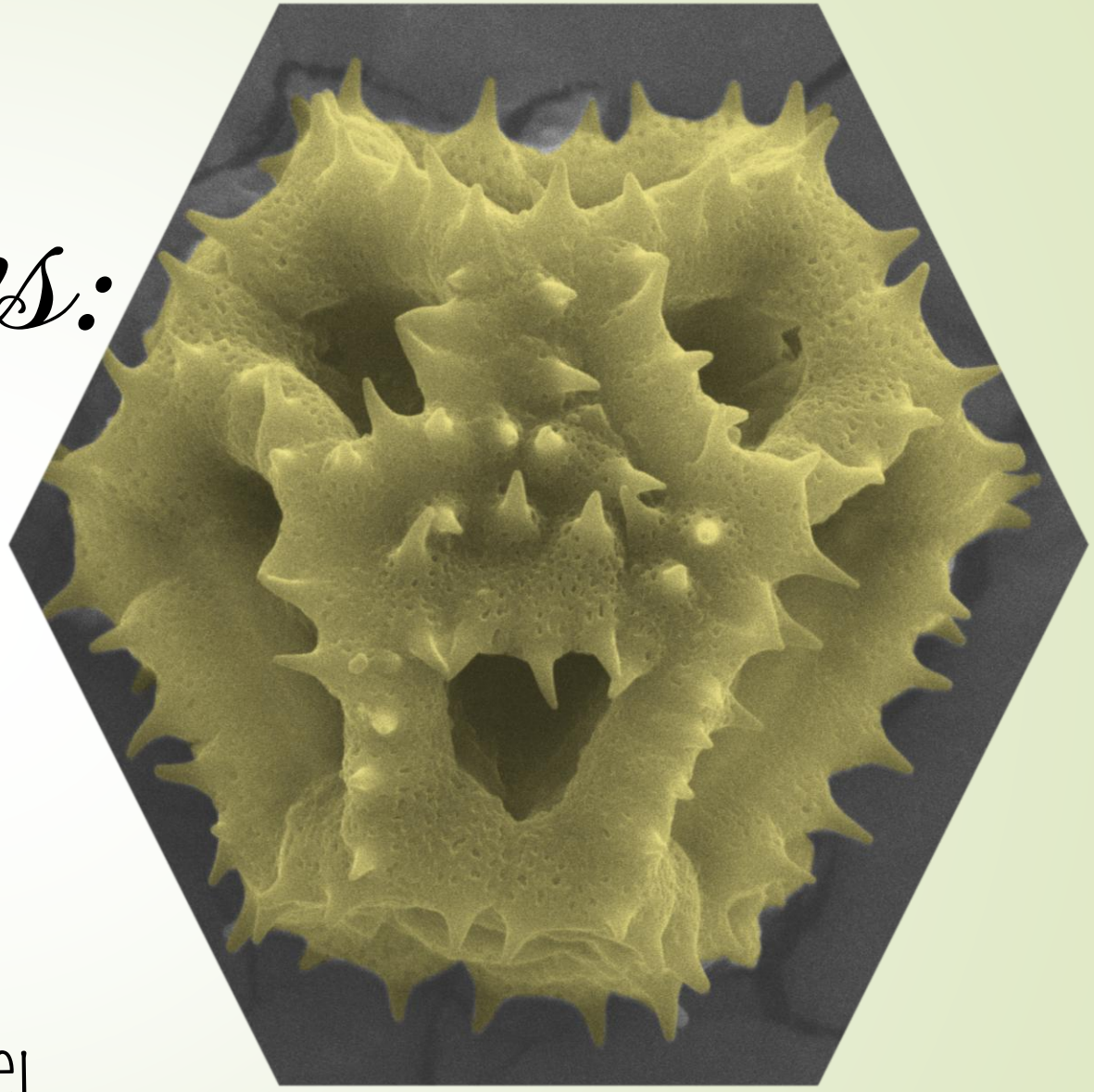
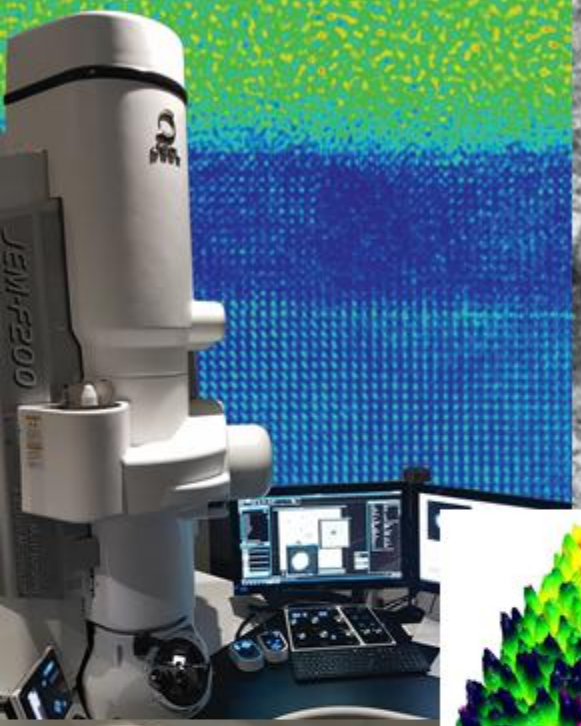
Secret Gardens:

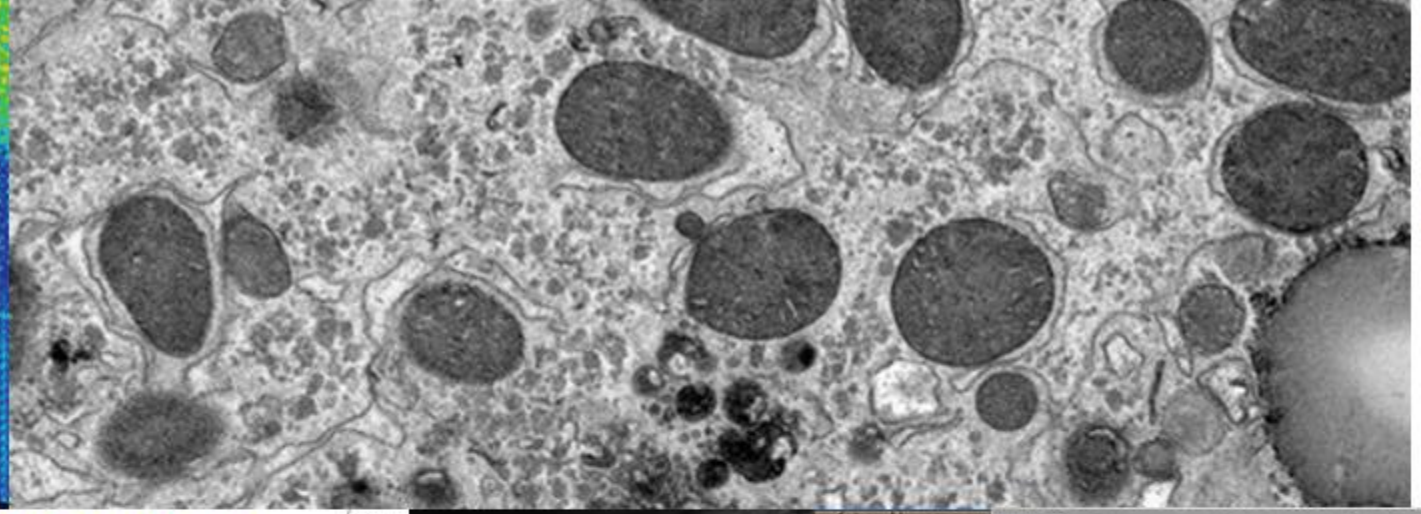
Gardening at the Micro-Scale

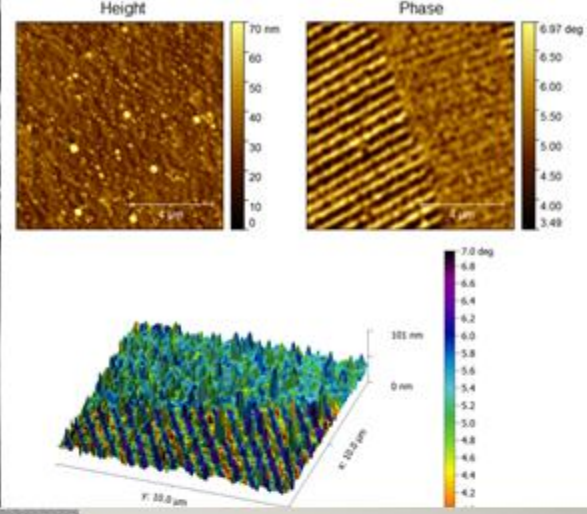


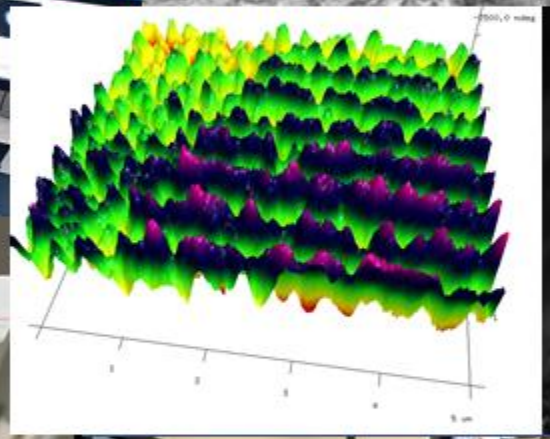
Dr Karen Privat & Dr Rhiannon Kuchel

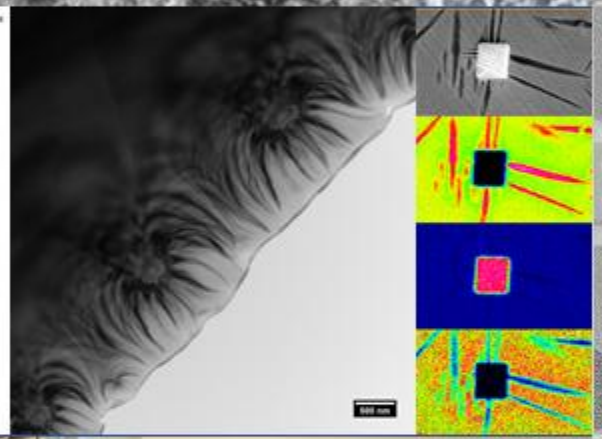
Electron Microscope Unit, Mark Wainwright Analytical Centre, University of New South Wales

