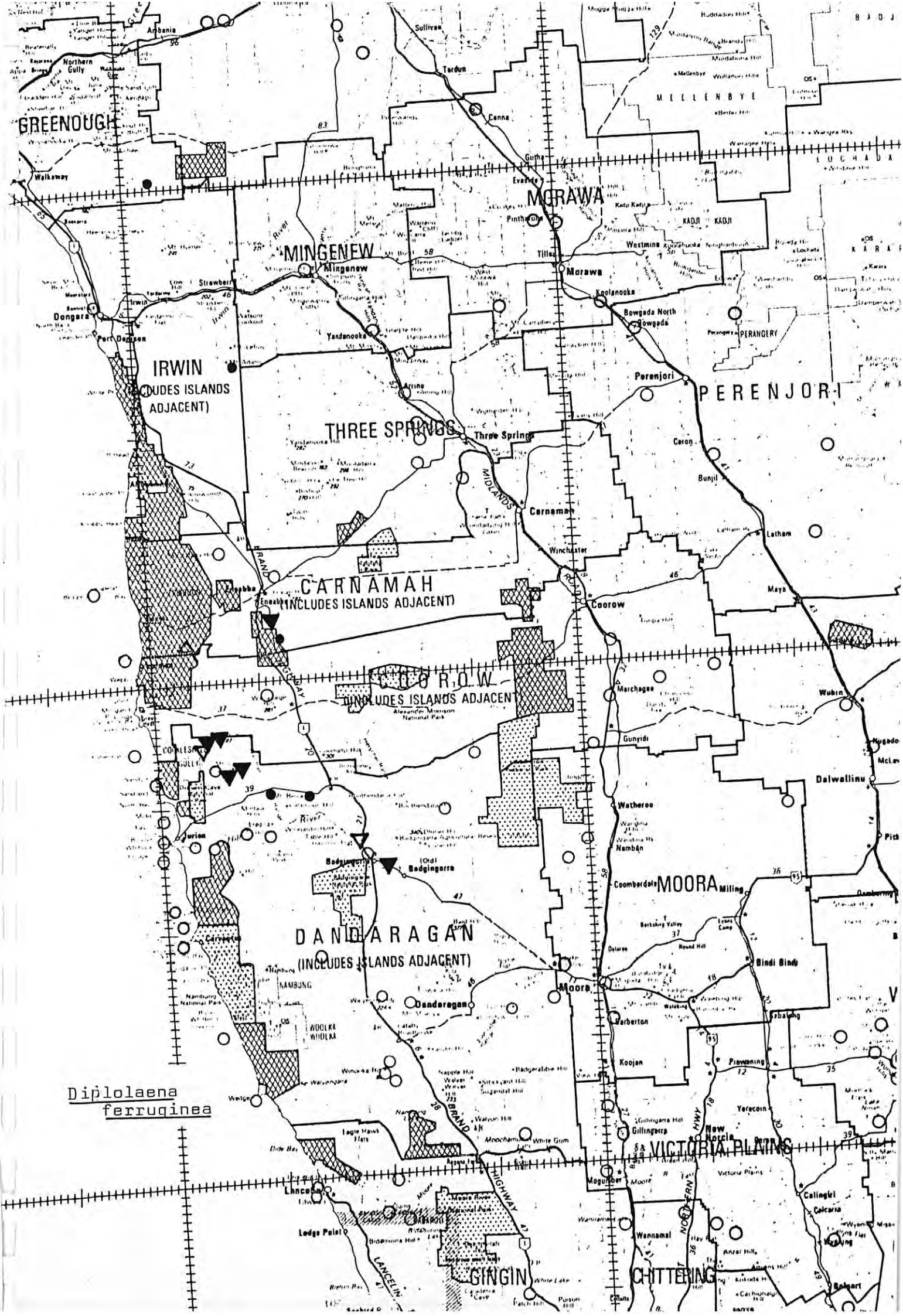
Spreading shrub to 50 cm high. Leaves broadly elliptic, ca. 2 x 1 cm; upper surface smooth, glandular-punctate, glabrous or glabrescent; lower surface cream to ferruginous velutinous. Flower heads ca. 2 cm wide; outer bracts narrow-triangular, ca. 12 mm long, ferruginous-tomentose; inner bracts linear-acuminate; petals linear, slightly shorter than outer bracts, with a dense, pale ferruginous tomentum.

*Distribution:* Western Australia, near Jurien Bay on the west coast.

Cockleshell Gully, C. A. Gardner, 8429; 15 mi NW of Badgingarra, spreading shrub to 50 cm, on laterite slope, A. S. George 6764.

In foliage this species resembles *D. dampieri* and *D. grandiflora*. It differs markedly from these in having involucre bracts which are narrowly triangular and petals which are densely ferruginous-tomentose.





*Diplolaena ferruginea*

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Dipholoena ferruginea*.....

Family *Rutaceae*.....

Date Recorded 5.5.81.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Cockleshell Gully	limestone heath, sandy soil	15 10 46	Y	C.A. Gardner 8429
	3.5 m SW of Mt Lesueur	stony sandy hill	23 7 69	Y	M.I.H. Brooker 1944
	2 m N of Cockleshell Gully	lateritic soil	Sept 66	Y	A.S. George, 7828
	Cockleshell Gully	lateritic slopes,	20 4 75	Bud	G.J. Keighery 202
	Mt Lesueur		21 8. 49	Y	C.A. Gardner 9357a
	Mt Lesueur		25 8 48	Y	C.A. Gardner 9086
	Mt Peron, NE of Jurien	lateritic boulders on slope	3 10 72	Y	S. Paust 1181
	Jurien Bay	sandy soil	3 11. 62	Y	R.D. Royce 7706
	15 m NW of Badginjarra	lateritic slope	13 8. 65	Y	A.S. George 6764
	5 km SE of Badginjarra	sand over laterite	10 9 79	Y	G.J. Keighery 2557
	Western Slope of Mt Lesueur 3011 Slat 115° 16' E	low heath, grey sand with <sup>clay</sup> laterite, 20 m below breakaway	17 6. 79	Y	E. Griffin 1882
	7.5 km SSE of Eneabba 29° 53' S lat 115° 19' E long	low woodland, grey loam in chalk bed between hills	9 7 77	Y	E. Griffin 911
Holotype	Eastern gullies of Mt Lesueur		16 10 46	Y	C.A. Gardner 8459
	8 km S of Eneabba 29° 53' S 115° 16' E	low open heath, grey sand	22 10 77	Y	R.J. Hnatiuk 773544
KP	Cockleshell Gully	sand, laterite breakaway	6 9 79	FY	G.J. Keighery 2428
	Gravel Road near Cockleshell Gully		20 9 70	FY	P. Fairall 51280



Dryandra nana Meisn.

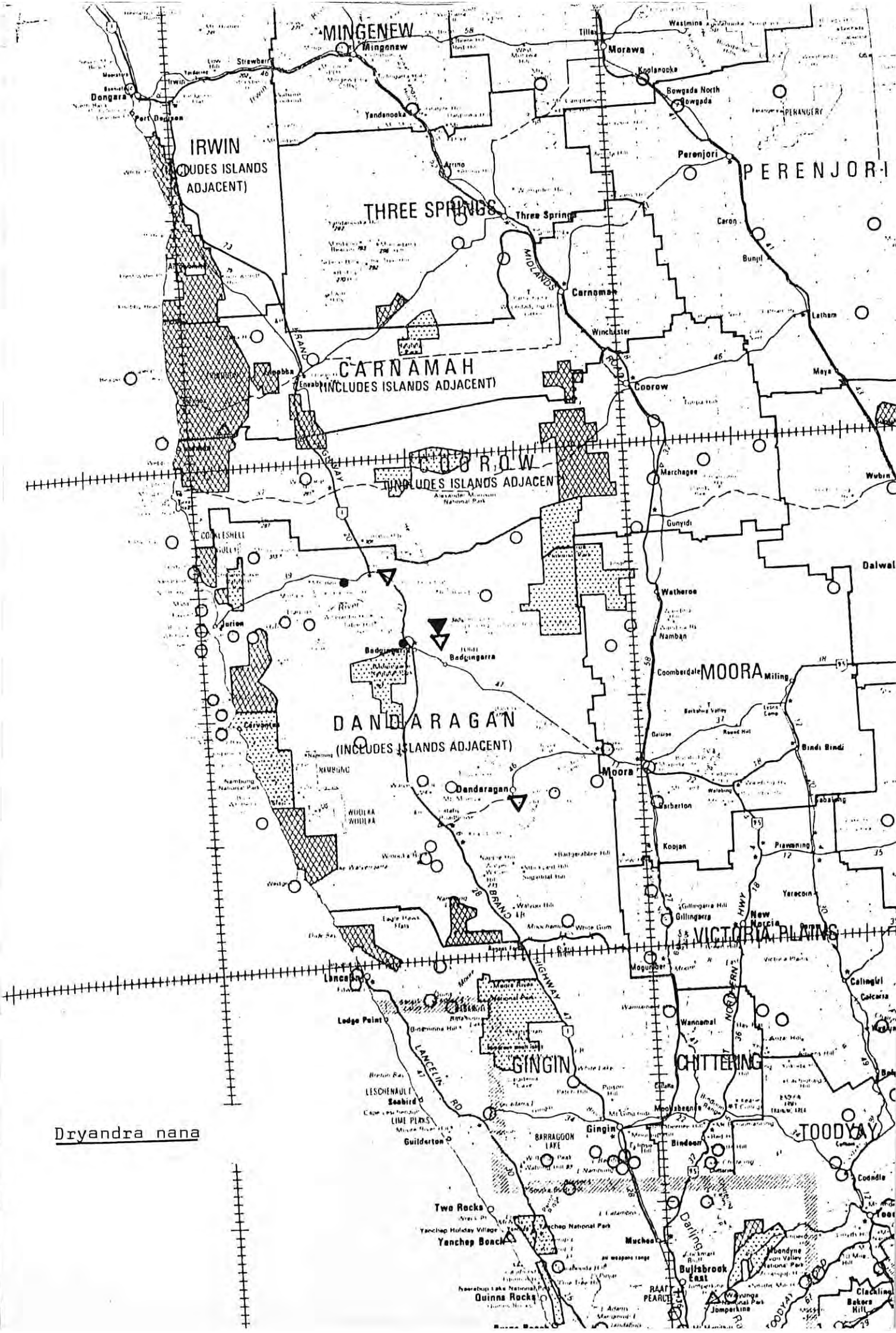
Hooker's J. Bot. Kew Gard. Misc. 7: 121 (1855)

+ Benth. Fl. Austral. 5: 571

24. **D. nana**, Meisn. in Hook. Kew Journ. vii. 121, and in DC. Prod. xiv. 475. A dwarf or creeping shrub with the habit of *D. nivea*. Leaves 2 to 4 in. long, crowded round the flower-heads on very short ascending stems, divided almost to the midrib into linear-lanceolate acute lobes, all very spreading and often falcate, 2 to 3 lines long, the margins not revolute, scarcely white underneath, with prominent primary veins. Involucre closely sessile within the leaves, ovoid, under  $\frac{1}{2}$  in. long, the bracts narrow-lanceolate, silky-villous, the outer ones with subulate points, the inner ones acute. Perianths with the entire base about  $\frac{1}{2}$  in. long villous towards the end, the divided portion of the tube about as long, the limb ovoid, reflexed before opening, slightly hairy. Style hairy, very long, doubled down to the limb until released, and then straightening to a length of about 3 in., with a large thick ovoid stigmatic end.

**W. Australia.** Near Dundagaran, Drummond, 6th coll. n. 210. With the habit of the *Ninea*, this species has a somewhat different foliage, and differs from the whole genus in the remarkable style.





Dryandra nana

ATL OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Dryandra nana* Meisn. Family Proteaceae Date Recorded 4.5.78

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	132 m peg Brand Hwy E of Rd	gravel patch	4.10.71	Y	A.C. Burns 149
	Top to Eneabba from Geraldton Hwy at 156 mi post + 24.6 m. west of Hwy		16.10.66	Y	F. Lullfitz C.5640
	Mesa S of Hill River	Lateritic	24. Aug 38	N	C.A. Gardner 9066
	S of Dairdaragan	lateritic rises on heaths	June 43	N	C.A. Gardner sn.
	Dairdaragan		Sept 63	Y	C.A. Gardner
	Badginjarra Res Station		3.3.61	N	C.N. Malcolm
	N of Badginjarra	lateritic soil, low scrub	13.8.65	Y	A.S. George 6718
	Badginjarra Res Station		3.11.62	Y	R.D. Royce 7696
Isotype	Dairdaragan				J. Drummond VI 240

Dryandra sclerophylla Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 123 (1855)  
+ Benth. Fl Austral. 5: 576

26. **D. sclerophylla**, Meisn. in Hook. Kew Journ. vii. 123, and in DC. Prod. xiv. 474. Apparently a low but erect shrub, not much branched. Leaves under 3 in. long, pinnate; segments numerous, triangular, acute, rarely 2 lines long, rigid, with revolute margins shortly decurrent to the next segments. Flower-heads not numerous, axillary or sometimes terminal, closely surrounded by numerous floral leaves of 2 or 3 in. Involucre 7 to 8 lines long, the bracts lanceolate, tapering into plumose points. Perianth about  $\frac{3}{4}$  in. long, silky-villous, the oblong obtuse limb becoming almost glabrous. Style rather longer than the perianth, with a slightly thickened stigmatic end.

**W. Australia.** Between Moore and Murchison rivers, Drummond, 6th coll. n. 209. The species is very nearly allied to *D. pulchella*.





Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Dryandra sclerophylla* Meisn. Family *Proteaceae* ..... Date Recorded 4.5.81 .....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	3m Sof Coorow Green Head Rd on Cockleshell Gully Rd	scrub on lateritic hilltop	18 2 70	? old Y	AS George 9827
	Mt Lesueur 30°11'S lat 115°02'E	low open heath, shallow grey sand over laterite	17 7 79	? old Y	E A Griffin, 1930
	Hill River septentrionalis versus ?		Sept 63	Y	C. Chapman
	in glareosis in coll. bus prope Enanba		Sept 63	Y	C A Gardner 8467
	Hill 1 km N of Mt Lesueur	low open heath, grey sand over laterite	29 8 79	Bud	E A Griffin 2030
	3m N of Regans Ford		4.11.64	Y	F. Lullfitz 263784
Isotype	Between Moore + Murchison				J Drummond 209
	K.P. NE edge of Badgingarra NP.	heath on laterite	9. 9. 79	Y	C. J. Keighery 2527

Dryandra subulata C.A.Gardner

+ J. Roy. Soc. W. Austral. 47: 59 (1964)

see also Erickson et al, p.101

**Dryandra subulata, C. A. Gardn. sp nov.**

§*Acrodontae* D.C.

Fruticulus humilis 30-35 cm. altus, ramis stricte ascendentibus, juvenilibus tomentosis vetulis glabratis; folia erecta, anguste-lineariter, plerumque 25-30 cm. longa, 1.5-2 mm. lata, integra, margine crasso arcte revoluta, in petiolum breviter attenuata (ipso basin subdilatatum) longiuscule mucronato-spinescentia juvenilia sparse, sericeo-puberula, adulta cernum glabra, subtus bisulcata, sericeo-tomentosa.

Capitula subsessilis, ramos et praecipue ramulos laterales copioso terminantia, expansa usque 2.5 cm., foliis numerosis capitula multo superantibus obvallata; involucri late turbinati; bracteae numerosissimae, exteriores lineari subulatae, usque 5-6 cm. longae, basi dilatatae, vicidae, interiores breviorae, omnes rectis et apicibus subulatae.

Perianthium ca. 2 cm. longum, basin brevem glabrum, sursum tomentoso-villosum, limbum glabrum, tubum sursum attenuatum et glabrum; stylus rectus glaber, perianthium non excedens; cylindrico-stigmatico atro-fusco, leviter sulcato.

Hab. in distr. Irwin prope flumen Hill, in fruticetis apertis in arenoso-glareosis, fl. m. Septem. Gardner 12175 (TYPUS) etiam locis eisdem, A. J. Gray.

This species differs from the others of this Section in habit, in the exceptionally long entire linear leaves none of which closely surround the flower-heads, the heads being surrounded by external subulate bracts which are almost three times longer than the involucre proper.







Dryandra tortifolia Kipp. ex Meissn.

Hooker's J. Bot. Kew Gard. Misc. 7: 124 (1855)

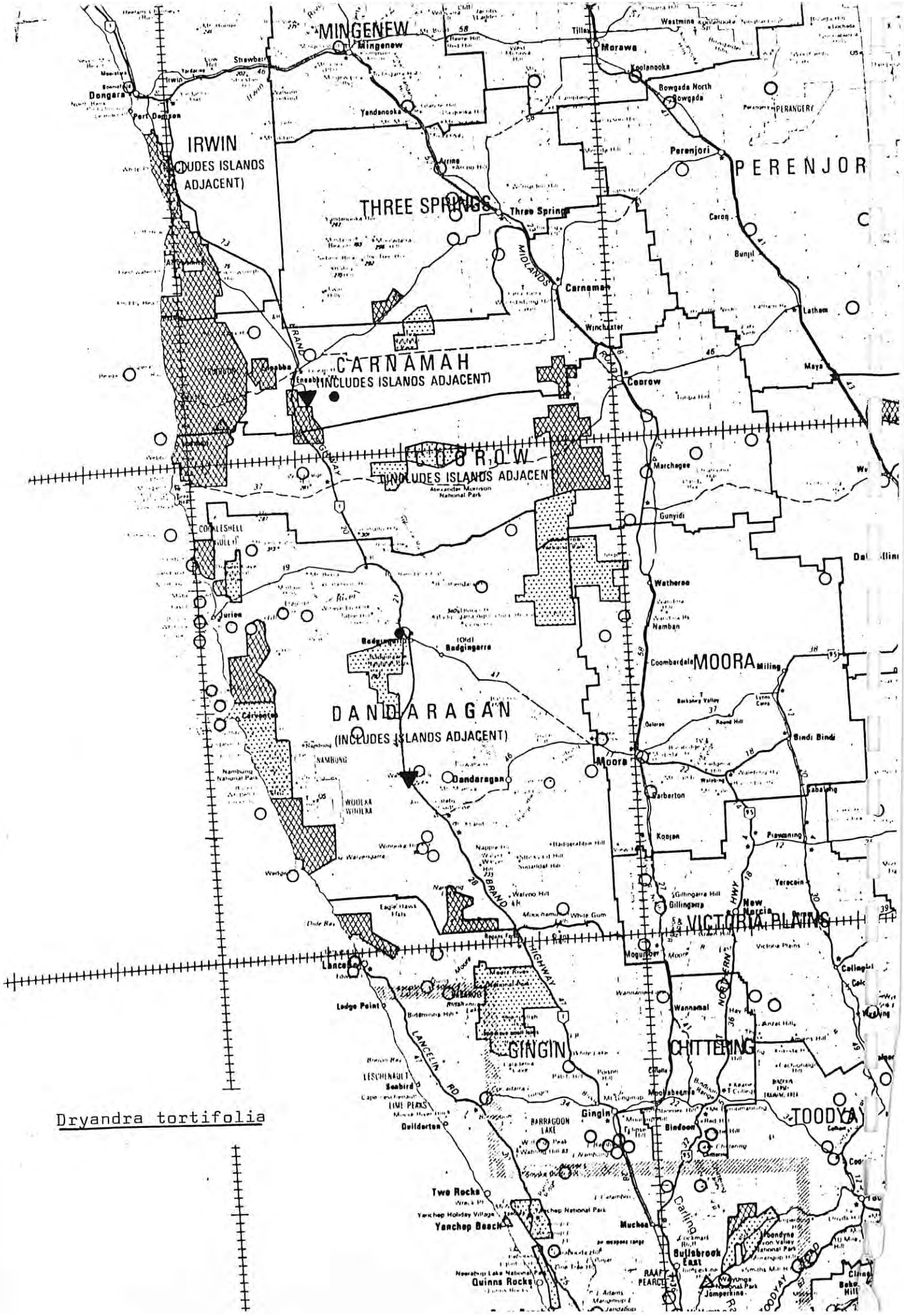
† Benth. Fl. Austral. 5: 574

as variety of D. arctotidis R.Br.

23. **D. arctotidis**, R. Br. Prot. Nov. 39. A dwarf shrub with the habit of *D. nivea*. Leaves much more rigid, 4 to 8 in. long, deeply divided into numerous linear-falcate rigid acute lobes, 2 to 4 lines long, separated by broad sinuses, with revolute margins, white underneath. Flower-heads rather large, terminal, surrounded by numerous long floral leaves ciliate at the base with long spreading hairs. Involucre ovoid, above 1 in. long, the bracts numerous, oblong-lanceolate or the inner ones almost linear, nearly glabrous except the densely ciliate margins. Perianths  $1\frac{1}{4}$  in. long, the undivided glabrous base longer than in most species, the remainder loosely villous. Style nearly 2 in. long, with a small narrow dark-coloured stigmatic end.—Meissn in Pl. Preiss. i. 595, and in DC. Prod. xiv. 475; Bot. Mag. t. 4035.

**W. Australia.** King George's Sound or neighbouring districts, Baxter, Drummond, 5th coll. n. 418; Mount Manypeak, Preiss, n. 515.

**Var. tortifolia.** Leaf-lobes narrower and more rigid, not so white underneath.—*D. tortifolia*, Kipp. in Hook. Kew Journ. vii. 121; Meissn. in DC. Prod. xiv. 475.—Between Moore and Murchison rivers, Drummond, 6th coll. n. 211. A specimen of Drummond's 3rd coll. suppl. n. 101, is intermediate as it were between this and the typical form as to foliage, but is not in flower.



Dryandra tortifolia



Dryandra tridentata Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 120 (1855)

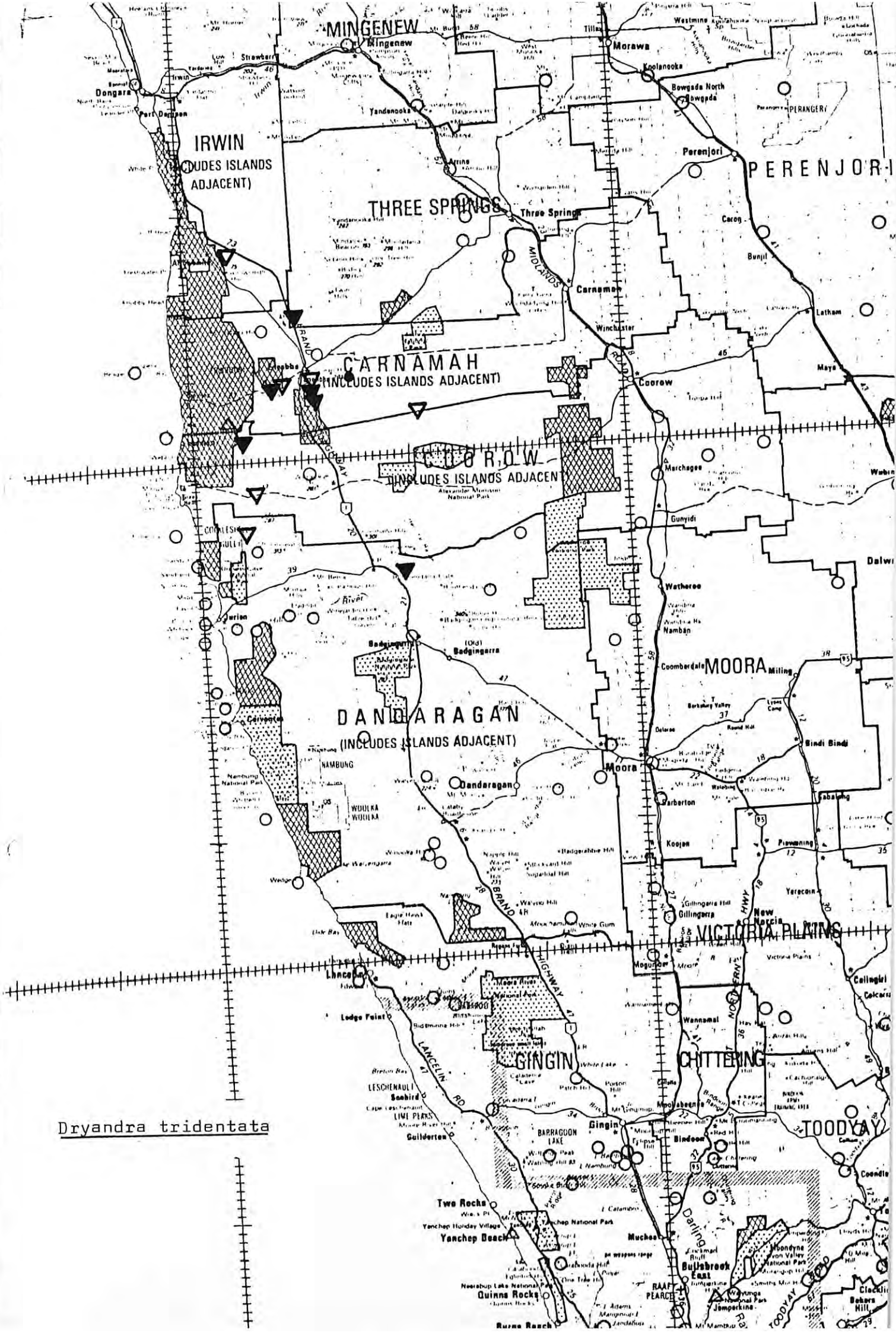
+ Benth. Fl. Austral. 5: 580

see also Erickson et al p.100

40. **D. tridentata**, Meisn. in Hook. Kew Journ. vii. 120, and in DC. Prod. xiv. 479. Stems 6 in. to 1 ft. high from an underground creeping trunk. Leaves linear or linear-cuneate, mostly 3-toothed at the end, tapering into a very short petiole, 1 to  $1\frac{1}{2}$  in. long, flat, prominently reticulate underneath. Flower-heads large, on very short peduncles from below the foliage, leafless except a few narrow scales passing into the outer involucre bracts. Involucres broad, hemispherical, a few of the outer bracts leaf-like and longer than the flowers but mostly entire and dilated at the base, passing into ovate-lanceolate bracts with long narrow points and these again into the inner linear-lanceolate ones, the paleae within the flowers few and very narrow. Perianths about 1 in. long, loosely villous, the limb narrow and acute. Style much longer, rarely quite straight, the slightly furrowed stigmatic end scarcely distinct. Capsule above  $\frac{1}{2}$  in. broad.

**W. Australia.** Near Dundagaran, Drummond, 6th coll. n. 207.





*Dryandra tridentata*

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Dryandra tridentata* Meisn. Family Proteaceae Date Recorded 4.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Eneabba		27.9.71	Y	AC Burns 141
	South Arrowsmith River, S of Dongara		10.9.67	N	AC Burns 64
	Cockleshell Gully		8.10.71	Y	AC Burns 154
	Green Head orientalem versus		24.9.62	Y old	W E Blackall 3578
	5 km S of Eneabba 29°52'S 115°16'E	grey sand, low open heath	27.4.77	Y (old)	J.S. Beard 1911
	2 m E on Marchagee Track (off Brand Hwy)	light grey sand	9.10.78	N	RJ Hnatiuk 770024
	10 km S of Eneabba on Brand Hwy	grey sand low open heath	3.8.76	Y	RJ Cranfield 854
	29°52'S 115°15'				RJ Anatiuk 760160
	2 km E of Lindoon 29°52'S lat 115°12'E		14.9.77	Y	RJ Hnatiuk 771033
	15 m N of Eneabba, S. Arrowsmith R		7.9.69	Y	AC Burns 129
	30 m W of Coorow		28.9.62	Y	F. Lullfitz
	Hill River		15.1.31	Y	CA Gardner
	45 m SW of Three Springs	sand plain	30.8.65	Y	K. Newbey 2280
	East of Green Head		24.9.62	Y	J.S. Beard 1911
	15 km S of Eneabba 29°56'S 115°16'E	grey sand low open heath	2.11.78	Fruit	E.A. Griff. in 1443
	Eneabba - Badgingarra Rd		21.9.66	Y	S. Chambers 161
	Cockleshell Gully		25.8.38	Y	W E Blackall 3578



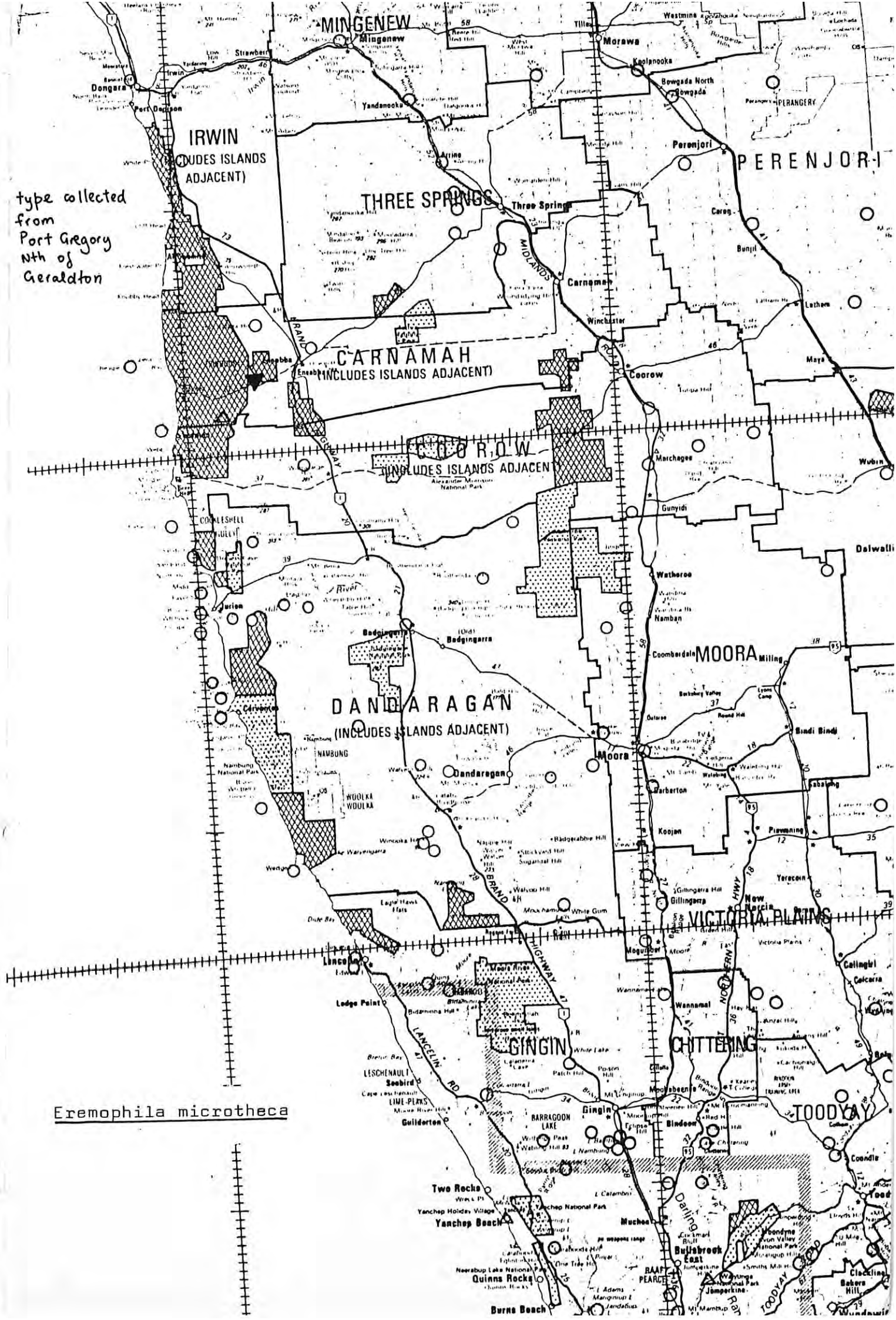
Eremophila microtheca (F. Muell. ex Benth.) F. Muell.  
Syst. Census. Austral. Pl. 104 (1882)  
+ Benth. Fl. Austral. 5: 14  
as Pholidia microtheca F. Muell. ex Benth.

13. ***P. microtheca***, *F. Muell.* An erect almost heath-like shrub, the branches and young leaves hoary with a very short minutely plumose, almost farinaceous pubescence, the older foliage glabrous or nearly so. Leaves rather crowded, linear, somewhat obtuse, slightly contracted at the base, 2 to 4 lines long. Flowers "lilac," on very short axillary pedicels. Calyx-segments plumose-pubescent, about 2 lines long. Corolla like that of *P. Woollsiana*, but rather smaller. Ovary rugose, 2-celled, with 2 ovules in each cell. Fruit rugose like that of *E. Woollsiana*, but smaller and not compressed, the only one seen was, however, not quite perfect.—*Eremophila Woollsiana* var. *angustifolia*, F. Muell. *Fragm.* ii. 160; *E. microtheca*, F. Muell. *Herb.*

**W. Australia.** Port Gregory, Murchison river, *Oldfield*.



type collected  
from  
Port Gregory  
Nth of  
Geraldton



Eremophila microtheca



# The Botanic Garden of Adelaide

Incorporating The State Herbarium

Postal Address: North Terrace, Adelaide, S.A. 5000

RJC:BAW  
H192/1981

Telephone 223 310  
223 303  
223 348  
223 398  
223 359  
223 320

17th March, 1981

Mrs M. Blackwell,  
29 Ord Street,  
WEST PERTH, 6005.

Sturt's Desert Pea  
(*Clianthus formosus*)  
State Floral Emblem

Dear Marion,

It was nice to talk to you yesterday and to hear of your work in the Encabba area. I have extracted what information I have on Eremophila microtheca and provide a map to the plant that I located at Lake Logue. I also enclose a small sample of live material. You will have noticed when you opened this letter the somewhat strong slightly pungent smell. This is a characteristic of E. microtheca and on a good day when downwind you will find the species before you see it. You are likely to find E. microtheca within the sand heath systems in depression areas where clay soils have accumulated such as the Lake Logue - Lake Indoon area.

I am interested in any eremophilas from the areas north of Perth as collections from these areas are few. Eremophila glabra is of particular interest. Myoporums are also of interest as I am trying to sort these out too.

Best of luck with your survey. I hope that future mining activities are controlled adequately within the area and the area is not over exploited.

Yours sincerely,



R.J. Chinnock,  
Botanist,

for Director.

Encls





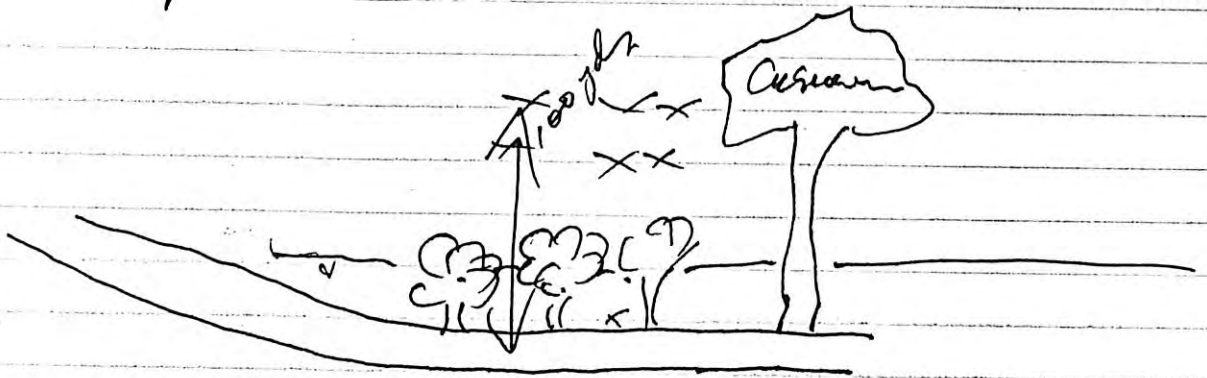
Localities of E. microtheca

1. Western side of Lake Logue. Growing on sandy-clay loam. Eucalyptus over Melaleuca. Chinnock/1979.
2. Eastern side of Lake Logue - sandy silt. C.A. Gardner/1948.
3. Approximately 2 km W of Lake Indoon on the south side of the Eneabba/Leahman road - two plants in clay pan depression. Monks/1978.

17th March, 1981



Exactly 2.1 Km W of Lake Indson turnoff  
Drop dam hill



Melaleuca



Eriostemon pinoides P.G.Wilson

+ Nuytsia 1: 54-55 (1970)

27. *Eriostemon pinoides* P. G. Wilson, sp. nov.

[Pinus, the pine, oides = like]

Fruticulus: ramuli cum sulcis puberulis inter sulcos verrucosi et glabri. Folia acicularia, ca. 1 cm longa, leviter torta, levia, glabra, subtus  $\pm$  rotundata vel triangularia, supra canaliculata. Flores 1-3, terminales; pedicellus 4-7 mm longus, basi minute bracteolata; sepala imbricata, late obtuso-deltaeidea, usque ad 1.5 mm longa, carnosa, glabra; petala obovata ca. 6.5 mm longa atro-rubra, glabra; filamenta petalina dimidio inferiore ovato, superiore tereti, ca. 3.3 mm longa; filamenta sepalina dimidio inferiore applanato, dimidio superiore crassiusculo, cum duobus cavis lateralibus profundis, ca. 4.5 mm longa; anthera late oblonga, ca. 1 mm longa, minute apiculata.

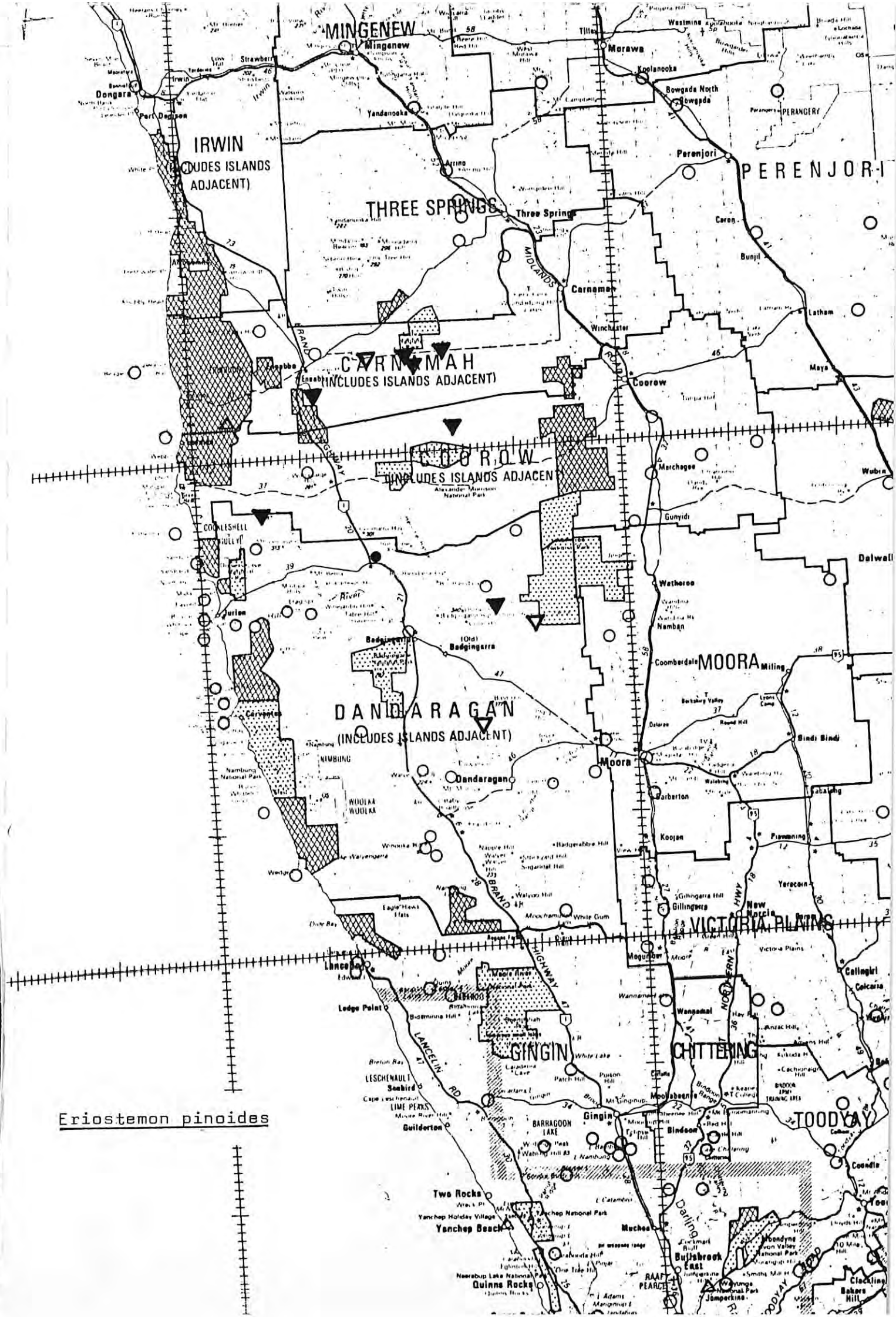
Holotypus: C. A. Gardner 9408, Summit of Mt. Peron, Western Australia, 26.viii.1949 (PERTH).

Small undershrub 0.3-0.6 m high. Branchlets minutely glandular verrucose in strongly demarcated glabrous leaf decurrencies, puberulous in the intermediate sunken strips. Leaves shortly petiolate; lamina acicular, somewhat pungent, ca. 1 cm long, slightly twisted, smooth, glabrous,  $\pm$  rounded to triangular below, canaliculate above. Flowers 1-3, terminal; pedicel 4-7 mm long, glabrous. Sepals broadly and obtusely deltoid, to 1.5 mm long, fleshy, glabrous; petals imbricate, obovate, ca. 6 mm long, dark red; staminal filaments dissimilar, the antipetalous ovate below and  $\pm$  terete above, ca. 3.3 mm long, sparsely pilosulose and abruptly apiculate, the antisepalous flattened below, becoming thicker above with two deep lateral concavities and a ventral medial ridge, ca. 4.5 mm long, pilose above; antipetalous anthers broadly oblong, ca. 1 mm long, antisepalous deltoid, pollen pale yellow; disc very thin and confluent with ovary; ovary bluntly pyramidal ca. 2 mm high, carpels rugulose on back, narrowed into a smooth, sterile apex; style slender, glabrous  $\pm$  equal to stamens; stigma small, no wider than style. Fruit and seed not seen.

DISTRIBUTION: Western Australia; west coast, between Coorow and the Hill River—Map 6.

WESTERN AUSTRALIA: 21 mi W of Winchester on Eneabba road, A. C. Beaglehole 12121 (Beaglehole herb.); Lateritic hill South of Hill River, C. A. Gardner 7058 (PERTH); 25 mi SW of Three Springs gravel K Newbey 7773 (PERTH)

This species is unique in the genus *Eriostemon* both in the form of the staminal filament and in the colour of the petals. Its relationship to *P. pungens* and *P. fitzgeraldii* is suggested by the stem and leaf morphology and by the staminal characters. Unfortunately the seed, which might help more in this regard, is unknown.



Errostemon pinoides

A. LAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon Eriostemon pinnatis... Family Rutaceae Date Recorded 85 Feb

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	SW of Watheroo NP	Sand, scrub	1. 11 76	Y	EW. Hwer W1833
	Tathra NP 29°48'S 115°30'E	sand over laterite, low open heath	7 9 79	Y	EAGriffin 290
	7 km S of Eneabba 29°53'S 115°16'E	sand, low open heath	4 8 77	Y	EAGriffin 981
	Hill River	lateritic hill	24 8 48	Y	CAGardner 9058
	10 m E of Eneabba	sand over laterite, low scrub	3 9 66	Y	ASGeorge 7843c
	5 m E of Dinner Hill, near Watheroo	gravelly sand,	20 9 55	Y	RD Royce 5143
	Reserve 2806, N of Alexander Morrison NP	sand over laterite,			
	29°58'S 115°34'E	low open heath with <u>Euc</u>	22 11 78	Fruit	EAGriffin 1769
		<u>Drummondii</u>			
	21 m W of Winchester on rd to Eneabba		24 8 65	Y	AC Beaughlehole R121
	25 m SW of Three Springs		30 8 65	Y	K Newbey 2273
	21 m W of Winchester		3 1 71	Fruit	C Chapman Sn.
	Watheroo NP, SE boundary	Sandy soil	6 10 71	Y	RD Royce 9634
	between Dandaragan and Badgingarra	sand heath	Aug 67	Y	A Simper 1
	Summit of Mt Peron		26 8 49	Y	CAGardner 9408
iWA					
Holotype					



Eucalyptus johnsoniana Brooker & Blaxell

+ Nuytsia 2: 222-224 (1978)

**Eucalyptus johnsoniana** Brooker *et* Blaxell, sp. nov. (Figs 2, 6). Pryor and Johnson code MADEJ.

*Frutex* 'mallee' ad 2 m altus.

*Folia juvenilia* petiolata, opposita, ovata, 3-7 x 1-3 cm. *Folia adulta* petiolata, non-opposita, lanceolata, 5-12 x 1-1.5 cm.

*Inflorescentiae* axillares, 7-florae. *Pedunculus* c. 1 cm longus, complanatus vel teretus. *Alabastra* c. 10 x 5 mm. *Hypanthium* campanulatum. *Operculum* hemisphaericum interdum umbone parvo. *Pedicellus* c. 5 mm longus. *Antherae* dorsifixae oblongae. *Loculi* 3-4. *Ovula* 2-seriata.

*Fructus* pedicellati, hemisphaerici vel globosi, c. 1 x 1 cm. *Discus* verticaliter depressus. *Valvae* deltoideae, interdum leviter protrusae. *Semina* pyramidalia, alis prominentibus.

*Type*: 6 km south of Coorow-Green Head intersection on Highway 1, south of Dongara, Western Australia (30° 06' S, 115° 24' E) 7 Oct. 1975, D. F. Blaxell W75/89 (holo: NSW; iso: K, FRI, PERTH).

A mallee to 2 m high, forming dense and broad clumps up to several metres across. Bark slightly rough, grey-brown, peeling in strips from the stems.

*Cotyledons* orbicular to reniform, 8 x 6 mm. *Juvenile leaves* petiolate, opposite for c. 9 pairs, ovate, 3-7 x 1-3 cm. *Adult leaves* petiolate, not opposite, lanceolate, 5-12 x 1-1.5 cm, yellow-green, concolorous, with the midrib and leaf edges pale yellow-green. *Glands* obscure in dried material.

*Inflorescences* axillary, 7-flowered. *Peduncle* c. 1 cm long, terete or slightly flattened. *Mature buds* c. 10 x 5 mm, hypanthium campanulate, operculum hemispherical and sometimes with a small umbo, pedicel c. 5 mm long. *Stamens* inflexed in bud. *Anthers* dorsifixed, oblong. *Style* short. *Locules* 3-4. *Ovules* in 2 vertical rows.

*Fruit* pedicellate, hemispherical to globose, c. 1 x 1 cm. *Disc* verticaliter depressus inside the orifice. *Valves* deltoid, the tips occasionally protruding from the orifice.

*Seed* pyramidal, with conspicuous wings, brown, smooth on dorsal side, ribbed on ventral side. *Chaff* cuboid, yellow and brown.

*Distribution*: Western Australia: south of Eneabba, east of Jurien Bay.

*Other Collections*: 11.8 km south of the Coorow-Green Head road intersection with Highway 1, at the turn-off to Lara Downs (30° 09' S, 115° 26' E) 7 Oct. 1975, D. F. Blaxell W75/89 (NSW) and M. J. H. Brooker 5002 (FRI, PERTH, NSW, AD, K); *Type locality*, M. J. H. Brooker 5003 (FRI, PERTH, AD, MEL).

Only three small populations of this species are known to us, all along a 10 km stretch of Highway 1 south of Eneabba, and within a few metres of the road. The soil is white sand over laterite with little relief to the topography. The vegetation is closed-heath with isolated patches of *E. johnsoniana* and mallee forms of *E. tottiana* barely emergent amongst dense sclerophyllous shrubbery.

The affinities of this species are not clear, but we here tentatively erect a monotypic sub-series (Johnsonianinae) to be placed between Buprestinae and Marginatinae of the Pryor and Johnson classification (a re-coding of the five series, Preissianae to Acmenoideae, is required to accommodate the dozen or so new taxa of *Monocalyptus* which have been discovered in recent years).

The species is named after Dr. Lawrie Johnson, Director of the Royal Botanic Gardens, Sydney, who has contributed so much over the years to the knowledge of the genus, in particular his enlightening publications of recent years on classification and morphology.

