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The lovely mound-forming *Dryandra subpinnatifida* var. *imberbis*

Margaret

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DRYANDRA STUDY GROUP

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Hello and welcome to the newsletter.

For the first time in quite some years, several new species of *Dryandra* (albeit to be called *Banksia*) are about to be described. They belong to the ser. *Aphragma* and include several which Margaret suggested in our book were worthy of further study because they appeared to be intermediates with known taxa. More details below but we will keep you informed when the study results are published.

Margaret has prepared a most useful article on a group of small to medium plants which she calls the “mound dryandras”. Fortunately, most have proved to be relatively hardy in the garden and being quite floriferous and often strongly coloured, they make excellent garden plants. I would be interested in your experiences with this group, especially their reliability and longevity, so pictures please and some notes on how you have found them in the garden. One thing I do know, from the information provided by Tim Darrington in France and Liesbeth Uijtewaal in The Netherlands, is that dryandras still grow well in glasshouses in Europe and many can be flowered. I thank them for keeping us informed of their progress. Margaret in her news from Denmark provides us with a lot of the early history of the Group and in particular, the role that Keith Alcock played. Keith was an avid collector of field specimens and provided numerous herbarium collections, which together with his meticulous locality records helped us so much to understand this large and confusing group. Thanks, Keith for all your work. Have you thought about growing them in glasshouses in England? On a much less happy note, Margaret also reports on the havoc caused by out-of-control “controlled burns” in the Bluff Knoll area and the damage to several rare dryandras. We hope that the policy will be reconsidered. She has also kept up to date with indexing the newsletters and you can obtain a copy by email if you contact her. Also most useful is the paper copy for \$5.00 of *The Illustrated Key to Dryandra* which I can highly recommend. And I still have copies of our book *The Dryandras* available at the bargain basement price of \$45.00 including postage.

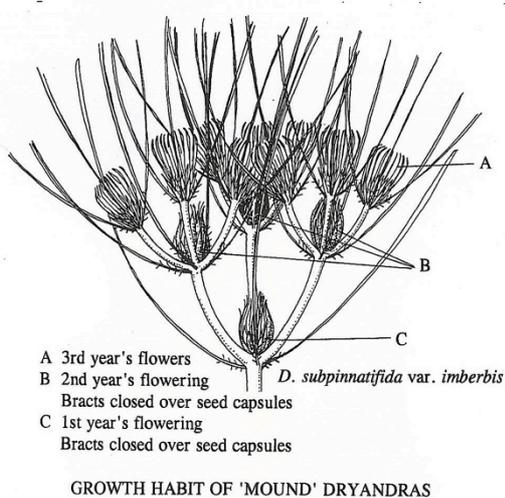
The group of dryandras in the Series *Aphragma* were the subject of an Honours project at UWA by Francis Nge and reported on in NL71 in 2016. Francis very kindly gave us a summary of his Honours presentation which I have included in this newsletter as an introduction to Margaret’s article on *D. sp.* “Boyup Brook” and *D. porrecta*, two of the nine taxa that Francis examined. The thesis work involved both morphology and genetic/DNA studies and as often happens, this led to conflicting outcomes for some taxa, notably *D. sp.* “Boyup Brook” and the western form of *D. porrecta*, where morphological work shows no distinction while DNA data indicates that they are distinct. Moreover, field observations on the western *D. porrecta* by Margaret and Lyn Alcock showed differences between various populations in things like flower colour and whether the flowerheads are buried under the soil. May have more information for the next Newsletter on the status of this group. Margaret and I have reported on plants flowering in our gardens and I unfortunately have lost my 30+ year old *D. brownii* which died in our recent drought.

Finally, just a reminder that subscriptions are due for 2019-2020 and I have included a form with the Newsletter.

Happy *Dryandra* growing
Tony

The Mound Dryandras

Among the most attractive, neatly shaped plants for the garden are the 'mound' dryandras. They are shrubs, usually less than 1 m tall and wide, which do not have a lignotuber or underground stem and so are killed by fire. From a single stem, the first branches arise from the base of the first flower head which is produced on a short stalk surrounded by ascending leaves. Several of these branches are formed and each of them produces one flower head, the following year. Each year, a mound of closely packed flowers accumulates. The flowers are hidden by the equally dense, long leaves, as the plant matures.