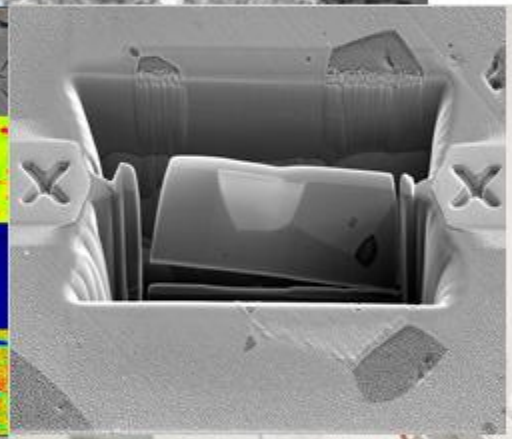

JEM-F200



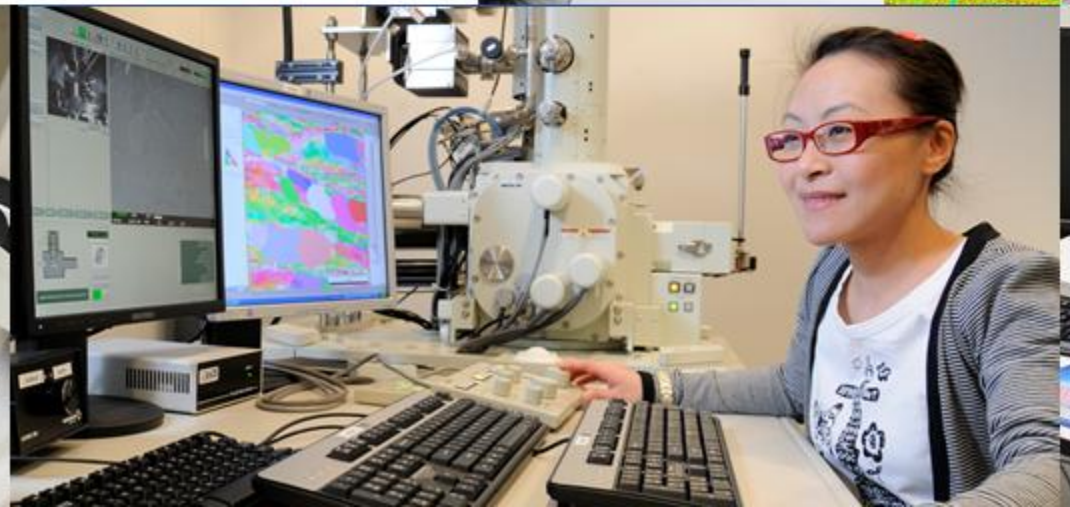

Height
Phase

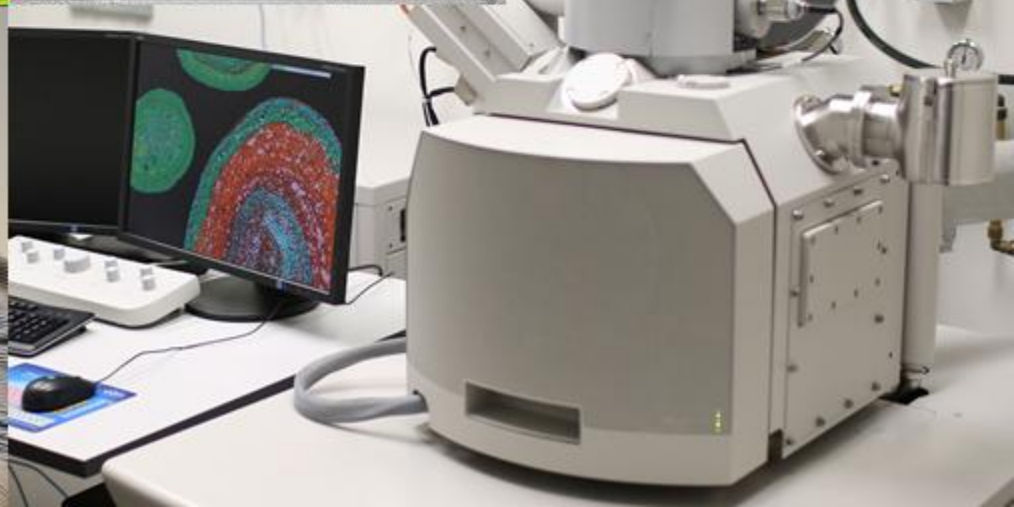








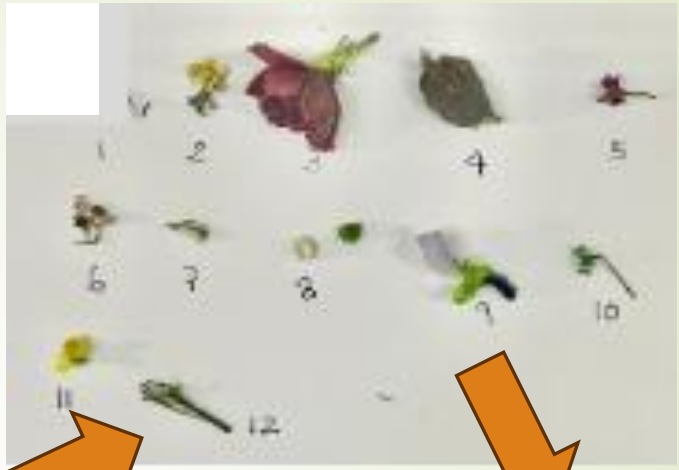




A closer look...



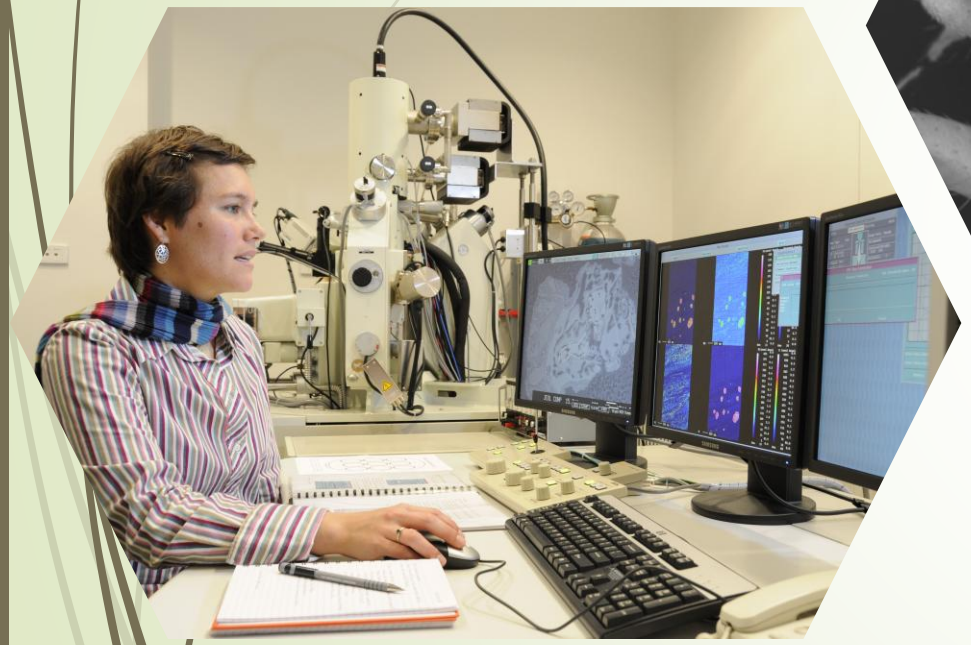




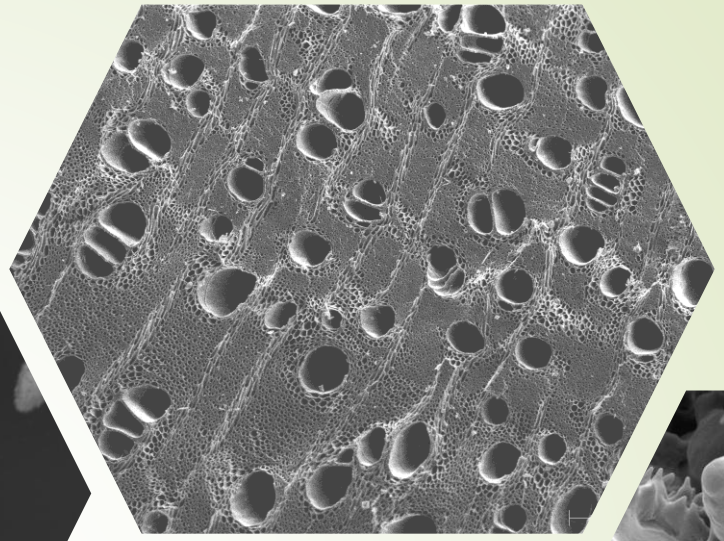


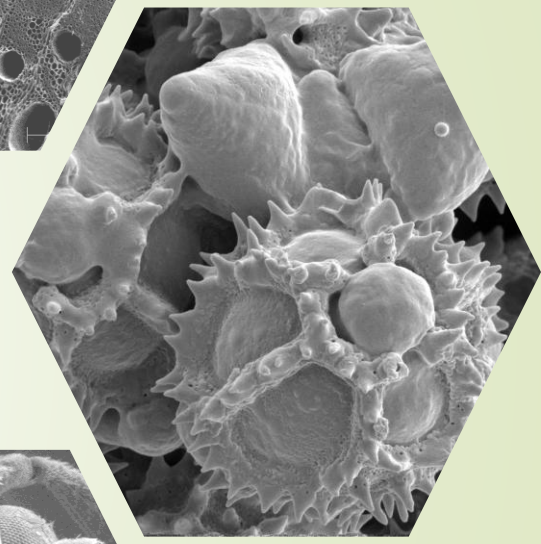
- Partnership with **Community Gardens Australia**
- Reaching beyond academic research into the wider community
- Spark interest, find new ways to connect with gardening objects, creatures & phenomena

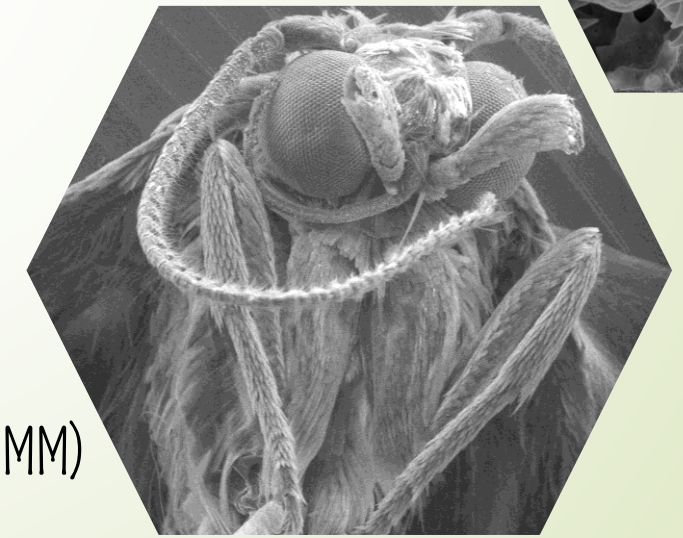
A closer look...





