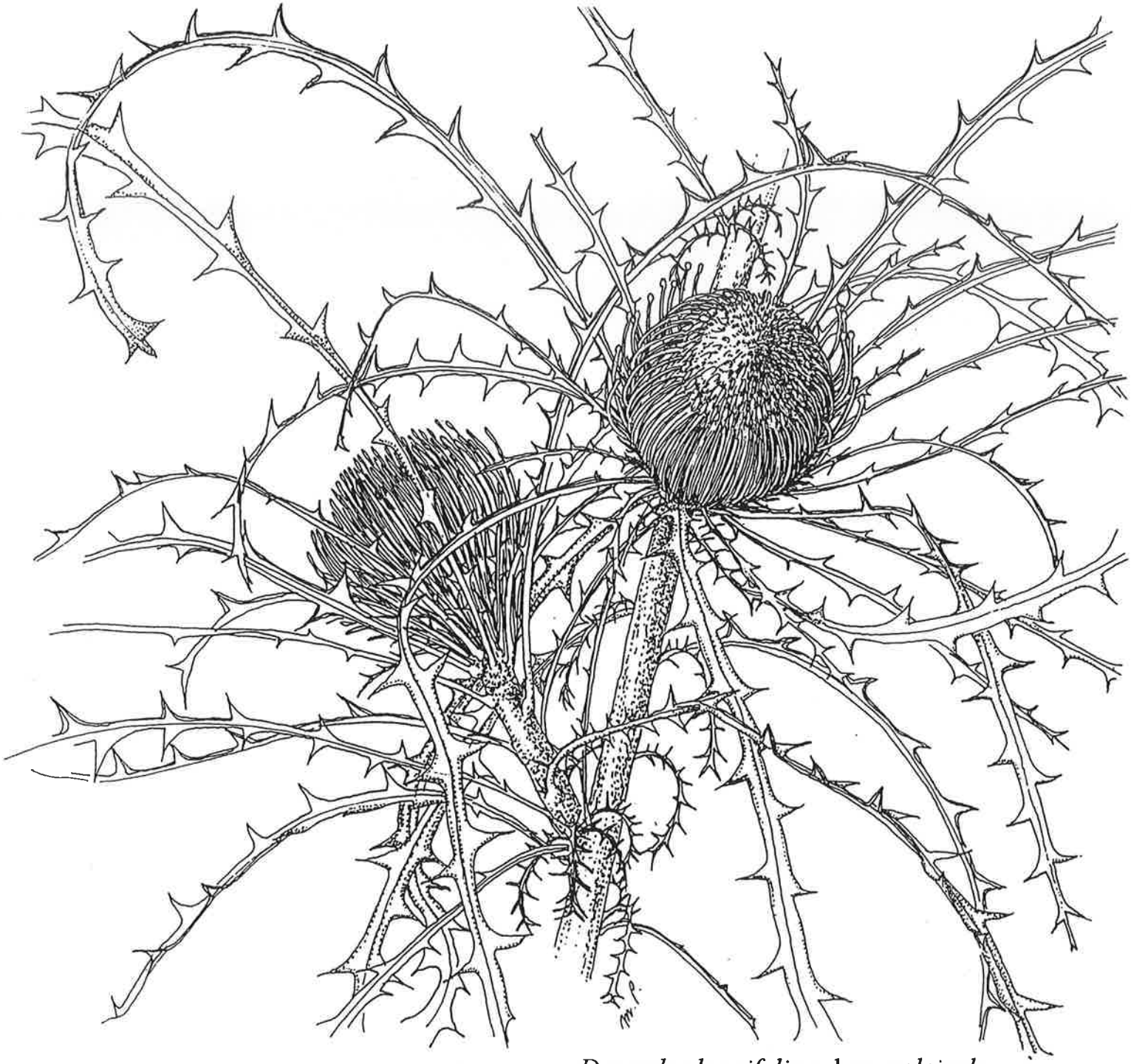
DRYANDRA STUDY GROUP
NEWSLETTER NO. 40



Dryandra longifolia subsp. *calcicola*

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ASSOCIATION OF SOCIETIES FOR GROWING AUSTRALIAN PLANTS

DRYANDRA STUDY GROUP

LEADER
Mrs. Margaret Pieroni
16 Calpin Crescent
ATTADALE
WA 6156

NEWSLETTER EDITOR
Mr. Tony Cavanagh
16 Woodlands Drive
OCEAN GROVE
VIC. 3226

Welcome to the first Newsletter of 2001, a special issue on the very interesting group of three subspecies, *D. longifolia.* Margaret first proposed an issue largely devoted to *D. longifolia* some time ago because there was very little information of this species, especially the new subspecies *calcicola* and *archeos,* which Alex George described in his revision of dryandra published in *Nuytsia* in 1996. Despite a long history in cultivation dating back to Kew Botanic Gardens in 1805, *D. longifolia* is relatively uncommon in cultivation although it has proven to be hardy and reliable in Perth, Ocean Grove, in the Victorian Grampians and at Cranbourne. If others have flowering plants, Margaret and I would be very interested to hear details from you. My experience at Ocean Grove is that they can withstand very dry conditions, part shade and will still flower profusely. They are one of the earliest species to flower for me. Margaret tells me that in the wild, *D. longifolia* subsp *longifolia* grows in dense scrub and the plants are almost impossible to photograph.

We begin with Margaret's very interesting account of a trip in May and June to Cape Arid to see all the subspecies, with an intriguing diversion to the old Hill Springs property now almost fully reclaimed by the dense scrub. She found them all, in some cases close to the track near the car park, after they had spent considerable time scrambling through dense bush to find them higher up the hill. Margaret's articles lists some of the main differentiating features of the three subspecies and includes a map of localities and very useful drawings of leaves, seeds and follicles and the peculiar habit of subsp. *calcicola* of forming prickly branchlets around the fruiting heads. I have included the description of *D. longifolia* which Margaret and I have prepared for the Dryandra book. This will of course be illustrated with several colour pictures, a small location map, and drawings of a typical leaf and of the seeds and follicles. The scientific description presented is based on the work of Alex George and also follows Alex's account of Dryandra in volume 17B of the *Flora of Australia.* We would like to thank Alex for so generously making available his descriptions available to us and for allowing us to use them. The colour page was organised by Margaret and shows most of the characteristics of the three subspecies. I also have a couple of other historical pictures which we may use in the next issue. I have included an article on what we know of the history of *D. longifolia* in cultivation which I hope is of interest.

Thanks to a number of members who have written in to relate their experiences with growing dryandra or to contribute short articles. These all add to interest in the Newsletter and I would encourage you all to think about a contribution. I have held over several items till next Newsletter but rest assured, I try to use all information I receive. Margaret has again given us details of those wonderful trips she regularly makes to see dryandras in their natural habitat. As I have indicated previously, I find these particularly useful in preparing the descriptions for the book and I am sure that any of us travelling to WA find them a mine of information. Lastly, I have included the financial statement for the group for 1/7/00 to 30/6/2000 (thanks to Margaret) and also a list of members as of 31/12/2000.

I hope that 2001 is a great year for you and we have some stability with the weather. I have suffered considerable losses this year with an incredibly warm summer coupled with extremely dry December and January. Many correas have succumbed and while my established dryandras have generally survived so far (can't say the same for many of my autumn planted seedlings), a major casualty was my 22 year old *D. formosa.* This broke open earlier in the year and finally died, due almost certainly to the prolonged dry. As I will describe in the next newsletter, I have many dozens of replacements on the way.

