

THE W.A. NATIVE ORCHID STUDY & CONSERVATION^{GROUP}



MEETINGS... 3rd WEDNESDAY each
month at..

KINGS PARK BOARD ADMINISTRATION CENTRE
Theatrette, KINGS PARK, WEST PERTH.

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OFFICE BEARERS 1985

Patron: Sir Crawford Nalder KB.
President: Kingsley Dixon
Kings Park & Botanic Gardens.
West Perth 6005 [REDACTED]
Vice President: John Tonkinson
[REDACTED]
Immediate Past President: Noel Clarke
[REDACTED]
Secretary: Stephen Van Leeuwin
[REDACTED]
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[REDACTED]
Field Trip Co-ordinator: Sid Gibbings
[REDACTED]
Committee Member: Don Graham
[REDACTED]
Registrar/Field Cultivation: Stephen Hopper
[REDACTED]
Editor/Librarian: K Jones
[REDACTED]

POSTAL ADDRESS OF WANOSCG:

P O Box 323, Victoria Park WA 6100.

THE WEST AUSTRALIAN NATIVE ORCHID STUDY & CONSERVATION GROUP

OBJECTS OF THE GROUP:

- a. To promote interest in and preserve Western Australian indigenous orchids.
- b. To learn the best means of cultivation and do all things possible for the conservation of native orchids in their natural environment.
- c. To learn their habitats and keep records.
- d. To have field days and learn to recognise the different genera and species.
- e. To hold meetings for the exchanging of knowledge and furthering of interest in Western Australian orchids.
- f. To affiliate with kindred organizations.
- g. To make rules for the governing of the Group's domestic affairs.
- h. To do all such other lawful things as are incidental to or conducive to the attainment of the above objects or any of them.

NEXT COMMITTEE MEETING

21 August 7.00pm

NEXT GENERAL MEETING

21 August 8.00pm

Speaker for Meeting:

Mrs Liz Lowry, a visitor from New Zealand will be the speaker at our next meeting. She will present a talk and slide show on the native orchids of New Zealand. This presentation should be very interesting and supplement the talk given at our first meeting by Bevan Burchill on the same topic.

Also there will be an illustrated talk on terrestrial culture and cultivation in South Australia by Kingsley Dixon.

He has visited South Australia growers involved in terrestrial growing and hybridising and the growers group should find the talk interesting.

WELCOME NEW MEMBERS

The Committee would like to take this opportunity to welcome Miss Sally Garnett to our Group.

COMING FIELD TRIP EVENTS.

JURIEN, AUGUST 24th & 25th.

The schedule and route for this weekend field trip has been finalized and is as follows:

DAY 1

The group will meet at Badjingarra BP roadhouse between 10.45am and 11.00am on Saturday. We will then proceed to Mrs Judith Paish's property, 10 km east of the Brand Highway on the Marchagee Track, hopefully arriving there by 12.00. In order to reach her property we will travel via the Brand Highway, Watheroo Road, and McKays Road. (See Map).

At Judy's property we will have lunch and spend some time searching for orchids in their *Eucalyptus* woodlands. At about 2.30pm we will then travel west on the Marchagee Track to Mazza Road, then head north to Tootbardi Road and then west to the Brand Highway. We will stop at suitable sites along this route. At approximately 3.30pm we will hopefully arrive at the Brand Highway and travel westwards on Banovich Road and to the eastern boundary of the proposed Mt Lesueur Nature Reserve. Along this road we will stop at a few creek crossings and the laterite hills and plateaus of the Gairdner Range. Eventually we will end up at the Jurien Road and will travel west on it to Jurien stopping at suitable sites between Banovich Road and Cockleshell Gully Road. Once at the Cockleshell Gully Road we will probably call it a day and head for the Jurien Recreation camp of the outskirts of Jurien.

Once at the camp we will be required to organise a few work groups to help with the setting up of the tables, washing up and the drying of the dishes. After our evening meal we will be given a talk and slide show by Mr Alf Popplewell, of the local wildflower society, on the flora of the Jurien region.

