DRYANDRA STUDY GROUP

NEWSLETTER No. 16

Dryandra nervosa

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SOCIETY FOR GROWING AUSTRALIAN PLANTS

DRYANDRA STUDY GROUP

LEADER

Mrs. Margaret Pieroni
16 Calpin Cres.
ATTADALE
W.A. 6156

NEWSLETTER EDITOR

Mr. Tony Cavanagh
16 Woodlands Dr.
OCEAN GROVE
Vic. 3226

I hope all members in the Eastern states have survived the "big wet". I know parts of New South Wales and Queensland are almost awash and in Victoria, we are having our wettest winter for many years. It will be interesting to see how dryandras fare- please let me have your observations.

In this issue, thanks to the sterling efforts of Margaret and Keith, I am able to bring a major discussion of the very complex Dryandra pteridifolia complex. This is preceeded by a description of the structure of the Dryandra flower together with line drawings by Margaret. Margaret also contributed an article on Dryandras in cultivation in Perth, and Hartley Tobin provided similar information for his gardens in Victoria. Ron Pearson supplied notes on his seed germination experiences and interesting comments on the weed potential of dryandras. Finally, there is a short note from me on the latest developments in Dryandra taxonomy- hopefully, something for everyone!

Two projects which could help gain more information on dryandras are a survey of frost tolerance and a survey/recording of pollinators. My feeling, which is not backed up by more than a few casual observations and a couple of comments, is that dryandras are reasonably frost tolerant but we need confirmation. Any comments from members in frosty areas would be gratefully received. The actual pollinators of many dryandras remain a mystery and it would considerably help our knowledge in this area if, over this winter, all growers could observe their plants, or make observations in the field, and let me have the information. I am still puzzled by the lack of preference for dryandras, even D. formosa, among New Holland honeyeaters and other birds in my garden.

The seed bank has been operating well, almost too well in fact, and Margaret is short of seed of some species. All donations of spare seed would be gratefully received- please ensure it is named correctly, or, if you are unsure, send a flowering specimen along with the seed.

Two reminders. The Group has a slide-tape set of dryandras which is available for loan from Tony Cavanagh. It runs for about 40 minutes and there is no charge apart from the user paying the return postage. Normal loan period is one month. The set will be re-vamped when the genus is fully revised. Secondly, Margaret has ample copies of most back issues of the Newsletter, and the following are available from her- No's 1-10 (spiral bound), $6.50 plus postage; No's 11 and 12 (spiral bound), $3.00 each plus postage; No's 13-16, $1.50 each plus postage.

Finally, a reminder that subscriptions for 1989-1990 are now due. I have held the cost the same as last year but the rising costs of copying and postage almost certainly mean a rise in subscriptions next year. Please send subscriptions to Margaret (cheques made payable to the Dryandra Study Group) and use the tear-off slip on the back page. This also has provision for comments, suggestions and questions.

All the best with your Dryandra growing. And yes, I do have a new printer for my computer!

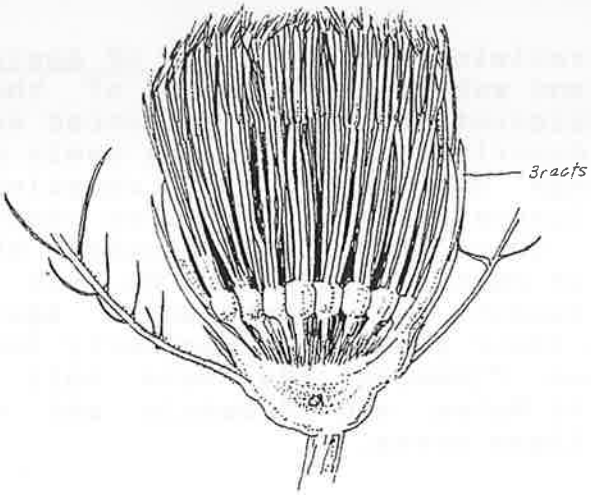
The Dryandra flower;

The flower heads of dryandras are made up of many flowers clustered together. Bentham's description of the inflorescence is as follows; "flowers sessile, in pairs, in dense terminal or lateral heads in a involucre of numerous imbricate scale-like bracts and usually surrounded by a ring of floral leaves similar to the stem leaves". Individual flowers are hermaphrodite and attached to a flat or nearly flat receptacle. The perianth (combined petals and sepals) forms a tube, topped when in bud by an oblong or linear limb (tip of perianth tube). The limb divides into four claws during flowering, splitting the perianth tube to nearly half way, with each claw holding an anther. The ovary at the base of each flower is very small and sessile. The long, thin straight style may not exceed the perianth in length. When, as in most cases, it is longer it will curve outwards through a split in the perianth until the stigma or tip of the style is freed when the limb breaks as described as above. The style then straightens. This explains the form of most species in bud, eg *D. formosa*, where the perianth limbs are at first held together in a central cluster, while the thin, wiry styles curve out around the bud. As the stigmas are freed, this effect disappears.

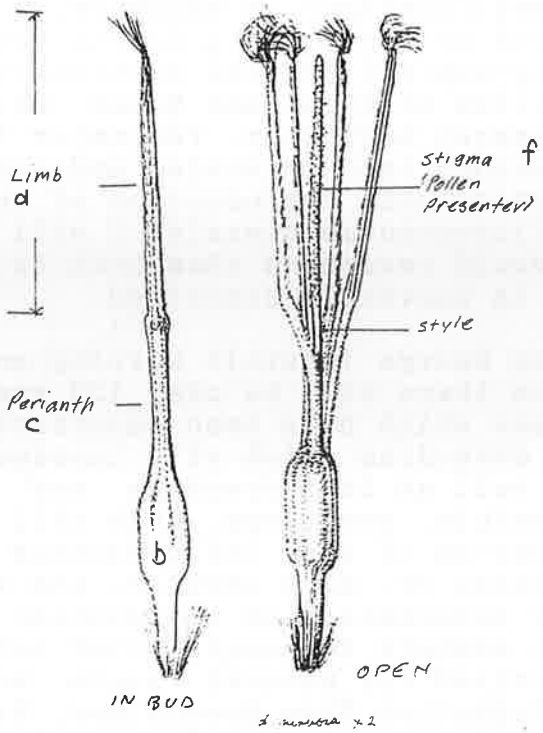
Key; a - receptacle, b - ovary, c - perianth, d - limb, e - anther, f - stigma.

Glossary;

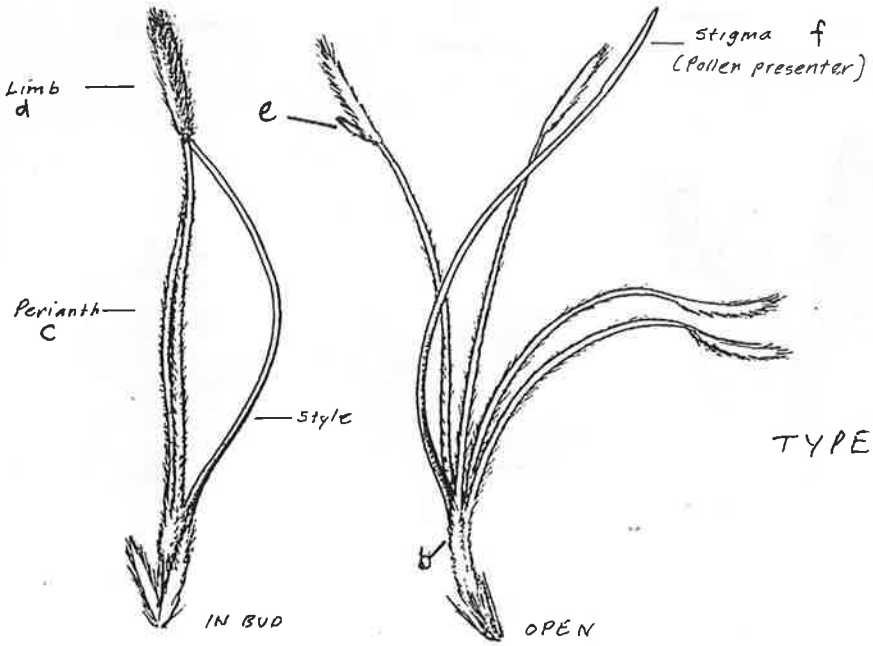
anther - that part of a stamen which contains pollen.
axillary - in axil formed by leaf and branch.
cuneate - broadest around middle and tapering to base.
dentate - toothed.
glabrous - surface destitute of hairs.
hermaphrodite - with male and female parts.
inflorescence - flower cluster.
involucre - whorl of bracts surrounding base of flower.
lanceolate - lance shaped; long and narrow.
limb - swollen end of perianth.
linear - long and narrow with parallel edges.
peduncle - main axis of an inflorescence.
perianth - collective term for calyx and corolla.
pinnate - compound leaf with leaflets either side of a midrib.
pinnatifid - leaf lobes cut half-way to midrib.
pistil - female part of flower - ovary, style and stigma.
plumose - hairs with feather-like branches.
ovary - contains ovules - becomes fruit.
receptacle - swollen head of flower stalk.
reticulate - net-like veins of leaf.
revolute - edges of leaf rolled inwards towards midrib.
sinus - recess between lobes of leaf.
stamen - male part of flower - filament and anther.
stigma - female flower part which receives pollen.
style - joins stigma to ovary.
subulate - awl-shaped.
terminal - at the apex.
tomentose - covered with closely matted short hairs.
villous - covered with long weak hairs.