Happy Dryandra growing

Tony

Tony Cavanagh

Cape Arid and *Dryandra longifolia*, 30th May-3rd June 2000

Ever since having to cancel our second trip to Cape Arid National Park last year, I was eagerly looking forward to returning there with Brian Moyle, this year. Our main objective was to find all three subspecies of *Dryandra longifolia* in flower, so as to compare them and to best define their distinguishing features. On our last visit, in 1996, subsp. *archeos* on Mount Ragged was flowering for the first time since fire swept through a large part of the National Park. I particularly wanted to see the fruiting heads with their unusual covering of prickly branchlets.

Having made good time on the first day of our trip and the weather being fine, we decided to make subsp. *calcicola* at Twilight Cove, west of Esperance our first *D. longifolia* stop. We were in for a shock, however. The road was closed for several kilometres each side of the dryandra population for roadworks. This is a scenic route which winds its way along the coast and past the Pink Lake. This Great Ocean Road is a worthy match for the one in Victoria. It does not connect Esperance with anywhere else and the destruction of the natural beauty being wreaked to make what appears to be a road wide enough for a free-way is appalling. I fear many of the dryandra plants which, as I reported earlier, were in such good condition in a population of mixed-aged plants will be destroyed, despite a conservation rating of Priority 1. I had hoped to take more photographs as many plants were in bud when Shirley Loney and I saw them six weeks previously, but it was not to be.

The following day, we left our base at Duke of Orleans Bay and headed east to Cape Arid National Park. Just as we had been told, there was water lying everywhere, especially along the edges of the road. The soil must be extremely poor-draining as there hadn't been any rain for some time. Further west, where the record rains of late last year and earlier this year had washed away several bridges on the highway there was little water to be seen, but here tracks were all but impassable. We had been advised that the track to Mt. Ragged was negotiable though covered with water in places. When confronted by a 'Road Closed' sign, however, we decided to back-track and take the long way round. This entailed driving more than 200 kilometres further, some of the way on rough tracks, first to the east and north of our objective, then approaching it from the north. North of Mt. Ragged, the sandplain and heathland vegetation gives way to woodlands where saltbush and bluebush dominate in the understorey.

Mount Ragged is a steep-sided pre-Cambrian ridge with a wave-cut platform on the southern side, similar to the Barrens in the Fitzgerald River National Park but much further, about 50 kilometres, from the coast. On this occasion we didn't have to climb as far as the quartzite ridge to find plants of subsp. *archeos* in flower. *D. armata* var. *ignicida* also grows on the slopes and on the flat heathland around Mount Ragged. Some of its flowers are a lovely deep pink. Also flowering at the base was *D. cuneata.* Close to the base and on the exposed slopes, the vegetation is low-growing.We also observed some beautiful hakeas, *H.laurina* and *H. pycnoneura* in full flower. These were at their best at the car-park below Tower Peak.While photographing these, we discovered two plants of *D. longifolia* subsp. *archeos* there as well.

Mount Arid was our objective the next day. Once again we found our track under water. Fortunately, this time the detour was not a long one and we soon found ourselves on a recently constructed gravel road, not on our map, but heading in the right direction. We could see the granite domes of Mount Arid in the distance.

We turned off onto a sandy track where we stopped to look at the heathland vegetation, rich in Proteaceae species. As in 1996, we were amazed at the number of plants flowering - so much earlier than elsewhere, among them, *Isopogon formosus* and *Banksia pulchella*. The track led to the coast at Thomas Fishery, passing Mount Arid. Closer to the sea, the heathland is dominated by stunted dryandras:- *D. falcata,* (many dead from die-back) *D. armata* var. *ignicida, D. nivea* subsp. *nivea, D. cuneata* and *D. nervosa.* The latter had not previously been collected so far east. While wondering whether we would have to walk a fair distance to the base of Mount Arid, we saw a track signed 'Hill Springs' leading into a valley and followed it to a small car-park surrounded by extremely thick vegetation, mostly eucalypts (whipstick mallees) and melaleucas. We had to bend double to get through the track leading up-hill from the car-park. After seeing a plant of *D. longifolia* beside the track, albeit not in flower, we felt sure we'd find more higher up once we got through the dense vegetation The track led past the stone ruins of a house and an enormous macrozamia which resembles a palm tree. Further up, the thick trees and shrubs gave way to a rocky slope with similar plants to the coastal heath - but no subsp. *longifolia.*

Back at the car-park, we looked around on the slopes beyond the dense bushes and while trying to find an easier way to get through them, Brian stumbled on a subsp. *longifolia* in full flower. About 1.5 m. tall, it was flowering for only the second time. We discovered a few more plants, well hidden among the mallees and young melaleucas. They receive almost no sunlight being so shaded and yet flower well during the shortest days of the year. (This would be the ideal plant for that difficult,narrow, shady spot in the garden - perhaps down the side of the house.) Once again, we'd gone looking too far away, when the plants we sought were only two or three metres from the vehicle!

A full colour leaflet,published by C A L M revealed a fascinating story. 'Hill Springs' was the childhood home of Amy Crocker (née Baesjou). The leaflet is illustrated with four of her paintings and features her story of Hill Springs. One painting shows the home, from the sea with Mount Arid behind it and another, the view to the sea with the house and farm in the foreground. They show a considerable area cleared except for several tall, bulbous-trunked macrozamias. The family grew their own fruit and vegetables and kept cows, hens, ducks and pigs. Mrs Crocker used to climb the hills and gather wildflowers in the foothills. She attributes the development of her talent as an artist to 'living in such a wonderful place'. She moved to Balladonia in 1910. Some of you might have called at the homestead there, as I did in 1985, to view her wonderful paintings. Her studies of insects are particularly impressive. She died in 1989, leaving a marvellous legacy of artworks and historical reminiscences. Brian and I were impressed by the fact that the natural vegetation has returned so that, except for a few stone walls (the house was destroyed in a bushfire in the mid-1920's) there are no signs of previous habitation. We saw no weeds and even the ruins and the car-park are hidden from view among the dense valley vegetation.

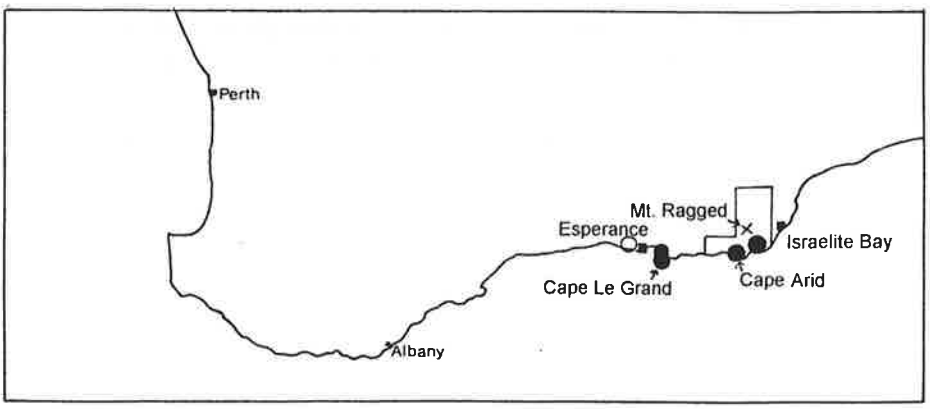
Later, we went as far as we could along the track going east to Israelite Bay (Fisheries Road extension) but the track was in such an atrocious condition that we turned back after another 'botany stop'. We found *D. cuneata, D. tenuifolia* var. *tenuifolia, D. nivea* subsp. *nivea* and *D. obtusa*,- the last two already beginning to flower. Elsewhere, *D. obtusa* doesn't flower until October.

