

DRYANDRA STUDY GROUP  
NEWSLETTER NO. 38



*Dryandra tridentata*

ASSOCIATION OF SOCIETIES FOR GROWING  
AUSTRALIAN PLANTS

*Dryandra tridentata*. A beautiful, small shrub which grows in sand. Flowers are borne at ground level and also terminally on the branches at times. It develops a large lignotuber and would benefit from pruning, in cultivation.

## DRYANDRA STUDY GROUP

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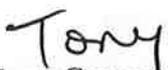
Mr. Tony Cavanagh  
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Welcome to the new millenium and hopefully another successful year of dryandra growing. I had hoped not to mention the weather but as we are now entering the third year of water restrictions in the Ocean Grove area and with all sprinklers banned, life is pretty tough in the garden. So far most of my well established plants have survived but I have not been game to plant much out and have several boxes of young dryandras ready to go if we ever receive any decent rain.

I think that everyone will agree that the articles and drawings that Margaret has supplied for this newsletter are superb. I was particularly impressed with the detail in the *D. fraseri* article and the lovely drawings of the seeds and capsules. It seems that Margaret has finally sorted out what turns out to be a very complex group. Like Margaret, I have long wondered about the differences between "D. ashbyi" and *D. fraseri* although I have always believed that the form now known as *D. fraseri* var *ashbyi* was the more upright, yellow flowered form with generally green to bright green leaves while *D. fraseri* var *fraseri* flowers are generally suffused with pink and the leaves are grey green. I also checked up an old article I wrote on this in Newsletter 9 (pages 12-13) and was pleased to see that we had "got it right" – the plant I believed to be var *ashbyi* had a glabrous perianth tube.

I must also thank Brian Moyle for his great assistance to Margaret and to me in the production of the Newsletter. Despite a very busy schedule, Brian has laid out and typed up Margaret's articles – many thanks, Brian. I would also like to thank David Lightfoot for producing another superb colour page from Margaret's photos of the various forms of *D. fraseri* and for taking on the daunting task of reviewing and summarising for the Newsletter several scientific articles on dryandras. I was delighted to have comments and observations from members and urge other members to tell us about their success and failures, especially with rare and uncommon species. Margaret's notes on the "mini" *D. conferta* and on *D. proteoides* is a case in point. How many other species have some "quirk" like perhaps requiring fresh seed to germinate? I have grown and flowered *D. proteoides* but I found that it is extremely prone to damping off and seedlings require a very well drained mix. In our conditions, it appears to have a limited life of around ten years. Margaret and I would welcome comments about whether we should consider increasing the price of the Newsletter and include perhaps another page of colour photos from members.

Happy Dryandra growing

  
Tony Cavanagh

Many thanks to all of you who commented on our last newsletter. Almost everyone who sent their subscription wrote that they liked the colour pictures and also Ray Purches' article on cuttings. To those of you who wrote that you were inspired to try growing dryandras from cuttings:- Good luck! Do let us know how you get on.

Special thanks to David Lightfoot for the excellent reproduction of the colour photos.

It was a pleasure to meet up with old friends at the ASGAP Conference in Brisbane in July. Several Study Group members attended and I signed up new members, who are growing about 16 dryandras in Victoria and have enjoyed a visit to WA this spring. Welcome to the Study Group Don and Jean Weybury.

We were very much 'dryandra deprived' in Queensland, though those who went on the pre-conference tour saw *D. arborea* growing at Dave Gordon's Myall Park gardens.

The Wildflower Society excursion to York in late July gave Keith Alcock and I the opportunity and pleasure to meet a relatively new member Hugh Seeds who lives there. We visited three reserves, two of which have populations of *D. proteoides*. We didn't see them, however, as they grow on rocky slopes well inside the reserves and the time was not available. *D. fraseri* var. *fraseri* was in flower and while driving between stops we saw *D. squarrosa* and *D. nobilis*. What we thought was *D. stuposa* among a roadside population of *D. nobilis* as we drove past, proved to be exactly that when we had time on the way home to stop and look.

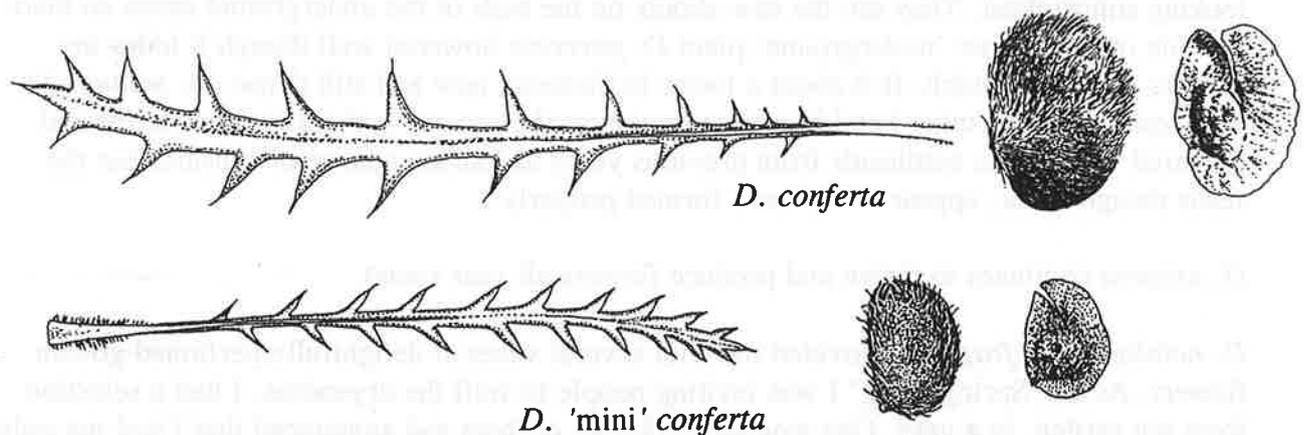
Brian Moyle and I returned to Eneabba and Badgingarra in late July. I wanted to take more photographs of the various Niveae dryandras and see the *D. nivea* subsp. *nivea* that Alan Tinker found near the Arrowsmith River north-east of Eneabba. After record rains in the area everything was flowering much earlier than usual. We found two of the *D. nivea* plants in flower- both with dark pink styles, fortunately not washed away but in a very wet area.