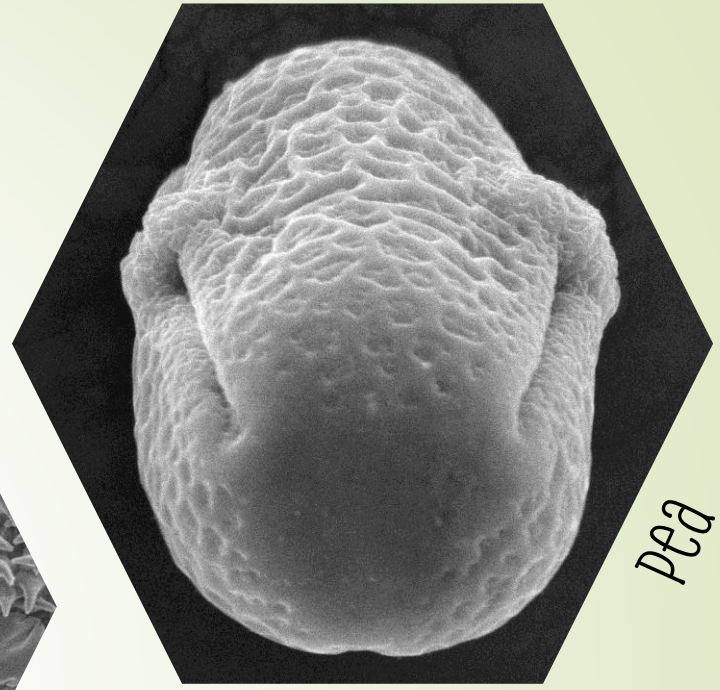




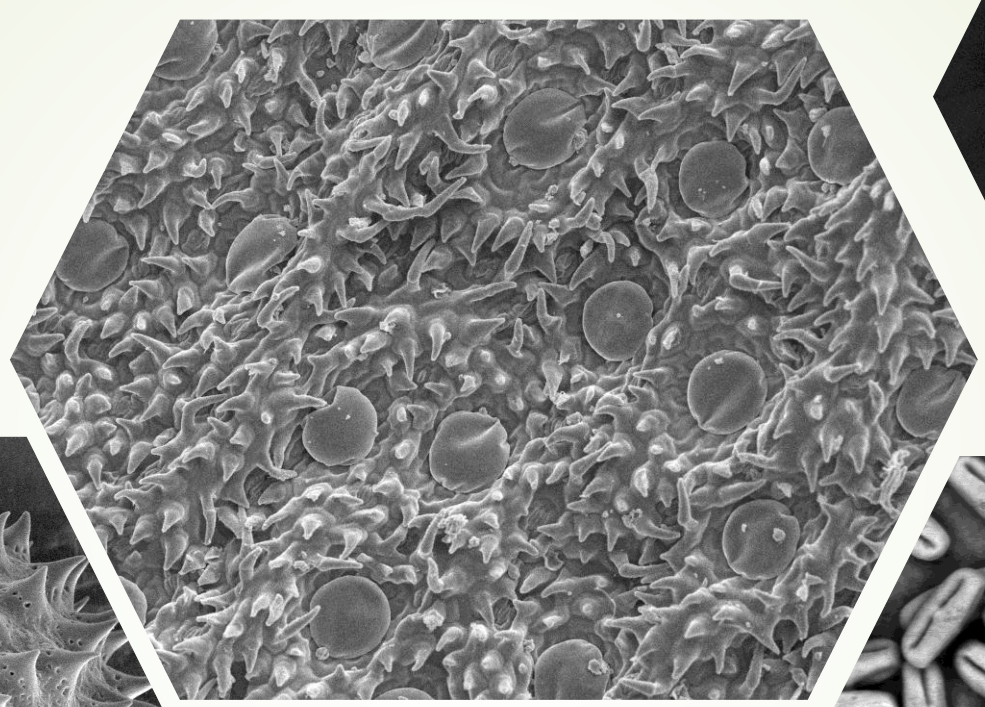


- Scanning Electron Microscopy (SEM)
- Millimetres to micrometres (1 µM = 1/1000th of a MM)
- No colour