"Plenidifolia" form 6 x 1
cross section

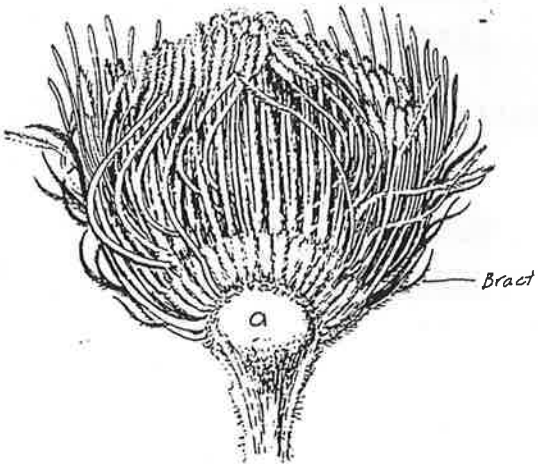


SINGLE FLOWER



D. quercifolia x 2 SINGLE FLOWER

TYPE B



D. quercifolia x 1
Cross section

LATEST ON THE TAXONOMY FRONT

It is pleasing to see two recent publications which have substantial information on dryandras. One is the weighty but very interesting Banksias, Waratahs and Grevilleas by John Wrigley and Murray Fagg, published by Collins. All of the currently named species are described together with leaf drawings which aid identification; in addition, 9 of Ted Griffin's proposed new species and three found by the authors during fieldwork are also briefly noted. The second is the long-awaited revised edition of How to Know Western Australian Wildflowers by William Blackall and Brian Grieve, revised by Grieve with assistance from Margaret Lewington. The major improvements on the earlier version are that leaf drawings are now scaled and each species description is accompanied by a small photographic reproduction of an herbarium specimen, not all of which show the inflorescences clearly. I will review both books in the December Newsletter but I would recommend them both to members for a detailed coverage of the genus as it is currently described.

Alex George is still working on his revision for the Flora of Australia but we know there will be over 100 species and sub-species, some of them being old names which have been resurrected. Margaret and I have commenced work on a book on dryandras which will incorporate descriptions of all the newly named species as well as leaf drawings and drawings of seeds, seed capsules and, where possible, seedlings. Each will be illustrated by two or three photographs, one a close-up of the inflorescence and, where possible, another showing either habitat or, more usually, the whole or part of the plant. We are anxious that our information on cultivation requirements is accurate and I again would ask all members to supply brief notes on their plants, particularly those which have survived for several years and have flowered. We have only very sketchy information from Queensland, New South Wales and Tasmania and would welcome additional material from members in these areas.

Examples of seedlings of various dryandras.

Top row (l to r)

arctotidis

preissii

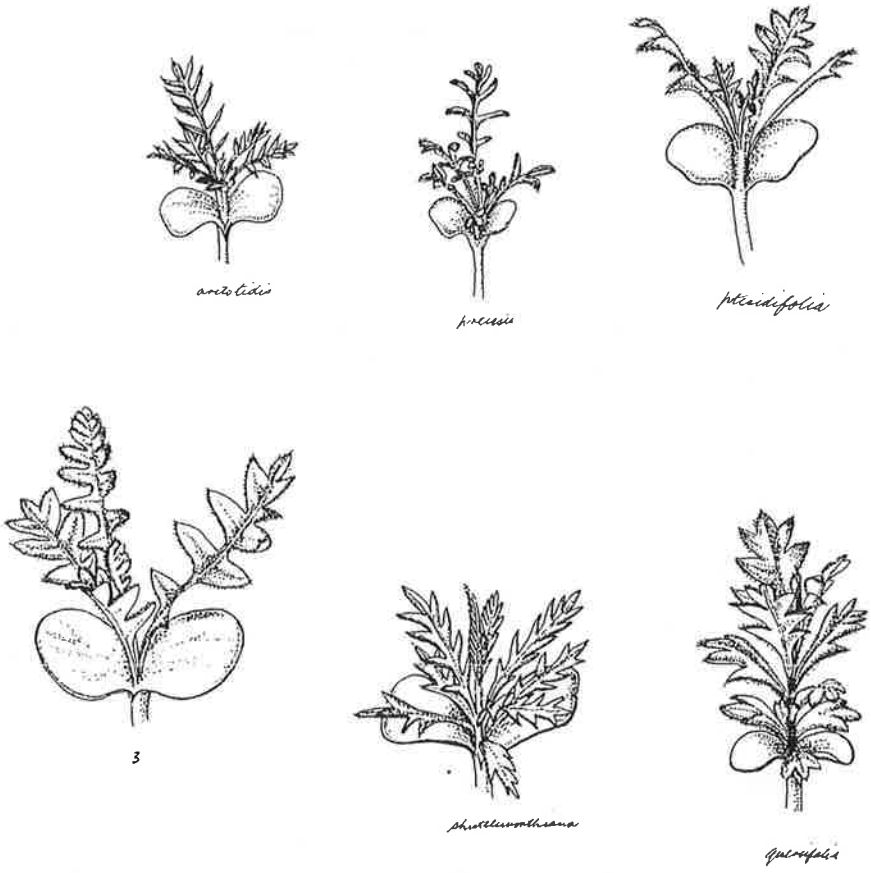
pteridifolia

Bottom row (l to r)

species

shuttleworthiana

quercifolia



DRYANDRA PTERIDIFOLIA- AT LAST THE REAL THING

In April last year, I set out on one of my Dryandra and Verticordia searching trips hoping to find the real Dryandra pteridifolia in flower. I had been given a few locations in the vicinity of the Fitzgerald River National Park and one further north to the east of Newdegate.

Several years ago on a camping trip with the Wildflower Society we spent a night camped in a gravel pit on Old Ongerup Road where we found several plants of a "pteridifolia" form which I discovered later is D. pteridifolia itself. The plants, which are prostrate and spreading with upright tangled leaves were not looking very healthy at the time. They were suffering from drought and a sooty mould. On my return last year, I found them in a much worse state, the few remaining plants which had not died showed no signs of flowers or buds. The following month (May 1988), the district experienced disastrous (for the farmers) flooding rains which well and truly broke the drought of many years.

Thinking that the good rains of last year would have revived the surviving dryandras and in the hope of my visit coinciding with the flowering period, I returned in April of this year on a similar trip. This time we approached the gravel pit from the east and before reaching it we found some D. pteridifolia plants further south in Hamersley Drive in the National Park. I was delighted to find them in flower and photographed some of them. Later on, at the gravel pit, where the plants were in full bloom and once again healthy, I was able to take more photographs, going from plant to plant searching among the very prickly leaves for the best flowers. As they are at ground level and often emerge from the underground stems covered in sand and sometimes the flowers are distorted by the closely-pressing leaf petioles, it was some time before I found the perfect one. Ants often build up mounds of sand around them burying the bracts surrounding the flowers.

I was surprised at the beauty of the flowers. They are quite different from those of the species we have been calling D. pteridifolia. The flower form is like that of D. shanklandiorum but smaller. All of the the other "pteridifolia" forms have a "shaving brush" shape in which the perianth does not relax on splitting but separates only slightly from the style (Type A).