DAY 2

On Sunday we will hopefully depart the camp by about 9.00am, heading east on the Jurien Road to arrive at the Drovers Cave National Park by about 9.30. After some time of searching for orchids within the Park

we will travel to Cockleshell Gully Road and head north to the Cockleshell Gully where we will look for orchids in the recent burnt area. We will hopefully arrive at Cockleshell gully by about 11.00am. After searching this area we will backtrack to the Jurien Road and then head south on the Mundinea Road. We will stop at several sites along this road including the Hill River and Mundinea Creek. Once we reach Bibby Road we head east to the Brand Highway probably stopping to look for orchids in the Badjingarra National Park if time permits. Once at the Brand Highway we head for home. (See Map).

The final number of people attending this trip is 18, which includes one visitor from New Zealand. These people will need to bring their own lunch for Saturday and their own bedding, blankets and linen or sleeping bag as well as a pillow. All cultery, plates and cups and tea towels etc. are provided. Catering has been arranged for the evening meal on Saturday, breakfast and a cut lunch on Sunday. The cost once again is \$17.00 which includes everything except travelling expenses.

Travelling arrangements will be finalized by Sid Gibbings at the August 21st meeting. The cost of petrol at three of the possible refuelling stops was, on the 1st of August as follows

Cataby.....	61.9c/l
Badjingarra.....	61.9c/l
Jurien.....	61.7c/l

PLEASE NOTE On a recent field trip to the area in question between the 27th of August and the 4th of September the following orchids were recorded.

<i>Caladenia flava</i>	bud
<i>C. gemmata</i> forma ? <i>gemmata</i>	bud
<i>C. deformis</i>	flower
<i>C. patersonii</i> var. <i>longicauda</i>	bud & early flower
<i>C. menziesii</i>	bud
<i>Caladenia</i> sp.	bud
<i>Diuris longifolia</i>	bud & early flower
<i>Eriochilus dilatatus</i>	late flower & seed
<i>E. scaber</i>	flower
<i>Leporella fimbriata</i>	late flower & seed
<i>Prasophyllum</i> ssp.	bud
<i>Pterostylis dilatata</i>	flower
<i>P. nana</i>	flower
<i>P. vittata</i> var. <i>vittata</i>	flower
<i>Thelymitra fuscolutea</i> var. ?	bud
<i>Thelymitra variegata</i>	flower & bud

GINGIN BINDOON, September 7th.

This trip is a day trip, with the main emphasis being on location population of the gazetted rare species *Caladenia gemmata forma lutea*. It is anticipated that a bus will be provided for this trip.

The route is as follows:

North from Muchea on the Brand Highway to the Gin gin turnoff where we will stop and conduct a search of a small swamp for orchids. In recent years I have recorded 22 species growing here. We will then travel into Gingin and turn east on the Mooliabeenee Road. Approximately 12 km east of Gingin we will head north on Cullulla Road to look for orchids in a burnt banksia woodland. Then via Barn Road and Glover Wells Road we will again reach Mooliabeenee Road. Once on this road we travel east to the Great Norther Highway where we travel south to Chittering Road. Once on Chittering Road we travel south to Julimar and into the Julimar State Forest. It is within this forest that we will hopefully find *Caladenia gemmata forma lutea* and other interesting orchids such as *C. filamentosa* var. *filifera*. On the way in the Julimar forest we will travel along several forestry tracks eventually coming out at Keating Road. We will then travel south on Keating Road, through the picturesque Chittering Valley and toward home. If time permits we will possibly be able to have a brief look for orchids in the Moondyne Nature Reserve.

Final arrangements for this trip will be made at the August meeting by Sid Gibbings. If you wish to attend this trip please let Sid or myself know at the next meeting or before.

GOOMALLING, September 14th & 15th.

This field trip has been organised in order to hopefully find more specimens of the unusual *Caladenia barbarossa*, with *Drakaea* like features, collected in the area by Bob Bates and Steve and Andy last year. At the present time transport arrangements are not finalized but people intending to attend this trip should inform Sid or myself at the next meeting. Accommodation overnight will probably be at Dowerin, either in the motel or at the local Agriculture Protection Board officers house depending on the number of participants. The A.P.B. officer, Rod Randall will present a talk on Saturday night on the flora of the area.