Common Community Garden Plants

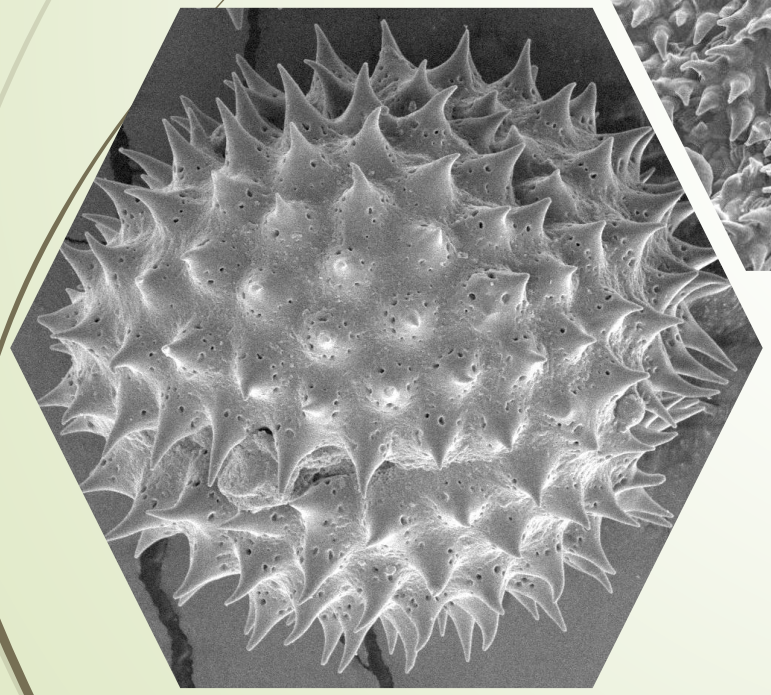


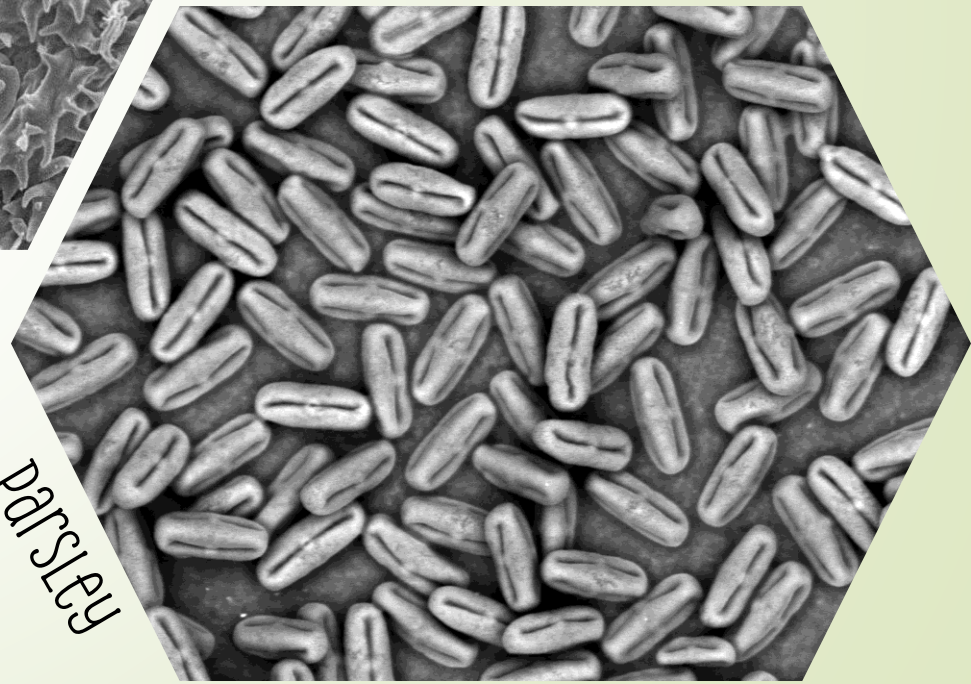
Pea



Thyme

Marigold



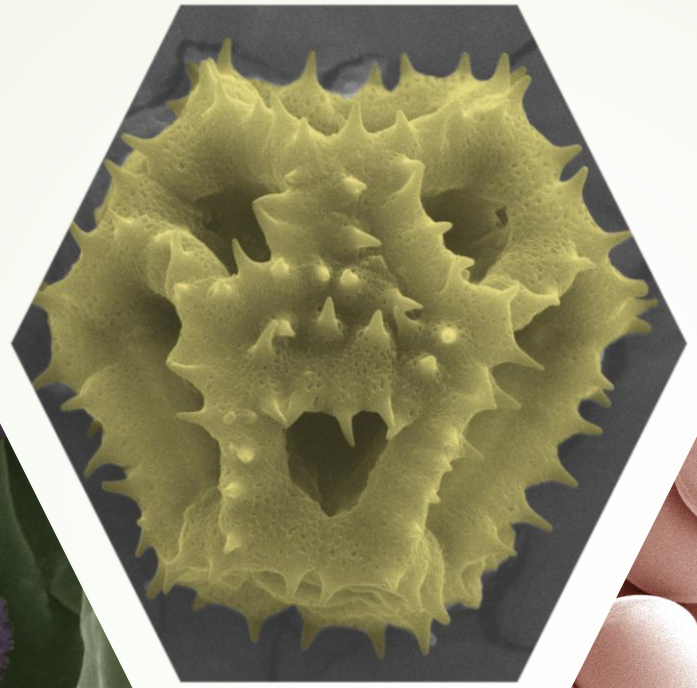


Parsley

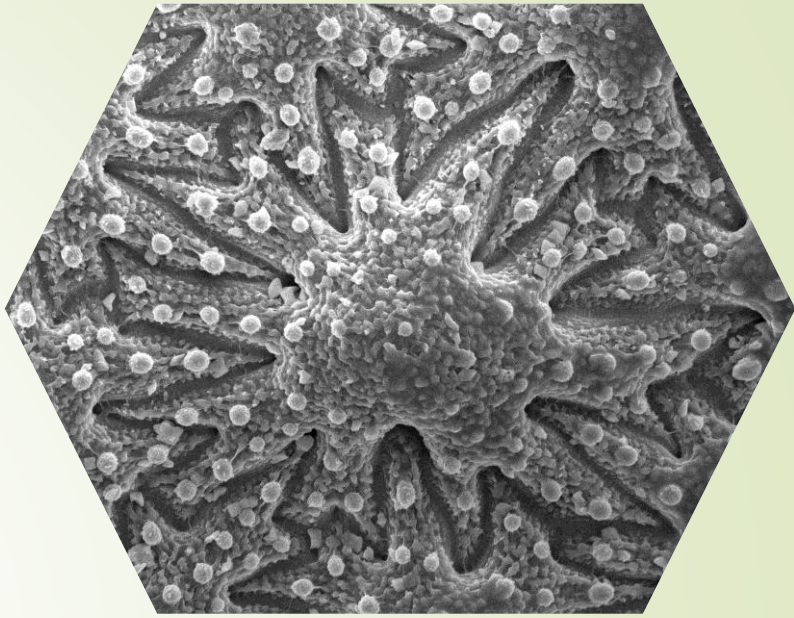
Common Community Garden Plants

Lavender

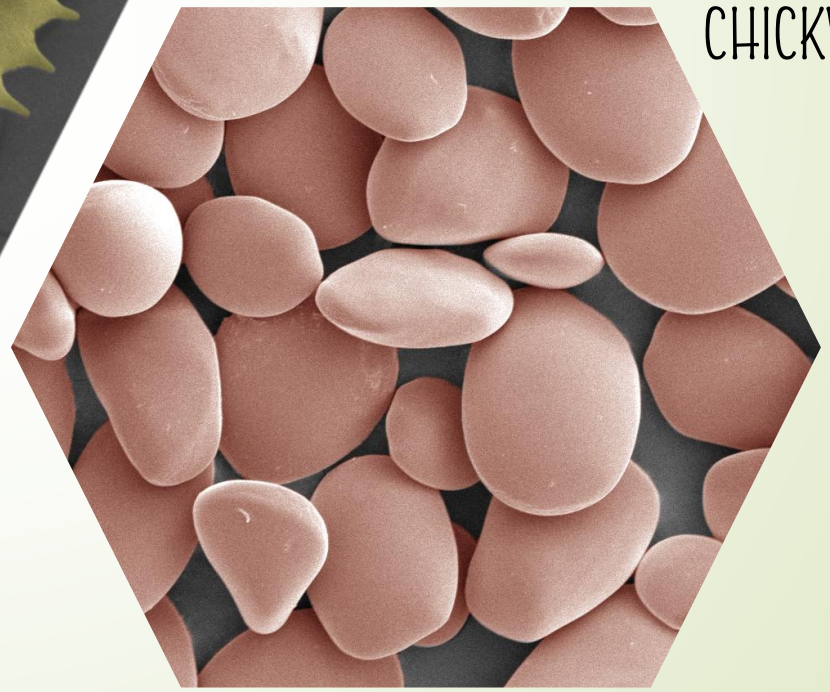




Dandelion

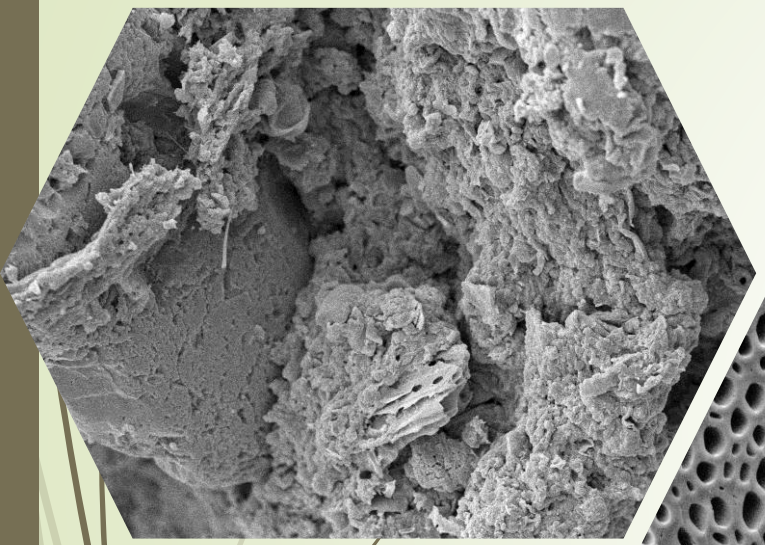


Chickweed



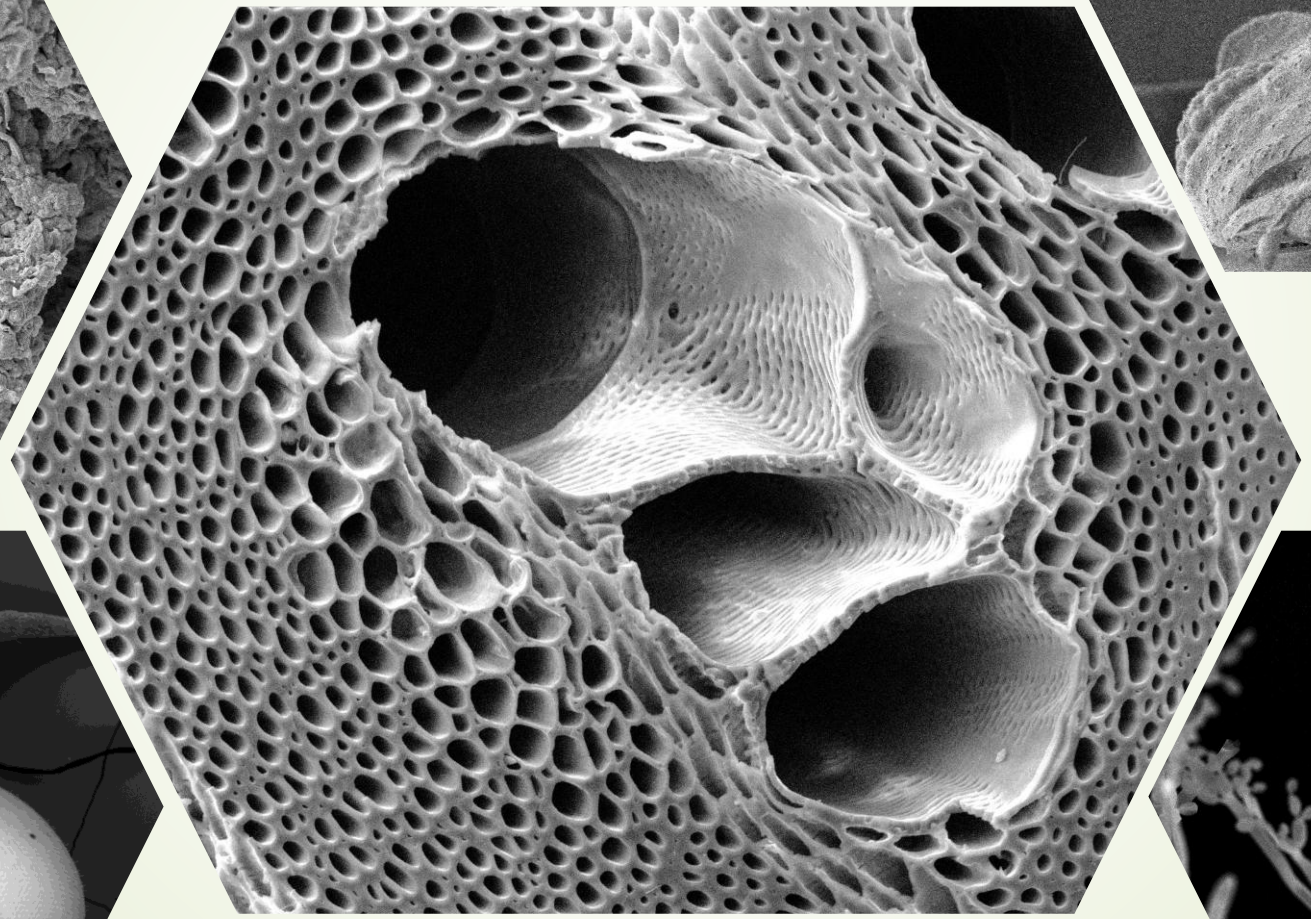
Arrowroot

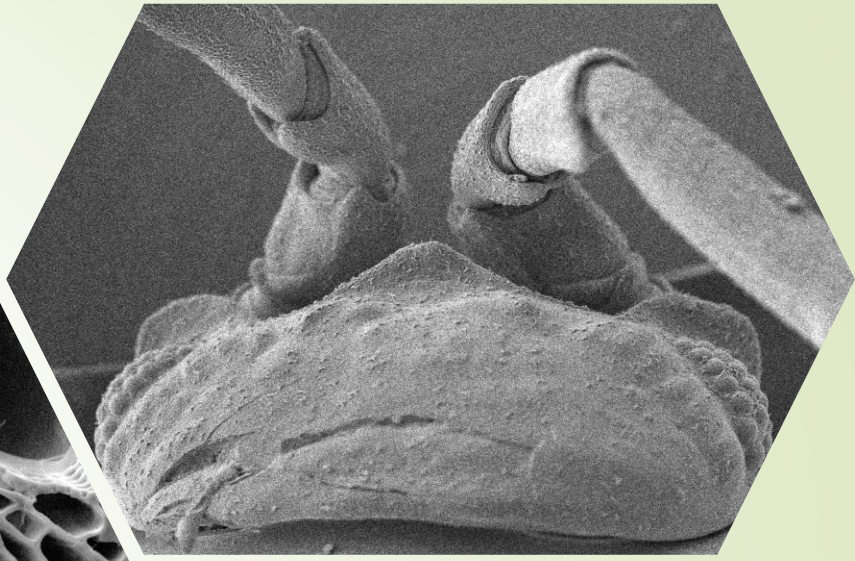