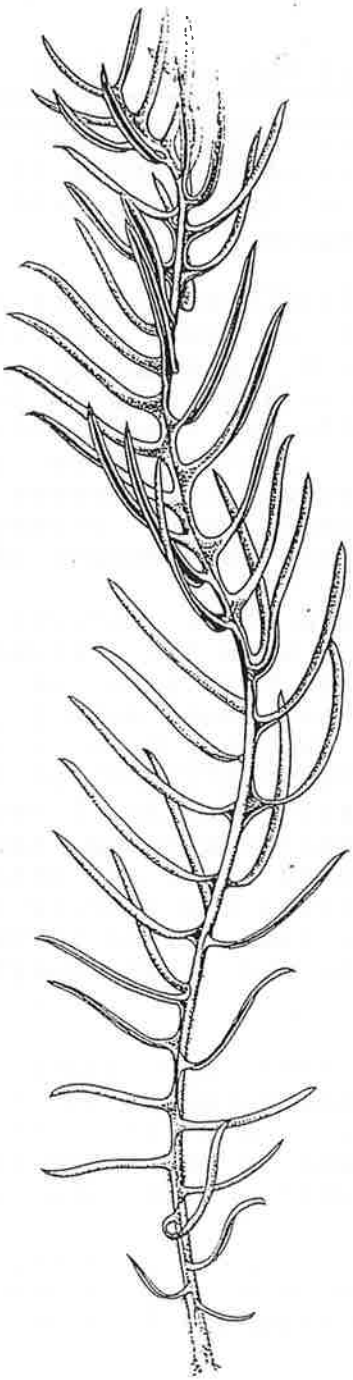
Dryandra pteridifolia and D. shanklandiorum are likeD. quercifolia and most other species where the style elongates and bows out before splitting from the four parts of the perianth which relax and separate from it below the level of the tips of the style (Type B).

My surprise was not only in the discovery that D. pteridifolia has a different structure which is the same as D. shanklandiorum but also in finding some beautiful colour forms which adds to the similarities between the two. As with

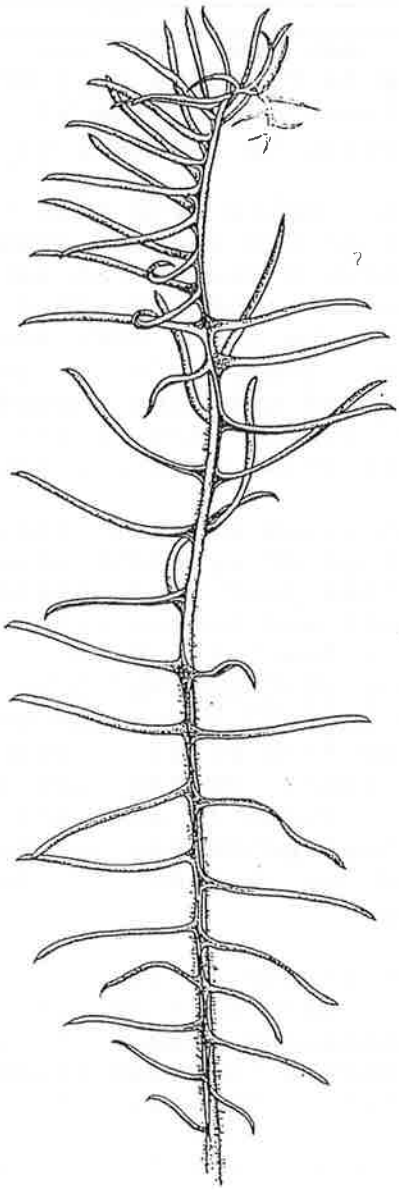
D. nobilis and D. drummondii (northern form), the colour of the limb varies within a population of plants from pale straw to a rich copper. The perianth is a dusky pink, the styles are light yellow with a deep yellow pollen presenter. The velvety bracts are rusty red/brown, very broad and shorter in proportion to the flower than in other "pteridifolia" forms.

Further on, south-west of Newdegate, we found another species, form 6, which could be confused with D. pteridifolia as the leaves are very similar though it tends to form a clump or small mound, but there could be no confusion when the flowers are compared.

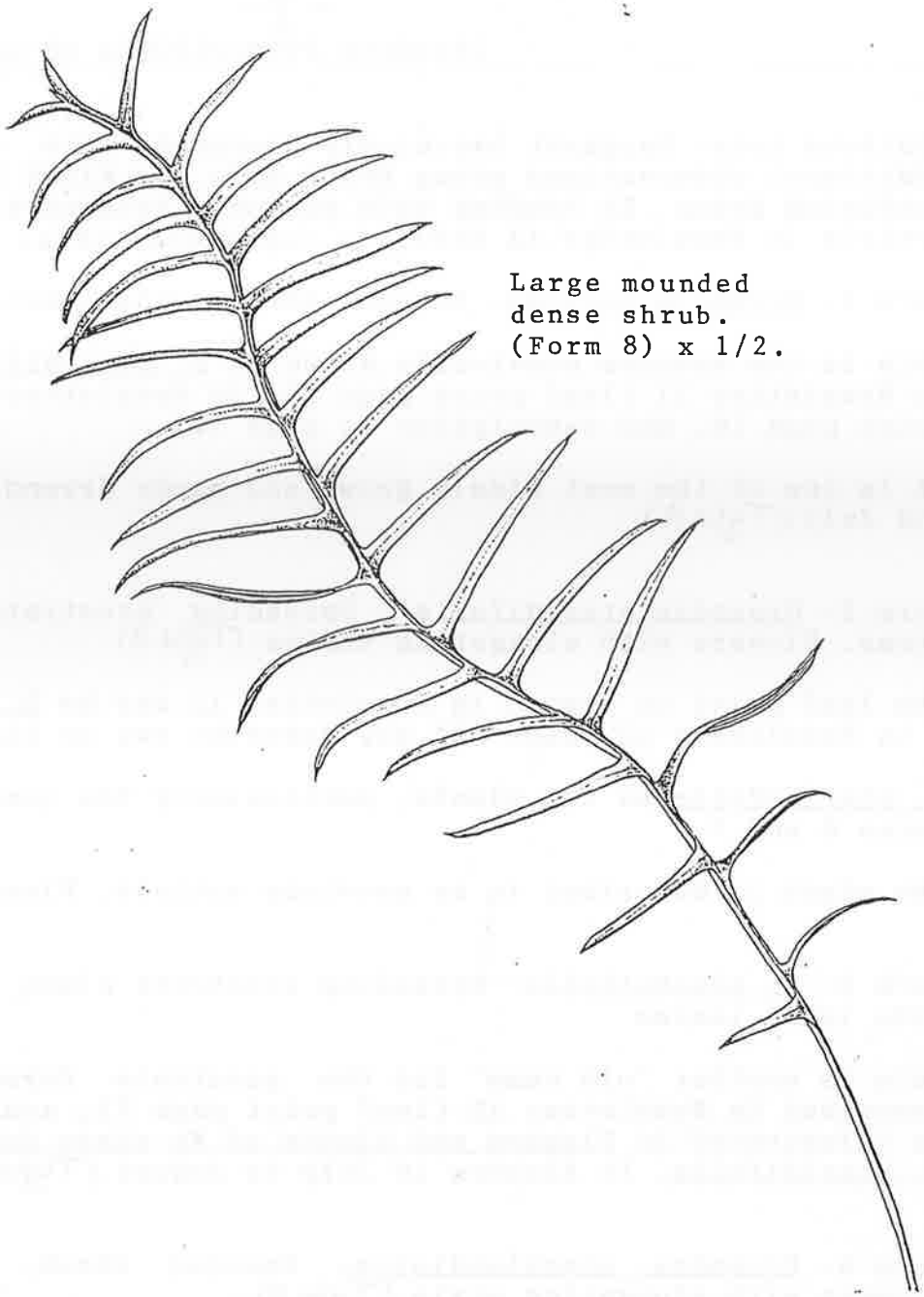
Margaret Pieroni.



