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Australian Pea Flower Study Group

PEA MAIL

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Introduction

The newsletter is gradually evolving. In this issue, I am introducing a series of diagnostic features to aid identification and a new section to highlight ecological relationships. The relationships expose aliens and deception in the plant world.

A member has suggested enthusiasts of pea plants may be classified as 'pea-nuts'. I think it is quite appropriate. Thanks to the pea-nuts who tell us about their patch: Karlo Taliana from the East Hills Group in NSW gives us an account of the peas in the Georges River National Park, south of Sydney; Mike Beamish tells us about the bush peas of Boolarra in the Latrobe Valley, Victoria; and Tim Hayes tells us about peas in the Goulburn area and his discovery of a new species of *Dillwynia* several years ago.

Last year I tinkered with iNaturalist and I am now addicted to this network for sharing biodiversity information. My relationship with iNaturalist is symbiotic. I record and identify observations, and in return I learn what grows where and when species are flowering. I get notifications of all observations of pea flowers in Australia. I also follow other naturalists including members of this group and someone that takes amazing photos of dragonflies. Last month I racked up my first century of observations. It fits well with my pea passion.

Editor's Tip: Look out for links to webpages, in brown underlined text, so that you can find further information. Either click on the link or to open in a new tab, hold down the Ctrl key and click.

Shirley McLaran
Study Group Leader and Newsletter Editor

Platylobium formosum

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Peas in a Pod—An intro to fruit characters

Shirley McLaran

There isn't always a flower to help you recognise a plant, but if you know what to look for, you may be able to identify a pea genus by the fruit, that is, the pods. The size, the shape and the way pods open, aid in identifying the genus. Some of the diversity in fruit is shown here along with a few botanical terms to describe the fruit characters and opening mechanisms. This is by no means an exhaustive list. Think of it as a starter kit.

Daviesia apiculata

Triangular pod with single seed developing ◄

Dehiscent: opening at maturity to release seed ►

Hovea linearis

The swollen ovoid pods (immature) are clasped by a hairy brown calyx. Mature fruit are dehiscent.

Pultenaea daphnoides

Seeds have been released from the ovoid pods.

Sophora tomentosa

Pods are strongly constricted between seeds

Moniliform: resembling a string of beads

Tomentose: covered with dense intertwined hairs

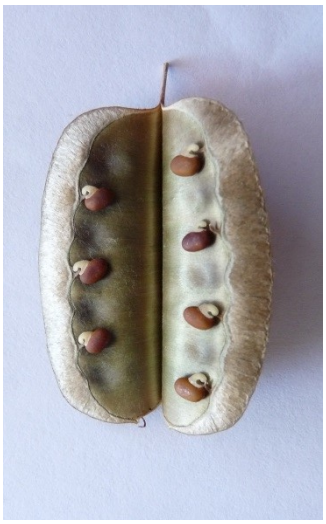
Indehiscent: not opening at maturity (released by predation or decomposition)

Genus	Fruit characters
Aotus	Ovoid, flat or inflated, usually hairy; seed without an aril
Bossiaea	Compressed, valves dehiscent on maturity; seeds have an aril (adj: arillate)
Daviesia	Triangular; compressed or inflated; seeds arillate
Dillwynia	Ovoid or globose; inflated; seeds arillate
Goodia	Oblong, compressed; seeds arillate
Gompholobium	Broadly ovoid or cuboid; seed without an aril
Hovea	Egg-shaped with two valves; inflated
Jacksonia	Ovoid or oblong; seeds without an aril
Mirbelia	Ovoid, inflated; longitudinally grooved
Oxylobium	Ovoid or oblong, inflated
Phyllota	Ovoid, inflated; one or two seeds without an aril
Platylobium	Flat, oblong, winged on the upper join; 2 valves roll back on maturity; seeds arillate
Pultenaea	Ovoid, flat or inflated; rarely more than 2 seeds; seeds have an aril
Sphaerolobium	Small, globe-like, stalkless

Platylobium formosum

Broad flat oblong pod with undeveloped seeds (left). Inside of pod containing seeds with arils (centre). Dehisced pod with valves rolled back displaying stalks where seeds were attached (right).

Aril: a fleshy appendage that assists in dispersal by encouraging animals to transport the seed



Click here for the glossary of botanical terms from PlantNET (The NSW Plant Information Network System).