The following day we returned to Esperance, hoping to find our third dryandra, subsp. *calcicola* at Dempster Head. With more time, we found six or seven shrubs, further along the limestone seam in the granite rock than where Shirley and I had looked, six weeks earlier.They were in full flower. The bushy, free-flowering habit of this subspecies makes it a very good garden subject. I had it growing well, flowering and setting seed, in my garden, several years ago. It reaches about a metre tall and spreads to more than a metre wide. The bushiness is no doubt due to the branchlets which surround the seed-heads forming lateral branches. Subsp. *longifolia* produces very few of these and forms tall, straight shrubs, while subsp. *archeos* falls in between. The stickiness of the bracts and follicles also varies - those of subsp. *longifolia* being very sticky, subsp. *archeos* less so and subsp. *calcicola* not sticky. The shape and size of the follicles and seeds are also quite different as the drawings show.

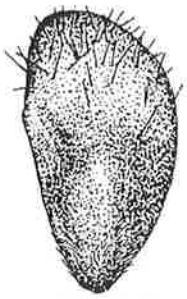
Footnote: Elizabeth George has a magnificent *D. longifolia* subsp. *longifolia* in her garden in a northern Perth surburb. Over 3m. tall, it is flowering well, about a month later than in the wild. It is doing extremely well, too, in Tony's garden and in the Dryandra collection at Cranbourne, in Victoria.

Margaret Pieroni 21/7/00

subsp.	Perianth	Leaf length (inc. petiole)	Stickiness (bracts & follicles)	Branchlets
longifolia	37 - 40 mm.	35 cm.	Very sticky	Very few
archeos	27 - 29 mm.	30 cm.	Slightly sticky	Occasional
calcicola	23 - 27 mm.	20 cm.	Non-sticky	Numerous

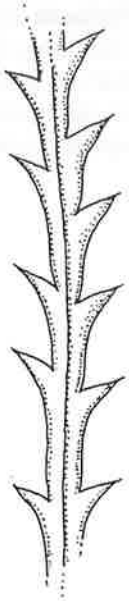


● subsp. *longifolia*
○ subsp. *calcicola*
× subsp. *archeos*



Follicle X 2.

Seed X 2.



x 1

subsp. *longifolia*

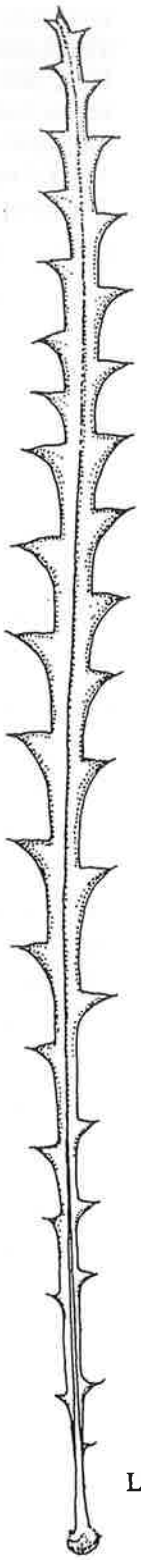
Leaf X .5

Leaf x .5

subsp.*archeos*

Follicle X 2

Seed x 2

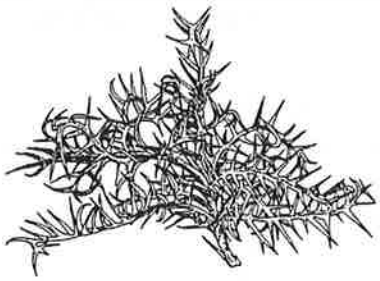


Leaf X 1

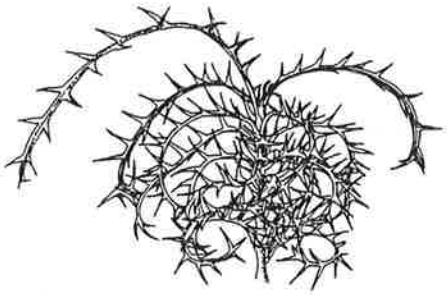
Dryandra longifolia

subsp. *calcicola*

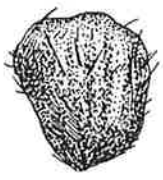
Simple leaf



Branchlet



A branchlet becoming a true branch



Follicle X 2

Seed x 2

Dryandra longifolia R.Br.

DERIVATION From the Latin *longus* (long) and *folium* (leaf), a reference to its generally long leaves.

TYPE COLLECTION Collected by Robert Brown at Lucky Bay (east of Esperance) in January 1802. First described by Robert Brown in *Trans. Linn. Soc. London* 10: 215 (1810). Holotype British Museum.

DESCRIPTION **Shrub** to 3 m, without lignotuber. Stems appressed-tomentose or -pubescent. **Leaves** linear, pungently acute, pinnatifid or serrate; lamina 11–30 cm long, 12–18 mm wide; teeth 6–21 each side, curved-triangular, almost at 90°, pungent; margins recurved to shortly revolute; petiole 5–30 mm long. **Inflorescence** terminal or on short lateral branchlets, closely subtended by leaves, to 7 cm across, yellow; involucral bracts lanceolate, acute or acuminate, straight or recurved, hirsute outside and sometimes ± viscid, glabrous inside, the innermost 14–30 mm long; flowers 150–250 per head. **Perianth** 23–40 mm long, yellow, curled-tomentose above base, then pubescent to hirsute; limb 2.5–5.5 mm long, hairy with coarse hairs mainly in lower half, commonly glabrescent. **Pistil** 28–48 mm long, incurved, glabrous except long hairs on ovary, yellow; pollen presenter cylindrical, narrowing slightly upwards, obscurely ribbed, 1.2–3.5 mm long. **Follicles** obovate, 8–12 mm long, sparsely hairy. **Seed** two per capsule, sometimes only 1, separator woody.

FORMS There are three subspecies:

^1 Perianth 37–40 mm long; limb 4.6–5.5 mm long; pistil 38–48 mm long; pollen presenter 2.8–3.5 mm long; involucral bracts 25–30 mm long (C. le Grand to C. Paisley, Mondrain Is.) subsp. **longifolia**

^1: Perianth 23–29 mm long; limb 2.5–4 mm long; pistil 28–35 mm long; pollen presenter 1.2–2 mm long; involucral bracts to 20 mm long

^2 Perianth limb 2.5–3 mm long; pollen presenter 1.2–1.6 mm long; involucral bracts straight (W of Esperance Bay) subsp. **calcicola**

^2: Perianth limb 3.5–4 mm long; pollen presenter 2 mm long; involucral bracts recurved (Mt Ragged) subsp. **archeos**

Dryandra longifolia R.Br. subsp. **longifolia**

DESCRIPTION Shrub to 3 m. Involucral bracts acute, straight or slightly recurved, hirsute and ± viscid outside, the innermost 25–30 mm long. Perianth 37–40 mm long; limb 4.6–5.5 mm long. Pistil 38–48 mm long; pollen presenter 2.8–3.5 mm long.

DISTRIBUTION Occurs from Cape le Grand to Cape Paisley and on Mondrain Is., W.A.

CONSERVATION STATUS Department of Conservation and Land Management Conservation Code: Priority Code Three.

HABITAT Grows near the coast in coarse sandy loam by granitic slopes, in scrub. Rainfall approximately 500-600 mm annually. Mean maximum temperature 21°C, mean minimum temperature 11.4°C, with up to 14 days in excess of 32°C.

