



Association Of Societies For Growing Australian Plants
Banksia Study Group Newsletter

Vol. 5 No. 3 - Autumn 2004

ISSN 1444-285X

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Subscription Renewal

OK – the boring stuff first. Subscriptions run from July to June each year (like a financial year). This means that this will be the last year of this subscription ‘block’ (i.e the 2003-4 year). It is time to renew subscriptions again. Anyone wishing to pay by direct debit please email me for the Study Group account details at casliber@ozemail.com.au

Outing to see *Banksia conferta conferta* in Coorabakh National Park, NSW

The Mid-North Coast District Group of the Australian Plants Society is going on a field trip which will include seeing this newly described population on June 19. Lucy Scope had visited the area last year and noted the majority of inflorescences to be recently finished in July, so speculated this would be the best time to visit. Any interested can contact her on (02) 6550 5734.

FJC Rogers Seminar 2004 “Banksias & Dryandras” 4th & 5th September 2004

Join me, Margaret Pieroni (Dryandra SG leader), Kevin Collins (Banksia Farm) and others at this weekend seminar in Colac (140km SW of Melbourne). Saturday is a 1 day seminar on various aspects of the two genera & Sunday garden visits.

Full Registration: \$85 / head; Full Registration less Saturday night dinner/guest speaker: \$65 / head. *Bookings close Friday 23rd July 2004.*

Registration forms can be found in your Region Journals and send to Brendon Stahl, 9 Parkers Road, Deans Marsh RSD Birregurra 3242. Cheques payable to SGAP Colac/Otway Group. All enquiries call Brendon Stahl on 03 5236 3325.

Threatened Banksias #4 & #5: *Banksia cuneata* & *B. oligantha*

I had intended having one species per issue, but these are so similar that I decided to present them together. Both are declared rare flora – *B. cuneata* is possibly the more at risk as, though it occurs in more discrete populations, there are likely fewer plants overall and the majority are on unprotected land or road verges. They may be worth trying to grow if in a Mediterranean (dry summer) climate and sandy soil. For seed, try Nindethana seeds (08 - 9844 3533), the Banksia Farm (08 - 9851 1770) or the Wildflower Society of WA seedbank.

***Banksia oligantha* - Wagin Banksia**

Introduction: This banksia was discovered by Ken Wallace of the Department of Conservation & Land Management, in 1984 during the collection of data for the Banksia Atlas. Previous nomenclatural synonyms include *Banksia* aff. *cuneata* and *B. sp.* 'Wagin' (SD Hopper 4171), but it was officially described and named by Alex George in 1987, the specific name derived from *oligo-* 'few' & *anthos* 'flower', as it has fewer flowers per inflorescence than any other banksia. It is in the subgenus *Isostylis* which includes the widespread *Banksia ilicifolia* and rare *B. cuneata*. Its current common name is the Wagin Banksia, because of the proximity of the first population to the town of Wagin. The second population near Katanning wasn't located until 5 years later. With the third and fourth populations discovered, the name seems less apt now.



Description: *Banksia oligantha* is an erect shrub or small tree to 5m without a lignotuber. The grey bark is smooth, becoming lightly fissured. Stems are hairy (hirsute to pubescent), becoming smooth (glabrescent) over time. The obovate to angular-obovate leaves are 1.5-3.7cm long and 4-20mm wide and quite concave - shining green above and pale below. The leaf margins have 2-4 1mm 'teeth' on each side, which are prickly enough to make fruit collection without gloves painful. Young leaves of juvenile plants resemble oak/acorn leaves, with leaves becoming more rigid and pointier with age. New seedlings and their leaves resemble other Banksia species such as *B. prionotes*.

B. oligantha (inflorescence above; habit below)



The terminal inflorescences are dome shaped and 2.5-3cm wide at flowering, which occurs in October - November. They contain 20-35 individual flowers (contrasting with 50 odd for *B. cuneata* and up to 6000 for *B. grandis*!), which are red grading to cream above with a pale yellow limb, all turning orange-brown. After flowering, there can be 1-6 pale grey and dark mottled follicles, which open spontaneously in the absence of fire. Fire may promote seedling establishment from seed.

Distribution & Habitat: Known from 4 populations only - near Katanning, Wagin, Harrismith and Wedin. The population near Wagin was the first discovered. There, plants grow on small yellow-brown acidic (pH 6) sand dunes along an ephemeral salt creek system, in shrubland with trees of *B. attenuata* and *B. prionotes*, also *Nuytsia floribunda*, *Leptospermum erubescens*, and *Kunzea ericifolia*. This population would appear to be declining; 300-400 plants were counted by Anne Taylor in 1984 but when surveyed by CALM officers Kim Kershaw and Bethea Loudon in February 2004, there were only 135 plants.