Soil Health



Worm castings

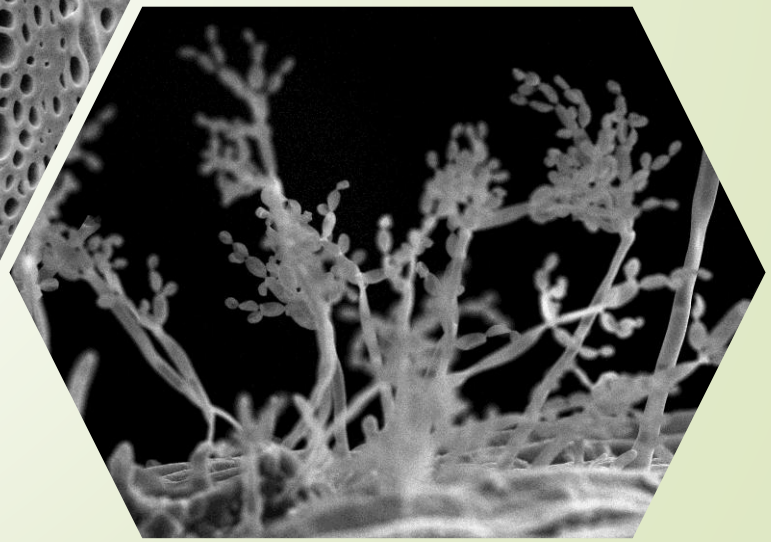
Charcoal





Slater

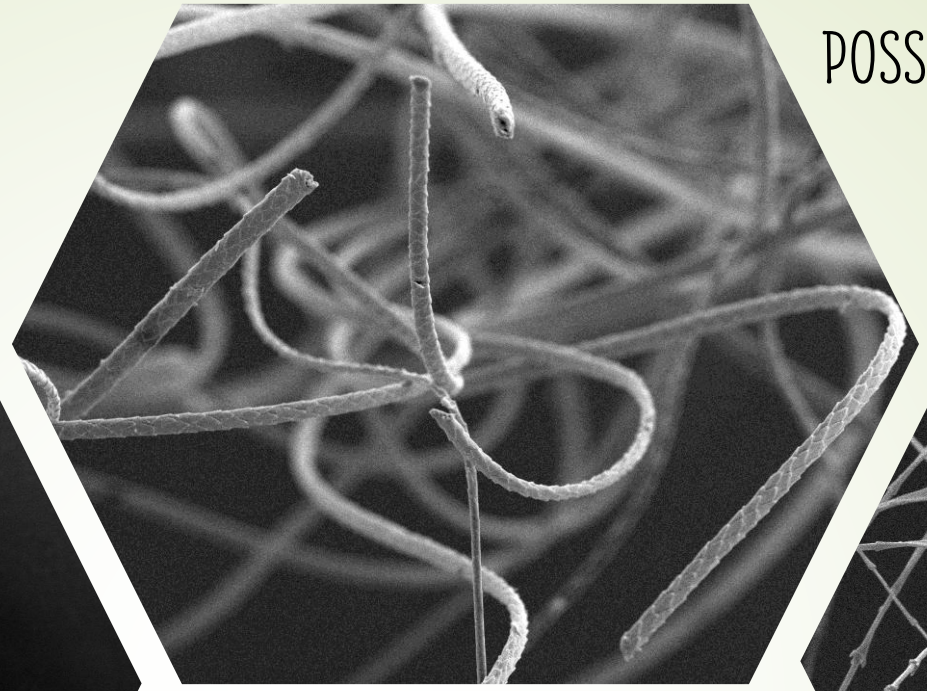
Mould



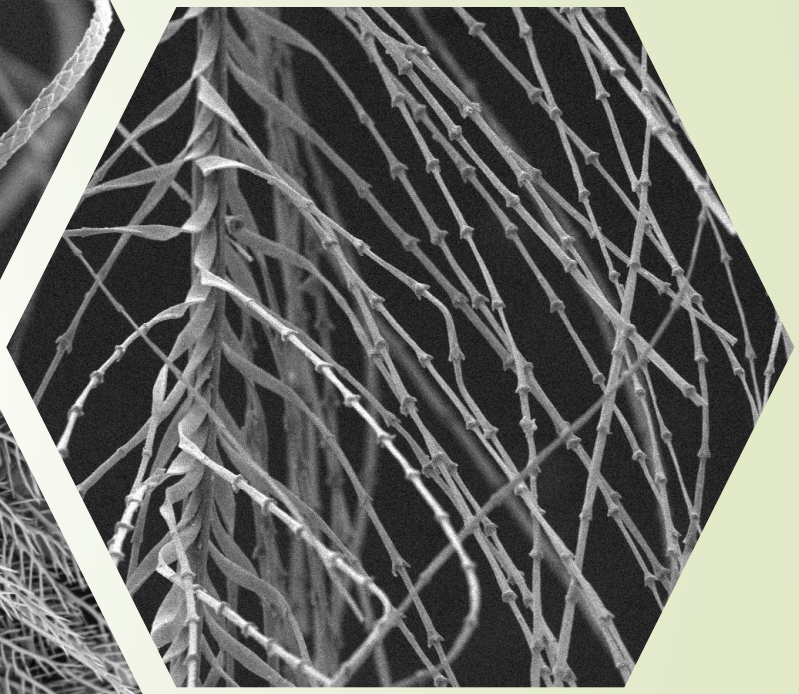


Black soldier fly

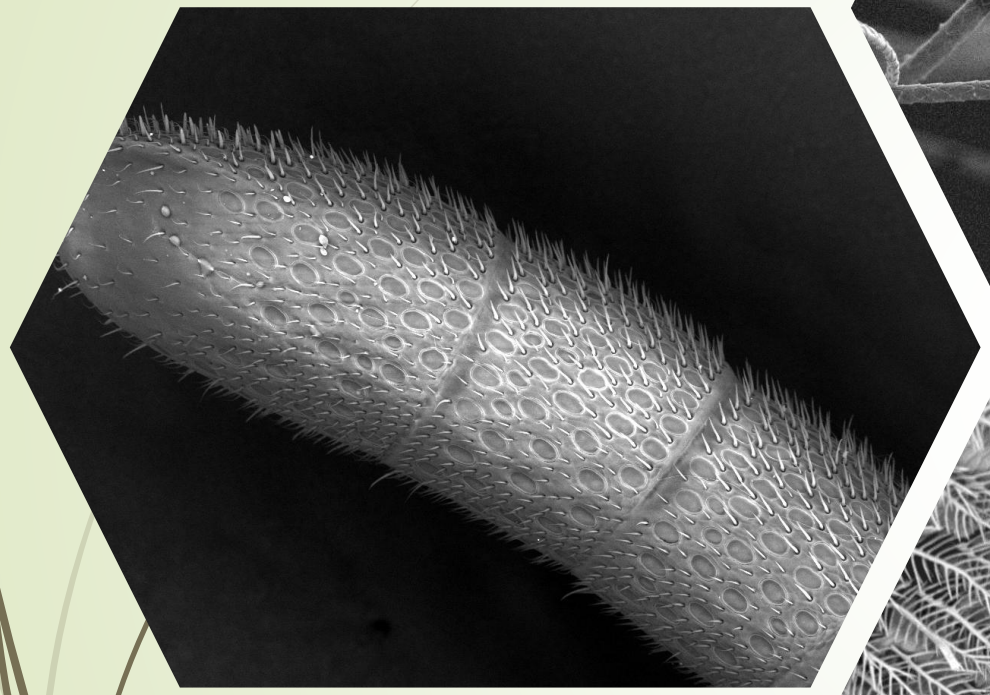
Pollinators



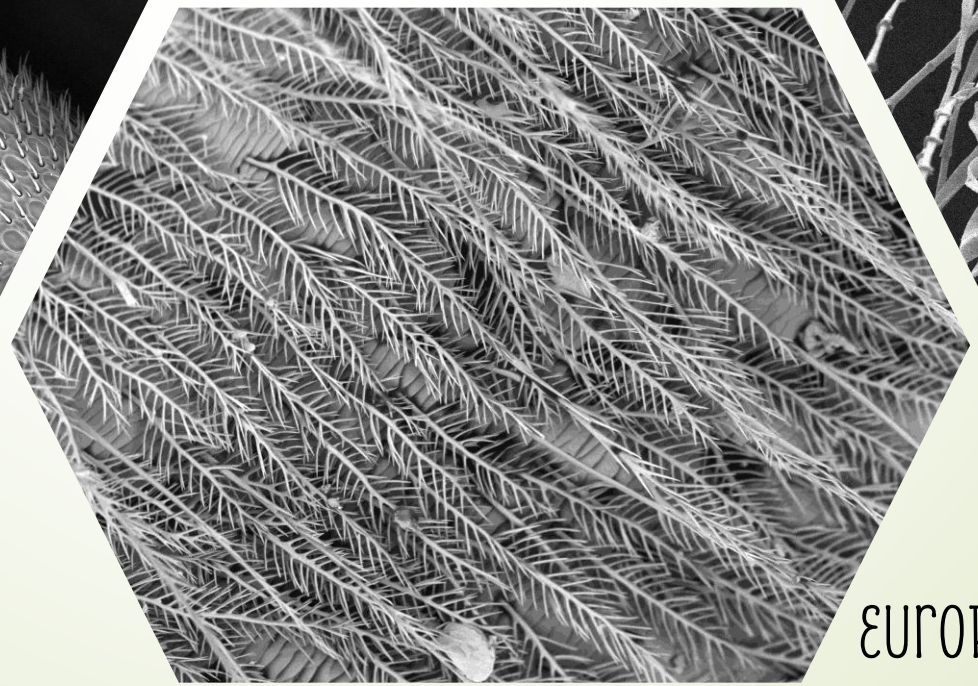
Possums



Birds



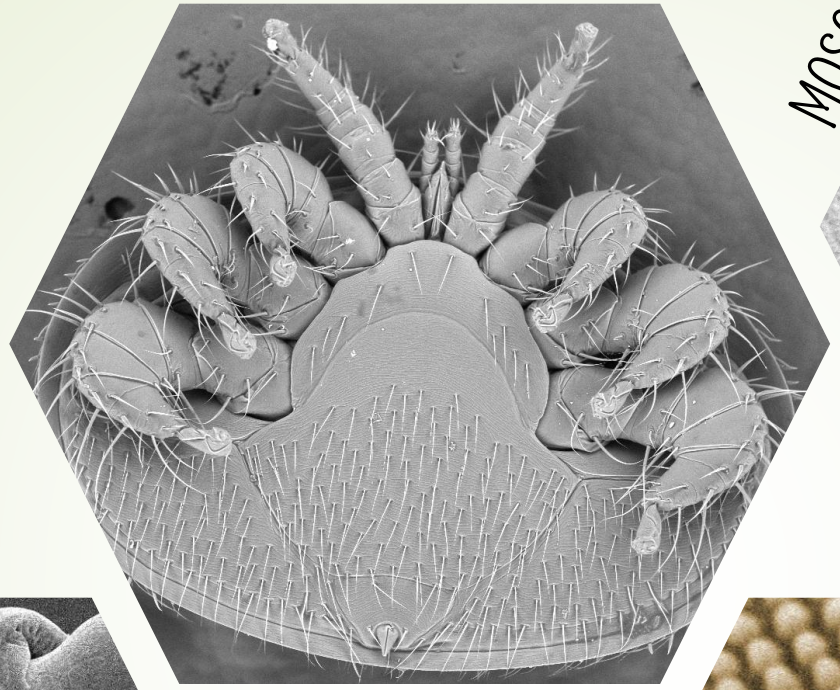
Native Bees



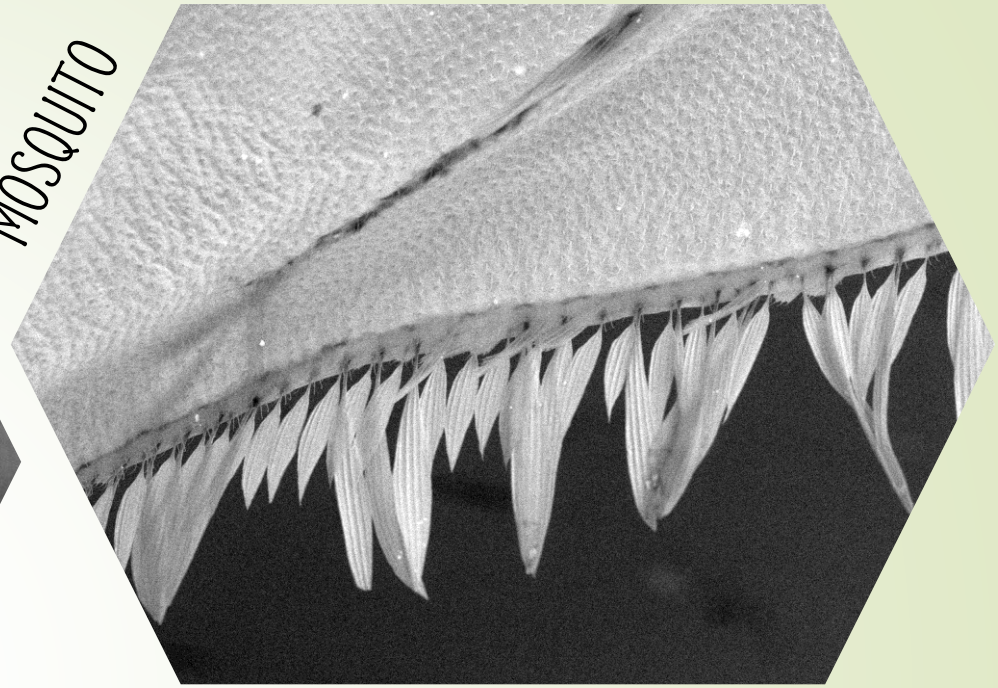
European Honeybees

Pests