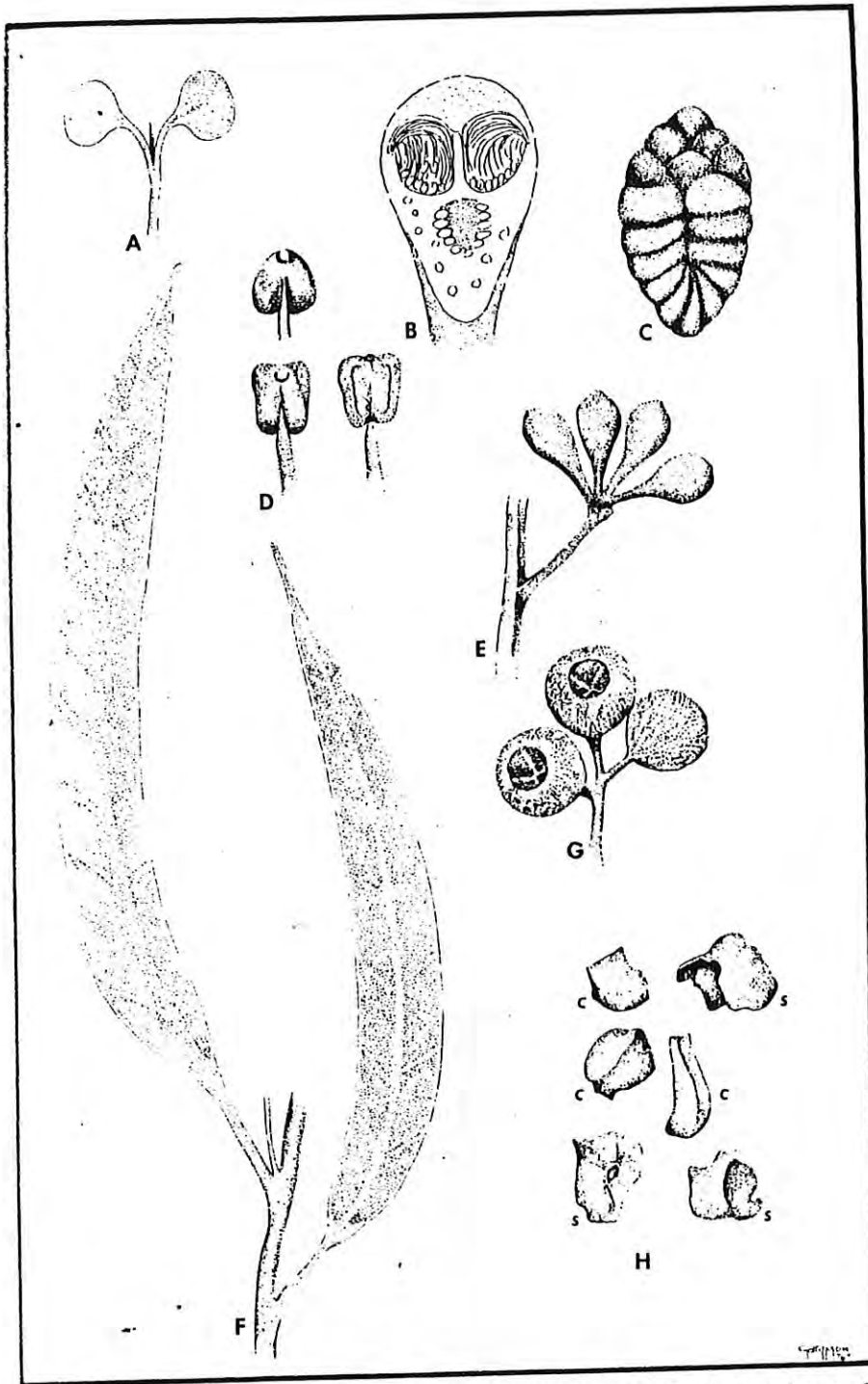
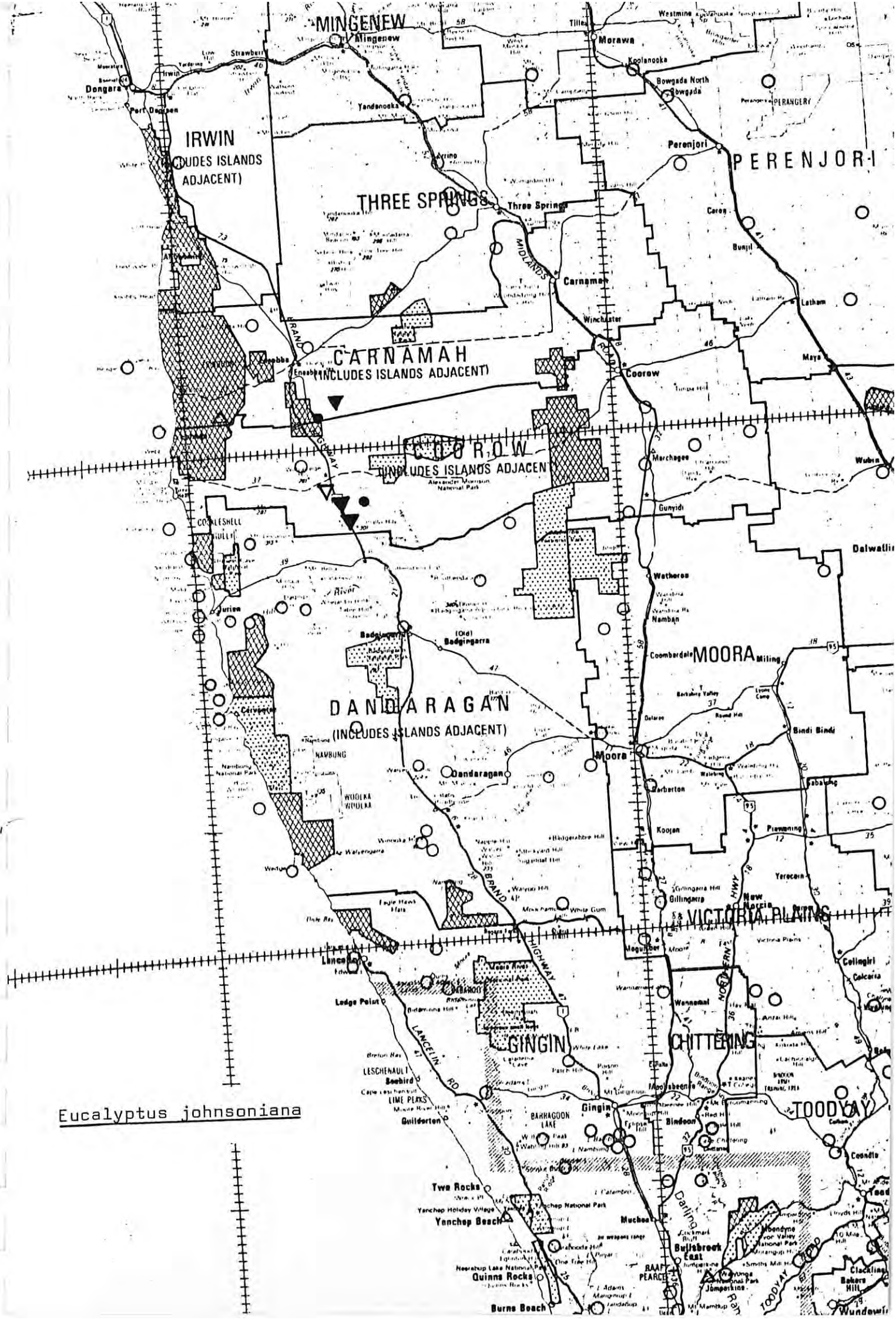


Figure 2—*Eucalyptus johnsoniana* sp. nov. A—Cotyledons, x 1. B—Bud section, x 6. C—Ovules, x 25. D—Anthers, x 25. E—Buds, x 1.5. F—Adult leaves, x 1.5. G—Fruit, x 1.5. H—Seed (s) and chaff (c), x 3.  
From MIHB 5002 except for fruit and seed (MIHB 5033) and seedling grown from MIHB 5033.

see also Lievense (1981)  
Blackwell & Griffin (1981)  
Rye & Hopper (1981)

The specimens from Mt Lesueur mentioned by Lievense are an undescribed entity different from *E. johnsoniana* (M.I.H. Brooker pers comm, 1979). See *E. sp* (EAG 2575) in Appendix 2 for this entity.



Eucalyptus johnsoniana





Eucalyptus pendens Brooker

+ *Nuytsia* 1: 243-245 (1972)

***Eucalyptus pendens* M. I. H. Brooker sp. nov. (Figures 1 A, B, 2)**

*Eucalypto sepulcrali* F. Muell. affinis a qua alabastris minus elongatis et fructibus minoribus non-urceolatis differt.

*Frutex* "mallee" 2-5 m altus ramificatione laxa demum pendente. *Ramuli* juvenes quadrangulares cortice laevi atro-rubra nitenti glauca. *Ramuli* maturi et caules cortice laevi cinereo-erubescenti. Glandulae oleorae in cortice et in medulla nullae. Lignotuberum formans.

*Cotyledones* reniformes 1.4-3.0 x 1.1-1.5 cm, triplinerves, supra virides, infra purpureae.

*Folia* plantulae sessilia, decussata, elliptica vel ovato-oblonga undulatescentia, 2-5 x 1-4 cm. Axis plantulae laevis. *Folia intermedia* breviter petiolata, decussata, late-elliptica, valde undulata, usque ad 16 x 8 cm. *Folia matura* petiolata, in gemma decussata, demum ab intranodiis separata, lanceolata, 6-12 x 1-2 cm costa in pagina una vel utrinque impressa, dense reticulata, sine glandulis oleosis manifestis, viridia, concoloria. Petioli complanati, 2-3 cm longi.

*Inflorescentiae* axillares, 7-11(13)-florae. Pedunculi erecti, validi, in sectione transversali ovales vel complanati ad apices latiores, 1.5-4.0 cm longi. *Involucrum* 6-bracteatum, bracteis 5-6 mm longis pro longitudine maxima connatis, demum deciduis. Inflorescentiae bracteatae in axillis foliorum dum inflorescentiae maturae expansis in ramulis veteribus defoliatis praesentes. *Alabastra* clavata sine cicatricibus abscissis, 9-11 x 6-8 mm, in pedicellos complanatos vel quadrangulares 3-8 mm longos angustata. *Operculum* hemisphaericum interdum umbonatum, vel conicum, verrucosum interdum radiatum 2-3-costatum, hypanthium aequans vel brevius. *Stamina* omnia fertilia. Filamenta alba, in alabaistro radiale inflexa, eglandulosa, acuminata. *Antherae* dorsifixae versatiles, reniformi-orbitulares, ab rimis obliquis, ovalibus, non-confluentibus dehiscentes. Glans terminalis. *Stylus* glandulosus, interdum ad apicem flexus. *Ovarium* 4-5-loculare, in hypanthio profunde impressum. *Ovula* verticaliter 2-seriata.

*Fructus* ovoideus vel cylindricus, truncatus, 1.3-2.0 x 1.2-2.0 cm, rugosus vel parum costatus. Discus obliquus ad verticalis. Valvae 4-5, profunde inclusae.

*Semina* 4-5 x 3-4 mm, latere dorsali rotundata, ventrali cum porcis aliquot ad hilum adscendentibus, nigra. *Ovulodia* angularia, quam semina minora, rufa.

*Type*: At 125 mile peg north of Perth on highway between Gingin and Badgingarra, Western Australia (30 14'S, 115 28'E), 23 July 1969, M. I. H. Brooker 1949. (holo: PERTH; iso: PERTH, FRI, K).

Allied to *E. sepulcralis* F. Muell. but differing in the less elongate buds and in the fruit which are smaller and not urceolate.

A *mallee* 2-5 m tall with a light, finally drooping canopy. New *branchlets* quadrangular, bark smooth, dark red, shining, glaucous. Older branchlets and main stems with pinkish-grey smooth bark. Oil glands absent in both bark and pith. Capable of forming lignotubers.

*Cotyledons* reniform, 1.4-3.0 x 1.1-1.5 cm, triplinerved, green above, purple beneath.

*Seedling leaves* sessile, decussate, elliptical or ovate-oblong, becoming undulate, 2.5 x 1.4 cm. Seedling axis smooth. *Intermediate leaves* shortly

petiolate, decussate, broadly elliptical, markedly undulate, up to 16 x 8 cm. *Adult leaves* petiolate, decussate in bud, finally separated on the axis by intranodes, lanceolate, 6-12 x 1-2 cm the midrib impressed on one or both sides densely reticulate, without apparent oil glands, green, concolorous. Petioles flat, 2-3 cm long.

*Inflorescences* axillary, of 7-11 (13) buds. Peduncles erect, stout, oval or flattened in transverse section, widening at the tip 1.5-4.0 cm long. *Involucre* of six bracts, 5-6 mm long, fused for most of their length, finally deciduous. Bracteate inflorescences occurring in leaf axils while mature expanded inflorescences occur on older branchlets from which the leaves have fallen. *Unopened buds* clavate, without an abscission scar. 9-11 x 6-8 mm tapering into the pedi-

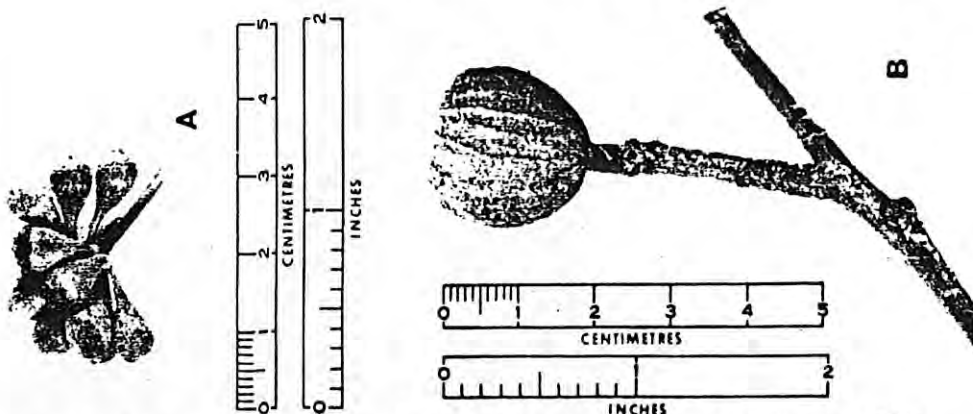


Figure 1—A, B—*Eucalyptus pendens* sp. nov. A—Buds (Brooker 1853). B—Fruit (Brooker 1949).

cels which may be rounded or quadrangular, 3-8 mm long. *Operculum* hemispherical and sometimes umbonate, or conical, verrucose and sometimes with 2-3 radial ribs, equal to or shorter than the hypanthium. *Stamens* all fertile. Filaments white and inflexed radially in the bud, non-glandular, acuminate. *Anthers* dorsifixed versatile, reniform-orbicular, opening by oblique, oval, nonconfluent slits. Gland terminal. *Style* glandular, sometimes bent at the top. *Ovary* 4-5 locular, deeply sunk in the hypanthium. *Ovules* in two vertical rows.

*Fruit* ovoid or cylindrical, truncate, 1.3-2.0 x 1.2-2.0 cm, wrinkled or shallowly ribbed. Disc oblique to vertical. Valves 4-5, deeply enclosed.

*Seed* 4-5 x 3-4 mm, dorsal side rounded, ventral side with several ridges ascending to the hilum, black. *Chaff* angular, smaller than seed, red-brown.

*Distribution*: Western Australia, near west coast in the region of the Hill River 120 to 150 miles north of Perth (Figure 2).

*Other collections*: 119.6 miles N of Perth on Gingin-Badgingarra highway (30°18'S, 115°30'E), 14 May 1969, A. S. George 9312, 9314, 9315 (PERTH); 120 miles on same highway (30°18'S, 115°30'E), 6 June 1969, Brooker 1850, 1852 (PERTH); 127.5 miles on same highway (30°12'S, 115°27'E), 6 June 1969, Brooker 1853 (PERTH, AD, GAUBA, CANB, FRI, K, MEL, NSW); 151 mile peg, Badgingarra-Eneabba road (30°02'S, 115°20'E), 30 Aug. 1969, A. S. George 9624 (PERTH).

*Flowering period*: July-August,

*E. pendens* is a remarkable species closely related to and resembling *E. sepulcralis* but differing in bud and fruit morphology (Figure 1). The two species occur approximately 350 miles apart and like some other Western Australian eucalypts they are notable for their restricted occurrence. *E. sepulcralis* occupies a few sites on sandy foothills of the ranges between the Fitzgerald River and Hopetoun on the south coast, *E. pendens* occurs on lateritic sandhills and has been collected only at the localities cited above. The species occurs as isolated groups of slender mallees whose stems are only a few cm in diameter and which emerge above low, dense, sclerophyllous shrubs. The canopy is thin and always pendulous. There are no other *Eucalyptus* species associated with it in the field.

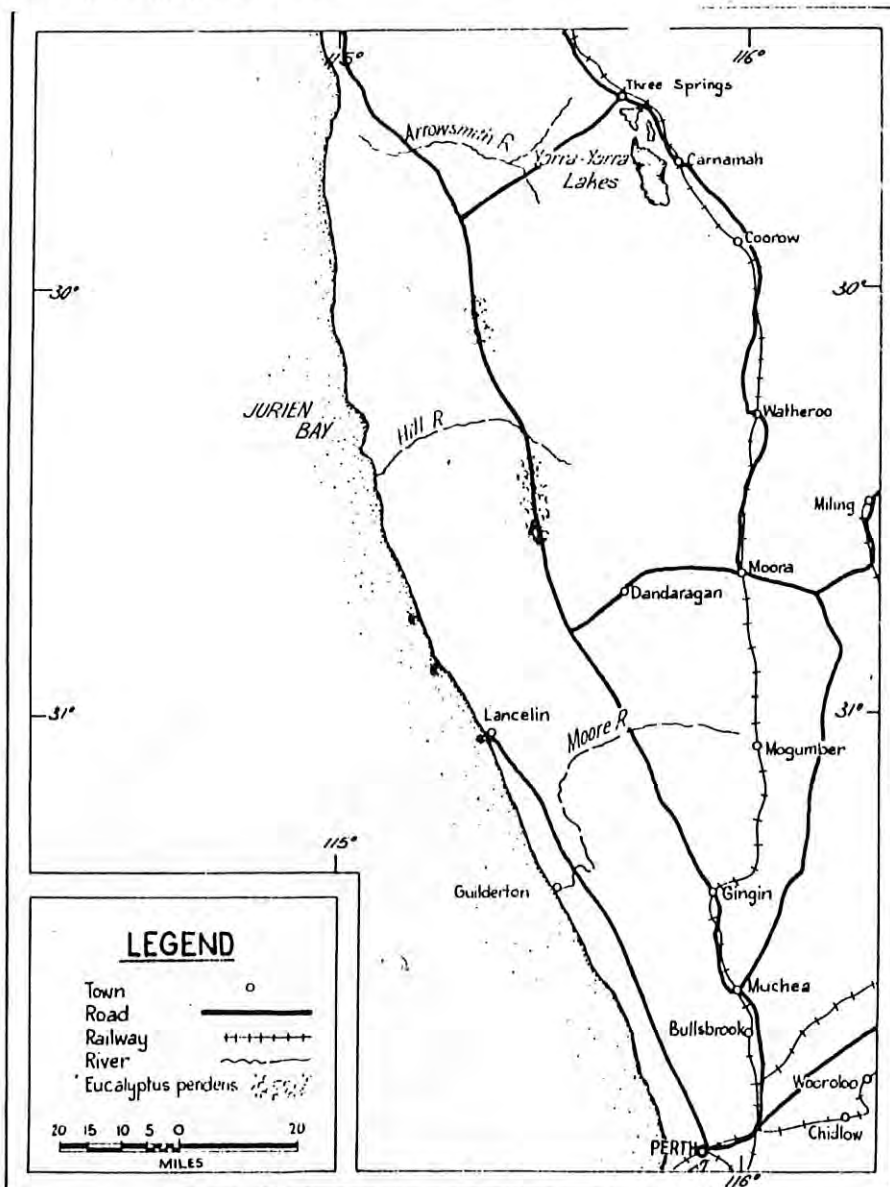
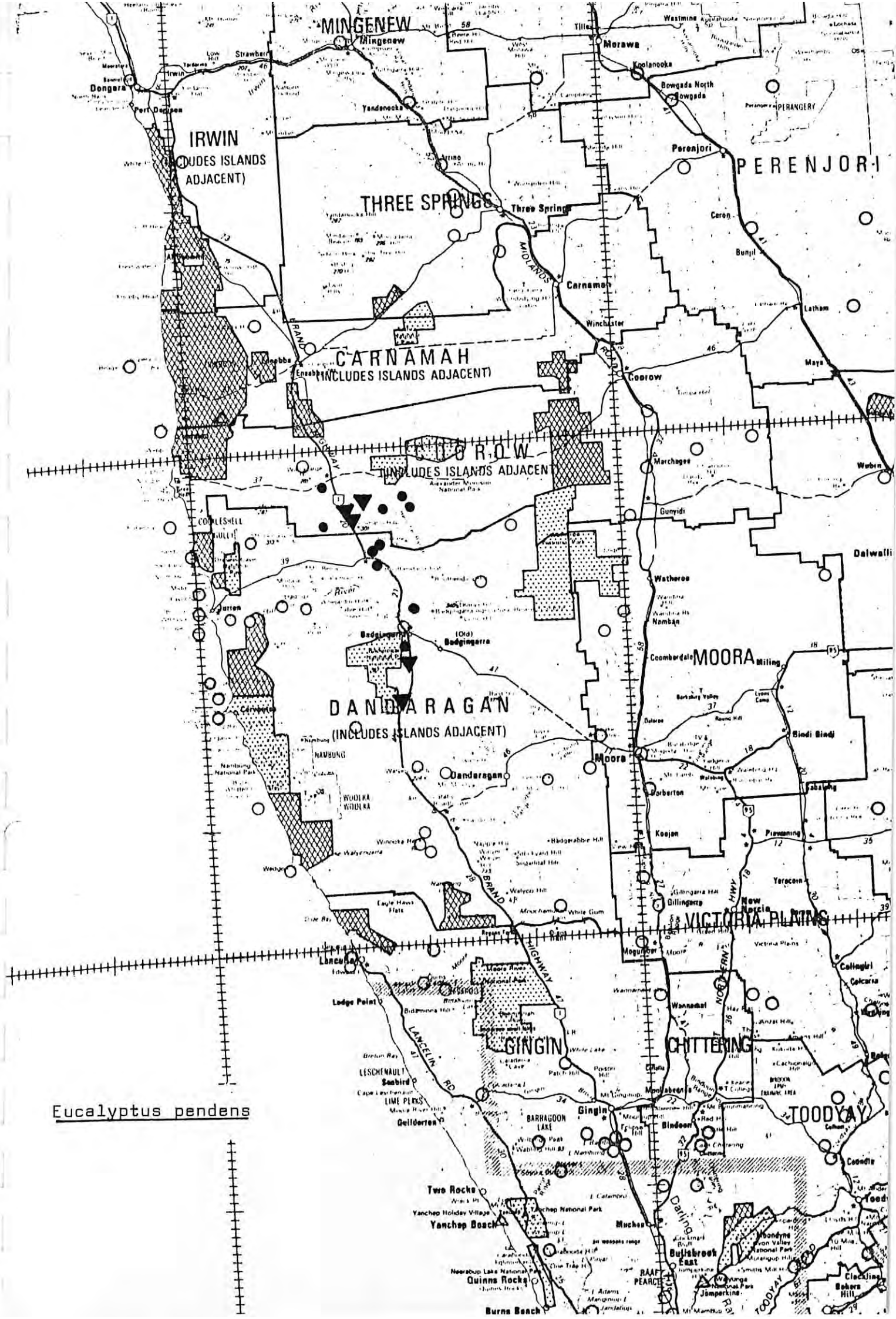


Figure 2- Distribution of *Eucalyptus pendens* sp. nov.



Eucalyptus pendens



Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Eucalyptus pendens* M.H. Brooker

Family Myrtaceae

Date Recorded 5.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
Holotype	125 m peg on Brand Hwy		23.6.69	Y (almost)	M.H. Brooker 1949
KP	8 m N of Jurin Bay Rd, Brand Hwy 30°05' S 115°20' E		30.9.74	Y	M. Wittwer SZ975
KP	7 m NNE of Jurin Bay Rd, off Brand Hwy	Laterite plateau	7.7.80	Bud.	I.R. Dixon S4646
KP	120 m peg on Eneabba Rd	Sand Heath	4.7.69	Bud	H. Demarz D1357
KP	Badgingarra	Scrub heath	15.9.69	Y	J.S. Beard 5847
KP	153 mp. Eneabba Rd 29°55' S 115°15' E		20.8.71	Bud	H. Demarz D3399
KP	1514 mp Eneabba Rd	Gravel	9.8.69	Bud	H. Demarz D1518
	119 m peg on Badgingarra Rd.		20.9.75		L.A.S. Johnson 8133
	120 m peg on Brand Hwy		6.6.69	Y	M.H. Brooker 1849
	119-120 m peg on Brand Hwy	low heath, sand plain	7.10.75	Y	D.F. Blaxell W75/85
	Near Badgingarra		Aug 68	Y	C.A. Gardner sn
	38.5 m N of Regens Ford on Brand Hwy	white sand	21.10.70	Y	BR Mashin 1470
	23 m S of Eneabba 30°00' S 115°18' E	white sand plain, heath	27.4.74	N	M.H. Brooker 4582
	110-120 m peg Brand Hwy, near Cervantes T.O.		Sept 79	Y	C. Brindley sn.
	N of 151 m peg Brand Hwy	lateritic soil	30.8.69	N	A.S. George 9624
	127.5 m peg on Badgingarra	lateritic sand	6.6.69	N	M.H. Brooker 1853



A. AS OF THE WESTERN AUSTRALIAN F JRA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Eucalyptus. pernix* Family *Myrtaceae* Date Recorded *5.5.87*

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	140-150m N of Perth on Brand Hwy. 38m N of Regans Ford	in Gravel lateritic soil on hillside low scrub	26 7 72 14 5 69	N N	LFA/lan. AS George 9312

Gastrolobium appressum C.A. Gardner  
J. Roy. Soc W. Aust. 47: 59-60 (1964)  
see also Rye & Hopper (1981) p 104

**Gastrolobium appressum C. A. Gardn. sp. nov.**  
Series *Racemosae* Benth.

Fruticulus 20-30 cm. altus, ramis subflexuosis, glabris, ramulis brevibus, dense foliolatis, appresse-pubescentibus, demum glabratibus. Folia ternata, brevissime petiolata vel subsessilia, rigida, erecta, arcte appressa, coriacea, ovato-lanceolata, acuta, leviter concava, basi leviter sed conspicue rotundata, 6-7 mm. longa, manifeste reticulata, glabra, supra reticulata, subtus pallida; stipulae nullae. Flores ad ramulorum apices in racemulos pauciflorae, positae, pedicelli graciles, subpatentim sericeo-pubescenti, plerumque 2 mm. longi; calyx glaberrimus, 6 mm. longus, lobi 3 inferiores lanceolati acuminati,







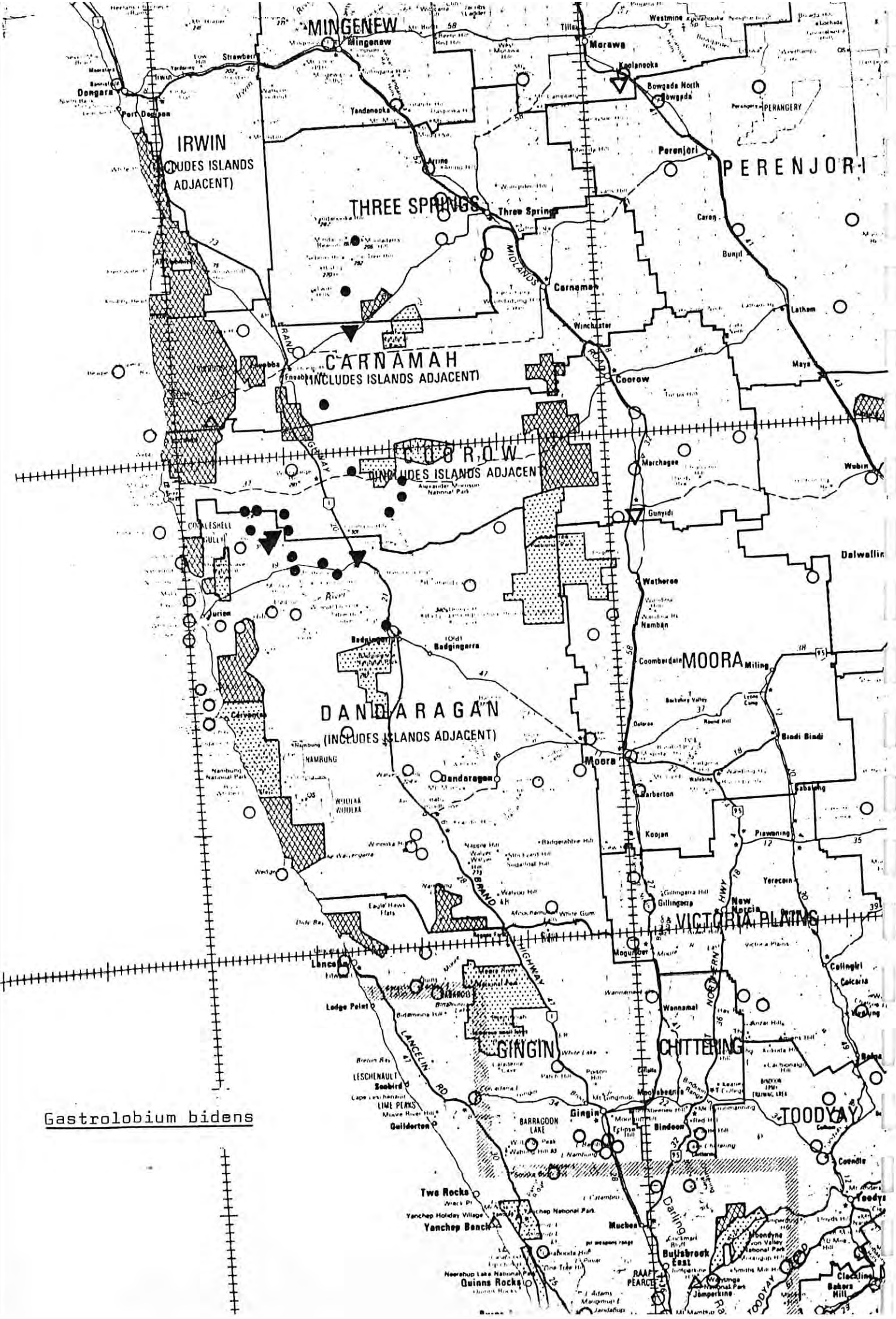
Gastrolobium bidens Meisn.

Bot. Zeitung (Berlin) 42:29 (1855)

+ Benth. Fl. Austral. 2: 106

31. **G. bidens**, Meisn. in Bot. Zeit. 1855, 29. A much stouter shrub than *G. velutinum*, the branches terete or slightly compressed, softly tomentose or villous when young. Leaves mostly opposite, linear-cuneate, truncate and often emarginate with a minute point, or sometimes 3-pointed, about 1 in. long, the margins much revolute, coriaceous, glabrous, and scarcely reticulate above, softly villous, almost woolly underneath. Racemes slender, sessile, villous, 1 to 1½ in. long, many-flowered. Bracts concave, acuminate, persisting almost to the opening of the flowers. Calyx not 2 lines long, villous, the lobes all acute, the 2 upper ones rather broader and shortly united at the base. Ovary on a long stipes; style short. Pod not seen.

**W. Australia.** Between Moore and Murchison rivers, Drummond, 6th Coll. n. 23.



Gastrolobium bidens

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon ... *Gastrolobium bidenes* Meisn... Family ... *Leguminosae* ... Date Recorded 25.5.81

\* not seen

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	2 km N of Mt Lesueur 30°10'S 115°12'E	closed heath, orange sandy-loam with pissolitic gravel	20 6 79	Y (early)	EAGriffin 1970
	near Coomaloo Creek 30°11'S 115°23'E		3 8 76	Y	RJHnatiuk 760114
	Reserve 29806, 15 km E of Enaabbba towards Three Springs 29°45'S 115°25'E	low open heath, grey sand	9 11 78	Fruit	EAGriffin 1531
	in glareosis, proper Gunyidi	lateritic gravel, hilltop	Sept 65	Y	CAGardner sn.
UWA	Koolanooka		3.7.52	N	NH Speck sn
UWA	7 m N of Watheroo, Gt Northern Hwy		1.8.72	Fruit	G. Stone
	Hill River	lateritic gravel	22.9.51	Fruit	?
	Mt Lesueur	mountain slope		Y	?
Type *					J Drummond VI 23

*Grevillea rudis* Meisn.

Hooker's J. Bot. Kew Gardn. Misc. 7:73 (1855)

Benth. Fl. Aust. 5; 484 (1870)

143. **G. rudis**, Meisn. in Hook. Kew Journ. vii. 73, and in DC. Prod. xiv. 390. An erect shrub or undershrub, the branches and foliage very scabrous and more or less hirsute with long spreading hairs. Leaves in the lower part of the branches cuneate, dilated and shortly once or twice ternately lobed or broadly toothed at the end, narrowed to the base but not petiolate, thick, rigid, penniveined, 1 to 2 in. long, the upper leaves distant, sessile, lanceolate, entire,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Racemes cylindrical, dense, 1 to  $1\frac{1}{2}$  in. long, hirsute and glandular-viscid, terminal or accompanied by one or two smaller ones lower down the branch. Bracts acuminate and comose on the very young raceme. Pedicels about 1 line long. Perianth hirsute, slender, straight, 2 lines long, the limb ovoid. Torus straight, without any gland. Ovary almost sessile, hirsute; style long, filiform but thickened at the end under the narrow stigmatic cone.

**W. Australia.** Between Moore and Murchison rivers, Drummond, 6th coll. n. 180.







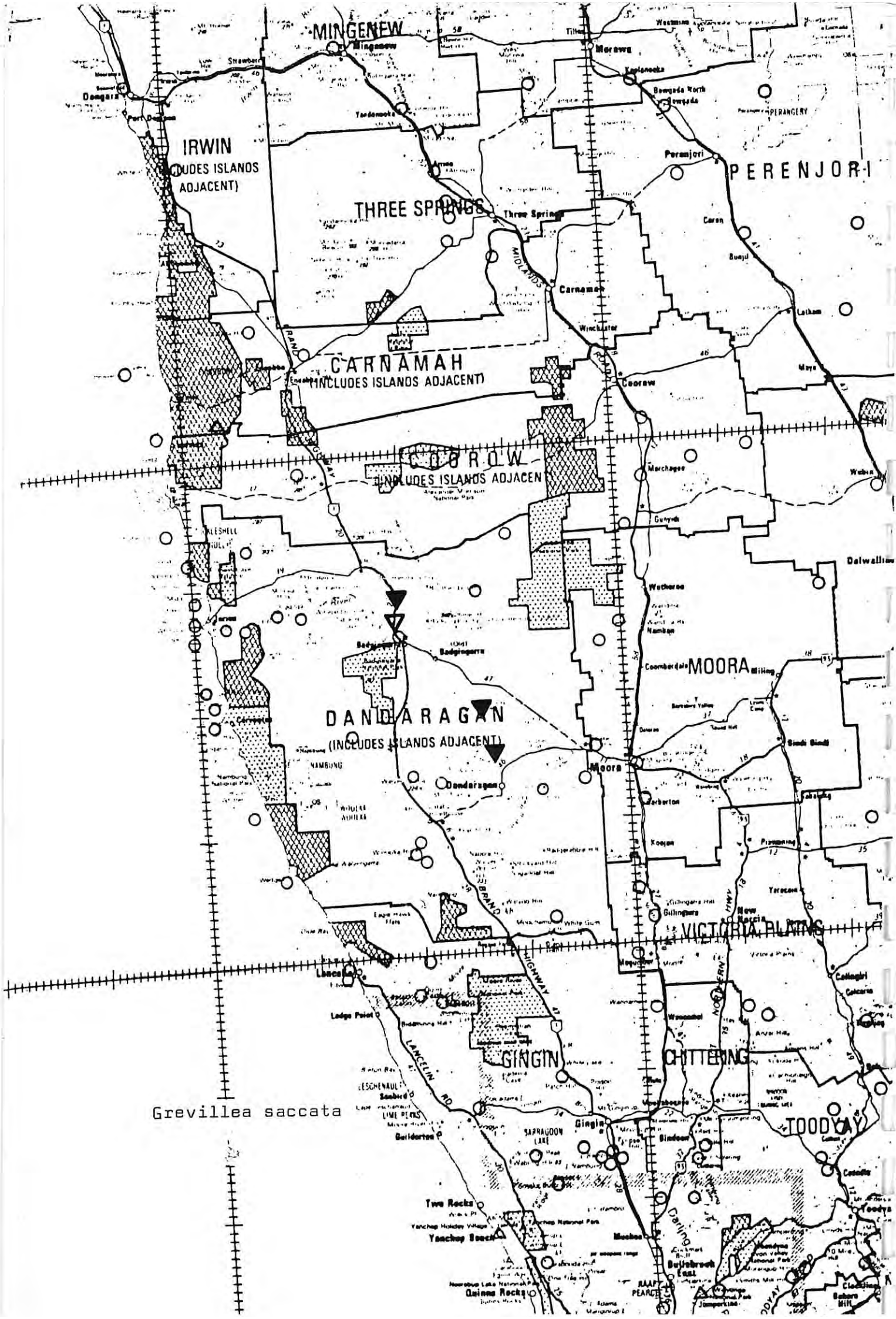
*Grevillea saccata* Benth.

Benth. Fl. Aust. 5: 450-451 (1870)

see also Rye & Hopper (1981) p 119

57. *G. saccata*, Benth. Apparently procumbent or very spreading, the branches and young leaves softly villous, almost woolly, the older foliage rarely glabrous. Leaves sessile, linear or lanceolate, with a callous point, the margins revolute,  $\frac{3}{4}$  to  $1\frac{1}{2}$  or sometimes 2 in. long, smooth or sparingly scabrous-punctate when the hairs wear off. Racemes umbel-like, few-flowered, terminal or in the upper axils. Pedicels 2 or 3 lines long. Perianth more or less pubescent outside, the tube very oblique, nearly 4 lines long and about as broad, the upper side dilated saccate and separated from the remainder by two longitudinal densely hairy ribs inside, the whole tube contracted and revolute at the top with a ring of reflexed hairs inside, the lower larger laminae of the limb dilated on the outer side but not constricted as in *G. brachystylis*. Torus very oblique. Gland broad, disk-like but scarcely prominent. Ovary villous, nearly sessile near the upper margin of the torus; style pubescent; stigmatic disk lateral.

**W. Australia, Drummond.** The habit is nearly that of *G. Drummondii*, but the perianth is very different.



Grevillea saccata

MINGENEW

IRWIN  
(INCLUDES ISLANDS  
ADJACENT)

THREE SPRINGS

CARNAMAH  
(INCLUDES ISLANDS ADJACENT)

COOROW  
(INCLUDES ISLANDS ADJACENT)

DANDARAGAN  
(INCLUDES ISLANDS ADJACENT)

MOORA

VICTORIA PLAINS

GINGIN

CHITTERING

TOODYAY

Mingenew

Dongara

Yardnooke

Three Springs

Wickiatar

Coorow

Dandaragan

Moora

Victoria Plains

Gingin

Chittering

Toodyay

Mingenew

Dongara

Yardnooke

Three Springs

Wickiatar

Coorow

Dandaragan

Moora

Victoria Plains

Gingin

Chittering

Toodyay



A. AS OF THE WESTERN AUSTRALIAN F JRA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Grewia* ..... *sacata* ..... Benth:.... Family *Proteaceae* ..... Date Recorded 2. 7. 81 .....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Hill River	Sand heaths	24 8 48	Y	C.A. Gardner 9043
	18km from Dandaragan on Rd to Badgingarra 30°33'S 115°38'E	heath, with <i>Euc. tottonia</i>	10 7 76	Y	DJ McGillivray 3277 + A.S. George
	18km from Dandaragan on Rd to Badgingarra 30°33'S 115°38'E		10 7 76	Y + Fruit	D.J. McGillivray 3278 + A.S. George
	Between Dandaragan & Jurien Bay		29. 6 38	Y	W.E. Blackall 3657
	9m North from Dandaragan		23 8 48	Y	C.A. Gardner 9002
	16 km S of Coomalbook, Broad Hwy		31. 7 80	Y	W. Kullmann 54661
	Between 136 + 137 m. peg, Badgingarra 30°15'S 115°25'E?	Yellow Sand	15. 8. 76	Y	E. Wißner, W1828

Gompholobium etoniae F. Muell.

+ Vic. Nat. 6: 38 (1889)

Note: photo in Gardner (1975) p 134 is not G. etoniae as is labelled.

DESCRIPTION OF A NEW GOMPHOLOBIUM FROM  
SOUTH-WESTERN AUSTRALIA. WITH NOTES ON  
OTHER SPECIES OF THAT GENUS.

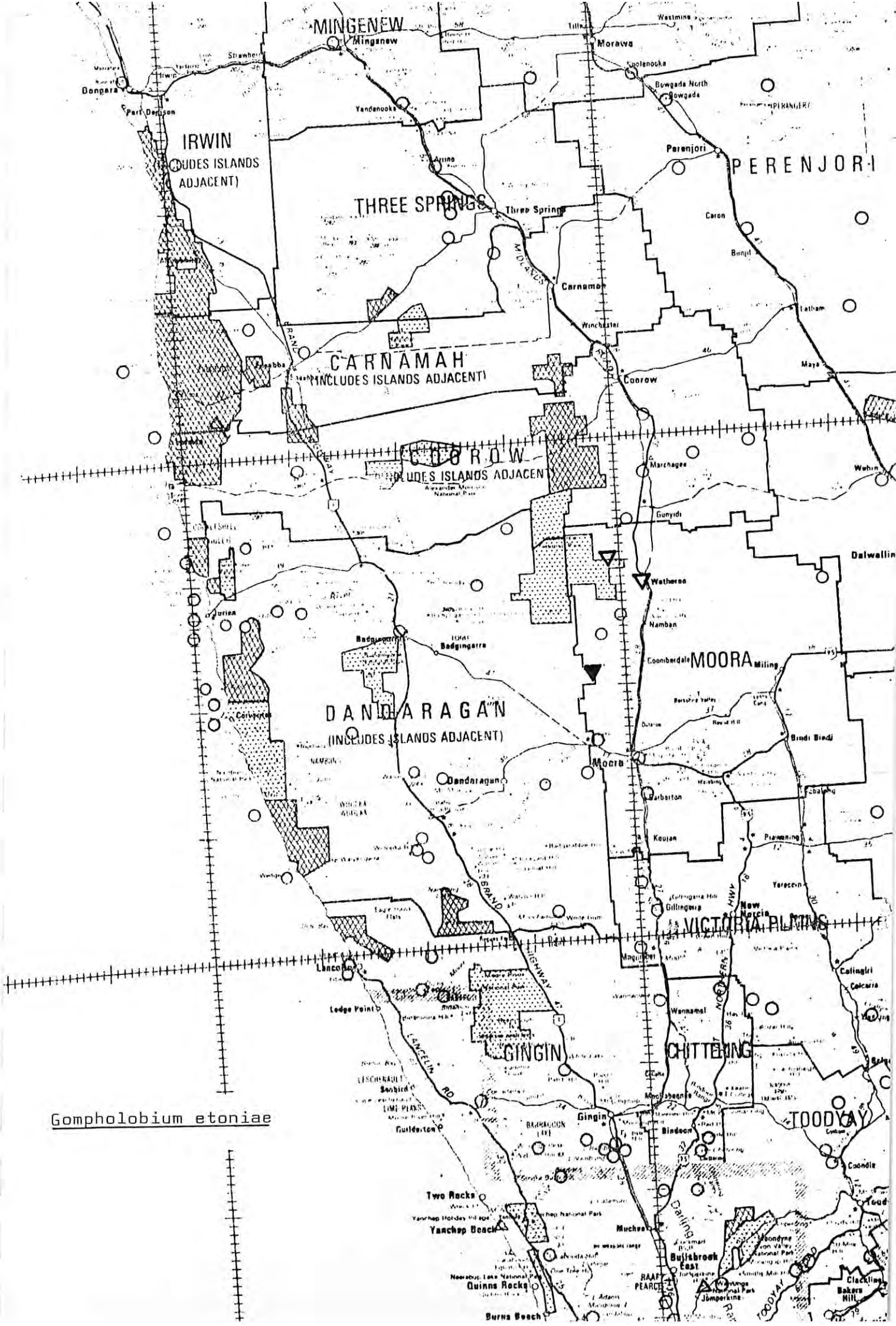
By BARON VON MUELLER, K.C.M.G., M. & PH.D., F.R.S. &c.

GOMPHOLOBIUM ETONIAE.

Branchlets beset with very short grey hairlets; leaves small, sessile; stipules, none; leaflets three, sessile, revolute along the margin, thus linear-cylindric, recurved-pointed outside somewhat rugulous and from minute sharp elevations rough; flowers axillary, solitary; their stalks short, glabrous, bearing early deciduous blunt bracts at the base and very small acute bracteoles at or near the middle; calyx glabrous outside; its lobes semilanceolar, only about as long as the tube, the upper two slightly shorter and somewhat oblique, all partially beset with minute hairlets inside: upper petal renate-orbicular; lateral petals semihastate-elliptic; lower petals almost semiorbicular-ovate, black-purplish, the others red-purplish, all glabrous and with a conspicuous stalklike narrow base; anthers ellipsoid, quite pale; style glabrous, flattened; stigma minute, ovulary glabrous; ovules few.

Near the eastern sources of Swan-River; Miss Martha Eaton.

*G. Buxteri*, to which our new plant is nearest allied, differs from it in the development of conspicuous stipules, in generally more slender leaflets, in more deeply cleft calyces with a thin vestiture also outside and with somewhat sticky lobes much thickened along their margin, in petals of seemingly lighter colour with always shorter stalklike base, in a capillary-thin style and in the ovulary being outside beset with hairlets. As regards fruit these two plants may also be different but those of *G. etoniae* are as yet unknown.



Gompholobium etoniae







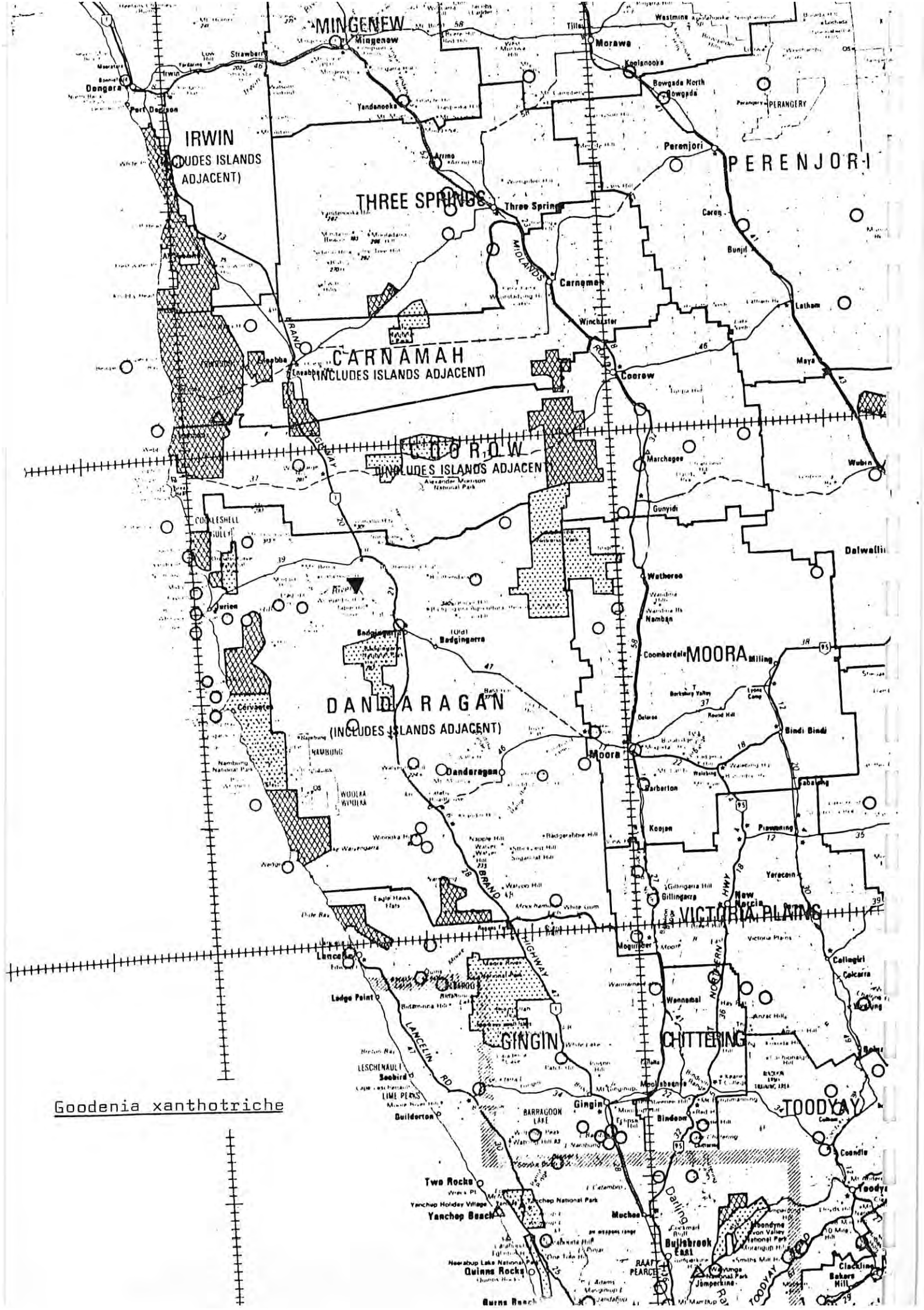
Goodenia xanthotricha De Vriese

Goodenoviaeae 155 (1854)

† Benth. Fl. Austral. 4: 56

3. **G. xanthotricha**, *De Vr. Gooden.* 155. An erect glandular-pubescent and apparently viscid undershrub or shrub with leafy branches. Leaves sessile and stem-clasping, lanceolate or linear, with revolute margins, toothed or rarely entire,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, the floral ones gradually smaller, linear and entire. Flowers sessile in dense terminal leafy spikes, at first very short, at length 3 or 4 in. long. Bracteoles linear, obtuse. Calyx-tube short; lobes linear, obtuse, 3 lines long or rather more. Corolla glandular-pubescent outside, 6 to 7 lines long, the lobes nearly equal and equally winged. Ovary adnate to the corolla-tube above the calyx-tube, the dissepiment reaching nearly to the top; ovules rather numerous, in 2 rows in each cell. Indusium very shortly ciliate. Capsule oblong-linear, 3 or 4 lines long, opening at length nearly to the base in 4 valves.—*G. leptotheca*, F. Muell. *Fragm.* vi. 13.

**W. Australia.** *Drammond, Ath Coll. n.* 195. The specimens are identified by De Vries in *Herb. Hook.* as his *G. xanthotricha*, which he at first intended to refer to *Dampiera*, and they agree with his description, excepting as to the seeds, said to be only 2 in each cell, which he must have taken from some other plant.



Goodenia xanthotriche





Hakea flabellifolia Meisn.