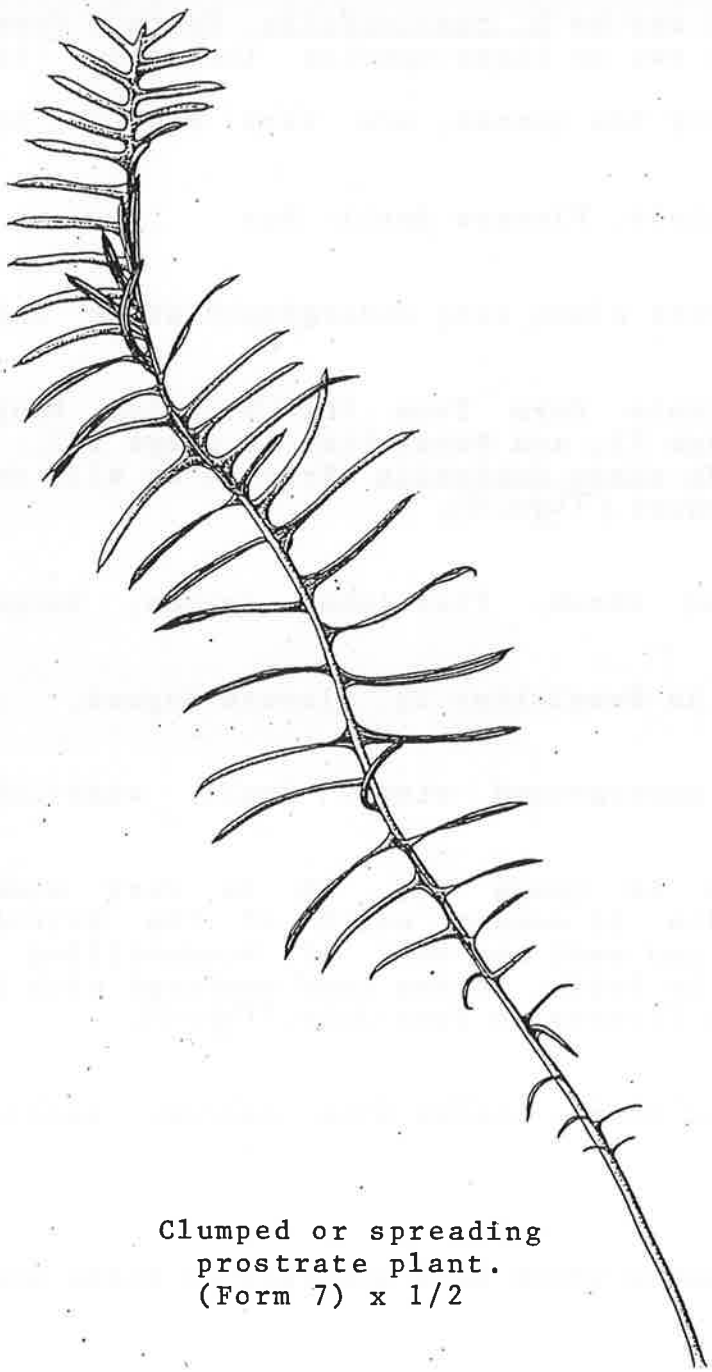
D, pteridifolia
(Form 2) x 1/2.



Low mounded shrub.
(Form 6) x 1/2



Large mounded dense shrub. (Form 8) x 1/2.



Clumped or spreading prostrate plant. (Form 7) x 1/2

DRYANDRA PTERIDIFOLIA UP-DATE

(Editors note- Margaret has kindly prepared this summary which is based on additional observations since Keith made the first attempt to separate this very confusing group. In reading this account, reference should be made to Keith's article in Newsletter 12 which is reproduced after Margaret's article.

Form 1- Dryandra nervosa- Mounded shrub, wide-lobed leaves.

This is the species previously known as D. pteridifolia. It has been described in Newsletter 11 (leaf print page 3), in Mewsletter 12 (cover illustration, leaf print page 16, and description on page 14).

It is one of the most widely grown and hardy dryandras and flowers between April and July.(Type A).

Form 2- Dryandra pteridifolia- Spreading prostrate plant with underground stems. Flowers with elongating styles.(Type B).

The leaf print on page 5 in Newsletter 11 may be D. pteridifolia. Keith's form 2 in Newsletter 12 (page 18) may describe two or three species including "true "

D. pteridifolia as the plants, particularly the leaves, are very similar to forms 6 and 7.

The plant is described in my previous article. Flowers April- May.

Form 3- D. blechnifolia- Spreading prostrate plant with underground stems and wide lobed leaves.

This is another "old name" for the prostrate form from the Stirling Ranges described in Newsletter 11 (leaf print page 7), and Newsletter 12 (page 18). It is illustrated in Flowers and plants of We stern Australia (Ericson et al), as D. pteridifolia. It flowers in July to August.(Type A).

Form 4- Dryandra shanklandiorum- Mounded shrub, flat-lobed leaves, large flowers with elongating style.(Type B).

Described in Newsletter 12 (page 19) and in Newsletter 15. Flowers August.

form 5- Spreading prostrate plant with underground stems. Small, wide-lobed leaves and small flowers.(

This species is described in Newsletter 12 (page 19). It is very widely distributed in South West Western Australia. It occurs north of the Stirling Ranges, at Kendenup north towards Darkan and east and west of Woodanilling as well as the more eastern locations given by Keith. It has been confused with D. preissei which it in no way resembles. It flowers in June-July.(Type A).

Form 6- Low mounded shrub with underground stems. Leaves with narrow, revolute lobes. Small floral leaves present.

Location- South west of Newdegate.

Description- A prostrate shrub or low mounded shrub with underground stems and

upright, tangled leaves which are spirally twisted and resemble those of D. pteridifolia. *Foliage*- Leaves are about 36 cm. long and very dense and tangled. They are a distinctly bluish-grey colour. The leaves spiral, usually only once, and thus not so much as in D. pteridifolia. The leaf lobes are 5 cm. long, widely spaced and only 2-3 mm. wide being strongly revolute and with a sharp point. Miniature floral leaves are produced. *Flowers*- The flowers are borne at the base of the leaves or at the ends of the underground stems and occur at ground level. The outer bracts are dark brown and triangular, the inner ones light rusty red, narrower and ovate. They are tomentose on the outside and glabrous on the inner surface. They cover about 2/3 of the length of the flowers which are a pale straw colour (Type A). The flowerheads are about 4 cm. across.

Form 7- Clumped or spreading prostrate plant with narrow, revolute leaf lobes.

Location- Badgingarra and Alexander Morrison National Parks.

Description- *Foliage*- Leaves are quite long, up to 40 cm. They stand upright on the plant rising from underground stems ad are spirally twisted. The lobes are widely spaced at right angles to the midrib and revolute. They are about 3 mm. wide- narrower than D. blechnifolia but wider than D. pteridifolia- and about 55 mm. long. *Flowers*- Similar to D. blechnufolia. It flowers in August (Type

Form 8- Large mounded dense shrub. Narrow leaf lobes, small floral leaves present.

Location- South of Ongerup, east of Harrismith, and at Tarin Rock Reserve east of Dumbleyung.

Description- This is one of the largest growing "pteridifolia" forms. D. shanklandiorum forms shrubs as large but they tend to become straggly and die out in the centre with age. Form 8, however, forms a very dense, compact mounded shrub to about 1.5 m. high and wide. *Foliage*- The leaves are very long to about 40 cm. with widely spaced lobes at right angles to the midrib. The lobes are 4 mm. wide, revolute, sharply pointed and 65 mm. long. The leaves are bluish grey-green, although not so pale as those of D. pteridifolia and Form 6. Some plants have leaves that are more green. The leaves form a tangled mass and floral leaves are produced in large numbers. *Flowers*- The flower heads are similar to those of Form 6. Flower colours vary from cream to dark straw yellow. The bracts are shaped and coloured like those of Form 6 but cover the flowers to only about half their length. Flowering period is from May to July. (Type A).

I have recently visited the gardens of the W.A. Herbarium where D. nervosa (labelled as "D. pteridifolia") has been widely grown. Pruning, it seems, has only been carried out where plants intrude on to pathways and roads. Some of the dryandras are, therefore, not a pretty sight, having been trimmed to one or even two straight sides leaving the rest of the shrub in its normal rounded shape. One at least has a neat, right angled corner having been planted at the junction of two roads. This species has very tangled leaves making a dense shrub which doesn't seem to die back in the centre like some do, so apart from the ugly shape, the plants don't seem to have suffered. I guess it would make an ideal low hedge, if that's your cup of tea.

Margaret Pieroni.

THE FORMS OF *Dryandra pteridifolia*

In the last Newsletter Tony Cavanagh described *Dryandra pteridifolia* and noted that at least three forms are known. These were briefly described and leaf prints were presented of the three. The species is, as Tony hinted, more complicated than that and at least five forms can be distinguished. Each is distinct and readily distinguishable in form and habit, though floristically the similarity is more obvious. The forms (in brief) are;

1. Upright mounded form from Stirling Ranges.

2. Clumped form with blue, often spirally twisted leaves with strongly revolute margins. Widely distributed.

3. Prostrate spreading form with relatively broad short leaves from the Stirling Ranges.

4. Upright open type with very thin flattened leaves and showy flowers. From Mt. Hampton southwest of Southern Cross.

5. Prostrate dense ground covering form with narrow elongated leaves. From Newdegate/Ravensthorpe.

Four of the forms appear to have relatively narrow distribution, the exception being the spirally twisted revolute leaf form which ranges at least as far as Eneabba in the northern sandplain to Ravensthorpe in the southern sandplain and various places in between. The distribution of my collections of the five forms is shown on the accompanying map, with the locations from Ted Griffin's paper superimposed.

All forms of *D. pteridifolia* are desirable horticultural subjects, mainly because of the very attractive foliage and interesting form. The deeply cut foliage is attractive at all times, but most particularly at the start of a growth flush, when soft new foliage is cloaked in a dense felt of hairs, dark pink at first then turning to golden as leaves enlarge. In the three upright forms the new growth can be produced as a halo around the whole plant, transforming its appearance from the typical hard, sturdy and prickly dryandra look to a soft and delicate fern-like plant. Flower heads are generally large, with felty bracts and buff or straw coloured floral parts. In most forms the flowers are, however, hidden by foliage. The exception is the Mt. Hampton form, which, while having a similar upright habit to the Stirling Range type, seems to show off the flowers better.