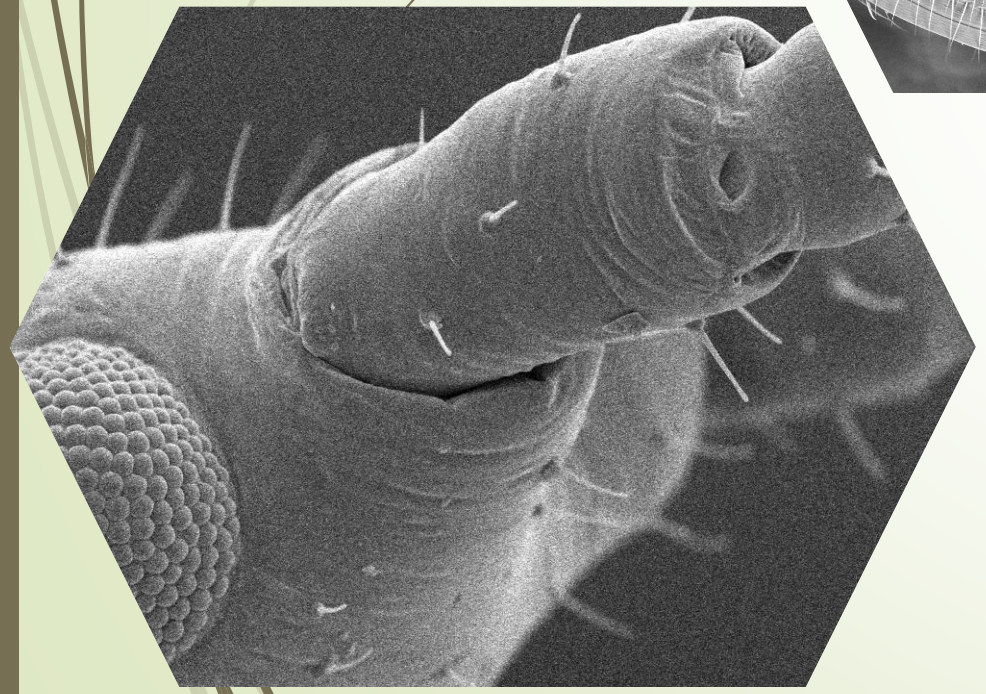
Varroa mite

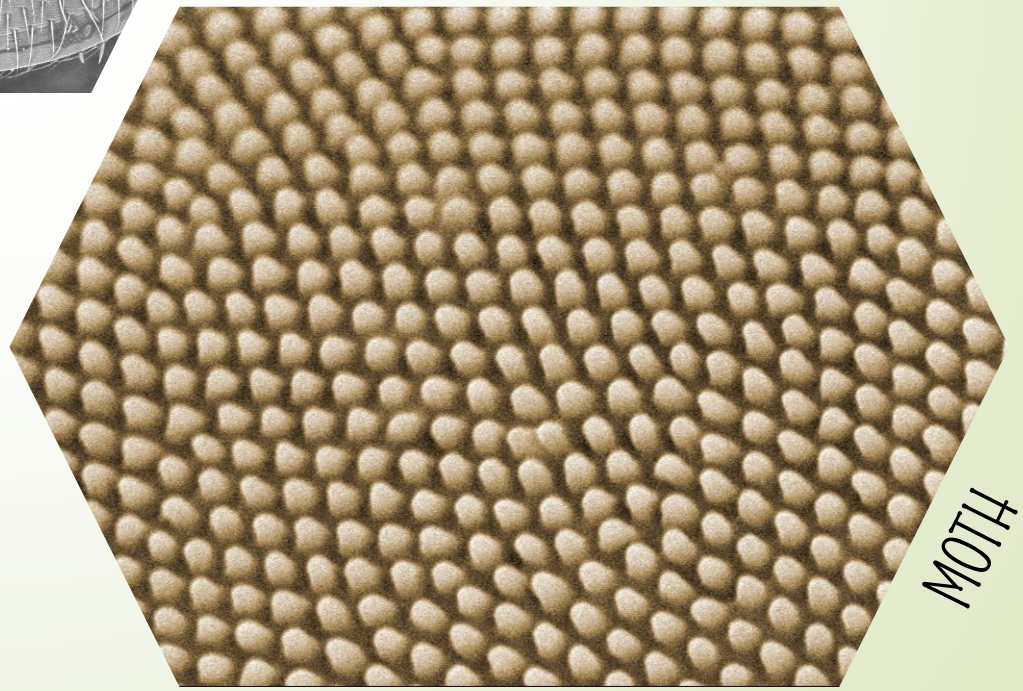


Mosquito



Aphid

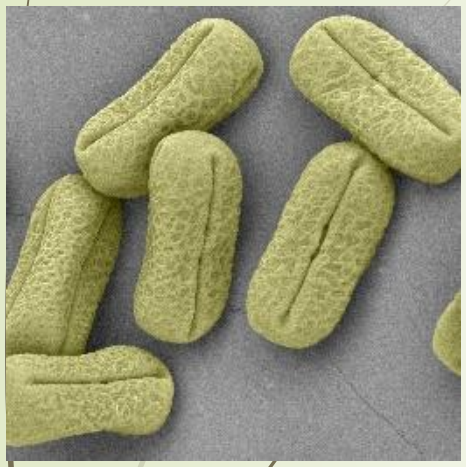


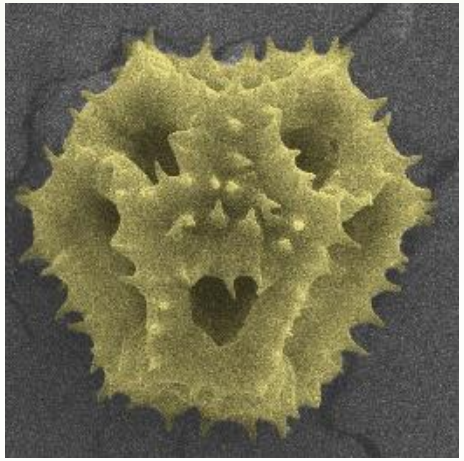
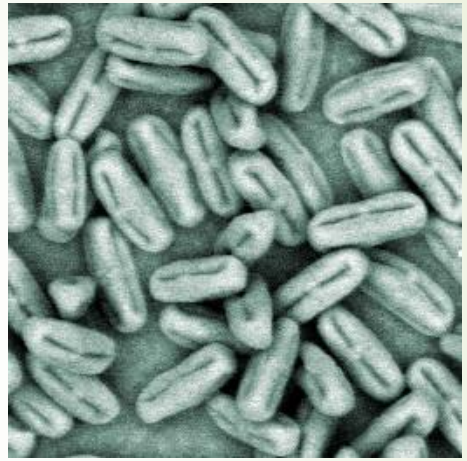
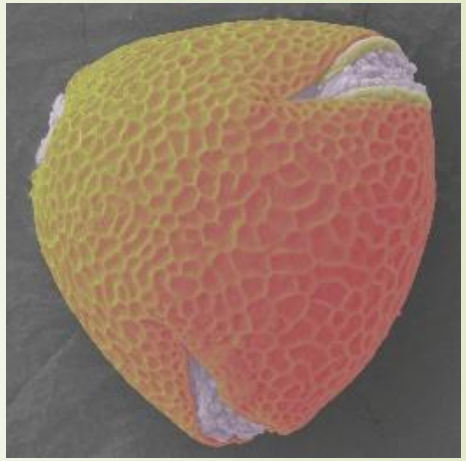
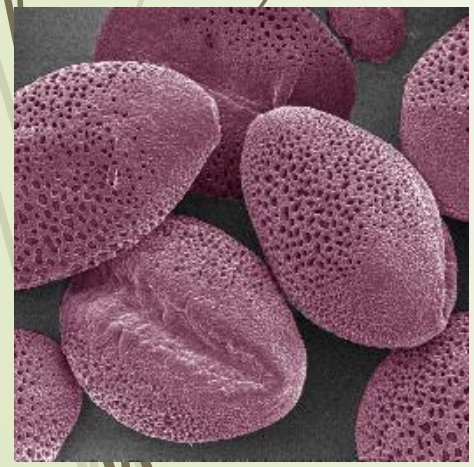
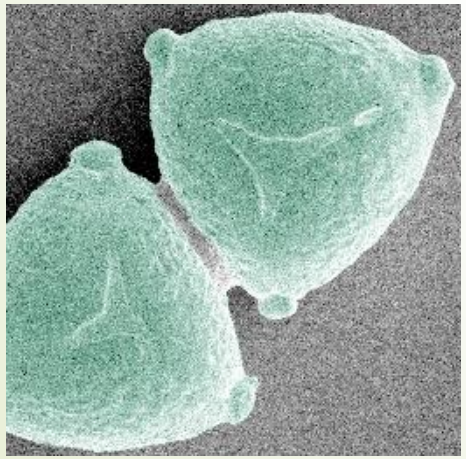
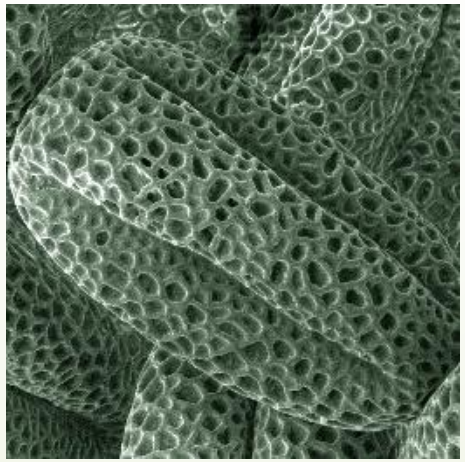
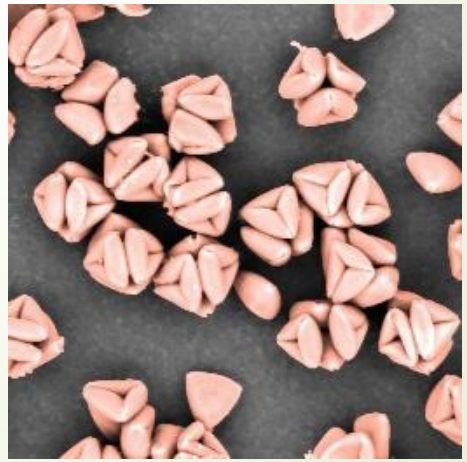
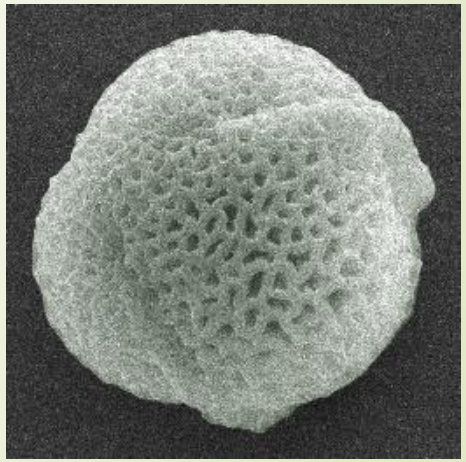


