ALGAL INTIMATES

Algal "intimates":

Parasites: Algae can be parasitized by other algae. These parasites may be colourless and totally dependent on their host for nutrition, or may be coloured and partially nutritionally dependent. They can grow within the host (***endoparasites***) or on its surface (as ***ectoparasites***). But, all have some emergent stage in order to release reproductive materials, and this enables them to be identified. Surprisingly, some algal parasites belong to the same major classification group as their hosts!

- **Ambiguous connections:** Unfortunately, sometimes the nutritional connection to a host is not known. Some organisms attach themselves intimately to specific hosts but may not be using them as food, merely as a support. A comprehensive term for any obligate and intimate connection between organisms is ***symbiosis***, and the organisms are called ***symbionts***.
- **Looser connections**: attaching to a plant host rather than a rock or other hard surface such as a jetty pile is called ***epiphytism***, and plants ***and*** animals that do this are called ***epiphytes***. These are extremely abundant and varied in marine habitats. In the examples shown below, for simplicity, only a few species ***highly specific or very commonly found*** on their hosts are illustrated. Most species for which there are few records ("rare" species) have been ***excluded*** also for brevity.

Identifying the "intimates"

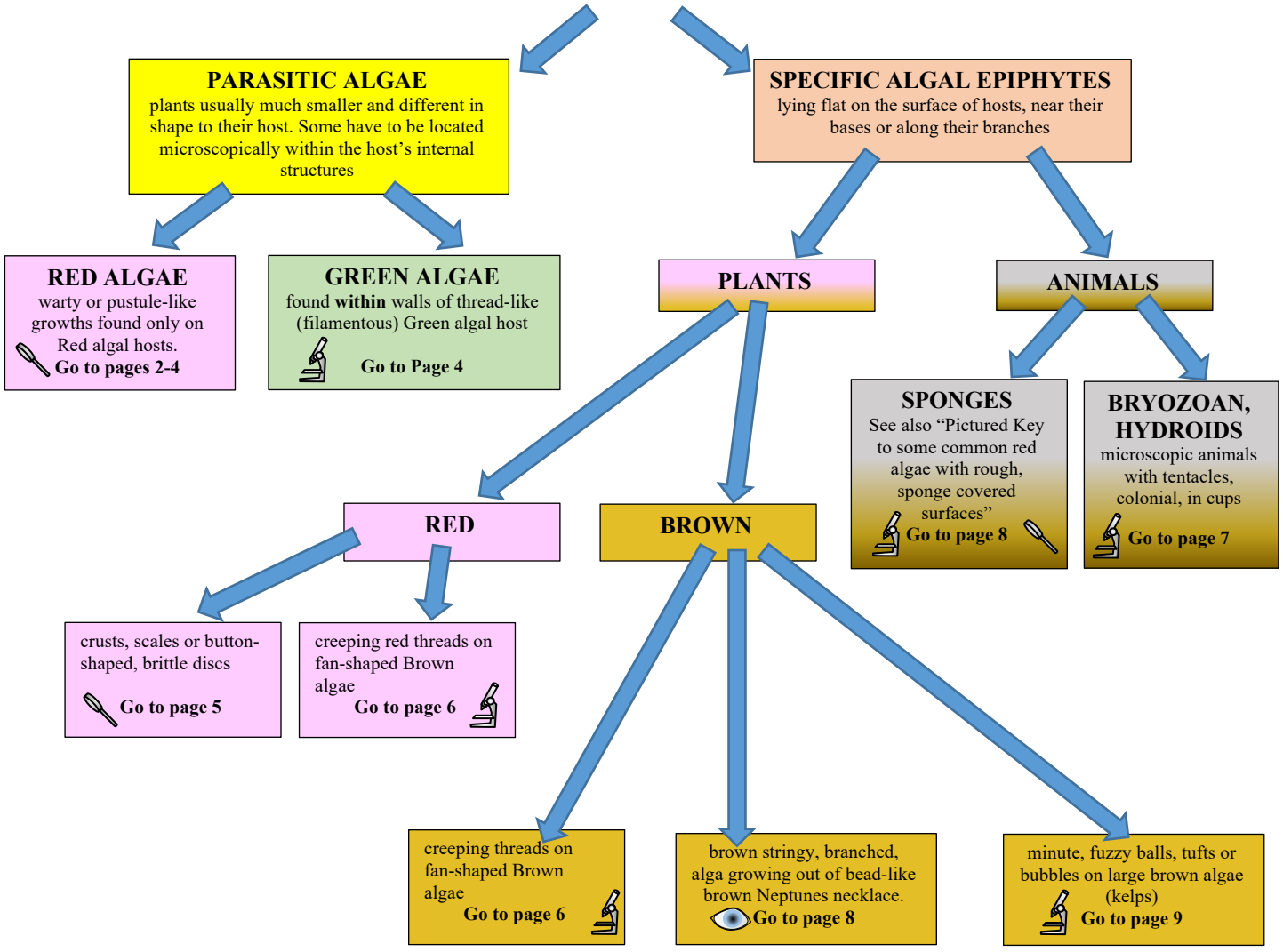
- **Animals**
  Only animals fixed on algal surfaces and commonly ***found on specific algal hosts*** have been included. Identifying the host will generally enable you to find the name of the intimate (parasite/symbiont) as well.
- **Algae**
  Unusual bumps, lumps, spots, warty or fuzzy outgrowths that don't seem to fit the usual shape of a plant are often good clues to identifying algal parasites/symbionts

