

EAST HILLS GROUP NEWSLETTER



SEPTEMBER 2017

NEXT EHG MEETING:

From 7 pm for 7.30 pm start, Wednesday 6 September 2017

THE LIVING ART OF NATURE'S GALLERY RAY AND ELMA KEARNEY

Exploring interdependency of species.
Expect fabulous photos of plants, animals and fungi,
and recent data about the imported Tomato Red Spider Mite

LUGARNO-PEAKHURST UNITING CHURCH
909 Forest Road Lugarno (opposite the Chivers Hill Lugarno shops)

Visitors are welcome.

WELCOME to the September 2017 edition of the East Hills Group Newsletter.

You can tell Spring is almost here - the Coming Events list is full to overflowing! Please have a look at page 11 of this newsletter: there's a lot to see and do!

A most important event of course is the East Hills Group visit to Sylvan Grove on 20 September. Please come along with a plate of morning tea to share and enjoy a guided walk and the beautiful flowers.

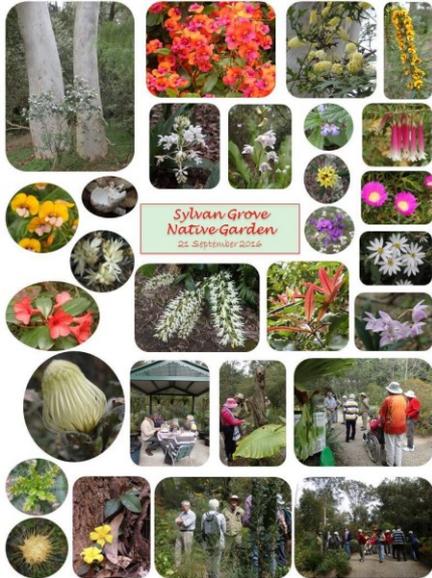
Also in this issue you can find Hugh Stacy's thoughts about the August Plant Identification table, brief notes of the business from the August meeting and an account of Liz Cameron's fascinating talk on fig pollination at that meeting, as well as photos and notes from Hugh's talk on some Banksias and Hakeas at our July meeting.

Jan Douglas, Editor

www.easthills.austplants.com.au



SYLVAN GROVE GARDEN VISIT – 20 SEPTEMBER 2017



East Hills Group is hosting another morning visit to Sylvan Grove Native Garden.

We're providing morning tea for our visitors and EHG members – please bring a plate to share and help to set up from 9 am if you can, so we can be ready for our visitors at 10 am.

Jim Mackay will be leading a walk around the garden, so we can all hear the inside story.

Don't forget your camera!

REFLECTIONS ON THE EHG AUGUST 2017 PLANT TABLE

Thanks to everyone who brought plant specimens.

Hugh Stacy

Our East Hills Group own-entertainment committee of President Graham Fry and Treasurer Liz Cameron deserved double pay for their efforts and we all thank them both sincerely. Preparing for presentations is time consuming and exacting. Taking us to Ghana and showing us something of life there was fascinating, while Liz's patient and careful explanations of the fig wasp and its strange life cycle unravelled some most peculiar behaviour, leaving us as inside out as the fig itself seems to be. I eat humble pie for supposing, some time ago, that this topic would be an easy one for an insect person such as Liz. How interesting, too, were the representative specimens of several relevant *Ficus* species that Liz showed us at the Plant Table.

It was great to see Alan Fairley in our audience. He has made a tremendous contribution to our local environmental knowledge and we will always welcome his attendance at any of our meetings. Also it was good to have our friends from Menai with us again.

The best part was to see how much everyone seemed to enjoy the Plant Table. To watch our newer members participating, chatting, questioning, showing what they are enjoying in their gardens, is so encouraging for everybody. The plant table has been an APS institution from the early days, but it must be inclusive and relevant for everyone.

And so there is no plant list to fill the page ... this time.

Some of our members are busy preparing to travel north to Coffs Harbour for the APS gathering there. Stay safe and return with your experiences to share with us.

FIGS AND WASPS – WHAT’S THE CONNECTION?

Presentation by Liz Cameron, Treasurer, APS East Hills Group

Figs (genus *Ficus*) belong to the plant family Moraceae, which also includes mulberries and breadfruit.

Most plants in this family are trees or shrubs and have simple leaves arranged alternately on the stem, milky sap (latex), stipules (leaf-like scales at the base of the leaf stem), very small flowers, and compound fruits.

