

FIELD BOTANY IN AUSTRALIA



ANDREW PENGELLY PHD 2017



From the mountains to the Pacific Ocean



Lookout at Katoomba, Blue Mts. NSW

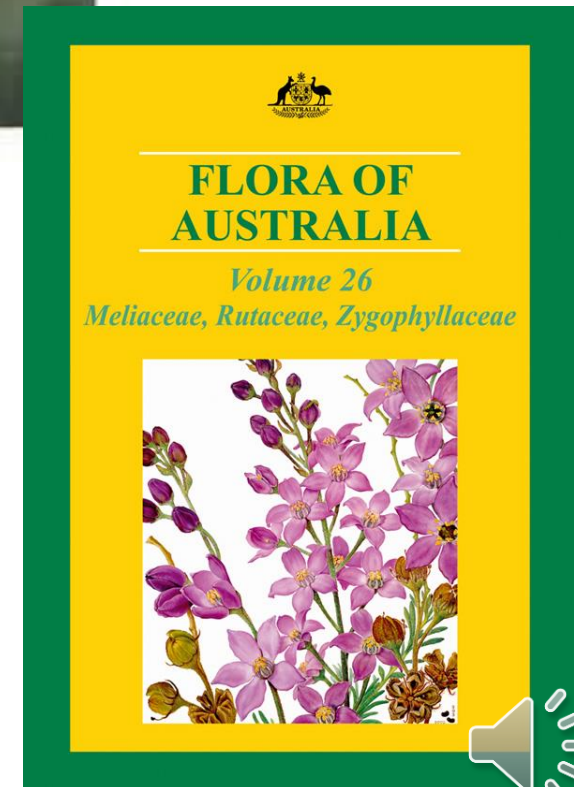
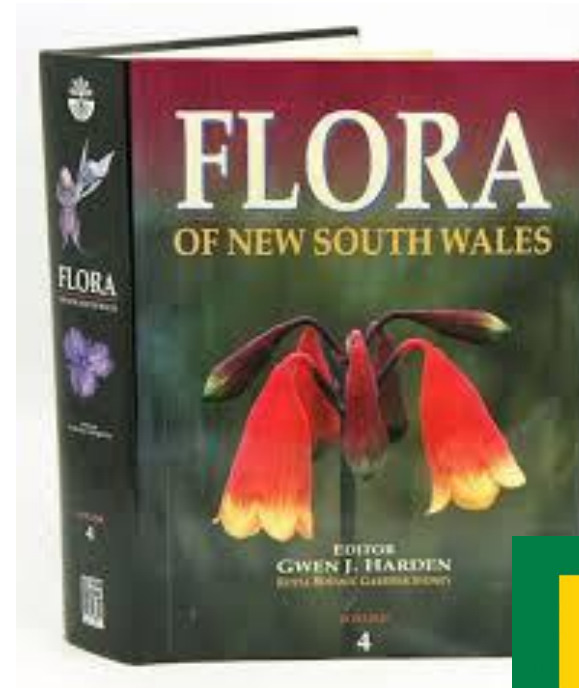


Flannel flowers (*Actinotus helianthi*) on headland at Crowdy Bay, NSW



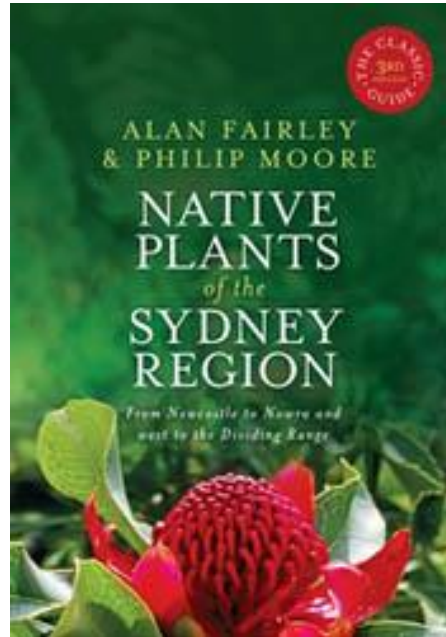
Field botany activities

- Practice identification skills
- Visit new and remote natural sites
- Practice use of field guides and Floras
- Become familiar with the vegetation patterns in your region
- Visit local floral reserves, national parks etc.
- Learn of key out plants
- Photograph plants and wildlife
- Collect and press plant specimens
- Send specimens to herbarium
- Volunteer project
- Harvest - non-endangered species only



Field botany aids

- Regional plant guides
- Plant press
- Loup / hand lens
- Harvesting tools
 - Pruners, hori hori
- Notepad
- Collecting bags
- Camera



Dr. Pengelly harvests *Dodonaea viscosa* (hop bush) leaves in Merriwa area, New South Wales, Australia