At Alexander Morrison National Park we were too late to photograph *D. cypholoba* but *D. lindleyana* subsp. *media* was flowering well, after last summer's fire near Eneabba but at Don and Joy Williams 'Hi-Vallee' we found *D. stenoprion* flowering. South of Cataby at Yandin Hill, some very good specimens of *D. lindleyana* subsp. *pollostata* are growing in the cap rock among other lovely plants including *D. hewardiana* and other genera in Proteaceae. This is a delightful spot for a rest stop with great views over the countryside to the coast. The hill is only 5 km's. from the Brand Highway.

In late August Elizabeth George and I went as guests of the Victoria Plains Tourism Association to Rica Erickson Reserve, south west of New Norcia and to Wyening Reserve, nearer Calingiri. We were among several guides showing more than 230 people the glories of our flora. This year the flowers were truly spectacular with many plants blooming at the same time, many earlier than usual, so that everyone, including the local people agreed that they'd never seen it as prolific and colourful. Our first walk at Rica Erickson Reserve near the corner of Old Plains Road and Calingiri Road featured seven dryandras. *D. polycephala* is spectacular there. Also flowering were *D. nobilis* and *D. squarrosa*. *D. nivea* subsp. *nivea* was almost finished and *D. lindleyana* subsp. *lindleyana* var. *mellicula* just starting to flower. Elizabeth and I were able to point out the differences in the two species. *D. fraseri* var. *fraseri* had spent flowers and we found plants of *D. bipinnatifida* with their 'ferny' leaves. Further

along towards Calingiri *D. purdieana* was in flower and we found it also at Wyening Reserve with *D. fraseri* var. *fraseri*. Some plants of the latter had very long narrow leaves.

On 1st September Brian Moyle and I drove to the gravel and sand pit south east of Dumbleyung where I thought I'd found a *D. conferta* X *meganotia* plant last April. I thought *D. conferta* would be about finished and *D. meganotia* not quite yet in flower but I was wrong on both counts. Even though we saw *D. conferta* in full flower not far away, the tall regular-looking plants were still in tight bud while some of the *D. meganotia* plants were opening. The hill is half laterite gravel and half deep yellow sand both of which are being quarried. *D. conferta* occurs in both soil types, but the plants I took to be a hybrid and the *D. meganotia* grow in the gravel. Unfortunately my special plant was still in bud, however, we found a few more similar plants one of which had un-opened flowers that opened fully in water before I pressed the specimen. On closer examination, especially of the seed, I am inclined to think these plants are probably not a hybrid after all. Possibly they are a 'mini' version of *D. conferta*. The drawings, seeds and follicles twice size and leaves actual size show the differences. I still find it strange that both the 'normal' and the 'mini' *D. conferta* are growing together. The 'mini conferta' plants are shorter and more spreading.



Leaves X1 and follicles and seeds X2

I am hoping to make a return visit to the reserve near Brookton soon to photograph the *D. ionthocarpa* (? subsp. "underground stems"! ). The *D. ionthocarpa* in gardens in Perth, contrary to the northern flora, is late flowering this year so I hope this time to get the timing right. I will write more about this and what could be a second new taxon at the same place, later.

This season has been a good one in my garden- the number of dryandras which have flowered for the first time exceeds that of those that have died. (Some of them never flowered.) A plant of *D. subulata* with its long grass-like leaves has flowered. Most of the leaves have died since I planted it, but now that the flowers are nearly done, it is putting on new leaf growth. This plant and one of *D. ferruginea* subsp. *tutanningensis* was grown by Kevin Collins and planted last year. The latter is doing well but has not flowered yet. With subsp. *pumila* it is the most widely grown and perhaps the hardiest of the *D. ferruginea* subsp.

While I was in Brisbane the long-awaited flowering of the Lesueur form of *D. fraseri* occurred- six beautiful inflorescences that all opened at the same time. I'm still waiting for the Minyulo form to flower. It is one of the most attractive ones.

My plant of *D. tridentata* did not put on any appreciable growth for many years, then suddenly shot up and produced four lovely green and gold flowerheads at ground level. In early September at the Wildflower Society's Spring Fling flower show, Don and Joy Williams brought me a similar specimen from their property, collected with a large part of its lignotuber. That probably explains why my plant seemed dormant for so long. It's been forming a lignotuber I suppose.

*D. falcata* has again produced two brilliant yellow inflorescences, though the plant is still less than a metre tall.

One of my favourites, *D borealis* subsp. *elatior* produced six lovely blooms before I went to Brisbane and another four after I came back. The outside of the long bracts is most attractive with red-brown hairs on the tips and a band of black hairs across the centre.

*D. drummondii* subsp. *hiemalis* looks marvellous. Just before it flowered, the leaves, which had been looking rather pale, turned their normal dark blue green- a beautiful contrast to the golden flowers with coppery-haired limbs.

I was delighted to discover what look like new plants near my *D. bipinnatifida* which is looking almost dead. They are the new shoots on the ends of the underground stems so there's still life in it. Another 'underground' plant *D. porrecta* flowered well though it hides the flowers under the mulch. It is about a metre in diameter now and still dense. *D. tenuifolia* var. *reptans*, on the other hand has spread out over the ground to three or four metres and flowered well. Some seedheads from previous years had an abundance of capsules but the seeds though black, appear not to have formed properly.

*D. arborea* continues to thrive and produce flowers all year round.

*D. nobilis* subsp. *fragrans* provided me with several vases of delightfully perfumed golden flowers. At the 'Spring Fling' I was inviting people to sniff the dryandras. I had a selection from my garden, in a vase. One woman sniffed all of them and announced that I had not only oranges, (to me the scent of the *D. nobilis* is like orange blossom) but lemons as well. It turns out that *D. praemorsa* var. *praemorsa* smells exactly like lemon. The scent does not waft through the air, unlike that of *D. nobilis* and, *D. praemorsa* var. *splendens*, though more spectacular is apparently scentless. There were some specimens of the latter which were pink, brought in by members of the Northern Suburbs branch, which were very much admired.

My direct seeding, then potting up, method of seed germination has been very successful this year. I have kept the seedlings in full sun up till now.

**Margaret Pieroni**  
**29.9.99**

### Mother (Nature) Knows Best

My garden, here in Attadale, a Perth suburb, could best be described as a 'bush garden' - almost by default! Since 1974 I have converted it from a garden with lots of lawn areas, including very small ones, and exotic plants such as roses and hibiscus, to a well-mulched area comprising the whole block, with almost 100% Western Australian plants and very little 'lawn'.