Woolcock, D. (1989), A Fieldguide to Native Peaflowers of Victoria and Southeastern Australia, Kangaroo Press in association with The Society for Growing Plants-NSW, Kenthurst, NSW.

Pea flowers of the Georges River National Park — Karlo Taliana, NSW

Karlo Taliana is a member of the Australian Plants Society NSW, East Hills Group. All photos by Karlo. (Reproduced from APS NSW enewsletter Jan-Feb 2021)

Most of my walking is spent around the Picnic Point area (Ed: Picnic Point is about 25kms south west of Sydney CBD on the northern bank of the Georges River) where some of the greatest general flora diversity exists. Each year, our local pea flowers decorate the bush with a variety of colours while also providing a valuable food source for insects. As the seasons roll by, each species steps forward on cue followed by others when their turn arrives often avoiding competition for pollinators. From my observations, pea flower regeneration in our local bushland appears to be highly successfully judging by the number of heavily-pollinated specimens.

Australian peas belong to the Fabaceae family (subfamily Faboideae). Our local pea species are mostly small shrubs although some can be climbers, scramblers, groundcovers or even larger tall shrubs. Our current species list includes:

- *Bossiaea ensata, Bossiaea heterophylla, Bossiaea prostrata*
- *Daviesia acicularis, Daviesia alata, Daviesia corymbosa, Daviesia uilicifolia*
- *Dillwynia retorta, Dillwynia rudis, Dillwynia sericea*
- *Glycine clandestina, Glycine tabacina*
- *Gompholobium glabratum, Gompholobium grandiflorum*
- *Hardenbergia violacea*
- *Hovea heterophylla*
- *Indigofera australis*
- *Jacksonia scoparia*
- *Kennedia rubicunda*
- *Mirbelia rubiifolia, Mirbelia speciosa*
- *Phyllota phylicoides*
- *Pultenaea daphnoides, P. flexilis, P. hispidula, P. retusa, P. stipularis, P. villosa, P. tuberculata*
- *Viminaria juncea.*

Bossiaea heterophylla (Variable Bossiaea) is one of our first peas to flower each year starting in autumn. It grows as an upright open shrub to one metre with flattened stems bearing large yellow and brown flowers.

Bossiaea heterophylla

Bossiaea heterophylla with bee

Pea flowers of the Georges River National Park (continued)

Daviesia acicularis is probably our rarest pea flower. Aside from just two plants in local government reserves north of the Georges River, there were only a few plants known to exist at Picnic Point in 2019. Unfortunately, two perished in the drought of 2019 while another four were destroyed with the widening of fire trails. Only two known plants remain in the laterite areas on Picnic Point ridge. The phyllodes (leaves) of this species are very sharply-pointed while the margins are also toothed making it one of the most prickly native plants in our local area. The fruits of all *Daviesia* are triangular in shape. ►

Daviesia acicularis

Daviesia alata at Menai

◄ *Daviesia alata* is another rarely seen pea flower, although according to local flora experts, it is now presumed extinct north of the Georges River (having not been seen for over 15 years now, since last sighted at Picnic Point). It grows as a low groundcover shrub with stems having a triangular cross-section and its leaves reduced to scales. There are very few specimens remaining south of the Georges River at Menai on the laterite areas and these are also under threat due to poor land management such as clearing and the dumping of mulch.

Pea flowers of the Georges River National Park (continued)

Dillwynia retorta (Eggs & Bacon) is by far our most common pea flower species with populations found widespread across all sections of the Georges River National Park. From early spring, the profusion of yellow and red pea flowers can be seen, although some plants will only have plain yellow flowers, but these are seldom seen. The majority grow as shrubs up to two metres high but low-growing forms may also occur.

Dillwynia retorta (Eggs and Bacon) at Picnic Point, Georges River National Park

Dillwynia retorta with yellow flowers at Illawong

Gompholobium grandiflorum (Large Wedge-pea) is a species common in the Sydney region and the Blue Mountains. It grows as an erect shrub to one metre bearing large yellow flowers. Like other pea flowers, the stamens are enclosed within the 'keel' portion of the flower but that doesn't stop the local native bees from knowing where to look. Look closely for the pollinators in the photos below.