(1) Growth habit of 'mound' dryandras.

Dryandras which conform to the habit of growth described and illustrated in the diagram are:

D. nivea subsp. *nivea*

D. nivea subsp. *uliginosa*

D. sp. Morangup

D. drummondii subsp. *drummondii*

D. drummondii subsp. *hiemalis*

D. drummondii subsp. *macrorufa*

D. subpinnatifida var. *imberbis*

Dryandra nivea is variable, both in leaf size and flower colours. In most populations, the flower

colours vary from plant to plant. The styles can be beige, yellow, orange-brown or deep red and the hairs on the tips of the buds (limbs) can be white through beige to a rich copper colour. The most striking combination is; dark red styles with copper – coloured limbs. *D. nivea* subsp. *nivea* is widespread in the south west region from north of Eneabba to Israelite Bay. Plants which appear to be stable hybrids with *D. brownii* can be found at the extremes of the distribution of *D. brownii*, which is from Cranbrook to the Fitzgerald River National Park. *D. nivea* flowers in spring.



D. nivea subsp. *uliginosa* is a larger shrub, with leaves to 45 cm long. It grows in winter-wet clay flats, east of Busselton, in the Whicher Range and on the Scott River plain to the south. Although rare in the wild, this taxon is hardy and often grown in gardens. Plants in the Kings Park Botanic Garden did well even in shady situations. It tends to flower a little later than subsp. *nivea*.





D. sp. Morangup occurs at Morangup Nature Reserve, south west of Toodyay and was recently discovered near Armadale by Fred Hort. It differs from *D. nivea* with its almost glabrous, involucre bracts, bright green rather than dark green leaves with wider, less deeply-cut lobes. Flowers consistently have deep pink styles and pale green or white hairs on the limbs. It flowers much earlier than *D. nivea* – in April. I believe it is currently being reviewed. See also *The Dryandras* Page 171.



D. drummondii subsp. *drummondii* occurs from Cranbrook to Wellstead Crossing and is common in the Stirling Ranges. The flowers range from pale yellow to deep pink. It grows in gravelly clay soils but does well in the garden in sandy soils, as well. Leaves are up to 36 cm long and somewhat twisted. It flowers in late spring to early summer.



D. drummondii subsp. *hiemalis*, as the name suggests, flowers in winter. The length of the leaves is comparable to subsp. *drummondii* but they are less twisted. This is a stunning plant that occurs in some of the coldest parts of the state, between New Norcia and Wickiepin. It thrives in sandy soils as well as gravel and doesn't mind some shade in winter. The glowing flowers with golden-yellow styles and either copper - coloured or beige hairs on the limb are well hidden at the base of the leaves on mature plants.



D. drummondii subsp. *macrorufa*, (Big Red) was collected by Marion Blackwell and myself, south east of Nyabing in January, 1992. It has very long leaves – to 90 cm and thus forms a much bigger shrub, to more than 1 m high and wide. The flowers are always red with a beige limb. It flowers a month or so later than subsp. *drummondii*.



D. subpinnatifida var. *imberbis* is a small shrub with dark green, narrow leaves and pale, lemon-yellow flowers in spring. It occurs in small populations in the south west forests but some populations have been destroyed. As well as the bulldozer, the plants are under threat from another *Dryandra*, *D. squarrosa* with which it hybridizes. Prickly lobes on the leaf blade, above the petiole are an indication of *D. squarrosa* contamination. Pure plants may already be extinct. This phenomenon is also occurring with *D. subpinnatifida* var. *subpinnatifida*, in the wild. The plants that were growing in the *Dryandra* Collection at Cranbourne, in Victoria, where I first saw this plant were hybrids. The magnificent pure plant that was growing at the Banksia Farm died and no plants

were able to be grown from the very small amount of seed it had produced.



Margaret Pieroni
Jan 2019

Correspondence

Many thanks for the latest *Dryandra* bulletin.