Moth

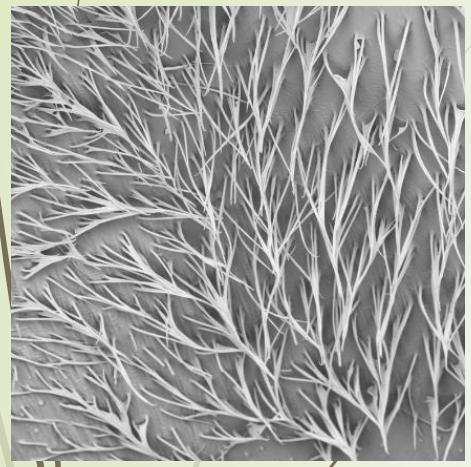
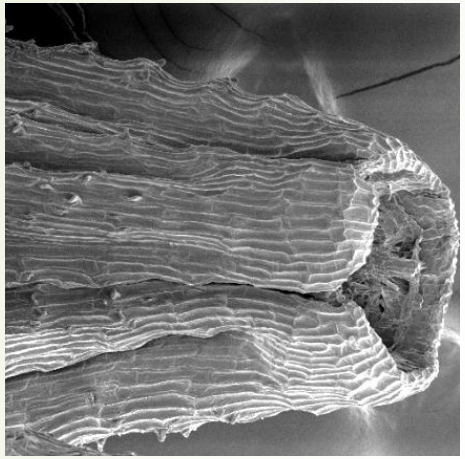
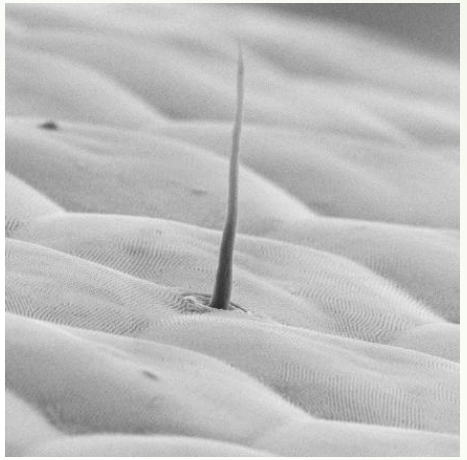
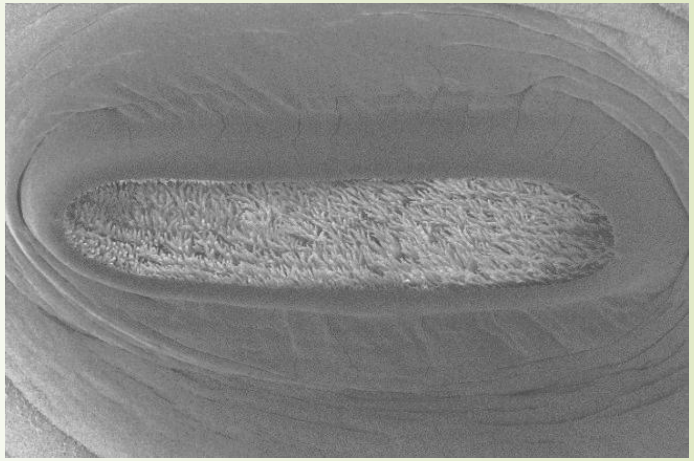
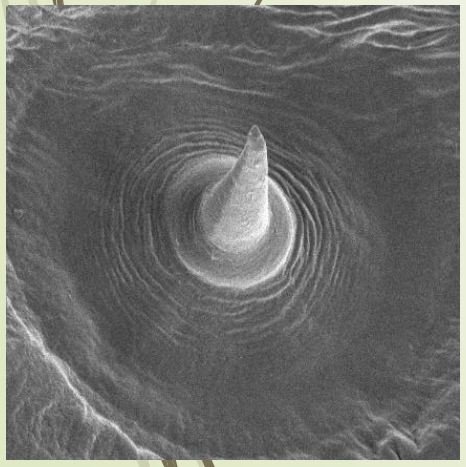
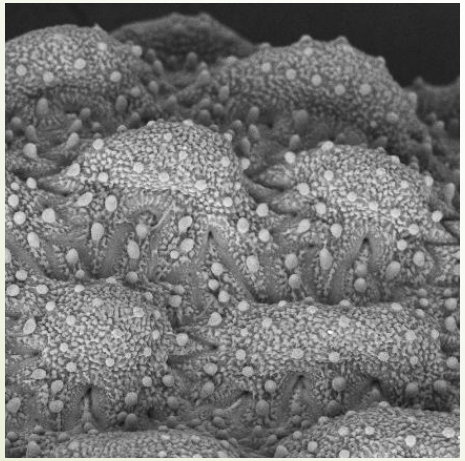
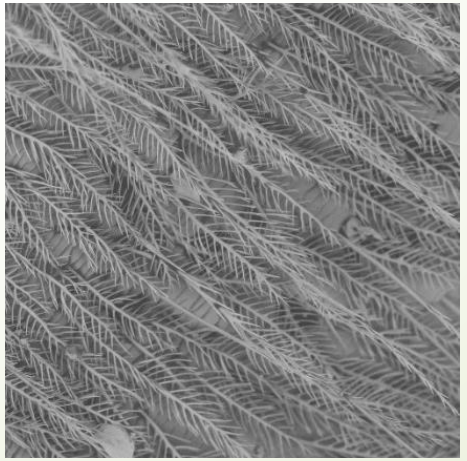
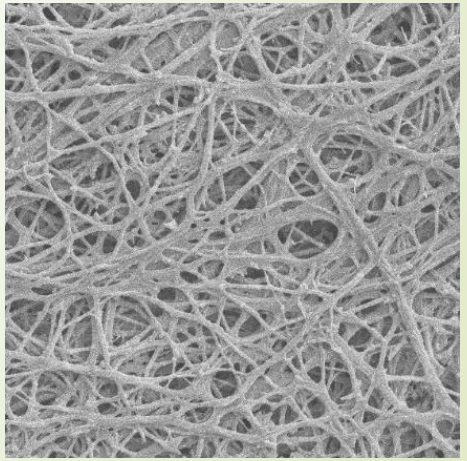

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829 posts 5,456 followers 670 following
Community organisation
Here to connect community gardens & city farms around Australia.
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linktr.ee/communitygardensaust and 2 more
Followed by probatrix
Follow
Message
Nat'l Gather...
Find a garden
SOIL
REWILDING THE UNDERGROUND
The Community Gardens Australia 2025 annual survey is now open!
New growing guides for Canberra gardeners!
Tamar and Meander Valley Community Gardens Open Day 30 November 2025
We're feeding Australia
We're starting a conversation in Canberra...
Join us in welcoming our new Chair!
Nominations now open for Community Gardens Australia Awards 2025
WA Community Gardens Gathering 15 November 2025
WA community garden grants now open!
2025 WA COMMUNITY GARDENS GATHERING
PROGRAM
National Community Gardens Day 2 November 2025
Enjoy all the celebrations in your community gardens
2025 SA COMMUNITY GARDENS GATHERING
Free Webinar
Highlights from our latest annual report and survey
GARDENING: it's cheaper than therapy and yields tomatoes
NATIONAL COMMUNITY GARDENS DAY
COMMUNITY GARDENS AUSTRALIA
2025 ANNUAL GENERAL MEETING