FLOREAT PARK, September 21st.

The aim of this Saturday morning trip is to verify the authenticity of a collection of *Caladenia dilatata* var. *falcata* house at the WAIT herbarium. These collection was collected from the CSIRO reserve at Floreat. We will hopefully inspect this reserve as well as search for orchids in the parkland around Reabold Hill and in particular the burnt area along West Coast Highway. The meeting place for this outing will be at the junction of Underwood Avenue and Perry Lakes Drive at approximately 9.30pm.

WINDY HARBOUR NORTHCLIFFE, September 28th-30th.

This field trip over the September-October long weekend is down to the Northcliffe Windy Harbour area to examine the many different types of habitat there and their orchid flora. We will be staying at Chudalup House in Windy Harbour. The cost of accomodation is approximately \$2.00 per person. We will be required to do all our own cooking and catering. A guest speaker may be available to speak to us on Saturday or Sunday night on the natural history of the area. More details on this trip will be provided at the next two meetings and in following bulletins but if you are interested in going please let Sid Gibbings know.

GOODALE RESERVE, October 5th OR 6th.

This trip is a return visit to Goodale Nature Reserve, just south of Pinjarra. Some members of the group visited this reserve earlier in the year in search of *Caladenia aphylla*, which we found. This trip will be of one days duration with the main emphasis being to hopefully find population of *Drakaea jeanensis* on the reserve. The arrangements for this trip will be made at the September meeting.

WOODVALE, October 13th.

This trip will be to the Wildlife Research Centre in Ocean Reef Road (formerly Mulluloo Drive) to see what Steve and Andy are doing with the information, provided by many members of our group for the orchid atlas project. We will be shown how the information is being processed by the computer and the new data that is being generated. We will then cross the road and have a look for orchids in burnt *Eucalyptus Banksia* woodland. If participants then feel up to it and if time permits we will travel down to the Ocean Reef Marina and see what orchids we can find in the burnt areas of coastal heath.

All the abovementioned fieldtrips should be very interesting and rewarding for those who attend. Now it is up to you to decide what field trips you feel are worthwhile attending. I would suggest that one very interesting trip and one where the more people who attend the more success we will have will be the Goomalling trip on September the 14th & 15th. More information and detail on field trips will be provided at the coming meeting and in future bulletins.

Stephen van Leeuwen.

Introduction:

Spiculea is a monotypic genus endemic to south Western Australia. Erickson (1951) illustrates the morphology of the plant very well and tells the story of a plant placed two weeks in an "eighty pound press" before being posted to the famous naturalist Edith Coleman in Victoria and there after 4 weeks one of its remaining buds opened. Several other authors have dealt with the plants ability to store food in the swollen, fleshy scape. Peakall (honors thesis 1984) gives a chromosome count of $2n = c.40$ for *Spiculea ciliata*. Warcup (1981) and pers. comm. noted that *Spiculea* requires the presence of soil fungi *Tulasnella* sp. for its seed to germinate. Pate and Dixon (1982) record a very high nitrogen content for tubers of *Spiculea* (30-36 mg n/g)

Distribution and Habitat:

Map 1. shows how the known distribution of *Spiculea* has advanced during the last 30 years or so as more detailed collecting is done. Before (1984) it was thought to be restricted to granite outcrops from Perth east to near Esperance, inland almost to Kalgoorlie and north to near Payne's Find. However in 1984 the author as well as Kingsley Dixon and others found it around sandstone rocks along the Murchison River & the author also saw it on a clay flat near Nyabing. The most common habitat is shallow soil pockets on and around granite outcrops in the company of other orchids such as *Diuris longifolia*, *Prasophyllum macrostachyum* var. *ringens*, *Thelymitra nuda* and *T. antennifera*.