Gompholobium grandiflorum keel

Gompholobium grandiflorum keel opened by pollinator

Pea flowers of the Georges River National Park (continued)

Late in the flowering season, non-pollinated pea flowers will release their stamens to ensure pollination occurs. See photo below of *Bossiaea heterophylla* with stamens released from the keel.

Bossiaea heterophylla with stamens released from keel

Hardenbergia violacea (along with another locally-occurring pea, *Kennedia rubicunda*) is quite clever as it has the ability to both climb or creep depending on where the plant initially germinates. If it has nothing around to climb, then it has no choice but to creep until it does find an erect shrub. Even when it is seen to creep over large areas, at flowering time it will hold the flowering stems erect vertically to increase its chances of attracting pollinators.

Hardenbergia violacea at Sandy Point,

Pea flowers of the Georges River National Park (continued)

My favourite local pea flower is *Mirbelia speciosa*. To my knowledge, this species is limited to a particular section of Picnic Point, a fact that has been confirmed by local flora experts who have studied the Georges River National Park for over 30 years. Specimens have been also found in the Sutherland Shire but these occur in the Royal National Park. This species grows as a small shrub to a metre tall and has been seen to occur in three colour forms – pink, purple and rarely white.

Mirbelia speciosa, common purple form

With just a few local peas described here, these are just some of the treasures that can be found in the local bushland of APS East Hills Group. In an area that is also diversely-rich in Proteaceae and Myrtaceae, the many members of the subfamily Faboideae make up a significant part of this ecosystem. While many of us can enjoy the colours on display as they brighten up the landscape, more importantly, they play an important role in sustaining many of the local insect species with the agreement that they will return the favour through pollination.

Boolarra Bushland Peas

Mike Beamish, Vic

All photos by Mike Beamish.

Four species of Peas make their presence known in October in the local bushland, here in Boolarra, in the foothills of the Strzelecki Ranges, Latrobe Valley, Central Gippsland, Victoria. Of course they are here all the time, but for most of the year they blend in with all the other plants that have similar foliage, in size, shape and colour. However, for a few weeks around October, they reach the peak of their flowering and in a good year they will light up the bush around them, completely hiding their foliage under a flush of egg and bacon flowers. Most of the bushland consists of remnant Messmate Stringybark woodland on heavy grey/brown clay loams, interspersed with intermittently flowing fern gullies and the occasional rise topped with a thin layer of grey sand, good for small, heath-type plants. The Peas tend to grow on the mid-slopes, rarely in the thicker vegetation in the gullies and one species prefers the sandy rises.

The largest of the four is the Hop Bitter-pea *Daviesia latifolia,* which is scattered through the bushland and most often seen adjacent to roads and tracks, where is most obvious but also probably receives more direct sunlight. Most of the plants are about 2m tall and broad, but there are occasional larger plants to 3m and they can reportedly get up to 5m tall. A plant that size in the full flush of flowering would be absolutely spectacular!

it

of

Daviesia latifolia (Above and left)

Most widespread throughout the bushland is the Prickly Bush-pea *Pultenaea forsythiana*, which grows on the slopes from the ridge-tops down to the edge of the gullies. It seems to like its own company, as it tends to grow in clumps of a few to dozens of plants. I wonder if they are suckering or just self-seeding around an ever-expanding parental group? The majority of plants are open and straggly to waist height

Boolarra Bushland Peas (continued)

with a few reaching shoulder height, less than 2m. The literature cites an upper limit of about 3m, but I haven't seen any of that size in the bushland.

This species seems to be a bit controversial! Most of the Australian Herbaria don't recognise this species as separate from *P. juniperina*, but the Melbourne Herbarium considers the Tasmanian, Grampians and West Gippsland plants significantly different from the eastern Victorian and NSW plants to separate the latter into *P. forsythiana*.

Pultenaea forsythiana

Probably just as widespread but nowhere near as obvious due to its smaller stature is the Golden Bush-pea *Pultenaea gunnii* subsp. *gunnii*. This one can get to 2m tall, but the largest I've noticed is about 60cm and most are well under that. It also manages to survive on some of the roadside verges in the district, those with a vestige of remnant vegetation that has withstood the ravages of "management" and weed invasion from the surrounding pastoral undertakings. At this time of year its golden spray catches the eye as you drive past. With its small round leaves and pretty little bunches of flowers, this is the one I'd most like to get into my garden.