There are about 750 species of *Ficus* and they include trees, shrubs, vines and epiphytes. Most are native to the tropics but a few grow naturally in the warm temperate zone. Australia has about 45 native species and Sydney has five, of which the best known are the Port Jackson or Rusty Fig (*Ficus rubiginosa*), Sandpaper Fig (*F. coronata*) and Moreton Bay Fig or Australian Banyan (*F. macrophylla*).

The avenues of figs in Penshurst Street and Hyde Park are Hill’s Weeping Fig *Ficus microcarpa* var. *hillii* - a Queensland subspecies of a widely-distributed tropical species; they produce an abundance of small pink fruits.

The Common Fig, *Ficus carica*, originated in the Middle East and western Asia, but has been cultivated throughout the world for its ornamental habit and large juicy fruit.

We generally think of fruit as the sweet fleshy products of trees and other plants which contain seeds and can be eaten as food. But the botanical definition of a fruit is narrower – it is the seed-bearing structure in flowering plants formed from the ovary of a flower after its fertilisation.

A fig is not a fruit in that strict sense. It doesn’t develop from the ovary of a single flower, it is actually a complex inflorescence (or group of flowers) at the end of a stalk (peduncle) and it develops as a fleshy receptacle enclosing many tiny flowers. This specialised multiple fruit is called a syconium, derived from *sykon*, the Ancient Greek word for fig. The opening (ostiole) of the syconium is very small and protected by scales or bracts.

Inside figs are three kinds of flowers – male flowers that produce pollen, fertile female flowers with long styles, and sterile ‘gall’ female flowers with short styles. In many fig trees, including stranglers such as the Moreton Bay Fig, each fig contains male flowers and both kinds of female flowers and the trees are described as monoecious (‘single house’). Other fig trees produce two kinds of figs, on separate trees, and are described as dioecious. I will talk about the first kind, the monoecious or hermaphrodite fig trees, and give a generalised outline of their pollination.

The pollination of figs is quite unusual. Their flowers are pollinated only by tiny fig pollinator wasps belonging to the family Agaonidae; in most cases, each species of fig is pollinated by a different species of wasp.



Photo: *Pleistodontes froggatti* female by SE Thorpe
https://commons.wikimedia.org/wiki/File:Pleistodontes_froggatti_female.jpg

This is an example of mutual need – the fig depends on the wasp for pollination and the wasp depends on the fig for food. Neither could complete its life cycle without the other. It is believed this mutualism arose about 80 million years ago.

Following is a description, as best I can understand it, of the complex interaction between figs and wasps that results in mature figs with viable seeds and a new generation of fig pollinator wasps. A key element is the staggered development of fig flowers and wasps, which prevents self-pollination.

I'll start the story at the point where a fertilised female wasp dusted with pollen flies to a receptive but unripe fig, attracted by its enticing scent. The scent of the fig has evolved to attract this particular species of wasp. The female wasp's long narrow head helps her struggle through the dense scales around the narrow ostiole, but she often loses her wings in the process. She starts probing the female flowers, which are already mature, with her egg-laying tube (ovipositor), trying to lay her eggs.

The style of a sterile flower is short enough for the wasp's ovipositor to reach the ovary and lay an egg on it; the wasp then injects an irritant secretion that causes the ovule to produce swollen tissue (a gall) on which the wasp larva will feed when it hatches from the egg. Ovaries in the long-styled female flowers are too deep for the wasp to reach with her short ovipositor but in her scrambling about and probing, her body sheds pollen onto their styles and these flowers are fertilised; their ovules will develop into the true fig fruits. This is the end the female wasp's role; she dies inside the fig after laying her eggs.