Beth reports there is no seedling recruitment here and little variation to the population structure (medium aged to old plants, although one patch of young plants 1.5m+ in height where the seedling/juvenile plant occurred in 2001). She is not be sure if the juvenile plant that was present in 2001 grew considerably in the time to the 2004 survey or if it perished during that time. If it did survive this may indicate that the species is fast growing in its early stages of life.

Beth also adds that another population near Katanning, of 1382+ plants, is on white-grey/yellow sand dunes, in similar vegetation. There is a wide range of plant sizes and ages here. The recruitment and establishment of seedlings is abundant and an amazing sight at the Katanning population, especially since they appear to germinate without any sort of disturbance.

Both populations are in large patches of bush surrounded by farmland. Weed invasion is surprisingly minimal, is a fire prone/susceptible habitat but neither location has been burnt for at least 20 years or so (apparently the Katanning site was burnt in 1975 and 1977 according to a local farmer). It is unclear what factors are influencing the different ages and recruitment, or what differences there are between these two sites; rainfall may have some part in it, plus the presence of rabbits at the Wagin population.

Kim Kershaw reports that the Harrismith population has gone from 96 plants to 13 plants from monitoring conducted in 1997/1998 to the monitoring this year (87% reduction with no seedlings seen. It is unclear whether the site requires some burning to stimulate germination or rabbit control as the rabbits may be chewing up the seedlings. However, this will require further monitoring. There wasn't really any bad indications of rabbit activity at the site but they may of been bad previously there have been 3 really bad dry years.

Finally, Kim reports that the new Toolibin/Wedin population consists of 188 adults and 35 seedlings and seems to have a strong population of rabbits as well (so you try and work it out?). Most plants are growing on an areas cleared for agriculture, right on the edge of the vegetation(heath), and are certainly exhibiting disturbance opportunistic behaviour.

The species is susceptible to *Phytophthora cinnamomi* (through tests on seedlings). There is no evidence of the disease's existence or deaths of other indicator species at any of the sites.

Banksia oligantha is ranked as Endangered; CALM does not advertise or disclose the location of such sites to the general public so as to ensure their continued protection and existence, only to those who need to know for research, landowners etc. One would need to consult with CALM district offices and have a valid reason for accessing the sites.

Cultivation: The Botanic Gardens and Parks Authority (Kings Park) have tried to grow this species on three occasions without much success, "probably due to trying to grow them out of season without the necessary facilities to allow germination". They do have one plant growing in one of their gardens. Three germinated out of 10, using a cool room. They did not use any form of pre-treatment eg smoke; in the past they have germinated other *Banksia* species without any pre-treatment. Cultivation tips: "if we could get any to establish we would probably treat them as we would any other *Banksia* - pot them in a well drained mix with a low-phosphorus slow release fertiliser and give regular watering and care". [Personal communication, Amanda Shade, Horticulturalist - Botanic Gardens and Parks Authority, 2004].

Kevin Collins of the Banksia Farm adds that *Banksia oligantha* grew rapidly to 3m in 5 years on lateritic sand (pH 6.5) and seemed to prefer this to more acid sand (pH 5.5). His were grown in open areas and prone to wind damage, with a few snapping off at ground level. He suggests that maybe a more sheltered area (such as how it grows in its natural habitat in open eucalypt forest) in deep coarse sand is better. Furthermore, pruning early on to induce a multistemmed rounded shrub would help. They flower after only 3 years and set seed profusely in cultivation.

#5: *Banksia cuneata* – Matchstick Banksia/Quairading Banksia

Introduction: *Banksia cuneata* was initially collected in 1971 and officially described in 1981 by Alex George, who gave it the epithet *cuneata*, Latin for 'wedge-shaped' after the leaves. Together with *B. oligantha* and *B. ilicifolia*, they form the distinctive *Isostylis* subgenus in the genus *Banksia*. Of the three, the Matchstick banksia, so named because its inflorescences in late bud resemble unlit matches, possibly has the most potential as a garden plant. What the flowers lack in size they can make up in numbers. It has been named the floral emblem of Quairading Shire and there is a park called 'Cuneata Park' in the town.



Description: It is typically a large shrub or small tree to about 5 metres high without a lignotuber. Bark is smooth and grey and the stems are hirsute, becoming smooth (glabrescent). The prickly, dull green, wedge-shaped (cuneate-obovate) leaves are 1 to 4 cm long and 5–15 mm wide, resembling holly leaves - with serrate margins with 1–5 teeth each side. Kim Kershaw of CALM in Narrogin describes them as bigger, with bigger spines, and more prickly than *Banksia oligantha*. Flowering has been recorded in late winter as well as spring (peak months? best times?). The inflorescences are 3–4 cm wide, with 55–65 flowers, which can be very numerous, are most attractive in late bud, pinkish with pale green limbs. They produce copious amounts of nectar. Old flowers soon fall, leaving around 1–5 mottled grey follicles, which remain closed until burnt by fire.