Here I am beginning the main flowering season with *D. catoglypta* (for the first time, here) and now *D. quercifolia*. *D. fraseri* var. *fraseri* has been flowering all winter but flowers better when it has more and afternoon light (I have two plants of this), the one in the relative "dark" has aborted numerous buds. I am still trying to build more greenhouse space, particularly as I have another ~20 species at the seedling stage.

Best wishes,

Tim Darrington (France)



Dryandra catoglypta

Tim



Dryandra quercifolia

Tim

Well done on your D's, Tim.

Interesting to hear your *D. quercifolia* starts to flower now, mine had quite a few flowers in autumn, stopped over winter and is coming back into flowering mode now.

I tried *D. catoglypta* years ago, from Hi-Vallee Farm seed, but unfortunately I lost them before they had flowered.

D. fraseri var. *crebra* failed as well for me after some years. Flowering in winter isn't a good idea under our conditions is it.

How are your *D. sessilis* buds doing? The buds on mine (var. *cygnorum*) are starting to show their individual flower buds. *D. sessilis* var. *flabellifolia* is growing well, no buds yet. It's a beauty! Much larger than var. *cygnorum*. I could try and propagate it from cuttings if you'd like one. Growing from seed might be quicker for you though ☐.

Best wishes

Liesbeth Uijtewaal (The Netherlands)

Thanks for the newsletter, most interesting read. I also received the welcome letter today from Margaret.

It was only after re-reading part of the newsletter that I realized Margaret was not growing Dryandras in Europe, oops.

I have been running my own landscaping business now for nearly 6 years after being made redundant from a factory job, they did me a huge favour.

I have always grown natives at home and because of the business I see a lot more of nurseries and collect for my own garden.

We have loads of Banksias but very few Dryandras as they are very difficult to find. We got loads of *D. nivea* a few years back and did mass plantings in a few gardens including our own.

Do you know of any growers in Victoria who grow Banksias and Dryandras for the landscaping trade? I am particularly interested in the easier forms for my clients. Margaret listed *D. fraseri*, *D. tenuifolia*, *D. cuneata*, *D. nivea*, *D. nervosa*, *D. quercifolia*, *D. drummondii*, and *D. obtusa*.

I would like to use any or all of these and any others you recommend for well drained native gardens in Victoria.

My wife also particularly wants to grow *D. nivea* ssp. *uliginosa* which we saw on a recent trip to W.A. in King's Park.

I always wanted a *quercifolia* for my garden.

If you could point me in the right direction that would be great.

Ps: one more question is *Banksia blechnifolia* the same plant as *Dryandra blechnifolia*? (I realize *Dryandra* are now called *Banksia*.)

Regards

Craig Gardner

(Hello Craig and thank you for your information. I am sorry but I am unaware of anyone growing quantities of either *Banksia* or *Dryandra* for the nursery trade. Seed is available commercially from the Nindethana Seed Company in WA and I believe they have most of the species Margaret recommended which I can vouch for as being quite reliable in well drained and sunny/light shade positions in Victorian gardens. A couple of others are *D. formosa*, *D. praemorsa*, *D. lindleyana*, and the large *D. longifolia*. And no, *Banksia* and *Dryandra blechnifolia* are not the same, *Dryandra blechnifolia* having become *Banksia pellaeifolia* in the 2007 revision. I hope that you continue to have success with growing Dryandras.

All the best,

Tony.)

News from Denmark

Late last year, Keith Alcock left to go back to England to live. His contribution to the Study Group and to the knowledge of *Dryandra* has been of great value, over many years.

Tony Cavanagh established the Dryandra Study Group in 1974 and Keith, who also lived in Victoria, took over as leader in 1983. I joined soon after and we corresponded often, after I began to grow and love dryandras, in Attadale, a Perth suburb.

Keith made several business trips to Perth over the next few years and I got to know him in person. He always made the most of his short stays in the state and he collected many herbarium specimens, some for the first time. We made a few collecting trips together, most memorably to the Stirlings in 1986 when we re-discovered *D. anatona* and *D. ferruginea* subsp. *pumila*.

The following year, Keith rang me to say that he was going to England to work for four years and he asked me if I'd take over as leader of the Study Group. Fortunately, Tony agreed to be the newsletter editor, so I was able to take on the rest of the job.