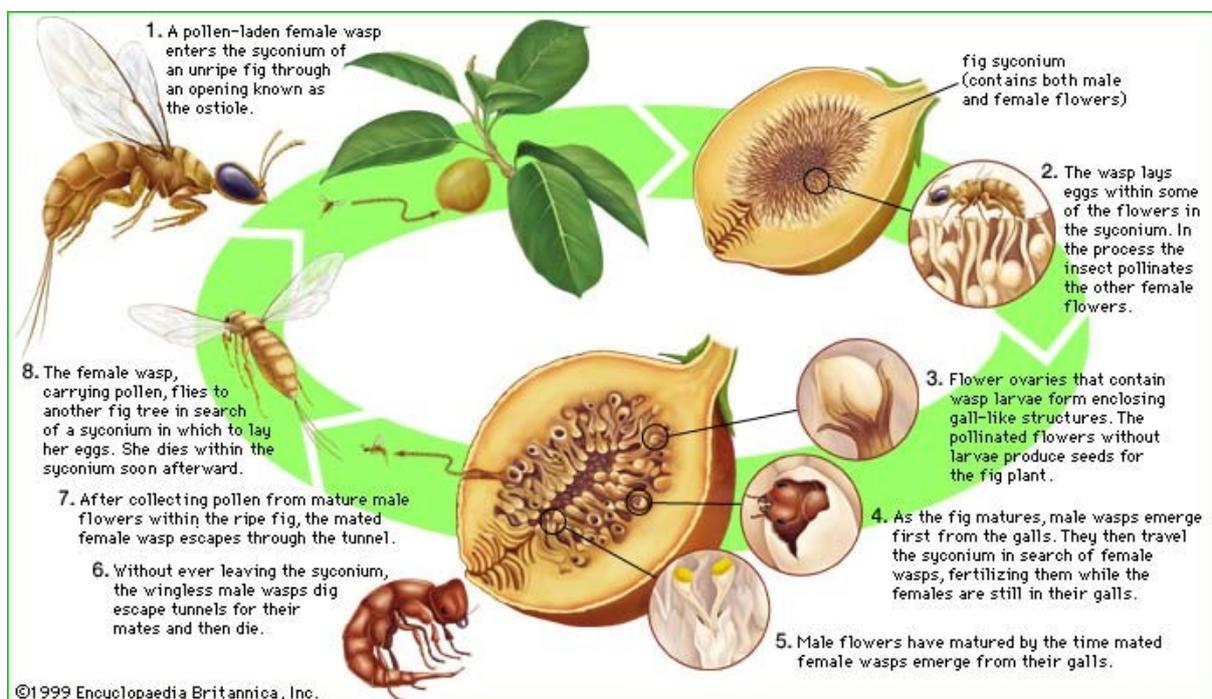


Diagram copyright Encyclopaedia Britannica <https://www.britannica.com/animal/fig-wasp>

In the sterile flowers the wasp larvae feed on the gall tissue and develop into male or female wasps. The mature male wasps emerge first, 4-6 weeks after hatching. They lack pigment and are sightless and wingless but are able to sense where the unhatched females are. The males have strong jaws and bite a hole in the galls containing females and mate with them.

The male wasps then die but, in some species, they first chew away the bracts around the ostiole or drill exit holes through the syconium wall. These actions will help the females to escape the fig after they emerge from galls.

Emergence of the fertilised female wasps from the galls coincides with the maturation of the male fig flowers and production of pollen. The male flowers are generally clustered close to the ostiole and as the black, winged female wasps scramble to leave the syconium, they crawl over them and pick up pollen on their bodies. They leave the fig through the enlarged ostiole (or through the holes drilled by the males) and fly towards the enticing scent of receptive figs of 'their' species. Thus the fig pollinator wasp's life cycle is continued.

After the female wasps leave the fig the ovules of the fertilised flowers mature as true fig fruits containing one seed each; they are tiny and dry and don't split to release the seed; they are responsible for the slightly 'gritty' texture of ripe figs. This kind of fruit is called an 'achene'; the tiny brown 'pips' on strawberries are also achenes.

As the true fig fruits mature the fig swells, darkens and becomes attractive as food for many birds and mammals. In the digestive tract of these consumers, the seeds are released from their dry cases and are ready to germinate when voided. Flying-foxes and birds such as fig birds, bowerbirds, currawongs and native pigeons are important fig eaters and dispersal agents.

For more information about fig pollination by wasps, and some great photos, you might like to visit the following website <http://waynesword.palomar.edu/arbimg10.htm>.

I would have liked to include a photo from this site showing a female Australian fig wasp beside a pin to illustrate the tiny size of the wasp, but the site's copyright statement is very clear and prohibits me from doing so unless I get permission first! Editor.

THE BUSINESS - East Hills Group meeting – 2 August 2017

Meeting notes by Liz Cameron

There were 21 in attendance including four visitors. There were three apologies.

Business was restricted to general notices - forthcoming APS events, new website etc.

Plant sales raised \$60 at the meeting. The applied clothing donated by Ian Cox raised \$145 altogether for EHG.

The meeting was followed by the plant table and supper.

AUTUMN BEAUTY

This is Hugh's account of his presentation at the East Hills Group's July meeting. Your editor has added explanations of a few botanical terms at the end of the article.