Growth:

Spiculea tubers (see fig. 5) must withstand desiccation of the soil about them for periods up to 6 months and endure ground temperatures of $50-60^{\circ}\text{C}$ during the long dry summers. After late autumn rains the tubers sprout and the single leaf appears in May or June. This leaf is red below green and almost waxy above; the plant quite glabrous. During winter the soil pockets on the rocks may be completely saturated for several weeks or they may bake hard in dry periods; the plants are subjected to frost and hail so they have to be tough! About September a bud appears at the leaf base and develops into a fleshy scape. In late October or November the first flower opens. By this time the leaf and lower part of the stem have died. Flowering now proceeds on food stored in the upper scape (see photo 1). After a wet spring flowering may continue into January. *Spiculea* is of course not unique in storing food in the scape. *Lobelia gibbosa* a plant from similar habitats also does it and orchids such as *Pterostylis* of the 'rufa group' and inland *Prasophyllums* may flower for several weeks on reserves stored in their scapes. Another feature I have noticed with *Spiculea* is the slow germination of pollen or growth of pollen tubes to the ovules. This takes up to 20 days with my cultivated plants. Seed capsules are also rather small compared to other orchids. The seed-coat of *Spiculea* is waxy and germination does not seem to proceed until the seed has been weathered by heat and damp.

Replacement tubers are formed close to the parent tuber and occasionally a second 'daughter tuber' is formed so that plants may form small clumps due to vegetative increase.

Pollination Strategy:

Very little has been discussed of the pollination ecology of *Spiculea*. (Rotherham (1968) discussed the pollination of "*Spiculea huntianus*" by thynnid wasp but that orchid was recognised as belonging to a separate genus *Anthrochilus* by Blaxell (1972)).

Rica Erickson (1951) noted that the labellum resembled an insect and that it was hinged in such a way that it could be flicked and would then fall back to its pendulous position. She surmised that some - "predatory insect might swoop to carry off the prey. The anchored bait would flip the marauder by its own momentum against the colum". Then more accurately she predicted. "If food is not the lure perhaps the visitor seeks a mate and copulates on the wing".

Indeed Stoutamire (1983) lists *Spiculea* among a list of Australian orchids which have sexually attracted pollinators and he (pers. comm. 1983) observed a black and yellow thynnid as the pollinating agent.

The present author was able to observe and photograph these male thynnids pollinating *Spiculea* near Balladonia in late October 1984.

Observations of Pollination:

Flowers of *Spiculea ciliata* were observed in situ at Moir's Rock near Norseman on October 25. These were in early flower and of c.100 flowers checked not one had had the pollinia removed. Several flower spikes were collected and the following day these were set up on a granite outcrop near Belladonia known as Newman's Rock. A careful check of the area revealed that no *Spiculea* grew there. The flowers from Moir's Rock were set up as a single group some 50 metres north of the waterhole on the summit of Newman's Rock at about 9.30am. Conditions were fine, the temperature about 30°C with a strong northerly breeze. (This wind and numerous blood-sucking 'March flies' made photography extremely difficult !)

Within 60 seconds a black and yellow wasp was observed to fly in from the down wind side of the orchids, circle once and land directly on an orchid labellum; its wings beat rapidly as it appeared to attempt to carry off this insectiforme lip. The labellum is hinged in such a way that it cannot swing from side to side but only up and down. The wasp's attempt to carry it off resulted in its being thrown between the column wings directly above so that the orchid pollinia were jammed onto its thorax. No sooner had this wasp flown off bearing the pollinia than its place was taken by two similar wasps, one twice the size of the other. These repeated the actions of the previous visitor. One was captured and later sent to the University of Western Australia for identification. A total of ten pollination events were observed. All wasps approached from down wind, flying very rapidly; some landed directly on the labellum, others landed on other parts of the flower spike. Some flew off without grasping the labellum but most aligned themselves, head up on it, "flapped" their wings vigorously and succeeded in jamming themselves into the column with its curiously formed wings. The ingenious design of the orchid can be seen in photo 2.