Keith had kept a meticulous record of hundreds of locations dating back to before my time and it was invaluable to me for my dryandra collecting trips. He also sent over the extensive seed collection. Both Tony and Keith have made my job so much easier and I am very grateful to them.

Keith returned to Australia in 1994 – 4 years had stretched to 7. He eventually settled in Kalamunda in the Perth Hills in 1998. Our dryandra trips which often included other Study Group members, resumed and in time, Keith established a wonderful garden of Western Australian plants with many dryandras. Erica Shedley and I visited him in July, last year. He had decided to move back to England to be with his family and his house was on the market.

Many thanks and best wishes go to Keith from all of the Dryandra Study Group.

In May, last year, despite forecasts of hot weather and strong winds, prescribed burns in the Stirling Ranges went ahead. Needless to say, as so often happens, the fire got out of control and burned out the eastern side of the National Park, including to the top of Bluff Knoll. Only one or two plants of *D. montana* survived and a small percent of the *D. anatona* populations.

Extreme measures have been taken over many years to conserve these two species that are restricted to the Stirling Range as I have reported in previous newsletters, by the DCBA Rare Flora Recovery Team and they share my sadness and anger. There was an investigation and report on the damage to rare vegetation and I hope there will be changes to the policy of burning but I'm not holding my breath. Meanwhile, if you are coming to WA, this year, don't bother to visit Bluff Knoll.

I have been keeping the index to the newsletter up to date, going back to newsletter no. 27. It is available from me by email. An index of newsletters 1 – 26 was compiled by David Randall and published in 1994 as Occasional Publication no. 4.

The **Illustrated Key to Dryandra** is also still available from me as a hard copy for \$5. (And I can highly recommend this as it helps considerably with identification especially with specimens where you have no idea what they might be. Tony).

Margaret Pieroni 12/1/19

Dryandras in my Denmark Garden

Just before Keith left for England, last year, he came down to visit me. As we were walking around the garden, we noticed that *Dryandra ferruginea* subsp. *pumila* was in flower. What I hadn't realised was just how many flower heads were on the plant, produced low down on the main stem, largely hidden below the spreading leaves and difficult to see while standing up. One side of the plant was overgrown by a naturally occurring Semaphore Sedge, *Mesomelaena tetragona*. Removal of some of its leaves revealed 22 flower heads on the *Dryandra*.

At the moment my plant of *D. nobilis* subsp. *nobilis* grown from seed collected at possibly the southernmost population of this taxon, is in flower. The flowers are more of a golden yellow than the one I had growing in Perth. What I like about it is that it always produces some terminal flower heads albeit on fairly short stems ideal for flower arranging.

Margaret Pieroni 14/6/19



D. ferruginea subsp. *pumila* flowerheads MP



D. ferruginea subsp. *pumila* plant MP



D. nobilis subsp. *nobilis* MP

Summary of Seminar Presentation by Francis Nge for his Honours Project, UWA, 2017

Species Determination in Banksia: Four new species in southwest Western Australia,

(Prepared by Tony Cavanagh).

(Francis very kindly provided us with considerable information and progress of his research in Newsletter No. 71 of July, 2016. His project dealt with taxa from the *Banksia* ser. *Aphragma*, sensu A.S. George (what we know as *Dryandra* ser. *Aphragma*) and as is so often the case, while some problems were solved, there are still quite a number of questions unresolved and requiring further research. Margaret had already noted in *The Dryandras* that two of the taxa Francis studied (sp. ‘Boyup Brook’ and ‘Jingaring’) appeared to be intermediates with known taxa and required further study. Francis in his field work identified the following as either new taxa or worthy of further study – sp. ‘Collie’, *B. porrecta*, eastern and western forms, and the two subspecies of *B. pteridifolia*, *vernalis* and *inretita* (along with sub. *pteridifolia* for comparison). He also investigated *B. pellaeifolia* which we know as *D. blechnifolia*, nine taxa in total. **Editor’s Note:** Margaret’s article below and Lyn Alcock’s photographs and observations of the Highbury population of the western form of *D. porrecta* make this summary of the results of Francis Nge’s thesis particularly relevant. Unfortunately, nothing is simple and while some new species have been recognized and named in a yet to be published paper, several still require more research for a final resolution).