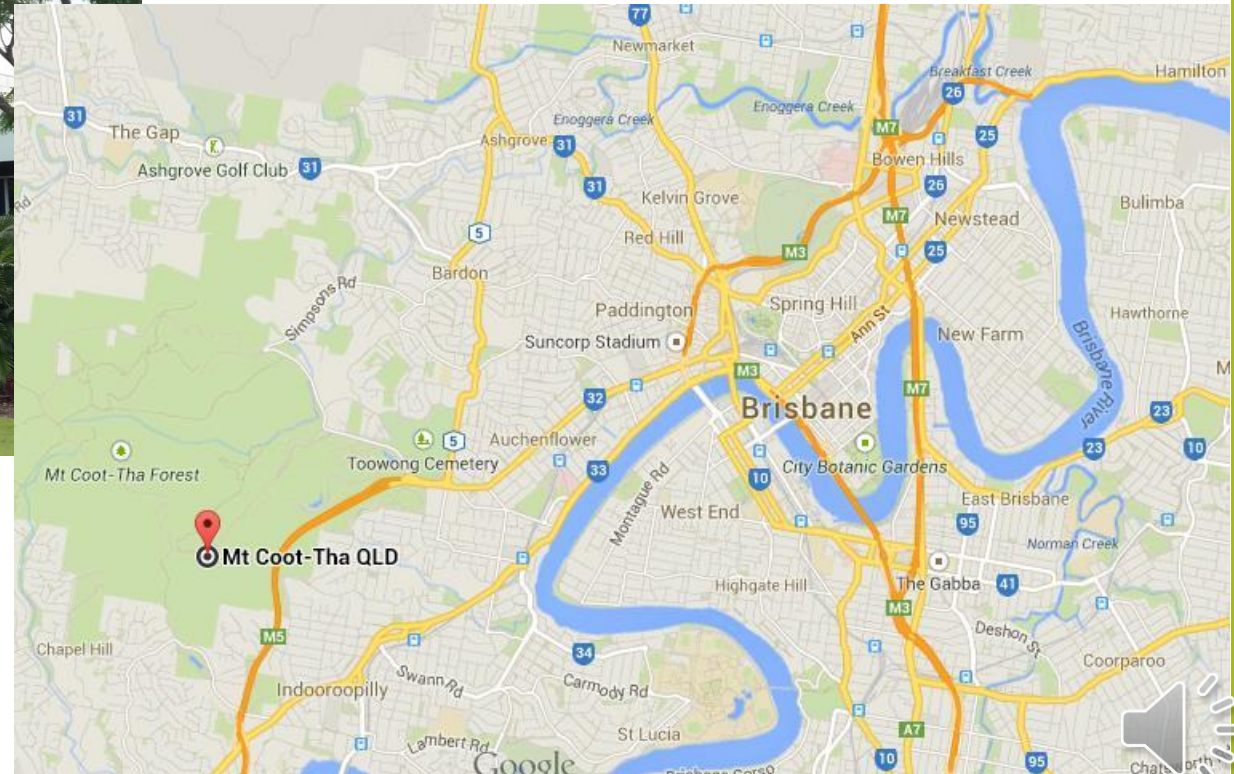


Volunteer at an herbarium



Queensland Herbarium, Mt. Coot-tha Botanic Gardens, Brisbane

<https://www.qld.gov.au/environment/plants-animals/plants/herbarium/>



Public resource for plant identification



Specimen mounting room



QUEENSLAND HERBARIUM (BRI)
Brisbane Australia

File of Queensland
Senna coroniloides (Benth.) Randell

Col. P.I. Forster PIF2416 17 APR 2015
Thomas M.B.
256 19m 34s 1604 26m 27s (20454) Depth m
(98,243734 7198550) (9947-447965) Alt. 429m

Bowen State Forest, S of the Edwinton - Theodore Road.
Woodland dominated by *Eucalyptus moluccana* and *E. viminalis*, tall
mossy of *Epiphyllum* mistle, drainage lines through uneven
ground, reddish clay loam, some red sandstone rocks
Dense 10-20m tall, foliage blue-grey; flowers yellow, full,
gingham.

Det. P.I. Forster APR 2015 194 Cassipinaceae
Dup.

* May be cited as computerized collection number
(Archival Paper) AQ 838617

QUEENSLAND HERBARIUM (BRI)
Brisbane Australia

AQ 838617

Name *J. Wang, T. Yi*
Coll. No. *5W0598*
Det. *Jian Wang*
Bot. Name *Rubus moluccanus*
Lat. ° 'S; Long. ° 'E Alt. *1100*
District *Cook*
Locality *Mt. Lewis, Greater Daintree
National Park.*
(GPS locality *16° 30' 46" S, 145° 16' 30" E*)
Habitat (landform, soil, assoc. veg., geological substrate)
On track side rainforest boundary
--AA--
+++--
VJFQ
Habit & Other Data
Climbing shrub. Flowers white
Voucher for
*DNA sample for KUN, Chinese
Academy of Sciences Yi 146*
Abundance *Common*



Hunter Valley Regional Botanic Gardens, NSW



<https://goo.gl/maps/5Y5sWgJnPhS2>

<https://www.anbg.gov.au/chabg/bg-dir/058.html>



Hunter Regional Herbarium

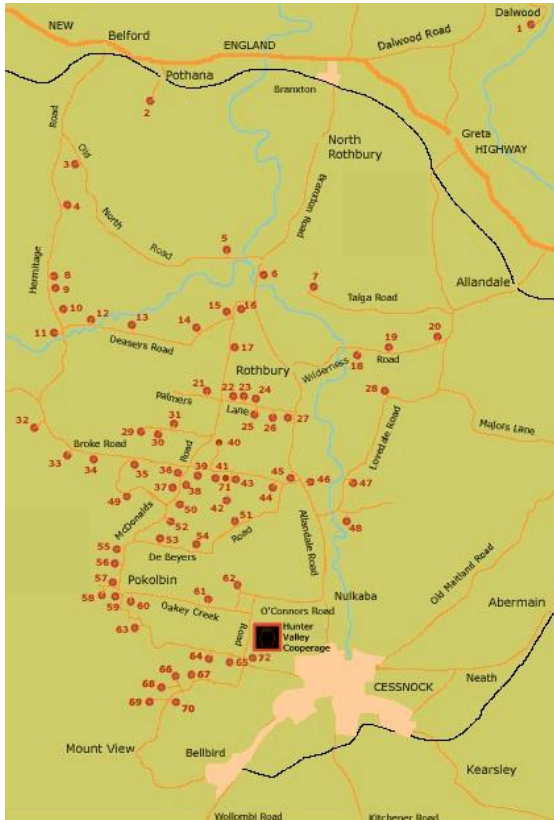


Herbarium curator at work.



Field study site

- Southern Cross Farm
 - 30 Lindsay Rd
 - Nth Rothbury, Hunter Valley region
 - New South Wales 2335. Australia



Persoonia linearis (Proteaceae)
Eucalypts in background.



Vegetation survey

Species check list. 2016-17

Andrew Pengelly

Southern Cross Farm, 30 Lindsay Rd, Nth Rothbury 2335.