I began by planting trees and shrubs, gradually replacing the grass. Some I propagated from seed and cuttings with help and advice from the Wildflower Society members and publications. Many plants were purchased from nurseries and from the Society, especially during the years in the late seventies, when we grew thousands of plants at Wanneroo for the Society.

If plants in my garden seem to be not quite in the right place and no particular design is apparent, that is probably the case. Where plants have died, seedlings have appeared, often of species, the original plants of which, are long dead and gone. Several species have arrived courtesy of the birds. I have plenty of bird-attracting flowers all year round. The various honeyeaters seem to prefer calothamnus, eucalypts, grevilleas, banksias, and dryandras and a magnificent *Verticordia grandis*. Native bees and other insect pollinators also visit, so there is usually a good supply of seed on most, but not all, of the species I wish to propagate.

As I don't have as much time as I'd like to devote to the garden, I appreciate very much, nature's help in providing me with plants. It is rewarding to find, while weeding, seedlings of many useful and attractive species, some of which I was very sorry to lose at the time of their demise.

Plants which regularly produce seedlings are:- *Dryandra polycephala*, *D. serra*, *D. praemorsa*, *Petrophile biloba*, *Hakea neurophylla*, 3 *Conostylis* spp., *Grevillea crithmifolia* and *Verticordia staminosa*.

Some that come up like weeds are:- *Chorizema cordatum*, *C. ilicifolium*, *Thysanotis multiflorus*, *Diplopeltis huegelii* and *Ricinocarpus tuberculatus*.

The birds have brought me:- *Enchylaena tomentosa* and *Dianella revoluta*.

*Diplopeltis huegelii* and *Thysanotis multiflorus* seedlings appeared for the first time several years after the ones I planted had died and now they are multiplying year by year. It took the death of a large *Banksia prionotes* to allow space and light for the seedlings to germinate, it seems.

When the council gave us a footpath in our street (like it or not!) I decided that it was time to convert the remainder of the weed-ridden grassed verge to an extension of the garden, with ground-covering plants. After covering the area with layers of wet newspaper and mulch I planted several *Grevillea curviloba*, *Hemiandra pungens* and *Myroporum parviflorum*. Among the few weeds that emerged were several plants of *Enchylaena tomentosa* which I have left to provide ground cover while the others are growing.

The *Enchylaena* and *Dianella* originated in nearby bushland reserves. Other local plants I have growing are:- *Burchardia umbellata*, *Hypocalymma robustum*, *Hibbertia hypericifolia*, *Dryandra lindleyana* subsp. *lindleyana* var. *lindleyana*, *D. sessilis* var. *cygnorum* and *Conostylis candicans*. Point Walter in Bicton-Attadale was the site of the first (type) collections of the latter three species.

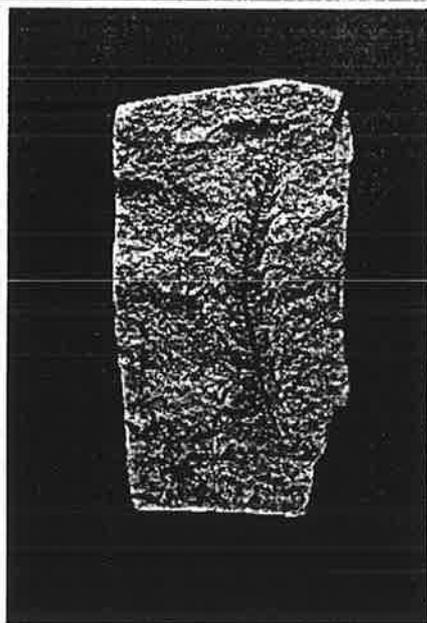
Naturally, the genus that predominates as far as number of plants, is *Dryandra*. I have 60 spp. growing with various degrees of success. There is always more than enough flowering material to keep me painting and drawing.

My wild garden no longer fits in with most of the housing in the suburb but I maintain that I was here first. More to the point, the bushland shrubs and trees were here even before that and they, sadly, are fast disappearing under concrete and paving.

Watering, mowing and time wasted on trying to maintain a lawn are now minimal and I am enjoying my wild garden, along with the birds, more than ever.

Margaret Pieroni  
January 1999

## Planter



Navn: *Dryandra acutiloba*

Lokalitet: Preschen, Bøhmen, Tsjekkia

Alder: Tertiær, Oligocen

Plassering i utstillingene: Plantemonteren

En plante som muligens er i slekt med den nålevende pors, *Myrica gale*, som er vanlig på våte myrer og ved bredden av tjern.

Vil du vite mer om denne fossilgruppen?  
[Faktaside om fossile planter]

Andre planter i utstillingen



## Paleontologisk museum

► Åpningssiden ► Monterliste ► Fossilgrupper ► Artsliste ► Spør en paleontolog

© Paleontologisk museum, Universitetet i Oslo, 1999.

Found this when I was browsing on the web. I don't know any more about *D. acutiloba* but it is intriguing to see it as a fossil in an Oslo Museum!

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## THE VARIETIES OF *DRYANDRA FRASERI*

For years I've been trying to comprehend the identifying features in *D. fraseri* especially var. *ashbyi*. I have found many different forms in many locations and have been under the misapprehension that the northern low-growing forms with blue-grey leaves with closely spaced lobes are var. *ashbyi*. However, it appears that they are all forms of var. *fraseri* including the unusual, consistent 'Lesueur' form.

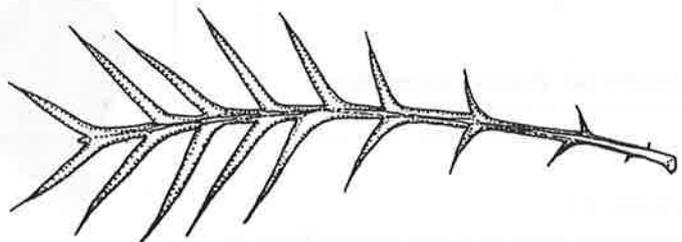
In newsletter no 13 (1987) Alex George wrote that "the use of *D. ashbyi* is not justified as both names, *D. fraseri* and *D. ashbyi* apply to a widespread and variable species. The herbarium specimens show a complete graduation from one to the other". In his revision the description of *D. fraseri* var. *ashbyi* refers to the perianth 'claw' as being glabrous or sparsely pubescent. The distribution is from Geraldton area north to Kalbarri and inland to Yuna. I recently asked Alex what was meant by the 'claw' of the perianth, as I thought it might be another term for the limb. When he told me it means the main shaft of the perianth, I determined to try and clear up the confusion. I have seen and photographed shrubs to about one metre high and wide north-east of Geraldton though I never collected seeds of this form, thinking it was typical var. *fraseri*.