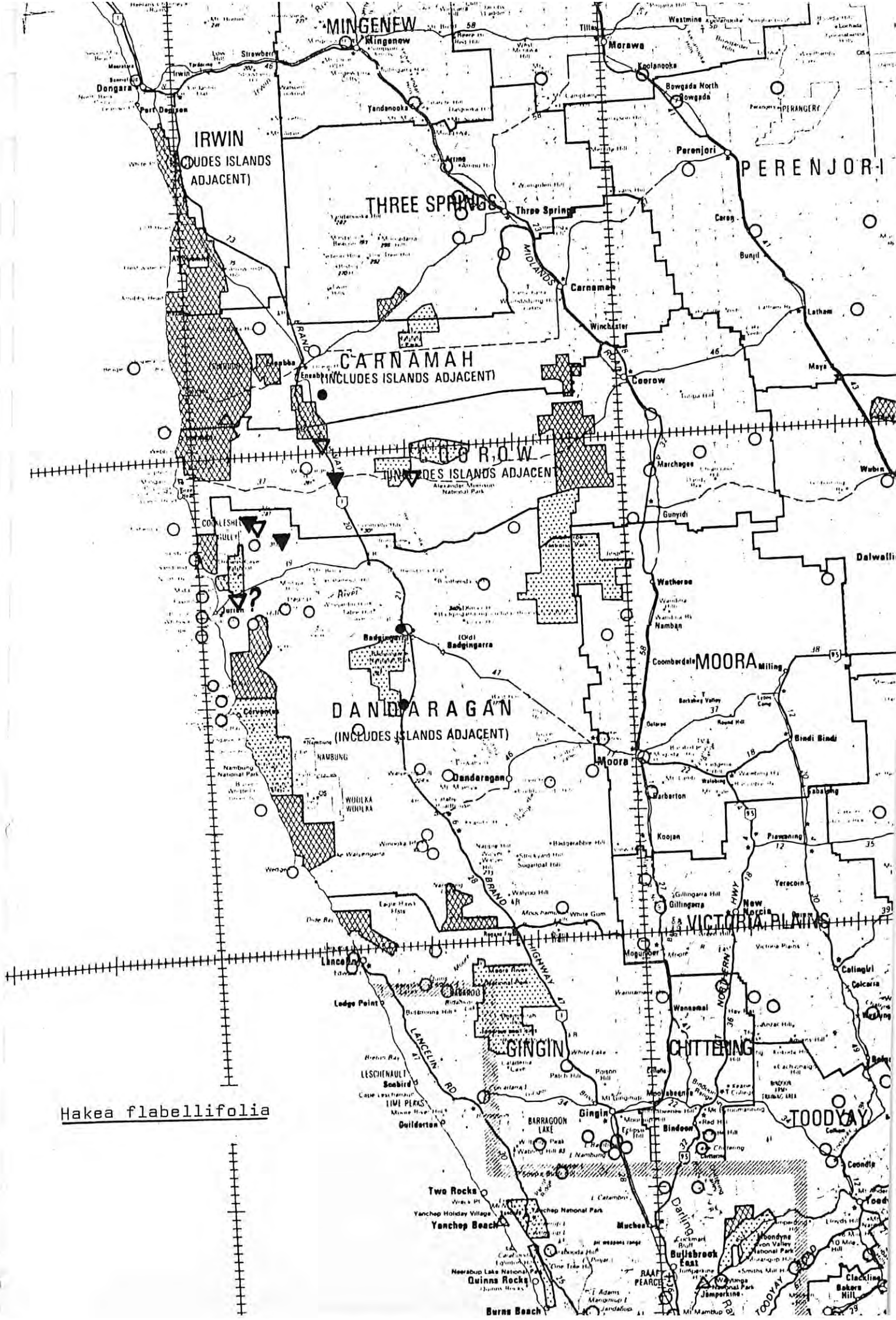
Hooker's J. Bot. Kew Gard. Misc. 7: 116 (1855)

+ Benth. Fl. Austral. 5: 501

17. **H. flabellifolia**, *Meisn. in Hook. Kew Journ.* vii. 116, and in *DC. Prod.* xiv. 409. An erect shrub, with minutely hoary branches or quite glabrous. Leaves cuneate but not so broad as in *H. Baxteri* and rather truncate than rounded at the toothed end, tapering into a long petiole,  $1\frac{1}{2}$  to 2 in. long,  $\frac{3}{4}$  to 1 in. broad at the end, very thick and obscurely veined. Flowers in axillary clusters, much smaller than in *H. Baxteri*. Pedicels not 1 line long. Perianth silky-pubescent, the tube under 3 lines long, revolute under the globular limb. Torus nearly straight. Gland thick, not very large. Ovary very shortly stipitate; style not very long, with an oblique stigmatic disk. Fruit unknown.

**W. Australia.** Between Moore and Murchison rivers, *Drummond, Gth. coll. n.* 196.





Hakea flabellifolia



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Hakea flabellifolia* Meisn. Family Proteaceae Date Recorded 4.5.81  
 \* not seen

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	26km S of Eneabba 29°57'S 115°19'E	sand over ironstone	10 8 79	Y	RJ Cranfield
	Greenhead Rd To Brand Hwy 30°03'S 115°20'E	Sand over laterite	24 1 79	N	B Barnsley 852
	Cockleshell Gully 30°09'S 115°07'E	sand over lateritic duricrust	22 10 79	Y	E Griffiths, 2428
	Cockleshell Gully	low open heath	Feb 40	Y	CA Gardner
	Mt Lesueur		Feb 64	N	CA Gardner 15996
	Jurien Bay		4 11 62	Y	RD Royce 7716
	Mt Lesueur, base, northern slope	stony scrubs	16 10 46	Y	CA Gardner 8447
	39 m W of Coorow		24 11 71	Y	H. Demar 2 3511
	Mt Lesueur		25 4 58	Y	CA Gardner 10602
K.P.	Jurien Bay to Regans Ford	Gravel	26 9.68.	N (Buds)	P. Fairall 2497
type *					J Drummond VI 196

Hakea megalosperma Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 117 (1855)

+ Benth. Fl. Austral. 5: 503

see also Erickson et al p. 101

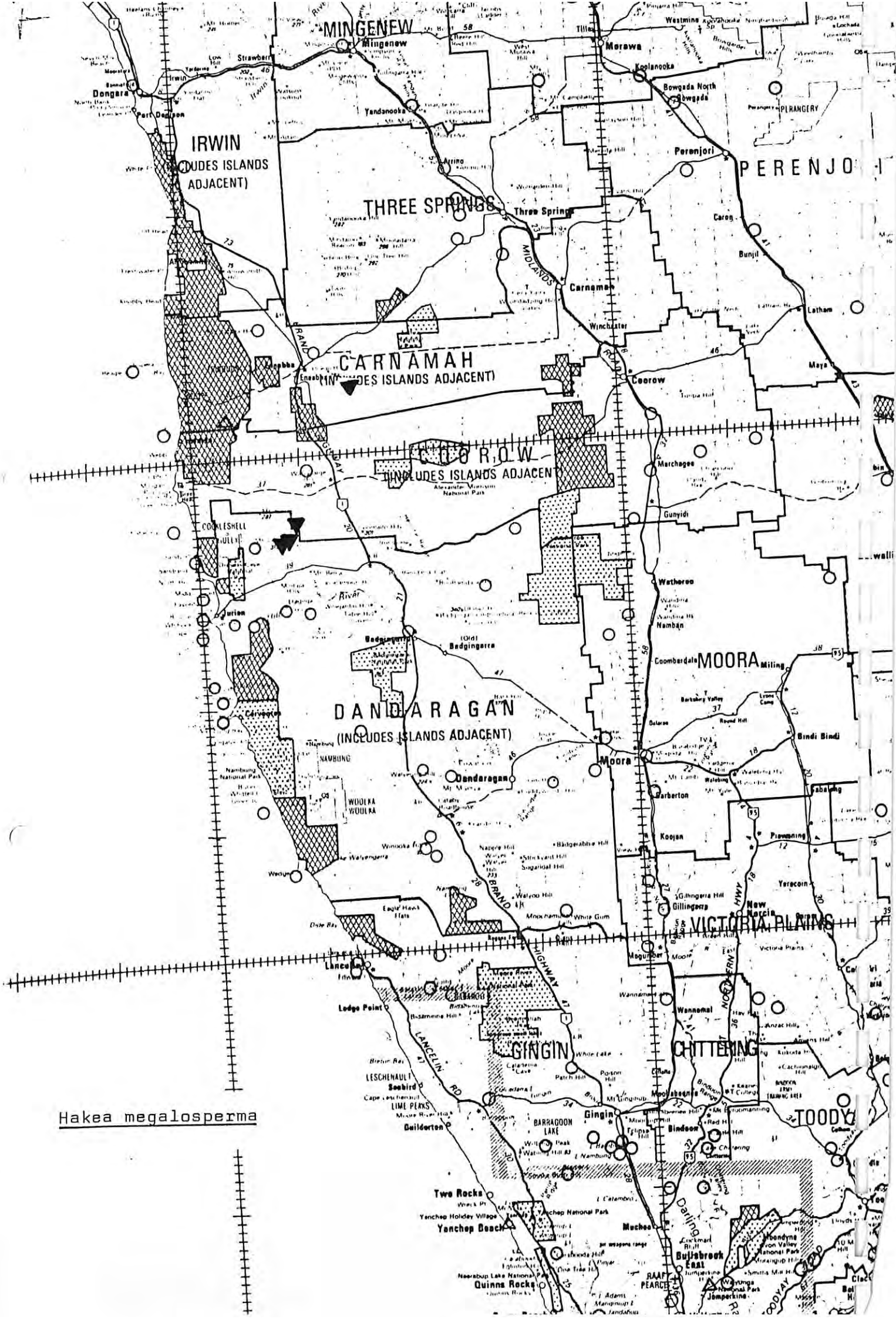
Blackwell & Griffin (1981)

23? **H. megalosperma**, Meisn. in Hook. Kew Journ. vii. 117, and in DC. Prod. xiv. 417. A tall shrub quite glabrous, the foliage glaucous. Leaves obovate-oblong to narrow oblong, very obtuse, tapering into a short petiole,  $1\frac{1}{2}$  to 3 in. long, very thick, veinless or obscurely penni-veined with the very faint primary veins very oblique. Flowers unknown. Fruit 2 to  $2\frac{1}{2}$  in. long,  $1\frac{1}{2}$  in. broad, smooth, scarcely beaked, the valves with dorsal ridges near the end forming prominent truncate appendages. Seed-wing broadly decurrent on both sides round the base of the nucleus.

**W. Australia.** Mount Lesueur, between Moore and Murchison rivers, Drummond, 6th coll. n. 154.

The affinities of this and the following species must remain very uncertain until the flowers shall be known.





Hakea megalosperma



Hakea megalosperma Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 117 (1855)

+ Benth. Fl. Austral. 5: 503

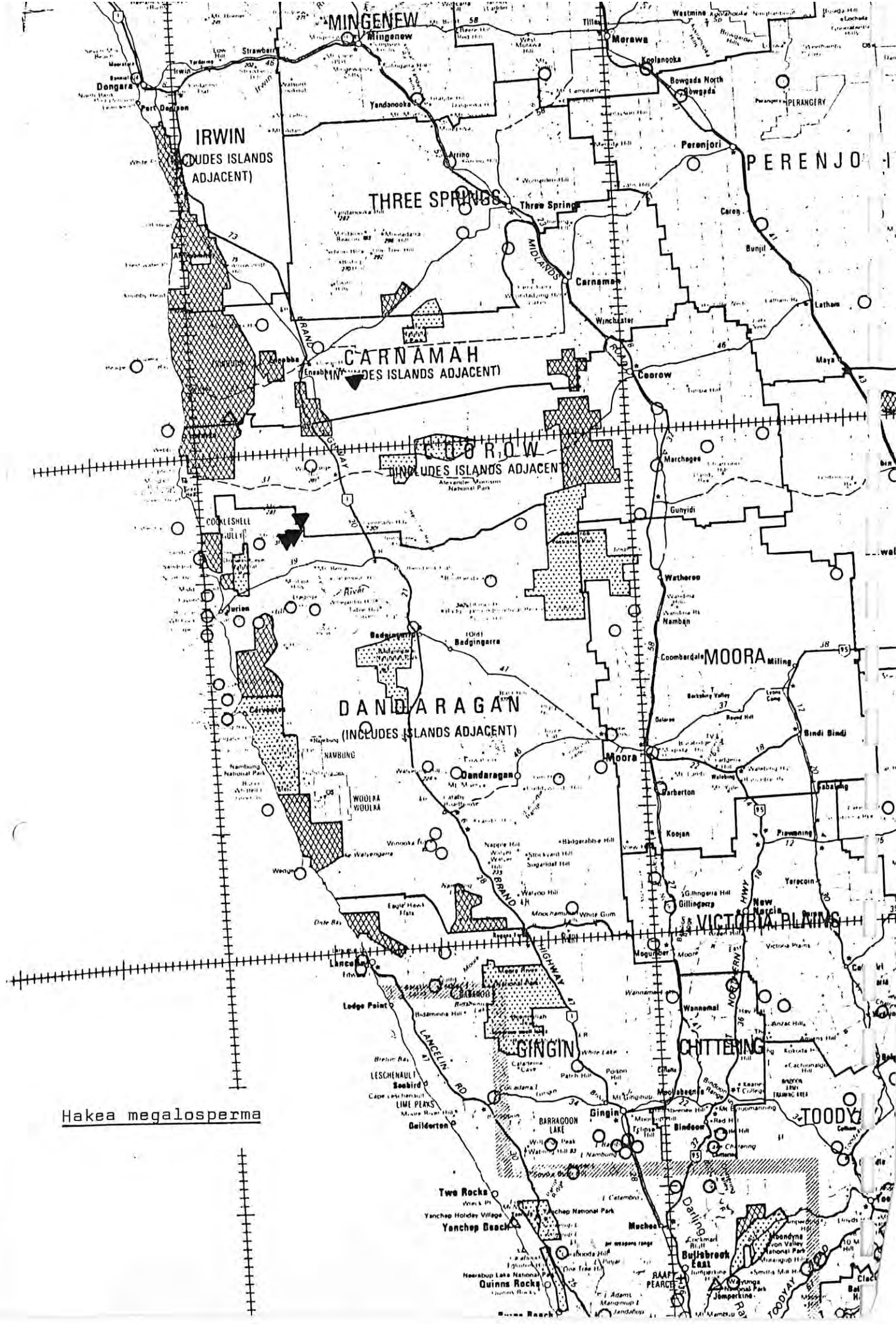
see also Erickson et al p. 101

Blackwell & Griffin (1981)

23? **H. megalosperma**, *Meisn. in Hook. Kew Journ.* vii. 117, and in *DC. Prod.* xiv. 417. A tall shrub quite glabrous, the foliage glaucous. Leaves obovate-oblong to narrow oblong, very obtuse, tapering into a short petiole,  $1\frac{1}{2}$  to 3 in. long, very thick, veinless or obscurely pinniveined with the very faint primary veins very oblique. Flowers unknown. Fruit 2 to  $2\frac{1}{2}$  in. long,  $1\frac{1}{2}$  in. broad, smooth, scarcely beaked, the valves with dorsal ridges near the end forming prominent truncate appendages. Seed-wing broadly decurrent on both sides round the base of the nucleus.

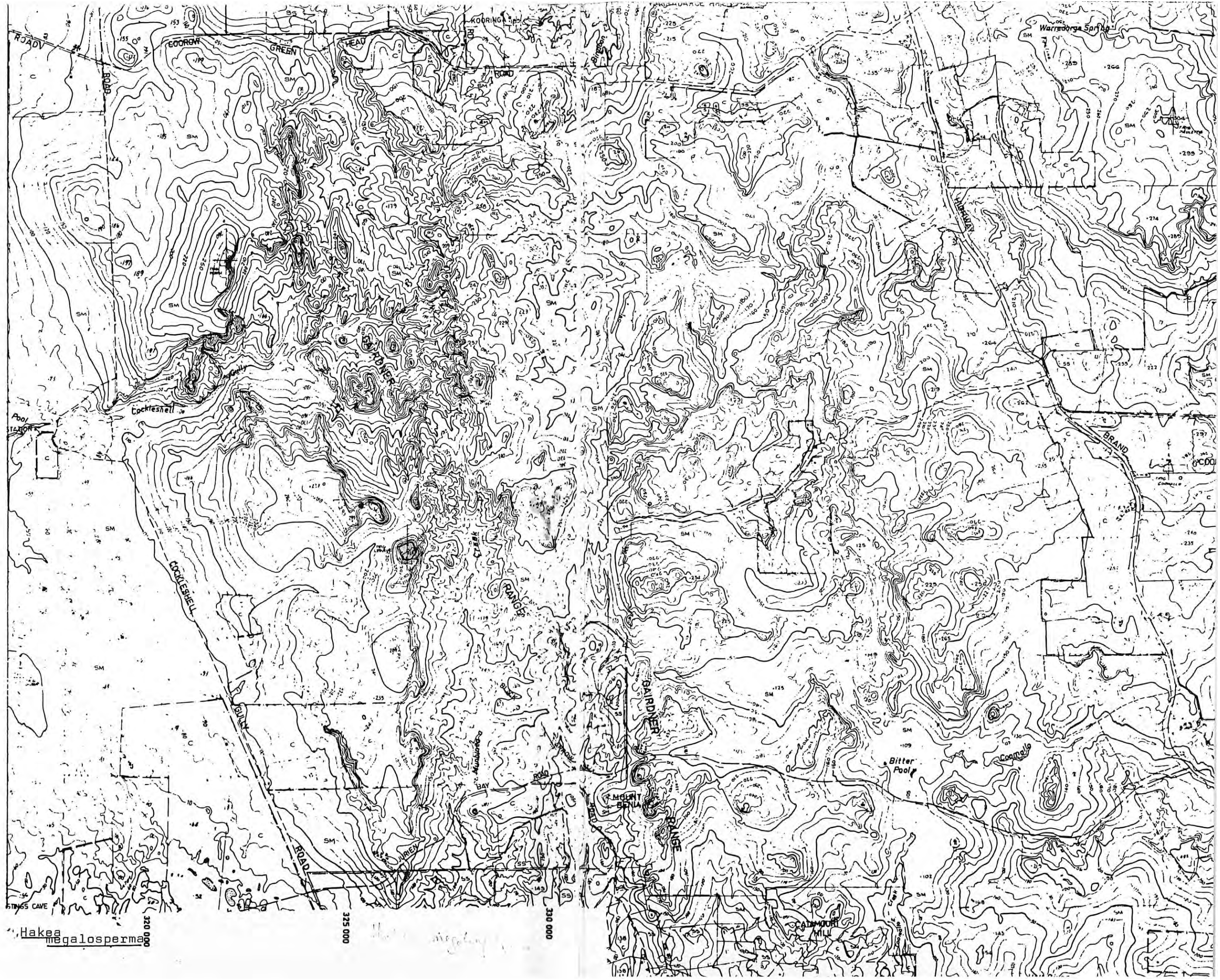
**W. Australia.** Mount Lesueur, between Moore and Murchison rivers, *Drummond*, 6th coll. n. 154.

The affinities of this and the following species must remain very uncertain until the flowers shall be known.



Hakea megalosperma





Hakea megalosperma

320 000

325 000

330 000







Hakea neurophylla Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 117 (1855)

† Benth. Fl. Austral. 5: 521

67. **H. neurophylla**, Meisn. in Hook. Kew Journ. vii. 117, and in DC. Prod. xiv. 413. Young shoots minutely hoary, the adult foliage glabrous and glaucous. Leaves ovate-elliptical to oblong-lanceolate, shortly acuminate or rarely almost obtuse, contracted into a broad but distinct petiole, 2 to 3 in. long, very thick and rigid, with nerve-like margins, irregularly triplinerved or quintuplinerved, with few anastomosing veins. Flowers in axillary clusters, the rhachis villous, about 1 line long. Pedicels glabrous, about 2 lines long, revolute under the ovoid-globular limb. Torus small, oblique. Gland small. Ovary sessile or nearly so; style not very long, with a straight stigmatic cone. Fruit about 1 in. long,  $\frac{3}{4}$  in. thick, with a nearly straight conical beak. Seed-wing rather broadly decurrent on the upper margin only of the nucleus.

**W. Australia.** Between Moore and Murchison rivers, Drummond, 6th coll. n. 195. Possibly a variety only of *H. petiolaris*.



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Hakea neurophylla* Meisn..... Family *Proteaceae*..... Date Recorded 4.5.81.....

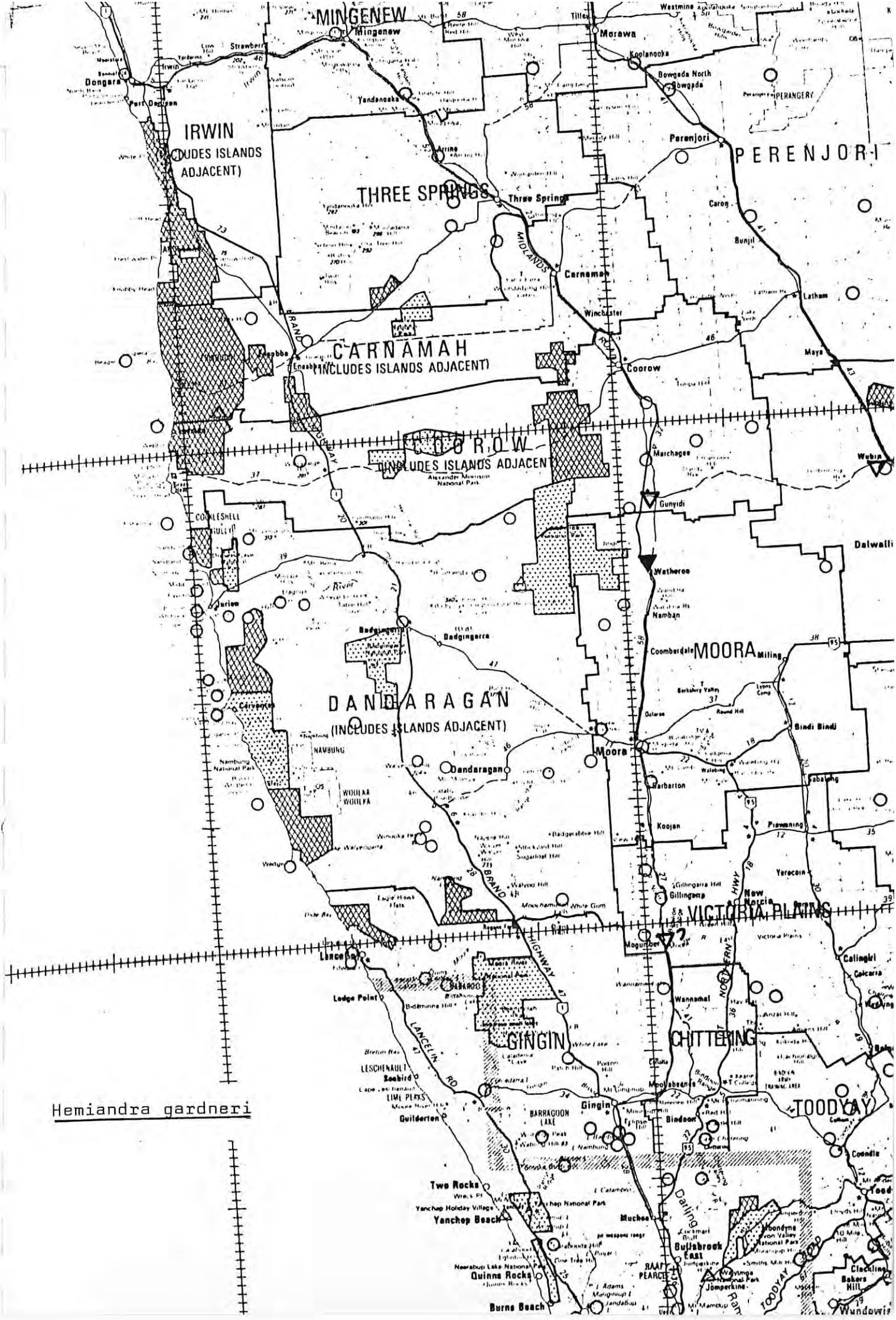
Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Mt Peron, NE of Jurin	Shrubland, sandstone	9.8.74	Y	B.R. Maslin 3728
	Mt Lesueur, East side	slope of mesa	17 7 79	Y	E. Griffiths 1913
	Mt Lesueur		Jun 65	Y	C. Gardner
	Mt Peron		26 Aug 49	Y	C. Gardner 9538
	Mt Lesueur		25 8 48	Y	C. Gardner 9079
	Mt Lesueur		14 2 40	N	C. Gardner
	Coomalbo ck, Brand Hwy, E of Jurin	low closed heath	3 8 76	Y	R. J. Hnatiuk 76028
		massive lateritic boulders			
		some sand, upper mesa			
		slopes			
Isotype	Mt Lesueur, east side			N	J. Drummond VI 195
K.P.	Mt Peron		18.6.70	N	H. Demarz 2323

Hemiandra gardneri O.H.Sargent

J.Bot. 65:175 (1927)

see also Blackall & Grieve (1956) plate 30





Hemiandra gardneri







Hakea  
neurophylla

320 000

325 000

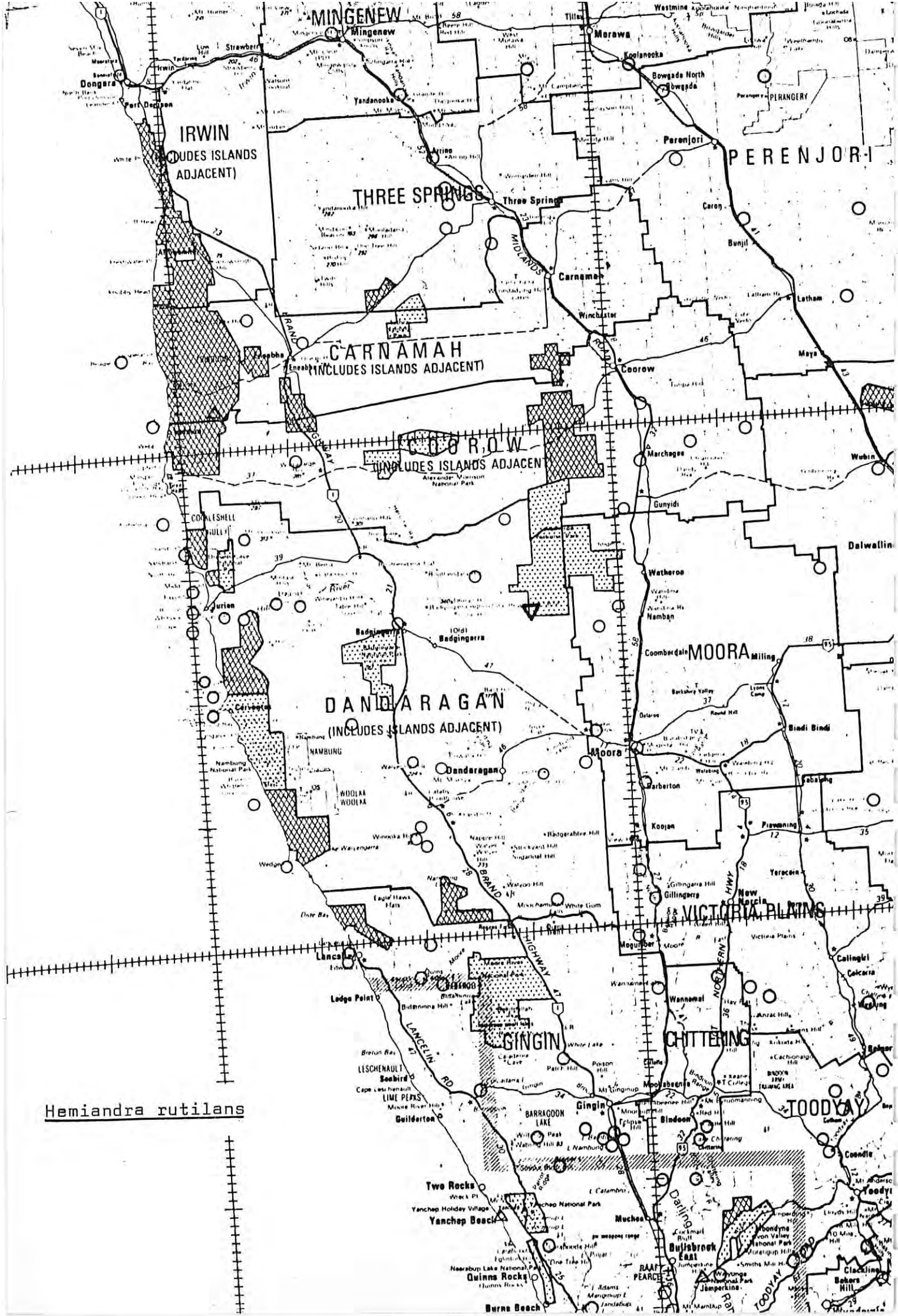
330 000

HNU RIVE

Hemiandra rutilans O.H.Sargent

J.Bot. 65: 175 (1927)





Hemiodandra rutilans

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Hemionandra ratibans* O.H.Sargent.

Family *Lamiaceae* ..... Date Recorded 5.5.81 .....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Watheroo NP, SW corner	Sandy soil	5 10. 71	Y	R.D.Royce 9592

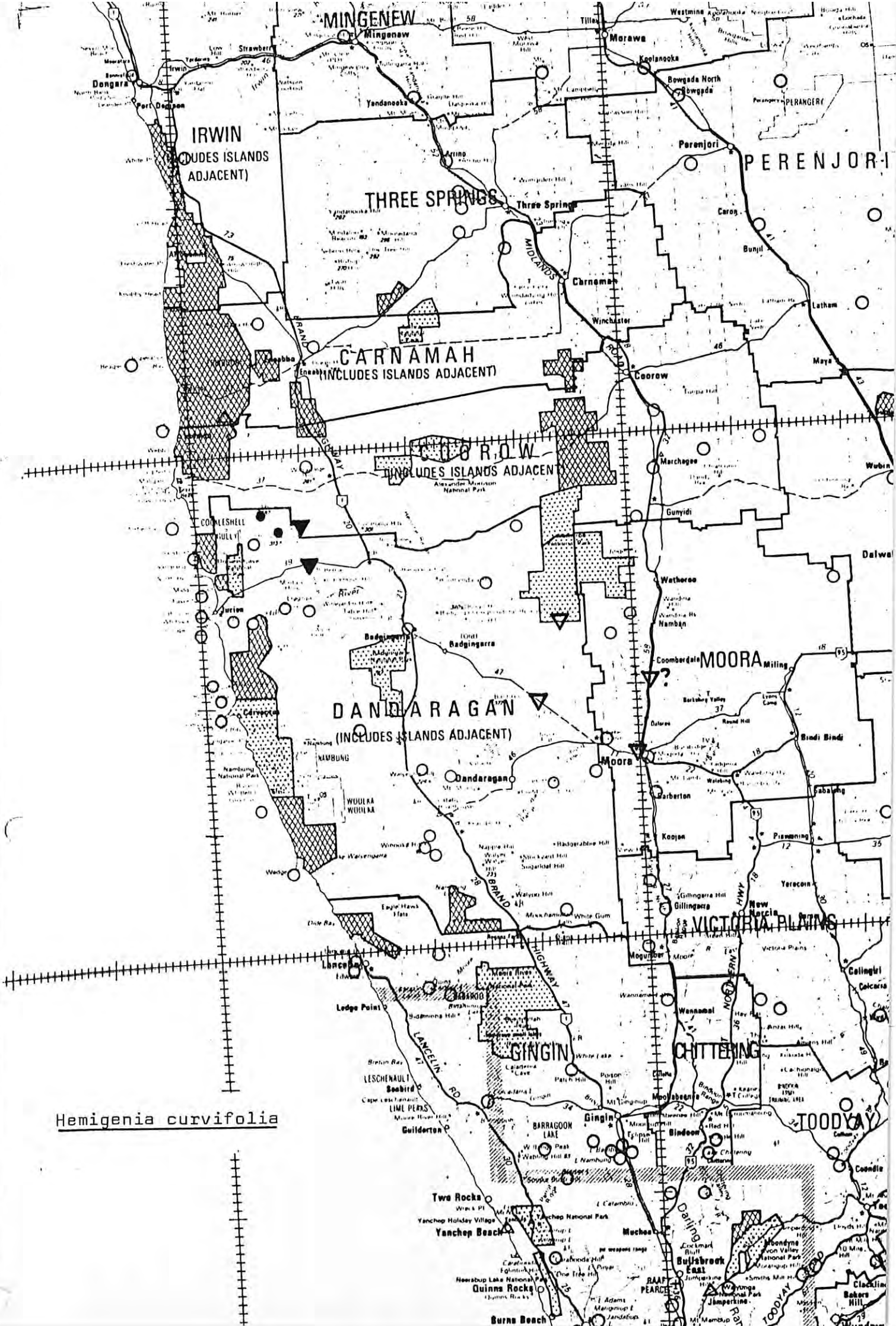
Hemigenia curvifolia F. Muell.

Frag. Phyt. Austral. 1: 210-211 (1859)

† Benth. Fl. Austral. 5: 117

13. **H. curvifolia**, *F. Muell. Fragm. i. 210.* A shrub of 2 or 3 ft., the branches woolly-hirsute, the young shoots silky-villous, the older foliage becoming glabrous. Leaves opposite, sessile, ovate-lanceolate or oblong, mostly acute, rigid, complicate, recurved,  $\frac{1}{2}$  in. long or rather more. Flowers rather small, clustered in the axils and in every respect like those of the small-flowered varieties of *H. sericea*.

**W. Australia.** Rocky hills, Hill river, *Oldfield*. There are but very few small specimens, more complete ones may possibly show this to be an extreme form of *H. sericea*.



Hemigenia curvifolia





Hypocalymma tetraptrum Turcz.

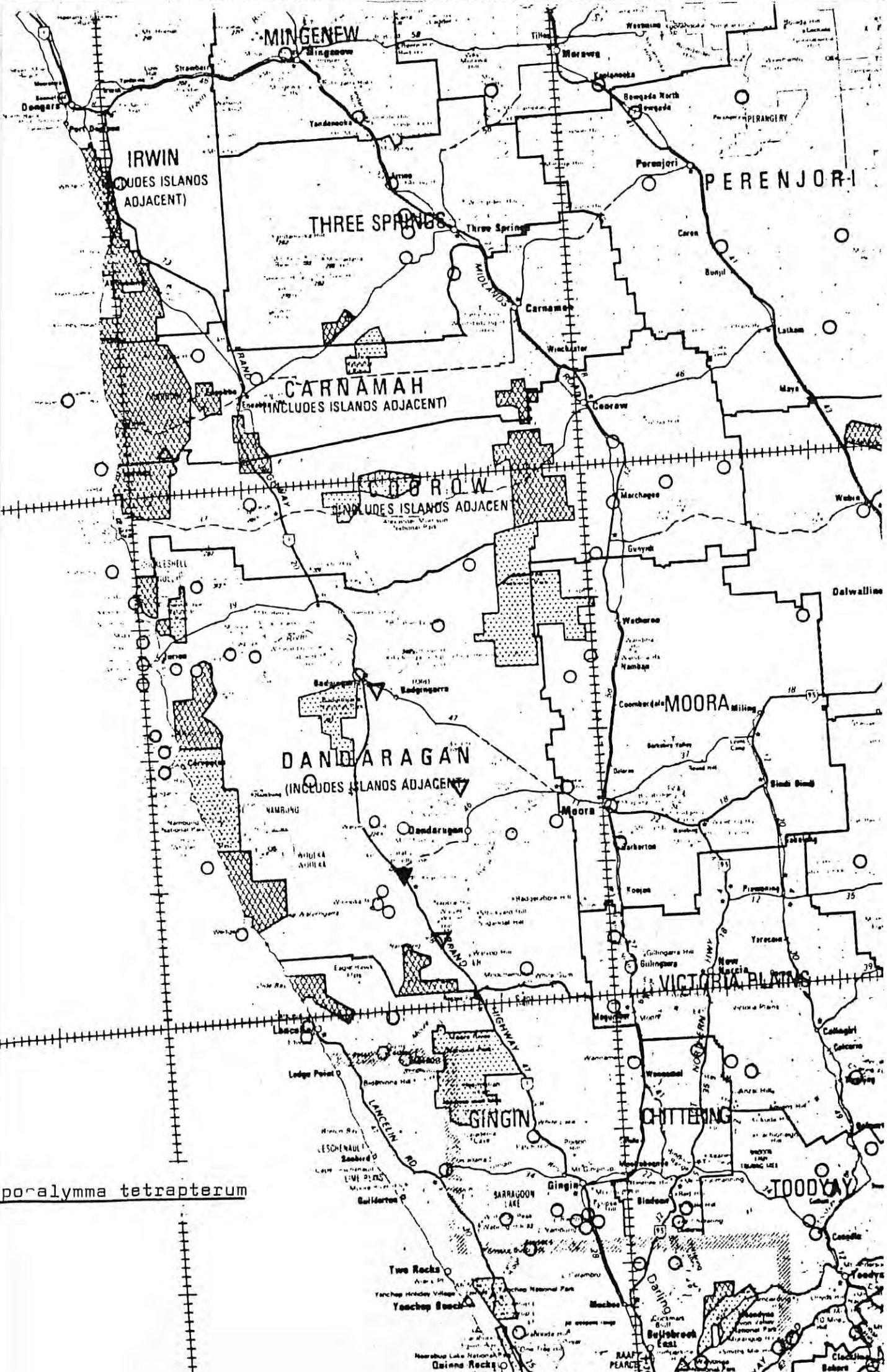
Bull. Soc. Nat. Mosc. 35: 325 (1862)

+ Benth. Fl. Austral. 3:93

5. **H. tetraptrum**, Turcz. in Bull. Mosc. 1862, ii. 325. Apparently a tall shrub, with virgate, more or less 4-angled branches, and quite glabrous. Leaves closely sessile or half stem-clasping, broadly oblong-cuneate, obtuse, mostly about  $\frac{1}{2}$  in. long or rather more. Flowers in closely sessile pairs, not so yellow when dry as in the allied species. Bracts broad, shorter than the calyx. Calyx-tube very open, about 2 lines diameter; lobes semiorbicular, half as long as the petals. Petals persistent, about  $1\frac{1}{2}$  lines diameter. Stamens almost 2-seriate. Ovary free, except the broad base, prominently 3-angled, with a short depression round the style, 3-celled, with 1 ovule in each cell or rarely a second abortive one. Capsule exceeding the calyx-tube, but enclosed in the persistent petals. Seeds oblong-reniform, with a large lateral hilum; testa crustaceous; embryo apparently entire.

**W. Australia.** Between Moore and Murchison rivers, Drummond, 6th Coll. n. 68.

Note; This species appears very similar to H. xanthopetalum and it is probably only an extreme form of same with broad oblong leaves.



poracymma tetraapterum

A. AS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Hypocalymma tetraphyllum* Turcz. Family *Myrtaceae* Date Recorded 29.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Jurien Bay Rd		29.8.38	Y	W Blackall 3686A
	Strathmore rd Turnoff (? Brand Hwy		15.11.75	N	JR Cannon 341
	6 m N from Dandারণ		24.8.48	Y	CA Gardner 9014
WA	Minegarra, Mt Mistry	Sand plain	22.9.51	Y	NH Speck
KP	near Badgingarra		21.5.68	Y	JS Beard 5457
KP	Cataby	Sand - gravel	10.8.69	Y (white)	H Demaree D1524
KP	7.0 m from Jurien Bay turnoff		16.10.66	N	F Lullwitz 65627



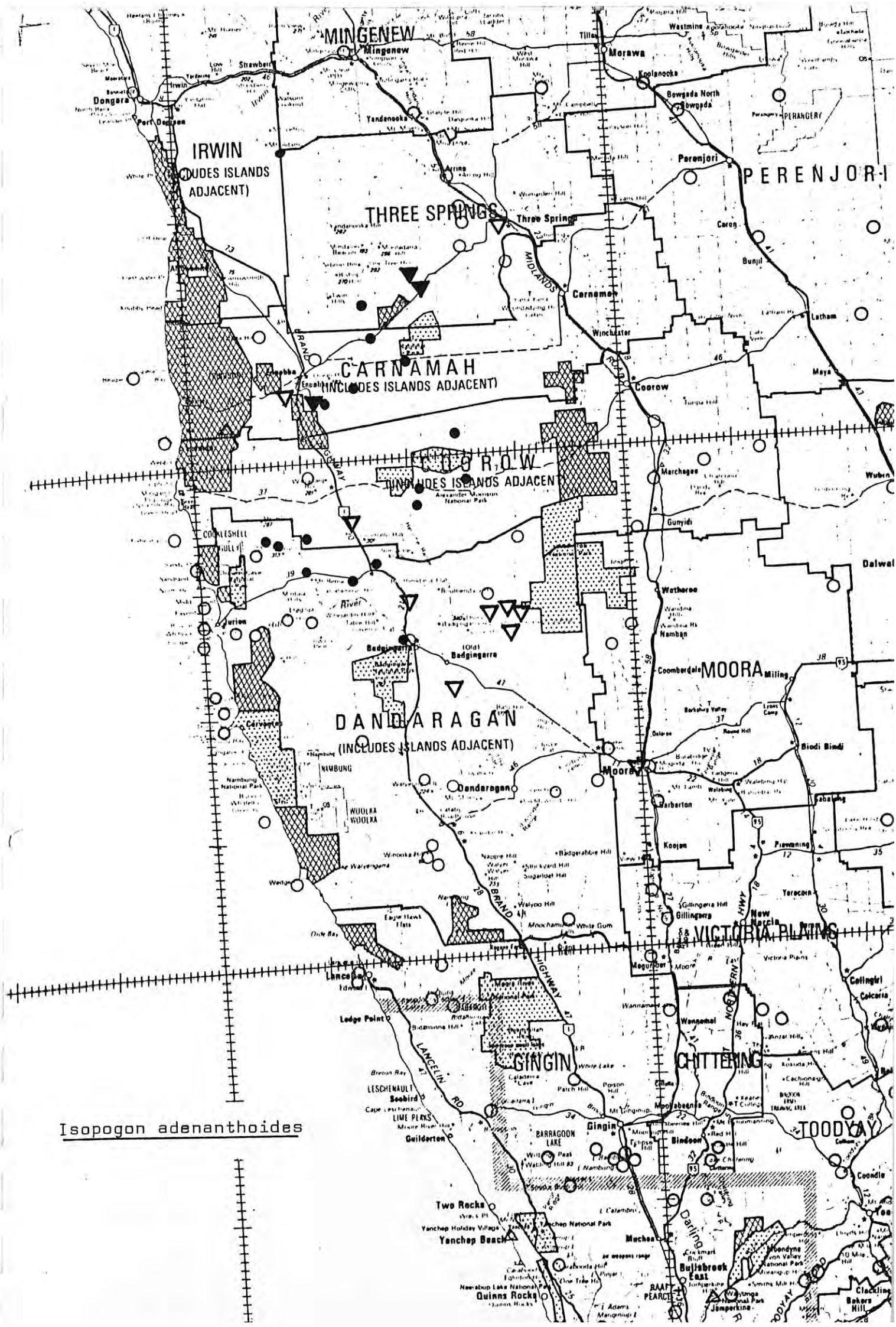
Isopogon adenanthoides Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 69 (1855)

+ Benth. Fl. Austral. 5: 343

13. **I. adenanthoides**, Meisn. in Hook. Kew Journ. vii. 69 and in DC. Prod. xiv. 278. A shrub with the aspect of an *Adenanthos* near *A. sericea* or of *Petrophila inconspicua*, the branches virgate, hirsute as well as the foliage with long fine spreading hairs. Leaves crowded, trifid, linear-terete, slender, acutely mucronate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Cones terminal, densely surrounded by the floral leaves, depressed-globular, 4 to 5 lines diameter without the perianths. Outer bracts ovate, acute, softly villous outside, passing into the cone-scales of which the inner ones are narrow from slightly spatulate to linear-acuminate. Perianth glabrous, about 1 in. long. Style-end long-clavate, densely papillose-pubescent, with a slight constriction under the pubescent bulbous base of the narrow tapering almost glabrous brush. Receptacle convex.—F. Muell. Fragm. vi. 241.

**W. Australia.** Hills west of Moore river, Drummond, 6th coll. n. 171.



Isopogon adenanthoides



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Isopogon adenanthoides* Meisn Family Proteaceae Date Recorded 4 5 81

Speci. NO.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Kangaroo Rd, NE Eneabba 29038'S 115°32'E	open heath, grey sand with occ latentic duricrust	7 9 79	Y	EAGriffin 2171
	43 km W of Watheroo	gravel	27 8 79	Y	H Demar 2, D7452
	158 m peg Eneabba Rd	sandy gravel	22 9 72	Y	H Demar 2 3937
	Three Springs WA		26 8 40	Y	W Blackall 4441
	23 m W of Watheroo	white sand	22 7 69	Y	M H Brooker 1915
	151 m peg Eneabba Rd	Sandy gravel	4 9 74	Y	H Demar 2 5132
	11 m S of turn off Eneabba Rd, Watheroo - Dinner Hill Rd		10 8 69	Y	H Demar 2 D1520
	Hill River		17 8 49	Y	C.A Gardner 9315
	Hill River	Sand heath, gravelly soil	24 8 48	Y	C.A Gardner 9063
	7 m N of Badgingarra Moora	sand, low scrub	19 6 61	Y	A S George 2605
	19 m SW of Three Springs	gravel	Sept 53	Y	? Kessel
	1/2 way between Watheroo Met station and Demar Hill (? Dinner Hill)		30 8 65	Y	K Newbey 2254
	Hill River	latentic hill	10 8 65	Y	A M Ashby 1598
	10 km SW of Eneabba	low open heath white sand over latentic	21 7 34	N	C.A Gardner
			9 7 77	Y	EAGriffin 917





Isopogon tridens F. Muell.

Fragm. Phyt. Austral. 6: 239 (1868)

+ Benth. Fl. Austral. 5: 342

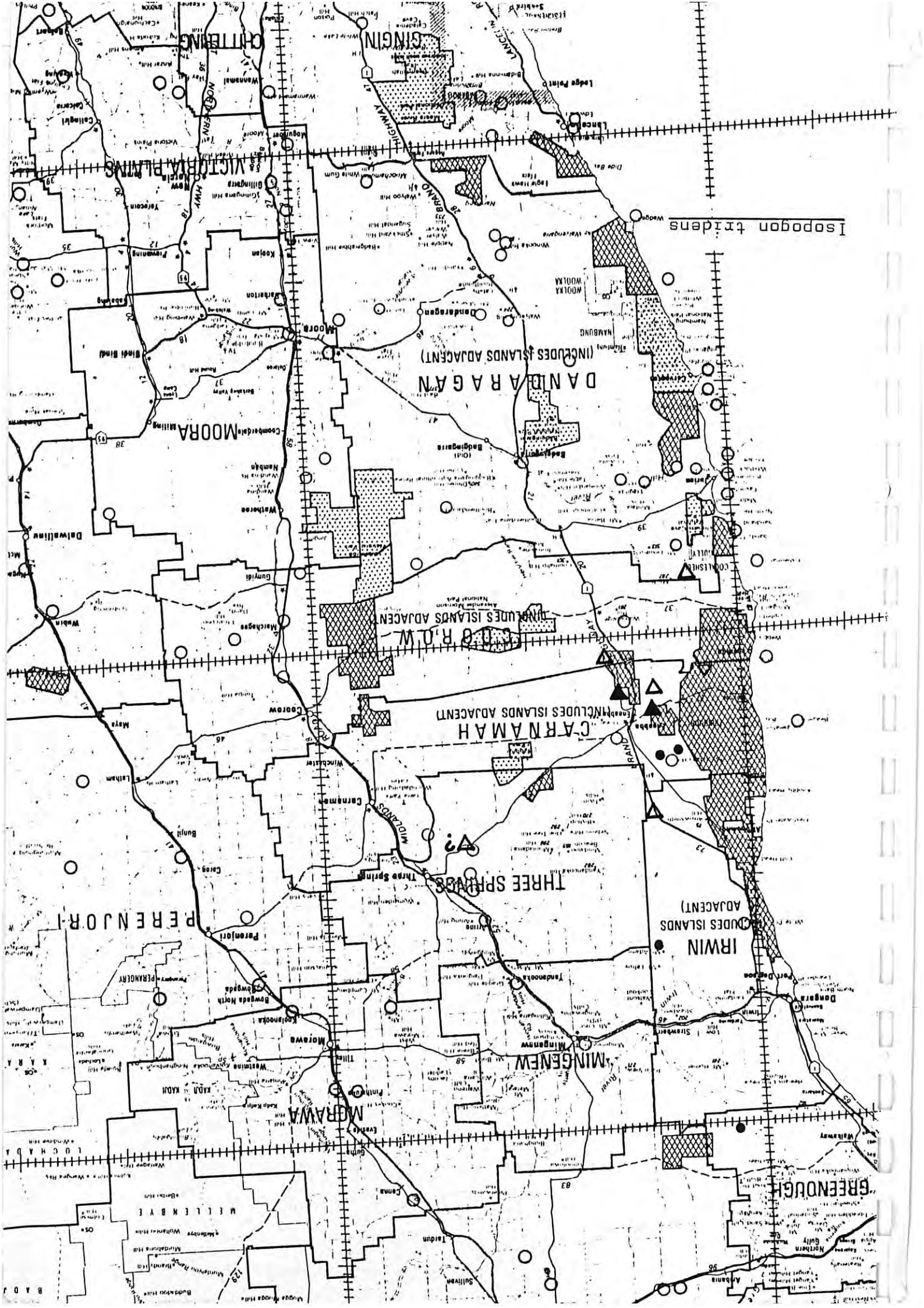
10. **I. tridens**, *F. Muell. Fragm.* vi. 239. A shrub with the habit and nearly the foliage of the shorter-lobed forms of *I. trilobus*, but a very different cone. Young shoots slightly pubescent, adult foliage and branches glabrous. Leaves narrow-cuneate, mostly 3-toothed, contracted into a rather long petiole, thick and obscurely veined, the whole leaf  $1\frac{1}{2}$  to 3 in. long. Cones terminal, sessile, depressed-globular, about  $\frac{3}{4}$  in. diameter without the perianths. Outer bracts broad, tomentose outside, numerous and closely imbricate, forming an involucre of  $\frac{1}{4}$  in. diameter. Cone-scales acuminate, the outer ones ovate-lanceolate, the inner ones narrow, all very densely villous on the back with long hairs, fulvous in the lower concealed portion, white on the exposed tips. Perianths not seen. Receptacle convex. Fruit of *Isopogon*.—*I. trilobus* var. *tridens*, Meissn. in Hook. Kew Journ. vii. 70 and in DC. Prod. xiv. 280.

**W. Australia.** Sandy plains near Diamond Spring, Moore river, Drummond, 6th coll. n. 170.

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Isoetes tridentata* F. Muell. Family *Protocera* Date Recorded 4.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Road Junction NE from Lake Logue	sand heath	27 8 48	Y (old)	CA Gardner 9111
	Near Arrowsmith crossing on S side of River, Dongara Rd		28 6 70	Y	AM Ashby 3251
	10m W of Three Springs	sand plain	1 11 74	N	J.S. Beard 7259
	SE of Lake Indoon Rd onto side rd	high shrubland	16 12 76	Y (old)	R.J. Thwaites 761427
	29°52'S 115°10'E				
	8km S of Eneabba 29°53'S lat 115°16'E long	coarse grey sand	27 4 78	N	RJ Thwaites 771544
<i>Isoetes</i>	Towards Diamond Springs				J. Drummond 170
	8km S of Eneabba 29°53'S lat 115°16'E	low open heath, sand over laterite	10 7 77	Y	EA Griffiths 881
	25km S of Eneabba		20 7 78	Y	RJ Scanfield 263



Jacksonia carduacea Meisn.