Botanical Name	Family Name	Common Name	Voucher #	Hakea salicifolia		Willow-leaf Hakea	804	Brachyoloma daphnoides		Daphne heath	861	Exocarpus cupressiformis	Santalaceae	Native cherry		Parsonsia straminea	Apocynaceae	Silkpod
Eucalyptus agglomerate	Myrtaceae	Blue leaf stringybark	AP687	Hakea sericea		Hakea		Epacris calvertiana			751	Hibbertia riparia	Dilleniaceae		750	Sowerbaea juncea	Anthericaceae	Vanilla plant
E. punctata		Small-fruited grey gum	978	Acacia parvipinnula	Mimosaceae	Silver-stem wattle	692	Lissanthe strigosa ssp. subulata		Peach heath	762, 924	Hibbertia linearis	Orchidaceae	Blue caladenia	765	Styldia graminifolium	Styldiaceae	Grass triggerplant
E. fibrosa		Red Ironbark	921	A. falcata		Hickory wattle	717, 770					Caladenia catenta		White fingers	778	Verbena rigida	Verbenaceae	Veined verbena
E. parramattensis Subsp. decadens		Parramatta red gum	705	A. elongata			727	Pultanea cunninghamii	Fabaceae	Eggs & bacon	747	Caladenia catenta		Black-tipped greenhood	768	V. litoralis		Coastal verbena
Angophora floribunda		Rough-bark apple	699; 977	A. podalyriifolia		Qld silver wattle	724	Dillwynia elegans			700	Diuris sulphurea		Tiger orchid		Cayratia clematidea	Vitaceae	Slender grape
Corymbia maculata		Spotted gum	708; 696	Allocasuarina torulosa	Casuarinaceae	Forest oak	704	Oxylobium ilicifolium		Prickly shaggy pea	755	D. dendroboides		Red bearded orchid	866	Sebaea ovata	Gentianaceae	Yellow century
Lophostemon conferta		Brushbox	920	Lycium feroicissium	Solanaceae	African boxthorn	703	O. pulteneae			888	Calochilus padulosus		Onion orchid	890	Centaurium tenuiflorum		Century
Leptospermum parvifolium		Tea tree	689, 754	Solanum nigrum		Black nightshade	777	Daviesia squarrosa			757	Microtis uniflora	Rhamnaceae	Bitter Cryptandra	725	Pandorea jasminoides	Bignoniaceae	Bower vine
L. polygalifolium		Tantoo, jellybush	697, 797, 860	S. radicans			939	Hardenbergia violacea		False sarsaparilla	769	Cryptandra amara var. amara		Cryptandra				
L. petersonii		Lemon-scented tea tree	955	Pimelea linifolia	Thymelaceae	Rice flower	698	Kennedyia rubicunda		Dusky coral pea	767	Romulea rosea var. australia	Iridaceae	Onion grass	766	Jacaranda mimosifolia		Jacaranda
Callistemon pinifolius		Pine-leaved bottlebrush	695, 898	Ludwigia peploides	Onagraceae		691				772	Patersonia sericea		Native iris		Hypericum gramineum	Clusiaceae	Small St. John's wort
Syncarpia glomulifera		Turpentine		Nymphaea caerulea	Nymphaeaceae	Cape waterlily		Mirbelia pungens			800	Sisyrinchium micranthum		Blue pigroot	851	Schinus molle	Anacardiaceae	Peppercorn tree
Melaleuca nodosa		Paperbark	710, 805	Philydrum lanuginosum	Philydraceae	Frogmouth	945	Glycine clandestina			773	Pittosporum undulatum	Pittosporaceae		780	Dendrophthoe vitellina	Loranthaceae	
M. alternifolia		Tea tree	918	Cyperus polystachos	Cyperaceae		694	Vicia sativa		Common vetch	773	P. rhombifolium			937	Platysace ericoides	Apiaceae	
M. linearifolia		Snow in summer	919	C. sesquiflorus			959	Jacksonia scoparia		Dogwood	795	Billardia scandens		Apple berry	774			
Calytrix tetragona		Fringe myrtle	752, 798	Schoenoplectus mucronatus		Bog bulrush	711	Hovea lanceolata			730	Xanthorrhoea glauca	Xanthorrhoeaceae	Grass tree		Parentucellia latifolia	Orobanchaceae	Red bartisia
Micromyrtus ciliata			913	Gahnia aspera		Saw sedge	722	Robinia pseudoacacia		Blackthorn	857	Lomandra longifolia	Lomandraceae	Spiny-headed mat-rush	854	Pratia purpurascens	Lobeliaceae	White root
Kunzea ambigua		Tick bush	907	Drosera peltata	Droseraceae	Sundew	707, 753	Breynia oblongifolia	Euphorbiaceae	Coffee bush	715	L. multiflora			862			
Backhousia myrtifolia		Cinnamon myrtle	925	Drosera pygmaea			853	Phyllanthus tenellus		Hen and chicken	713	L. filiformis ssp. coriacea			889	Xyris complanata	Xyridaceae	
Syzygium australe		Brush cherry	938	Themeda triandra	Poaceae	Kangaroo grass	693	Poranthera microphylla			870	L. gracilis	Brassicaceae	Common cress	855	Haloragis heterophylla	Haloragaceae	Rough raspwort
Persoonia linearis	Proteaceae	Narrow-leaf geebung	685	Setaria sphacelata		S. African pigeon grass	702	Chrysocephalum apiculatum	Asteraceae	Yellow buttons	701	Cardamine paucijuga		Lesser swinecress	794	Denhamia silvestris	Celastraceae	
Grevillia montana		Spider flower	686	Lepidosperma sp.			714	Ozothamnus diosmifolius		White dogwood	775	Coronopsis didymus	Campanulaceae	Tufted bluebell	781, 865	Hypericum gramineum	Clusiaceae	Small St John's wort
G. robusta		Silky oak	902	Chloris sp		Windmill grass	702	Macrozamia flexuosa	Zamiaceae			Silene gallica	Caryophyllaceae	French catchfly	793			
				Melinis repens		Natal red grass	779	Mitrascame elsinoides	Loganaceae		706	Petrorhagia nanteuillii		Proliferous pink	771			
				Briza maxima		Quaking grass		Goodenia paniculata	Goodeniaceae		718, 900	Dodonaea viscosa ssp. angustifolia	Sapindaceae	Hopbush	803			
				Briza minor		Shivery grass					852	Dianella caerulea	Phormiaceae	Blue flax lily	864			
				Cassytha glabella	Lauraceae	Slender devil's twine	709											
				Pomax umbellata	Rubiaceae		712											