Brian Moyle was about to go to this area so I asked him to collect some material for me. Now I'm almost sure I have var. *ashbyi* at last. The very tall columnar form from near the Kalbarri turn-off, Eurardy Station and further north towards the Zuytdorp Cliffs is apparently var. *ashbyi* as well. I haven't looked at this 'claw' of the perianth yet on this form.

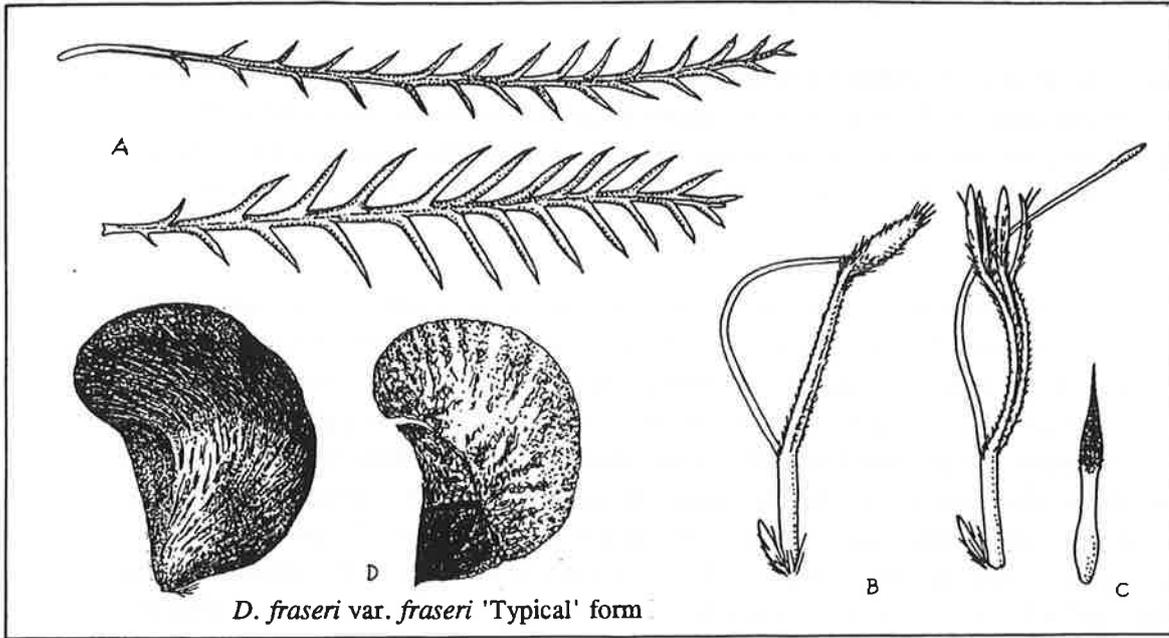
As may be seen from the drawings, the variation in all the rest is enormous- leaves, follicles and seeds and growth habit included. *D. fraseri* var. *oxycedra*, however, being non-lignotuberous is distinctive, at least. But- the northern 'Eurardy' form resembles it superficially.

The 'Lesueur' form appears quite different from the rest, having very large involucral bracts and leaves with very short, almost triangular lobes. Plants in the two populations we have looked at near Mt. Lesueur seem to be very consistent- more so than in populations of other *D. fraseri* forms. It is not sufficiently different to separate from var. *fraseri*, so we have a very diverse taxon in var. *fraseri*.

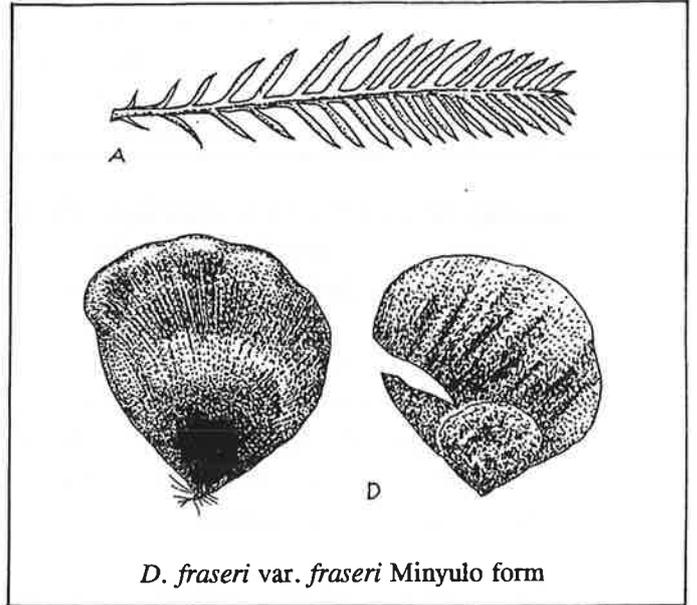
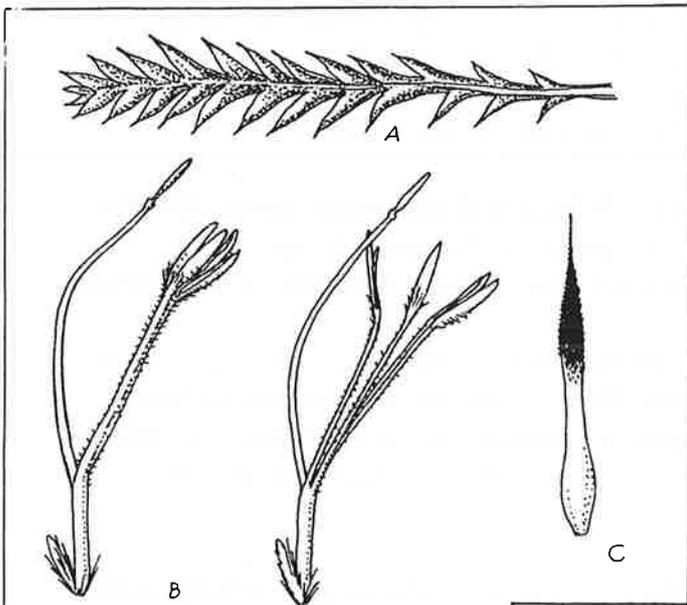
Flowers of var. *ashbyi*, including the 'Eurardy' form appear to be always pale yellow whereas many forms of var. *fraseri* may be suffused with pink most noticeably while still in bud. In var. *ashbyi* the lack of hairs on the perianth and its relative slimness, it would seem to me, is the reason why the perianth parts look silky and relax more than those of var. *fraseri* as can be seen in the drawing. The inflorescences with open flowers look like those of some isopogons or petrophiles with the styles standing stiffly above a tangle of dangling silky perianth parts. In the few specimens I've examined the capsules and seeds are smaller than most of the var. *fraseri* forms. The Eurardy form has larger capsules and the leaves are much bigger, similar to those of var. *oxycedra*.