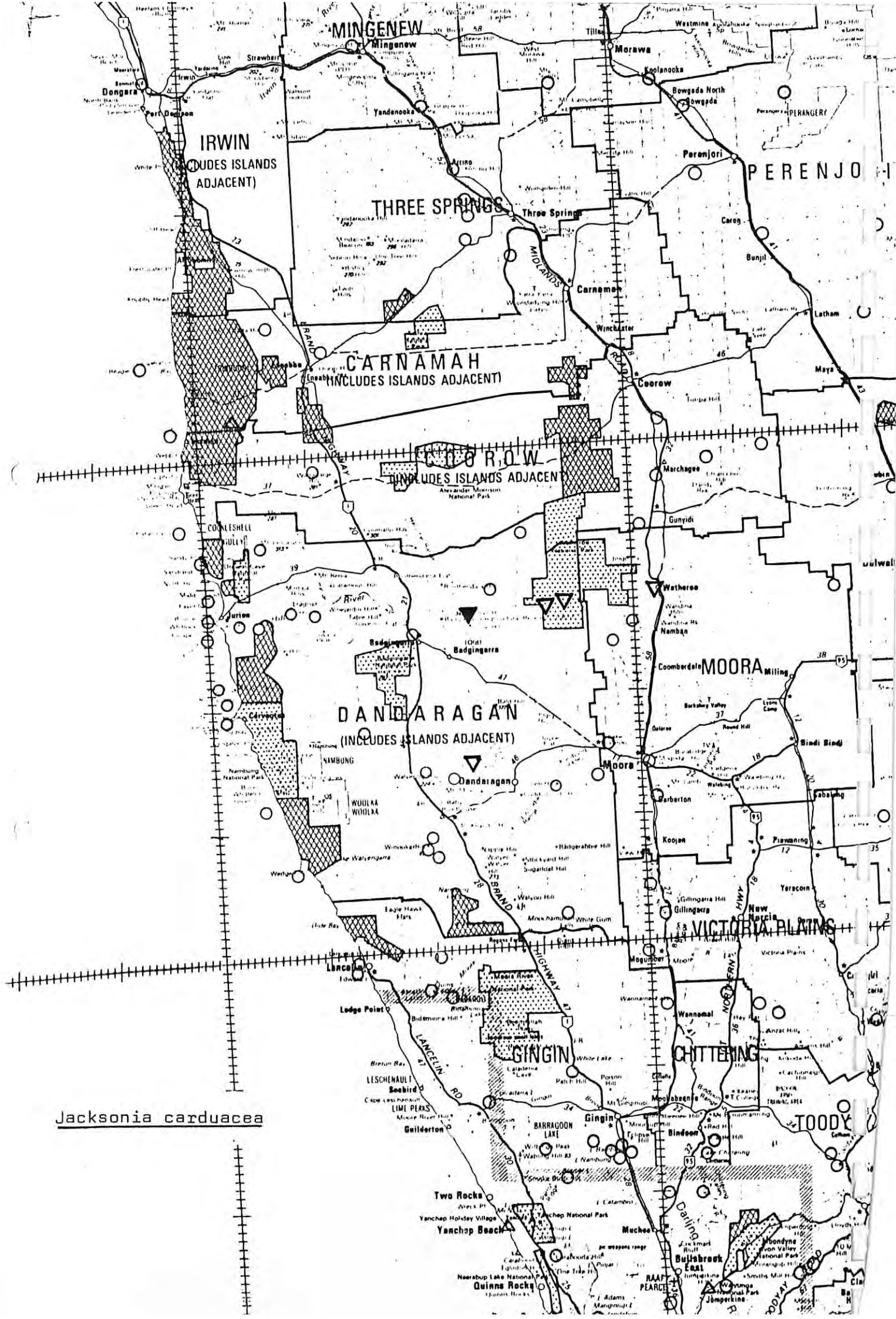
Bot. Zeitung (Berlin) 13: 25 (1855)

+ Benth. Fl. Austral. 2: 54

3. **J. carduacea**, *Meisn. in Bot. Zeit.* 1855, 25. An erect shrub with virgate clustered branches, angular or somewhat compressed, silky or softly villous. Burren phyllodineous branchlets numerous, flat, sessile, cuneate-oblong,  $\frac{1}{2}$  to 1 in. long, prickly-toothed or sometimes forked, thick, usually 3-nerved, glabrous or silky-pubescent. Flowers in terminal heads within the uppermost phyllodineous branchlets and shorter than them. Pedicels very short. Bracts and bracteoles subulate-acuminate. Calyx about  $\frac{1}{2}$  in. long, loosely clothed with long silky hairs, the lobes with long subulate points. Petals nearly equal in length, shorter than the calyx. Ovary very shortly stipitate. Pod not seen.

**W. Australia.** Between Moore and Murchison rivers, *Drummond, 6th Coll. n. 14.*





Jacksonia carduacea

A. AS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Jacksonia cordata* Meisn. Family Leguminosae Date Recorded 8 5 81  
 \* not seen

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Watheroo	Sandy soil	4 11 54	Y	R Royce 4951
	Watheroo		Nov 67	N	C Chapman esn
	Strathmore Rd Reserve 26248 Sof Badgingarra 30°34'S 115°21'E	Sandy clay, low heath	5 11 75	Y	A S George 14201
	20 m from Watheroo, Badgingarra Rd		Sept Oct 62	Y	Dr B Smith
	Between Watheroo & Dinner Hill		Aug 68	Y old	J Drummond 14
	Dinner Hill		14 12 62	Y	C A Gardner
	Dinner Hill	Gravel heath	11. 1. 63	Y	F Lullfitz sn F Lullfitz sn J Drummond VI 14

\* type \*

*Jacksonia eremodendron* E. Pritzel

+ in Diels & E. Pritzel, Bot. Jahrb. Syst. 35: 239-240 (1905)

*Jacksonia eremodendron* E. Pritzel n. sp. — Fig. 30 A—E.

Fruticosa vel arborea floribus exceptis subglabra, pallide-viridis, ramis nuatis, horizontalibus, patentibus, margine undulatis, grosse dentatis, sed inter dentibus nunquam incisus, dentibus in speciminibus junioribus acute pungentibus, in phyllocladiis superioribus ac speciminum adultorum obtusioribus floriferis, rigidissimis, nervo medio prominente, minute prominenter reticulatis, apice obtusis vel subtruncatis.

Floribus in dentibus solitariis pedunculatis, pedunculis calycem subaequantibus; calyce profunde 5-aequilobo, lobis valvatis late linearibus acuminate, extus cum pedunculo brevissime sericeis, petalis calycem subaequantibus, ovario stipitato dense sericeo pubescente; legumine breviter stipitato marginibus exceptis subglabro, conspicue sed non prominenter reticulato, ovato.

Frutex vel arbuscula usque ad 3 m altus. Phyllocladia speciminum adultorum ca. 6—7 cm longa, 12—15 mm lata, dentibus ca. 5 mm inter se distantibus; in speciminibus junioribus phyllocladia usque ad 20 cm longa sed vix latiora. Pedunculus — 7 mm longus, calyx ca. 8 mm longus (apertus), ovarii stipes 4 mm. Legumen maturum 7—10 mm longum, 4 mm latum.

Hab. in distr. Irwin meridionali in fruticetis apertis arenosis prope Watheroo, flor. et fruct. m. Dec. et Jan. (D. 2092, E. PRITZEL Pl. Austr. occid. n. 983) prope Coorow (haud longe septentrionem versus) D. 2092, specimina juniora sterilia.

Species affinis *J. grevilleoides* Turcz., differt phyllocladiis nunquam incisus minute sed prominenter reticulatis, legumine calycem superante, pedunculis calyci subaequilongis. Etiam statione ab illa *J. grevilleoides* quae in regionibus australioribus distr. Stirling sita longe distat. Phyllocladiis *J. floribundae* similis.



Fig. 30. A—E *Jacksonia eremodendron* E. Pritzel: A Habitus. B Calyx defloratus. C Ovarium dissectum. D Ovulum. E Fructus novellus.









Lechenaultia juncea E.Pritzel

+ in Diels & E.Pritzel, Bot. Jahrb. Syst. 35: 553 (1905)

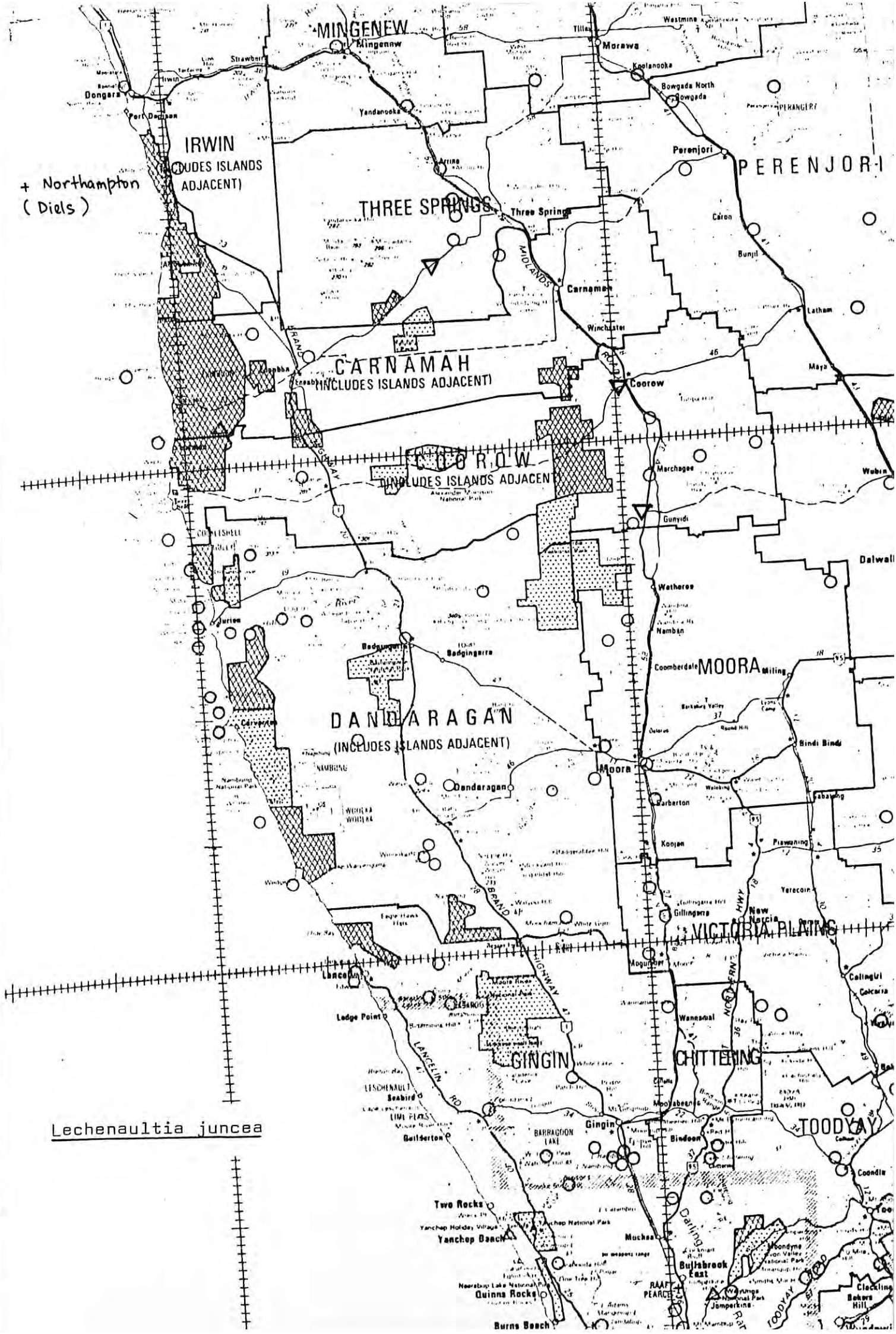
*Lechenaultia juncea* E. Pritzel n. sp.

Planta aphylla, caulibus e basi communi plurimis pauciramosis junciformibus teretibus vel minutissime striatis, glabris vel basibus et radicibus extus suberosis; floribus paucis majusculis, ovario lineari a pedunculo haud distincto, calycis lobis supra ovarium liberis angustissime linearibus; corolla conspicua pallescenti-coerulea, lobis tribus inferioribus supra medium connatis late alatis, alis transversaliter nervosis, lobis 2 inferioribus cum aliis infra medium connatis sed vix brevioribus, linearibus vel angustissime alatis, tubo intus piloso.

Planta usque ad 40 cm alta. Ovarium ca. 4—4,5 cm longum, calycis lobi ca. 5 mm longi, corolla ca. 4,2—4,5 cm longa.

Hab. in distr. Irwin in fruticetis arenosis pr. Watheroo Dec. flor. (E. PRITZEL Pl. Austr. occ. 982); et in locis similibus pr. Northampton flor. m. Nov. (D. 5636).

Species floribus *L. heteromeræ* Benth. similis, sed valde differt habitu junciformi, foliis bracteolisque nullis, calycis lobis angustioribus.



ATL ; OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Lechenaultia juncea* E.Pritzl Family *Goodeniaceae* Date Recorded 5.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Coorow		Sept 1940	Y	C.A. Gardner
	Gungahlin	In sandy gravel	13.12.62	Y	F. Lullfitz 61885
? type	14m SW of Three Springs	"Sandy shrubbery"	10.12.61	Y	AS George 3225
x	Northampton				E Pritzl 982
					Düls 5636



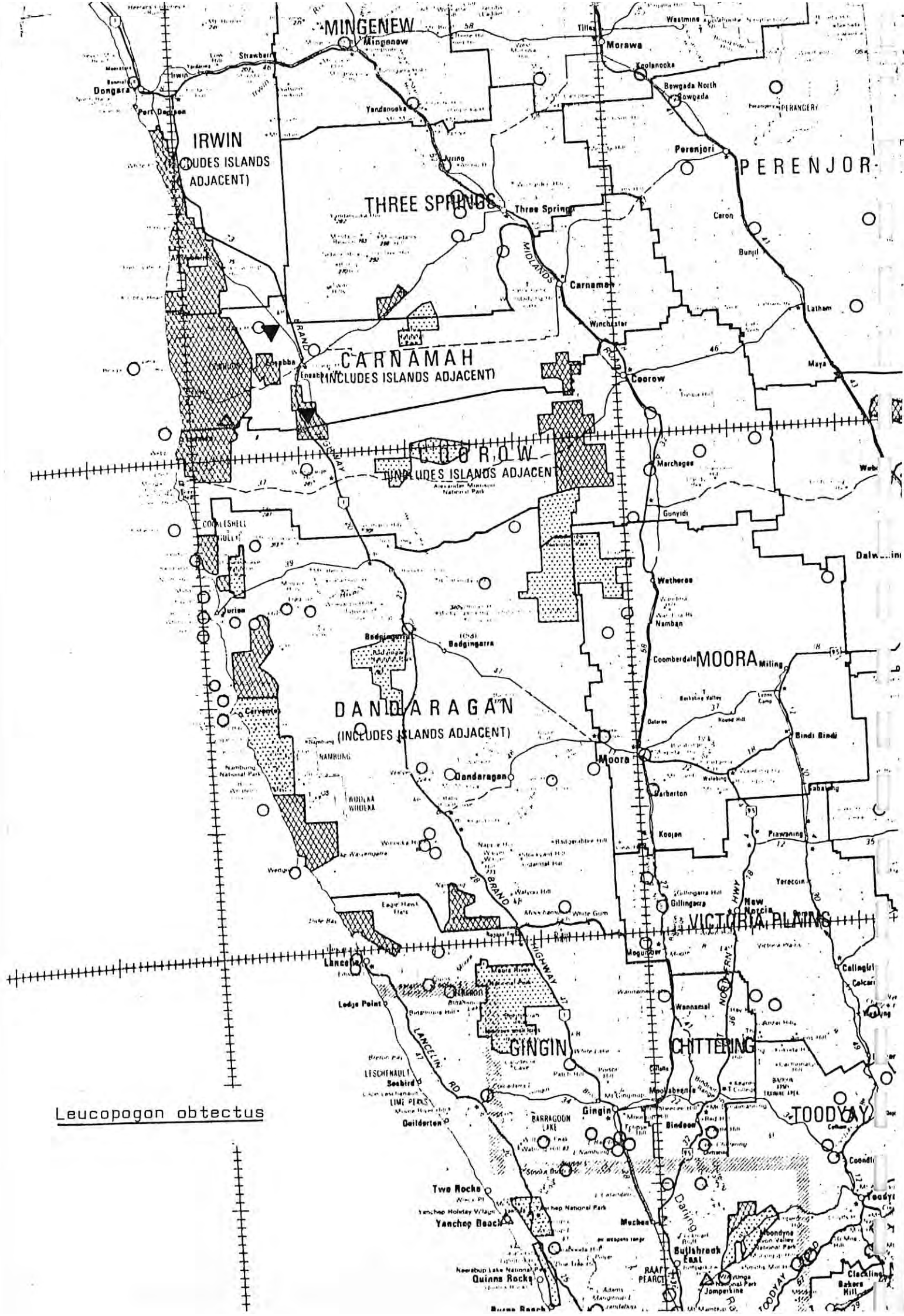
Leucopogon obtectus Benth.

+ Fl. Austral. 4: 223 (1869)

see also Rye & Hopper (1981) p 148

112. **L. obtectus**, *Benth.* A shrub of 1 to 2 ft. or perhaps more, with few long, erect branches completely covered by the glaucous foliage. Leaves broadly cordate-ovate or orbicular, mucronate, rigid, concave, erect, imbricate, 4 to 6 lines diameter. Peduncles axillary, very short, bearing 2 to 3 flowers not exceeding the leaves. Bracts small; bracteoles not half so long as the calyx, broad, mucronate. Sepals nearly 2 lines long, lanceolate, acute. Corolla-tube nearly as long as the calyx; lobes rather shorter. Anthers linear, attached above the middle or near the top, obtuse, without sterile tips. Hypogynous disk deeply lobed or separating into distinct scales. Ovary 5-celled.

**W. Australia.** Between Moore and Murchison rivers, *Drummond, 6th Coll. n. 125.*



Leucopogon obtectus



Leucopogon oliganthus E. Pritzel  
+ in Diels & E. Pritzel, Bot. Jahrb. Syst. 35: 474 (1904)

**Leucopogon oliganthus** E. Pritzel n. sp.

Fruticulus erectus ramis elongatis ramulis brevissimis dense foliatis, axibus junioribus ac foliis breviter pubescentibus; foliis lanceolatis acutis supra convexis, infra ca. 6-nerviis, imbricatis; floribus ca. 2—5 ramulos terminantibus inter folia fere obtectis, sed conspicuis; bracteis sepalis triplo brevioribus, carinatis, lateraliter compressis; sepalis longe ellipticis obtusis scariosis corollae tubum superantibus; corollae lobis quam tubus duplo longioribus, longe barbatis; ovario 2-loculari, stylo brevissimo.

Frutex, ca. 40—60 cm altus, ramuli ad 4—4,5 cm longi. Folia 7—10 mm longa, ca. 2 mm lata; flores ca. 6—7 mm longi, bracteolae ca. 4 mm longae, sepala ca. 3 mm longae, 4 mm latae, corollae pila ca. 4 mm longa.

Hab. in distr. Avon septentrionali inter Moora et Dandaragan, in fruticetis apertis arenosis, flor. m. Jun. (E. PRITZEL Pl. Austr. occ. 388, D. 3304).

Species sectionis I. seriei VI. *Concurvae* Fl. Austr. addenda videtur. Structura florum et foliis majusculis firmisque et vestimento *L. gnaphalioidi* similis, differt foliis acutis, ramulis abbreviatis, inflorescentiis paucifloris, sepalis latioribus obtusis.





**GREENOUGH**

**MINGENEW**

**MORAWA**

**IRWIN**

**THREE SPRINGS**

**PERENJORI**

**CARNAMAH**

**COOROW**

**DANDARAGAN**

**MOORA**

Leucopogon oliganthus

**VICTORIA PLAINS**

**GINGIN**

**CHITTERING**

A. AS OF THE WESTERN AUSTRALIAN F. JRA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Leucopogon oliganthus* E.Pritzl Family *Epacridaceae* Date Recorded 8.6.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	West of Moora Burma Rd Mogumber	among <i>E. acedens</i> , <i>E. redunca</i> + <i>E. callophylla</i>	June 1901 22.6.65 16.7.57	Y Y Y	Dielst + E.Pritzl 402 AC Burns 8 AHPopplewell
	West of Moora Dandaragan Mogumber		June 1901 July 1920 Aug 1930	Y Y Y	Dielst + E.Pritzl 459 CAGardner 465 WEBleckell sn.

Leucopogon plumuliflorus F. Muell.

Fragm. Phyt. Austral. 6: 29-30 (1867)

+ Benth. Fl. Austral.

59. **L. plumuliflorus**, F. Muell. *Fragm.* vi. 29. A weak shrub of 1 to 2 ft., the branches and foliage more or less pubescent and hirsute with rigid hairs. Leaves broadly ovate-cordate, very obtuse or with a minute callous recurved point, convex with recurved margins, under  $\frac{1}{2}$  in. long. Spikes solitary, terminal, contracted into an almost globular plumose head. Bracts small, ovate, membranous; bracteoles ovate-lanceolate, acute,  $\frac{3}{4}$  line long, ciliate-hirsute. Sepals  $2\frac{1}{2}$  lines long, the lower part lanceolate, the rest narrow-linear and plumose-hirsute. Corolla nearly  $1\frac{1}{2}$  lines long, the lobes shorter than the tube. Anthers oblong, attached near the top, emarginate, without sterile tips. Hypogynous disk lobed. Ovary 2-celled; style very short.—*Styphelia plumuliflora*, F. Muell. *Fragm.* vi. 29.

**W. Australia.** Between Moore and Murchison rivers, *Drummond*, 6th Coll. n. 122.













Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *L. leucopogon* *phymuliflorus* F. Muell Family *Epacridaceae* Date Recorded ... 5.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Summit of Mt Lesueur		Feb. 40	Y (old)	CA Gardner
	Nth of Mt Lesueur		9. 3. 78	old	R. J. Cranfield 1238
	Jurien Bay	Sandy soil	3. 11. 62	Y	R. D. Royce, 7712
	Cockleshell gully		25 8 38	Y	WE Blackall 3617
	Mt Lesueur		23. 9. 62	Y	WS Beard
	Mt Lesueur	Stony soil	16. 10. 46	Y	CA Gardner 8462
	Mt Lesueur		25. 8. 48	Y	CA Gardner 9261
	Between Mt Lesueur & Cockleshell gully		25 8 38	Y	WE Blackall 3617
	Mt Lesueur		12 10. 51	Y	CA Gardner 10582
	Cockleshell gully	low open heath, grey sandy sandstone gravel, slope of mesa	10. 11. 79	Y	EA Griffiñ 2508
	Mt Lesueur	low open heath, grey sand and lateritic gravel slope of mesa	23. 9. 79	Y	EA Griffiñ 2342
	Mt Lesueur	heath on laterite	16 9 76	Y	J. S. Beard 7825
	Between Moore and Marchison Rivers		1853	Y	J. Drummond VI 1853
	Mt Lesueur	open heath shallow grey sand over lateritic duricrust	17 7 79	N	EA Griffiñ 1879
	Hill, 1 km N of Mt Lesueur	low open heath, shallow grey sand amongst boulders, slope of mesa	27 8 79	Y	EA Griffiñ 2000

Myriocephalus suffructicosus Benth.

+ Fl. Austral. 3: 559-560 (1867)

Shrubby at the base, the branches white with a close cotton, the flowering ones simple, erect, above 1 ft long. Leaves linear or linear-lanceolate, half stem-clasping, somewhat coriaceous

with a close cotton, the flowering ones simple, erect, above 1 ft. long. Leaves linear or linear-lanceolate, half stem-clasping, somewhat coriaceous with revolute margins, the larger ones above 1 in. long, the upper ones small and distinct. Clusters of flower-heads hemispherical,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter. General involucre of very numerous bracts in many rows, a few small narrow herbaceous and woolly, all the others with white obovate spreading laminae 1 to  $1\frac{1}{2}$  lines long, forming a very conspicuous ray to the clusters. Partial heads mostly 2-flowered, the involucre bracts about 5 or 6 besides the subtending one, usually very narrow without scarious margins. Achenes glabrous or nearly so, but as well as the whole partial flower-heads, apparently glutinous. Pappus of several exceedingly fine bristles, nearly as long as the corolla, simple but bearing usually at their tips 1 to 4 little globular transparent bodies (glands?).

**W. Australia.** Between Moore and Murchison rivers, Drummond, 6th Coll. n. 153.





Myriocephalus suffructosa



Petrophile chrysantha Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 68 (1855)

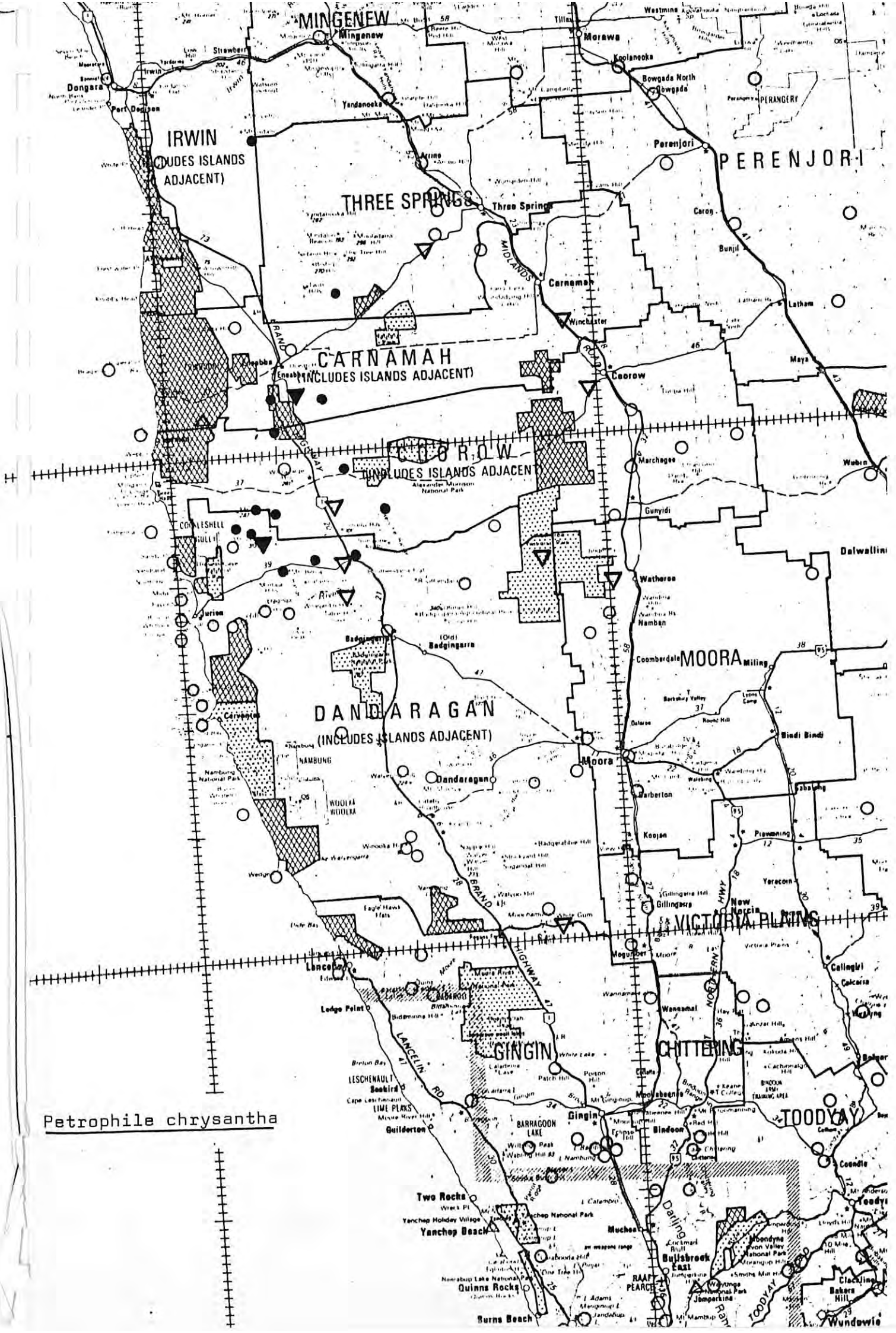
+ Benth. Fl. Austral. 5: 331-332

23. **P. chrysantha**, Meisn. in Hook. Kew Journ. vii. 68, and in DC. Prod. xiv. 271. A shrub of 2 or 3 ft., with erect branches, the young shoots tomentose-pubescent and sprinkled with long fine hairs, becoming at length nearly glabrous. Leaves short and crowded along the branches, simply pinnate, with terete pungent-pointed segments grooved above, the lowest pair proceeding from near the base of the petiole, the whole leaf not exceeding  $\frac{3}{4}$  in. Cones terminal, sessile, ovoid, 3 to 4 lines diameter without the perianths. Outer bracts broad, obtuse or with minute points, imbricate, glabrous except the ciliate margins; outer cone-scales similar, the inner ones gradually narrower, more concave, hirsute outside with long hairs, glabrous inside. Perianths about 5 lines long, very densely hirsute with yellow or fulvous hairs, the segments falling off separately. Style-end continuous, fusiform, at first bearing a few reflexed hairs, but at length nearly glabrous. Nuts expanded in the upper part into 2 flat truncate wings, 2 lines long and  $1\frac{1}{2}$  lines broad, densely comose at the base, the remainder hirsute with short hairs.

W. Australia. Between Moore + Murchison Rivers Drummond  
VI Coll, no. 165; Near Dandaroga Oldfield

Note : The inland specimens (between Marchagee & Three Springs) appear different from the Type and other specimens. The inland entity may prove to be a new variety or species.





Petrophile chrysantha



A. GAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Petrophile chrysantha* M. L. S. n. .... Family *Proteaceae* ..... Date Recorded 8. 5. 81 .....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
Isotype	Mt Lesueur, Slope			Y (old)	NH Speck
	Mogumber to Regans Ford		21 8 65	Y	F Humphreys
	12 m SW of Three Springs		30 8 65	Y	K Newbey 2250
	Moore River		Aug 1901	Y	Drummond 17165
	15 m E of Mt Peron		26 8 1949	Y	CA Gardner sn.
	17 m NW of Badgerin garra	on slope below latentia breakaway	13 8 65	Y	AS George 6758
	Hill River	Latentia hill		Y buds	CA Gardner 9070
	W of Watheroo	Sand	Sept 53	Y buds	A Kessel
	Watheroo N.P., SW Corner	Sand	24 7 69	Y	KM Allan 57
	Jurien Bay Rd, 120 m N of Perth		6 10 71	Y (old)	RD Royce 9617
WWA	7 km SSE of Eneabba 29° 52' S 115° 19' E	gravelly soil, low open heath under open woodland	29 8 38	Y	W Blackall 3679
	W of Coorow, Coorow Reserve		4 8 77	Y	E A Griffini 994
	Winchester		30 7 67	Y	C Chapman sn.
			24 7 71	Y	M Blackwell sn.

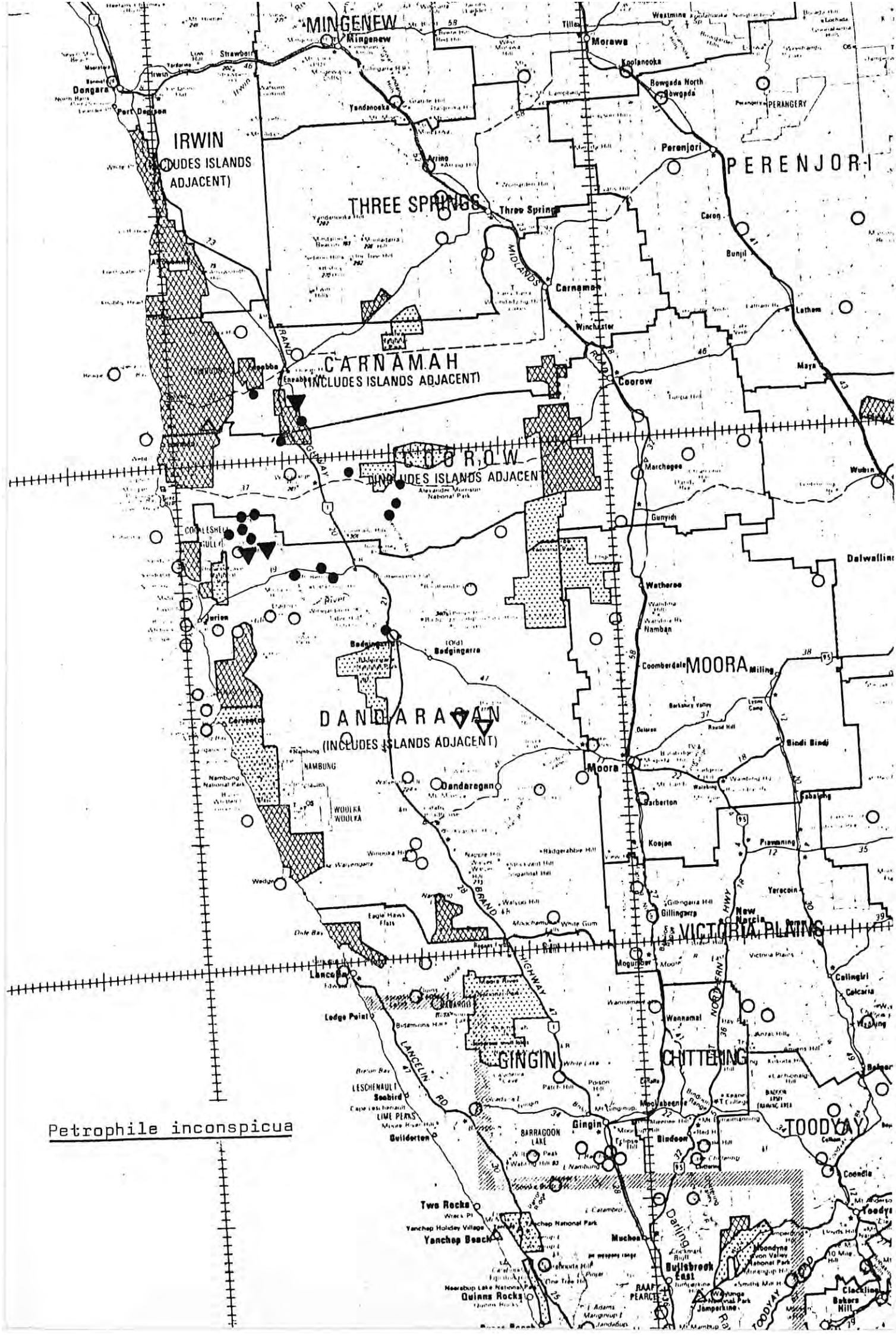
Petrophile inconspicua Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 68 (1855)

+ Benth. Fl. Austral. 5: 327

14. **P. inconspicua**, Meissn. in Hook. Kew Journ. vii. 68, and in DC. Prod. xiv. 272. A shrub with the aspect almost of an *Adenanthos* or of *Isopogon adenanthoides*, the young shoots tomentose-pubescent and sprinkled with long fine spreading hairs. Leaves short, crowded, pinnate with compact narrow terete segments, grooved on the upper side, minutely pointed but not pungent, the whole leaf about  $\frac{1}{2}$  in. long. Cones in our specimens crowded in leafy tufts at the ends of the branches, but all in an advanced state, the outer bracts apparently fallen off. Cone-scales linear or lanceolate, thin and flat, villous outside. Perianth very slender, hirsute, nearly 1 in. long, the tube falling off entire except the lower glabrous portion which is more persistent as in *Isopogon*. Style-end continuous, fusiform, slightly thickened at the base, and hirsute with a few reflexed hairs disappearing after the flowering is over. Nut, according to Meissner, nearly flat, oval, with a short obtuse terminal wing, glabrous with ciliolate margins. I have only found young fruits which appeared to me to be comose all over, as in *Isopogon*.

**W. Australia.** Between Moore and Murchison rivers, Drummond, 6th coll. n. 172. This species has so much of the character of *Isopogon*, that I should at once have transferred it to that genus were it not for the uncertainty which prevails about the shape and indumentum of the nut, besides that the style is much more that of the section *Serruriodes* of *Petrophila* than of *Isopogon adenanthoides*, which is the nearest to the present species in *Isopogon*.



Petrophile inconspicua

ATL 3 OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Petrophile inconspicua* Meisn. Family Proteaceae Date Recorded 5.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	9 m N of Dandaragan		19 8 49	Y	CAGardner 9281
	9 m N of Dandaragan		24 8 48	Y	CAGardner 9012
	7 km S of Enagba 29°53'S 115°16'E	low open heath, white sand over pissolitic gravel	10 7 77	Y	EAGriffin. 863
	Hill River		July 63	Y	<sup>CA</sup> ? Gardner 12113
	3 m SW of Mt Lesueur	stony sandy hill	24 7 69	Y	MIHBrooker 1942
	Turbin Bay Rd		29 8 38	N	WEBlackall 3682
	near Mt Lesueur		22 7 62	Y	CAGardner 13928
	Hill River	lateritic hills	July 43	Y	CAGardner
	on Dandaragan Badgingarra Rd		28 8 65	Y	Fw Humphreys
K.P.	Enagba area		15.7.71	Y	F.W Humphreys
W.A.	Mt Lesueur			Y (old)	NH Speck SH
W.A.	Between Dandaragan and Badgingarra	clay	Aug 67	Y	A Simper S
Isotype	Between Moore + Murchison Rivers			N	J Drummond VI 172



Phlebocarya

Phlebocarya pilosissima F. Muell. ex Benth.

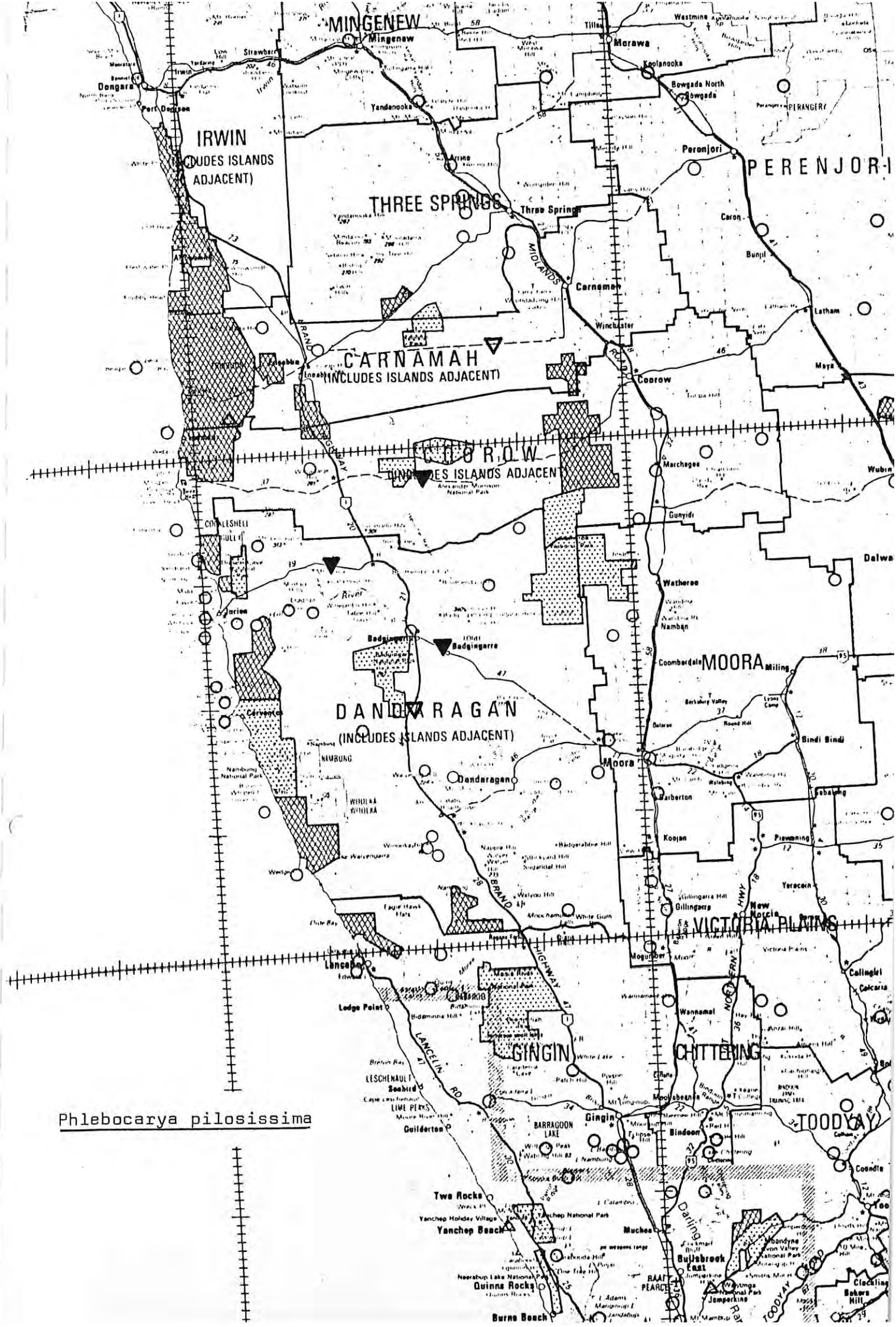
+ Fl. Austral. 6: 425 (1873)

2. **P. pilosissima**, *F. Muell. Fragm.* viii. 23 (as a var. of *P. ciliata*).

Leaves erect, rigid, mostly under 1 ft. long, flattened but under 1 line broad, striate, with long hairs on the sides as well as on the margins. Stems short, the panicle rather loose and hairy. Bracts linear-subulate. Flowers about 2 lines long, the segments narrow but obtuse. Anther-connective produced beyond the cells but not so much so as in *P. filifolia*. Ovary in the flowers examined completely 3-celled, but the dissepiments very thin and readily disappearing as the flower withers.

**W. Australia**, *Drummond*.

Note: This species is very similar to *P. filifolia* of which it may prove to be a varient.



*Phlebotomus pilosissimus*



Physopsis spicata Turcz.

Bull. Soc. Nat. Mosc. 22/2: 35 (1849)

+ Benth. Fl. Austral.

see also Erickson et al p. 108

#### 6. **PHYSOPSIS**, Turczan.

Calyx tubular, 4-toothed. Corolla-tube short, cylindrical, the limb of 4 nearly equal spreading lobes. Stamens 4, included in the tube; anthers without appendages. Ovary 2-celled, with 2 ovules in each cell, laterally attached above the middle, but usually only 1 ovule perfect. Style slender, very shortly 2-lobed. Fruit dry, enclosed in the calyx, often reduced to a single cell and seed.—Woolly shrub. Leaves scattered, undivided. Flowers small, opposite and sessile, in a dense woolly spike, each one within a small bract.

The genus consists of a single species endemic in Australia, differing from *Mallophora* chiefly in inflorescence.

1. **P. spicata**, Turcz. in Bull. Soc. Imp. Nat. Mosc. 1849, ii. 35. An erect shrub, with rather stout woolly-tomentose virgate branches. Leaves scattered or irregularly opposite, sessile, oblong, obtuse, with recurved margins, narrowed at the base, rarely exceeding  $\frac{1}{2}$  in., glabrous or slightly scabrous and nerveless on the upper side, cottony-white underneath. Spikes dense, either solitary or clustered at the ends of the branches, usually 1 to  $1\frac{1}{2}$  in. long, each flower sessile within a linear bract, which is glabrous inside, woolly outside, and very deciduous. Calyx enveloped in cottony-wool forming an ovoid mass about 3 lines long, the calyx itself, when stripped of its wool nearly tubular and very shortly 4-toothed. Corolla-tube scarcely exceeding the calyx, slightly thickened inside at the throat, the lobes broad and obtuse. Stamens inserted above the middle of the tube, the filaments very short. Ovary glabrous, inserted on a disk, in the very young bud completely 2-celled with 2 ovules in each cell, but at the time of flowering usually very oblique with only one perfect ovule.

**W. Australia**, Drummond, 4th coll. n. 284.





ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon: *Physopsis spicata* Turcz. Family: *Chloranthaceae* Date Recorded: 25.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	West of Moora	Sand plain	30.11.61	Y	T.E. Aplin 1304
	East of Hill River	Sand heaths	15.1.31	Fruit	C.A. Gardner sn
	in arenosis apertis, interflumen Arrowsmith et Coorow		Nov 1968	Y	C.A. Gardner, sn
	Hill River		30 9 60	Y	C.A. Gardner 12781
	152 m peg, Eneabba Rd		7 2 74	Y	H. Demar 5059
	probe Mt Arrowsmith		Nov 1937	Y	C.A. Gardner sn
	37 m W of Coorow on Rd to Eneabba		7 11 70	Y	H. Demar 2934
	Dinner Hill, 35 m W of Weatheros	sandy soil	4 11 75	Y	R.D. Royce 4981
	147 m peg on Eneabba Rd		1 10 68	Y	A.C. Burns 83
	East of Badgingarra		4 11 66	Y	A.M. Ashby 2041
	150 m N of Perth on Rd to Eneabba	on Sand heath	17 10 69	Y	A.S. George 9797
	in arenosis flumen Hill		Nov 1962	Y	C.A. Gardner sn.
	30 km S of Eneabba (150 m Eneabba Rd)		19 11 68	Y	H. Demar 752
	1 m E on McNamee Rd off Brand Hwy	gravel soil	19 7 78	Y (early)	R.J. Cranfield 242
	3028'S 115°30'E				
	Intersection Brand Hwy, Coorow-Green Head Rd	heath, sand over laterite	24 1. 79	Y	B. Barnsley 864
	Hill River District			Y	A.S. George sn



Pityrodia viscida W.V.Fitzg.

† J. W. Austral. Nat Hist. Soc. No 1: 30 (1904)

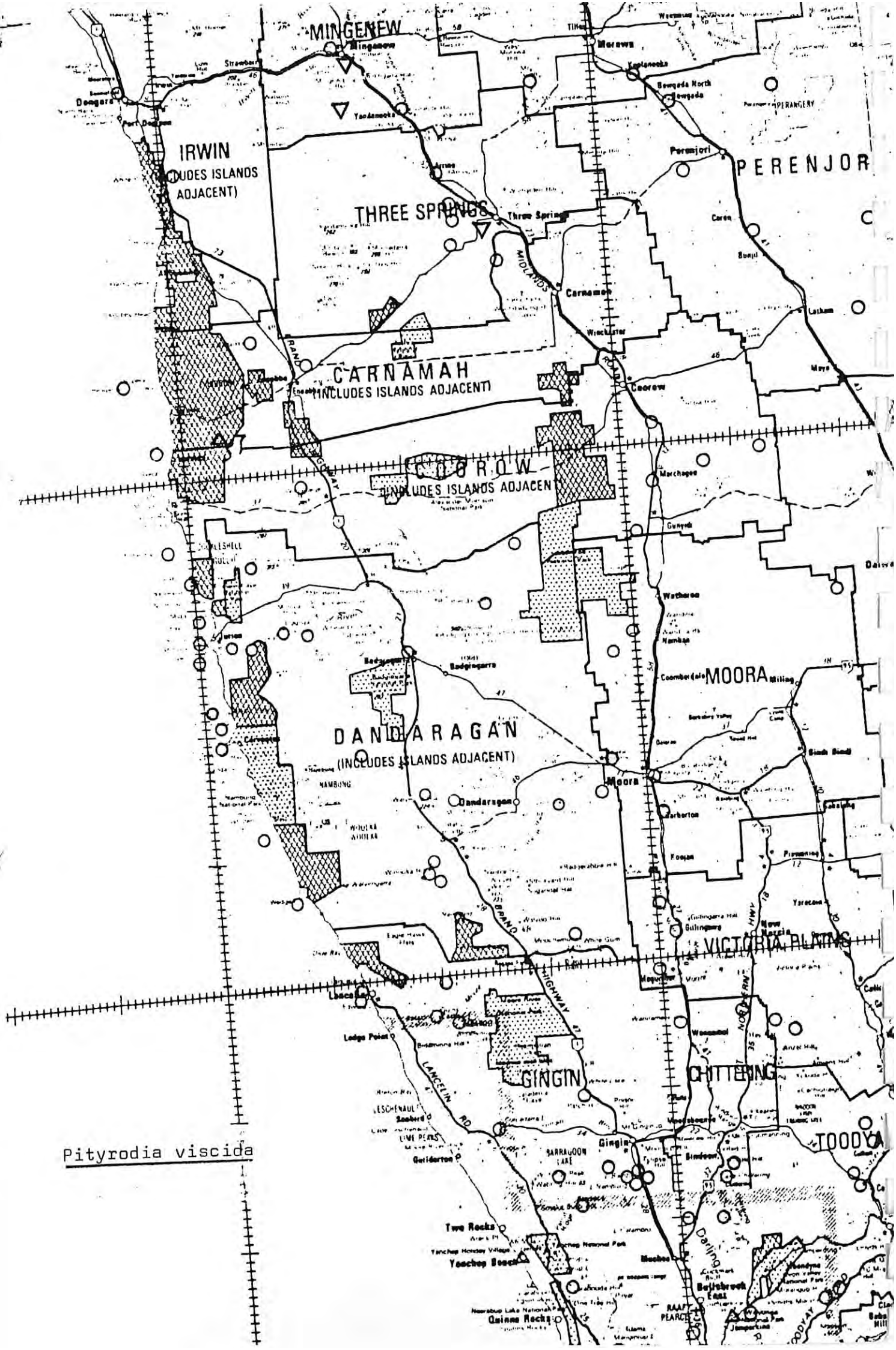
**PITYRODIA VISCIDA, Sp. nov.—**

An erect or diffuse shrub of 1-1½ feet high, with numerous twiggy branches, closely invested with a short dingy viscid pubescence. Leaves mostly opposite, shortly petiolate, obovate to elliptical, obtuse, 3-4 lines long, flat or with slightly recurved margins, glabrous and viscid above, white-tomentose beneath. Flowers few, almost sessile and solitary in the upper axils, subtended by 2 linear bracteoles. Calyx about 3 lines long, the lobes 3-nerved, lanceolate, acuminate, twice as long as the turbinate tube, viscid, hirsute. Corolla white, 5-6 lines long, glabrous without, the white woolly hairs below the insertion of the filaments copious; tube short and broad; lobes rather broad, the lowest middle lobes 3 times longer and broader than the others. Anthers scarcely exerted, shortly appendiculate. Ovary glabrous and slightly reticulated in the lower half, the upper portion densely invested with a white furluraceous tomentum; ovules nearly sessile, attached at or near the top; style glabrous and slender, hooked at the extremity, conspicuously bilobed.

*Locality.*—Arrino, sand plain, Sept. 1903.—W. V. F.

*Remarks.*—From its nearest ally, *P. (Chloanthes) hemigenioides*, F. v. M., the new species is distinguished by the viscid pubescence, obovate leaves and semi-glabrous ovary.