Herbarium collection

Botanical Name	Species	SubSpecies	Family Name	Common Name	Voucher #	Date	Habitat	Place
Acacia	buxifolia		Mimosaceae	Box-leaf wattle	814			Grenfell
Acacia	concurrans		Mimosaceae	curracabah	729		Roadside planting	Greta
Acacia	dorotoxylon		Mimosaceae	Currawang	827			Grenfell
Acacia	elongata		Mimosaceae		727	21/7/16		Rothbury
Acacia	falcata		Mimosaceae	Hickory wattle	717; 770			Rothbury
Acacia	linearifolia		Mimosaceae		749			Rothbury
Acacia	longifolia		Mimosaceae	Coastal wattle	740			Port Macquarie
Acacia	parvipinnula		Mimosaceae	Silver-stem wattle	692			Rothbury
Acacia	podalyriifolia		Mimosaceae	Qld. Silver wattle	724		Cultivated	Kurri Kurri
Acacia	ulicifolia		Mimosaceae	Prickly Moses	746			Rothbury
Agonis	flexuosa		Myrtaceae	Willow myrtle	896	28/10/16	Cultivated	Rothbury
Ajuga	australis		Lamiaceae	Native bugle	872	15/10/16		Merriwa
Allocasuarina	torrulosa		Casuarinaceae	Forest oak	704			Rothbury
Amyema	pendula		Santalaceae	Mistletoe	683			Grenfell
Angophora	floribunda		Myrtaceae	Rough-bark apple	699	14/4/16		Rothbury
Backhousia	myrtifolia		Myrtaceae	Cinnamon myrtle	925	23/11/16		Rothbury
Billardiera	scandens		Pittosporaceae	Apple berry	774	2/9/2016		Rothbury
Boronia	pinnata		Rutaceae	Pinnate Boronia	785	9/9/2016		Mt. White
Brachyloma	daphnoides		Ericaceae	Daphne heath	861	6/10/2016		Rothbury
Brachyscome	multifida		Asteraceae	Cut-leaf daisy	792	11/9/2016		Rothbury
Brachyscome	spp.		Asteraceae	Burr daisy	806			Grenfell
Breynia	oblongifolia		Euphorbiaceae		715	1/5/2016		Rothbury
Bursaria	spinosa		Pittosporaceae	Blackthorn	726			Payne's Crossing
Caladenia	catenta		Orchidaceae	White fingers	778	6/9/2016		Rothbury
Callistemon	pinifolius		Myrtaceae	Pine-leaved bottlebrush	695; 898; 901			Rothbury
Callitris	endlicheri		Cupressaceae	Cypress pine	684			Grenfell
Calytrix	tetragonia		Myrtaceae	Fringe myrtle	752; 798	31/3/16; 17/8/16		Rothbury
Cassinia	laevis		Asteraceae	Cough bush	688			Grenfell
Cassinia	trinerva		Asteraceae		926	24/11/16		Elands
Cassytha	glabella		Lauraceae	Devil's twine	709			Rothbury
Cayratia	clematidea		Vitaceae	Slender grape	917	13/11/16		Rothbury
Centaurium	tenuiflora		Gentianaceae	centuary	940	8/12/2016		Rothbury
Chamaecytisus	palmensis		Fabeaceae	Tree Lucerne	833			Grenfell-Adelargro Rd
Chloris	sp.		Poaceae	Windmill grass	702			Rothbury
Chrysocephalum	apiculatum		Asteraceae	Yellow buttons	701	14/4/16		Rothbury
Chrysocephalum	semicalvum		Asteraceae		884	16/10/16		Merriwa
Centaurium	tenuiflorum		Gentianaceae	centuary	940	8/12/2016		Rothbury
Cissus	hypoglauca		Vitaceae	Native grape	927	25/11/16		Elands
Clematis	glycinoides		Ranunculaceae	Headache vine	732			Port Macquarie



Calytrix tetragona – fringe myrtle (Myrtaceae)



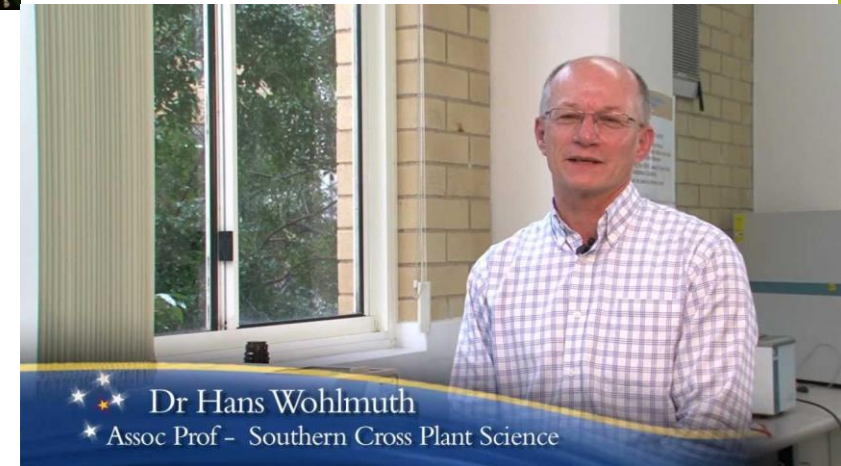
Callistemon pinifolius – bottlebrush (Myrtaceae)



Southern Cross University, Lismore NSW



Medicinal plant herbarium



<https://www.youtube.com/watch?v=eom7j4pacX8>



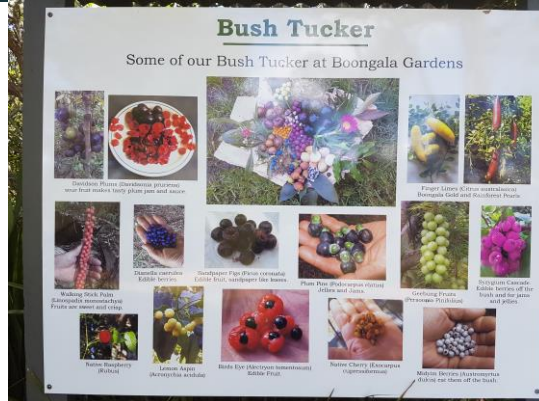
Field botany in Sydney



Herbalist at Farmer's Market, Sydney



Boongala Gardens



Citizen science project

THREATENED SPECIES INFORMATION



Persoonia pauciflora

Conservation status

Persoonia pauciflora P.H. Weston is listed as an Endangered Species on Schedule 1 of the New South Wales Threatened Species Conservation Act 1995.

Description

P. pauciflora is a newly discovered species which has recently been formally described (Weston 1999). It is a small spreading shrub, 0.1-1.4m high, 0.4-2.0m wide, with bright green needle-like leaves which are moderately hairy when immature. *P. pauciflora* closely resembles *P. Isophylla* and to a lesser extent *P. pinifolia*, but is distinguished by its inflorescence which is fewer-flowered and shorter (Weston 1999).