Pultenaea gunnii subsp. *gunnii*

Boolarra Bushland Peas (continued)

Last but not least is the Smooth Parrot-pea *Dillwynia glaberrima*. This is the one that seems to stick to the ridge-tops that have a layer of grey sand on their caps. They grow to about shoulder height, 1.5m or so, and have lovely, soft foliage in an open, sometimes arching, habit. This would be my second choice from these local peas, for introduction to my garden, but it's hardly necessary when I can wander through my local patch at any time to see them.

Dillwynia glaberrima

There may well be other peas hiding in the Boolarra Bushland, that I haven't yet noticed – Running Postman *Kennedia prostrata* occurs nearby, as does Twining Glycine *Glycine clandestina*, so it is quite possible that there are more discoveries to be made down the track.

Donkey orchids masquerading as pea flowers

Shirley McLaran

Evidence suggests that nectarless donkey orchids mimic food rewarding pea flowers to attract pollinators. The orchids' flowering periods overlap with those of the pea flowers and the colour reflectance of the orchid flower is similar to that of yellow-red pea flowers. Solitary bees of the genus *Trichocolletes* confuse orchids for surrounding pea plants while they are foraging and collecting pollen. In their attempts to look for nectar, the bees transfer orchid pollinia, thereby pollinating the orchids without reward for their efforts.

A study observed pollinator behaviour on several species of the genus *Daviesia* (the model) and *Diuris brumalis* (the mimic) and the data indicated that *Diuris brumalis* shares the same pollinators with *Daviesia decurrens* and *Daviesia rhombifolia* in Jarrah woodland, and *Daviesia horrida* on granite outcrops.

Click on the link below to view The Australian Orchid Foundation's project page for more information.
https://www.australianorchidfoundation.org.au/308-2016/

D Scaccabarozzi, S Cozzolino, L Guzzetti, A Galimberti, L Milne, KW Dixon and RD Phillips. *Masquerading as pea plants: behavioural and morphological evidence for mimicry of multiple models in an Australian orchid.* 2018. Annals of botany 122, 1061-107.

Parasitism in Western Australian Peas

Shirley McLaran

Three pea genera host endoparasites of the genus *Pilostyles*. It is considered that each of the three genera host a distinct *Pilostyles* species, but the endoparasite may occur on several species within the host genus. For example, *Pilostyles collina* parasitises *Gastrolobium leakianum* and *Gastrolobium ebracteolatum. Pilostyles hamiltonii* only grows in plants in the genus *Daviesia,* and *Pilostyles coccoidea* in the genus *Jacksonia.* These are the only species of *Pilostyles* in Australia and they all occur in WA.

Endoparasites do not have stems, leaves or roots and obtain all their nutrients from the host. Pilostyles are only visible when the flowers and fruits emerge by erupting through the stem surface.

Click on the link below to read the article in The Conversation.

https://theconversation.com/the-mysterious-pilostyles-is-a-plant-within-a-plant-98767

Pilostyles hamiltonii
Photo by Kevin Thiele KRT3188 CC BY 2.0

Members are invited to share their interests in pea flowers so that we can get to know each other.

Below, Tim Hayes tells us about the peas in his area and his discovery of *Dillwynia glaucula*.

Tim Hayes

I live near Goulburn in the NSW Southern Tablelands. Have 30 acres not far from town. Ten pea species grow on the property; a yellow-flowered *Dillwynia sericea* is the most unusual – different to the usual red/yellow combination (Am probably the only member of the local APS group interested in the peas).

In our local area – say an hour's drive in any direction, there would be 55 pea species on my count. *Pultenaea* and *Daviesia* top the count of the genera represented at 9 species each. Under that, *Dillwynia* and *Bossiaea* have 7 each. At the bottom of the list, there are 9 genera which are represented by just one species. *Swainsona* and *Zornia* are two of these. All are shrubs with just two (*Jacksonia scoparia* and *Pultenaea flexilis*) capable of being tall shrubs. All are Spring-flowering except for *Bossiaea heterophylla* which flowers late March/early April. Favourite genus is *Dillwynia*.