Pityrodia viscida

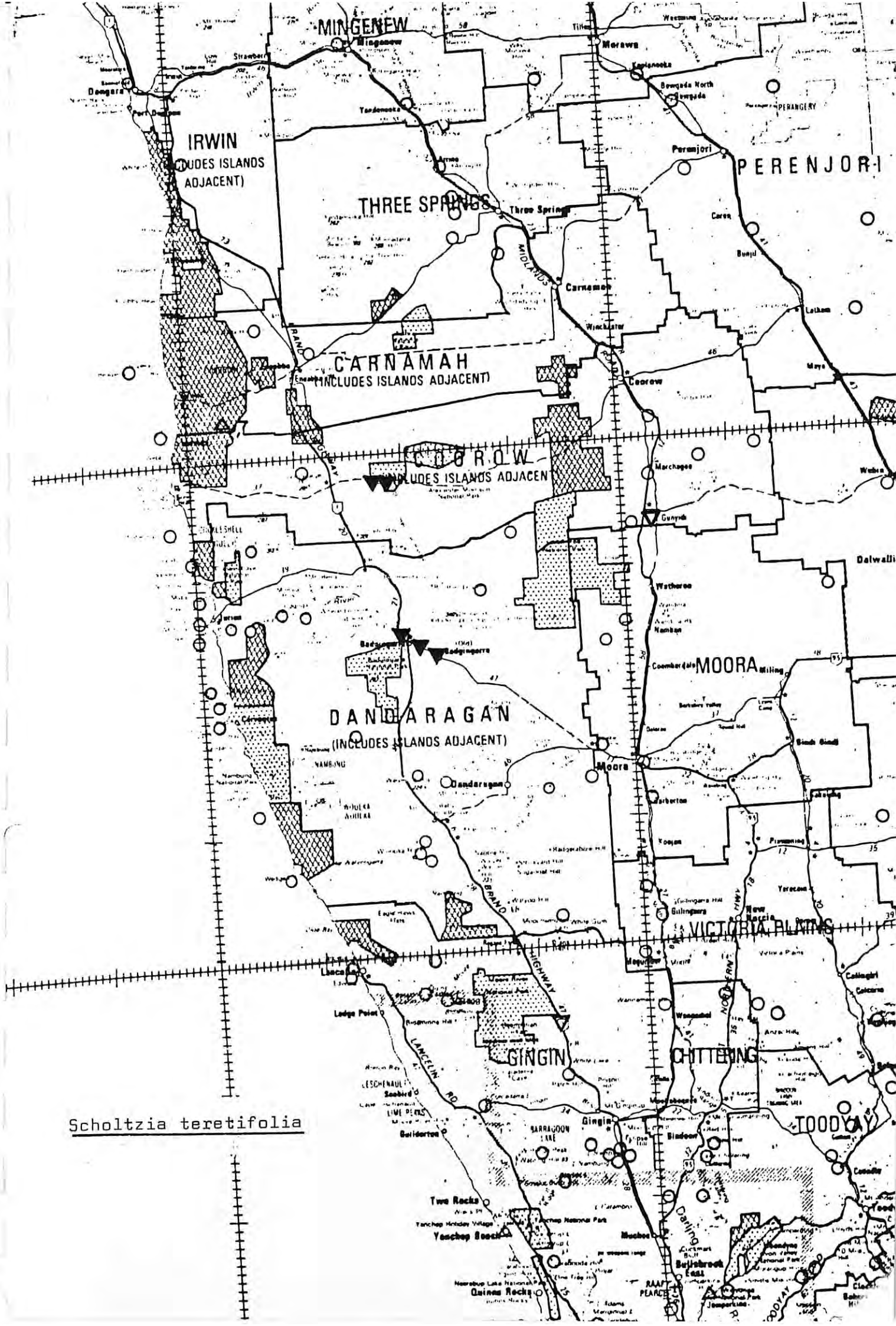


Scholtzia teretifolia Benth.

+ Fl. Austral. 3: 70-71 (1869)

12. **S. teretifolia**, *Benth.* Stems in our specimens numerous, erect, 6 to 8 in. high. Leaves linear, terete or channelled above, obtuse, not exceeding 2 lines and mostly clustered as in *Astartea*. Flowers solitary or 2 or 3 together on very short peduncles in the upper axils. Calyx-tube broadly turbinate, somewhat rugose, about 1 line diameter; lobes broad, scarious, denticulate-ciliate. Petals twice as long as the calyx-lobes, nearly  $1\frac{1}{2}$  lines diameter. Stamens above 20; filaments rather long; anthers broadly obovate or the cells almost distinct, opening in large oblong pores. Ovary very convex or almost free, 2-celled with 2 superposed ovules in each cell; style immersed in a central tubular depression.

**W. Australia**, *Drummond*, n. 136. The foliage gives this plant a very different aspect from that of the other species, yet the floral characters are entirely those of *Scholtzia*.



Scholtzia teretifolia



A. AS OF THE WESTERN AUSTRALIAN F - JRA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon .. *Schottia. hirtifolia* Benth.....

29 5 81

Family .. *Myrtaceae*.....

Date Recorded .. 19 10 78.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	11 km E of Brand Hwy to Coorow 30°03'S 115°27'E	low closed heath, grey sandover laterite	19 10 78	Y	RJHnatick 780282
	3 km E of Badgingarra 30°28'S 115°36'E		1 10 74	Y	DJE Whibley 4851
	Just W of Badgingarra 30°23'S 115°32'E		1 10 74	Y	DJE Whibley 4825
	Badgingarra townsite	sandy heath	26 10 60	Y	RD Royce 6409
	Between Gin Gin + Regans Ford		1 10 68	Y (Early)	AE Burns 80
	Gungahlin		Sept 68	Y	E Read 9
	Badgingarra		Oct 60	Y	Mrs Kelly sn
	14 km E of Brand Hwy towards Coorow	low sand plain	28 10 77	Y	B Jack 14c
	NW corner of Alexander Morrison NP 30°02'S 115°29'E	low open heath	18 11 78	Y	E A Griffin 1716
KP	Badgingarra	Grey sand Wandoock	3.12.65	Y	F. Lullwitz 24492

Sphaerolobium macranthum Meisn. var. pulchellum (Meisn.)  
Benth.

+ Fl. Austral. 2: 67 (18 )

11. **S. macranthum**, Meisn. in *Pl. Preiss.* ii. 213. Stems more rigid and thicker than in *S. vimineum*, erect, terete, scarcely striate, occasionally spinescent at the end, but without the lateral branchlets of *S. daviesioides*. Leaves on a very few barren branches only, small, subulate, and usually verticillate. Flowers clustered, forming rather dense racemes, and often, but not always, larger than in *S. vimineum*. Calyx about 2 lines long, the tube scarcely half so long as the upper lip. Standard broad, rather longer than the other petals; keel broad and rounded at the top, not so incurved as in *S. fornicatum*. Style incurved, with a narrow membranous wing under the stigma. Pod broader than long.—*S. Drummondii*, Turcz. in *Bull. Mosc.* 1853, i. 267.

**W. Australia.** Swan River, *Drummond*, 1st Coll, 2nd Coll. n. 115, and 5th Coll. n. 47; from King George's Sound to Murchison river, *Oldfield*.

*S. crassirameum*, Meisn. in *Bot. Zeit.* 1855, 28,—from between Moore and Murchison rivers, *Drummond*, 6th Coll. n. 20,—differs slightly in the branches rather thicker than usual.

Var. *pulchellum*. Of smaller stature, with smaller flowers, appearing more red in the dried state.—*S. pulchellum*, Meisn. in *Bot. Zeit.* 1855, 28.—Between Moore and Murchison rivers, *Drummond*, 6th Coll. n. 19.

Var. *parviflorum*. Flowers smaller, all yellow.—Clay-plains, near M'Callum Inlet, *Mazwell*.



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Sphaerolobium macranthum* Meisn.  
*var. pulchellum* (Meisn.) Benth. Family *Leguminosae* Date Recorded 8.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	8 km SSE of Eneabba 29°53'S 115°19'E	sand over laterite, low open heath	15-9-78	Y	EAGriffin 1047
	Badgingarra Hill River		10-9-60	Y	L Sternbohm + Mrs Kelly
	Watheroo NP, western boundary	Sandy soil	22-9-51	Y	NH Speck
	Between Jurien + Dandaragan Reserve 29806, 15k E of Eneabba towards	sand + laterite, low open heath	6-10-71	Y	RDRoyce 9643
	Three Springs 29°45'S 115°25'E		27-9-32	Y	WBlackall 2902
	132 m peg Brand Hwy		9-11-78	N (Fruit)	EAGriffin 1535
	Eneabba - Coorow	Sand heath	4-10-71	Y	ACBurns 151
UWA	Hill River	laterite + sandplain	24-9-62	Y	JSBeard 1914
type *			23-9-53	Y	N.H. Speck 159/3
					J Drummond VI 19

\* not seen



Stawellia dimorphantha F. Muell.

Fragm. Phyt. Austral. 7: 85-86 (1870)

+ Benth. Fl. Austral. 7: 67

see also Rye & Hopper (1981) p 172

**87. STAWELLIA, F. Muell.**

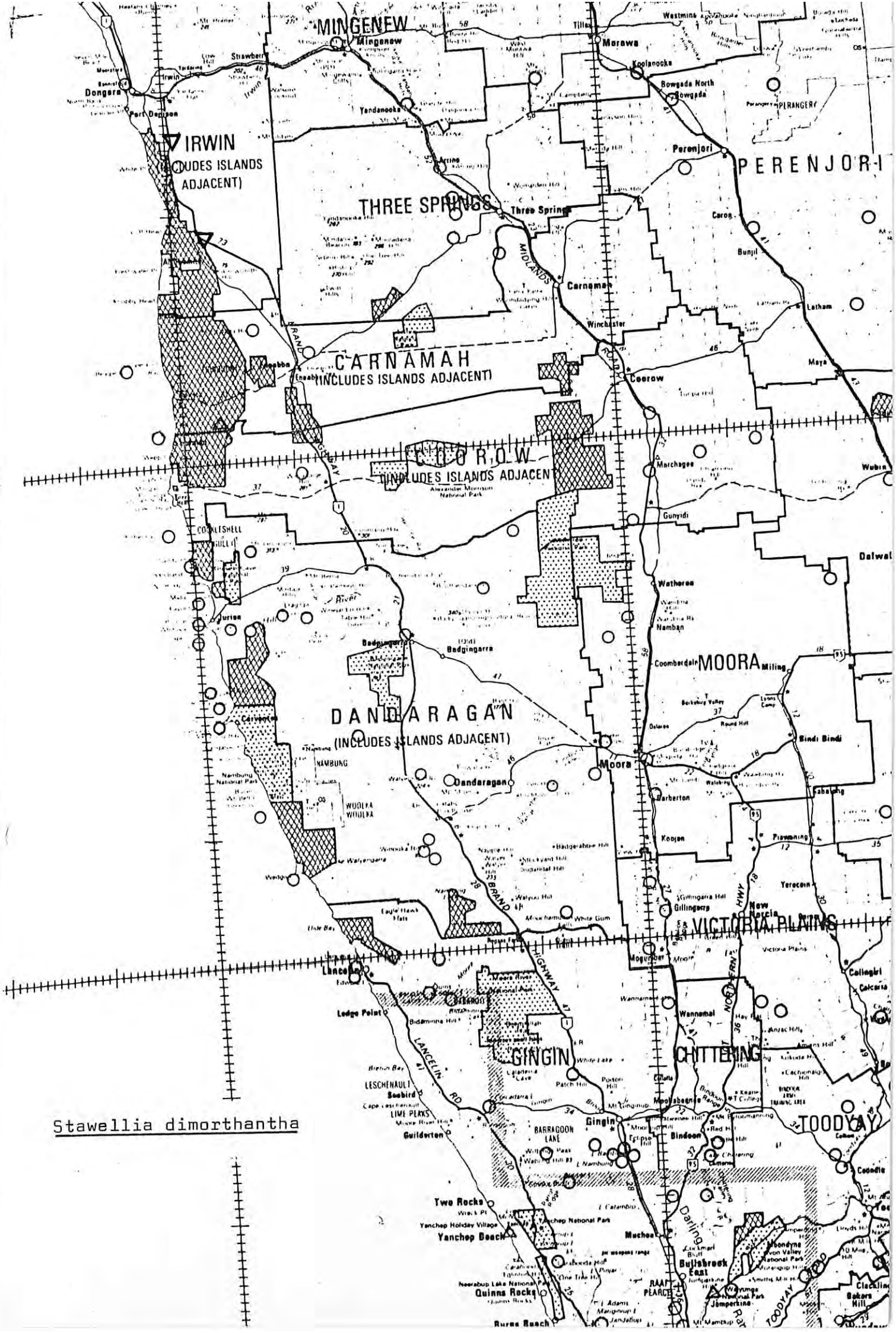
Perianth of 6 equal 3-nerved segments, shortly united at the base. Stamens 3, inserted at the base of the inner segments and shorter than them; filaments filiform or flattened; anthers linear or linear-lanceolate, erect, the cells opening inwards in longitudinal slits. Ovary 3-celled, with 2 ovules in each cell; style filiform entire. Capsule opening loculicidally in 3 valves. Seeds 1 or 2 in each cell, with a black shining crustaceous testa.—A tufted perennial, with linear filiform radical leaves, and simple scapes. Flowers in a dense terminal head, with imbricate bracts, the outer ones produced into filiform leaves.

The genus is limited to the single species endemic in West Australia.

**1. *S. dimorphantha*, F. Muell. *Fragm.* vii. 85.**—A slender glabrous perennial, forming dense tufts of 4 to 5 in. Leaves all radical except those of the flower-heads, linear-filiform, shorter than the scapes, with scarious imbricated dilated bases. Stems simple, rigidly filiform. Flower-heads 3 or 4 lines diameter, surrounded by rigidly filiform leaves or summits of the outer bracts often 1 in. long. Rhachis of the head or spike often branched though close and compact. Bracts scarious, imbricate. Flowers solitary and sessile within them, a few of the outer perianths in each head very narrow linear and 3 lines long, the others much shorter and broader. Filaments of the outer flowers filiform, of the inner ones short and flat. Capsule very small, enclosed in the perianth.

**W. Australia.** *Drummond.*

The remarkable difference in shape of the outer and inner flowers may be partly but not entirely caused by a difference in the degree of development. I have not succeeded in finding ripe capsules or seeds in any of the specimens, and have described them after F. Mueller.



Stawellia dimorphantha



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Straniera cynanchocarpa* (Miehb.) F. Muell.  
 \* not seen

Family Proteaceae

Date Recorded ..... Date Recorded ..... S.S. 81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Hill River		9. 1. 59	Y	CA Gardner 12077
	Mt Lesueur	Sand heath	13. 1. 40	Y	CA Gardner
	Mt Lesueur - western base	Sand heath	12. 2. 40	Y	CA Gardner
	1/2 m E of Diamond of the Desert Springs	Gravel	8 1 66	Y	K. Newbey 2366
	8 km W of New Badgingarra 115°30'E, 30°21'S		1. 11. 74	N	DJ E Whibley 4794
	Badgingarra, on Brand Hwy		18 11 71	N	JR Cannon 149
	38 m N of Regans Ford		18 2 70	Y	AS George 9825
	86 m N of Gin Gin	White sand, heath	2 11 70	N	TEH Aplin + R Corney 3179
	2 km NW of Mt Lesueur, NE of Jurien	low open heath, shallow	6. 12. 79	Y (bud)	E A Griffith 2670
	30°10'S 115°11'E	white sand over laterite			
	38 m W of Eoorow on Green Head Rd		15 1. 67	Y	C. Chapman sn
K.L.	158 m N of Jurien Bay Turn off 30°00'S 115°20'S		14 12 67	Y	D Young Y465
K.L.	"West Rd to Snag Island" (Eoorow Green		4 12 65	Bud	F Lull 72 4511
	Head Rd, W of Brand Hwy)				J Drummond VI 190
type *					



Stylidium aconioides Carlquist

+ Aliso 7: 43-44 (1969)

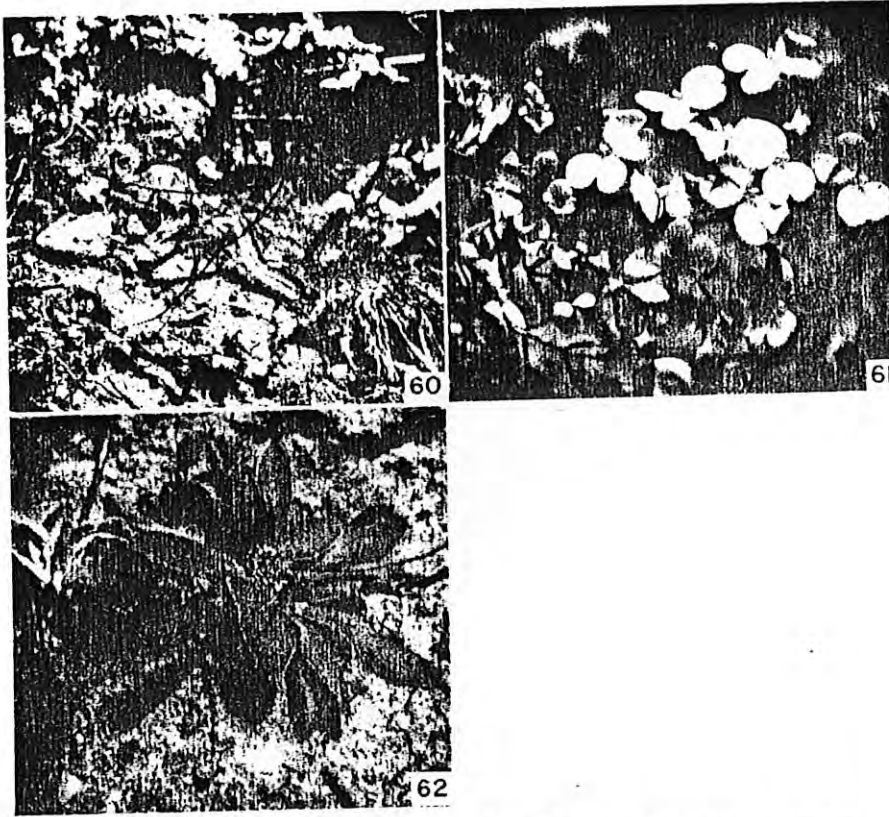
STYLIDIUM AEONIOIDES.—In the same general area where *S. inversiflorum* grows, another new species can be found (Fig. 60-62). The presence of scale leaves in this new species suggests possible affinity with *S. squamellosum*, but the leaves are entirely different, the plant glabrous, and the flowers unlike in size and details. *Stylidium diuroides* is also quite different, as is *S. inversiflorum*. The hyaline-margined leaves find a parallel only in *S. maitlandianum* (Fig. 63), a species which is close to *S. diversiflorum* and, to a lesser extent, *S. carnosum*, *S. brunonianum*, *S. striatum*, and *S. glaucum*, none of which suggest close affinity to *S. aconioides*. Leaves of *S. maitlandianum* are succulent, whereas those of *S. aconioides* are fibrous and flabellately veined. *Stylidium aconioides* is apparently a plant of ironstone slopes, but seems to favor sandy pockets on those slopes. The proposed specific name is intended to suggest a resemblance in aspect (but not in size) to any of several species of *Aeonium* (Crassulaceae).

*Stylidium aconioides*, sp. nov.

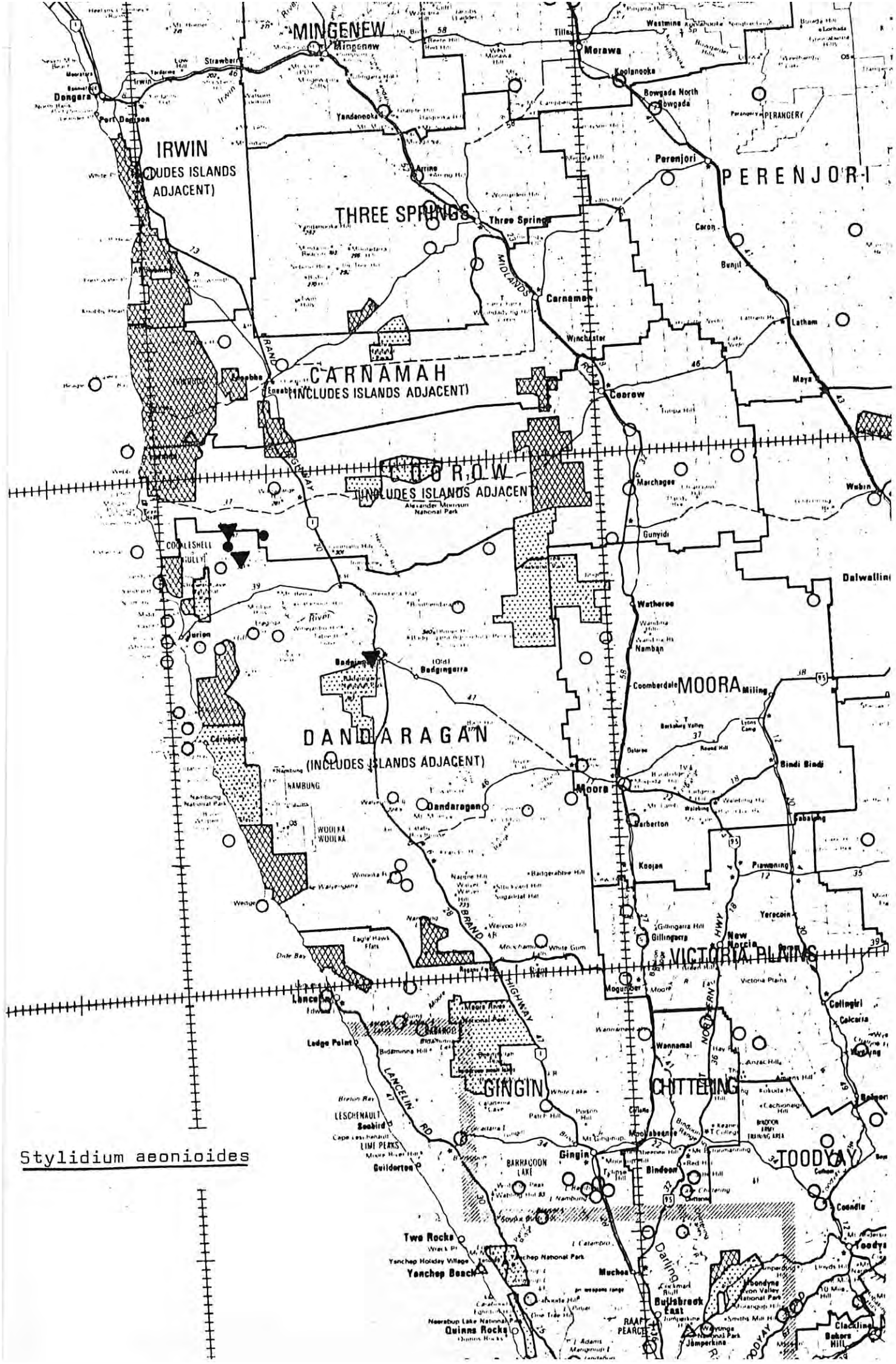
Perennis caudice simplice, caespitosa, infra folia squamis brevibus linearibus subacutis instructus. Folia basalia rosulata, patentia, elliptica, glabra, manifeste flabellatim venosa et striata, ut petioli margine albo-hyalino fimbriato limbato. Lamina 5-15 plerumque 20 mm longa, 3-6 plerumque 4 mm lata. Petiola linearia, albida, ca. 5 mm longa. Scapi 1-4, laterales. Scapus glabrus e basi rubescens. Inflorescentia panicula corymbiformis vel elongata, ramosi dichasiformes. Scapi bracteae numerosa, ellipticae, ca. 4 mm longae, 1 mm latae, margine albido-hyalina, limbata. Pedicelli glandulosi ad apicem, bibracteolati. Calycis tubus turbinatus, 1 mm longus. Calycis lobi deltoidei obtusi, 2 mm longi. Flores flavides. Corollae tubus brevis. Corollae lacinae inaequales, 2 majores ca. 3 mm longi, 2 mm lati; 2 minores 2.5 mm longi, 2 mm lati, ovato-ellipticae, obtusae. Labellum deltoideum, minutum, acutum, exappendiculatum. Appendices faucis minutes, 6 vel 8, filiformes. Columna ca. 3 mm longa. Capsula turbinata, 2 mm longa.

Caespitose perennial, rooting along the short, erect, usually unbranched stem, the rosette of spreading leaves tending to be appressed to soil. Leaves elliptic-spathulate, fibrous-coriaceous, narrowing into a linear petiole. Lamina 5-15, mostly about 10 mm long, 3-6 (mostly about 4) mm wide, petiole about 5 mm long. Leaves glabrous, but with margins transparent-fringed. Vegetative leaves alternating annually with zones of minute scale leaves which are green at first but turn brown and cover older portions of the stem. Scapes one to several per rosette, lateral, 6-18 cm tall. Inflorescence axis wiry, slender, reddish below, green above, glabrous; portion below lowest flower bearing numerous scattered elliptical transparent-fringed bracts about 4 mm long, 1.5 mm wide. Inflorescence a panicle, corymbiform at first, elongate later, branches composed of symmetrical simple or compound dichasia. Pedicels each bearing 2 bracteoles, glandular at base of ovary. Ovary turbinata, ca. 1 mm long, calyx lobes ca. 2 mm long, deltoid, obtuse. Flowers yellow. Corolla tube short. Corolla lobes ovate-elliptic, obtuse, rounded, slightly unequal, the smaller about 2.5 mm long, the larger about 3 mm long, all about 2 mm wide. Labellum deltoid, acute, minute. Throat typically with six minute tooth-shaped appendages, two of which may be bifid, probably representing fused pairs, so that a total of 8 throat appendages might be recognized. Column about 3 mm long. Capsule about 2 mm long, turbinata.

*Type:* In scrubby vegetation (*Comesperma*, *Hakea*, *Dryandra*, *Stirlingia*) on hillside on Cadda Road (to Frenchman's Bay), 1 mile from Eneabba-Badgingarra Highway, W.A. October 28, 1967. *Carlquist* 3926 (RSA).  
*Isotypes:* K, US, CANB, PERTH, E, CHR.



60-62. *Stylidium aconioides* Carlquist, *Carlquist 3926*, Badgingarra, W.A.—Fig. 60. Habit.  $\times \frac{3}{4}$ .—Fig. 61. Group of flowers.  $\times 1\frac{1}{4}$ .—Fig. 62. Stem, showing scales (left); basal rosette of leaves (right).  $\times 1$ .—Fig. 63.



Styliidium aenioides

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Styliidium asonoides* Carlquist Family *Styliidiaceae* Date Recorded 5.3.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Mt Peron (NE of Jurin)		11.10.1951	Y	C.A. Gardner 10267
	Mt Peron	slope in stony, sandy soil	11.10.1951	Y	C.A. Gardner 10567
	Hill, 1 km NW of Mt Lesueur, NE of Jurin	low open heath. slope of MUSA; grey sand with lateritic gravel	4.9.1979	Y	E.A. Griffin 2122
	4 km NW of Mt Lesueur, NE of Jurin	on hillside, low open heath, shallow white sand over sandstone	6.11.1979	Y	E.A. Griffin 2487
Isotype	1 m from Brand Hill, Cadda Rd		26.10.67	Y	S. Carlquist 3926
v/w A	1/2 km N of Turnoff Brand Hill to Cervantes (120 m N of Perth)	grey sand over laterite	30.10.74	Y	S. James 74.10.19



Stylidium inversiflorum Carlquist

+ Aliso 7: 42-43 (1969)

STYLIDIUM INVERSIFLORUM.—Erickson (1958) says, concerning *S. diuroides*, that "material from Mt. Leseur is sparsely leaved, 2-whorled, and with calyx lobes twice as long as the tube, very glandular hairy." This description applies to what proves to be a new species from sand heaths in the vicinity of Jurien Bay (a region which includes Mt. Leseur), and this new species (Fig. 53-54) proves quite different from *S. diuroides*. In addition to the elongate stems, borne high on prop roots and bearing whorls of terete leaves, this plant is distinguished by many floral details, especially the inverted orientation of the flowers. The lack of throat appendages is notable. The membranous fold in the throat of the corolla is a feature which otherwise is found only in *S. lepidum* (Fig. 57) and *S. corymbulosum*. The shape of the corolla lobes is distinctive, and mimics corolla-lobe shape of other species with inverted floral orientation, *S. calcaratum* (Fig. 5, 6), and *S. spinulosum* (Fig. 65), although not *S. choreanthum* (Fig. 35). Because *S. inversiflorum* is a distinctive species, I cannot select any other species as clearly its closest relative, and placement in sect. Saxifragoideae can be considered only tentative.

*Stylidium inversiflorum*, sp. nov.

Perennis adscendens, aulis simplicis; innovationes glabrae, 2-5 cm longae, pseudoverticillatae, primo anno saepe rubrescentes, apice folia majora dense rosulata gerentes, demum efoliatae, cortice griseo-nigrescente obtecte et e nodis inferioribus radicanter efformantes. Folia anguste linearia, teretis, recta, plerumque erecto-patentia, glabra, acuta nonnullis mucronata, 5-40 plerumque 20 mm longa. Racemus simplex. Inflorescentia cum floribus 5-17 cm longa, glabra in parte inferiora. Bracteae lineares, 5 mm longae vel breviorae. Pedicelli tenelli, glanduloso-pubescentes, 5 mm longi vel breviori. Calycis tubus glabrus vel glandulosus, clavatus, 2-3 mm longus. Calycis lobi lanceolati, obtusi, 2 mm longi. Corollae tubus 2 mm longus. Corolla flavida, ut in *S. spinuloso*, *S. calcarato*, *S. perpusillo* et *S. choreantho* lata. Corollae lacinae plerumque valde inaequales, posteriores 2 late linearicuneatae vel spathulatae, apice latiores, subtruncatae manifeste multidentatae; anteriores 2 longiores irreguliter spathulato-oblongo-lineares medio circa angulate prorsum curvatae, subserratae. Corollae lacinae e basi 1-2 callosis instructae, e basi purpureo-brunneo-maculatae. Corolla faux exappendiculata, sed membrana faucis instructa. Labellum lanceolatum, saepe curvatum. Columna 4 mm longa vel breviora. Capsula clavata, 3 mm longa.

Perennial, usually unbranched, the stem usually supported by aerial roots. Stem terete, wiry, glabrous, pale or reddish, turning gray when old. Leaves in false verticils, 1 or 2 of which are formed each year, separated by lengths of stem which are bare or provided with a few short leaves. Leaves acicular, slender, straight, 5-40 (mostly 20) mm long, glabrous, green, acute but not mucronate. Scape terminal, glabrous, ebracteate below portion which bears flowers. Entire inflorescence 5-17 cm long, always a simple raceme. Upper portions of inflorescence and pedicels sparsely glandular-pubescent. Bracts of the inflorescence linear, 5 mm long or shorter (rarely a few vegetative leaves present at the level of the lowermost flowers). Pedicels 5 mm long or shorter, wiry. Ovary clavate, glabrous or with a few glandular hairs, 2-3 mm long at anthesis, calyx lobes lanceolate, obtuse, 2 mm long. Corolla tube short. Flowers yellow with orientation inverted compared with that of most *Stylidium* species, but like that of *S. spinulosum*, *S. calcaratum*, *S. perpusillum*, and *S. choreanthum*, the column operating from below upward in the space between the 2 lower (morphologically posterior) curving corolla lobes. Upper corolla lobes truncate, spathulate, with toothed distal ends. Lower (morphologically anterior) corolla lobes irregularly spathulate-oblong, curved. All corolla lobes provided with a small purple mark near base (appearing brown on the yellow background). One or two minute callus-like or gibbus-like protuberances at the base of each corolla lobe and a membranous wing inserted on the upper side of the throat; no true throat appendages present. Labellum lanceolate, often curved, with no appendages. Column 4 mm long or less. Capsule clavate, about 3 mm long.

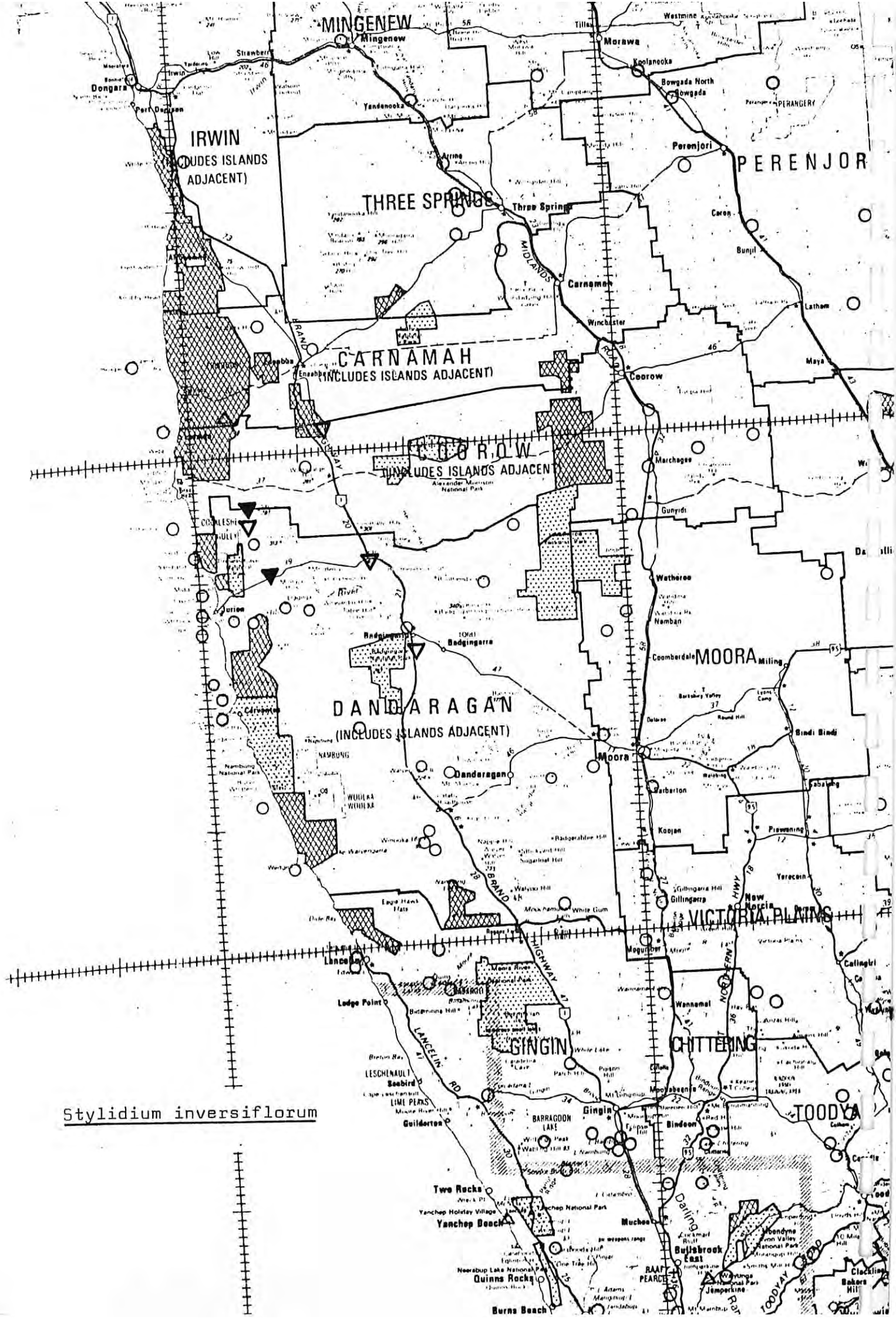
*Type*: In sand heath with *Hakea*, *Melaleuca*, *Leucopogon*, *Leschenaultia* along Cadda Road, north of Badgingarra, W.A. October 28, 1967. *Carlquist* 3925 (RSA). *Isotype*: K.

*Other collection*: In sand, with *Macropidia fuliginosa*, *Daviesia epiphylla*, Cockleshell Gully, W.A. October 4, 1967 (RSA).

see also Grieve & Blackall (1975) plate IX



Fig. 53-59.—Fig. 53-54. *Styloidium inversiflorum* Carlquist, *Carlquist 36-12*, Jurien Bay, W.A.—Fig. 53. Habit.  $\times \frac{1}{2}$ .—Fig. 54. Inflorescence.  $\times 1\frac{1}{2}$ .—Fig. 55-56.



Stylidium inversiflorum

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Stylidium inversiflorum* Carlquist Family *Stylidiaceae* Date Recorded 5.3.1981  
 \* Specimen not seen, see Carlquist

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	46 miles N of Regans Ford	Sandheath	29.10.1966	Y	A.S. George 8624
	15 <sup>3</sup> km from Jurien Bay toward Moora, at turnoff the Moora-Eneabba Rd.		24.9.1968	Y	E.M. Canning WA/68 3395
	38 km from Jurien Bay, Western Australia, toward Eneabba		24.9.1968	Y	M.E. Phillips WA/68 1571
	Cockleshell Gully		4.10.1967	B+w photo	S. Carlquist 3642
	15 km SE Eneabba 29°59'S 115°18'E		20 10 79	Y	RJ Cronfield . sn.
UWA	0.8 km N of Jurien Bay Rd on Cockleshell Gully Rd	low heath, sand	28 9 77	Y	AH Burbidge 2507
UWA	5.5 km N of Cockleshell Gully	shallow sand over laterite	28 9 77	Y	AH Burbidge 2508
UWA	9 m E of Hill River/Cadda Rd Junction	white sand	Oct 71	Y	S James 71.10/41
UWA	along Cadda Rd. (Type locality)				
Holotype	along Cadda Rd, north of Badgingarra		28 10 67		S Carlquist 3925



Stylidium nonscandans Carlquist

+ Aliso 8: 447-453 (1976)

**Stylidium nonscandans** Carlquist, spec. nov.

Figs. 1-12

Perennis glabra, 20-45 cm alta. Innovaciones erectas, cuadrangulares, roseo-brunneae, folia dense rosulata-verticillata, verticillis ca. 6 (2-8) cm inter sese distantibus. Folia ecirrhusa, linearia vel trigono-linearia, glabra, apice acuta, 5-50, saepius 27 mm longa. Racemi terminales solitarii, 3-5 usque 9 cm longe pedunculati, bracteae linearis-subulatae acutissimae; pedicelli, 3-1.5 cm longi, prophyllis 2 bracteis similibus minoribus instructi. Calycis lobi acuti, tubo aequilongi, ca. 3 mm longi. Corolla rosacea, tubus brevis, lacinae obovatae, ca. 7 mm longae, ca. 5 mm latae, corolla postice duplo profundius quam lateribus inter lacinas incisa. Appendices faucis 6, ante lacinas posteriores binatae minimae subulato-filiformes, ante anteriores singulae majores, late-oblongae apice acutae rotundatae vel truncatae. Labellum anguste triangulari-ovatum acuminatum, ca. 2 mm longum, glanduloso-ciliolatum, basi appendiculis filiformibus glanduloso-pilosis labello aequilongis instructum. Columna breviter glanduloso-pubescentis; thecae antherarum acutae, basi pilis capitatis numerosis suffultae. Septum ovarii reductum, lunatum; placenta crassa subglobosa, ovulis magnis erectis instructa. Capsula subglobosa 6 mm longa.

Shrublike glabrous perennial 20-45 cm tall, branched from near the base, the innovations erect, with quadrangular reddish-brown stems. Leaves in dense verticillike rosettes, these spaced mostly about 6 (2-8) cm from each other along the stems. Leaves not hooked at tips, linear (triangular in transection) glabrous, apices acute, 5-40 mm long, averaging about 27 mm. Racemes terminal and solitary, the inflorescence axis ("peduncle") 3-5 or up to 9 cm long, with linear-subulate acute bracts at bases of branches ("pedicels"), these pedicels 0.5-1.5 cm long, bearing pairs of prophylls similar to the bracts but smaller. Calyx lobes acute, about the same length as the tube (ovary), about 3 mm long. Corolla pale rose, tube short, the lobes obovate, about 7 mm long by 5 mm wide, the corolla limb twice as deeply incised dorsiventrally as laterally (lobes united into lateral pairs). Throat appendages 6, the posterior 4 minute and tending to be united into pairs, the anterior 2 larger, broadly oblong, and with acute, roundish or truncate tips. Labellum narrowly ovate-triangular, acuminate, about 2 mm long, glandular-ciliate, provided with a pair of filiform glandular-pilose basal appendages about the same length as the labellum proper. Column covered with short glandular hairs; anther sacs acute, with numerous vesiculate hyaline trichomes clustered around the thecae. Septum of the ovary reduced to a crescent with a thick subglobose basal placenta bearing several large erect ovules. Capsule at maturity about 6 mm in diam.

*Holotype*.—In white sand, especially abundant on road margins, with mallees, *Isopogon*, *Hakea*, *Conospermum*, 34 mi W of Coorow, Western Australia. October 3, 1974, *Carlquist 5807* (RSA).

*Isotypes*.—PERTH, CANB, MEL, US, GII, MO, K, NSW, NY and others.

*Additional collection*.—On white sand, with *Banksia menziesii* R. Br., *Adenanthos*, *Hibbertia*, Red Cully road 3 mi S of junction with Mogumber-Regan's Ford road. October 6, 1974, *Carlquist 5951* (RSA, PERTH, CANB, MEL, US, GII, MO, K, NSW, NY, E, WTU, UC and others).

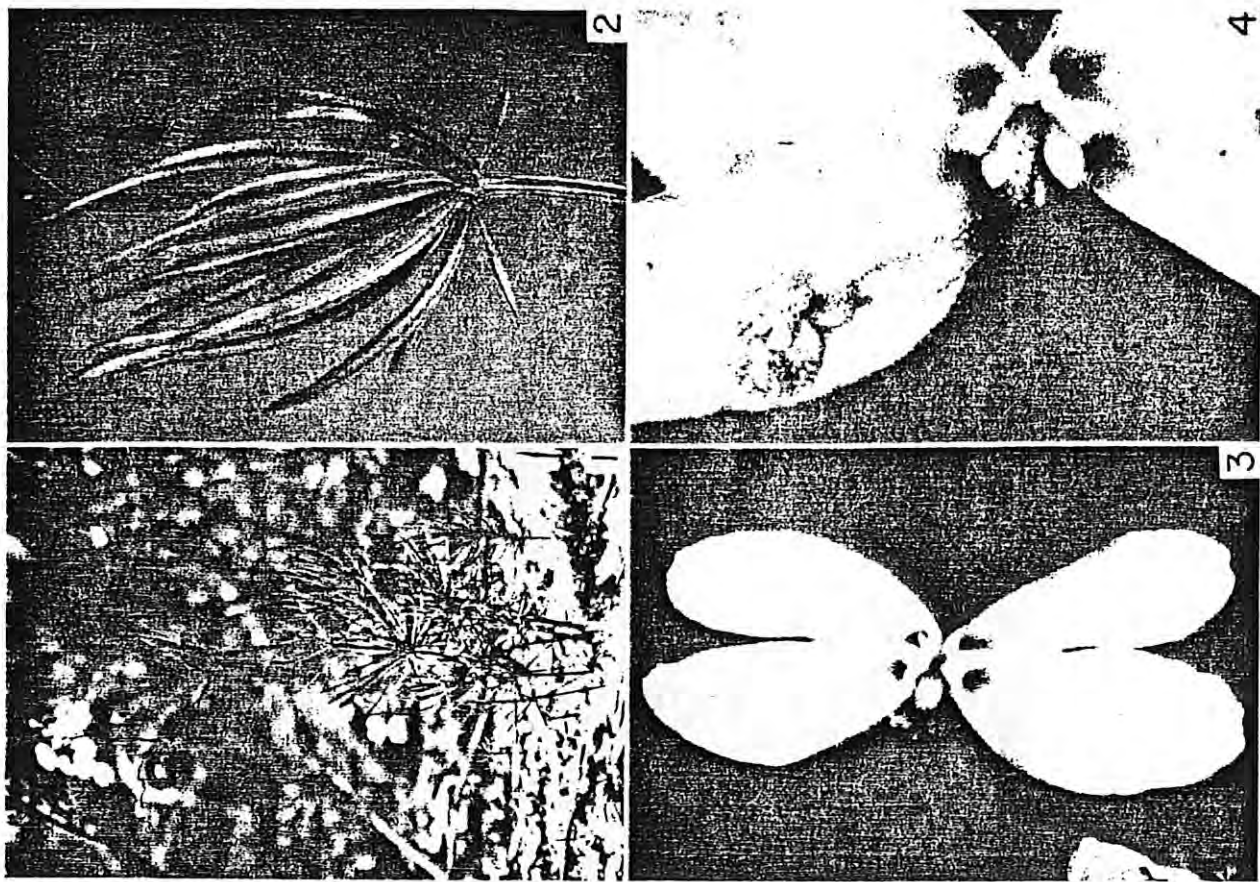
*Stylidium nonscandans* has been named deliberately to compare it to *S. scandens* R. Br., to which it is related. Juvenile shoots of *S. scandens* can be quadrangular and bear linear leaves lacking hooks at their tips as in *S. nonscandens*. However, stems of *S. nonscandens* are always quadrangular (like those of *S. verticillatum* F. Muell.), and leaves never bear hooks at their tips and never form any kind of tendrillike attachment to surrounding vegetation. Indeed, the shrublike plants of *S. nonscandens* grow scattered among

the low shrubbery of depauperate sand heath which consists (except for mallees and Banksias) of growth as low as or lower than the *S. nonscandens* plants. The adult tendril-tipped leaves of *S. scandens* are markedly concave along the midrib above and have recurved margins, features not present in leaves of *S. nonscandens*.

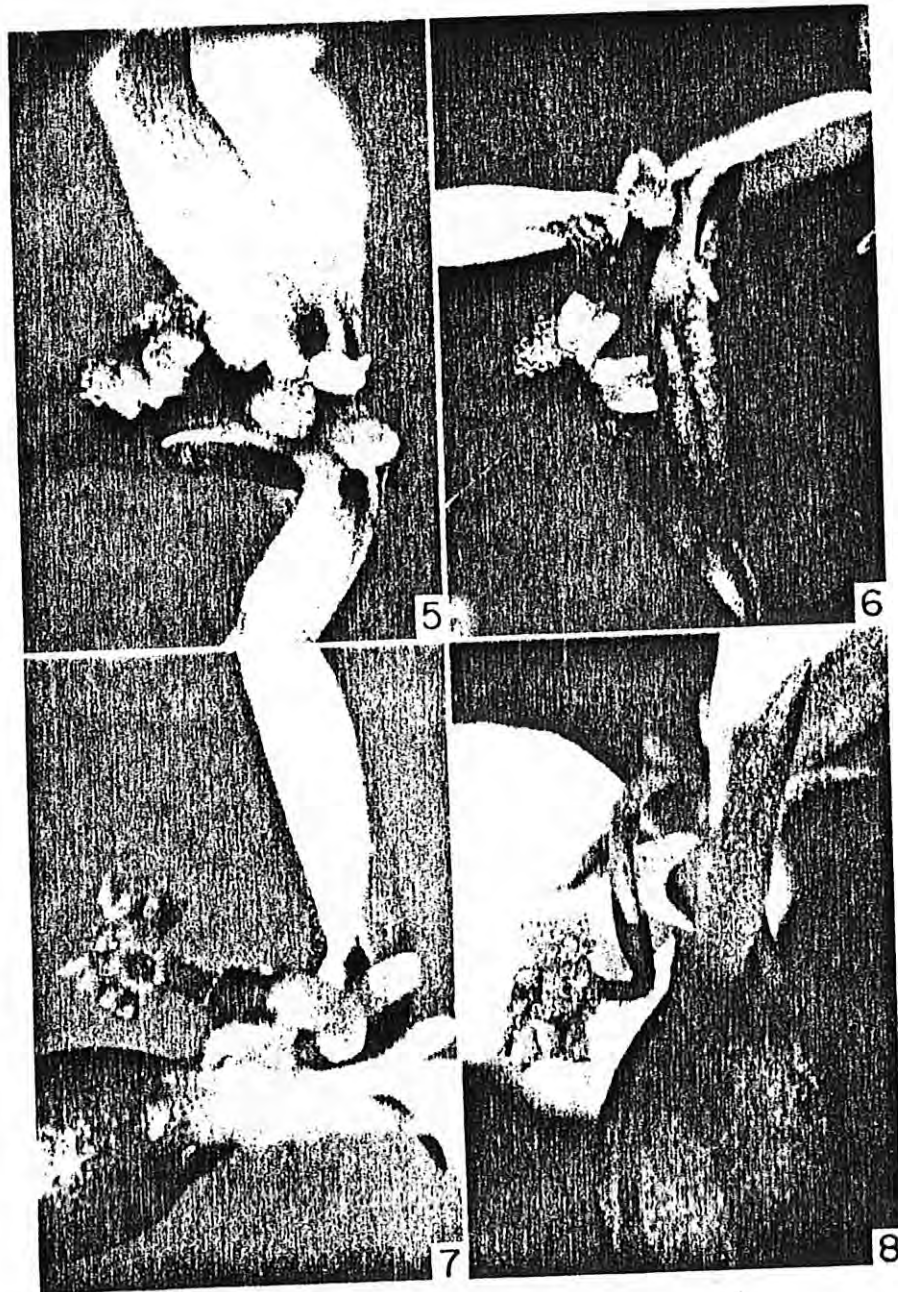
The calyx lobes of *S. nonscandens* are markedly narrow and acute, and thus like those of *S. verticillatum*, whereas calyx lobes of *S. scandens* are broad, rounded, and obtuse. The corolla of *S. nonscandens* is the same size as that of *S. scandens*, but never deep rose in color (as in some populations of *S. scandens*); the lobes are united for about half their length laterally, as in *S. verticillatum*. The throat appendages of *S. nonscandens* are much smaller than those of *S. scandens*. The labellum of *S. nonscandens* is like that of *S. scandens* except that the basal appendages are not long; they are slightly shorter, in fact, than the main lobe of the labellum. The vesiculate hairs among the anthers (figured well by Erickson, 1958, for both *S. scandens* and *S. verticillatum*) are particularly conspicuous in *S. nonscandens* (Fig. 9). The capsules of *S. nonscandens* differ from those of both *S. scandens* and *S. verticillatum* in that those two species have only a globose placenta, whereas a crescentlike septum is present in capsules of *S. nonscandens* (Fig. 12). In this respect, *S. nonscandens* resembles *S. galiooides* C. A. Gardner, a species that has large seeds similar to those of *S. nonscandens*. *Stylidium nonscandens* is like *S. scandens* and unlike *S. verticillatum* in that it lacks vestiture except on portions of the flower (glandular-pubescent in all three species).