Distribution

P. pauciflora has an extremely restricted distribution. All known individuals occur within 2.5km of the original or "type" specimen, which was recorded near North Rothbury in the Cessnock Local Government Area.



http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=67214
<https://www.lwppropertygroup.com.au/docs/default-source/huntlee/persoonia-3.pdf?sfvrsn=0>



Another endangered plant



Pokolbin Mallee - profile

Indicative distribution

The areas shown in pink and purple are the sub-regions where the species or community is known or predicted to occur. They may not occur throughout the sub-region but may be restricted to certain areas. ([click here](#) to see geographic restrictions). The information presented in this map is only indicative and may contain errors and omissions.

Scientific name: *Eucalyptus pumila*

Conservation status in NSW: Vulnerable

Commonwealth status: Vulnerable

Profile last updated: 20 Apr 2016

Description

A mallee-form eucalypt to 6 m high with smooth bark that sheds completely from stems in strips; bark coppery in colour, but weathering to greyish. Juvenile leaves are ovate, up to 12 cm long and 6 cm wide. Adult leaves are lanceolate to falcate, up to 16 cm long and 2.5 cm wide, glossy green both sides. Inflorescences (groups of flowers, buds or fruits) form in angle between the stem and leaf and are 7-flowered. Buds are stalked, up to 12 mm long and 9 mm in diameter. Flowers are white. Fruit are hemispherical, with a short stalk, 6 – 7 mm long and 7 – 9 mm in diameter, with four exerted valves.

Distribution

Currently known only from a single population west of Pokolbin in the Hunter Valley



Local Organizations

- Australian Plant Society
 - Hunter Valley Branch (Secretary)
 - Meetings, field days
 - Parry's Native Flower Nursery
 - Journal
 - Native Plants of New South Wales
 - Australian plants

<http://www.hunterorganicgrowerssociety.org.au/>

- Hunter Organic Growers Society
 - Field days
 - Macquaridale Biodynamic Wines
 - Limestone Permaculture
 - Riverdell Nursery

<http://anpsa.org.au/>





<http://www.sydneyfungalstudies.org.au/Intro.html>

- Field Days
- Lab i/d training
- Annual conference



Hericium erinaceus



Werrikimbe National Park



Tasmannia insipida
Brush pepperbush



Hoppy's Lookout.

Granite outcrop >3,600ft. Overlooks ranges and valleys cloaked in rain forest and wet sclerophyll forests.

The trip was organized by the National Parks Assn. of NSW local bushwalking club.

Sloanea woollsii

Yellow carabeen

Signature tree – NSW rainforests



Dorrigo National Park

<http://www.nationalparks.nsw.gov.au/visit-a-park/parks/dorrigo-national-park>



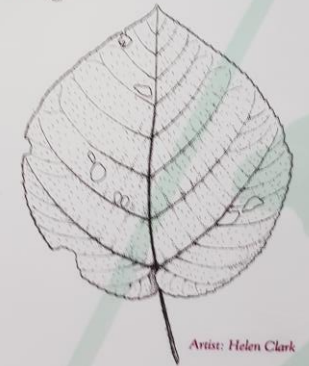
Crystal Shower Falls



World Heritage Rainforest Site

Look don't touch

The giant stinging tree (*Dendrocnide excelsa*) behind this sign is best viewed from a distance. It has fine stinging hairs on the leaves, shoots and branchlets. Beware, even fallen leaves can sting!



Artist: Helen Clark



Myall Lakes



Broadwater with paperbarks – *Melaleuca quinquinervia* (Myrtaceae)



Gompholobium latifolium (Fabaceae)



Tripladenia cunninghamii (Colchicaceae)



Ziera smithii (Rutaceae)



Caladenia quadrifaria (Orchidaceae)



Ethnobotany



Muelleria

Plant, Algal and Fungal Taxonomy and Systematics

Vol 34, 2015-2016

Plate LXVI



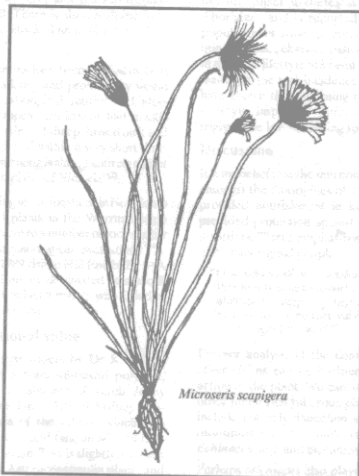
Microseris lanceolata (Walp.) Sch.Bip. (as *Microseris forsteri* Hook.f.)
Source: State Botanical Collection
Illustration: W.H. Fitch (1860)
Murnong or Yam Daisy (*Microseris walteri* Gand.) has long been recognised as an important food plant of Aboriginal people of southern Australia. The characteristic pump, annually replaced tubers were eaten raw or cooked. Other species, *M. scapigera* and *M. lanceolata*, have cylindrical and branched roots. Their use as food plants is largely unknown.

Aust. J. Med. Herbalism Vol 2 (1), 1990

Australian medicinal plants

Microseris scapigera – tonic food plant of the aborigines

Andrew Pengelly ND DBM MNHAA
Past Senior Lecturer in Herbal Medicine, Nature Care College, Sydney



Abstract

Microseris, commonly known as the daisy yam, is a perennial Australian herb which has attracted much attention from botanists and anthropologists due to its use as a staple food by Aborigines in a number of Australian states.

Botany

Microseris is a member of the Asteraceae family and is classified in the small sub-family Cichorieae, also known as Lactuceae or Liguliflorae. This sub-family contains well known medicinal plants as dandelion (*Taraxacum officinale*), chicory (*Cichorium intybus*), mouse ear (*Heteracium pilosella*), sow thistle (*Sonchus oleraceus*) and lettuce (*Lactuca sativa*). They are distinguished from other Asteraceae by their ligulate or ray florets and absence of tubular or disc florets. Another characteristic is the presence of white latex and absence of essential oils⁽¹⁾.

In appearance *Microseris* resembles the dandelion and the common catsear (*Hypochaeris radicata*), although its flower

shape, whilst bright yellow, more closely resembles the chicory. The tubers, which often occur in pairs, are described by Gott as "resembling a small round radish or tapering carrot, white to dark brown on the surface, whitish or semi translucent inside, and crisp in texture"⁽²⁾.

Historical use by aborigines

Known as "murnong" to the Victorian Aborigines, the tubers were either eaten raw or roasted in baskets and formed a staple item of diet⁽³⁾.