Descriptions

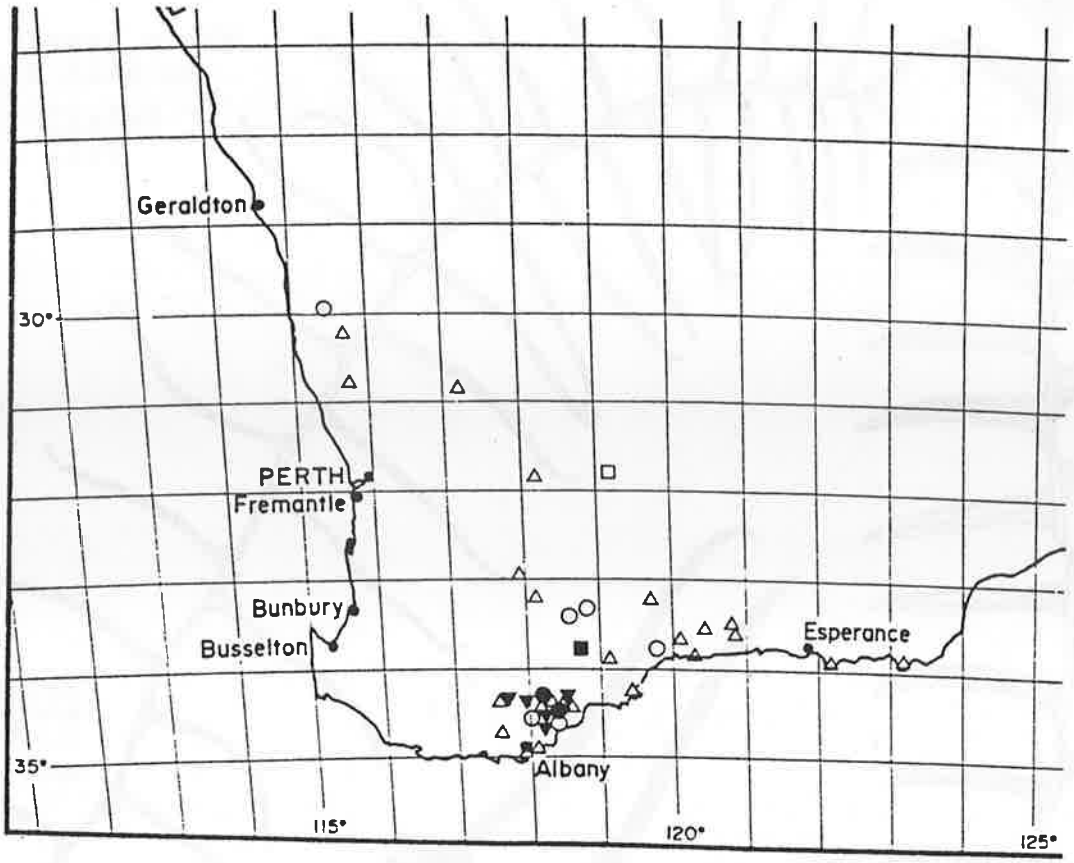
1. Upright mounded form

Location; The Stirling Range area including South Stirling, Manypeaks and Pallinup River. Found in flat country rather than the hills. Sandy soils over laterite.

Description; A rounded shrub to 1.5 by 3m but generally 1 by 1.5m with an upright but densely branching habit. The framework of stems rises to 0.5-1m from the ground, but the densely tangled leaves, tightly packed around upper parts of stems, surround and obscure the stems, leading to the rounded leafy mound appearance.

Foliage; Leaves are 40-60cm in length with deeply cut lobes at right angles to the leaf axis. They can be somewhat spirally twisted though not strongly so. At the widest point of the leaf the lobes are 5-6cm in length and can vary from triangular

Distribution of *D. pteridifolia* Forms



Key; Ted Griffin distribution of species : (△). Study Group specimens : form 1. (▼), form 2. (○), form 3. (●), form 4. (□) form 5. (■).

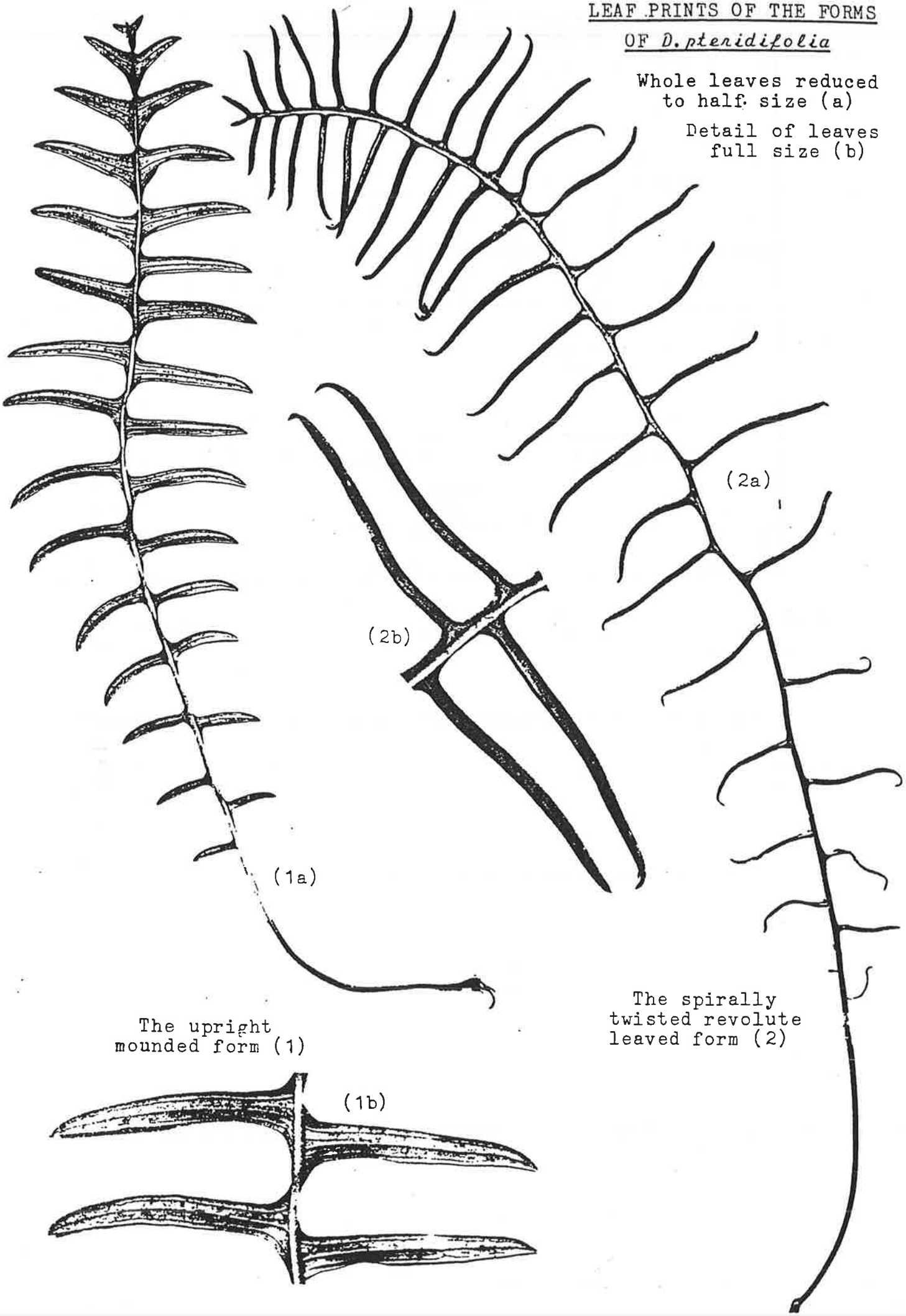
to elongate with a more triangular base. The lower one third of the leaf stem has no leaflets, then comes a series of small discrete leaflets leading to the broadest section and finally a decrease in size of leaflet to the tip. Over the last one third of the leaf there is more fusion of the leaf bases. Leaflets are flat, or very slightly revolute. On mature leaves the upper leaf surface is glabrous and olive to blue-green. The prominently veined undersurface is covered by a dense layer of white hairs. New growth is covered on both surfaces with bright pink hairs which turn golden as leaves expand.