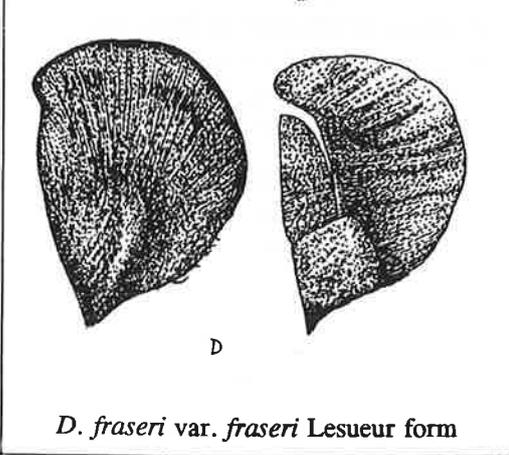
Var. *ashbyi* 'Eurardy'



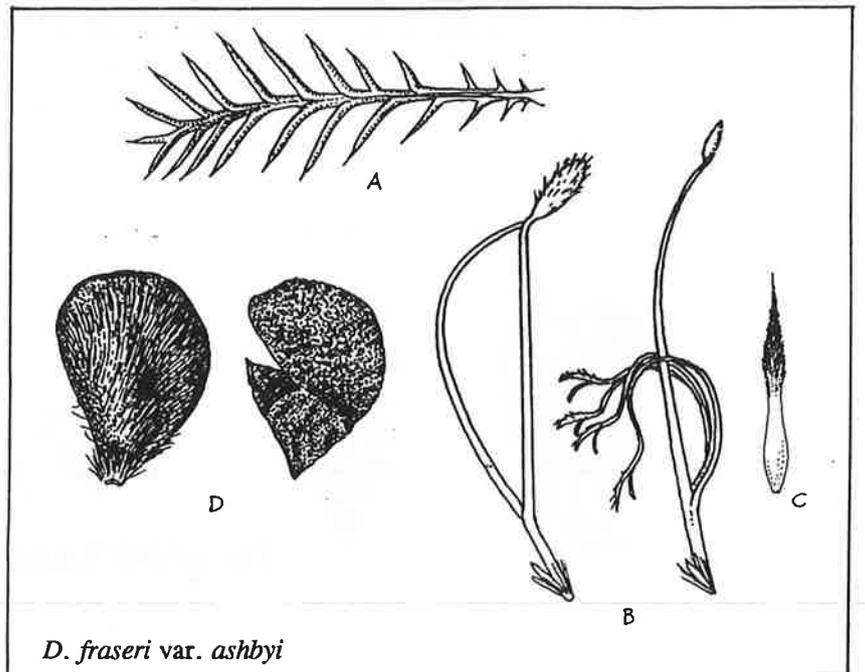
*D. fraseri* var. *fraseri* 'Typical' form



*D. fraseri* var. *fraseri* Minyulo form



*D. fraseri* var. *fraseri* Lesueur form



*D. fraseri* var. *ashbyi*

- A. Leaves x 1
- B. Flower in bud (L) and open (R) x 2
- C. Longest involucre bract x 2
- D. Seed follicle (L) and seed (R) x 2



*D. fraseri* var. *fraseri* 'Typical' form



*D. fraseri* var. *fraseri* Lesueur form



*D. fraseri* var. *fraseri* Minyulo form



*D. fraseri* var. *ashbyi*

## GROWING DRYANDRA PROTEOIDES

Who has succeeded in growing *Dryandra proteoides* from seed?

The answer, if my recently-formed conclusion is correct is no-one, or very few, unless.....(read on!)

At a recent function I was introduced to a man who was very anxious to question me about dryandras- specifically he wanted to know why *D. proteoides* seed did not germinate. For some time I have been hearing from people with the same problem. I thought it might have something to do with the freshness, or otherwise of the seed as, alone among dryandras, the capsules, whilst stored, open to shed the seed, during hot weather. I mentioned this and was assured that the seed, purchased from a commercial supplier, was fresh, as the date, May 1999 was on the seed envelope.

Later that evening I was talking to Study Group member, Kevin Collins of the Banksia Farm, Mt. Barker, who was eager to tell me some good news. He had great germination results from the latest batch of *D. proteoides* seeds that I'd sent him. It so happens that he'd asked me for some in June, just before I went out to photograph the plants in flower, in the wild. I collected a few capsules which he sowed within days.

It would seem, then, that they should be sown as soon as possible after collection, within weeks rather than months.

Keith Alcock obtained good results with *D. proteoides* in his germination trials (see newsletter no. 20). It is quite likely, he told me, that the seed had been recently collected. In any case, he made a practice of keeping the seed-heads with their enclosing bracts, intact, as a means of prolonging the viability of the seeds. This would seem to be an advantage with regards this species in particular. Insect control could be more problematic, however.

After flowering, the long bracts close over the spent flowers so that the seeds form within what looks like an un-opened inflorescence. The separator and the wing of the seeds are very thin and smooth resembling brown tissue paper which is an unusual feature of this species.

This year has not been a good one for the flowering of *D. proteoides*. It is only the second time that I've gone out especially to photograph the flowers. Several years ago arriving at Lupton Reserve, in July, it was immediately obvious that the dense bushes were in flower, because the ground was strewn with tattered flowerheads left by cockatoos. There were still many on the bushes, however. They are borne deep inside the bush on old wood.