Beth Gott of the Botany Department at Monash University, has written a lengthy study of murnong, which included a list of dozens of ethnographic records from Victoria, New South Wales and South Australia⁽⁴⁾. One of the earliest written records comes from the explorer Major Mitchell, who wrote the following observation at Bogen River, New South Wales, in 1839:

Aust. J. Med. Herbalism Vol 2(1), 1990

"There is a small cichoraceous plant with a yellow flower named tao by the natives, which grows in the grassy places near the river, and on its root the children chiefly subsist. As soon almost as they can walk, a little wooden shovel is put into their hands, and they learn thus early to pick about the ground for those roots and a few others"⁽⁵⁾.

Natural and current distribution

Microseris used to grow over a wide area of Southern Australia. Its limits appeared to be the arid centre, the Great Dividing Range to the East, and the sub-tropical regions with summer rainfall. There is also an alpine form but it lacks the tuberous rootstock. The lowland varieties are dormant in the summer⁽²⁾.

The effects of Aboriginal gathering have been studied by Gott who concluded that "its abundance and productivity would probably have increased by Aboriginal activity"⁽⁶⁾. Unfortunately the influence of European settlement had drastic consequences on murnong. Cattle and sheep thrived on it and its numbers were severely depleted within a very short time, and Gott reports that today "murnong is almost entirely absent from the western and northern plains of Victoria"⁽²⁾.

I have observed the plant growing in two locations in New South Wales, the first were isolated plants in the Warrumbungle region near Coonabarrabran close to a number of rock shelter and cave sites undergoing archaeological excavation. The second was on the November 1989 visit to Hill End by NHAA members. The hills over Hill End are dominated by mullock heaps and *Microseris*. At least unlucky miners who failed to find gold nuggets didn't have to starve.

Constituents and nutritional value

An initial analysis of *Microseris* tubers by Dr K. O'Dea confirmed the presence of a fructose-based polymer, presumed to be inulin, and the absence of starch. Jenny Brand and co-workers at the University of Sydney conducted a quantitative analysis of the tubers, which also contain small amounts of protein and fats, and found they provide 264 kJ of energy per 100 gm. This is slightly less than Jerusalem artichoke (another Asteraceae/inulin plant) and nearly 80% of the energy value of the potato⁽⁷⁾. Further, inulin has demonstrated immunostimulatory properties via activation of the alternate complement pathway⁽¹⁰⁾.

More nutritional and pharmacological data are needed before we can properly assess the true therapeutic potential of this plant. At this point we can compare the properties of the closely related plants mentioned above. In the chemical review of the Lactuceae (or Cichorieae) sub-family by Gonzalez, sterols and flavonoids figure strongly in most species examined. Carotenoids, fatty acids, and polyacetylenes were also present⁽¹⁾.

Fructans and diabetes

Inulin is a carbohydrate which consists of 20–30 units of the monosaccharide fructose, and is tolerated better by diabetics than other carbohydrates⁽⁸⁾. Similar fructans are found in the Graminae family eg couch grass. Small amounts of glucose are found in inulin⁽⁹⁾.

Much attention has been directed in recent years to the

reconstruction and analysis of traditional diets of tribal Aborigines⁽⁹⁾. Most Australian plant foods tend to be high in complex carbohydrates and fibre. Fructan containing foods are also prevalent. While humans lack the necessary enzymes to digest fructans, it is believed that bacteria in the colon break them down to short chain fatty acids, and these have been shown to inhibit liver glucose production in animals⁽⁷⁾. In this way inulin may protect against diabetes in humans, whilst providing a sweet tasting source of kiloJoule energy.

Mature onset diabetes is a major problem amongst Aborigines and is reported to be as high as 25% of the population in urban communities⁽⁹⁾. A combination of unique metabolic characteristics along with a dramatic change in diet and lifestyle has been postulated as the main factors leading to the high incidence. Studies carried out by O'Dea have shown that returning to a more traditional diet and lifestyle improves glucose tolerance and stabilizes triglyceride levels, leading to a reversal of diabetes⁽⁹⁾.

Discussion

It is my belief that the murnong was an important tonic plant amongst the Aborigines of southern Australia. Certainly it provided nourishment in kiloJoule terms, and probably provided protection against diabetes and other metabolic disorders. Tierra emphasizes the role of tonic foods in the diet of aboriginal peoples:

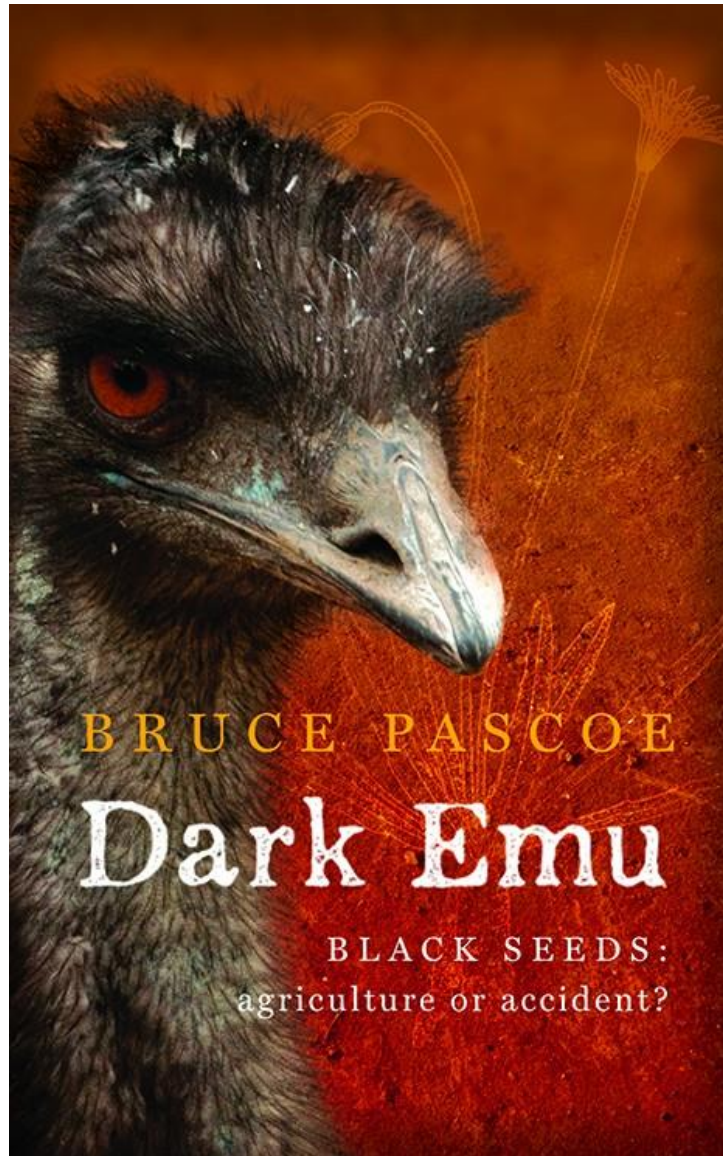
"Most wild foods are considered tonic. It is considered that they may be able to impart to those who digest them their abilities to adapt to their natural environments, thus helping to counteract various physiological as well as psychological stresses"⁽⁹⁾.