Flowers; Flower heads are carried terminally on the leafy stems of the plant but are generally hidden by the dense long foliage surrounding the bud. The triangular outer bracts of the buds, like the stems of the plants, are densely covered on the outer surface with a felt of white hairs but are glabrous and golden brown inside. The narrower inner bracts have a glabrous inner surface and are a glossy darker brown and have longer rusty brown hairs on the back and as a fringe. Seeds are embedded in a mat rusty hairs. Floral parts are a pale straw to orange colour. Buds 3-5cm wide by 5-6cm long. Flower heads do not spread during flowering as fully as other *Dryandra* species, and are not much wider than the bud.

LEAF PRINTS OF THE FORMS OF *D. pteridifolia*

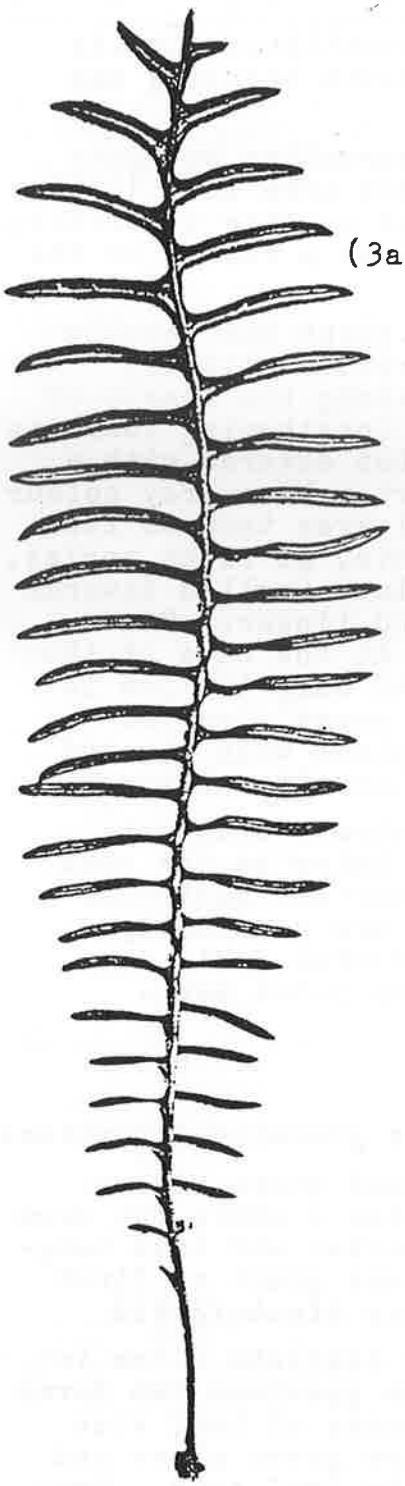
Whole leaves reduced to half size (a)

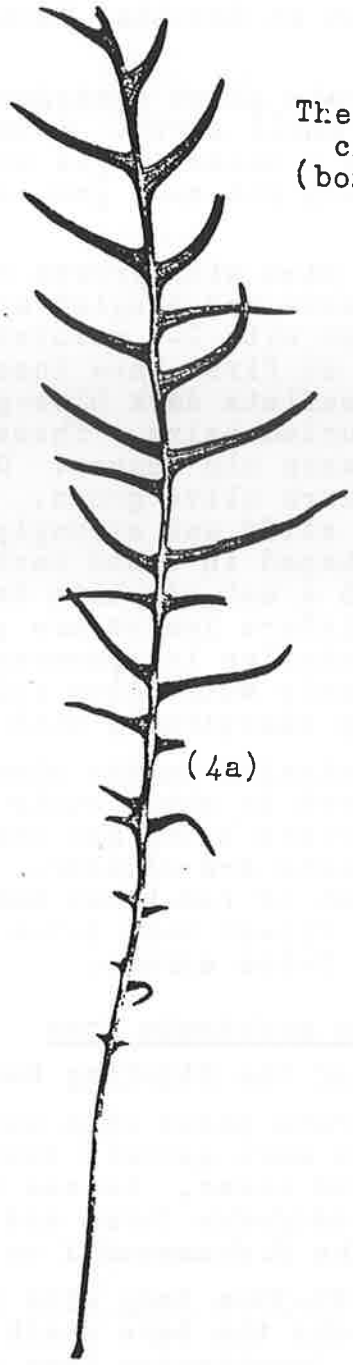
Detail of leaves full size (b)



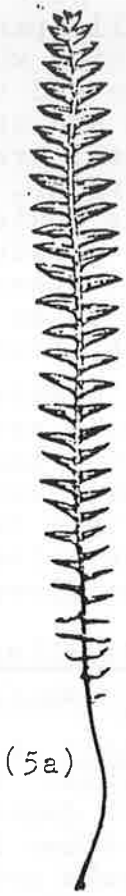
The upright mounded form (1)

The spirally twisted revolute leaved form (2)



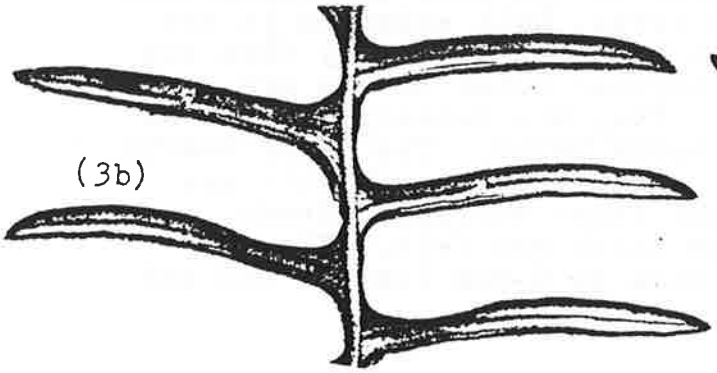


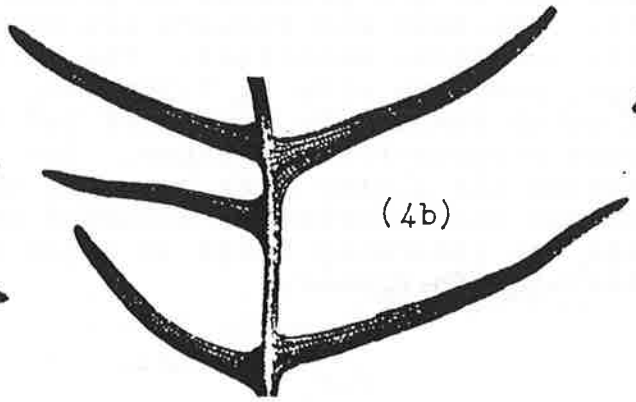
The prostrate ground covering form (5) (both full leaves)



The Stirling Range prostrate form (3)

The upright Southern Cross-Hyden form (4)





2. The spirally twisted revolute leaf form

Location; Occurs over a wide area, though discontinuous in its distribution. Recorded at Eneabba, Nanarup, South Stirling and Ravensthorpe.

Description; A prostrate plant occasionally spreading but generally appearing as a small shrub. Stems seldom more than 10-20cm from ground level with a dense tangle of leaves arising vertically. Flowers borne terminally but near ground level as a result of the low growth.

Foliage; Variable in size with growth of the plant but usually 50-70cm long. Very dense and tangled and characteristically spirally twisted, often with 2-3 revolutions along the length of the leaf. Leaf stems at first bare then with lengthening leaflets spaced well apart. Leaflets dark blue-green but covered with a bloom of tiny white curled hairs. These impart a blue-grey colour to the one and two season old leaves. Older leaves tend to lose the bloom and appear dark olive green. Leaflets, at right angles, to the stem, are very stiff and strongly revolute (rolled inwards at the margin), 'C' shaped in cross section and linear. Undersurface is coated with a mat of white hairs. At the base of the new shoot growth, miniature leaves are produced only 10-15cm in length but otherwise similar in appearance to normal leaves. This form is an extremely attractive foliage plant with the red new growth contrasting beautifully with the blue older leaves.

Flowers; Carried terminally on the short prostrate branches. Outer bracts are covered in short rusty brown hairs on the outer surface, the inner surface being the same colour but glabrous. The narrower inner bracts are similar. Seeds are eventually embedded in a felty mat of red-brown hairs. Floral parts are pale straw coloured. Flower buds 3-5cm wide by 5-6cm long. Fully open flowers to 5-6cm across.

3. The Stirling Range prostrate form

Location; Foothills of the Stirling Ranges in gravelly situations.

Description; A prostrate plant with underground stems and upright leaves. Spreads more quickly than species 2 above but does not form a dense ground cover. Leaves are shorter and less tangled than other *D.pteridifolia* forms and a mature plant at first glance looks not unlike *D.drummondii* or *Banksia blechnifolia*.

Foliage; From about 25-35cm long with linear leaflets 4-5cm in length. This form lacks the bare stalk of the previous two forms but has in common the lengthening then shortening of leaf size from the base upwards. Leaflets are dark olive green above and creamy below and carried at right angles to the leaf axis. Margins are revolute but not strongly so. The form has the normal red-yellow fuzz on new growth.