Distribution & Habitat: *Banksia cuneata* grows in yellow-brown sands in shrubland, with *Banksia prionotes* and *Xylomelum angustifolium*. It is one of the most sensitive banksias to dieback, and is only known from 12 populations over a 90 km range near Quairading in Western Australia's central wheatbelt. Furthermore, much of the land nearby is heavily

cultivated and weed-infested in places, and many of the populations are right on road verges. Most populations are on private property - Kim reports relationships with local private property landowners are good as CALM have fenced off populations with rabbit exclusion fencing and conduct rabbit baiting programs to keep the rabbit population under control.

Kim adds that there has been successful translocation of some populations to areas away from roads. The main issue here is that they may need additional water during the first summer but after that, they're away.

The plant requires fire to regenerate at certain intervals as its seedpods remain closed until burnt. It is non-lignotuberous and hence can be eliminated from its habitat through fires which occur too frequently (ie. it requires sufficient time between fires for seedlings to reach maturity, flower and set seed).

Cultivation: Ironically, the species has some weed potential; Kingsley Dixon of the Western Australian Herbarium reports that it was once trialled as a cut flower crop in Moore River north of Perth and plants naturalised there.

In cultivation, *B. cuneata* requires a sandy, well drained soil and a sunny aspect. Extra summer water in dry-summer climates appears necessary until the plants are established. A tub or large container may be appropriate if local soils are too heavy. It is a rapidly growing species and can be very showy, although cut flowers are reported to drip a lot of nectar!. To date the plant hasn't been tried in areas of summer humidity, though presumably it would be difficult to grow there as it is exquisitely sensitive to *Phytophthora*

Review of More Recent Scientific Articles

In 2003, Byron Lamont et. al. published a fascinating paper on the promotion of hybridization between *Banksia prionotes* & *hookeriana* in disturbed habitats in the Eneabba Plain. 240-320km north of Perth in Western Australia. Here the two species coexist, in general, without hybridising (However they have been readily hybridized at the Waite Institute, resulting in *B.* 'Waite Orange'). One main barrier appears to be their asynchronous flowering; *B. prionotes* flowers mainly January to May, and *B. hookeriana* June to October. Anthropogenic disturbance has been found to encourage larger plants which produce more flowers in an extended flowering season (for *B. prionotes*) and promote earlier flowering (for *B. hookeriana*). This study recorded hybrids in populations of *B. hookeriana* studied in disturbed areas, with none found in undisturbed areas. Why larger plants? Lamont had previously shown that soil water availability and levels of 4 nutrients were higher in sands supporting *B. hookeriana* beside roadways than in undisturbed vegetation. Also greater flowering in disturbed areas has been shown to attract more pollinators.

The impression from analysis of the hybrid plants was that the high incidence of hybrids was a recent phenomenon (most appeared to have only F1 (first cross) hybrids), and much of the man-made disturbance, apart from the main highway, in the area is post 1970.

Furthermore, Margaret Sedgley at the Waite Institute has observed that the F1 hybrid is fully fertile. Lamont speculates that seed from the hybrids could reach soils where they may be able to out-compete their parents and flourish, and thus pose considerable biological consequences to existing species.

An older study by Lamont found *Banksia menziesii* also had larger plants with more cones on road verges, with increased availability of nutrients and water. Funnily enough, at least

one hybrid of *B. menziesii* has been recorded with *B. prionotes*. I am not aware of the plants' proximity to a disturbed area however.

Sue and R. D. Wooller from the School of Biological Sciences, Murdoch University, WA, have published another article on particular pollinators of banksias, this time *Banksia nutans*, which appears to be principally pollinated by the honey possum, *Tarsipes rostratus*. This is the most abundant and widespread mammal in one large heathland where 97% of the tiny (7–10 g) possums trapped near *B. nutans* were found to carry its pollen. An experiment was conducted that regulated access to flowers by different groups of pollinators. Exclosures around bushes removed access to flowers by flying animals, but still allowed honey possums to visit the flowers. This treatment resulted in fruit set that was not significantly different from bushes to which all animals had access. Exclusion of animal visitors resulted in significantly lower (albeit substantial) fruit set. This indicates *Banksia nutans* has a capacity for self-pollination that may offset the apparent reliance on honey possums for pollination.

Another paper reveals a record among flowering plants for a banksia. A study in 1992 on leaf lifespans and sclerophylly in *Banksia petiolaris* and *B. baueri* showed that the former's leaves survived up to 13.5 years, with an average lifespan of 5.9 years. Thus, *B. petiolaris* has the longest lived leaves of an angiosperm (flowering plant) to date! The paper explores the reason for this – the nutrient poor soils and dry climate favour a strategy of nutrient/carbon conservation rather than rapid turnover (leaves hold a high proportion of nutrients, so longevity reduces nutrient loss which occurs with loss of old leaves). Furthermore, the unusual prostrate habit with vertical leaves ensures that older leaves aren't shaded out as with vertical shrubs.

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