A *Spiculea* flower consists basically of a labellum with long hinge and short yellow curved body possessing two eye-like swellings at the top, a long curved 'ovipositor' shaped appendage below and a few cilia underneath. (See photo). This is a fair copy of the wingless female thynnid. The male wasps are probably attracted by a chemical copy of the female wasp's sex-pheromone lure produced by the labellum. The rest of the flower is made up of the column neatly placed just the right distance above the labellum to receive the male wasp which presumably is one of those species which copulate on the wing. The flower's sepals serve no other apparent function than to protect the flower in bud.

Several experiments were carried out at Newman Rock and surrounds. When placed in a shrub some 2 metres above ground level the flowers continued to attract wasps but when shifted to the mallee scrub some 100 metres away wasp visits ceased, nor did wasps visit when the flowers were placed south of the waterhole, or on the nearby salt pan or on the degraded Belladonia Rocks. When later returned to the original site some hours later wasp visits

began again indicating that the male wasps were concentrated about the rock waterhole and did not live elsewhere.

Some of the wasps were so vigorous in their actions that they broke off orchid labella and flew away with them. Some of these flowers minus labellum were set up nearby but did not attract wasps. At about 35°C the flowers gave off a faint spicy odour which was not noticeable at lower temperatures.

A photograph was taken of a male thynnid grasping the labellum of a *Spiculea* but due to the blustery conditions and lack of flash equipment this photo was hardly satisfactory (see photo 3). However a photograph was taken later using a captured wasp and this shows more clearly the pollinator and flower together (photo 4).

Conclusions:

Spiculea do appear to attract male thynnids as pollen vectors - the attracting mechanism seems to be sexual, probably a pseudo-pheromone produced by glands on the orchid labellum. The insectiforme labellum representing a 'pseudo-female' wasp is a secondary or close range visual attractant. Actual pseudo-copulation was not observed as the wasps attempt to remove the decoy before copulating on the wing.

It is likely that only one species of wasps is involved throughout the southern part of the range of *Spiculea*. It is quite likely that a different species may be involved with the more isolated Kalbarri populations.

Footnote. The author has had *Spiculea* in cultivation in Adelaide since 1981. The plants flower annually in a 10cm diameter pot of clay loam. Viable seed has been produced by selfing the plants and this seed has been germinated using the symbiotic flasking method.

References:

- Blaxell, D (1972) Contr. New South Wales Natl. Herb. 4:278
- Erickson, R (1951) "Orchids of the West"
- Hoffmann, N and Brown, A (1984) "Orchids of South-West Australia"
- Keighery, G J (1982 unpub.) 'Notes on the Biology and Phytogeography of Western Australia, Park 18 Orchidaceae' (Kings Park Board)
- Pate, J S and Dixon, K W (1982) "Tuberous, Cormous and Bulbous Plants ..." (Univ. of W A Press)
- Stoutamire, W P (1983) 'Wasp Pollinated Species of Caladenia in S. West Australia Aust. J. Bot. 31: 383
- Warcup, J H (1981) "Mycorrhizal Relationships of Australian Orchids" New Phytol. 87:371-381



Fig 1 Plant of *Spiculea ciliata* showing food stored in swollen upper stem. (Cultivated plant Adelaide)



Fig 2 Flower of *Spiculea ciliata* showing insectiforme labellum and unusual column.



Fig 3 Thynnid wasp grasping labellum. (Newman Rock W A)