FLOWERING PERIOD June to October.

RELATED OR CONFUSING SPECIES The three subspecies are similar in appearance but have a number of small floral differences to separate them. Subspecies *longifolia* is typically a tall bushy shrub to 3 m with large yellow flowerheads and large flowers (perianth 37-40 mm long). Leaves are up to 30 cm long, with rigid triangular lobes sometimes widely spaced. Subspecies *calcicola* tends to be a shorter, more spreading shrub with smaller flowerheads and flowers (perianth 23-27 mm long). Leaves are shorter, typically less than 20 cm. In subsp. *calcicola,* many small light green branchlets and single specialised leaves are produced outside the fruiting head, surrounding the involucral bracts in an intricate tangle of prickly foliage. This is also seen in subsp. *archeos* to a lesser extent and in subspecies *longifolia* infrequently. Dissection of one such fruiting head from subsp. *calcicola* revealed 8 branchlets and 6 single leaves surrounding the involucre. Only one or two of these branchlets grow on to become true brancjhes.

Subspecies *archeos* is confined to Mt. Ragged and is one of the easternmost dryandra growing in the wild. It is one of the earliest flowering, flowers appearing in April and May. It is characterised by more hairy and recurved involucral bracts (in subsp. *calcicola* they are straight) and the perianth has sparser and fewer fine appressed hairs.

DISTINGUISHING FEATURES The tall bushy appearance with stiff pinnatifid leaves and large flowerheads are all characteristic of this subspecies. It is also the only dryandra growing on the Recherche Islands.

CULTIVATION *Dryandra longifolia* was one of the earliest species grown in England, having been flowered in 1805 from seed collected by Robert Brown. It is generally uncommon in cultivation although plants have been very successful in Perth, in southern Victoria and at Cranbourne where they are large bushy shrubs with large numbers of flowers. The plant favours sandy soil but does well in well drained clay loams. It is reliable and tolerant of dry conditions and prefers a sunny position, plants under shade tending to become leggy with reduced flowering. Its frost tolerance is unknown. It grows well from seed, germinating in 30 to 40 days with high success. It can also be grown from cuttings but there is little information on the success of this method. It is a very attractive large shrub which would make a suitable hedge plant and is well worth trying in a larger garden.

Dryandra longifolia subsp. **calcicola** A.S.George (1996)

DERIVATION Named from the Latin *calx* (lime) with the indeclinable suffix *–cola,* a reference to the soil of the natural habitat. It is one of the few dryandras that will grow in alkaline soils.

TYPE COLLECTION Collected by Alex George west of Twilight Beach, west of Esperance, on 13 October, 1994. First described by Alex George in *Nuytsia* 10:343 (1996). Holotype PERTH.

DESCRIPTION Shrub to 1.5 m. Involucral bracts ± acute, straight, appressed-hirsute outside, not viscid, the innermost 14–20 mm long. Perianth 23–27 mm long, spreading-hirsute; limb 2.5–3 mm long. Pistil 28–35 mm long; pollen presenter 1.2–1.6 mm long.

DISTRIBUTION Occurs on the coast to the west of Esperance, W.A.

CONSERVATION STATUS Department of Conservation and Land Management Conservation Code: Priority One. The main populations are close to roads. One is on the outskirts of the Esperance townsite.

HABITAT Grows in sandy soil over limestone, in coastal heath. Climatic conditions are similar for all three subspecies.

FLOWERING PERIOD June to September.

DISTINGUISHING FEATURES Has a smaller perianth limb and pollen presenter, and usually also involucre, than the other subspecies.

CULTIVATION Has similar requirements to subsp. *longifolia* but will tolerate alkaline soils. It should do well in a coastal garden.

Dryandra longifolia subsp. **archeos** A.S.George (1996)

DERIVATION From the Greek *arche* (first) and *eos* (dawn). The subspecies grows on Mt. Ragged near Israelite Bay on the eastern limits of dryandra in the wild and is one of the first to receive sunlight each day.

TYPE COLLECTION Collected by Alex George on the south end of Mt. Ragged on 1 July 1976. First described by Alex George in *Nuytsia* 10: 342 (1996). Holotype PERTH.

DESCRIPTION Shrub to 2 m. Involucral bracts acuminate, recurved, appressed-hirsute, ± viscid, the innermost c. 20 mm long. Perianth 27–29 mm long; limb 3.5–4 mm long. Pistil 33–34 mm long; pollen presenter 2 mm long.

DISTRIBUTION Confined to Mt Ragged, W.A.

HABITAT Grows among quartzite boulders on slopes, in dense scrub. Climatic conditions are similar for all subspecies.

CONSERVATION STATUS Department of Conservation & Land Management Conservation Code: Priority Two. The population occurs within a National Park.

FLOWERING PERIOD April–June.

DISTINGUISHING FEATURES See comparison above.
CULTIVATION This species has been rarely cultivated but should require similar conditions to those for subsp. *longifolia.*

Scientific description based on the work of Alex George and follows Alex's account of *Dryandra* in *Flora of Australia,* vol. 17B.

D. longifolia subsp. *calcicola* ⇒
Branchlets surrounding fruiting head
In cultivation, Perth. M. Pieroni

D. longifolia subsp. *calcicola*
Esperance ⇓

D. longifolia subsp. *longifolia* ⇑
In cultivation, Perth. Photo E. George

D. longifolia subsp. *archeos*
Mt. Ragged ⇒

Dryandra longifolia R. Br. in history

Dryandra longifolia has a long history in cultivation. Specimens of the plant were first collected by Robert Brown at Lucky Bay (near present-day Esperance) in January 1802, during Matthew Flinder's voyage in the *Investigator*. Also present with Brown was the gardener Peter Good who was responsible for collecting seeds and live plants. This he did diligently with the result that many Australian plants were introduced to England (and to the Royal Gardens at Kew especially) in the period 1803-1805. Among the material were seeds of *D. longifolia*, introduced to Kew in 1805 but not flowered until 1813 when a flowering specimen was provided to the editors of the horticultural magazine *Curtis' Botanical Magazine*. This, along with a specimen of *D. sessilis* also from Kew, were the first two dryandras to be illustrated in colour although a very nice black and white drawing of *D. formosa* appeared in the *Transactions of the Linnean Society of London* in 1811. The article in *Curtis* describes the plant as a "very fine shrub, with much larger flowers than those of the species featured in the preceding plate ", i.e. *D. sessilis*.

D. longifolia was to be illustrated twice more in English gardening magazines, in 1827 in Robert Sweet's *Flora Australasica* and in 1837 in *Paxton's Magazine of Botany*. Both authors were glowing in their praise of the plant, Paxton referring to it as " a plant of much beauty; its erect growth, lobed and graceful pendant foliage, render it a valuable acquisition to the greenhouse. These characters, combined with its singular yellow flowers, studding at intervals, a stem six feet high, stamp it with an effect at once pleasing and attractive,---. In Manchester Botanic Garden, from whence we obtained the sample of our drawing, the plant flowered profusely in the greenhouse; it stood fully six feet high (in its pot), and being well clothed with verdure, a remarkably pleasing effect was produced by the contrasting colour of the flowers and foliage". Sweet noted that his specimen came from the Bristol Nursery of Mr. J. Miller where "we have observed that the different species of this genus and of banksia flower more freely in his Nursery than we have observed them in any other collection; some of them also perfect their seeds there". It is likely that seeds for the Bristol Nursery specimens came form the collector William Baxter who was active in W.A. in 1823-25 and 1829 and was especially interested in Proteaceae. The origin of the Manchester Botanic Gardens specimen is unknown but is probably also from a plant grown from Baxter's seed as Drummond, another active W.A. collector did not begin successful supplying seed until around 1837-1840.