Name That Pollen

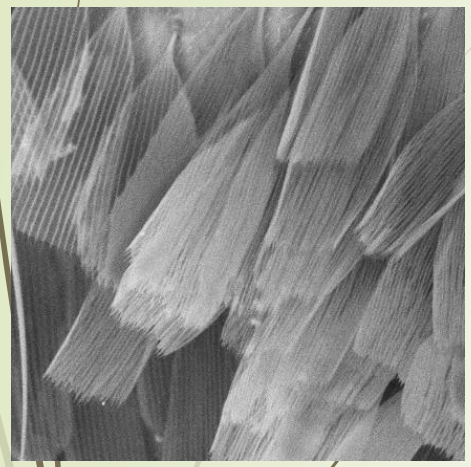
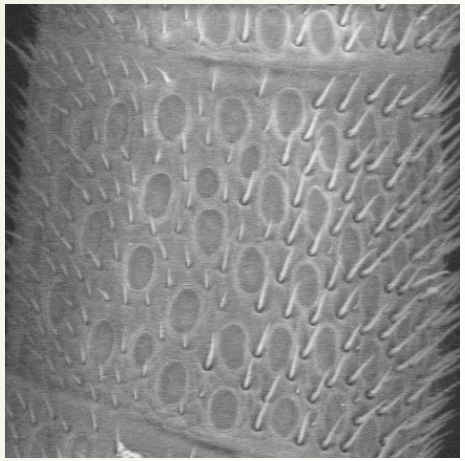
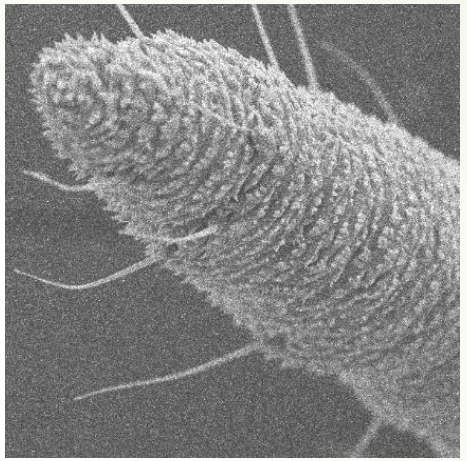
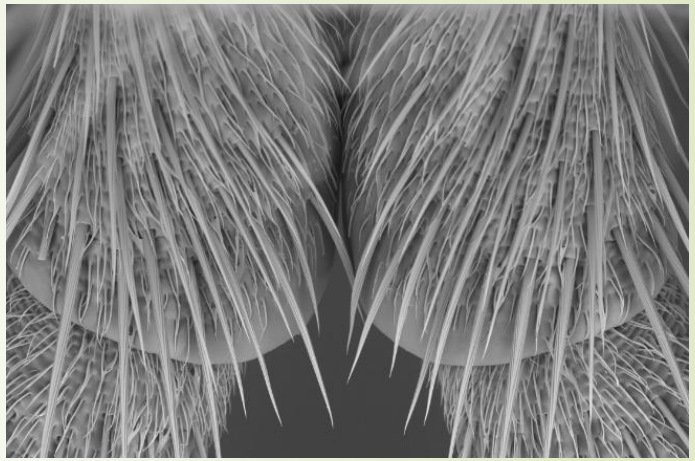
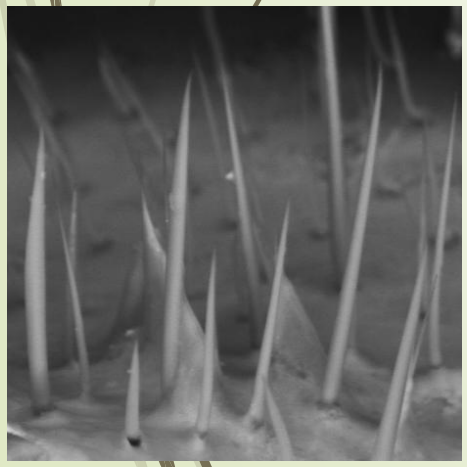
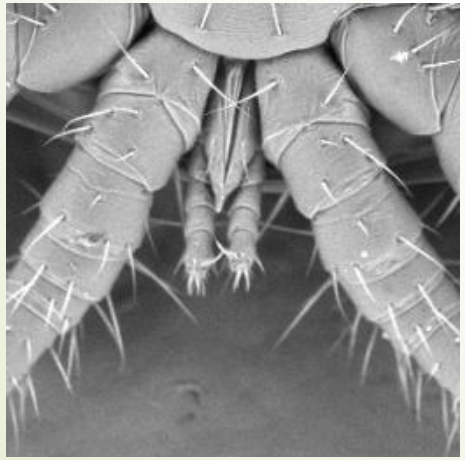
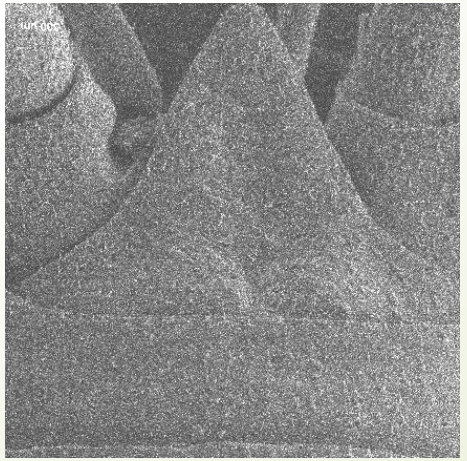
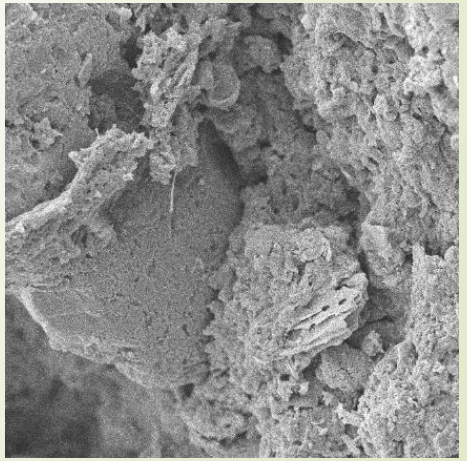


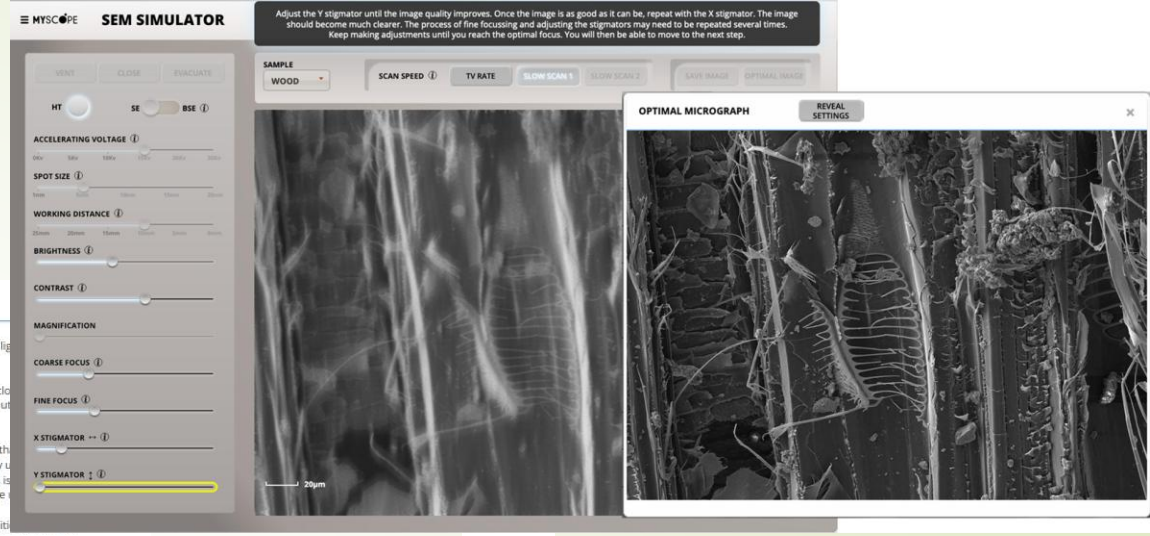
Animal or Vegetable?

Heads or Tails?

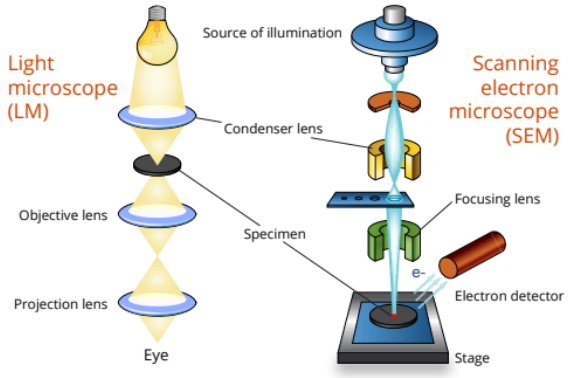









For more info...



How does an SEM work? - Structure of an SEM

Electron microscopes are in many ways analogous to light microscopes. This is surprising at first glance, given the contrast between the simple technology of the light microscope and the complex electronics, vacuum equipment, voltage supplies and electron optics system of electron microscopes. In both cases there is a source of illumination (light bulb vs electron source), a condenser lens (glass vs electromagnetic), a specimen and a detector (the eye vs an electron detector). A comparison of these features is used frequently as a starting point for any discussion of SEM.



The SEM uses a beam of high energy electrons generated by an electron gun, processed by magnetic lenses, focused at the specimen surface and systematically scanned (rastered) across the surface of a specimen. Unlike the light in a light microscope, the electrons in an SEM never form a real image of the sample.

The SEM image is a result of the beam illuminating the sample one point at a time in a rectangular scanning pattern (raster), with the strength of the signal generated from each point being a reflection of differences (e.g. topographical or compositional) in the sample. The viewing screen is scanned in synchrony with the beam on the specimen in a one-to-one relationship between points on the specimen and points on the image viewing screen (a point-by-point translation). Increased magnification is produced by decreasing the size of the area scanned on the specimen.

What can it do differently to a light microscope?

The scanning electron microscope (SEM) provides the competent user with an advantage over the li
three key areas:

Resolution at high-magnification: Resolution can be defined as the least distance between two clo
which they may be recognised as two separate entities. The best resolution possible in a LM is about
typical SEM has a resolution of better than 10 nm (typically 5 nm).

Depth of field: This is the height of a specimen that appears in focus in an image - SEM has more th
of field compared to the LM. This means that great topographical detail can be obtained. For many u
dimensional (3D) appearance of the specimen image, is the most valuable feature of the SEM. This is
even at low magnifications, can provide much more information about a specimen than is available

Microanalysis: The analysis of sample composition including information about chemical compositi
crystallographic, magnetic and electrical characteristics.

The image below is of a bee's head showing an eye and an antenna. Note that all of the antenna is in focus in the SEM image (right).



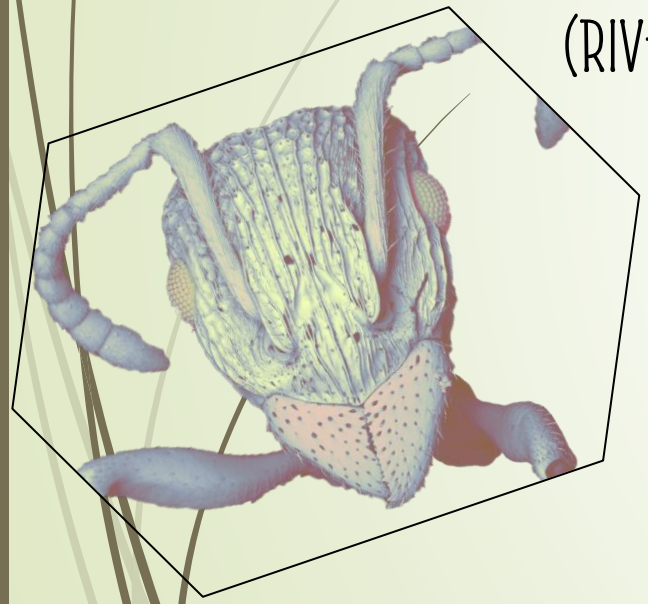
Two images side to side, from Optical and SEM microscopes, same sample.

Microscopy Australia's **MYSCOPE** website:

https://myscope.training/

Thank you!

- Community Gardens Australia
- UNSW Faculty of Science
- Our local community garden members (Riverwood, Maroubra, Mosman, UNSW)





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