The study questions that were posed were: are the taxa morphologically distinct, do they show genetic divergence, and is there congruence between multiple lines of evidence (where “congruence” means agreement between different sources of evidence). This involved comparing morphology and genetics data with results obtained from phenology (how seasonal and other aspects of climate influence the life cycle of plants and animals) and habitat studies, for example.

Morphology Studies: Francis chose 29 morphology characters based on Alex George’s 1996 treatment of *Dryandra* in *Flora of Australia* and applied them to 68 Herbarium specimens and

156 field collected specimens. The figure below shows the basic leaf morphology of the test taxa. The morphology data was used to provide two separate datasets, one complete which combined floral and vegetative characteristics for all specimens, and a second which examined leaf morphology of field collected specimens only (to assess leaf morphology variation over one growth season). The “complete” data set showed that all the studied taxa except *B. ‘Boyup Brook’* were morphologically distinct. ‘Boyup Brook’ showed affinities with Western *B. porrecta*. As the same result was achieved with the “leaf morphology only” specimens, the conclusion from the morphology studies is that sp. ‘Boyup Brook’ is not morphologically distinct.

Genetic Studies: The genetic work is exceptionally complex (at least to lay readers!) and several techniques were used, including extracting DNA from 139 samples belonging to 29 populations (at five individuals per population). Far from “clearing up” problems, data from the several techniques sometimes gave conflicting results. Francis found that the technique known as Sanger sequencing appeared to show that only *B. pteridifolia* sub. *inretita* was distinct and was unable to resolve the relationship between sp. ‘Boyup Brook’ and the other taxa. Other genetic work appeared to show that sp. ‘Boyup Brook’ is distinct from *B. porrecta* (which does not agree with morphological work), all subsp. of *B. pteridifolia* are distinct, the two *porrecta* forms are distinct, and the relationships of the remaining taxa are unresolved, although sp. ‘Jingaring’ and ‘Collie’ are noted as not distinct.

Overall outcome: The above seemingly conflicting results were at least partially resolved for some taxa by congruence analysis.

Four new species are recognised (but are yet to be named) – *B. porrecta* (eastern); *B. pteridifolia* sub. *vernalis*; *B. pteridifolia* sub. *inretita*; sp. ‘Jingaring’. The following retain their species status – *B. pteridifolia* sub. *pteridifolia*; *B. aurantia*; *B. pellaeifolia*;

These taxa are classed as “pending”, their status is unresolved and they require further study – sp. ‘Collie’, sp. ‘Boyup Brook’ and *B. porrecta* (western form).

Dryandra sp. Boyup Brook and *D. porrecta*

In April, 2016, Brian Moyle and I joined Kevin Thiele and Honours student, Francis Nge on a trip to collect leaf samples, for DNA analysis of *D. sp. Boyup Brook*, *D. porrecta* and *D. sp. Jingaring*. (See Francis's excellent article and my report in newsletter no. 71).

Sp. Boyup Brook, which had been incorrectly identified as *D. aurantia* in the Herbarium collection, usually flowers in June but the plant in my garden was already in flower and when we got to the location of the plants, north of Boyup Brook, we found them beginning to flower. Unlike (the previously seen) *D. porrecta* they do not flower completely under the ground. They have about 45 - 50 flowers per head as opposed to about 30 - 35 for *D. porrecta* and they are similar in size and colour to *D. aurantia*, that is orange - not pale yellow - with or without a pink tinge, like all of the *D. porrecta* that I have seen, western and eastern.