I have been propagating them for quite some years mostly from seed; just this year I have commenced with cuttings. In the last few years, it has been difficult to collect seed with little set probably due to the dryness; this year should be different.

In November 1995 I was exploring the roadsides in the Windellama area south of Goulburn in Southern NSW. I came across a shrub in flower which had *Dillwynia* flowers. I had not seen it elsewhere and checked its characteristics with the *Dillwynia* key in the Flora of NSW Vol 2 (Gwen J. Harden).

It seemed to me that none of the species described in the key fitted my description of this plant. I took a specimen (with flowers) to the herbarium at the Botanic Gardens in Canberra and submitted it for identification.

When the result came back, the specimen was named as *D. ramosissima.* This species occurs in sandstone areas to the east of Goulburn from about Tallong north into the Southern Highlands and further. I was familiar with it. One of its features is spinescent branchlets. The plants I had encountered in Windellama did not have this characteristic and I felt that some other features were not shared either. The Windellama plants were much larger and while, of course, size is not a definitive indicator, it is a possible sign of real difference.

I contacted the herbarium again and questioned the identification. I also had a specimen (with seed pods) sent to the National NSW Herbarium at the Royal Botanic Gardens in Sydney – I did this through a friend, Harry Brian, whose name will be familiar to the older generation of NSW APS members. In his spare time, Harry volunteered at the herbarium. The name proposed by the herbarium was *Dillwynia sericea* – glabrous form. *D. sericea* is a fairly widespread plant in this region and one I was quite familiar with. I had to admit disappointment at the adjudication. In further discussions with personnel at the herbarium in Canberra, I got to meet highly-regarded botanist Michael Crisp (later honoured though the name *Dillwynia crispii*). His position was simple: the specimens presented were not described by the Dillwynia key from the Flora of New South Wales Volume 2.

Nothing happened for a while. I felt convinced that it should be recognised as a new species. I decided that I might approach the Botany department of one of the universities in Canberra. It was my belief that

Tim Hayes (continued)

it would provide a suitable subject for investigation by a student or staff member. Shortly after that, however, I suffered ill-health and was out of action for some months.

Not long after I started recuperation, I was contacted by a Peter Jobson who had taken on the task of revising the genus *Dillwynia* in NSW. I gave him the details of where I had found the species; it later emerged that similar plants were known from two other locations in southern NSW between Canberra and Cooma. Plants at neither site had been investigated fully or described. The colony I had found in Windellama was more extensive than those in the other occurrences. About mid 1998, it was published as a new species named *Dillwynia glaucula* by Peter Jobson and Peter Weston (principal author of the then-current *Dillwynia* key).

It was gratifying to know what I had found was a new species. One minor regret: if I had submitted a specimen with flowers to the RBG herbarium, then that would have been the holotype for the species. Ah well, you can't win 'em all!

> A holotype or 'type specimen' is the single specimen upon which the description and name of a species is based. It is usually kept in a museum or herbarium research collection. It pins down the defining features of that particular species.
>
> A 'type locality' is therefore the place that specimen was collected.
>
> Karen Thumm

Platylobium formosum Sm. — Handsome Flat Pea

Tribe:	Bossiaeeae
Derivation of Name:	*Platylobium* from Greek *platys*, flat or broad and *lobus*, a pod *formosum* from Latin *formosus*, beautiful
Description:	Showy spreading or upright shrub 1 to 2 metres high with yellow and red flowers to 1.5cm in Spring and Summer, and strongly-veined heart-shaped leaves to 5cm. Flat, oblong pods are 2 to 4cm long and the upper edge is winged. The pods are featured in the 'Peas in a Pod' article on page 2.
Distribution:	Open forest and heathland from Jervis Bay in NSW to south-east Queensland. Plants in Victoria and Tasmania formerly known by this name were reclassified in a revision of the genus by Thompson in 2011.
Conservation Status:	Not considered to be at risk in the wild
Cultivation:	Considered a hardy species for moist, shady sites. Requires good drainage. Propagate from seed following pre-treatment with boiling water.

Australian Native Plants Society, Australia (2020) *Platylobium formosum*. Retrieved from http://anpsa.org.au/p-for.html

Thompson, I.R. (2011), A revision of *Platylobium* (Fabaceae: Bossiaeeae). *Muelleria* 29: 54-172

Can you see the similarity?