There are two other records of *D. longifolia* being cultivated overseas last century, one in Belgium and the other in Vienna, Austria (later transferred to Florence, Italy). I have given more details in my earlier historical articles in Newsletters 17,18 and 19 but *D. longifolia* was one of 13 dryandras being grown in Belgium in 1833 (possibly at the University of Liege) and one of 11 that Baron Karl von Hugel was known to be growing in his garden in Vienna in the 1840s. When the property was sold around 1848, many of the glasshouses and plants were bought by the Russian nobleman Anatole Demidoff and were transported to his property of San Donato outside of Florence, Italy. *D. longifolia* was listed in the catalogue of the gardens published between 1854 and 1858 but was not in the auction catalogue of 1880. Nevertheless, as it is likely that Hugel himself collected the seed when he visited Australia in 1833-34, the 11 dryandras at San Donato could have been at least 25-30 years old. It is intriguing to know how they kept dryandras as pot plants for such long periods of time.

Cultivation Requirements of Dryandras as Discussed in 19th Century Horticultural Journals

The early English gardeners very soon learned that South African and Australian proteaceae were "touchy" garden subjects and required quite special conditions for successful cultivation. Because of the climate, all plants were grown in pots in glasshouses. The glasshouses were initially heated by stoves which gave a dry heat and allowed successful cultivation of some Australian banksias for more than 50 years, although if not properly maintained, such stoves could produce poisonous fumes and kill many of the plants. By the 1820s, some large nurseries were using steam heating which was cleaner and easier to control but as it generally produced a moist atmosphere, it proved unsatisfactory for the proteaceae. By the 1850s, there were few proteaceae to be found in any English Botanic Gardens or nurseries and this is reflected in the cultivation of dryandras. *D. nobilis* was flowered in 1852 at Kew and James Smith, Curator commented "(these) plants were at one time were in high favour with cultivators. Of later years, they have fallen in estimation,---". The only other dryandra that was to feature in *Curtis' Botanical Magazine* was "D. calophylla" (*D. drummondii)* in 1899. J.D. Hooker was to observe that of the nine species in cultivation at Kew in 1810, none now

existed. Furthermore, nine species had previously been figured in *Curtis* " --- the last, *D. nobilis*, so early as 1852, an evidence of the decline of interest once taken in the cultivation of Australian plants".

The earliest on the cultivation requirements of the Proteaceae that I have found is in Joseph Knight's book *On the cultivation of the plants belonging to the natural order of Proteeae*—" of 1809. Knight was a gardener for many years at the extensive gardens of Joseph Hibbert at Clapham, London. Hibbert was famous for his collections of South African Proteas but he also had an interest in Australian plants of this family. Knight bought the collection around 1809 when Hibbert's interests changed and set up a nursery. He was probably in as good a position an anyone to advise on cultivation of proteaceae and it is fascinating to read what he said. He stressed such practices as ensuring excellent drainage and cleanliness in preparing pots for seeds and seedlings and in allowing good air circulation for the growing plants. He stated "It is the business of an intelligent gardener to imitate nature as far as may be practicable, the soil and particular situation, in which each species grows wild." He described his soil mix "In which I have found at least two thirds of these plants succeed" (as a) "light soapy loam mixed with a greater or lesser proportion of sand." He advocated winter sowing (December to March) "so they will produce strong plants before the following winter" and also made the very important observation, now well established for Proteaceae, "I think the whole family have a great dislike to be sown in artificial heat". He further declared " I believe that the best time to transplant the seedlings is as soon as the cotyledons are fully grown and the future stem begins to elongate --- nor have I ever found them checked by this early removal". In these early years, growing from cuttings proved a problem – "It requires more skill to know, when and which part of a branch will soonest strike root, than almost any other part of their management, nor is it possible perhaps to lay down any other general rule, than that the branch should be well ripened". But his other advice was sound – remove leaves with a sharp knife, cut the base cleanly and do not bruise or tear the bark, press the cuttings firmly into the sand and do not cut or shorten the leaves on the section of cutting above the surface. He also noted that while cuttings of some species formed roots in two or three months others, especially the hard-wooded species, might require as long as two years.

Other advice came from Robert Sweet, Joseph Paxton and John Smith of Kew Botanic Gardens. All were essentially similar to Knight in using well drained mixes of equal parts of loam, turf and sand, with small, broken up potshards for further drainage "as the roots are very fond of running amongst them", water carefully in spring and summer, early in the morning or late in the evening, never during the heat of the day and water very sparingly in winter, grow them in a light, airy greenhouse with winter temperatures just above freezing, and repot annually, into a pot just larger than the one that have come from. Smith was a firm advocate of potting "high", with the plant sitting some two or three inches above the soil at the edge of the pots. While he concedes that such plants looked "unsightly", Smith maintained that this practice allowed drainage away from the plant stem and minimised the chance of what we night now call collar rot. He was also keen that gardeners regularly pruned the tall, upright-growing species such as *D. serra*, to produce more robust and long-lived plants.

While *D. longifolia* and other dryandras were successfully grown as pot plants in England and Europe last century, it is surprising that relatively few species are in cultivation today in Australia. I have found in recent years, with an older garden and more shade and tree-root competition, that I am having more difficulty with establishing young dryandra plants. Once established, and providing that drainage remains satisfactory, most are reliable and long-lived. I would be interested in others comments.

Tony Cavanagh.

NOTES FROM MEMBERS

(From Don and Jean Weybury, Greendale, Vic.)
The newsletter is simply great reading. Keep up the good work. We would gladly pay extra to have another colour plate included. I would like to let you know of the results of our sowing of dryandra. Of eight lots of seed planted one per pot in late March to mid April, we had the following results by 24 July:

D. fraseri var *fraseri,* 5 seeds all up, most with two pairs of leaves.
D. falcata, 5 seeds, 2 up with one pair of leaves.
D. arctotidis, ?6 seeds, 1 up, 1 up and lost , surviving plant has one pair of leaves.
D. anatona, 7 seeds, all up and doing well, 1 pair of leaves.
D. praemorsa, D. nervosa and *D.* aff. *brownii X nivea,* none up.
D. drummondii subsp. *hiemalis,* 5 seeds, 1 up, leaves just starting.

Joy Williams, (from Hi Valley out of Badgingarra), gave me some seeds of *D. speciosa.* Of 7 seeds, 3 came up and are doing well, around 75 cm high.

(From Barbara Buchanan, Myrrhee, Vic.)

Most of the 22 species of which Margaret sent seed in late 1999, were germinated by the paper-towel-on-the-window-sill method. Not all actually appeared again when transplanted into tubes and I have realised on reading someone else's description of the method (I think Paul Kennedy), that I probably potted them too soon as the radicle was still quite short. Anyway, at one stage I had over 50 healthy looking plants and I was wondering where I was going to find good homes for them. By late autumn, some started to die and I managed to get some 13 into the ground when the ground was wet enough from the end of April. Unfortunately, *D. quercifolia* and *D. carlinoides* (which looked pretty seedy in any case) died but the rest look healthy but have not made much growth over the winter. They have had to contend with a snowfall which did a lot of damage to established plants, including an old *D. praemorsa,* which lost its main trunk and looks pretty silly but as it is near a nice *Banksia grandis,* I don't want to risk damaging its roots by removing it. Our winters can be quite severe and I have lost more of my potted seedlings but I hope to finish planting the remainder in early spring.