*Stylidium nonscandens* is thus a northern vicariant of *S. scandens*. Such characteristics as the acute calyx lobes and presence of a capsule septum show that it is not merely a juvenilitic variant of *S. scandens*. It is to be expected in various areas of the great sandplain around Jurien Bay from Greenhead to Gingin, and might have been discovered previously had this recently opened area been botanized during the brief flowering season of *S. nonscandens*. Plants were particularly abundant along the road west from Coorow, forming conspicuous displays in the segment from 34 to 39 mi W of Coorow.

I was alerted to the possible distinctness of *S. nonscandens* by finding it in these localities so far north of the habitats of *S. scandens*. *Stylidium scandens* is a species of the south coast of southwestern Australia, ranging from approximately Mt. Manypeaks along the Albany and Northcliffe coasts to Bunbury (Erickson, 1958). That area is rich in the Restionaceae on which *S. scandens* so typically climbs. *Stylidium verticillatum* is also a southern species, endemic to scree slopes in the Stirling Range (Carlquist, 1969). *Stylidium verticillatum* can be regarded as a vicariant of the *S. scandens* complex, just as may *S. galiooides*, which grows among white quartz boulders in the Mt. Barren range south of Ravensthorpe and Jerramungup.

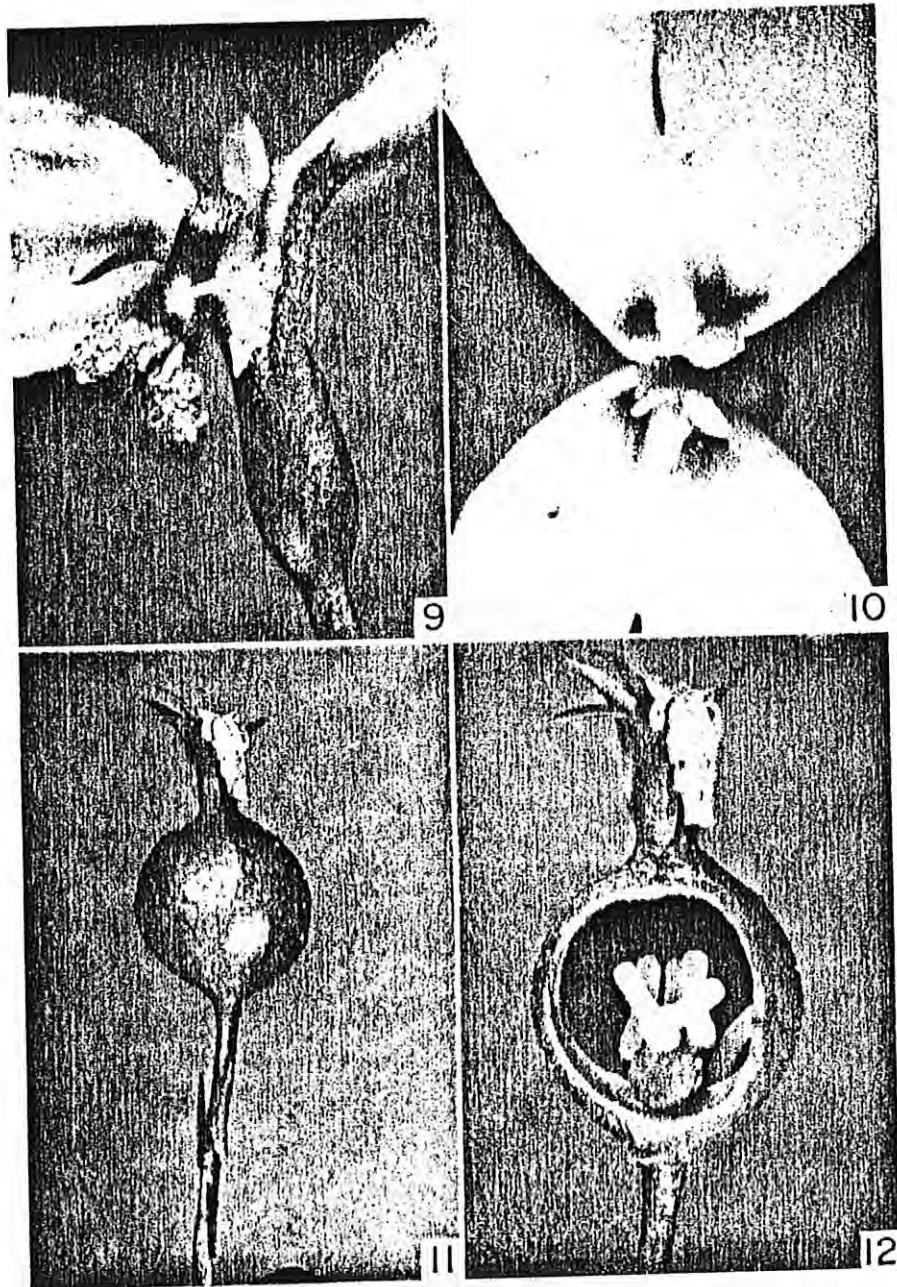


Figs. 1-4. *Stylidium nonscandens* (Carlquist 5507).—1. Habit of small plant in flower. —2. Rosette of leaves terminating one of the stems, illustrating linear nature of leaves, which lack recurved margins.—3. Corolla; face view to show shape of lobes.—4. Center of corolla; column has been arranged atop corolla limb to show details of glandular hairs; throat—clages visible at base of column.



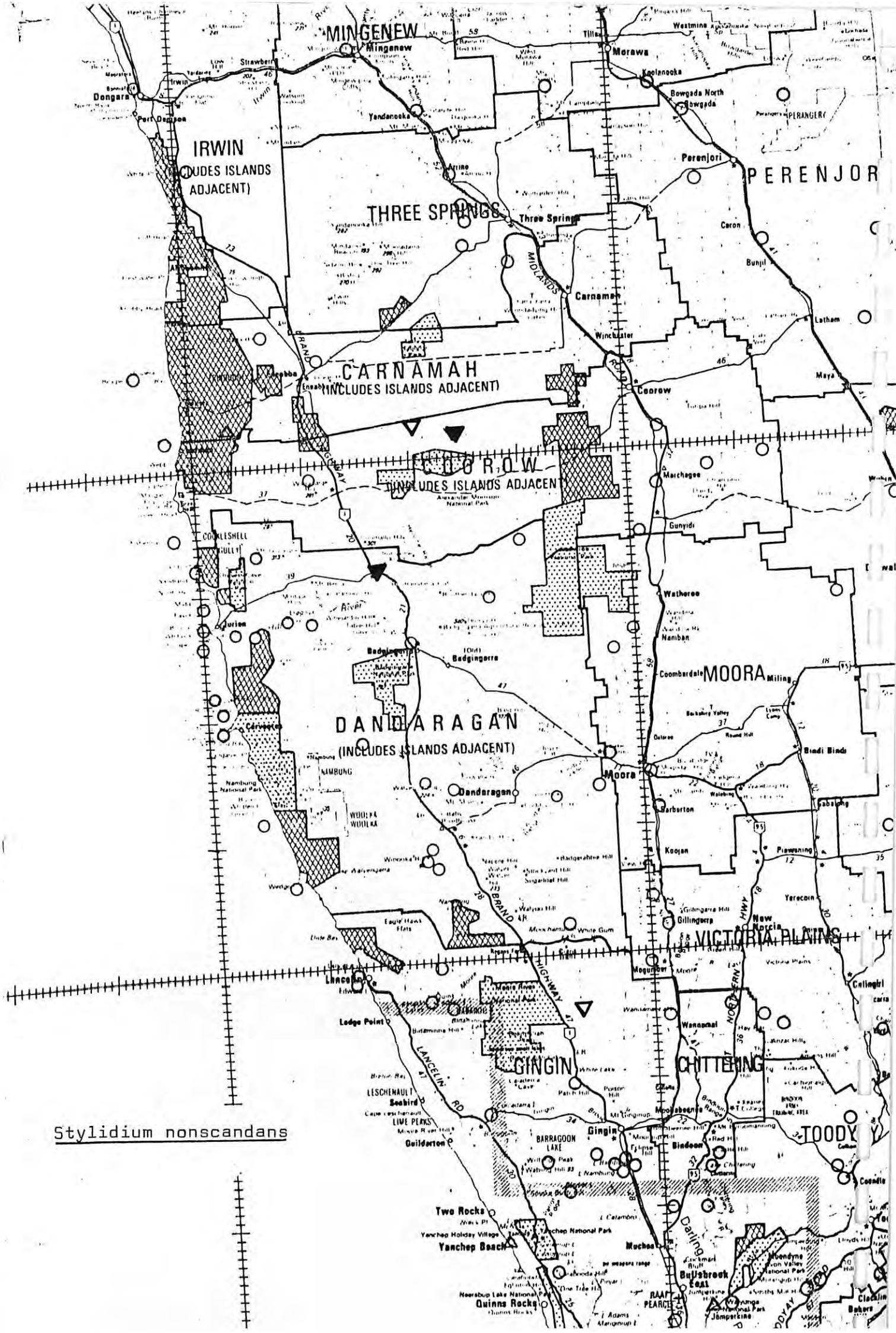
Figs. 5-8. *Stylidium nonscandens* (Carlquist 5907). Details of flower.—5. Side view of flower, showing column poised; larger throat teeth and one appendage of the labellum are visible.—6. Side view of flower; the unopened anthers have mucronate tips; vesicular hairs adjacent to the anthers.—7. Side view of flower; the column is in poised condition and at a stage of late anthesis, with stigma (seen in face view) developed.—8. Side view of flower, showing stigma developed; labellum and one of the acute calyx lobes can be seen.





Figs. 9-12. *Stylidium nonscandens* (Carlquist 5907). Details of flower and fruit.—9. Flower; side view to show glandular pubescence and vesicular hairs on column, which has been displaced so as to reveal the labellum.—10. Throat of flower, face view; throat appendages differ somewhat from those of Fig. 4.—11. Undehiscent fruit with bracteoles on pedicel; calyx lobes acute.—12. Fruit; sectioned to show maturing ovules on globose placenta and the vestigial crescentlike septum.





Stylidium nonscandans

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Stylidium nonscandens* Carlquist Family *Stylidiaceae* Date Recorded 5.3.1980  
 \* Not seen, see Carlquist

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Reserve 28606, North of Alexander	low open heath with			
	Morrison National Park	emergent Eucalyptus <i>drummondii</i>	22. 11. 1978	Y	E.A. Griffin 1771
		white sand with outcroppings			
		laterite boulders.			
Isotype	34 m W of Coorow	white sand & Mallee	3 10 74	Y	S Carlquist 5807
*	Red Gully Rd, 3m S of junction with				
*	Mogumber Regans Ford Rd	laterite sand	6 10 74	Y	S Carlquist 5951
	<i>Carrollia</i> sp.				

5807

Tetratheca remota J. Thompson  
+ *Telopea* 1: 174-175 (1976)

**15. *Tetratheca remota* J. Thompson sp. nov.**

HOLOTYPE: Mount Lesueur, C. A. Gardner 9362, 21.viii.1949 (PERTH).

Fruticulus usque ad 40 cm altus. *Rami* glabri sed dense tuberculis parvis vestiti. *Folia* alterna vel aliquot opposita, usque ad fere 20 mm longa, apparenter anguste linearia. *Pedunculi* usque ad 20 mm longi; receptaculo usque ad 1 mm diametro. *Flores* 5-meri. *Stamina* filamentis usque ad 0.5 mm longis; tubis antherarum flavis, 1.5-2 mm longis. *Ovarium* glabrum; ovulis 2.

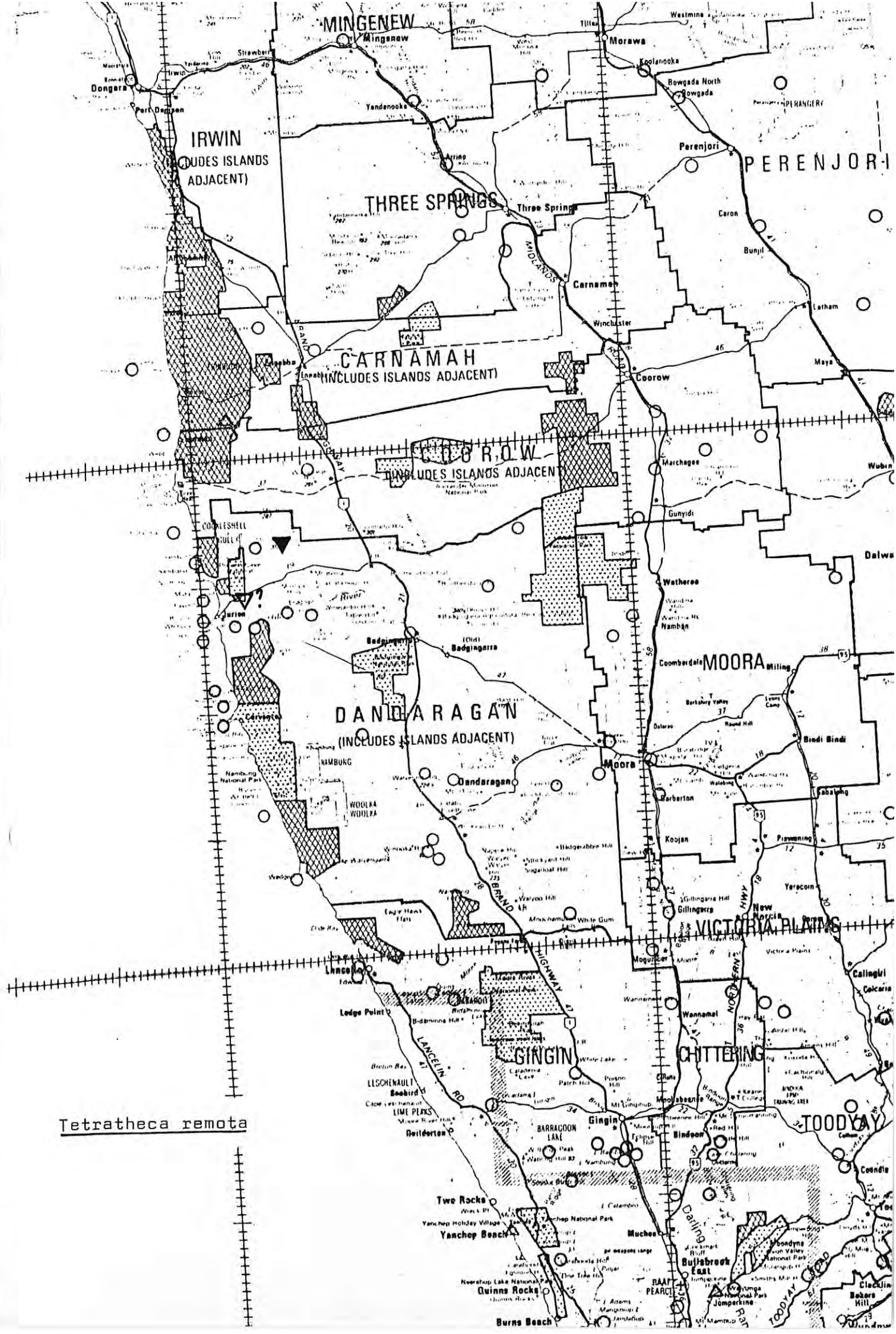
A small often sparsely-leaved shrub to 40 cm in height with slender stems branching near or above a slender woody stock. *Stems* slender, terete, glabrous and densely covered with minute tubercles; 0.3-1.0 mm wide in the flowering region, the branching alternate and at an acute angle. *Leaves* alternate or occasionally a few upper ones opposite, to almost 2 cm in length but usually shorter, appearing narrow-linear owing to the usually revolute margins, both surfaces glabrous or the upper part with a few stiff hairs especially near the rather obtuse apex, the base of the blade broad, less revolute and somewhat cordate, the petiole distinct; the leaves appearing to be somewhat deciduous on the lower part of the plant. *Flowers* occurring singly in leaf-axils, the bracts apparently absent. *Peduncles* to 20 mm long, glabrous but minutely tuberculate on the upper part, very slender, broadening suddenly in the upper part to a somewhat lobed receptacle 1 mm or less in diameter. *Calyx-segments* 5, dark-coloured, deciduous, broadly elliptical to ovate, acute or obtuse, glabrous except on the inner surface, with hairs especially near the margin, the base of each attached inside the top of the receptacle and curved back over it and with a thick central boss fitting into a more deeply recessed part of the receptacle. *Petals* 5, dark pink with a dark patch at the extreme base, obovate to linguiform, 6-7 mm long and c.  $\frac{1}{2}$  or less in width, the greatest width above the centre, deciduous. *Stamens* usually 10, 3-4 mm long; filament slender and somewhat hairy, to c. 0.5 mm long, at an angle to the body of the anther; body of the anther 2 mm long, purple, shining and smooth, with a broad base extending behind the filament, gradually contracting into the anther-tube; anther-tube yellow, 1.5-2 mm long with a broad almost straight orifice. *Ovary* glabrous, with a broad base, the slender style 3 mm long. *Ovules* 2, 1 in each loculus, attached below the top of the central axis. *Fruit* not seen.

DISTRIBUTION: Known only from the Type specimen from the South Irwin district of SW. Western Australia. Map 5, see p. 174.

SPECIMENS EXAMINED: WESTERN AUSTRALIA: South Irwin District: Mt Lesueur, Gardner 9362, 8.1949 (PERTH). Without precise locality: Western Australia, Drummond (MEL 1008126, 1008128, 1008355).

This species seems to be related to *T. virgata* and perhaps *T. deltoidea* but differs in having slender filaments. From *T. deltoidea* it also differs in its long anther-tubes.





Tetratheca remota





2

Thomasia formosa S. Paust  
+ Nuytsia 1: 351 (1971)

**Thomasia formosa** S. Paust sp. nov. (Figures 2 and 11)  
(formosa = handsome)

*Frutex* stellato-tomentosus. *Folia* angustissime ovata, petiolata, 20-40 x 4-10 mm. *Stipulae* oblique ovatae, 4-7 mm longae. *Racemi* saepe ramosi. *Bracteolae* 3, lanceolatae, calycem subtus. *Calyx* 10 mm longus, stellato-hirsutus, lobis 5 ovatis. *Petala* 5, spatulata, 1 mm longa. *Stamina* 5, filamentis 1 mm longis, antheris anguste triangularibus 3.5 mm longis. *Ovarium* 3-loculare, 2 mm longum, albo-stellato-tomentosum. *Stylus* 3 mm longus, glaber.

*Type*: ± 5 mi W of Three Springs, Western Australia, 29 Sept. 1972. C. Chapman s.n. Holo: PERTH, iso: K.

Erect, multistemmed, woody *perennial*, up to 50 cm high; branchlets, leaves and inflorescence closely stellate-tomentose, rufous. *Leaves* alternate; petiole 5 mm long; lamina very narrowly ovate, 20-40 mm long, 4-10 mm wide, rugose above; margin ± crenulate, recurved. *Stipules* foliaceous, obliquely ovate, 4-7 mm long. *Racemes* leaf-opposed, 70-120 mm long, 7- many-flowered, often branched; peduncle 30-40 mm long; pedicels 10 mm long; bracts ovate 1-3 mm long; bracteoles 3, lanceolate, reflexed, 7 mm long, subtending calyx. *Calyx* pink, papery, 10 mm long, stellate-hairy, divided to below the middle into 5 ovate lobes, ribs thickened. *Petals* 5, spatulate, slightly concave, 1 mm long, glabrous. *Stamens* 5; filaments linear, 1 mm long; anthers narrowly triangular, 3.5 mm long. *Ovary* globose, 2 mm long, white stellate-tomentose, 3-celled; style filiform, 3 mm long, glabrous, ovules 4-8 per locule. *Seed* not seen.

*Distribution*: South-west Western Australia; this species is known only from collections made 8 km W of Three Springs.

*Thomasia formosa* is similar to the more southern species, *T. angustifolia* Steud. and *T. petalocalyx* F. Muell. in that it has a tomentose, 3-celled ovary and a glabrous style. It is distinguished from these species by the much larger flowers and inflorescence and by its leaf form.

Journal of the Royal Botanic Garden, Edinburgh  
Volume 10, Part 1, 1952

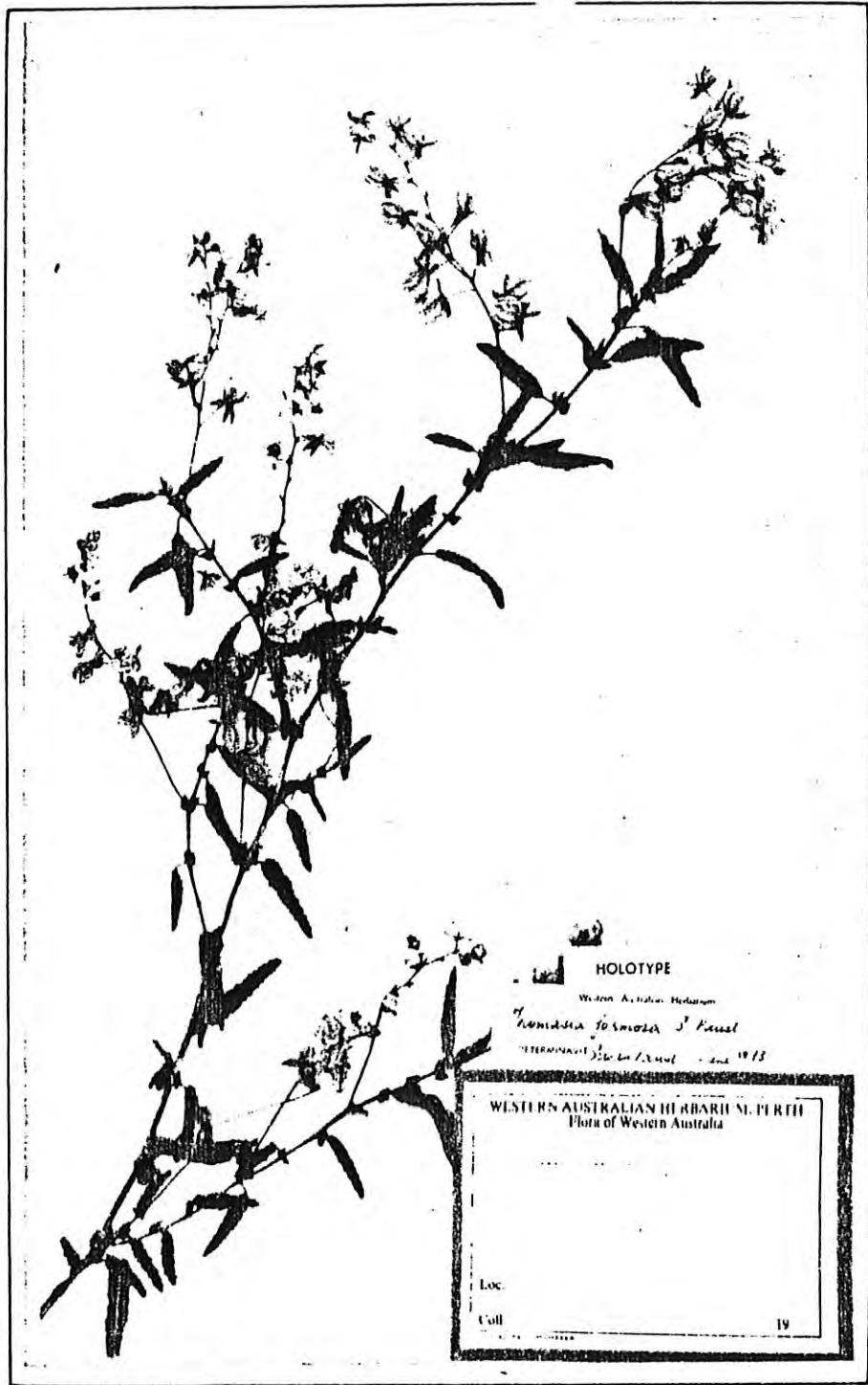
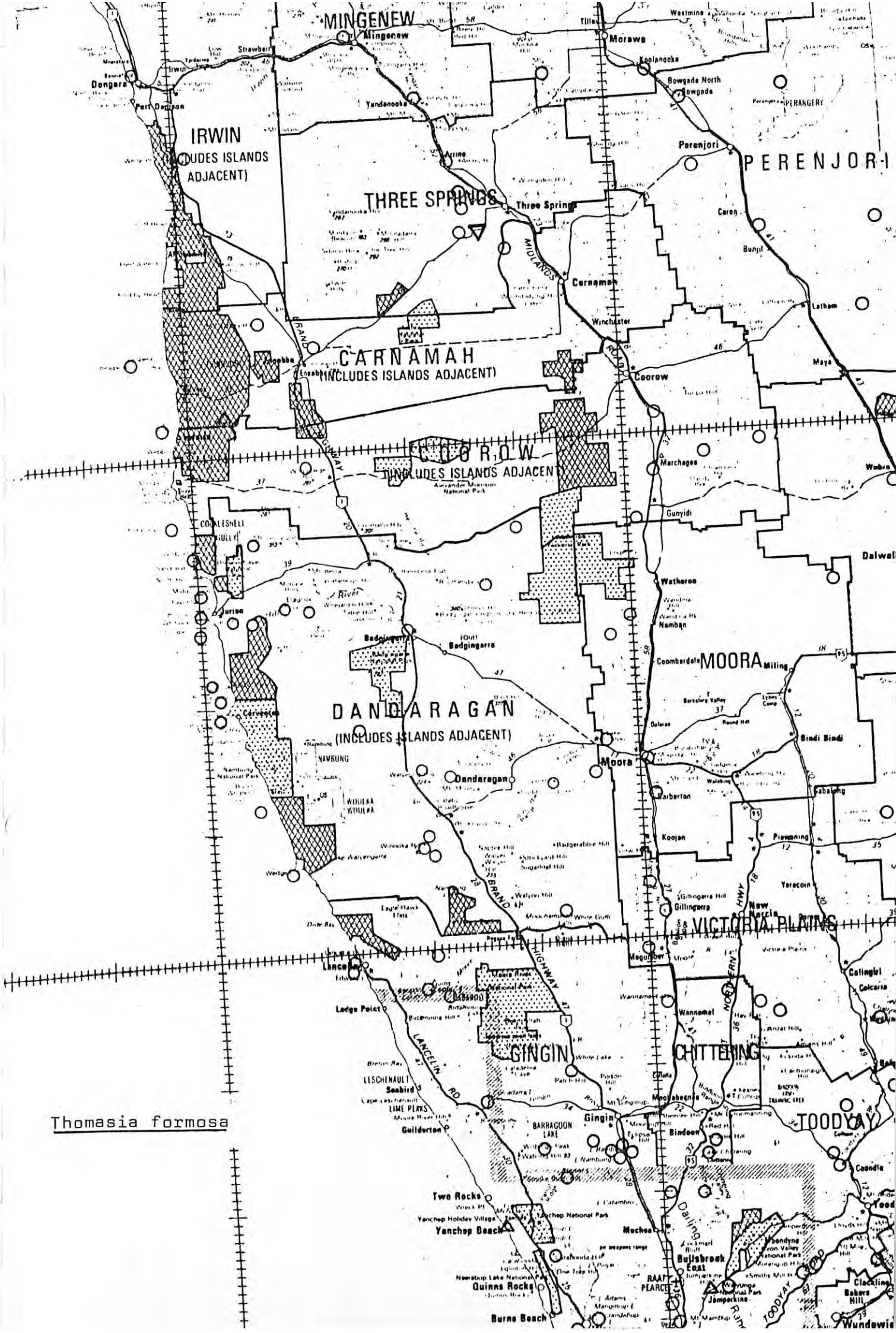


Figure 2—*Thomasia formosa* sp. nov. Holotype—± 5 mi W of Three Springs, C. Chapman.



Thomasia formosa





Thysanotus spiniger N.H.Brittan

† J. Roy. Soc. W. Austral. 43: 13 (1960)

(vii) *Thysanotus spiniger* N. H. Brittan sp. nov.

*Holotype*: Hill River, N. H. Brittan 52/39, 24.ix.1952 (vegetative) and Botany Department experimental garden, N. H. Brittan 58/39, 8.xi.1958 (flowers) (PERTH).

*Herba* perennis, rhizoma crassa brevis, fibrae radicales fasciculatae, elongatae, haud tuberosae. *Folia* plura ante florationis marcescentia, circa 15 cm longa, complanata, marginis et dorsum brevis hirsutibus. *Caulis* vel 40 cm longae, rigidae, teres, nuda, sulcata, pilis brevibus paulum recurvatis hirsutibus; copiose ramosus, ramis brevibus dichotomose ramosus, ramulis ultimis in aculeis brevibus terminibus. *Bractae* inferne folioides, ciliato-marginatae, bractae superne breves, acutae. *Umbellae* 1-2 floris, bractae breves deltoides. *Perianthum*: tepales exteriores late lineari-lanceolatae, mucronatae, anguste membranaceo-marginatae, circa 13 mm longae, 3 mm latae; tepales interiores ellipticae, fimbriatae. *Stamina* 6, antherae aequales, 8 mm longae, rectae haud contortae, stylus adversus, declinatus. *Ovarium* subglobosum, stylus curvatus. *Capsulam* maturam et semina haud video.

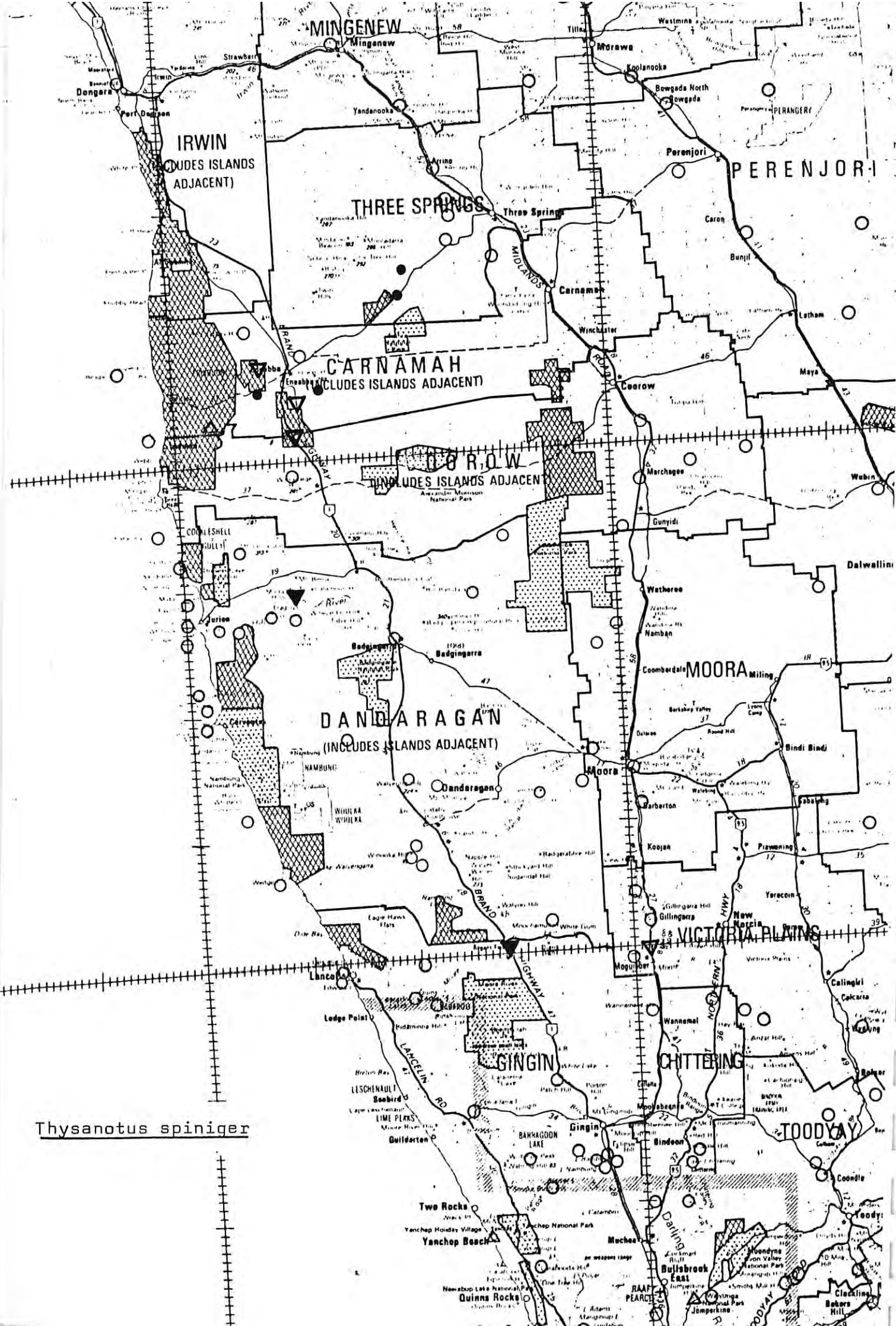
Perennial, short thick rhizome, roots clustered, long not tuberous. *Leaves* flattened, several per shoot at the start of the growing season, up to 15 cm long, shortly hirsute on margins and on ridges on the back, dying before flowering period. *Shoots* stiff, up to 40 cm tall, naked, terete, ridged, with short, somewhat recurved hairs on the ridges; copiously branched, side branches short and branched again dichotomously, final branches terminating in a short prickle-like cone. Lower bracts leaf-like, ciliate margined, upper ones short, acute. *Umbels* 1-2 flowered, bracts short, deltoid. *Perianth*: outer tepals broadly linear-lanceolate mucronate, with narrow membranous margins, ca. 13 mm long, 3 mm wide; inner tepals elliptical, fimbriate. *Stamens* 6, equal, anthers 8 mm long, straight not twisted, declinate opposite to the style. *Ovary* subglobose, style curved. Ripe capsule and seed not seen.

Differs from *T. dichotomus* in its more rigid habit, the semi-pungent ends of the branches not bearing flowers and the six, straight equal length anthers.

*Type locality*.—Hill River area, N.W. Avon District.

*Holotype*.—Hill River, N. H. Brittan 52/39, 24.ix.1952, flowers from plant cultivated in experimental garden of Botany Department, University of W.A., N. H. Brittan 58/39, 18.xi.1958 (Fig. 7, Nos. 2, 3, and 4 and Plate VII) will be deposited in the Herbarium, Department of Agriculture, Perth.

*Other specimen*: Nr. Mogumber, N. H. Brittan 55/13, 24.ix.1955 in Herbarium, Botany Department, University of W.A.



Thysanotus spiniger

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Thysanotus spiniger* N.H. Britton Family *Liliaceae* Date Recorded 5.5.81.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	1.5m S of Regans Ford	In Sand with <i>B. attenuata</i>	22.11.60	Y	A. George 1704
	NE from Lake Logue	low open heath, white	27.8.49	N	C. Gardner 9119
	8km S of Eneabba 29°53'S 115°16'E	Sand over clay colluvium	20.10.76	Y	E. Ariffin 661
Holotype	Hill River Sheet 5 3275 12518		24.9.52		N.H. Britton 52/39
	8km S of Eneabba 29°53'S 115°16'E	Bank. <i>Hookeriana</i> heath	20.9.77	Y	R. J. Mathew 771282
		dune crest			
K.P.	11 m S of Eneabba	Sand heath	21.12.68	Y	H. Demar 0973
UWA	near Moggumber		24.9.55	Y	N.H. Britton 55/13
UWA	30 m N of Cockle shell gully towards Eneabba		8.9.73	Y	N.H. Britton 73/26
UWA	1.2 m S of Regans Ford.		10.9.74	Y	N.H. Britton 74/20



Thysanotus vernalis N.H. Brittan

+ J. Roy. Soc. W. Austral. 43: 10-11 (1960)

(ii) *Thysanotus vernalis* N. H. Brittan sp. nov.

*Holotype*.—S. of Mt. Lesueur, N. H. Brittan 55/27, 2.x.1955 (K)

*Herba* perennis, fibrae radicales fasciculatae, tuberosae, glabrae. *Folia* radicalia 1-2, circa 10-25 cm longa, canaliculata, acuta, tuberculato-marginata, ad basin expansa in alata membranacea. *Scapus* 1-2, 14-35 mm longus, teres, glaber, nudus, ad dimidio superne dichotomum ramosum. *Bractae* ad nodos, acutae, 7-8 mm longae, prope basin ad 3-4 mm ad apicem. *Ramosis* ultimis 1-2 cm longis, umbellae solis desinis, bractae acutae, fuscae venosae, membranaceo-marginatae, 3 mm longae. *Umbellae* 2-5 floris, pedicellis tenuis, prope basin articulatis, 4-5 mm longis, erectis vel cernuis. *Perianthum*: tepales exteriores 10 mm longae angusto-lanceolatae, anguste membranaceo-marginatae, mucronulatae: tepales interiores ellipticae, fimbriatae. *Stamina* 6. purpurea vel flava, tria antherae exteriores 2.5-3 mm longae, rectae, contortae: tria antherae interiores 4 mm longae, rectae, contortae. *Ovarium* globulum sessile, stylus erectus 3.5 mm longus.

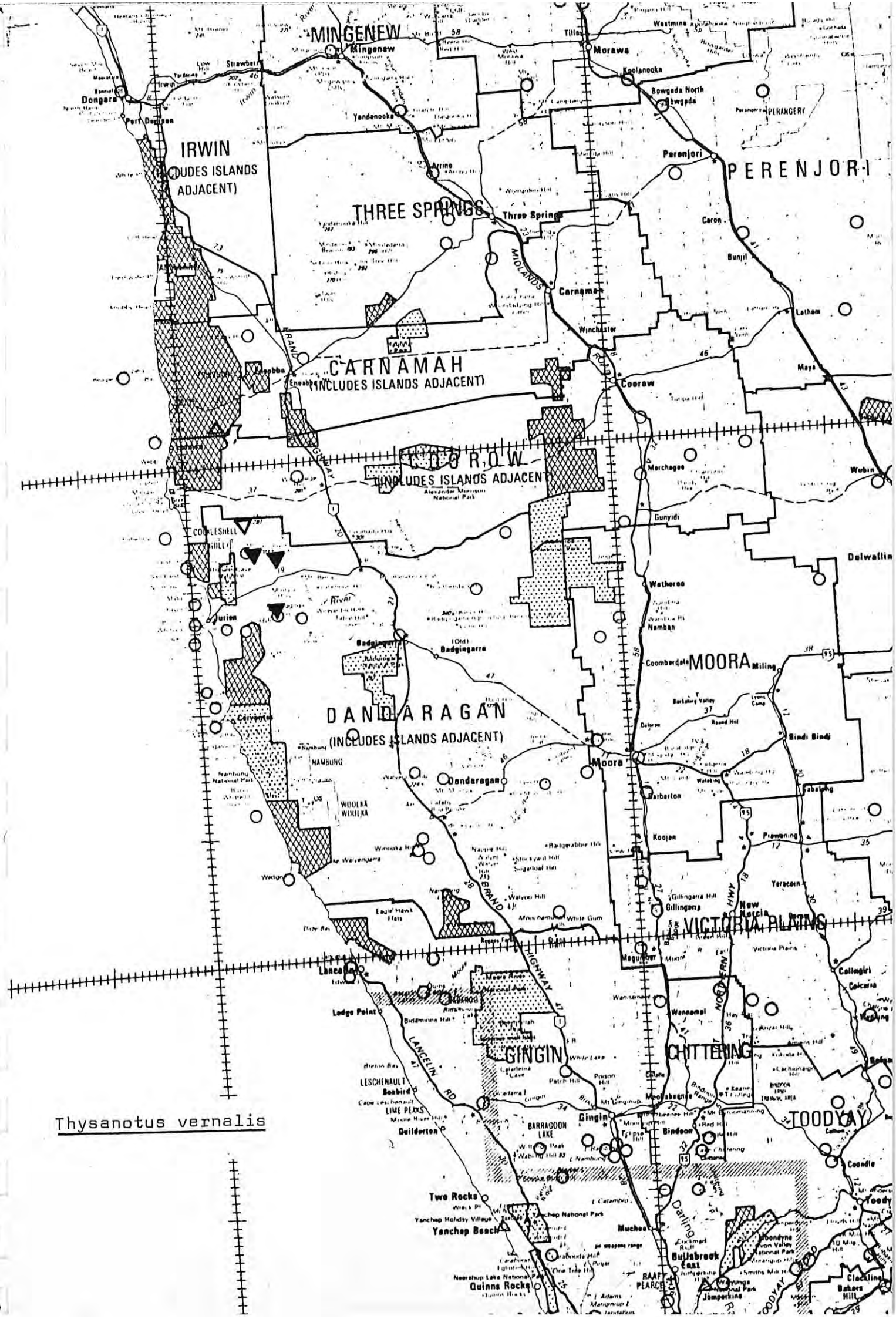
Perennial, roots clustered, tuberous, glabrous. Radical leaves 1 or 2, 10-25 cm long, channelled, acute, tuberculate margined, expanding at the base into membranous wings. Scapes 1 or 2, 14-35 cm long, terete, glabrous, naked, branched dichotomously in the upper half. Bracts at nodes acute, 7-8 mm long at the base to 3-4 mm long at the apex. Final branches 1-2 cm long terminating in a single umbel, bracts acute, dark veined, membranous-edged, 3 mm long. Umbels 2-5 flowered, pedicels thin, articulated near the base, 4-5 mm long, erect to bending downwards in fruit. Perianth as in genus, outer tepals 10 mm long, narrow-lanceolate with narrow membranous margins, mucronulate: inner tepals elliptical, with long fimbriate margins. Stamens 6, purple-yellow, outer anthers 2.5-3 mm long, straight, twisted: inner anthers 4 mm long, straight, twisted, lower lobes cordate. Ovary globular, sessile, style straight, 3.5 mm long.

Distinguished from other tuberous rooted species by its open, dichotomously branched inflorescence and by the possession of straight, not curved anthers almost equal in length.

*Type locality*.—Region about Mt. Lesueur, S. of Irwin District, W.A. in sand plain vegetation on sandy loam or clay soils.

*Syntypes*: S. of Mt. Lesueur N. H. Brittan 55/27 2.x.1955 (2 sheets).

The holotype (Fig. 2) is in the Herbarium, Royal Botanic Gardens, Kew. The other sheet (Plate II) will be lodged in the Herbarium, Department of Agriculture, Perth.



Thysanotus vernalis



Urocarpus phebalioides Drumm. ex Harv.

Hooker's J. Bot. Kew Gard. Misc. 7: 55 (1855)

+ Benth. Fl. Austral. 1: 352

as Astrolasia phebalioides (Drumm.) Benth.

see also Rye & Hopper (1981) p 184

9. **A. phebalioides**, *Benth.* Branches elongated, often appearing glabrous, but really clothed with a minute stellate pubescence. Leaves on rather long petioles, orbicular, ovate or oblong, obtuse, mostly under  $\frac{1}{2}$  in. long, rarely  $\frac{3}{4}$  in. Pedicels slender, either in terminal umbels soon becoming lateral, or 2 or 3 together in the upper axils. Flowers as in *A. pallida*, at least when fully out. Ovary stellate-hairy, truncate and not lobed, the 2 carpels united at the top, and retaining the shape for some time after flowering, the outer angles at length growing out into long horizontally diverging beaks.—*Urocarpus phebalioides*, Drumm. in Hook. Kew Journ. vii. 55; *Eriostemon Drummondii*, F. Muell. Fragm. i. 105.

**W. Australia.** Mount Lesueur, *Drummond*.





Strangea cynanchocarpa (Meisn.) F. Muell.

Fragm. Phyt. Austral. 7: 132-133 (1871)

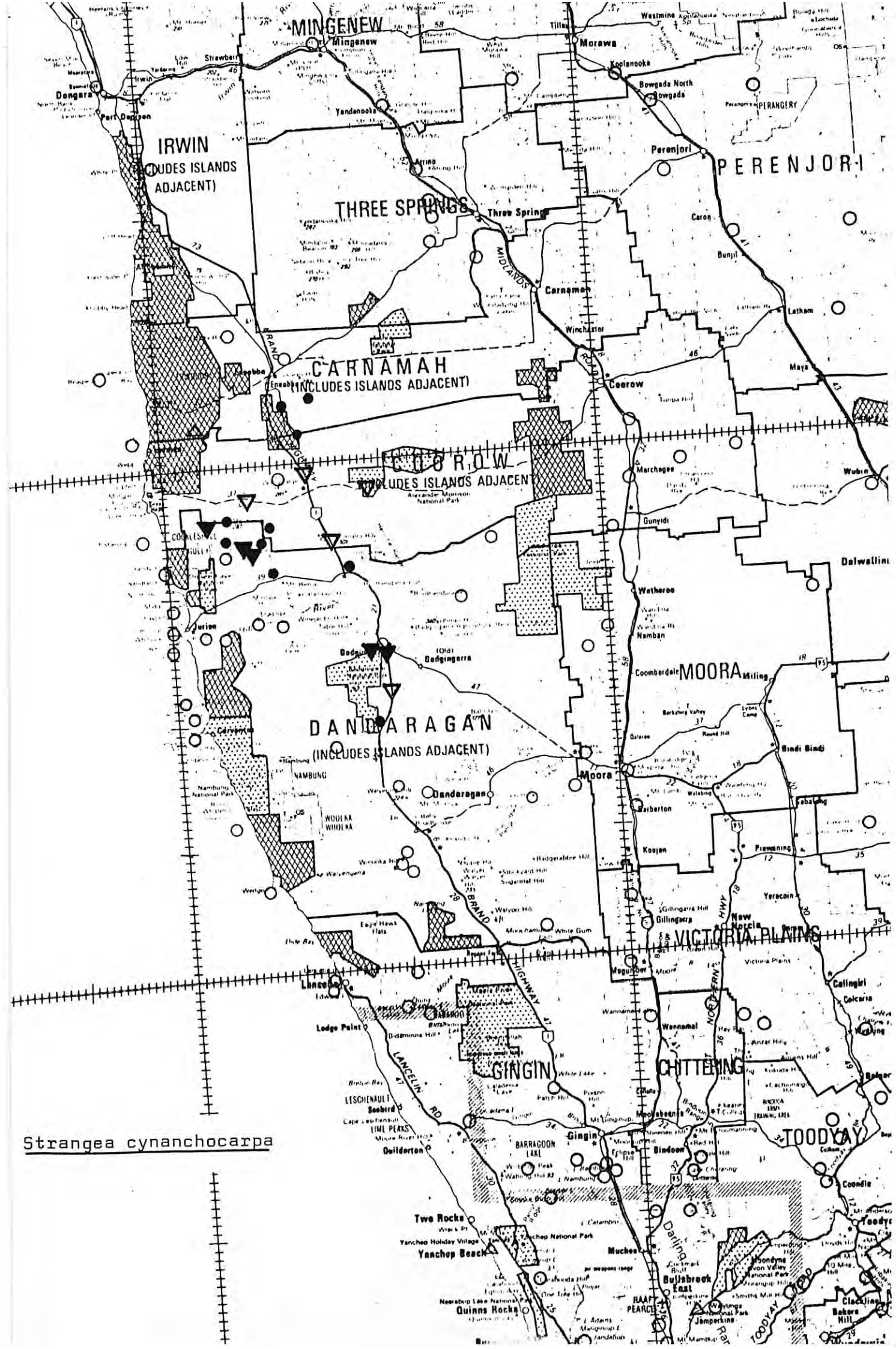
+ Benth. Fl. Austral. 5: 453-454

as Grevillea cynanchocarpa Meisn.

66. **G. cynanchicarpa**, Meissn. in Hook. Kew Journ. vii. 75. A spreading but stout and rigid shrub of 3 or 4 ft., the young branches tomentose, the adult foliage glabrous. Leaves rather crowded, erect, linear, acute or mucronate, thick and rigid but flat or slightly concave, veinless, contracted at the base but scarcely petiolate, 2 to 4 in. long in some specimens, 3 to 6 in. in other. Pedicels solitary in the axils, about 3 lines long. Perianth unknown. Torus very oblique. Gland prominent, thick, obliquely semiannular. Ovary tomentose-villous, stipitate on the upper margin of the torus, with 2 laterally attached ovules as in all other *Grevilleæ*; style short and thick; stigmatic disk large and lateral. Fruit 2 to 2½ in. long, rather narrow, hard, tapering at both ends, obtusely ribbed, opening along the upper suture. Seed flat, oblong, 1½ to 2 in. long, thin but not distinctly winged, slightly thickened about the hilum which is very near the base, the outer membranous coating separating from the inner and opening in two valves. Embryo of the shape of the seed and equally distant from both ends, the radicle exceedingly short at the lower end.—*Molloya cynanchicarpa*, Meissn. in DC. Prod. xiv. 348.

**W. Australia.** Moore river and sand plain north of Diamond river, Drummond, 6th coll. n. 190; Cockleshell gully, Murchison river, Oldfield.

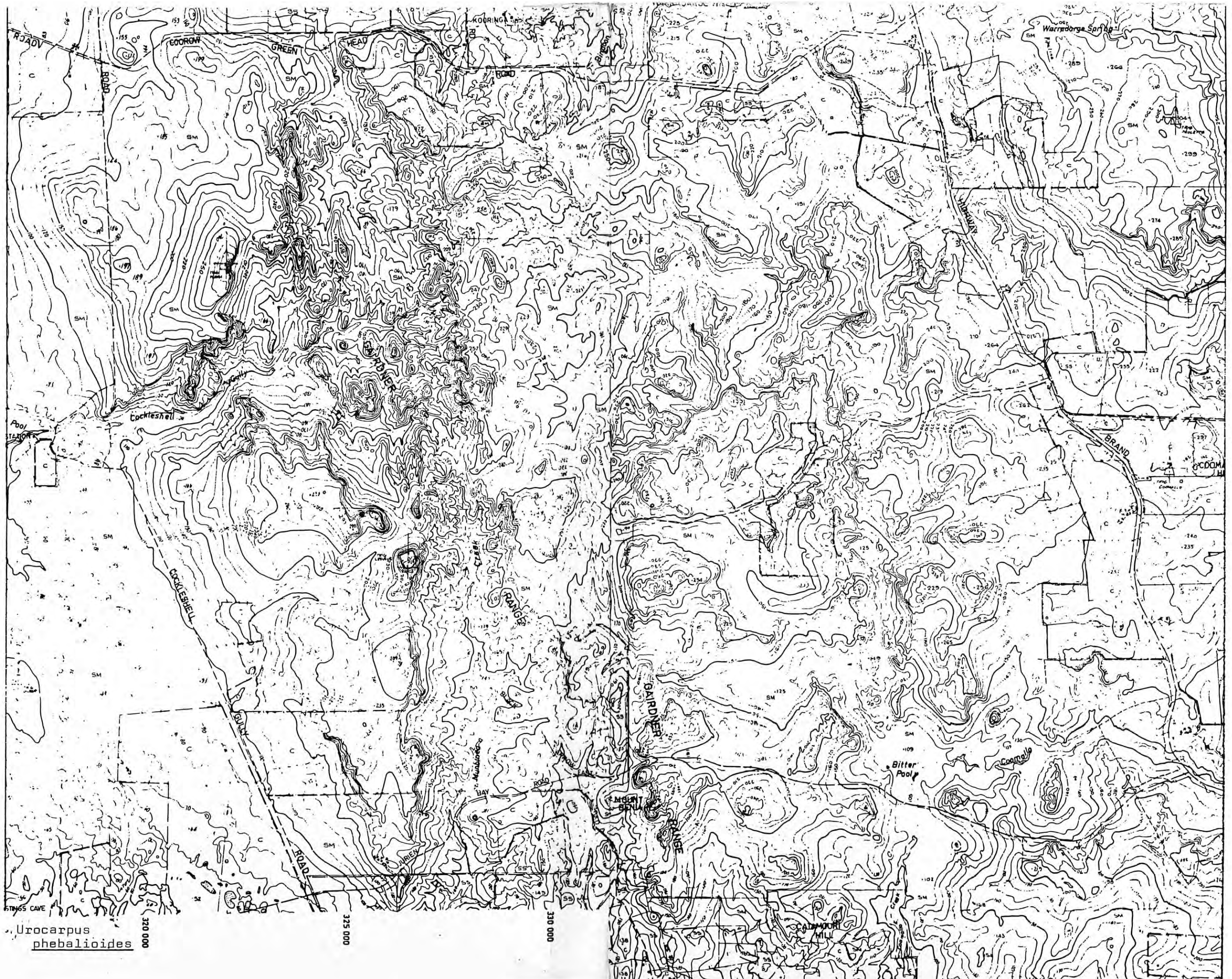
This has been proposed as a distinct genus on the supposition that the seed was winged at the upper end like that of a *Hakea*, and that the ovule was solitary. That proves however to be a mistake. The ovary, fruit, and seed are precisely those of several true *Grevilleæ*, except as to what appears to be the outer coating of the seed, which in this species and in *G. Strangea* separates itself from the inner in a manner not observed in other species, but which, in the absence of any other character, can scarcely justify the generic separation of these plants so long as the seeds of so many allied species remain unknown.