Further analysis of the constituents are required before other claims can be justified concerning the therapeutic action of the plant. We can at least draw comparisons with other inulin rich tuberous plants of the Asteraceae. These include not only dandelion and chicory, but also stronger immunostimulants such as burdock (*Arctium lappa*), *Echinacea* spp, and eclempane (*Inula helenium*).

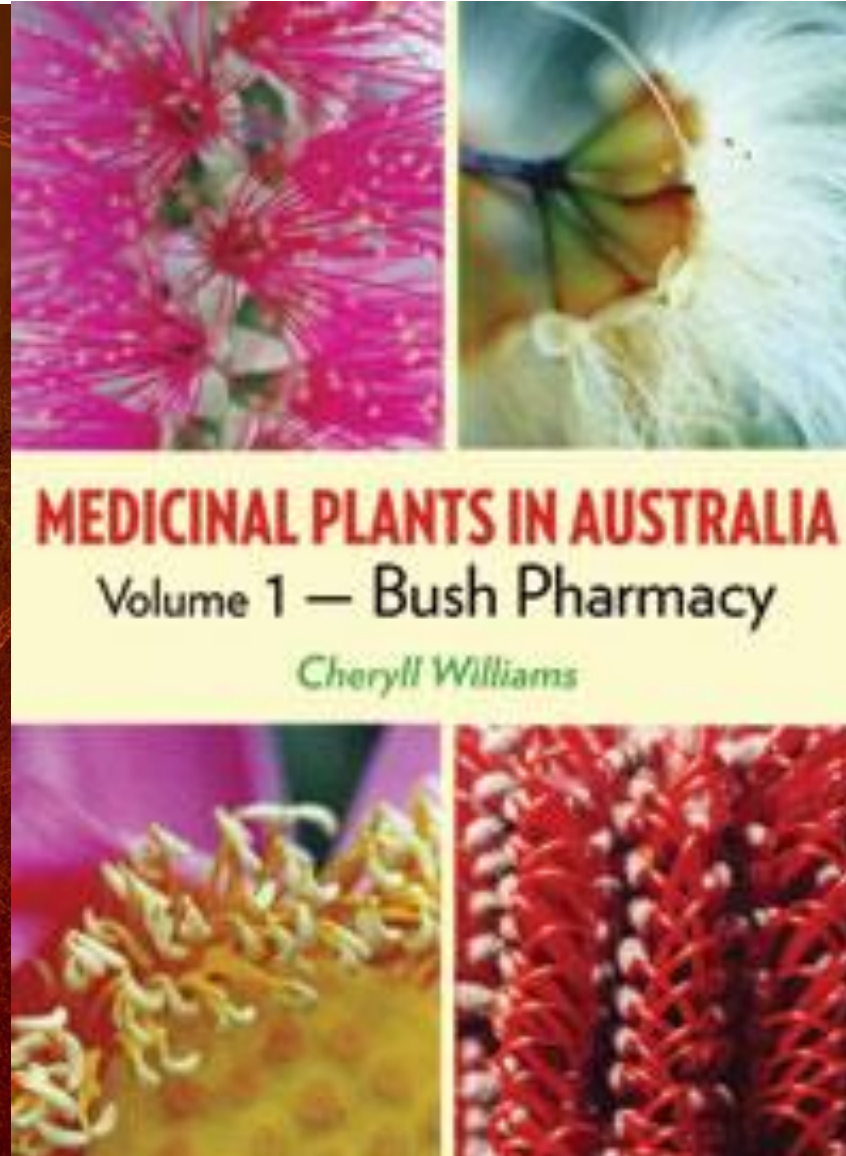
Perhaps *Microseris* also played a role in maintaining resistance against infections.

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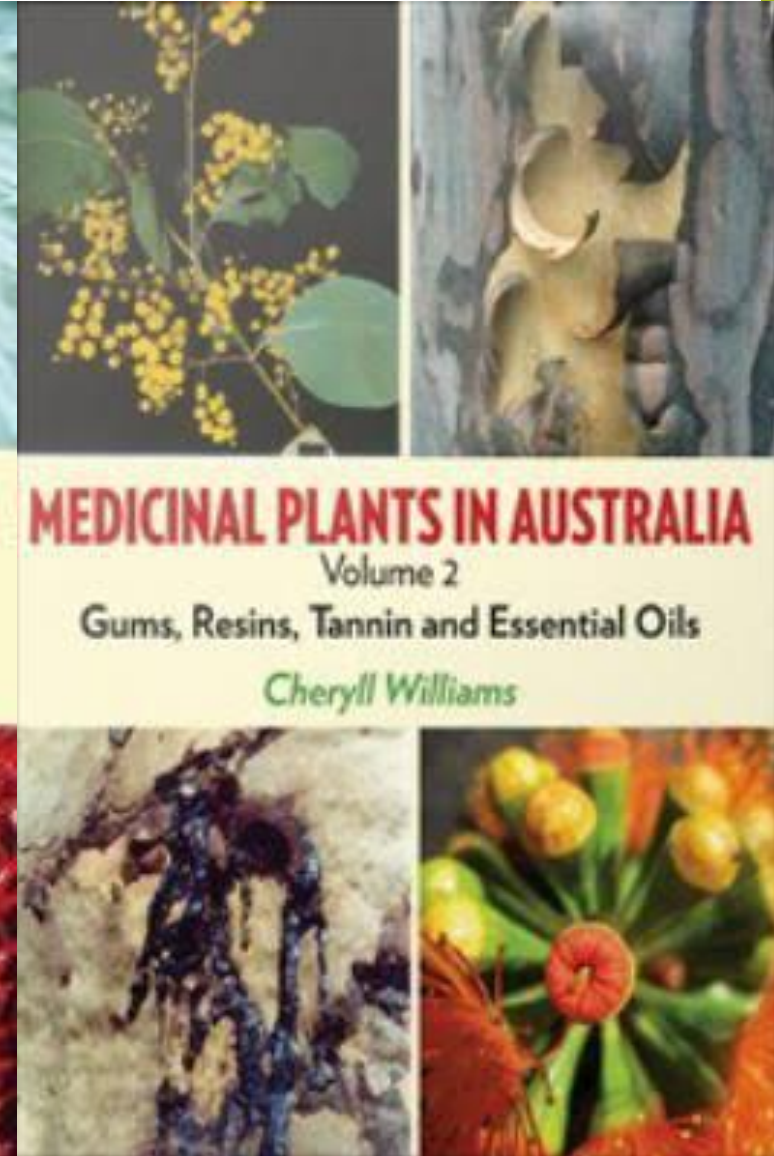
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Aromatic plants and aromatherapy