Hugh Stacy

During this 2017 autumn on the Blue Mountains I have seen some very special things. All of us, of course, are seeking our own concept of beauty, and each one of us has preferences. At our meeting on 5 July I wanted to contribute to our group's entertainment, because I have enjoyed so much the contributions that different members have made at other similar meetings in recent times.

What are these special things? They show subtle beauty, though are little known; some may be known to bush lovers, though seldom grown; I have seen an unusual form I have never heard of before; this one has such tiny flowers that magnification will be required for my observations to be meaningful. So please, find your reading glasses and look closely into the pictures, closely enough to see the different sorts of hairs!

Newnes Plateau Banksia

In the mid 1970s I visited Royal Botanic Gardens botanist Don McGillivray at the Herbarium, seeking help with identification. (He remembered me from classes we shared as first year students nearly 20 years before.) I still have clear memory of the time he gladly gave me that morning. It was early in his research at the start of his major revision of *Grevillea*; he led me into back rooms where, laid out on large tables, were specimens on loan from herbariums all over the UK and Europe. This was a revelation to me: to see Australian plants, mounted with the collector's name and details, many already then over 150 years old, irreplaceable fragile relics supplied on trust, that I now realise form the historical fabric and references of botanical exploration in Australia on foot or horseback.

In discussion about *Banksia paludosa* [Swamp or Marsh Banksia], I asked Don whether it grows anywhere taller than 1.5-2 m? 'Oh yes' he said; 'it grows to 5 m on the Newnes Plateau'. Sometime later, when Alex George was preparing *The Banksia Book* (published by Kangaroo Press with financial support from SGAP, available 1984), he sought photos from members. I submitted one of a beautiful silver-grey flower spike on a bush 3 m high on a plateau at Blackheath which I labelled *B. paludosa*, and was so disappointed it was not used. By then, you see, George had named *B. conferta* ssp. *penicillata* and rejected my unsupported identification.

Now, the Newnes Plateau Banksia has been elevated from a subspecies to a full species, ***Banksia penicillata***. Flowering is from April to June or July; the spikes in bud show a wonderful range of colours which change as they develop:

The spike is reddish in the early stages,



changing to orange, then to brown,



becoming darker brown as the flowers split open (at anthesis). These colours are common in the forested eastern areas of Newnes.

Note how every horizontal branch carries a series of flower buds, each one representing a year's growth; note also that only one flower spike per branch develops during a normal season.



Where the plateau falls away on rocky slopes towards the Capertee Valley, we find different coloured flowers, young yellow buds and older pink ones on separate branches.



Then, a surprise: after good autumn rains, here is an outboard yellow (younger) spike growing beyond the pink one, making two spikes flowering at once on one branch!



A final image shows a handsome pink spike at anthesis. This tree is about 30 years old now and is thriving at Blackheath, where I also have been growing the red/brown ones for 25 years, one as a street tree of handsome rounded shape, having horizontal branches from waist high. (It is shown in the first three photos.) All are about 5 m high. Sadly, I know of no others in cultivation in the Blue Mountains. In Lugarno two *B. penicillata* survive at five years from seed, each 1 m high, both watered for survival now through summer. Neither has flowered as yet.



The Hairy Hakea

Our next look is at *Hakea gibbosa*, the Hairy [or Downy] Hakea. It flowers in winter, June to August.

Flowers form in sets of four; perianths and styles are glabrous (hairless); pedicels (flower stalks), stems, leaves hairy.



Now observe the close-up of the fruit as it forms, noting how the style is curled like a pigtail, with a 90 degrees bend in the suture line (where the fruit splits to open).

Only while looking at this picture afterwards did I realise that it shows how this bend causes the fruit to open awkwardly, like a book, rather than the two halves unhinging cleanly.



This species does not grow naturally on the Blue Mountains. Yet this plant grew strongly for several years at Blackheath, to 3 m, and set plenty of seed. Then, in October two years ago, a heavy snow storm left drifts around the base for several days; it died gradually, from the bottom up, during the next few weeks.

Hakea propinqua

Our third plant is ***Hakea propinqua***, which flowers from May to July. It was described by Alan Cunningham. *Propinqua* means *near*, but whether he meant by relationship or by position is not clear. Like *H. pachyphylla* and *H. nodosa*, it has tiny flowers. Although *H. propinqua* is widespread across the Sydney sandstone and Blue Mountains, nowhere is it particularly abundant.

The first picture shows massed tiny flowers shining in morning sun. This plant is 2.5 m high and features flowers tinged with pink; it does seem to possess a delightful natural variation not previously seen.