(From Randy Linke, Edmonds, Washington state, USA).

(Randy has previously grown dryandras in the USA and is again hoping to cultivate them in the Edmonds area of Washington state which he tells us has a climate similar to that of southern England. Depending on their winters, he may need to grow the plants in pots and shelter them in a glasshouse over winter. Randy also collects botanical prints of Proteaceae and sent Margaret the following extract from the article on *D. longifolia* in *Paxton's Magazine of Botany* of 1837. I have referred to this in my historical article but have reproduced Randy's information because it does give a lot more detail on the cultivation requirements of dryandras as given in horticultural magazines of the period. Editor).

> " . . . is a plant of much beauty; its erect growth, lobed and gracefully pendent foliage, render it a valuable acquisition to the greenhouse. These characters, combined with its singular yellow flowers, studding at intervals, a stem six feet high stamp it with an effect at once pleasing and attractive, and which recommends it to a place in every collection.
>
> "In Manchester Botanic Garden . . . the plant flowered profusely in the greenhouse; it stood full six feet high, and being well clothed with verdure, a remarkably pleasing effect was produced by the contrasted colour of the flowers and foliage.
>
> "The soil should be a mixture of equal parts of turfy loam, peat, and sand, the more sandy the better. In shifting always do it with moderation, . . . As over-watering is directly injurious, it is indispensable, that the pots . . . be well drained.
> While the sap is in circulation, and the plants in consequence, making new wood and leaves, they will bear a good supply of water, but in autumn and winter it is requisite to give it with great caution. At all times they should enjoy an unencumbered and light situation, where plenty of air can reach them, for they do not thrive so well if overcrowded amongst other plants. . . . Cuttings do not take readily, still they may be brought to produce roots if portions of the ripened wood, taken off at a joint, are prepared in August or September , observing not to shorten any leaves, and potted in sand, but not plunged; as soon as they have made young roots pot them into soil, for the sand if they remain long in it will injure them; after they are potted off, and until fresh roots have been made in the soil, they should have the uniform atmosphere of a close cold frame, from which the must be exposed by degrees.

Up-date

During a recent, return trip to Esperance with Elizabeth George and Brian Moyle, principally to see the spectacle of the verticordias further north, we had a chance to re-visit Twilight Cove.

The environmental damage caused by the roadworks, earlier in the year is every bit as bad as I had feared. The road has been levelled by filling the valleys and de-capitating the hills of the former dunes and the resulting expanses of bare sand and limestone are being colonised by weeds.

As the topography has been altered, it was difficult to re-locate the population of *Dryandra longifolia* subsp. *calcicola*, no longer visible from the road, except on foot. I was relieved to discover that there are still many plants remaining, after all. We later found a few mature plants further west, near Observatory Point.

M. Pieroni 6/11/00

Growing Tip

Some dryandras with underground stems can become untidy in cultivation. I have been removing dead and diseased leaves from my plants of; *D. obtusa, D. porrecta* and *D. calophylla* as well as *Banksia petiolaris, B. repens* and *B. blechnifolia* with good results. The leaves, in the centre (the oldest part) of the plants come away easily, with a sharp tug. The result has been new leaf shoots and flowers taking their place and filling the bare spaces. The banksias, in particular are susceptible to a type of scale that starts with white, mildew-like spots and progresses to even more unsightly yellow, then dead, patches. Spraying with white oil is effective in controlling the scale and reducing the number of leaves that need to be removed.

M Pieroni 6/11/00

***Dryandra* - a haven for little birds**

A plant of *Dryandra longifolia* subsp. *longifolia,* planted in my garden in December 1989 is now almost 4 m. tall and about 3 m. wide, with 5 - 6 main upright, column-like branches that divide again to produce an attractive sculptural effect. Situated near an open paling, 2m. high fence, it provides excellent security from intruders. The shrub flowered well this year, producing copious amounts of nectar for the resident Brown, Singing and White-Cheeked Honeyeaters, but that is not the extent of its achievements. A few days ago, when I was photographing the beautiful new pink and green buds on my plant of *D. drummondii* subsp. *drummondii* growing nearby, I was delighted to discover that it also provides a safe haven for the White-Cheeked Honeyeater that I happened to notice, sitting on her nest. Several neighbourhood cats regularly prowl the garden, fences and roof, stalking the birds, but they could not penetrate the dense, prickly foliage of the dryandra to reach the nest (placed strategically in the middle of the shrub, above the fenceline). What a clever little bird!

Elizabeth George, Alexander Heights, W A
24/10/00

Travels in 2000

Hoping to find the 'little tufty' *Dryandra lindleyana* in flower, north west of Cranbrook, Shirley Loney and I returned to Mount Barker in late July.

On the way, we detoured east of Albany Highway on the Woodanilling Road and drove south on River Road, stopping to admire *D. nobilis, D. stuposa* and *D. acanthopoda* in flower. Several kilometres farther south, we found a new location– one plant, but a very large one, of *D. lepidorhiza.*

We were too early for 'little tufty' and *D. brownii* which were still in bud and too late for *D. porrecta.* However, at Kevin and Kathy Collins' Banksia Farm at Mount Barker we were delighted to see so many of their dryandra plants thriving and flowering well. Cockatoos and parrots are inflicting a lot of damage to both flowerheads and seedheads. It was gratifying to see *D. fuscobractea,* probably almost extinct in the wild, in flower...safe from road widening and die-back infection but under attack from cockatoos!

I had arranged to meet Sarah Barrett, the C A L M Endangered Flora officer in Albany, in the Stirling Range National Park the next day and Kevin went with us. Sarah had brought a local farmer, Wendy Bradshaw, who recently found the rare *D. mucronulata* subsp. *retrorsa* on her property, north of Cranbrook and then on another property, south-west of Broomehill, a few months later. This latter population is probably the one that several of us were looking for, 10 years or more ago. It had been collected by the late Ken Newbey. Wendy had another specimen, also collected there, to show me. It was a *D. subpinnatifida* var. *imberbis* X *D. squarrosa* as far as I could tell. She hadn't noticed either of the supposed parents there, however, so I wondered whether only the hybrid now exists in that location. I'm concerned that *D. subpinnatifida* var. *imberbis* may become extinct through hybridisation with *D. squarrosa,* as 'pure' plants are hard to find. Almost all plants in a wild population have leaves with some prickly lobes on the main leaf blade, indicating *D. squarrosa* 'contamination'. I have never seen a good population of var. *imberbis.* On our way home we called in to see the *D. subpinnatifida* var. *subpinnatifida* in Dryandra forest.Close by a group of plants is a large, dense, bushy shrub of *D. squarrosa*. It has dark green leaves with a short petiole, having small prickly lobes. Nearby were typical *D. squarrosa* with lighter green leaves with no petiole and thus no basal lobes which are typical of *D. subpinnatifida* and gives this species its name. A few metres away, some *D. subpinnatifida* plants had leaves with several lobes along the length of the leaf blade, inherited from *D. squarrosa.*

I digress...Back to the Stirlings. I had hoped to re-locate a plant, identified by Alex George as *D. conferta* var. *parva* that I had collected and photographed, south of Ongerup in 1987. Its flowers were a golden yellow and the inflorescence slightly different in shape from those I've seen since. We found var. *parva* at several locations on the way but the plant I was looking for no longer exists.We also looked for *D. pseudoplumosa* again. Both Ken Newbey and Charles Gardner had collected it, in the sixties–the first, south of Toompup and the second, at Chillinup. We failed to find it but Sarah will follow up Ken Newbey's one, as it could be on a private property in the area.