Lemon Myrtle: *Backhousia citriodora*

B. citriodora, known as lemon-scented myrtle and lemon ironwood is a sub-tropical tree, it's distributed restricted to SE Queensland - particularly in the Eumundi-Gympie area. However it is widely cultivated across Eastern Australia

It is a tall evergreen with dense foliage, and covered by terminal clusters of white staminate flowers during summer



https://commons.wikimedia.org/wiki/File:Gardenology.org-IMG_2281_rbg11jan.jpg



Eucalyptus oil profiles

Genus	Species	Common name	Major constituent	Minor constituents
<i>Eucalyptus</i>	<i>globulus</i>	Tasmanian blue gum	1,8-cineole	a-pinene
	<i>radiata</i>	narrow leaf peppermint	1,8-cineole	a-terpineol citral
	<i>divers</i>	broad leaf peppermint	piperitone	phellandrene
	<i>polybractea</i>	blue mallee	1,8-cineole	p-cymene
	<i>stageriana</i>	lemon ironbark	citral	phellandrene
	<i>melliodora</i>	yellow box	1,8-cineole	a-pinene
<i>Corymbia</i>	<i>citriodora</i>	lemon scented gum	citronallal	citronellol



Eucalyptus melliodora (yellow box) planting at Stanley, Merriwa NSW



Leptospermum polygalifolium – tantoon, jellybush

- The original tea tree found at Port Jackson, used by early settlers for making tea
- Previously known as *L. flavescens*

Essential oil profile variation in subspecies (Brophy et al. 2000)

<i>L. polygalifolium</i> subspecies	Essential oil components
<i>polygalifolium</i>	α -, β - pinene
<i>montanum</i>	α -, β , and γ -eudesmol.
<i>howense</i>	
<i>cismontanum</i>	1,8 cineole
<i>transmontanum</i>	α - pinene spathulenol
<i>tropicum</i>	
<i>wallum</i>	



<https://www.flickr.com/photos/31031835@No8/6273629928/in/photostream/>

Brazilian cultivated plants recorded high levels of the sesquiterpene nerolidol (Demuner et al, 2011)



Kunzea ambigua – tick bush

- This is a shrubby species with white staminate flower heads, found in coastal and sub-coastal regions of SE Australia.
- Patents for Du Cane® Kunzea oil from Tasmania have been granted for Australia and 6 other countries

<http://ducanekunzeaoil.com/html-english/homePage.shtml>

- Chemical constituents (Thomas, Narkowicz, Jacobson & Davies, 2010):
 - α -pinene (48%)
 - 1,8-cineole (14.5%)
 - Sesquiterpenes: variable levels of globulol (to 22%), viridifloral (to 38%)
- Kunzea oil is registered with the Australian TGA for the following conditions: can be used for:
 - the temporary relief of the pain of arthritis
 - relief of the symptoms of influenza
 - relief of muscular aches and pains
 - help in the relief of nervous tension, stress and mild anxiety
 - the temporary relief of the pain of rheumatism
- Use in aromatherapy
 - The aroma is described as fresh, spicy with a hint of cinnamon (Trevena, 2016). Pleasant with clean, fresh invigoration undertones (Webb, 2000)



<https://www.flickr.com/photos/22691568@No4/6926360760>

Blending essential oils

This species blends well with Eucalyptus oils, and with sandalwood oil to enhance the effectiveness for arthritic pain (Trevena, 2016).



MELALEUCA TRAIL



Travelling inland



- | | |
|-------------------------|--|
| 4. SARSPARILLA: | <i>Hardenbergia violacea</i> - An original plant from this site |
| 25. SCRIBBLY GUM: | <i>Eucalyptus rossii</i> - Scribbles on bark are made by a moth larva |
| 26. GRENELL GREVILLEA: | <i>Grevillea lanigera</i> (Grenfell Form) - Beautiful small Grevillea, yet to be brought into cultivation. Deep Pink & Cream flowers winter & spring |
| 27. MINT BUSH: | <i>Prostanthera ovalifolia</i> - Largest natural stand occurs Grenfell District with many colour forms |
| 28. MINT BUSH: | <i>Prostanthera</i> sp. - Unnamed species |
| 29. GOODENIA: | <i>goodenia globata</i> - An original plant from this site |
| 30. EARLY WATTLE: | <i>Acacia genistifolia</i> - An original plant from this site |
| 31. BROAD-LEAF HOPBUSH: | <i>Dodonaea viscosa</i> - Red or purplish fruit in summer |
| 32. VIOLET KUNZEA: | <i>Kunzea parvifolia</i> - Pink flowers in late spring |
| SMOOTH PEA: | <i>Swainsona gonocarpa</i> - Brick red flowers in spring & summer |



No 5. Quandong (*Santalium acuminatum*)

These small trees are semi - parasitic relying on roots of other plants to provide nutrients.

They are generally difficult to cultivate.

The small greenish flowers are followed by large, globular, shiny red fruits to 3.5cm in diameter and have a very high Vitamin C content.

The fruit can be made into jam, chutney, or pie filling, after adding a lot of sugar. The nut can also be eaten.

The seeds were once used as marbles and used in the game of Chinese chequers.



No 74. Nardoo (*Marsilea drummondii*)

The unusual plants are, in fact, true ferns and produce their spores in organs called sporocarps.

These hard structures, about the size of a pea, were gathered by Aborigines and ground into a flour to make bread. The leaves of these plants resemble four leafed clovers.

They grow in or near water to the west of Grenfell.

Nardoo was Burke and Wills' last meal.



Botanical art



<https://lynetteweir.com/linocut-australian-linocut-artist/australian-wildflowers-linocuts-artist-linocut/>



<http://www.nicoleberlachillustration.com/shop>