Seed came from a white-flowered plant on Mount Hay.

The pink-tinged spike (right) is set tall against blue sky and grey cloud, while pink flower parts stand out in leaf axils all over the plant (below).



The picture at right shows the typical red stem and details of structure of these little pink flowers, their 2-3 mm perianths and hooked styles are glabrous, pedicels 4-10 mm, softly hairy, with six flowers per rachis in each leaf axil.



The image at left features pink pollen presenters, red nectary central in the flower, tepals separated and anthers visible, flowers lying cruciform at this stage.

In the image at right, note the bracts covering two unopened confluences on the left side.



Pollination is presumably by small insects, ants and little flies which can slip under the hook of the style to reach the nectary; on straightening its head upright, the insect may collect pollen from the pollen presenter itself. Considering how small are the flowers, why does *H. propinqua* produce such large fruits?

Despite such an abundance of flowers, this particular plant has not set a single seed. Where were the pollinators!

Some botanical terms

<https://www.anbg.gov.au/cpbr/cd-keys/orchidkey/html/glossary.html>

anther - The pollen-bearing part of a stamen.

anthesis - The period of flowering.

inflorescence - The flowering structure of a plant

nectary - A gland which secretes nectar.

pedicel - The stem which supports a single flower in an inflorescence.

perianth - A collective term for the petals and sepals of a flower.

rachis - The main axis of a compound leaf or an inflorescence (to which the pedicels or petiolules are attached).

tepal - A division of the perianth, a sepal or a petal.

Wikipedia: Glossary of botanical terms https://wikivisually.com/wiki/Glossary_of_botanical_terms#C

confluences of an inflorescence when the overall structure substantially differs from that of the individual branches of the inflorescence, a rarely used term; e.g. the bottlebrush multiple-flower head of Callistemons.

COMING EVENTS – CHECK YOUR DIARY!

You can find more district group events on the **new** APS NSW website at

<http://austplants.com.au/calendar>

1 September	 National Wattle Day – wear a sprig of wattle and speak out to contradict the allergy myth!
1 to 25 September Friday, Saturday, Sunday, Monday, 10am to 4pm	Boongala Native Gardens and Rainforest open days. Plant sales, open garden and rainforest walk. Small admission charges for open garden and walk go to Royal Flying Doctor Service. www.boongalagardens.com
Saturday 2 September 1 pm	East Hills Group propagation meeting with Menai Wildflower Group. Illawong Rural Fire Brigade Headquarters. [click for map]
2-3 September	2017 APS NSW Get-Together, Coffs Harbour – Rainforest Riches Revealed. Program includes walks, talks and garden visits.
2 & 3 September	Illawarra Grevillea Park open days. http://www.grevilleapark.org/
Wednesday 6 September From 7 pm for 7.30 pm	East Hills Group meeting – Ray and Elma Kearney on The Living Art of Nature's Gallery. The topic includes the interdependency of species - plants (including orchids), animals and fungi - and some recent data about the imported Tomato Red Spider Mite which attacks plants of the Solanum family and their discovery of a new host plant.
Saturday 9 September 1 pm	Menai Wildflower Group meeting – Ross Jeffree: Conservation Successes in Bhutan. Illawong Rural Fire Brigade HQ.
Sunday 10 September 9 am – 4 pm	Stony Range Botanical Garden ‘Wild Things’ Spring Fair organised by APS Northern Beaches Group. Plant sales, exhibitions, guided walks, refreshments etc. 810 Pittwater Road, Dee Why.
9 & 10 September	Illawarra Grevillea Park open days. http://www.grevilleapark.org/
16 & 17 September 9.30 am – 3.30 pm	Plant sale and open garden – Westleigh Natives 47 Eucalyptus Drive, Westleigh 2120
Wednesday 20 September 10 am; 9 am for helpers	East Hills Group visit to Sylvan Grove Native Garden. Sylvan Grove, Picnic Point. https://www.bankstown.nsw.gov.au/index.aspx?NID=28
20 September 8 pm	Sutherland Group meeting GyMEA Community Hall, 39 GyMEA Bay Rd, GyMEA
23 & 24 September	Plant Lovers’ Fair, Kariong https://www.plantloversfair.com.au/
January 2018	ANPSA Annual Conference – Hobart Closing date for early bird rates is 30 September 2017

Your editor is always looking for contributions!

Photos of your garden or a plant that tickles your fancy
could have been here!



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