I'm pleased to report that we have quite a little network of Dryandra enthusiasts in that region, now :- Kevin and Kathy, Wendy and Sarah and Penny Moir at Chillinup, whom Sarah and I visited in April. Penny has since joined the Study Group. She is training a Landcare apprentice to re-vegetate parts of her property. So, although our search for dryandras was less than successful, it was a very satisfying and enjoyable trip for meeting enthusiasts and I hope, enthusing them even more.

Shirley and I drove back to Perth, taking back roads previously un-travelled (yes, there are still quite a few of them!) as we like to do. We found *D. porrecta* and *D. octotriginta* on two different gravelly ridges and, south of Dumbleyung, a really special *D. fraseri* var. *fraseri* with small but very numerous, dark pink flowers.

In July, Lloyd Carman, from Eden Hills, Adelaide wrote, enclosing a beautiful photograph of his plant of *D. porrecta.* The flowers, a lovely deep pink, are well displayed- above the ground. The plant is growing on a slope, without any mulch, which is recommended if you want to see the flowers. I had to dis-inter those on my plant in order to photograph them. In the wild, also, they are usually well hidden, under the ground. This has led to speculation as to the pollinators of *D. porrecta.* So, I was surprised to read Lloyd's remarks :- "The other day we were looking out of our front window when a movement caught our eyes. It was the grey- brown rump of the Wattle Bird as it moved from flower to flower under the leaves of *D. porrecta."*

August 26th-27th
Elizabeth George and I were again invited to be among the guides for the Victoria Plains Tourism Association's Wildflower Walks, centred on Calingiri. Accompanied by Shirley Loney, we set off a day earlier for Wongan Hills, by a circuitous route, to explore back roads and look for dryandras.

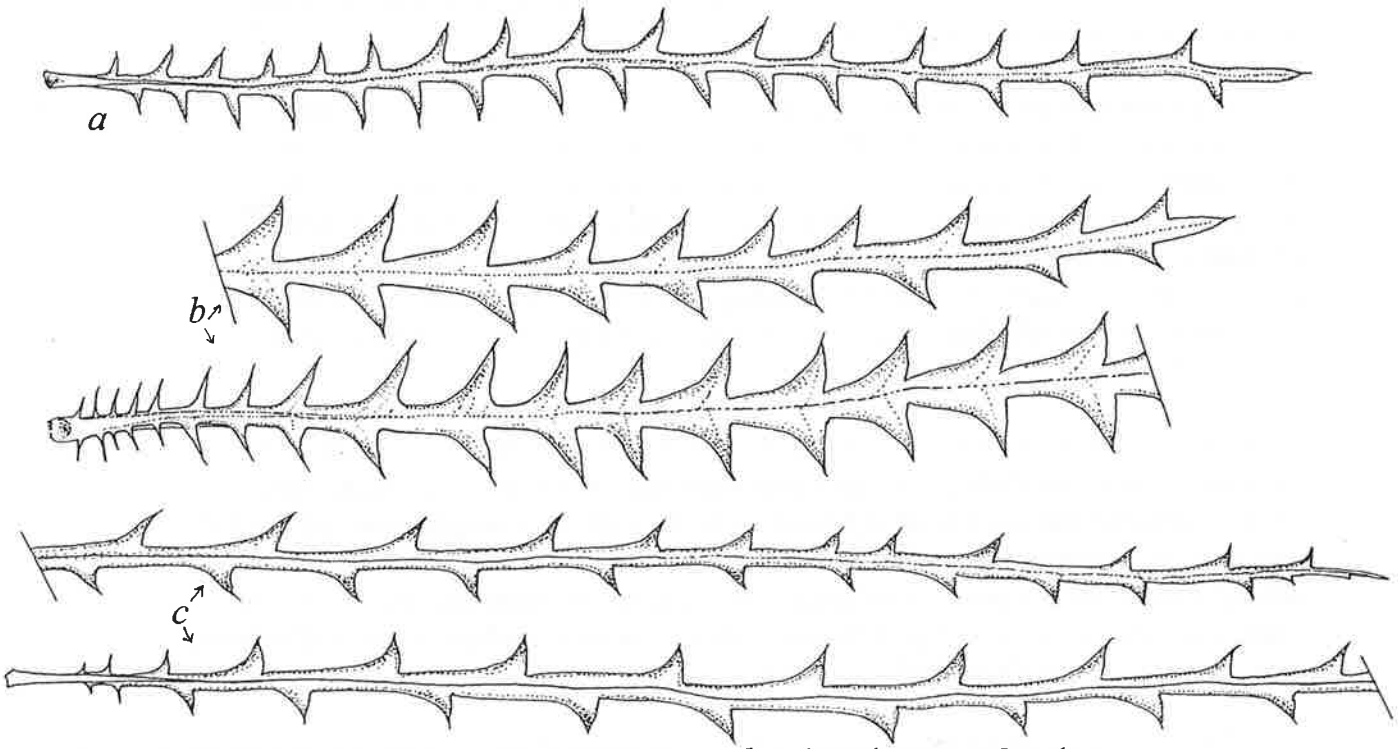
My first objective was to see *D. echinata* in a gravel pit on Boonanarring Road, north of Gingin. It was the only population of any size that I'd seen when I first saw it several years ago. I might have known we would find the population decimated, as the gravel pit has been in use again. *D. echinata* is dwindling in other locations, as well. It used to be fairly common on Mogumber West Road, before it was widened and sealed.

Our next goal was the location on Nammegarra Road, north of Regans Ford, where Kevin Collins had collected what appeared to be *D. nivea*, last December. The area is low-lying, with low shrubs including *Banksia telmatiaea.* The dryandras, which were flowering prolifically, are *D. lindleyana* subsp. *pollosta*. Most were small plants with either dark pink or clear yellow flowers, at ground level but some older plants were sprawling shrubs and, although not exhibiting the formal mounding habit of *D. nivea* were not unlike it in growth as Kevin's specimen had shown.

We drove east on Gillingarra West Road, where I hoped to have the sunshine to photograph a particularly good, dense patch of *D. kippistiana,* growing with *D. echinata,* which Lloyd and Lorraine Carman, Keith Alcock and I had stopped in the rain to look at in 1996. Once again, the clouds defeated me but at least, the dryandras are still there, looking quite spectacular.

We saw several populations of *D. hewardiana*, before detouring to look for *D. fuscobractea*, which I'd not been able to find in 1996. On the tops of the two hills, where it used to grow there are gravel scrapes on both sides of the road and no sign of the *D. fuscobractea* in the road verges. We drove slowly back and eventually spotted a dead plant, which led to the discovery of about a dozen more, very much alive and in flower. The flowerheads are small, pale yellow with a mauve limb. The leaves, with a rounded tip, are rather oak-like and generally larger than those of *D. cuneata* with which it is grouped, taxonomically. There were small shrubs, less than 1m. tall, other younger plants and several seedlings.

On Thompson Road, south-west of Waddington, we found *D. echinata* on the road verges. One plant, especially densely floriferous, had long, robust leaves like *D. hewardiana* and, only a few metres away, another plant had much longer, narrower leaves. I have often observed marked variations in the leaves of this species, even within populations, which has led me to think that it arose as a stable hybrid of *D. polycephala* and *D. hewardiana.* It may also be that *D. echinata*, as a 'proper' species and *D. hewardiana* hybridise. In any case, not far along the road we found *D. hewardiana*. This is a more open, tall shrub, with paler yellow flowers.