D. sp. ‘Boyup Brook’

Margaret



D. sp. ‘Boyup Brook’ plant

Margaret



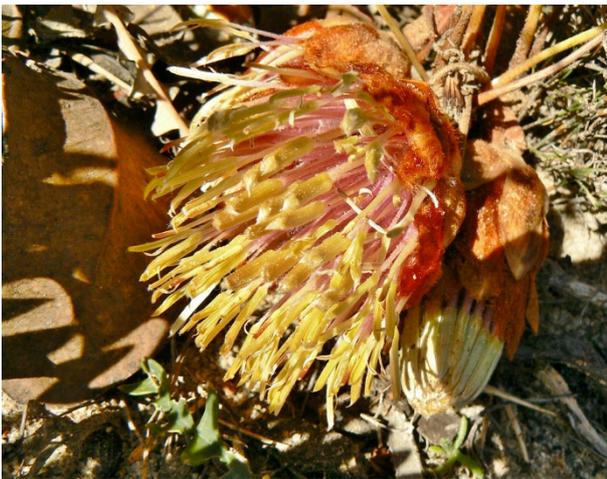
D. aurantia flowerhead

Francis Nge

Kevin and Francis subsequently collected specimens of sp. Boyup Brook on private property further east, which I have not seen.

We visited several locations of *D. porrecta* – most of them known to me, and one, south-east of Highbury (Elson Rd), that I had not seen before.

From his examination of the herbarium specimens of *D. porrecta*, Francis had separated western and eastern forms and we could see at a glance that there was indeed a difference. The leaves of the eastern form have narrower leaves with pointed, narrower lobes than those of the western form.



D. porrecta (eastern form) L. Magenta Rd. MP



D. porrecta (eastern), plant, L. Magenta Rd., plant

During the trip, we failed to find any flowers on any of the numerous plants that we looked at – including the Highbury ones. We noted, however, that the leaves on the plants in that location were slightly larger than others. It is exhausting work trying to find flowers when they are beneath the ground, although, as Lyn's photos show, the flower heads at this location were not buried. We wasted time and energy this time, as I did on subsequent visits to this site, in looking for underground flowers. I did find a few flowers, though, at Mount Barker, in June 2017, that were buried but it took more than a half hour to find them and on a visit to the location of the eastern form two months after the trip with Francis, I found that the flowers there were also under the soil.

I was very surprised to get Lyn's email with the photos and descriptions of the Highbury plants. I had decided not to visit the location, next week, when I'm planning a trip, because I thought there had not been enough rain. The plants looked half-dead when I last saw them. Lyn said that the flowers were often a distinct pink with many on each plant, most were not underground and they did not just flower around the edge of the plants as usually occurs, but many were inside the bunch of each plant group. They looked to be slightly larger than those we had seen at King Rock.



D. porrecta (western, Highbury) Lyn Alcock



D. porrecta (western, Highbury), part buried, Lyn



D. porrecta (western, Highbury), plant, Lyn

I have forwarded the Lyn's photos to Francis and have asked him whether there have been any further developments. In his presentation, *Species Determination in Banksia: Four new species in southwest Western Australia*, in 2016, Francis found that *D. sp. Boyup Brook* and *D. porrecta* (western form) are not morphologically distinct. The DNA analysis, however showed that they are,

in fact, distinct. Francis indicated that further work was needed to get higher resolutions of the molecular phylogeny and also more flowering specimens.

Margaret Pieroni 18/7/19

Another casualty

Members may recall in Newsletter 75 I was describing how one of the oldest plants in my garden was a 30+ year old *D. brownii*. Perhaps I spoke too soon. This year, Victoria had one of its warmest summers on record and probably the driest ever (I recorded only 32 mm to the end of April) and, yes you've guessed it, I no longer have a *D. brownii*! Despite my best efforts with watering, I was unable to keep the plant going and the result is as you see below. Now looking for another *D. brownii*.



Tony Cavanagh, July.

***Dryandra filioloba* blooms.**

A plant rarely seen in flower is the very tangled, mounded shrub with blue-green foliage, *Dryandra filioloba*. To fill this space, I have included a picture of my plant's current flowers with more details in NL78.



Tony Cavanagh, July.

A.N.P.S.A. DRYANDRA STUDY GROUP

SUBSCRIPTIONS FOR 2019- 2020

The group’s year runs from July 1, 2019 to June 30, 2020 and subscriptions are now due. Subscriptions are \$10.00 for Australian members and \$12.00 for overseas. The cost for receiving by email is \$5.00*. Please make cheques payable to the Dryandra Study Group and forward to Margaret. Thanks to all those who have paid.

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