Flowers; The inflorescences are borne on the ends of underground stems and so are produced at ground level, half embedded in the soil. The buds and flowers are much more densely hairy than the first two forms described. The triangular outer bracts are large, over 1cm wide by 1.5cm long. They are densely covered on the outer surface by long dark red-brown hairs. The inner bracts become progressively thinner. Both inner and outer bracts are glabrous and glossy dark brown on the inner surface. Seeds, as with the other forms are embedded in thick red felt. Flower heads are generally large to 4-5cm wide by 6-8cm long in bud and 5-6cm wide in flower.

4. Upright Southern Cross - Hyden form

Location; Mount Hampton on the road between Moorine Rock and Hyden on a laterite rise.

Description; An upright plant with dense upright stems to 0.5-0.75m. Leaves less dense and shorter than the Stirling Range upright form. Flowers terminal on short branches below main axis. Both flowers and framework of plant more visible. Flowers creamy yellow but more obvious than other forms and consequently more showy.

Foliage; Approximately 25-35cm in length. Stems bare for first third of length then with leaflets generally angled forward to the leaf axis at 45°. Less tendency than other forms for lower leaflets to be small. Leaflets not at all revolute, generally feel flatter and thinner than other forms. As with form No 2 above, miniature leaves are produced at the base of new growth. Characteristically with the leaves of this form, once the fuzz of purple red hairs of the new growth are shed the leaves are glabrous on both upper and lower surfaces. The undersides have a sculptured pitted surface.

Flowers; Very showy large flower heads are produced. Outer bracts are generally longer and thinner than other forms - to 2.5cm long by only 0.5cm, lengthening to 4cm with the narrower inner bracts. The outer surface of both inner and outer bracts is densely covered with long red-brown hairs and the inner surfaces are glabrous and light golden brown, darkening by the time seed has set to dark red-brown. Seed, as with other forms, embedded in dense red-brown felt. Flower buds up to 3-4cm wide by 5-6cm long and fully open flowers 8-10cm across.

5. Prostrate ground covering form

Location; On back road joining Lake Grace - Newdegate Rd. and Ongerup - Ravensthorpe Rds., meeting the latter east of Jerramungup

Description; A delightful miniature form of *D. pteridifolia* with underground stems and vertically held leaves. Under good conditions the form can build up to a fairly dense ground cover up to 3-4m across. In habit it is very like *D. calophylla* but the leaves are much narrower. Flower heads are borne at the tips of the underground stems and are consequently at ground level.

Foliage; The leaves are very short for the species, only 20-25cm long with small leaflets - the largest only 1-1.5cm in length. General shape is not dissimilar to form No 3 with a short length of bare stem then gradually longer leaflets borne regularly and held at right angles to the leaf axis. Leaflets mid to dark green in colour, glabrous above and covered with a felty mat on the undersurface.

Flowers; The flower heads, like the leaves, are miniatures of the other forms. Buds are only 2cm wide by 3cm long and the fully opened flowers only 2-3cm across. Outer bracts are triangular and only lightly hairy. Inner bracts are longer and narrower, to 2cm in length, and with long red-brown hairs on outer surface. The inner surface is light buff brown, darkening by the time seed is set.

Cultivation notes - all forms

All of the forms can be grown from seed, though none are amongst the most reliable performers from seed. The seeds are long and flat - approximately 1cm in diameter - and appear to be more susceptable to damping-off than some of the smaller species.

However, by dusting with a fungicide such as captan, and attention to watering-in with captan or captan/benomyl, a good strike should result. Cuttings should be possible with the two upright forms but even with these the cutting material is very thick and course. Seed seems a better option.

None of the forms of *D. pteridifolia* are common in cultivation but all have at least been tried with good results. Tony Cavanagh has grown form No 1 very successfully for a number of years in slightly raised beds at Ocean Grove (Vic), while Hartley Tobin has both 1 and 2 growing well in the open ground at Coronet Bay and The Gurdies (Vic). We have had form 3 going very well for a number years in full sun in a raised sand mound. Alby Lindner has several large plants of form 5 doing superbly in the open ground in his garden near Horsham. Many others have recorded *D. pteridifolia* on their survey sheets but I can't differentiate on the information provided. If possible let me know, when filling out the sheets, which forms you have.

We have all five forms represented at Cranbourne and all seem equally hardy. The division of forms is; 1. 10 plants from four collection localities, 2. 3 from 1, 3. 18 from 6, 4. 1 from 1, 5. 4 from 2.

DRYANDRAS AND FIRE- SOME RESPONSES

(Editor's note- In Newsletter 14, I reproduced part of a letter from Ken Stuckey in which he reported massive regeneration of D. formosa and D. praemorsa after the Ash Wednesday fires. The article has drawn a couple of comments which I have reproduced below.)

I was a little concerned to read the article "Dryandras and Fire" containing material from Ken Stuckey. The prolific regeneration of D. praemorsa and D. formosa could be the cause for some concern. As you probably know, there is a strong move on at the moment urging people not to grow Australian plants outside their natural range principally for this reason- to avoid excessive regeneration of some species so they become weeds or pests. More recently there was an article in Indigenotes in which it was pointed out that as well as over 850 exotic species naturalised in Victoria, there were about 95 Australian species that have produced spontaneous populations outside gardens and could be looked upon as being potential environmental weeds.

Ron Pearson

The dryandras mentioned as potential weeds are both sought after as cut flowers. If pickers were allowed to cut the flowers, it might solve the problem- by reducing the number of plants seeding and saving the natural populations from the pickers here in W.A.!

Margaret Pieroni

DRYANDRAS IN CULTIVATION- EXPERIENCES IN PERTH

(Editor's note- Margaret prepared this survey as a comparison with the results I reported for southern Victoria in Newsletter 15. I would be pleased to have other growers experiences, however brief, as it is only by such information that we can fill in some of the gaps in our knowledge of the cultivation requirements and performance of dryandras. Margaret used my three categories but addd a fourth, a group she referred to as "absolutely hopeless."!

Group 1

D. arctotidis- Perhaps still too early to tell but my plant only one year old from the nursery is looking very good.

D. armata- My plant must be about ten years old and is still growing extremely slowly- it is only 20 cm. high and has not flowered. I'll try another plant or two in another position to see if this behaviour is consistent.

D. fraseri- (Syn. ashbyi- see Alex George's article in Newsletter 13.) I have two plants, one of which is only two or three years old and hasn't flowered. My original plant is still very vigorous and always flowers well and sets plenty of seed. It's hard to gauge growth rates because the species is so variable, some forms grow to large shrubs while others are quite small.

D. cuneata- Same remarks as for D. arctotidis.

D. nivea- I have three "forms" one of which is probably typical nivea. The oldest one has flowered but not set seed. All are vigorous and spreading well.

D. praemorsa- The original tree has died and there are hundreds of self-sown seedlings to select from. This must be the hardiest dryandra.

D. nervosa- (previously described and illustrated in newsletters as "D. pteridifolia"). Flowers prolifically but has not set seed. Beautiful mound, especially when new growth shows in December. 0.75 by 1.3 m.

D. tenuifolia- The typical form is growing very well and flowers and sets seed. The prostrate form from a nursery is only one year old but looks well. The bush form is 1.2 by 1.75 m.

D. calophylla- Two years old from a nursery. It hasn't flowered yet but is growing (spreading) well.

D. drummondi- (Stirlings form). This is a beautiful plant, 0.6 by 1.4 m. The flowers are magnificent but not easily seen at the base of the leaves. I have a problem with the leaves as well, possibly the same one as you. White, powdery spots appear which turn rusty or yellow and spoil the leaves. This disfiguration also occurs on D. nervosa and my prostrate banksias. I have tried washing it off with a soft brush and soapy water but it seems to have re-occurred.

D. obtusa- This is one of the hardiest and most rewarding prostrate plants. It grows naturally in sand so does well here, once it has been planted out. My two plants are very healthy looking but have not flowered yet. Friends in Peppermint Grove have a plant that has flowered.

D. squarrosa- (Syn. carduacea, see Alex George's article in Newsletter 13). I had a plant several years ago that grew and flowered well until it was crowded out by surrounding plants. I now have two plants from last year's sowing which are progressing well.

D. baxteri- My plant has grown quickly to cover a fence. It is a good screening plant being quite bushy and flowers well and sets a few seed. 1.6 by 1 m.

D. nobilis- Does very well for me. Flowers prolifically and sets seed. 2.5 by 1.5 m.

D. ?longifolia- I have the form from Dempster Head which Keith claims is different to typical D. longifolia. It looks good but hasn't flowered after four years. 0.4 by 0.6 m.