Dryandra echinata *a* Boonanarring Road *b* and *c* Thompson Road

While stopped to look at the *D. echinata,* I noticed what looked like a dense, rounded clump of grass on the other side of the road. It proved to be the neatest, narrowest-leafed *D. nivea* subsp. *nivea* I have ever seen – a really stunning plant. Its densely packed, completely hidden 'honeypot' flowers were just finished.

At Mount O'Brien, on the outskirts of Wongan Hills, we saw the local species, *D. comosa, D. wonganensis, D. purdieana* (in flower) and *D. pulchella.*

Rica Erickson Reserve, on the corner of Old Plains Road and the Calingiri road, when we arrived for the Wildflower Walk the following day, was a delight. The flowers were even more colourful and prolific than when we were there last year,ten days later. *D. squarrosa* was particularly striking and *D. polycephala* provided a massed display of bright yellow blossoms in dense stands as only this species, among dryandras, can. *D. nivea* subsp. *nivea* was at its best, each flower with its style still enclosed in the limb, forming a domed mass of 'honeypots' at the base of the leaves. *D. fraseri* var. *fraseri* had just finished and *D. lindleyana* subsp. *lindleyana* var. *mellicula* was in early bud. *D. nobilis* was also in full glorious flower, though the number of plants is declining.

At Wyening Reserve, south-east of Calingiri, we saw *D. purdieana* in bloom and *D. fraseri* var. *fraseri* with some late flowers.

4th-6th September
When some old friends from Sydney came to Perth, I took the opportunity to accompany them for the first part of their northern wildflower trip. Shirley Loney went with me and we stayed at Don and Joy Williams' Badgingarra property, Hi-Vallee where we met Study Group members, Kath and Ray Sykes and enjoyed the Williams' warm hospitality and wonderful flora.

Don had often spoken about 'Big Soak Plain' and this time he and Joy took us to see it. The area is east of Alexander Morrison National Park - a vast area of heathland (kwongan), vacant crown land, stretching towards Watheroo National Park. Driving along the firebreak on the southern boundary, we saw :- *D. cypholoba, D. subulata, D. shuttleworthiana, D.kippistiana, D. bipinnatifida* subsp. *multifida, D. glauca, D. platycarpa, D. nana, D. pteridifolia* subsp. *vernalis, D. sclerophylla, D. vestita, D. sessilis* var. *flabellifolia, D. speciosa* subsp. *macrocarpa, D. carlinoides* and *D. tortifolia.*

At Hi-Vallee, the following day, we did the tour of the property with a small detour to the area where Kevin Collins had collected what appeared to be a very long-leafed *D. sclerophylla*. This was what it proved to be, though, surprisingly, some plants had pink flowers. Being quite small, howeve, the inflorescences are not as showy as the normal, golden yellow ones. *D. tridentata,* in the same location, was also in flower, with its wonderful green and gold flowerheads clustered at the base of the leafy stems, with just an occasional terminal one on a few plants.

On the rocky slopes of the 'breakaways', *D. nobilis* subsp. *fragrans* was still bearing its large golden flowers and *D. carlinoides* was beginning to open. These two are sweetly perfumed and grow together with masses of what I consider to be the most beautifully perfumed plant of all, *Hakea neurophylla.*

Just east of Hi-Vallee, on Tootbardi Road is *D. serratuloides* subsp. *perissa* which was in flower. The inflorescences with their long, pink bracts fringed with white hairs, resemble tiny proteas. It was gratifying to discover that further north, where a fire 6 years ago had destroyed a population of this declared rare plant, there were many small plants, a few, less than 30 cm. tall bearing their first flowers.

Margaret Pieroni 2/9/00

S.G.A.P. Dryandra Study Group
List of members as at 31/12/2000

Keith Alcock, Kalamunda, W.A. 6926
Craig and Sharon Beeching, Sale, Vic. 3850
Dr. J. Ben-Jaacov, Bet-Dagan, Israel
Barbara Buchanan, Myrrhee, Vic. 3732
Lloyd Carman, Eden Hills, S.A. 5050
Tony Cavanagh, Ocean Grove, Vic. 3226
Kevin and Cathy Collins, Mt. Barker, W.A. 6324
Dennis Craig, Bunbury, W.A. 6230
Val Crowley, Darkan, W.A. 6392
Max Ewer, Avenue Range, S.A. 5273
Alex George, Kardinya, W.A. 6163
Elizabeth George, Alexander Heights, W.A. 6064
Hans Griesser, The Patch, Vic, 3792
David Kilpin, Tanunda, S.A. 5352
David Lightfoot, Surrey Hills, Vic. 3127
Shirley Loney, Daglish, W.A. 6008
Nei Marriott, Stawell, Vic. 3380
Max McDowall, Bulleen, Vic. 3105
Penny Moir, Borden, W.A., 6338
Sandra Murray, Kulin, W.A. 6365
Paul Niehoff, Blackburn, 3130
Ron Pearson, Mentone, Vic. 3194
Margaret Pieroni, Attadale, W.A. 6156
Royce Raleigh, Wartook, Vic. 3401
David Randall, Cobram, Vic. 3644
Peter Ray, Mahogany Creek, W.A. 6073
Thelma Roach, Lucindale, S.A. 5272
June Rogers, Horsham, Vic. 3401
Alf Salkin, Mt. Waverley, Vic. 3149
Hugh Seeds, York, W.A. 6302
Peter Shannon, Dalkeith, WA 6009
Yvonne Shields, Mt. Ommaney, 4074
David Shiells, Violet Town, Vic. 3669
Jan Sked, Lawnton, Qld. 4501
G. Paul Stain, Bibra Lake, W.A. 6163
Dr. Rod Sutherland, Natimuk, Vic, 3409
Kath Sykes, Hawthorn East, Vic. 3123
Lyndal Thorburn, Queenbeyan, N.S.W. 2620
Hartley Tobin, The Gurdies, Vic. 3984
Christene Wadey, North Eltham, Vic. 3095
Don Weybury, Greendale, 3341
Don & Joy Williams, Badgingarra, W.A. 6521
David Wyman, Warrandyte, Vic. 3113

Other groups and organisations
Battye Library, Perth, W.A. 6000
Library, Australian National Botanic Gardens, Canberra
Library, Deakin University, Geelong, Vic.
Library, National Herbarium, South Yarra, Vic.
Editor, *Australian Plants*, Sydney, N.S.W.
Editor, *Native Plants for New South Wales*, Sydney, N.S.W.

S.G.A.P. Regional and State Groups

Bairnsdale, Vic.
Blue Mountains, N.S.W.
Canberra, A.C.T.
Fleurieu, S.A.
Geelong, Vic.
Maroondah, Vic.
New South Wales.
Queensland.
South Australia.
W.A. Wildflower Society.
Victoria.
Tasmania.

DRYANDRA STUDY GROUP

FINANCIAL STATEMENT 1.7.99 - 30.6.00

Cash at bank at 1.7.99		$1648.91
Income	Members subscriptions	311.00
	Donations	18.00
	Sales of publications etc.	29.00
	Bank interest	3.53
		361.53
	Total	$2010.44
Expenditure	Newsletter expenses	230.00
	Bank charges	1.36
	ANPC subs.	63.03
	Stationery, postage, photocopying	130.80
		425.19
	Less petty cash in hand	57.45
	Total	367.74
Cash at bank at 30.6.00		$1642.70