Both of these organisms are named *Aotus* meaning 'without ears'. The plant genus is in reference to the lack of bracteoles compared with other pea genera, for example, *Dillwynia*, *Pultenaea* and *Phyllota*. The derivation of the animal genus is a little more obvious—their ears are difficult to see.

Aotus ericoides

Panamanian Night Monkey

The specific epithet of *Bossiaea scolopendria* is derived from the Greek word skolopendra, meaning a centipede or millipede. The species is commonly known as the Plank Plant.

News

New pea-nuts

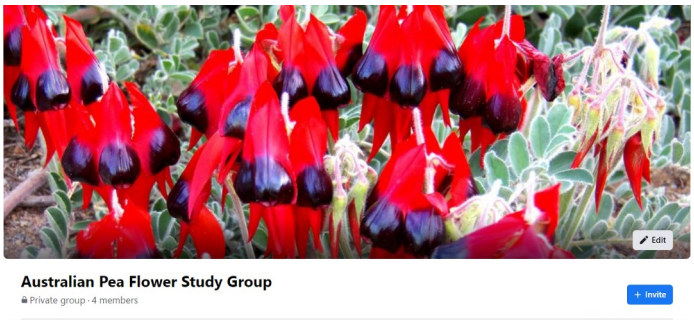
Nicole Beres, VIC

‘Members of the Fabaceae family are particularly beautiful, and I have always enjoyed admiring them, and now growing them. I grew my first Sturts Desert Pea last year from seed to bloom and ever since I have been excited to grow more. ‘

Andrew Mayo, WA

Facebook Group

The study group now has a facebook group to provide a place for members to share photos, discuss anything related to peas and communicate with other members in real-time. Only members will be permitted to join the group. Invitations will be sent shortly, but if you can’t wait, try searching for ‘pea flower study group’ and request to join. The photo of *Swainsona formosa* was taken by Kevin Stokes.



The group is private, meaning only members can see who's in the group and what they post, however, it has been made visible so that anyone can find the group and join if interested.

If you haven’t joined the group yet, the membership form is at the end of the newsletter. Please take a couple of minutes to fill out the form and email it to **fabpeamail@gmail.com**. The purpose of the form is to capture contact information and find out what interests you about pea flowers and where you are located. It will also help in moderating the facebook group.

Next Issue

Hovea is the genus to be featured in the next newsletter. The genus has around 40 species, all of which are endemic to Australia. The newsletter depends on contributions from members. I would love to hear of your experiences with growing Hoveas. Any photos of hoveas that you are prepared to add to the group photobank are also welcome.

Photo Credits

Photos relating to articles were provided by the author of that article unless otherwise stated. Other photos were provided by the editor unless otherwise stated.

Study Group Email

Please send newsletter contributions, suggestions, photos and any other correspondence to the study group email:

fabpeamail@gmail.com

AUSTRALIAN NATIVE PLANTS SOCIETY (Australia) Inc
ABN 56654053676

Australian Pea Flower Study Group

Website: http://anpsa.org.au/pea-flowerSG

MEMBERSHIP APPLICATION

Membership is open to all financial ANPSA members and is complimentary.

Newsletter distributed by email only.

To confirm your membership, please complete this form and return to: **fabpeamail@gmail.com**

Name		Suburb	
Email		State	
Phone		Post Code	
Branch/Region of which you are a member			

My interests in pea flowers are (tick as many boxes as you like and/or add your own):

Identification ☐ Cultivation ☐ Propagation ☐ Conservation ☐

Other:

If you have a favourite species or genus, please share: _____

If at any time, you wish to stop receiving emails, please let me know and I will remove your email from the distribution list.

Your comments and ideas most welcome – please use the space below.

The Australian Native Plants Society (Australia) Incorporated [**ANPSA**] is the national coordinating body for the various Native Plant Societies formed in each State. The Study Groups are national in nature and therefore under the umbrella of **ANPSA**.

ANPSA has established specific Rules and By-Laws to govern the activities of Study Groups and has also appointed a National Study Group Coordinator to ensure the smooth running of all the various Study Groups operating throughout Australia.

All individual members of a Study Group must be a member of one of the ANPSA Member Societies.