D. mucronulata- It was very vigorous but died suddenly. It occurs in areas near where D. formosa grows so may respond to similar conditions in cultivation. It is excellent for screening, mine next to a paling fence was dense to the ground and grew quickly to fence height.

D. polycephala- One of the easiest and most rewarding plants here with flowers covering the bush. It also self-seeds in the garden. I have two plants, one 1.3 by 1.3 m. while the other is as tall but less bushy being in partial shade. Strangely enough, I've had no success with a similsrr species, Ted Griffin's sp. B although I know others have grown it in Victoria.

D. quercifolia- One of the best dryandras in my garden is the lovely pink flowered form I've described previously. I give it some summer watering otherwise the buds may not open. It should be in less shade as some of the branches are long and not upright. I have planted another one grown from seed of a pink plant found in the wild. The original one is 1.75 by 2.75 m. and the new one is 0.3 m. high after two years.

D. speciosa- This is an excellent plant in my conditions. Mine was rather sparse until this year but after the good winter rains of last year, has become quite bushy although still small- 0.5 by 0.75 m. It is the red-flowering Badgingarra form and it has 30 buds on it at the moment. However, it has never set seed. (How would pollinators find the flowers?)

D. shanklandiorum- Growing very well although rather slowly- 0.5 by 0.5 m. Hasn't flowered yet.

D. brownii- This is a plant very similar to D. nivea. Only three years old and growing well at 0.2 by 0.2 m., it still hasn't flowered.

Group 2

D. formosa- I have to put this in Group 2 only because I have found it short-lived. I'm on my third! All my plants have grown very well and very quickly. They have flowered prolifically and have set seed and then suddenly died. My present one has flowered after three years and is 2m. by 1m. I think perhaps they should be watered regularly so that none of the roots ever dry out. They grow in rocky, inhospitable situations on peaks of the Stirling Ranges and on exposed cliffs on the south coast near Albany for instance, but these are places where there is an an almost year-round rainfall, however light and misty at times.

Dryandra sp.- This is Keith's "pteridifolia" form 5 in Newsletter 12. This plant spreads to cover very large areas in the wild but is very slow growing in my garden. It hasn't flowered yet.

D. pulchella- I have a plant about four years old which is doing well, 0.4 by 0.6 m. I have planted it in a sunny spot hoping to emulate the conditions under which it grows in the Wongan Hills.

Group 3

D. bipinnatifida- One plant grew very little and soon died once planted out in the garden. I now have another, still in the pot from last year's sowing. It is looking very healthy. I'm pretty sure it's the large-leafed Darling Ranges form while the previous one was the northern sandplains form.

D. preissii- Two plants have died at an early age. It usually grows in pure gravel and doesn't seem to like our sand.

D. proteoides- I had a plant which grew very slowly for several years and then died. I think I agree that it's one for heavy though well drained soil. I've seen plants growing and flowering well in cultivation at Capel and at Darkan (Val Crowley's) but not in pure sand. I'm still trying it but I'm not optimistic.

D. carlinoides- I've had difficulty obtaining a plant so far. Seeds seem to take a long time to germinate. The first dryandra I saw in a garden was a very well grown one not far from here. It flowered well so I should be able to grow it here. I have one seedling to plant out this year.

D. tridentata- A plant, two years old from seed, is growing slowly. It was looking yellow and drawn until a dose of iron chelates caused it to resprout and turn green.

Group 4

These are plants which haven't survived past the seedling stage or have died soon after planting out.

D. shuttleworthiana- One grown from seed another well grown one from a nursery both died in the pots.

D. stuposa- A nursery-bought one died soon after planting out. I have one from last year's sowing ready to try again.

D. subulata- Two years in succession I've had healthy seedlings grow to planting-out size and then die.

D. serratuloides- Several seedlings of both forms died soon after germination.

D. cirsioides- A small plant died soon after planting out.

D. ferruginea- I've had no luck with any of the forms after the seedling stage except for the beautiful, short-leafed, small-growing form from the Stirling Ranges (unnamed). It is growing well and is in bud for the first time. Hartley Tobin has had this one growing and flowering well for several years. Mine is 0.2 by 0.4 m. and could possibly be in Group 1. I bought the plant from Morande Nursery about five years ago.

I haven't tried the following-

D. conferta- There are several forms so I'd have to try them to find a suitable one for my conditions.

D. hewardiana- I have one ready to plant out.

D. sessilis- The limestone-loving coastal form is very common in this area. It is fast growing and flowers prolifically. We have grown hundreds for our Greening Australia project at Point Walter but I don't have one in the garden nor have I tried typical D. sessilis.

D. plumosa- I have a plant of the un-named aff. plumosa from the Stirlings ready to plant out.

D. kippistiana- I haven't succeeded in germinating any seed.

Others I would like to try include- D. serra, D. vestita, D. seneciifolia, D. erythrocephala, D. foliolata and D. foliosissima.

Margaret Pieroni.

SEED GERMINATION AT MENTONE, VICTORIA

I have had varying success with germination of Dryandra seeds. The last batch was planted out in September and all seedswere exposed to the same conditions. Seeds of each species were planted out in their own small containers and after germination, each seedling was tranplanted to it's own pot.

They seemed to be progressing very well for the first few weeks until we had our first spell of hot, humid weather when the majority of them collapsed at the soil surface due to damping off. I had been spraying them and the soil surface with "Mancozeb" but under difficult conditions, it does not seem good enough. I have experimented with other fungicides including "Benlate" but had in the past found "Mancozeb" satisfactory.

The attached table shows how the seeds fared. In January, I had 5 D. calophylla, 1 D. arborea, 2 D. plumosa, 3 D. plumosa and 1 D. baxteri.

Species	No. sown 9/9/88	No. germ. and date	Time Weeks
ferruginea	3	Nill	-
calophylla	7	5 (5-21/10)	4-6
arborea	9	9 (15/10)	5
sessilis	4	2 (30/9)	3
proteoides	3	Nill	-
plumosa	6	5 (30/9-15/10)	3-5
serratuloides	8	1 (30/9)	3
tenuifolia	5	1 (6/10)	4
horrida	8	4 (2-15/10)	3-5
preissii	4	2 (2-21/10)	3-6
obtusa	4	3 (15/10)	5
baxteri	7	6 (30/9-21/10)	3-6
armata	7	Nill	-

Ron Pearson

NOTES ON CULTIVATED DRYANDRAS, SOUTHERN VICTORIA

Coronet Bay

In my last report, the plant I had as D. ashbyi I now believe is D. armata (102). 401 D. drummondii has given up, the competition being too strong. Unfortunately, it had not produced any seed so I have lost it's genetic line. 104 D. obtusa also gave up against stronger competition and possibly because of lack of light. 103 D. nivea also died but there appears to be no obvious reason for it's death. 207 D. formosa suddenly was not there and my only explanation is that it became nourishment for one of the many rabbits that seem to take to my plants from time to time! 387 D. sp. H and 286 D. praemorsa which were new additions last year appear to be surviving although D. sp. H is having a battle and at one stage I thought I had lost it- new growth has now appeared. The other plants are looking good except since making my observations, 207 D. tenuifolia has died so I collected a quantity of seed from it which will be planted next spring. 102 D. armata is now looking very sick and I don'tt think it will survive the winter.

The Gurdies

At The Gurdies, my most impressive plants by far are the D. formosa which produce an abundance of flowers and seed. The size of the plants are restricted by cutting off the majority of flowers and other pruning. The D. bipinnatifida on the other hand are restricted in size because they seem to have become a favourite part of the diet of some of the rabbits. 8630 D. praemorsa, the pink form, has been exceptional in its growth and has flowered well for its age. It hasn't produced seed as yet but I hope for some next year.

Some plants which appeared to be doing well will appear as casualities in next year's list. The only explanation I have at the moment is that the ground has probably been too moist for just a little too long. Because of this I am developing another garden to the north-east of the house. It is an area that will need some water in the summer but I'll face that problem when I have to.

8203 and 8205, both D. pteridifolia, manage to survive and produce the odd flower although brother 8204 gave up this year. I have never been quite happy with their classification and now, the more I read, the more I feel they are possibly D. preissii. I hope to organise some time to visit W. A. next year and will try to check out some of the localities from which I collected the seed of these plants. 8201 D. ferruginea produced three flowers this year and I was ready for them this time. Now I hope to find some seed. The plant is the form from the Stirlings.

Hartley Tobin

SUBSCRIPTIONS FOR 1989-1990

The group's year runs from July 1, 1989 to June 30, 1990. Subscriptions are $3.00 for Australian members and $5.00 for overseas. Please make cheques payable to the Dryandra Study Group and forward to Margaret. Thanks to all those who have already paid.

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COMMENTS OR SUGGESTIONS FOR INFORMATION