Strangea cynanchocarpa







Urocarpus  
phebaloides

320 000

325 000

330 000



Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Urocarpus phebalioides* Drummond <sup>Harv.</sup>

Family Rutaceae

Date Recorded 4.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Mt Lesueur		21. 8 49	Y	CAGardner 9359
	North Slope Mt Lesueur 30°11'S lat 115°12'E long	low open heath, grey sand and lateritic boulders, below breakaway	17 7 79	Y	EAGriffin 1899
	Mt Lesueur 30°11'S lat 115°12'E long Mt Peron	low open heath, grey sand and lateritic boulders, below breakaway	22 9. 79 June 1966	Fruit Y	EAGriffin 2308 ? Gardner
Isotype	Mt Lesueur		1854	fruit	J Drummond ? 84

Verticordia patens George

+ W. Austral. Nat. 10/2 : 30-31 (1966)

2. *Verticordia patens* A. S. George, sp. nov.

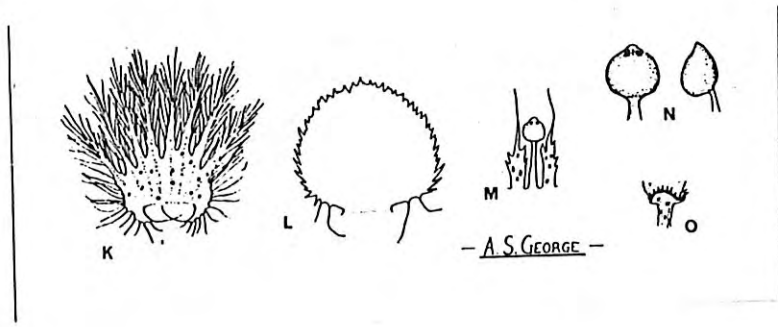
Frutex glaber, 1 m. altus. Folia, pedicelli, bracteolae et tubus calycis cum glandulis oleosis prominentibus. Rami principales pauci, erecti, sparse foliati, ramuli floriferi ad apices corymbosis. Folia linearia, triquetro-teretia, acuta, breviter petiolata, 5-15 mm. longa. Flores flavi, 6-8 mm. diametro, in pedicellis tenuibus 8-20 mm. longis. Bracteolae orbiculares, concavae, imbricatae, liberae, in anthesem deciduae. Tubus calycis glaber, turbinatus, irregulariter 10-costatus; lobi 2.5-3 mm. longi, orbiculares, 7-9-pectinato-lobati, in basem auriculis reflexis ciliatis. Petala orbiculari-ovata, glabra, breviter dentata, ad basem cillis paucis reflexis. Stamina staminodia-que quam petalis breviora; filamenta tenuia; anthera ad apicem 2-porosa glandulis dorsalis latissimis apicibus brevibus obtusis. Staminodia late-linearia, acute-dentata, apicibus filiformibus. Stylus quam staminibus brevior, stigma parva. Ovuli 2.

Holotypus: Mogumber Mission, Moore River, in sandy clay with *Eucalyptus calophylla* and *Dryandra sessilis*, A. S. George 6431, Sept. 26, 1964.

A glabrous shrub to 1 m. Leaves, pedicels, bracteoles and calyx-tube with prominent oil glands. Main stems few, erect, sparsely leaved; flowering branchlets corymbosely arranged towards apices. Leaves linear, triquetrous-terete, acute, very shortly petiolate, opposite or alternate, 5-15 mm. long. Flowers bright yellow, solitary in the axils. Pedicels slender, 8-20 mm. long. Flowers 6-8 mm. across. Bracteoles orbicular, concave, imbricate, free, deciduous at anthesis, leaving a thick annular scar bearing a row of short, thick setae. Calyx tube glabrous, turbinate, irregularly 10-ribbed; lobes orbicular, 2.5-3 mm. long, with 7-9 pectinately fringed lobes and two reflexed deeply ciliate basal auricles. Petals orbicular-ovate, glabrous, shortly dentate, with a few reflexed cilia at the base. Stamens and staminodes shorter than the petals. Filaments slender, anthers globular, 2-porose towards the apex, connective broad, with a slightly projecting obtuse appendage. Staminodia broad-linear, acutely dentate with filiform apices. Style shorter than stamens, stigma small. Ovules 2.

Known only from the Mogumber-Moora district. Near Moora, on sandplain, Miss A. Ashby 95, Sept., 1946; 2 miles W. of Moora, associated with *Actinostrobos*, F. W. Went 136, Sept. 5, 1962; 5 miles W. of Moora, in sandheath, J. S. Beard 1844, Sept. 23, 1962; W. of Gillingarra, in sand, with *Banksia* spp., *Adenanthos sericea* and occasional *Eucalyptus tottiana*, A. S. George 6409, Sept. 26, 1964.

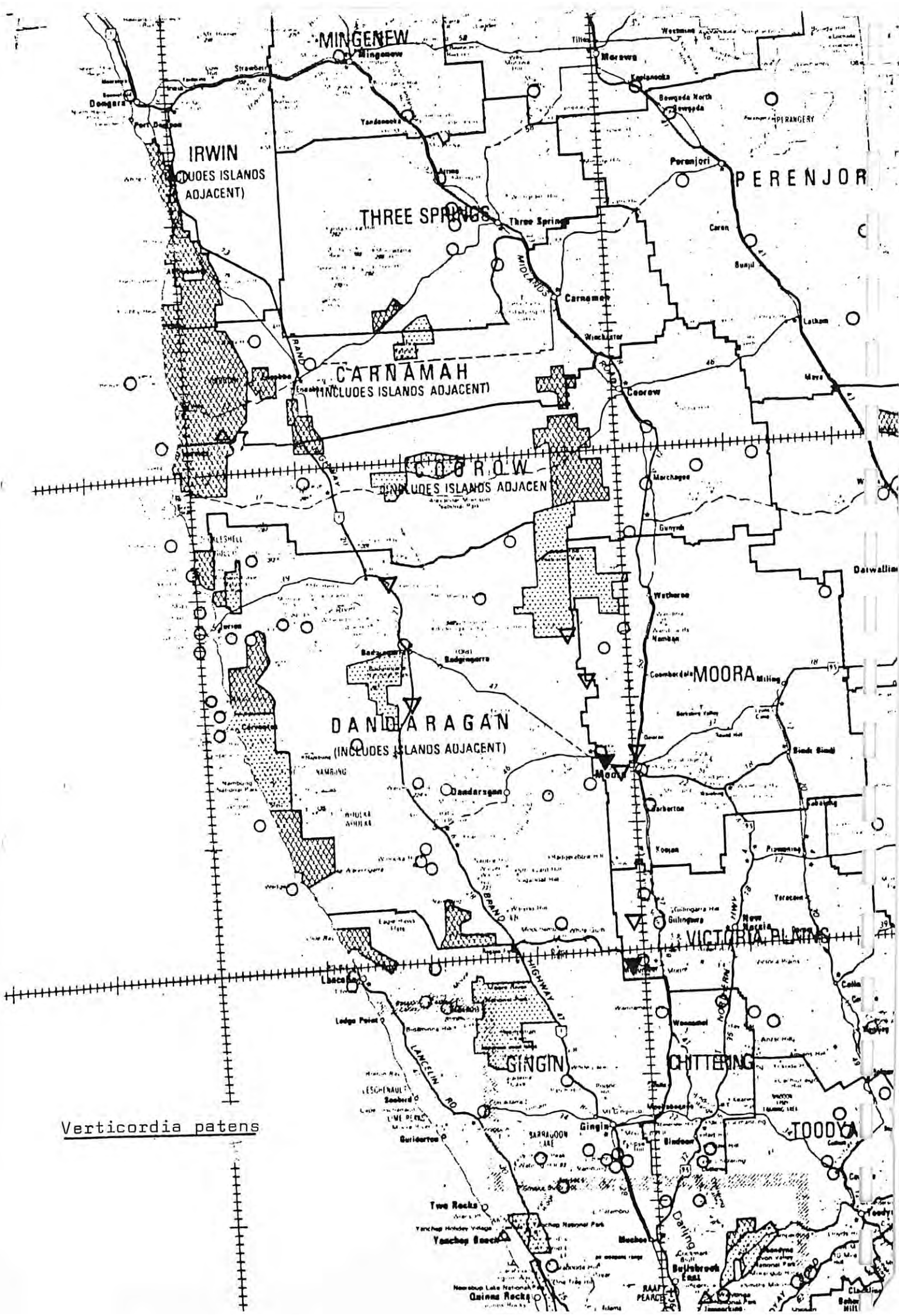
The tall, open habit is a distinctive feature of the species, the specific epithet being derived from this point. It is closest to *V. nitens* (Lindl.) Schau., differing from that species in the more branching habit, the yellow flowers, the calyx tube less prominently ribbed with more oil glands, the prominent reflexed auricles to the calyx lobes, the anther appendages much less prominent, and the broader dentate staminodia. From *V. serrata* (Lindl.) Schau., it differs in a number of small points which together give it a different aspect. The habit is taller and more open, the leaves never ciliate; the flowers bright yellow rather than golden yellow; the calyx tube turbinate rather than compressed; the petals broader, less deeply toothed, with reflexed basal cilia; the stamens shorter with smaller anthers and less prominent appendages; and the apices of the staminodia filiform rather than obtuse. From *V. grandiflora* Endl., *V. chrysantha* Endl., *V. preissii* Schau., and *V. acerosa* Lindl., it is at once to be distinguished by the petals, as well as combinations of the characters outlined above.



- A. S. GEORGE -

K-O, *Verticordia patens*

K. Calyx lobe, x 8; L. Petal, x 8; M. Stamen and staminodia, x 8;  
N. Anthers; O. Base of calyx tube, showing annular scar with setae  
after bracteoles have fallen. Drawn from A. S. George 6431.



Verticordia patens



A. AS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Verticordia patens* A.S. George

Family *Myrtales*

Date Recorded 29.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	W of Gillingarra	sand	26.9.64	Y	AS George 6409
	5m W of Moora	sand heath	27.9.62	Y	JS Beard 1844
	56m N of Regans Ford, 30°32'S 115°28'E	sand plain	16.7.74	Y	BL Powell (Rye) 74040
	Watheroo National Park South Boundary	Sandy Soil	4.10.71	Y	RP Royce 9556
	✓ Sand plain near Moora	✓	✓	Y	RD Royce 9507
	15km W of Coombedale 115°50'E 30°36'S	sandy	Sept 46	Y	A Ashby 95
	Moora, Nth Watheroo Rd		2.11.74	Y	DJE Whibley 4944
	Near Moora (2m t)	gravel	10.9.71	Y	AC Burns 64
	104.6km NNW of Gin Gin	heath, sandy soil	5.9.62	Y	F W Went 136
Isotype	6.3m from Juiem turn off		2.11.70	Y	TEH Appleton R Covey 3123
KP	5m W of Moora	in sand heath	16.10.66	Y	AS George 6431
KP			23.9.62	Y	F. Lullwitz LS624A JS Beard 1844

Xanthosia tomentosa George

+ J. Roy. Soc. W. Austral. 50:99-101 (1967)

see also Erickson et al p.98

& Blackall & Grieve (1980) plate XVI

APIACEAE

*Xanthosia tomentosa* sp. nov.

Herba perennis ramis pluribus prostratis vel ascendentibus, ad 50 cm longis; stellato-tomentosa, rami demum glabriusculi. Folia in mentosa, rami demum glabriusculi. Folia in axillaribus conferta; 10-30 mm longa vel longiora, cuneato-rhomboida, in petiolo laminibus aequilongis angustata, 3-10-lobata, lobis breviter mucronatis vel acutis, nervis obscuris. Inflorescentia solitaria, terminalia, in pedunculo 3-15 cm longo. Bractee involucrales 4, 6-9 mm longae, lanceolata-ellipticae, acutae, inderdum lobatae. Bractee radiatae 4, 15-20 mm longae, ad medium tripartitae, segmentis lateralibus oblique-ovatis, centrale oblanceolata mucronata-acuta. Umbellae 5, floribus ♂ vel ♀. Flores ♂ in pedicellis 0.75-1 mm longis. Calycis tubus 2.5 mm longus; utrumque carpellum latere utroque 3-4-costatum; lobis cordatis, obtusis, < 1 mm longis, glabris. Petali lobos calycis excedentes, inflexi, glabri. Lobi disci prominentes pills plumosis hirsuti. Styli crassi, ± 1.7 mm longi. Flores ♂ similes sed minores, pedicellis longioribus, carpellis et stylis rudimentalibus.

*Holotype*: 2 miles N. of Cockleshell Gully A.S. George 7827a, Sept. 1, 1966.

Perennial herb with many prostrate or ascending stems to 50 cm long, stellate-tomentose, the stems at length more or less glabrous. Leaves scattered on the main stems, but crowded on axillary branchlets, 10-30 mm long, sometimes longer, cuneate-rhomboid, narrowed into petioles as long as the laminae, 3-10 lobed, the lobes shortly mucronate or acute, the nerves obscure. Inflorescence solitary, terminal, on a peduncle of 3-15 cm. Involucral bracts 4, 6-9 mm long, lanceolate-elliptical, acute, sometimes lobed. Ray bracts 4, 15-20 mm long, divided to the middle into 3 segments, the lateral ones obliquely ovate, the central one oblanceolate, mucronate-acute. Umbels 5, the flowers ♂ or ♀. ♂ flowers on pedicels of 0.75-1 mm. Calyx tube 2.5 mm, each carpel 3-4 ribbed on each side; lobes cordate, obtuse, less than 1 mm long, glabrous. Petals exceeding the calyx lobes, inflexed, glabrous. Disc lobes prominent, hirsute with plumose hairs. Styles thick, ± 1.7 mm long. ♂ flowers similar but smaller, on longer pedicels, with rudimentary carpels and styles.

*X. tomentosa* is close to *X. rotundifolia* D.C., differing chiefly in the decumbent, many-stemmed habit, the leaf shape and the persistent indumentum (the specific epithet referring to the last character). Other collections are from Mt. Peron, C.A. Gardner 8433 and 10265, and 2 miles E of Diamond Springs, K. Newbey 2353.

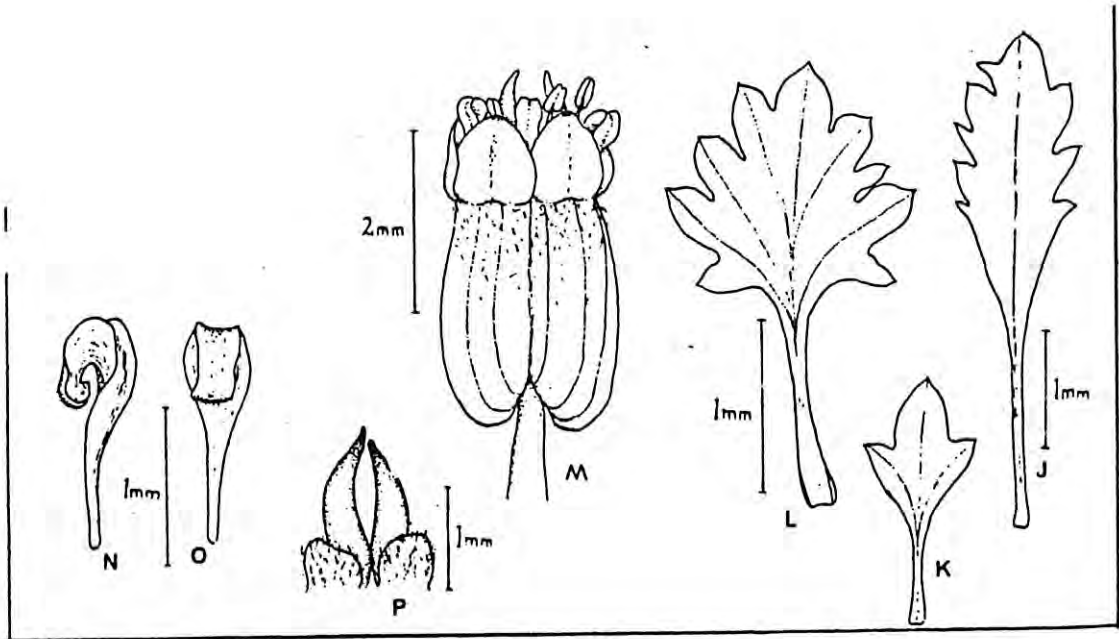
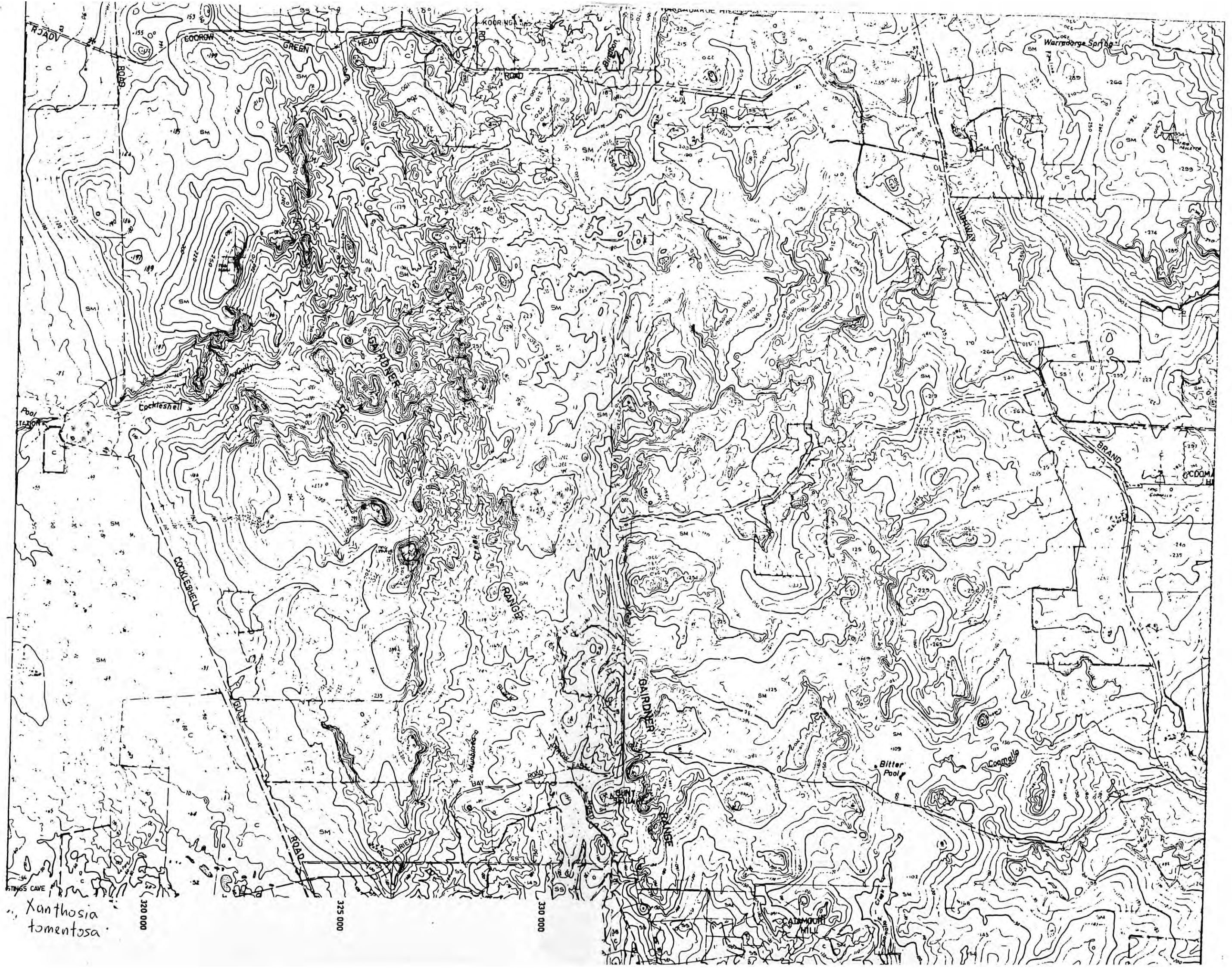


Figure 4.—

J-P *Xanthosia tomentosa*: J, Leaf from Gardner 8433; K, Small leaf from George 7827b; L, Leaf; M, Flower; N, O, Side and inner view of petal; P, Styles and lobes of disc. L-P from holotype.





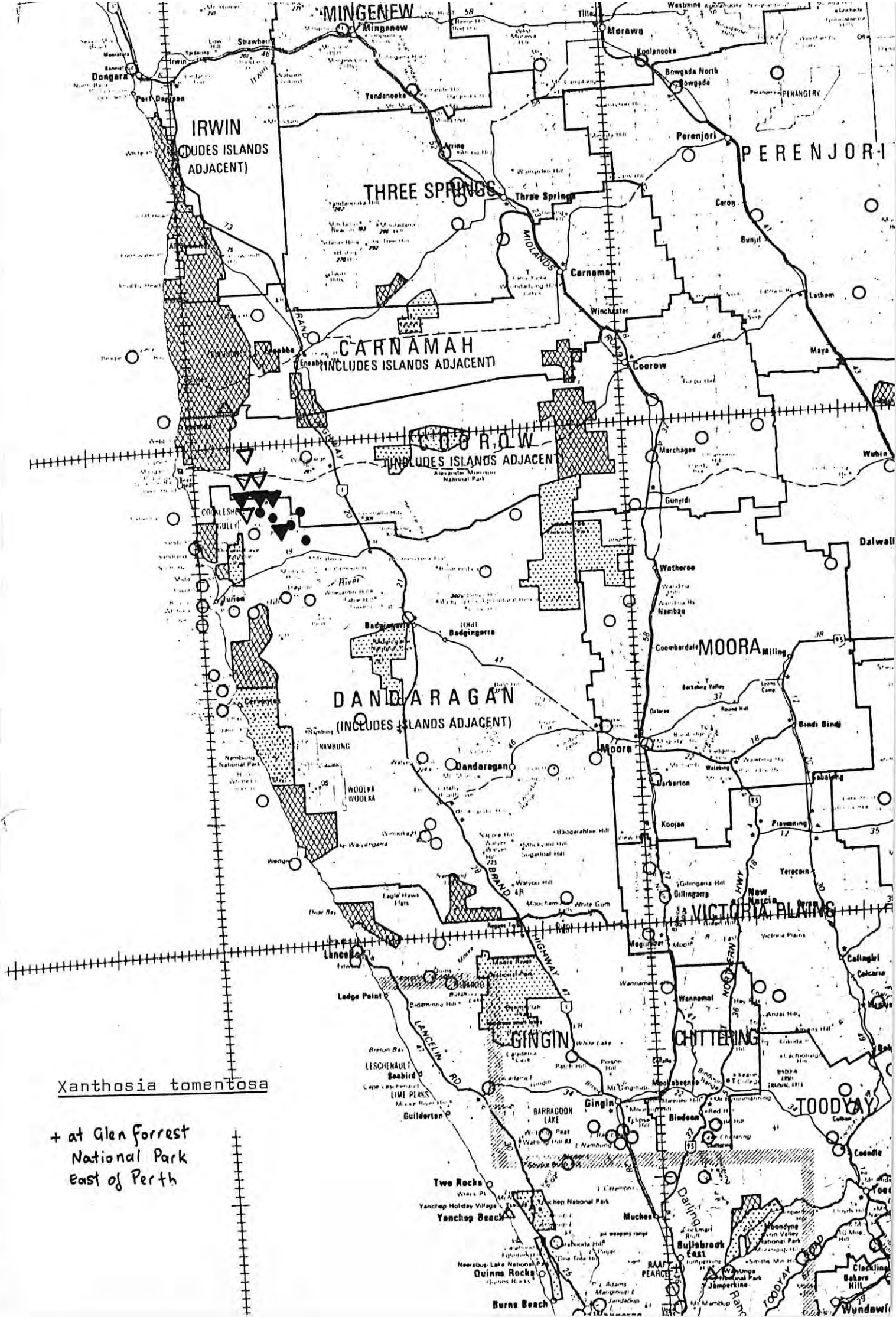
Xanthosia  
tomentosa

320 000

325 000

330 000





Xanthosia tomentosa

+ at Glen Forrest  
National Park  
East of Perth



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Xanthosia tomentosa* George.....

Family *Apiaceae*..... Date Recorded 25.5.81.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Hill, 1 km ENE Mt Peron, NE of Jurien	low open heath, grey sand	24.10.79	Y	E A Griffin 2447
	3006' stat 115° 10' E long	over laterite upland			
	23 miles from Jurien, towards Eneabba		24.9.68	Y	M E Phillips
	4 m north of Cockleshell Gully	heath, lateritic areas	10.11.74	Y (late)	G J Keighery 170
	Cockleshell Gully		26.9.71	Y	A C Burns 137
	Glen Forest N.P.		10.10.61	Y	T E Aplin 1020
	Mt Peron, NE Jurien		11.10.51	Y	C A Gardner 10265
	Jurien Bay	Sandy soil			
	Mt Lesueur		3.11.62	Y (late)	R D Royce 7704
	Mt Lesueur		25.10.73	Y	D Kitchener 40
	2 m E of Diamond Springs, NE of Jurien		27.10.73	Y	D Kitchener 60
	Mt Peron, NE of Jurien	Gravel	8.1.66	Y	K Newbey 2353
	8 m N of Jurien		15.10.46	Y	C A Gardner 8433
	9.5 m N of Jurien Bay turn off to Eneabba	Sandy gravel	9.10.68	Y	H Demar 2 429
	2 m N of Cockleshell Gully		21.10.66	Y	F W Hemphris
KP	2.7 m W (?) Cockleshell Gully on Eneabba Rd	low scrub, lateritic soil	1.9.66	Y	A S George 78276
KP	"West rd to Snag Island" (Goorow-Green Head Rd, W of Brand Hwy)	heath, white sand/laterite	28.10.73	Y	G J Keighery 482
			4.12.65	Y	F Lullfitz 24514

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Xanthosia tomentosa* George..... Family *Apiaceae*..... Date Recorded 25.5.81.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
UWA	Mt Lesueur			Y	NHSpec 54
UWA	Green Head turnoff	sandy soil		Y	?
UWA	Cockleshell gully			Y	NHSpec
UWA	Eneabba Sandplain, N of Cockleshell gully		Aug 67	Y	GG Smith 54
UWA	Mt Lesueur - Cockleshell gully Rd			Y	
Holotype	2m N of Cockleshell Gully	low scrub, lateritic soil	Sept 1966	Y	ASGeorge 7827a

APPENDIX 2. Apparently Undescribed Species in the Eneabba  
- Mt Lesueur Area.

Acacia sp. aff. celastrifolia (EAG 2219) Cockleshell Gully - erect shrub to 1m; mainly on lateritic upland soils around Mt. Lesueur (see Map A).

Acacia sp. (EAG 802) South of Lake Logue - dense shrub to 1.5m tall; only growing on causeway on road to Leeman.

Acacia sp. (EAG 2888) Lake Logue - Arrowsmith, - low slender, spreading shrub to 40cm tall; growing in shallow grey sand over limestone Kankar.

Acacia sp. (EAG 2891) Lake north of Lake Logue - dense shrub to 1.5m tall; only found in grey sand under Eucalyptus camaldulensis around edge of lake.

Acanthocarpus sp. (EAG 2784) Mt. Adams, Eneabba - apparently this species is relatively common throughout the Northern Wheatbelt. (G.J. Keighery pers. comm.).

Andersonia sp. (EAG 2565) Mt. Lesueur - Mt. Peron - erect shrub to 40cm tall; only found towards the base of breakaway slopes (see Map A).

Andersonia sp. (EAG 2213) Mt. Benia - erect shrub to 40cm tall; only found on breakaway slopes of Mt. Benia (see Map A).

Astroloma sp. (RJH 770022A) Mt. Lesueur - Eneabba - erect multistemmed shrub to 20cm tall; flowers cream; common on lateritic uplands and breakaway slopes (see Map B).

Bulbine sp. (GJK 2487) South of Lake Logue - growing in clayey wetland south of Lake Logue.

Calthropsis sp. (EAG 2224) North of Mt. Lesueur.

Calytrix sp. aff. brevifolia (EAG 3126B) Rocky Springs - erect shrub 30cm tall; growing in grey sand over laterite, on western boundary of Rocky Springs Reserve, 10 km South of Eneabba.

Darwinia sp. aff. helichrysoides (EAG 2196) Alexander Morrison National Park - Tathra National Park - erect, slender shrub to 25cm tall.

Daviesia spp. - several new species will be described from this area by MD Crisp.

Dryandra sp. aff. falcata (EAG 1676) Badgingarra-Eneabba - erect, single stemmed at base, to 1.2m tall; quite common and abundant in the area (see Map C).

Dryandra sp. aff. conferta (EAG 1777) - Alexander Morrison NP.

Dryandra sp. aff. horrida (EAG 1507) ? Badgingarra - Eneabba - erect large shrub, to 1.2m tall; abundant in small locations, e.g. Rocky Springs Reserve but confined to Iron rich laterites.

Eremaea spp. Several undescribed species are recognised from the Eneabba area and are being revised by Dr. R.J. Hnatiuk.

Eucalyptus sp. (EAG 2575) Cockleshell Gully - mallee or tree to 5m, white bark; mallees growing on slopes of breakaways and trees with E. wandoo on heavier soils of Gully.

Eucalyptus sp. (EAG 2231) Brand Highway, East of Mt. Lesueur.

Genus nova aff. Ecdeiocollea (EAG 2157) Mt. Benia - Eneabba - tufted to 40cm, growing with Ecdeiocollea monostachya but less robust or abundant (see Map D).

Gompholobium sp. aff. polymorpha (EAG 2306) Cockleshell Gully - erect, slender to 25cm tall; lateritic upland and breakaway slope (see Map A).

Goodenia sp. (EAG 1631) East of Eneabba - small slender to 20cm tall; growing on lateritic uplands (see Map D).

Grevillea sp. aff. eriobotrya (EAG 815) Eneabba - erect to 1.5m tall.

Grevillea sp. aff. thelemaniana (EAG 2228) Cockleshell Gully - tall shrub, layered, to 2m tall; growing in steep gullies.

Haemodorum sp. aff. simulans (EAG 2519) West of Coomallo Creek - short leaved, inflorescence to 60cm.

Haemodorum sp. (RJH 771355) Eneabba - broad flat leaf recumbent; inflorescence to 1m.

Haemodorum sp. (EAG 1564) East of Eneabba - like Haemodorum paniculata but with broad stem-clasping leaves.

Hakea sp. aff. falcata (EAG 2799) Mt. Adams - shrub to 1m tall, growing in shallow sandy depression. Other localities unknown.

Halgania sp. (EAG 1714) West of Alexander Morrison National Park and Mt. Adams. - Small, slender to 20cm tall; in lateritic gravels.

Hemichroa sp. (GJK 2544) Lake Indoon.

Hibbertia sp. (EAG 2253) Cockleshell Gully - Eneabba - erect; species like H. rhadinopoda (See Map D).

Hibbertia sp. (EAG 2530) Hill east of Mt. Lesueur - multistemmed; growing on lateritic upland (see Map D).

Hibbertia sp. (EAG 2155) Rocky Springs Reserve.



Isopogon sp. (EAG 2195) Coomallo Creek - Alexander Morrison National Park. - erect shrub to 1.5m tall; lateritic upland.

Lawrencina sp. (EAG 3084) Saltlakes East of Leeman - erect, growing in salt lakes; apparently also in North Eastern Wheatbelt.

Lasiopetalum sp. (RJH 800023) Mt. Adams.

Lepidobolus sp. (EAH 2093) Jurien - Eneabba - relatively common particularly in small gravelly localities on some breakaway slopes (See Map E).

Leucopogon sp. aff. nutans (EAG 3088) Leeman - erect to 1.1m tall; growing in sand over limestone between Eneabba and Leeman.

Leucopogon sp. (EAG 1031) Jurien - Cockleshell Gully - erect, to 40cm tall; quite abundant over most of the lateritic upland of Cockleshell Gully.

Leucopogon sp. (EAG 1571) Tathra National Park. - erect slender to 30 cm tall; lateritic upland.

Leucopogon spp. (EAG 2206, 2366, 2641, 2697, 2698) - these each appear to represent separate species mainly in the Cockleshell Gully area.

Leucopogon sp. (EAG 2800) Mt. Adams and West of Alexander Morrison National Park. - Erect to 40cm; growing in very restricted habitats at the base of breakaways where weathered sandstone outcrops.

Lomandra sp. (EAG 2571) Cockleshell Gully and Coomallo Creek. - growing at base of breakaways.

Melaleuca sp. aff. acerosa (EAG 3072) Lakes East of Leeman - shrub to 1m tall; calcareous aeolinite near salt Lakes.

Melaleuca sp. aff. acerosa (EAG 2436) Cockleshell Gully - Eneabba - tall shrub to 1m tall; very abundant, particularly in loam of Cockleshell Gully.

Melaleuca sp. (EAG 2927) East of Lake Indoon - low paperbark, to 1.5m tall, flowers on old wood; growing in clayey drainage lines.

Melaleuca sp. aff. leptospermaroides (EAG 565) East of Lake Indoon. - Tall shrub to 1.5m, quite abundant in clayey flats.

Melaleuca sp. aff. megacephala (EAG 2359) Mt. Lesueur area to Eneabba. - Erect, multistemmed to 50cm tall; quite abundant on lateritic upland and breakaway slopes.

Melaleuca sp. aff. sclerophylla (EAG 1590) Eneabba area.  
- erect to 90cm tall; growing on lateritic uplands east of Eneabba and some clayey flats west of Eneabba.

Microcorys sp. (RJH 771501) Coomallo Creek - Eneabba  
- low slender shrub to 20cm tall; on lateritic upland (see Map E).

Mirbelia sp. (GJK 2500) South of Lake Logue.

Olax sp. (RJH 770028) West of Eneabba. - Erect small shrub; shallow sand over limestone.

Olax sp. aff. phyllanthi (RJH 771499) Eneabba - Mt. Lesueur - Species growing mainly on lateritic uplands.

Persoonia sp. aff. sulcata (EAG 795) Jurien - Eneabba.  
- low shrub to 20cm tall; relatively common around Eneabba.

Petrophile sp. (EAG 2199) Cockleshell Gully - Alexander Morrison National Park. - Slender to 30cm tall; appears to be a pink or grey flowered form of P. brevifolia growing on lateritic uplands.

Petrophile sp. (EAG 2547) near Mt. Lesueur .  
- recumbent shrub, multistemmed to 40cm tall growing in sandy valley north of Mt. Lesueur.

Petrophile sp. (EAG 1760) Eneabba - Alexander Morrison National Park. - Uncommon species, small shrub to 30cm tall; lateritic gravel, flowers yellow.

Pultenaea sp. (EAG 2205) West of Alexander Morrison National Park. - Erect shrubs to 30cm tall; growing at base of breakaway on weathered sandstone.

Scaevola sp. (GJK 2471) West of Eneabba - in orange sand over limestone.

Scaevola sp. (EAG 3104) North of Lake Indoon  
- prostrate shrub; growing in grey sand.

Stylidium sp. (EAG 2794) Mt. Adams - small like S. piliferum but purple flower and smaller inflorescence.

Synaphea sp. (RJH 80017) Mt. Adams.

Thysanotus sp. (EAG 2511) Mt. Lesueur - Eneabba.  
- erect to 40cm tall, like T. sparteus; growing on lateritic uplands and some clayey flats.

Tricoryne sp. (EAG 1451) Eneabba. - Small slender, 15cm tall.

Triglochin sp. (GJK 2480) South of Lake Logue.

Trymalium sp. aff. myrtillis (EAG 1950) Mt. Lesueur area.  
- slender recumbent shrub; growing mainly on lateritic uplands.

Verticordia sp. aff. nitens (RJH 771142) Eneabba  
- erect shrub to 90cm; growing in well drained  
white sand.

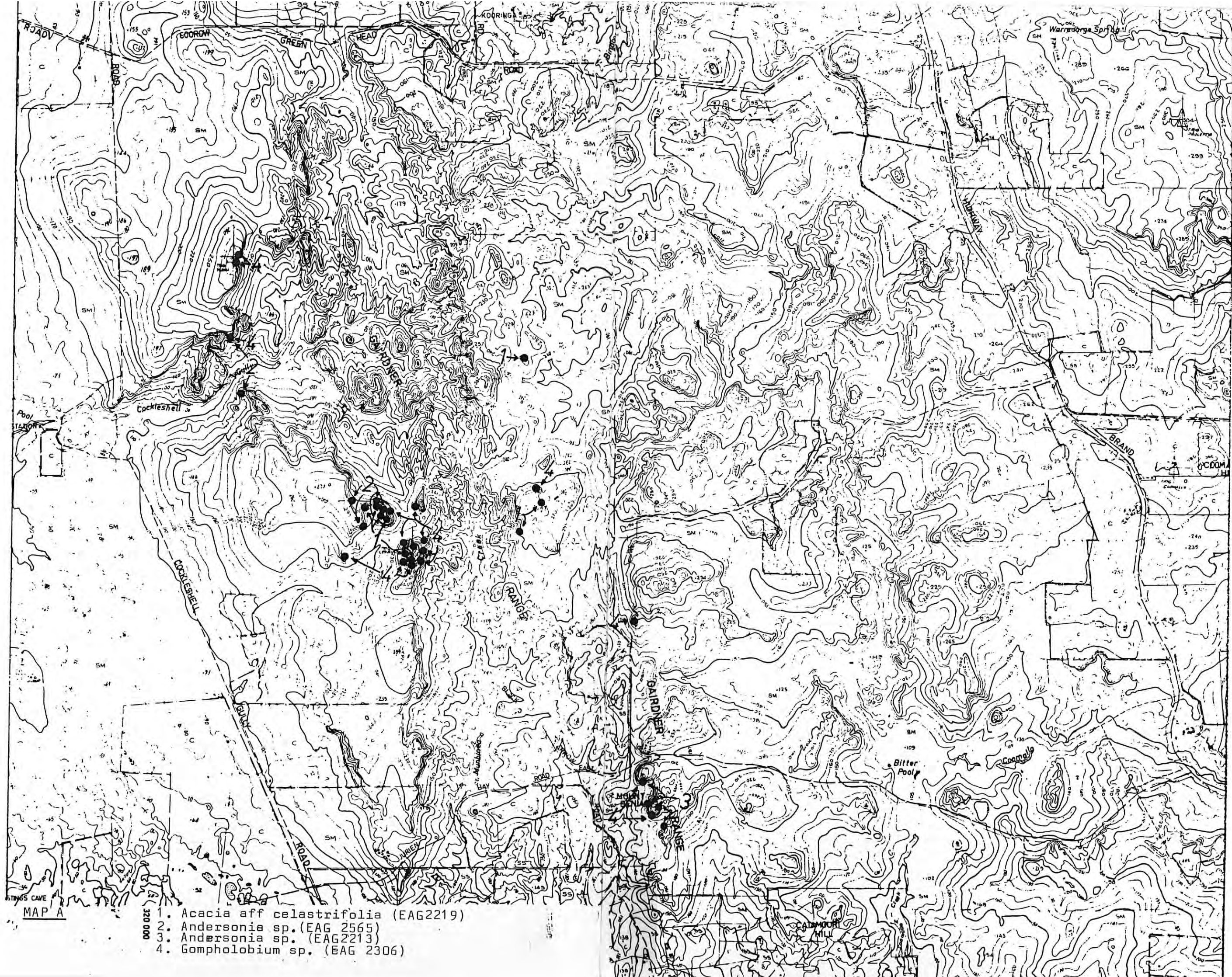
Verticordia sp. (EAG 1635) Rocky Springs.  
- erect slender shrub 1.2m tall; growing in yellow  
sand.

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Collection numbers mentioned are (for the most part)  
lodged at the Western Australian Herbarium. Initials  
represent collector.

EAG - E.A. Griffin  
RJH - R.J. Hnatiuk  
GJK - G.J. Keighery





MAP A

- 1. *Acacia* aff *celastrifolia* (EAG2219)
- 2. *Andersonia* sp. (EAG 2565)
- 3. *Andersonia* sp. (EAG2213)
- 4. *Gompholobium* sp. (EAG 2306)

300 000

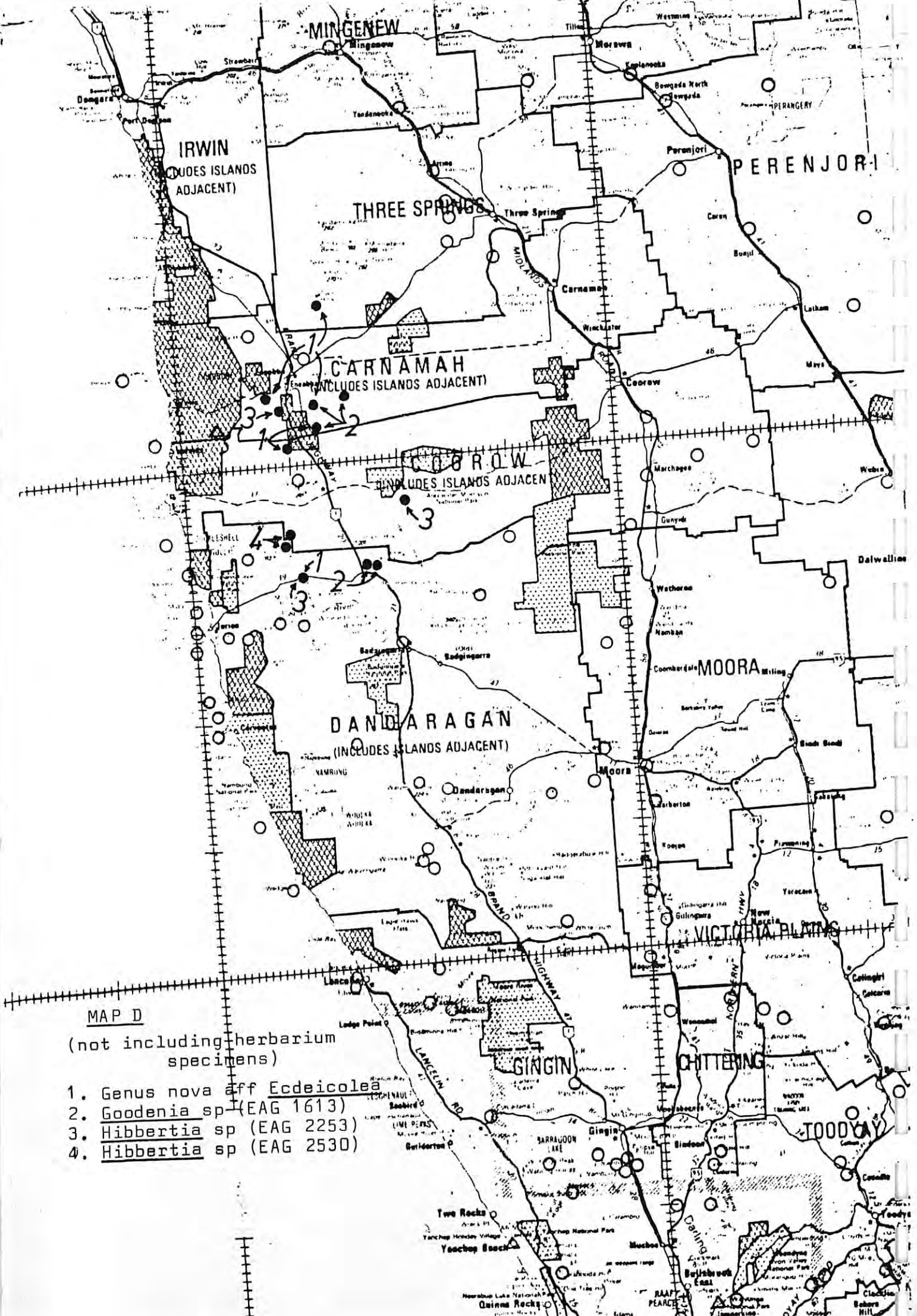




MAP B  
320 000  
Astroloma sp (R3H 770022A)





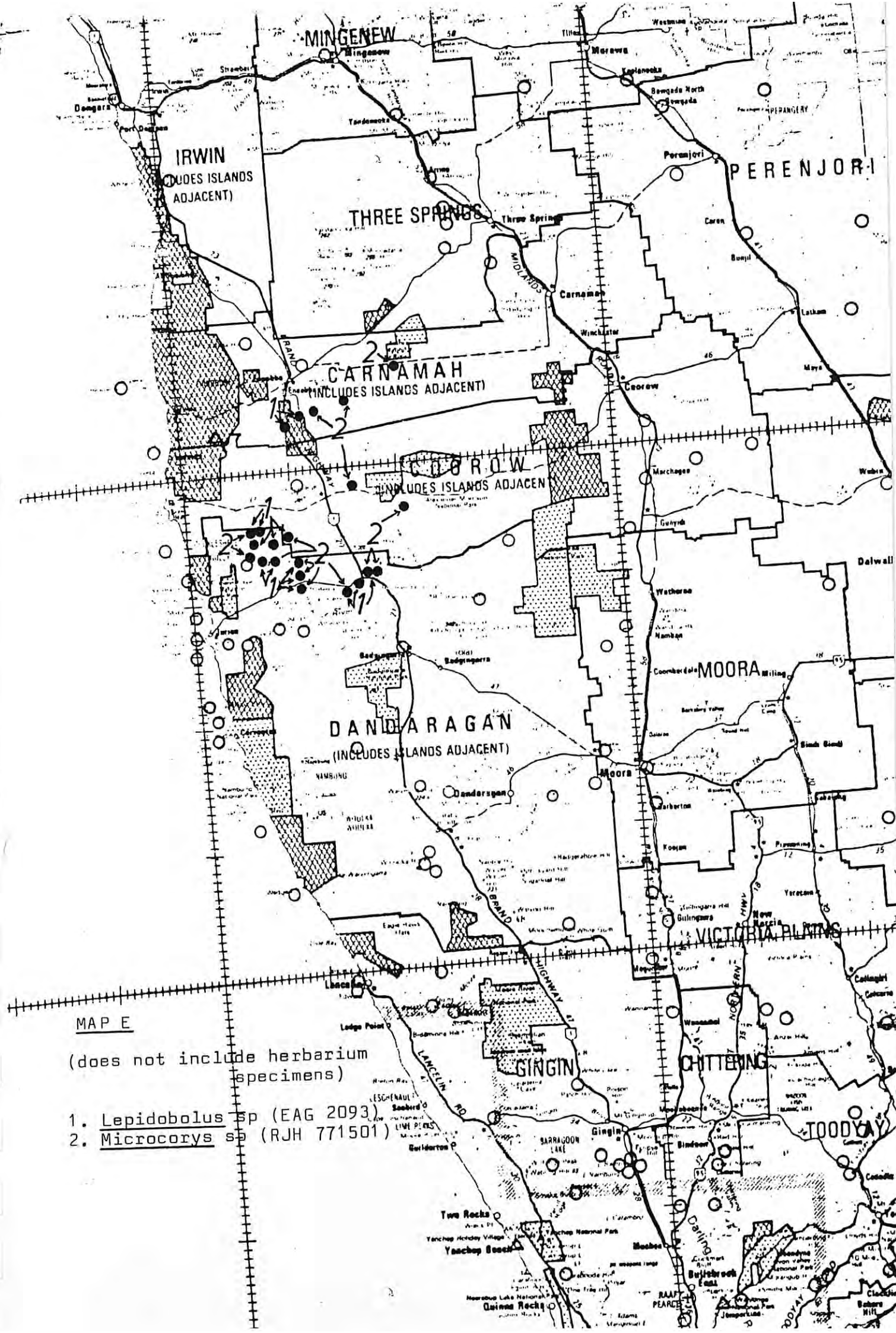


MAP D

(not including herbarium specimens)

1. Genus nova aff *Ecdeicola*
2. *Goodenia* sp (EAG 1613)
3. *Hibbertia* sp (EAG 2253)
4. *Hibbertia* sp (EAG 2530)





**MAP E**

(does not include herbarium specimens)

1. Lepidobolus sp (EAG 2093)
2. Microcorys sp (RJH 771501)



Appendix 3. Species excluded from this report but which are mainly restricted to the Study Area.

- an assessment of their Range, etc as per Table 1, and
- details for each of these species as per Appendix 1.