Quite often, I have been shown a plant in a garden and told that it never flowers. The owner is always surprised when I point out the flowers, hidden usually at the base of the main stem.

*D. proteoides*, with its magnificent bracts, is much sought after as a cut flower. As they don't have a stem it is necessary to wire the flowerheads to an artificial stem. Sometimes the flowers are removed and only the opened, dried bracts are used in this way.

Unfortunately, I don't have any *D. proteoides* growing. Are there any members who do, and would be prepared to send fresh seed to other members who would be able to sow them immediately? I have always sent the most recently collected seed but it was probably already too late. *D. proteoides* seed is always in demand from members.

**Margaret Pieroni**  
**July 1999**

## OBSERVATIONS ON GROWING DRYANDRAS IN SOUTHERN VICTORIA

I found various members comments on dryandra growing interesting.

Your comments on the survival, or non-survival, of Dryandra seedlings and poor root development reinforces my own observations. I had a slight improvement on other years, regardless of whether they are autumn or spring germinated, by keep them well shaded when it was hot and sunny and dry (at this stage I am referring to seedlings in containers). When it is raining in the cooler part of the year, I find that the shade cloth breaks up the heavier rain and hail and get a more even soaking. When rain persisted during the cooler months I would shift the plants into my poly house until they were obviously very dry, then out they would come again. It is surprising how much dryness they can stand when it is not hot.

While on the subject of keeping the plants shaded and dry, I built an extra shade area for these plants in pots with permanent shade cloth on the southern side and roll up shade cloth on the eastern, western and top sides. Nothing on the north to protect them from the north wind. That might be something for the future. The shade cloth on the top can also be rolled back to make use of direct sunlight and warmth in the cooler months. This means I can protect, or expose the plants to the elements as seems appropriate.

Last year I mentioned the potting mix problem and change to a commercial mix. I feel that it is an improvement but has not completely solved the problem. I need clear, see-through pots to be able to see what is happening at the root level. I have found that two plants side by side, getting the same treatment and looking much the same above the potting mix, develop differently with one possibly dying. In an examination of the root systems I find that the survivor has a nicely developed root system and the potting mix is usually fairly dry. The other has a very poor root system and the potting mix is usually very damp. Which brings me to thinking, Is it damp because the poor root system has not been taking up water, or, has it been the dampness that has inhibited the root development?

Trying to hold young Dryandra plants in pots over summer nearly always ends up in disaster. If the pot is too small the mix invariably dries out and the plant dies, if the pot is too large the mix tends to remain wet for too long and root rot develops. Sounds like Goldilocks and the porridge (too ...). Many of the plants that do survive do not seem to like dramatic changes in weather once they have been planted out, so it still becomes a problem to get them through their first year. I'm going to try planting some of the small plants before summer and see if, with a bit of protection, they can establish themselves better than in the past.

You mentioned the variation in soil condition at Cranbourne. I can confirm that with our own sandy soil here, I can dig a dead plant out of a 'bone dry' spot and test the soil 30-40 cm away to find it is quite damp and supporting near by plants quite well. All this makes me wish for some additive that would really stimulate strong root growth as it always seems to me that those plants that have not developed a strong root system by the time they are planted out are the ones that do not survive the first year or collapse without warning at a later date.

Growth performance of my Dryandras during 1998, as usual presented some pluses and minuses.

Two of the *D. polycephala* remain and both flowered well last year as well as producing seed. The *D. formosa* nearby are also doing well together with a number of survivors from my 1998 planting. Some of those have got to 0.5 meters in 9 months and are looking great. The *D. praemorsa* survive without any attention but are starting to look a bit scraggly as there is virtually no foliage for the first meter or more. The seedling *D. praemorsa* I mentioned at the base of one of my *Callitris columellaris* is still doing extremely well.

I have just lost the second *D. formosa* of the ones that we use for cut flowers. The hot, dry weather had passed before any sign of stress showed up. Both still have very strong root systems so all I can say is that they must have lost out in the competition for nutrients with neighbouring plants, including some 19 year old *Banksia integrifolia* and *B. serrata*. I also lost one of these well established *D. formosa* to a period of exceptionally strong east winds. The prevailing south-westerlies cause the plants virtually no problems, but the occasional easterly can catch the plants unaware.

Probably my biggest surprise was the *D. hewardiana* which had attained 30 cm in less than 12 months and looking so healthy, suddenly gave up. It was well protected by some *B. ericifolia* which may finally have deprived the plant of moisture before the weather broke in late March.

*D. brownii* and *D. fraseri* are getting crowded out but surviving. I even think the *D. fraseri* has actually fought back and is looking much better. Of my more recent new plantings, *D. pteridifolia*, *D. speciosa*, and *D. ferruginea* succumbed to the hot/dry weather but *D. quercifolia* is surviving and looking good. One planted, and some self sown seedlings of *D. formosa* look like surviving. Their small size, about 2 cm, could have been to their advantage during the harsher weather. A number of other *D. formosa*, *D. nivea*, *D. obtusa*, and *D. pteridifolia* have been planted during this autumn and should feature in my next report.

## DRYANDRA GROWTH INFORMATION

Hartley Tobin

31:01:1999

No.	Name	Size H-x-W	Age	Mulch	Moist	Drain	Sun	Flw	Seed
8621	D.BROWNII	0.3 x 1.0	14	YES	SWAS	GOOD	50%	YES	NO
8600	D.FRASERI	0.5 x 0.8	13	YES	SWAS	GOOD	60%	YES	YES
9700	D.FERRUGINEA	xxxxxx							
9801	D.FORMOSA	0.1 x 0.1	0	YES	SWAS	GOOD	80%	NO	NO
9900	D.FORMOSA	0.0 x 0.0	0	YES	SWAS	GOOD	80%	NO	NO
9800	D.HEWARDIANA	0.3 x 0.3	0	YES	SWAS	GOOD	80%	NO	NO
9702	D.QUERCIFOLIA	0.3 x 0.3	1	YES	SWAS	GOOD	80%	NO	NO
9703	D.PTERIDIFOLIA	xxxxxx	<i>These plants were looking good, but gave up before the</i>						
9701	D.SPECIOSA	xxxxxx	<i>hot/dry weather arrived.</i>						

SWAS = natural moisture summer, autumn, winter & spring -

(+) if there has been added summer moisture.