Scale: The coin used as a scale is 24 mm or almost 1" wide. Some plants are microscopic, others can be seen only with a hand lens, while others can be seen with the unaided eye

Microscope images of algae are usually stained blue.

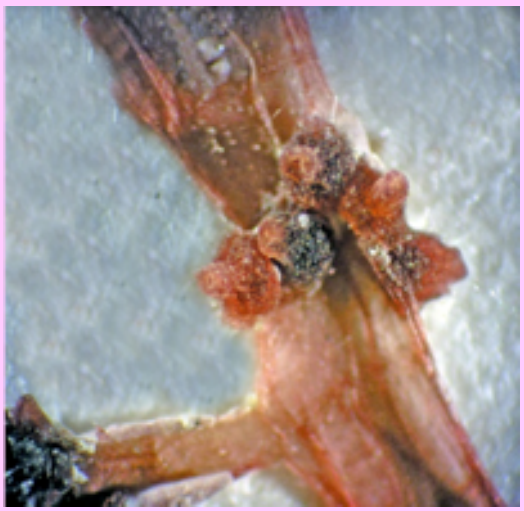
Common names: descriptive names and common names found in Edgar G.J. *Australian Marine Life. Second Edition* (2008). Sydney, New Holland have been used where they aid in identification. These are marked by §

SEARCH STRATEGY



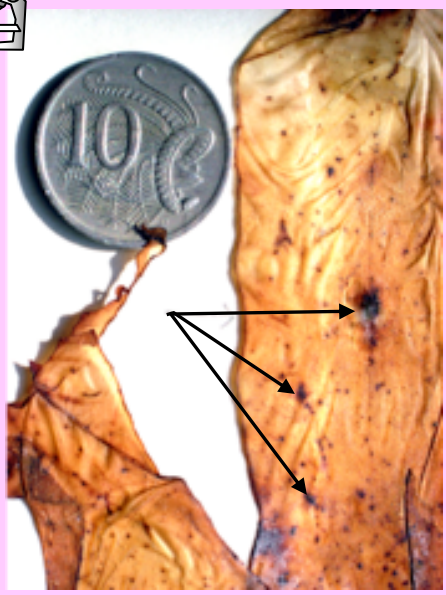
PARASITIC RED ALGAE for a summary of red algal intimates see Preuss, M., *et al* (2016). *Synopsis of red algal parasites….* *in* Botanica Marina vol. 60 issue 1

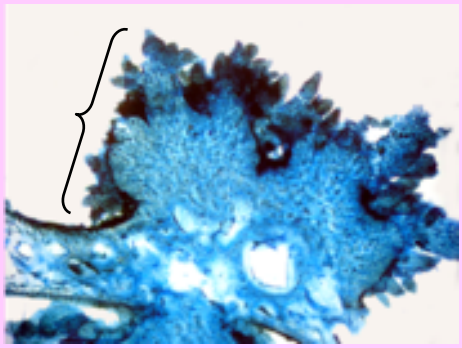
warty growths on ***Champia viridis***



Above: host plant, ***Champia viridis***
Centre**:** the parasite, ***Champiocolax lobata*** (arrowed)
Right: detail of the warty parasite