SPECIES	APPROXIMATE GEOGRAPHIC RANGE					
	1	2	3	4	5	6
<i>Banksia elegans</i>		F		GR	+	3RC
<i>Hovea stricta</i>		F			++	
<i>Hypocalymma xanthopetalum</i>					++	
<i>Isopogon linearis</i>		F			++	
<i>Lasiopetalum linearis</i>		-		?	?	
<i>Spiro Gardnera rubescens</i>	+	B	VR	GR	?	2E
<i>Stachystemon axillaris</i>	+	D	R		+	3E

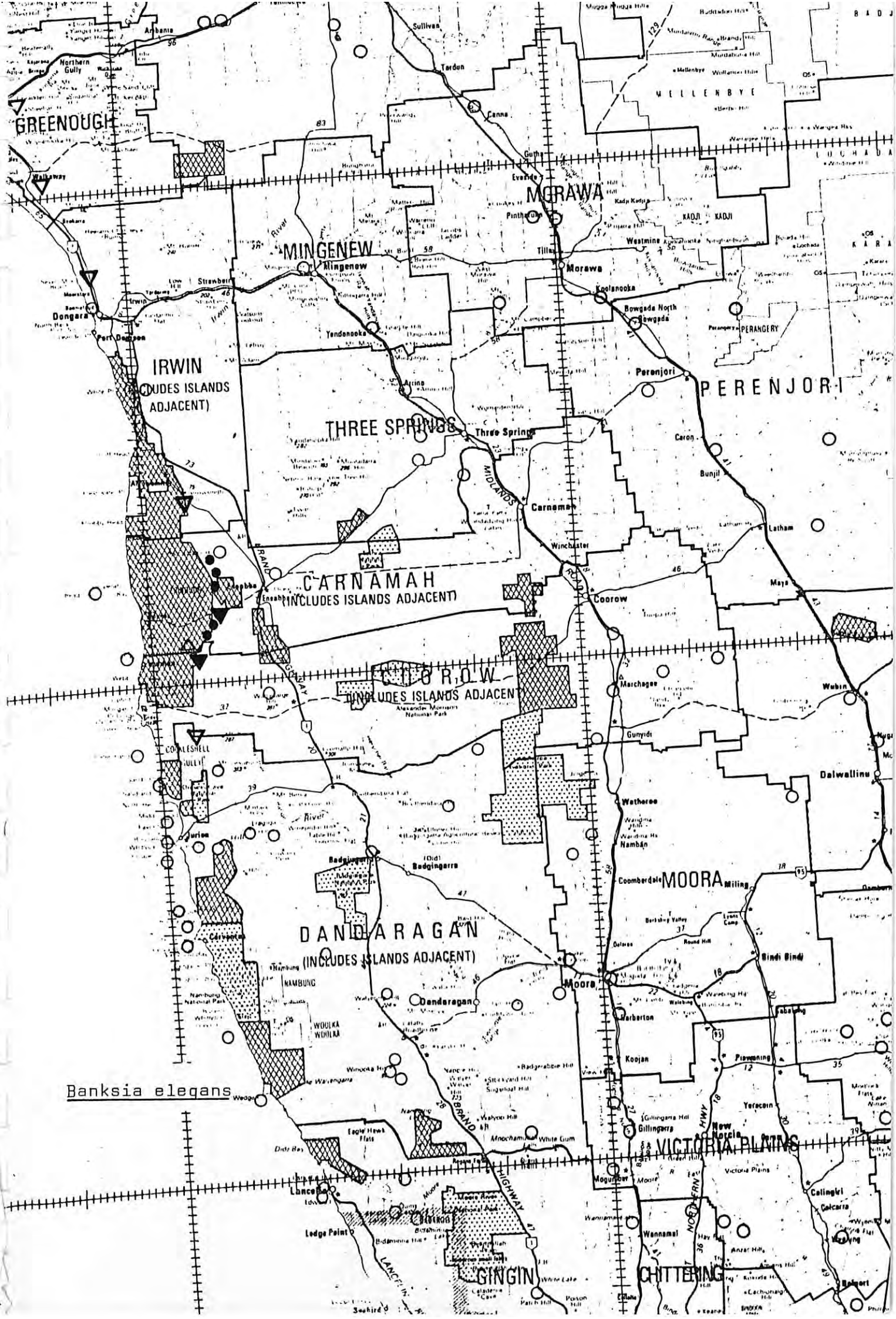
Banksia elegans Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 119 (1855)

+ Benth. Fl. Austral. 5: 561

44. **B. elegans**, Meissn. in Hook. Kew Journ. vii. 119, and in DC. Prod. xiv. 465. A small tree, the specimens at first sight closely resembling those of *B. Candolleana*, the leaves of the same size, with numerous broad pungent-pointed lobes, but divided only a little more than half way to the midrib, and the under surface pale or whitish with a minute tomentum, which almost conceals the veins, the smaller reticulations quite inconspicuous. Spikes globular, larger and more dense than in *B. Candolleana*. Perianth straight, fully 1 in. long, the tube minutely pubescent, the limb narrow, glabrous, fully 2 lines long. Style curved, erect, the stigmatic end fusiform and furrowed.

**W. Australia.** Valley of the Lakes, Hill river, Drummond, 6th coll. n. 200.



Banksia elegans

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Banksia elegans* Meisn. Family Proteaceae Date Recorded 15.8.1981

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Three Springs (sw of Eneabba)	red sand	16.10.46	Y	C.A. Gardner 8486
	Three Springs (sw of Eneabba)		25.8.44	Y	C.A. Gardner 9385
	Near L. Indoon 115°09'E 29°53'S	Sand	14.11.71	Y	A.S. George 11192
	N of Arrowsmith Lake		16.10.69	Y	A.S. George 9775
	Three Springs (sw of Eneabba)		10.1.59	Y	C.A. Gardner 12075
	Diamond of the Desert Springs (NE of Turin)		Jan 40	Y	C.A. Gardner sn
	Greenough River		Nov 1877	Y	F. Mueller
	Lake Indoon 29°52'S, 115°10'E	Sand, fringing woodland	24.1.79	Fruit	B. Barnsley 888
	Diamond of the Desert Springs (NE of Turin)	sand heath	Dec 35	bud	H. Steedman
	Walkaway		Feb 65	Y	G. Lullfitz
	Lake Indoon, (1/2 km North) 29°51'S, 115°08'E	Sand plain	7.10.77	Y	A.C. Burns 27
	9 m N of Dongara, 7 m W of Geraldton Hwy	yellow sand, low woodland	14.10.76	Y	E.A. Griffith 622
	Near Diamond of the Desert Springs	in scrub-heath	31.10.74	Y	J.S. Beard 7225
	Lake Indoon	Sand	8.1.66	N	K. Newbery 2385
	Arrowsmith S of Dongara		7.4.74	Fruit	B.M.J. Hussey sn
			Sept 70		E. Humphreys
	9 m N of Dongara		2.11.65	Y (1)	J. Drummond VI 201 Culliford L 216



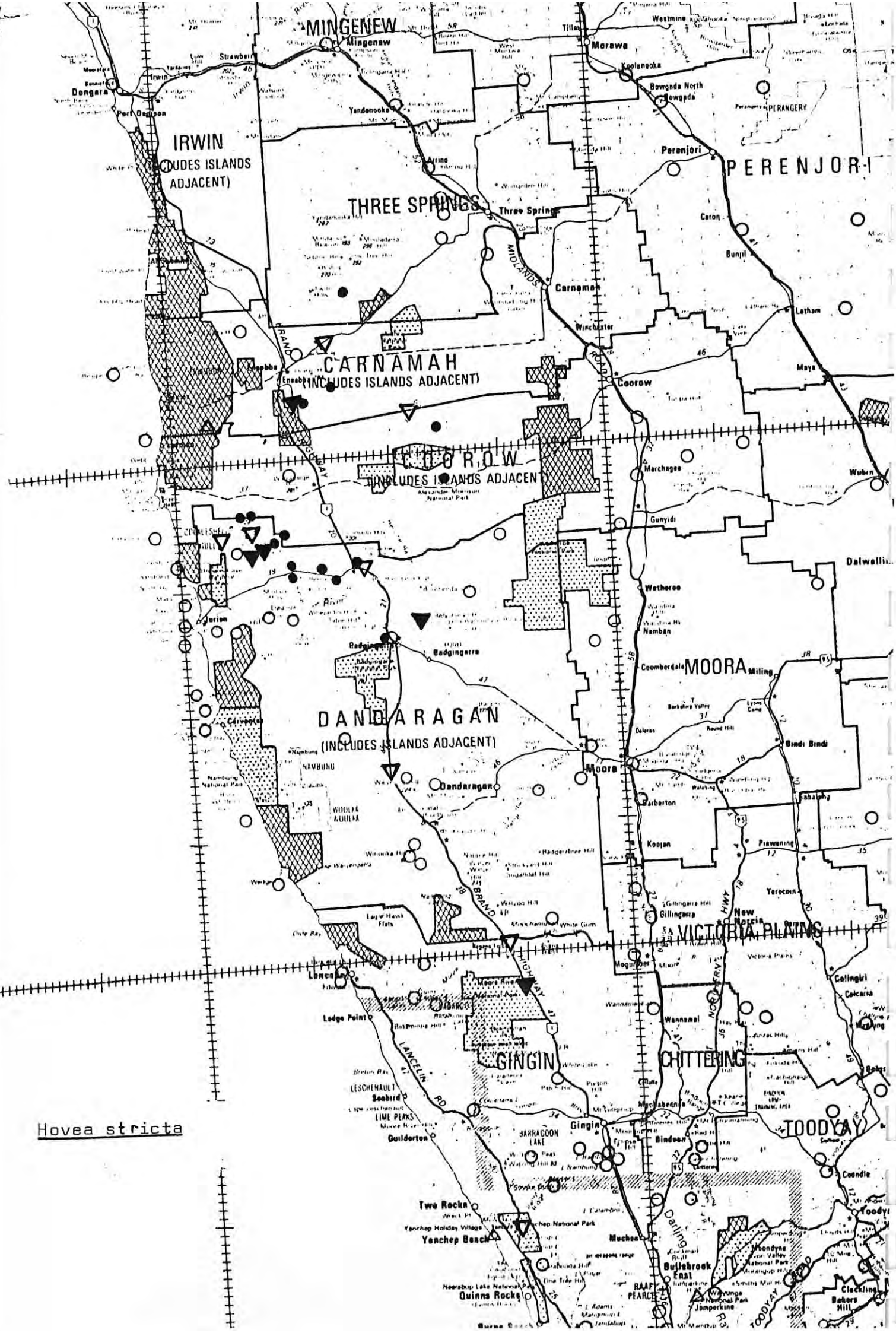
Hovea stricta Meisn.

in Lehm. Pl. Preiss. 1: 79 (1844)

+ Benth. Fl. Austral. 2:176

10. **H. stricta**, Meissn. in Pl. Preiss. i. 79, and in Bot. Zeit. 1855, 30. Stems little-branched, erect, rigid, 1 to 1½ ft. high, loosely tomentose-villous. Leaves lanceolate or linear, or the lower ones ovate-lanceolate, often erect, ½ to 1 in. long, obtuse with a short rigid point, the margins revolute, rounded or cordate at the base, rather rigid, reticulate and glabrous above, hoary-tomentose or loosely villous underneath. Flowers 2 or 3 together on short pedicels. Bracts and bracteoles subulate. Calyx 2 to 3 lines long, silky or loosely villous, upper lip large and broad, lower lobes much shorter narrow and acute, but not so small as in *H. trisperma*. Standard ½ in. diameter. Staminal sheath often splitting on the lower side as well as the upper, but I have never seen any stamen free. Ovary stipitate, glabrous, with 2 ovules. Pod not seen.

**W. Australia.** Sandy woods, Sussex district, Preiss, n. 1057; Vasse river, Oldfield; Swan River and between Moore and Murchison rivers, Drummond, 6th Coll. n. 27.



Hovea stricta

ATL OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon: *Hovea stricta* Meisn. .... Family: *Leguminosae* ..... Date Recorded: 25. 5. 81  
 \* not seen

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Between Dandaragan and Gingin		June 43	Y	AGardner sn
	Mt Lesueur		9 6 31		
	7m N of Badgingarra		19 6 61	Y	ASGeorge, 2606
	10m S of Regans Ford		26 8 64	Y	K Newbey 1386
UWA	Mt Lesueur		Sept 57	Y	BSGruve + DMChurki
UWA	Top Mt Lesueur	laterite		Y	N.H. Speck
UWA	Surren Bay	Sand plain			Basim bin Hamzah
UWA	Yanchep		Aug 65	Y	AM Baird
KP	Mt Lesueur - Mt Paton	Sandy	18 6 70	Y	H. Demaree 2322
KP	Near Junction Mogumber - Regans Ford Rd	on yellow sand	6 7 65	Y	F. Lullgitz 44178
KP	Cockshill gully		23 8 70	Y	PFairall 2577
type *					J Drummond 27

ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data sheet for Specimens at the Western Australian Herbarium

Taxon *Hovora stricta* Meisn. Family *Popilionaceae* Date Recorded 25.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Wall cliff				Miss Bussell sn
	29 m N of Regans Ford		20 78	Y	RJ Cranfield 230
	Mt Lesueur 30°11'S 115°12'E	low open heath, grey sand over laterite, Mesa	17 79	Bud	EAC Gillin 1841
	3m SW of Mt Lesueur	stony, sandy hill	24 769	Y	MH Brooker 1938
	Carriannah		11 8 61	Y	Mc George sn
	Mt Lesueur, Hill River, NW of Moora		June 31	Y	CAGardner sn
	8km S of Eneabba, 29°53'S 115°16'E	low open heath, white sand	10 7 77	Y	EAC Gillin 884
	8km S of Eneabba, 29°53'S 115°16'E	low open heath, white sand	5 10 76	Y + Fruit	EAC Gillin 597
	48km W of Cooroo		sept 1938	Y	WE Blackall 3964
	near Coomaloo Creek 30°11'S 115°23'E		3 8 76	Y	RJ Thattink 760116
	in <i>arenosis fruticatis</i> , probe flumen Hill		sept 1965	Y	CAGardner sn
	" " " " " "		30 9 60	Y	CAGardner 12788
	Bindoon - Gingin		5 8 63	Y	V.E. Sands 638.4.4
	Between Dandaragan + Hill River		23 8 48	Y	CAGardner 9028
	30 m W of Three Springs	sand heath	27 8 48	Y	CAGardner 9137
	Between Moora and Jurien Bay	dry sand plain	16 8 73	Y	TG Hartley 13973
	Cockleshell Gully		25 8 38	Y	WE Blackall 3581



Hypocalymma xanthopetalum F. Muell.

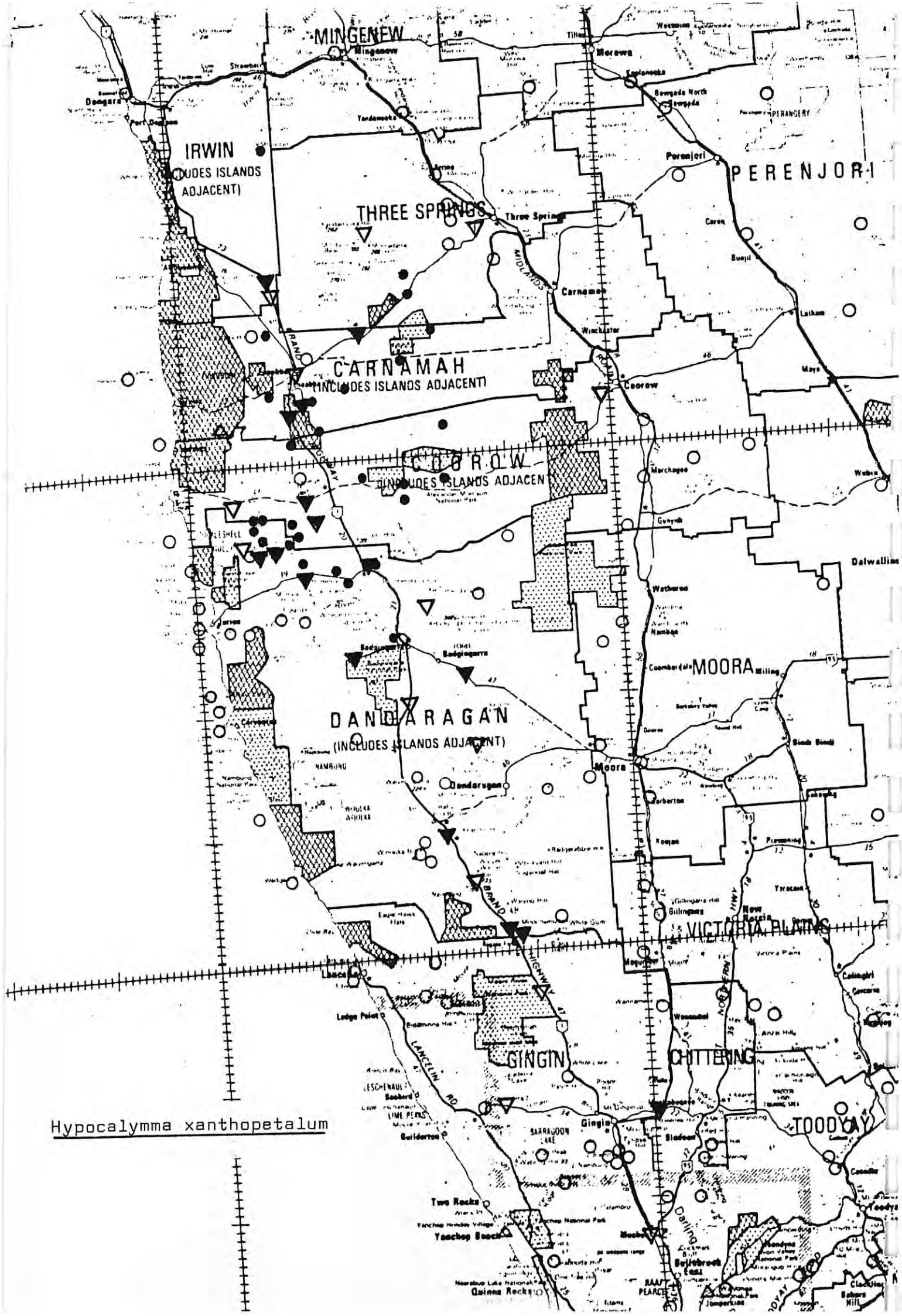
Fragm. Phyt. Austral. 2: 29 (1860)

† Benth. Fl. Austral. 3: 93

1. ***H. xanthopetalum***, F. Muell. *Fragm.* ii. 29. Erect or diffuse, not much branched, attaining 1 or 2 ft., the branches pubescent. Leaves from narrow-oblong to broadly oblong-cuneate or almost obovate, obtuse, minutely denticulate-ciliate,  $\frac{1}{4}$  to  $\frac{3}{4}$  in. long, narrowed at the base, but sessile or half stem-clasping. Flowers yellowish, in closely sessile pairs. Bracts orbicular, scarious, covering the calyx-tube. Calyx-tube nearly 2 lines diameter, the lobes half as long as the petals, entire or denticulate-ciliate. Petals persistent, about  $1\frac{1}{2}$  lines diameter. Stamens numerous, the filaments almost 2-seriate. Ovary only slightly prominent at the top, with 3 raised angles continuous with the style without any central depression, 3-celled, with 2 ovules in each cell, but 2 of the cells often very small, with semiabortive ovules.—*H. cuneatum*, Turcz. in Bull. Mosc. 1862, ii. 325.

**W. Australia.** Murchison river and adjoining districts, *Drummond*, 6th Coll. n. 67, *Oldfield*.

*H. ciliatum*, Turcz. in Bull. Mosc. 1862, ii. 325, is a slight variety with narrower leaves.



Hypocalymma xanthopetalum

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon: *Hypocalymma xanthopetalum* F. Muell Family: *Myrtaceae* Date Recorded: 29 5 81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Hill River	sandy-clay flats	21 7 34	Y	CAGardner
	14 km E of Mumbine Rd on Coada Rd		9 5 74	Bud	BL Powell (Rye) 7400S
	2 m E of Regains Ford	sand	26 8 64	Y	K Newbey 1376
	Between Dandaragan + Gingin	Sand heath	Jun 43	Y	CAGardner sn
	5 m SE of Badgingarra	heath, sand + laterite	10 9 79	Y	GJ Keighery 2549
	1 km NW of Mt Lesueur 30°10' S 115°11' E	low open heath, grey sand over gravel, upland	27 8 79	Bud	EAGriffin 2015
	6 km W of Brand Hwy towards Green Head 30°04' S 115°16' E	low open heath, grey sand over laterite	25 7 80	Y	EAGriffin 2757
	Mt Lesueur		21 8 49	Y	CAGardner 9356
	32 m W of Watheroo		22 7 69	Y	MIH Brooker 1916
	Mt Lesueur Summit	stony soil	16 10 46	Y	CAGardner 8461
	7.4 m E of Gingin	sandy soil, woodland	26 7 59	Y	AS George 38
	S of Cockleshe U Gully		24 5 67	Bud	JHawell 341
	Moone River NP	sandy soil	2 10 71	Y	RD Royce 9474
	Mt Lesueur		?	Y	CAGardner 10589
	Murcha		28 8 48	Y	Bro Kissane 36
	(104.6 km) NNW of Gingin	heath, sandy soil	2 9 70	Y	TEH Applein + RCoveny 3132

A. AS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Hypocalymma xanthopetalum* F. Muell. Family *Myrtaceae*  
 \* *narrow leaf form* - var. *linearifolium* C.A. Gardner inedit.

Date Recorded 29.5.81.....

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	Mimegarra Rd, 1 km from Brand Hwy	low closed heath	3.8.76	Y	RJHnatick 760006
	Three Springs	grey sand	21.7.62	Y	CA Gardner 13943
	Between Moora + Jurun		16.8.73	Y	TA Hartley 13940
	1 km N of Mt Lesueur 30°10'S 115°11'E	low open heath, grey sand + boulders, slope of Mesa	27.8.79	Y	EAGriffin 2001
	2 on N of Regans Ford		19.7.78	Y	RJ Cranfield 212
	19 m W of Three Springs	gravel	30.9.65	Y	K Newbey 2260
	Moora - Mingenew (Wojboorow)		Sept 1943	Y	WGBlackall 3971
	Three Springs		26.8.40	Y	WGBlackall 4393
	Cnr Jurun Rd + Brand Hwy (Coomaloo Reserve) 30°13'S 115°25'E	low heath, grey sand over laterite; upland	14.11.78	N	EAGriffin 1665
	Reserve 29806, 15 km E of Eneabba to Three Springs, 29°45'S 115°25'E	low open heath, sand and gravel; hilltop	9.11.78	Fruit	EAGriffin 1524
*	15 m N of Eneabba		7.9.69	Y	AC Burns 125
*	10 km S of Eneabba on Brand Hwy	low open heath, grey sand	3.8.76	Y	RJHnatick 760167



A AS OF THE WESTERN AUSTRALIAN I...ORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Hypocalymma xanthopetalum* F. Muell.

Family *Myrtaceae*

Date Recorded 29.5.1981..

Speci. NO.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
* UWA	7m S of Arrowsmith Rd.		18.8.71	Y	H Demarz D3388
* UWA	9m E of Mt Peron	in sand	31.1.65	Y	K Newbey 2299
* UWA	N from Diamond of the Desert Springs Swan.	lateritic soil	26.8.48	Y	C A Gardner 9096
UWA	Slopes Mt Lesueur		Sept 54	Y	D Churchill
UWA	Between Regan's Ford + Contaboy		22.9.53	Y	NH Speck
UWA	Dandaragan - Badgingarra	Sand heath	10.8.71	Y	B. Dell + K Felson
UWA	Nth of Yanchep on Lancelin Rd to Gin Gin	on sand in Actinostrobus swamp	Aug 67	Y	A Simper 10
UWA	Slope of Mt Benia	laterite	12.8.65	Y	G A Smith UWA 842
UWA	Mt Lesueur track	Sandy soil	10.8.71	Y	B Dell.
KP	74.75mp Eneabba Rd 30°75' S 115°55' E	Sand heath	18.5.71	Y	Am Baird
KP	161.2 M N of Perth - Eneabba 29°90' 115°30' S	Sand heath	4.7.69	Bud	H. Demarz D1355
KP*	7m S of Arrowsmith R		17.5.68	Y	H Demarz D103
KP*	Eneabba		18.8.71	Y	H Demarz D3388
			1.6.68	Y	E Withwer 642

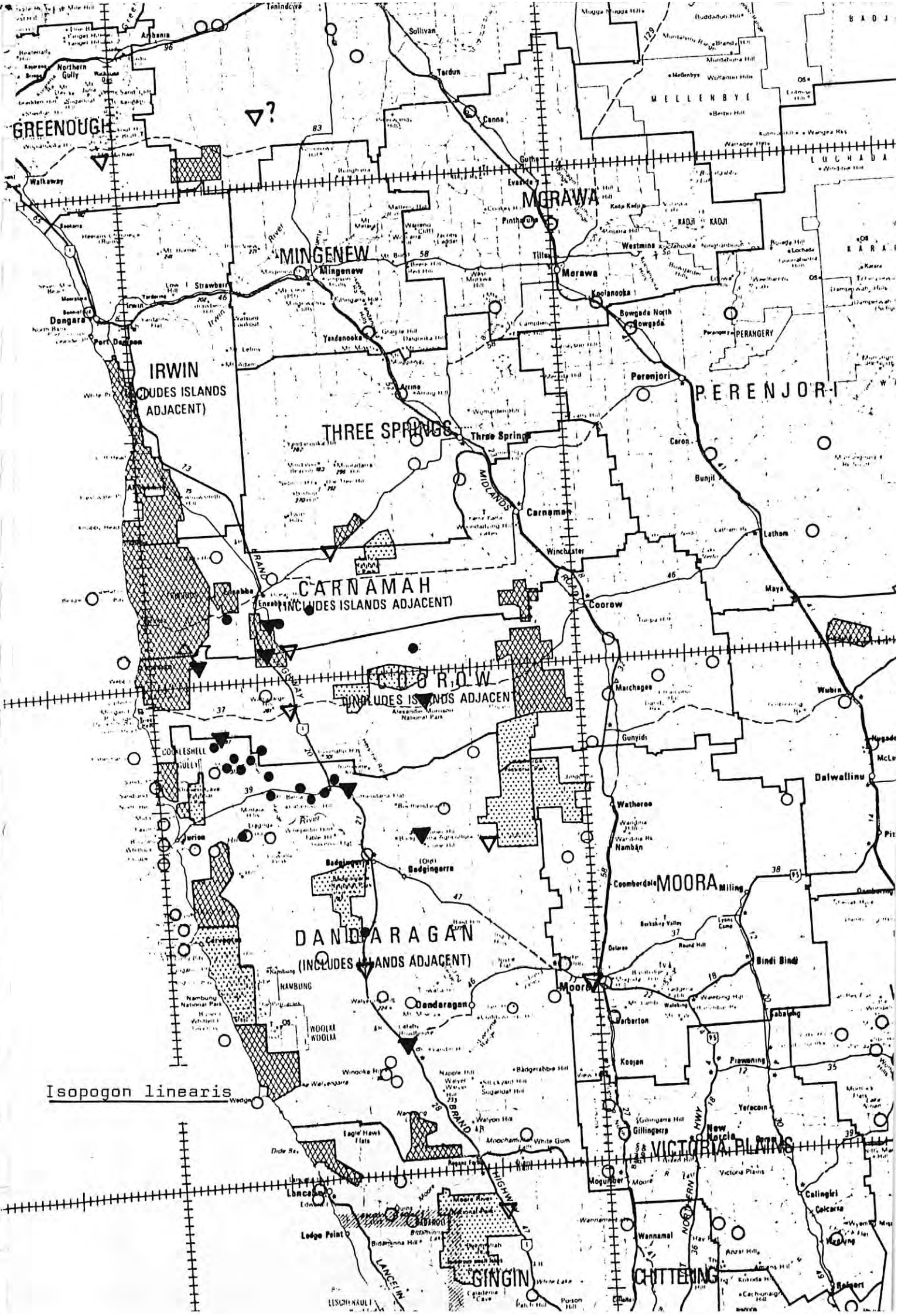
Isopogon linearis Meisn.

Hooker's J. Bot. Kew Gard. Misc. 7: 69 (1855)

+ Benth. Fl. Austral. 5: 339

3. **I. linearis**, Meisn. in Hook. Kew Journ. vii. 69, and in DC. Prod. xiv. 282. An erect shrub of 1 to 2 ft., the branches and young leaves softly pubescent, the older foliage glabrous. Leaves linear, with a callous point, contracted into a short petiole, mostly  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. long, thick, with more or less distinct nerve-like margins and a very few oblique veins. Cones nearly globular,  $\frac{3}{4}$  to 1 in. diameter, terminal and solitary or in a cluster of 2 or 3. Outer bracts not numerous but rather large and imbricate, ovate-lanceolate, silky-pubescent or at length nearly glabrous, the inner ones  $\frac{1}{2}$  in. long. Cone-scales shorter, the outer ones broad the inner ones narrow-lanceolate, all very woolly-villous outside. Perianth quite glabrous, rather above  $\frac{1}{2}$  in. long. Style-end slightly clavate and minutely pubescent, separated by a narrower neck from the pubescent bulbous base of the otherwise glabrous narrow brush. Receptacle ovoid-conical.—F. Muell. Fragm. vi. 238.

**W. Australia.** Gardiner's Range north of Dundiragan, towards Moore river, Drummond, 6th coll. n. 169.



GREENOUGH

MINGENOW

MORAWA

IRWIN

(INCLUDES ISLANDS ADJACENT)

THREE SPRINGS

CARNAMAH

(INCLUDES ISLANDS ADJACENT)

COOROW

(INCLUDES ISLANDS ADJACENT)

DANDARAGAN

(INCLUDES ISLANDS ADJACENT)

MOORA

VICTORIA PLAINS

GINGIN

CHITTERING

Isopogon linearis



ATLAS OF THE WESTERN AUSTRALIAN FLORA

Western Australian Wildlife Research Centre - Data Sheet for Specimens at the Western Australian Herbarium

Taxon *Isopogon bineri* Meisn. Family Proteaceae Date Recorded 5.5.81

Speci. No.	Locality	Habitat	Date Collected	In Flower?	Collector & Number
	16 km N of Hill R. bridge on Brand Hwy 30°15'S 115°26'E	stone sandy clay, low heath	29 9 79	Y	J Taylor 944, MDCrish + R. Jackson
	8 km S of Eneabba 29°53'S 115°16'E	low open heath, pale sand	28 9 79	Y	RJHnatiuk 790072
	Alexander Morrison NP, (Res 29083) 30°01'S lat 115°38'E	low open heath, grey sand over lateritic gravel	2 1 79	N (old)	EAGriffin 1809
	M+Peron		25 8 49	N	CAGardner 9393
	?		?	Bud	CAGardner 9317
	(West of Three Springs) Lockshell Gully		Sept 38	Y	WBlackall 3574
	Three Springs (W of Eneabba)		25 8 49	Y	WBlackall 9393
	51 m W of Coorow		Sept 67	Y	GHGittens 1703
	67 m NNW of Gingin - Brand Hwy	white sand + laterite; heath	2 9 70	Y	TEHApin + RCooney 3144
	Cataby	sandy area	2 9 73	Y	ECNelson 17276
	Hill River	lateritic hills	June 43	N	CAGardner
	Moora		Sept 46	Y	AAshby 104
Isotype	Gardiners Range			old Y	Drummond VI 169
	Between Dandaragan + Hill River		23 8 48	Y	CAGardner 9029
	10 m S of Regans Ford	in sand	26 8 64	Y (young)	KNewbey 1390





Lasiopetalum lineare S. Paust

+ Nuytsia 1: 353-356 (1774)

**Lasiopetalum lineare** S. Paust. sp. nov. (Figures 5 and 12)  
(linearis = linear, referring to the leaves)

*Folia* anguste-lineariter, brevissime petiolata, 20-40 x 1-4 mm, supra glabra, subtus stellato-tomentosa, marginibus revolutis. *Cymae* in capitula laxa contractae. *Bracteolae* filiformes. *Calyx* 7 mm longus, intus glaber, extus stellato-tomentosus, lobis 5, lineari-lanceolatis. *Petala* 5, orbicularia, 0.5 mm longa. *Antherae* fere sessiles, late-oblongae, 1.5 mm longae. *Ovarium* 3-loculare, 1 mm longum, albo-stellato-tomentosum. *Stylus* 3 mm longus pilis stellatis grandibus reflexis albis hirsutus.

*Type*: Watheroo West, Western Australia, 4 Nov. 1954, R. D. Royce 4965. Holo: PERTH, iso: K.

Erect, multistemmed, woody perennial, up to 40 cm high. *Branchlets* stellate-tomentose. *Leaves* alternate; petiole minute; lamina narrowly linear, 20-40 mm long, 1-4 mm wide, normally tightly revolute, almost glabrous above, stellate-tomentose below. *Cymes* leaf opposed,  $\pm$  8-flowered, closely stellate-tomentose, contracted into loose heads; peduncle 10-20 mm long; bracts filiform, 3 mm long; bracteoles normally 1, filiform, 4 mm long, subtending calyx. *Calyx* lilac (dark maroon near base of anthers), 7 mm long, almost glabrous within, white stellate tomentose outside, divided to the base into 5 linear-lanceolate lobes. *Petals* 5, orbicular, 0.5 mm long. *Anthers* 5, almost sessile,

broadly oblong, 1.5 mm long. *Ovary* globose, 1 mm long, white stellate-tomentose, 3-celled; style filiform, 3 mm long, with large white reflexed stellate hairs; ovules 2 per locule. *Fruit* a loculicidal capsule; seeds 1 per locule, almost cylindrical, villous, 2.5 mm long, 1 mm wide.

*Distribution*: South-west Western Australia, from Eneabba south to Gingin.

Eneabba Creek, C. A. Gardner 9128; 26½ mi from Watheroo on road to Jurien Bay, F. W. Humphreys 183; 5 mi SSE of Yeal Swamp in Wanneroo Forestry Reserve, Y. Chadwick 2554.

*Lasiopetalum lineare* has floral characteristics similar to those of *L. drummondii* Benth., but is distinguished by having linear leaves.

Note: This species is very similar to L. Drummondii having narrow linear leaves.

Lasiopetalum lineare sp. nov.  
(Lasiopetalum lineare sp. nov.)

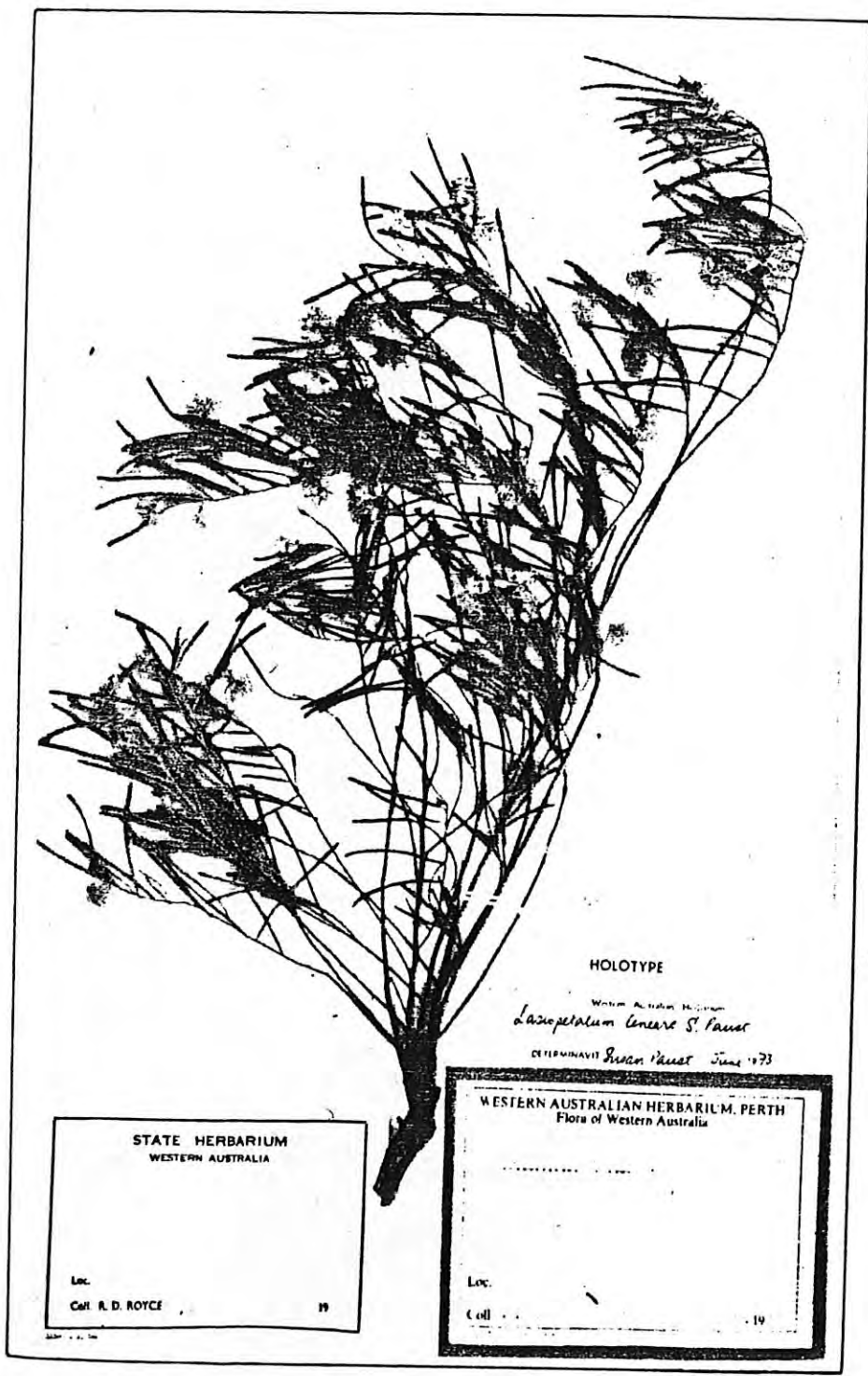


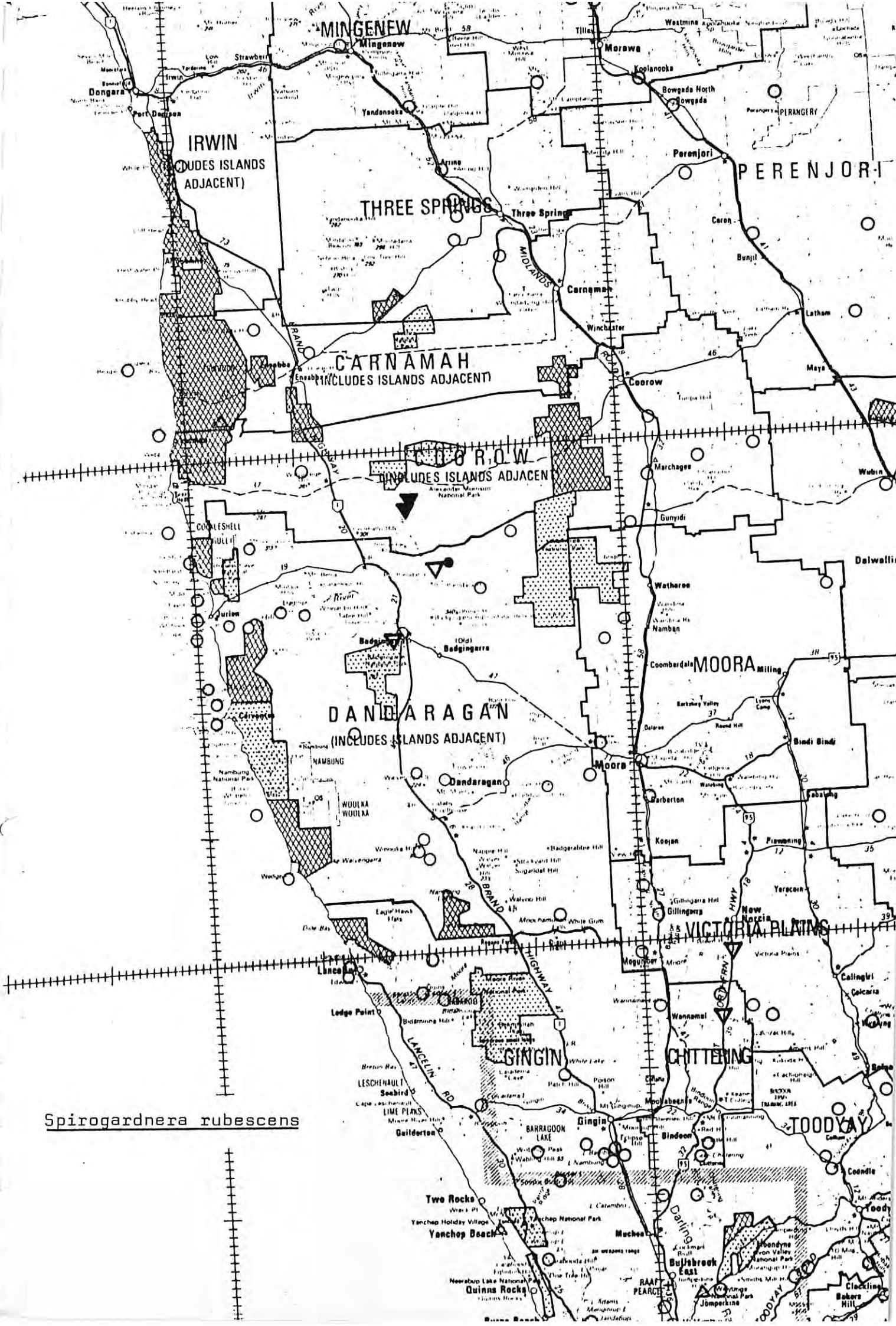
Figure 5—*Lasiopetalum lineare* sp. nov. Holotype—R. D. Royce 4965.







Spirogardnera rubescens Stauffer  
Naturf. Ges. Zurich 113: 307 (1968)



Spirogardnera rubescens





Stachystemon axillaris A, S, George

+ J. Roy. Soc. W. Austral. 50: 97-99 (1967)

EUPHORBIACEAE (PORANTHEROIDEAE)

*Stachystemon axillaris* sp. nov.

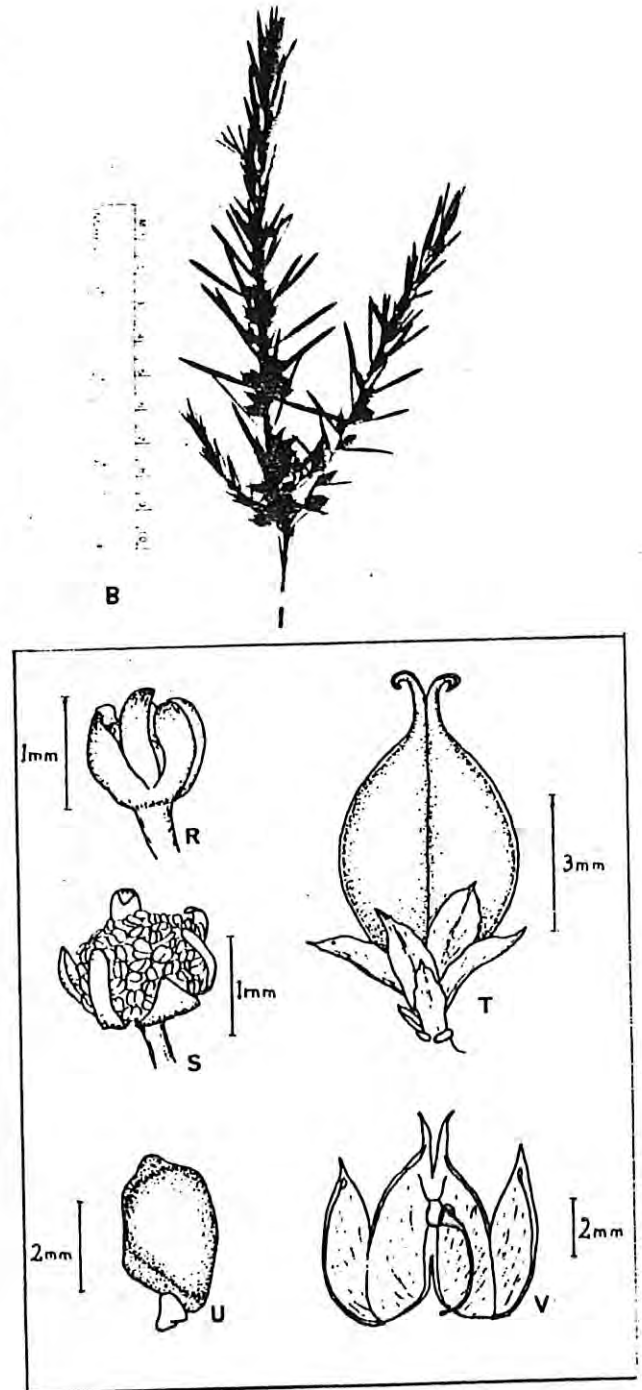
Frutex erectus, tenuis, glaber, ad 70 cm altus. Folia 0.5-3 cm longa, plerumque 1.5-2.5 cm, late-lineararia, obtusa vel acutiuscula, breviter petiolata; stipulae scariosae, lanceolatae, acutae, decurrentes. Flores virides, axillares, solitarii vel plures, ♂ supra ♀ sed saepe 1 ♀ cum 2 ♂, bracteis paucis parvis scariosis. Flores ♂ pedicellati, ± 1.75 mm diam.; segmenta perianthii herbacea, inaequalia, triangularia vel angustelanceolata, obtusa, incurva; stamina numerosa filamentis brevibus inaequalibus in receptaculo convexo. Flores ♀ breviter pedicellati; segmenta perianthii 2.5-3 mm longa, scariosa, lanceolata, acuta, integra vel irregulariter serrata; ramuli styli 2 raro 3, recurvi. Capsula ovoidea, compressa, 5-6 mm longa (sine styli ramulis persistentibus), abortu monosperma; placenta ab septo secedens. Semen oblique oblongum 4-5 mm longum, carunculatum, hilo impresso.

*Holotype*: 5 miles W of Mogumber Siding, A.S. George 6828, Sept., 17, 1965.

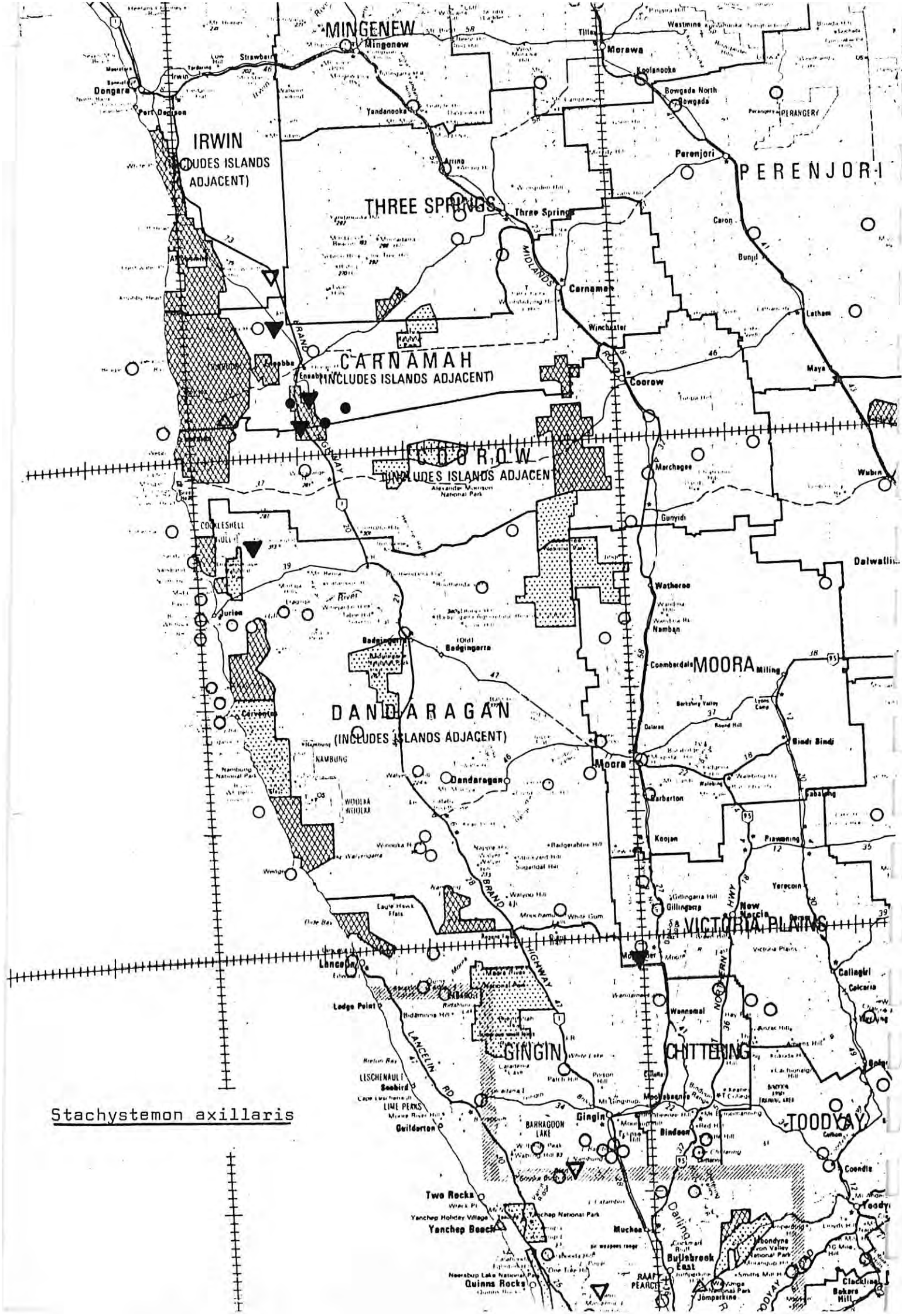
An erect, slender, glabrous shrub to 70 cm. Leaves 0.5-3 cm long, usually 1.5-2.5 cm, broadly linear, obtuse or somewhat acute, shortly petiolate; stipules scarios, lanceolate, acute, decurrent. Flowers green, axillary, solitary or several, the ♂ above the ♀ but often 1 ♀ between 2 ♂, with a few small scarios bracts. Male flowers pedicellate, about 1.75 mm diam.; perianth segments herbaceous, unequal, triangular to narrow-lanceolate, obtuse, incurved; stamens numerous with short unequal filaments on a convex receptacle. Female flowers shortly pedicellate; perianth segments 2.5-3 mm long, scarios, lanceolate, acute, entire or irregularly serrate; style branches 2, rarely 3, recurved. Capsule ovoid, compressed, 5-6 mm long (without the persistent style branches), one-seeded by abortion; placenta separating from the septum. Seed obliquely oblong, 4-5 mm long carunculate, the hilum impressed.

The species differs from the other three of the genus principally in having the flowers axillary, not crowded at or below the apices of the branchlets so as to appear whorled; and in

the short convex receptacle of the male flowers. There are further differences in the floral morphology. It is also known from Wanneroo (J. Havel 177) and 4 miles S. of Cockleshell Gully (George 7814).



*Stachystemon axillaris*: R, S. Male flower; T. Fruit; U Seed; V. Dehiscent fruit. R, T from George 6828, S. from Havel 177, U, V from George 7814.



Stachystemon axillaris