The following Dryandras, for one reason or another, have been planted well away from the house and not in garden beds, receive no extra moisture or mulch.

Qty	Name	Size H-x-W	Age	Drain	Sun	Flw	Seed
#x	D.FORMOSA - 84	Max.	3.5 x 3.0	14	GOOD	80%	YES
		Min.	1.5 x 1.0	14	GOOD	80%	YES
#x	D.FORMOSA - 94	Max.	2.0 x 1.5	4	GOOD	80%	YES
		Min.	0.7 x 0.5	4	GOOD	80%	YES
#x	D.FORMOSA - 98	Max.	0.5 x 0.3	0	GOOD	80%	NO
		Min.	0.1 x 0.1	0	GOOD	80%	NO
2x	D.POLYCEPHALLA		0.7 x 0.3	4	GOOD	80%	YES
			0.5 x 0.5	4	GOOD	80%	YES
2x	D.PRAEMORSA		2.7 x 2.0	14	GOOD	70%	YES
			2.7 x 2.0	14	GOOD	70%	YES
1x	D.PRAEMORSA		0.6 x 0.3	1	GOOD	80%	NO

## Notes and News from Members

From Ron Pearson, Mentone, Vic.

Because of several other commitments (including learning about computers from scratch and operating a Friend's Nursery for a large Melbourne suburban park), I have not been very active with growing dryandras in recent years. Also, a number of species I was growing died suddenly but two propagated from club seed continue to grow well in my garden. After 7 years much to my delight one flowered and I include some information on it. According to my records, it is *D. sp. nova* aff. *pteridifolia* (3), a prostrate ground covering plant, Keith Alcock's form 5, seed collection number 341. It is a lovely ground covering specimen, about 30 cm high and across with flowers at ground level. The inside of the flower head is quite bright while the anthers are a dull yellow. It has about 60 individual flowers and the bracts are glabrous inside and brown fur on the outside. The flower heads are about 50 mm in diameter.

The newsletter continues to be full of interesting information and Margaret is certainly putting a lot of time into dryandras. The colour pictures are particularly useful and add to the value of the newsletter.

(Margaret identified this species as *D. porrecta*, one of the new species that has been little grown previously. It is very useful to have reports of success (and failures) – thanks Ron. Ed.)

From Kevin and Kathy Collins, Banksia Farm, Mt. Barker, W.A.

The coloured page in Newsletter 37 is great. Perhaps we could increase the annual subscription to, say, \$10.00 per annum and include more colour photos. For example, it could provide an opportunity for members to have the best of their garden-grown plants, photos or slides, scanned and included in future newsletters for others to enjoy.

Keep up the good work. The history of the group in the last newsletter was very interesting.

(What do members think of an increase in price for the newsletter if more coloured pictures could be included? This of course would be providing that David Lightfoot was able to continue to do the printing. Please let Margaret or myself have comments.)

From Neil Marriott, Stawell, Victoria.

It was great to see the colour photos in the last newsletter – excellent!

Ray Purches' article on dryandras from cuttings was welcome – I have been propagating dryandras from cuttings for years. However, I find cutting grown plants a lot slower to become established to dry, hot summers compared with seedling grown plants. This can be a problem – watering in summer can often result in killing the plant you are trying to help! However, when well mulched and particularly when grown in garden beds and not out in open ground, they can do extremely well.

From Rod Sutherland, Natimuk, Vic.

The newsletters continue to be a mine of information. I enjoyed the recent article by Ray and Rose Purches and I hope to see them at a weekend SGAP meeting in Wangaratta.

My block is in western Victoria on poor, sandy ground (acid). Several dryandra species do well – *D. praemorsa*, *D. formosa*, *D. nivea*, *D. speciosa*, *D. plumosa*, *D. polycephala*, *D. sessilis*. The last batch of plants I put out did not fare well and only a few have survived (two droughts and a lot of heavy frosts). Dryandras are frustrating plants but it is well worth while persisting with them.

From Max Ewer, Avenue Range, S.A.

Congratulations on such a great newsletter – the colour page was fantastic.

I am at present extending my garden or arboretum as I call it and have just finished planting 500 trees and shrubs, mainly hakeas of course, but a mixture of natives I have raised from seed over the last 12 months. I have added another 13 dryandras to the list you made when you visited us in 1997. These are *baxteri*, *carlinoides*, *comosa*, *falcata*, *ferruginea* subsp. *ferruginea*, *horrida*, *ionthocarpa*, *kippistiana* var. *kippistiana*, *plumosa* subsp. *plumosa*, *quercifolia*, *sclerophylla*, *stuposa*, *subulata*. (That is a great effort, Max, here's hoping that they all continue to thrive – Ed.).

### ***Dryandra* in *Flora of Australia* Volume 17B**

Volume 17B of the *Flora* has been eagerly awaited by Proteaceae enthusiasts for some time as it includes three of the major genera of the family – *Hakea*, *Banksia* and *Dryandra* – as well as two small rainforest genera from Northern Queensland, *Musgravea* and *Austromuelleria*. In fact, I believe that sales of the paper back version (even at a RRP of \$69.95) have been going so well that it is now difficult to buy one. Alex George did the revision of both *Banksia* and *Dryandra* while Bill and Robyn Barker and Laurie Haegi from the State Herbarium of South Australia, prepared the *Hakea* descriptions. The volume is very important because for *Hakea* and *Dryandra*, this is the first revision in over 130 years (since George Bentham) and the number of species has increased enormously (149 species of *Hakea* and 93 of *Dryandra*). If we include all the subspecies and varieties of *Dryandra*, there are an additional 34 “infraspecific taxa”. The botanical descriptions are concise and include information on habitat, distribution, synonymy and illustrations. A detailed key is provided for each genus. The work is intended as a standard reference work on the Australian flora and is in no way a “popular” treatment but it is nevertheless very useful for “knowledgeable amateurs and students requiring botanical information”. The value for the non-professional user I think lies in the many black and white line drawings that supplement the scientific text and the 16 pages of quality colour plates illustrating 32 species of *Hakea*, 14 *Banksia*, 16 *Dryandra* and one each of *Musgravea* and *Austromuelleria*. Many of the colour pictures have not been published previously. Eleven professional botanical artists (including Margaret) prepared the 58 plates of line drawings that provide excellent visual identification aids. I have listed below the species illustrated with colour plates and also the species included as a flowering branch in line drawings. Most of the plates of line drawings also include sketches of leaves, seed capsules, seeds and individual flower parts and flowers. If you have access to a copy of the volume (a University or State Library is your most likely bet), you can check these out.