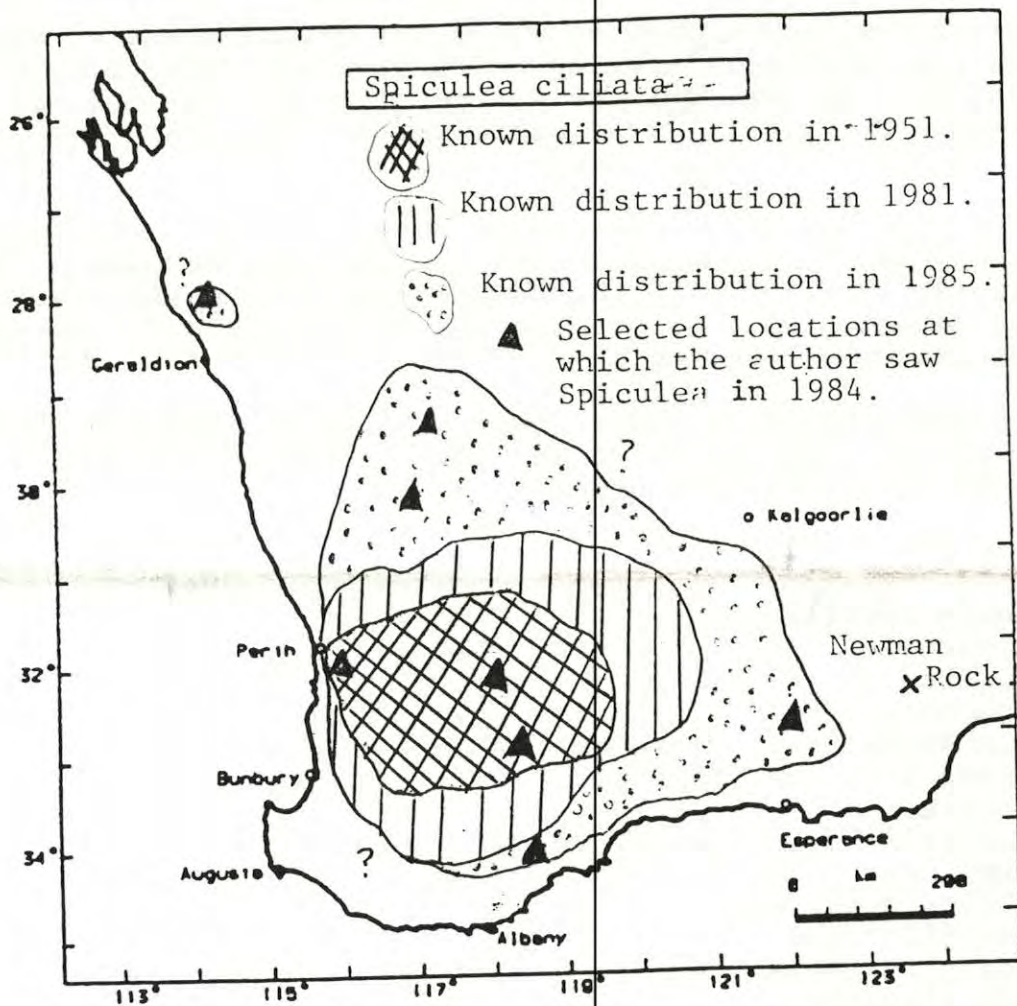


Fig 4 Thynnid wasp shown with *Spiculea* flower on which it was captured.

SLIDES PLEASE!

To enrich the poster display which the Group assembled some years ago we need photos of species which have not appeared so far. This display will be used for the Native Plant Display and Wildflower Exhibition being held 27-30 September in Kings Park and as a static display at other shows.

Members with one or two slides of any of the following species are requested to bring them along to the next meeting. They should be clearly labelled with the photographer's name and species. Those slides selected will be printed and the photographer acknowledged at the September meeting.

Photographs should be whole flowers or spike or where applicable whole plants. The theme of the display is the beauty and diverse forms of WA terrestrial orchids.

Photos requires include:

Caladenia aphylla
 C. barbarossa
 C. cristata
 C. drummondii
 C. filamentosa var. caesarea
 C. filamentosa var. filifera
 C. gemmata
 C. menziesii
 C. sigmoidea
 Calochilus robertsonii
 Corybas dilatatus
 Cryptostylis ovata
 Drakaea elastica
 Elythranthera brunonis
 Gastrodia sesamoides
 Lyperanthus nigricans
 Microtis any sp.
 Monadenia bracteata
 Paracaleana nigrita
 Prasophyllum fimbria
 P. nigricans
 P. macrostachyum
 P. gibbosum
 Pterostylis allantoidea
 P. barbata
 P. nana
 P. scabra var robusta
 P. vittata
 Spiculaea ciliata

NATIVE PLANT DISPLAY ROSTER

The Kings Park Native Plant Display and Wildflower Exhibition is coming up again and is to be held on the September long weekend, 27-30 September. This clashes with the Windy Harbour weekend but we are hoping that those that cannot attend the field trip will volunteer their time either a morning or afternoon to man the display. This is the only occasion in which the group goes public and a good showing of members is vital to the success of the display. As with last year we will be selling some items amongst which will be a special bumper issue of the bulletin. I can assure any who participate that the response from visitors and the public is a thrilling one. Of course Andrew's book will ensure that any curly questions can be quickly and accurately answered.

cont. next page..

cont. from page 11.

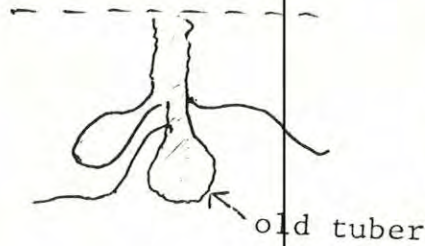
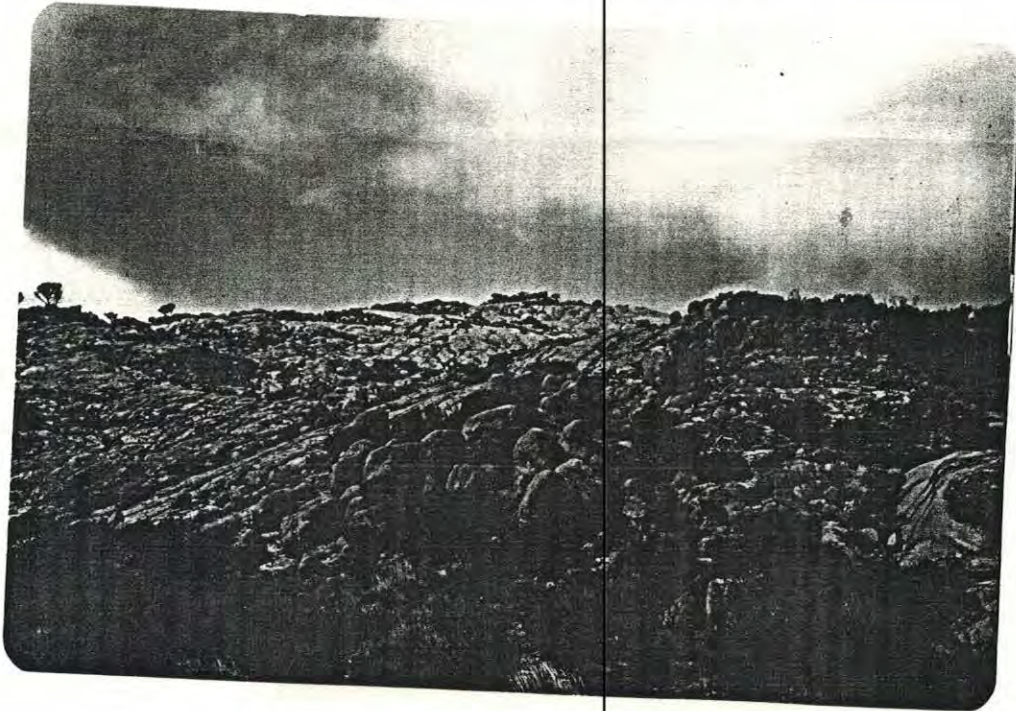


Fig 5 *Spiculea* : below ground.



Granite outcrop near Kalgoorlie.
Habitat of *Spiculea*.

cont. from page 12.

Your support is needed if this is to be a success and help promote the aims of the group. A roster page will be drawn up for the next meeting but if you cannot attend or are a country member visiting Perth at that time please write to the Secretary WANOSCG, Stephen van Leeuwin, P O Box 52, Victoria Park with details of when you are available, preferably with some alternative times.

Thanks, Kingsley

FIELD TRIP DIARY

August 24/25
September 7
14/15
21
28-30
October 5/6
13

Dongara/Eneabba
Gingin/Binoon
Goomalling
Floreat Park
Windy Harbour/Northcliffe
Goodale Reserve
Woodvale

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