#### **Species illustrated by colour plates:-**

*columnaris*, *comosa*, *epimicta*, *formosa*, *fraseri* var. *fraseri*, *glauca*, *idiogenes*, *nivea* subsp. *nivea*, *porrecta*, *quercifolia*, *sessilis* var. *cygnorum*, *speciosa* subsp. *macrocarpa*, *tenuifolia* var. *tenuifolia*, *tortifolia*, *tridentata*, *xylothemelia*.

#### **Species shown as flowering branches or inflorescences (black and white line drawings):-**

*acanthopoda, anatona, borealis* subsp. *elatior, calophylla, carlinoides, conferta* var. *conferta, cynaroides, erythrocephala* var. *erythrocephala, ferruginea* subsp. *flavescens, glauca, hewardiana, hirsuta, horrida, idiogenes, kippistiana* var. *kippistiana, lepidhoriza, mimica, nana, nervosa, nivea* subsp. *nivea, pallida, serra, serratuloides* subsp. *serratuloides, shuttleworthiana, squarrosa* subsp. *squarrosa, stuposa, subpinnatifida* var. *imberbis, viscida.*

Tony Cavanagh

**DRYANDRA STUDY GROUP**

**FINANCIAL STATEMENT 1.7 98-30.6.99**

Cash at bank at 1.7.98		\$1793.49
Income	Members subscriptions	227.00
	Donations	97.00
	Sales publications	50.00
	Bank interest	1.75
		<u>375.75</u>
	Total	<u>2169.24</u>
Expenditure	Newsletter expenses	400.00
	Printing O.P. no. 3	33.00
	Bank charges	3.53
	ANPC subs	60.00
	Stationery, postage, photocopying	<u>40.00</u>
		<u>536.53</u>
	Less petty cash in hand	<u>16.20</u>
		<u>520.33</u>
Cash at bank at 30.6 99		\$1648.91

Breeding System of *Dryandra quercifolia* and *D. formosa* (Proteaceae). Matthews and Sedgley. *Aust J Bot* 1998, 46, 439-452

This paper investigates the stigma receptivity and breeding system of *D. quercifolia* and *D. formosa*. These two species were chosen because of their prominence (amongst *Dryandras*) in the cut flower industry. In 1998 only 22 ha of *Dryandra* were under cultivation in the cut flower industry, which represents only 0.9% of the native plants under such cultivation. The authors comment that little scientific work has been done on *Dryandra* breeding systems compared with *Banksia*.

They determined stigma receptivity by a number of methods and used controlled hand pollination using both self and cross pollen. Their hope was to help determine optimum breeding strategies for both commercial and recreational cultivation and thus ultimately reduce bush flower picking and aid species conservation.

Basically the authors went to a commercial flower farm and performed two sets of experiments. The first was to determine the peak time of pollen receptivity. They took fresh pollen from the same donor and then applied it to florets of a known age on bagged inflorescences which had had their pollen removed (to avoid self-pollination). They applied the pollen at various times after the flowers had formed. The flowers were then left for seven days before being harvested and examined for evidence of fertilisation.

The second experiment used various pollen donors including self or other plants at the most receptive time (determined from the first experiment). They then examined whole inflorescences for evidence of fertilisation and later for the number of seed set, seed per fruit follicle and number of aborted seeds.

#### Results.

For both species peak receptivity occurred at days 2-6. For *D. quercifolia* receptivity started earlier, suggesting that self-pollination may be more common, and continued for longer.

In terms of breeding systems *D. quercifolia* seemed to be more receptive overall than *D. formosa*. Both species were receptive for both self and cross pollen, **but** both species had high levels of seed abortion following self-pollination. (*D formosa* was slightly more self-compatible than *D. quercifolia*.) This suggests some sort of self-incompatibility mechanism and may be part of the explanation as to why some individual plants in gardens never set seed.

Interestingly, in both species, the seed set was much greater in open (natural) pollinated inflorescences than in the hand pollinated bagged ones.

Seed production, Pollinator Attractants and Breeding Systems in Relation to Fire Response- Are there Reproductive Syndromes among Co-occurring Proteaceous shrubs? Lamont et al. *Aust J. Bot.* 1998, 46, 377-385.

The research outlined in this paper sought to determine whether the ability of a species to resprout after fire affected its seed production numbers and storage. The authors worked on the hypothesis that if a plant were killed by fire, especially if it had poor seed storage capabilities, it would have a high seed production each year in order to rapidly recolonise after the fire. Its characteristics could include

abundant pollinator rewards, self-compatibility, many flowers, and a high fruit to flower ratio. Those able to resprout after a fire would have less need to produce large numbers of seed to ensure survival of their genes.

They compared *Dryandras sessilis* (killed) and *lindleyana* (resprouts) as well as *Hakeas erinacea* (killed) and *cristata* (resprouts). All four species occur together in John Forrest National Park on the Darling Scarp.

They looked at pollen counts, flowers per inflorescence, and inflorescence per plant (corrected for size), identity of flower visitors, and a bagging experiment to look at self-compatibility. The following year they looked at fruit numbers, open vs closed fruit and calculated fruit to flower ratios.

They found that the two dryandras were mainly pollinated by vertebrates both bird and mammal and that the hakeas were mainly pollinated by insects. *D. sessilis* had peak nectar production at dawn whereas *D. lindleyana* had peak production at dusk, in line with bird vs nocturnal mammal pollinators.

All values for the flower production attributes were higher in *D. sessilis* compared with *D. lindleyana* (as expected) but the reverse was true with the hakeas. With regard to the breeding system, *H. erinacea* was the only species to show self-compatibility with both the dryandras aborting all self-fertilised fruit. With regard to fruit production the results were as expected with much higher levels and ratios in the two species killed by fire.

Thus the authors showed that the dryandras in general followed the author's initial hypothesis although the hakeas did not do so. In the paper's discussion a number of complicated arguments were put forward as to why this may have been so.

The results section of this paper is quite detailed and does give an insight into the floristic and reproductive strategies of this pair of dryandras (as well as the hakeas). Those of you who would like the further details should seek out the paper.

**David Lightfoot**