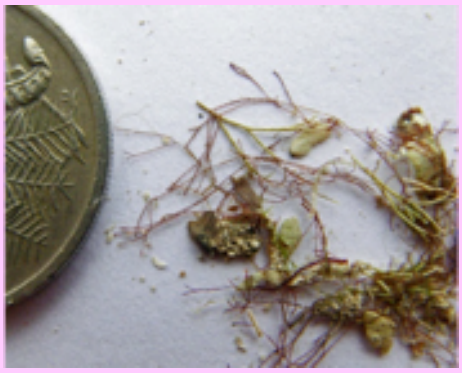
Lenormandia pustules

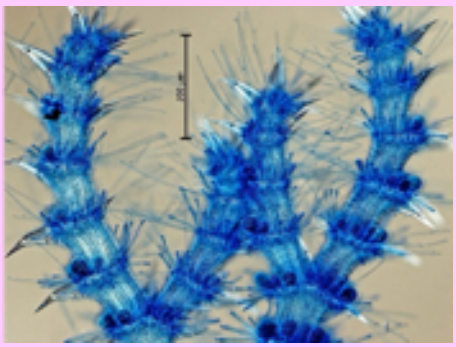


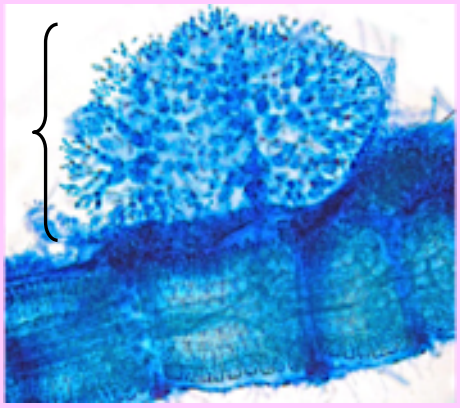


Far left: host plant, ***Lenormandia spectabilis***
Centre: detail of host surface with the parasite ***Tylocolax microcarpus*** (arrowed)
Above: section of the host blade with parasite emergent (bracketed)

microscopic cushions on the filamentous red alga, ***Centroceros***

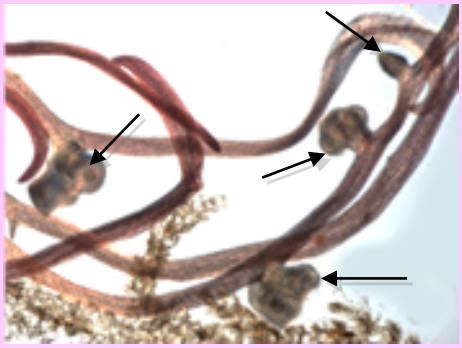


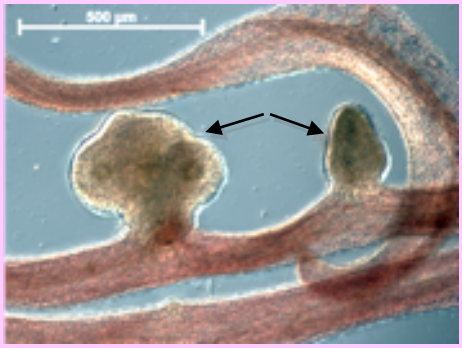




Above: host plant, ***Centroceros***
Centre: detail of host plant tips
Right: microscopic view of the parasite, ***Episporium centroceratis*** (bracketed), a male plant

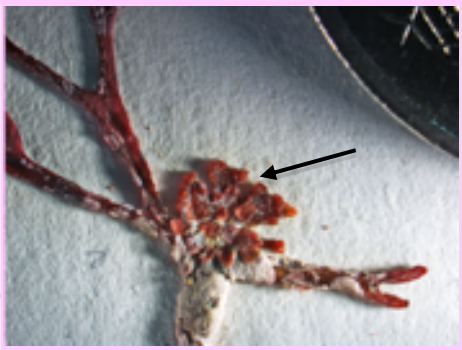
colourless bumps on *Hypnea* species

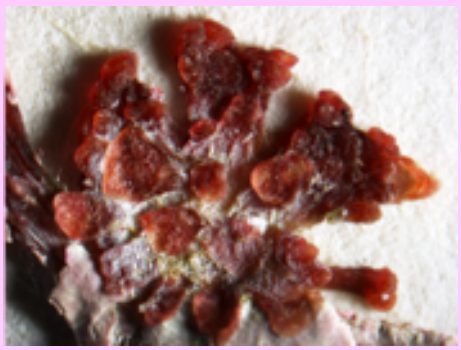




Left: host plant, ***Hypnea filiformis***
Centre: stalked, bumpy parasite ***Hypneocolax*** (arrowed)
Right: detailed view of colourless parasites with rounded cystocarps (arrowed)

bunches of red outgrowths on many *Laurencia* species





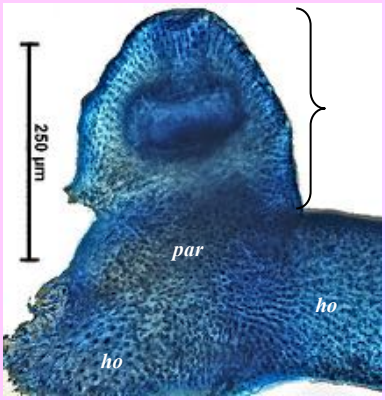
Left: host plant, ***Laurencia filiformis***
Centre: parasite, ***Janczewskia tasmanica*** (arrowed) in the fork of the host branches
Right: detail of the parasite

internal parasite of mainly §Rosy Coralline, *Haliptilon roseum*

Left:
host, §Rosy Coralline in shallow water.
Photo: D. Muirhead

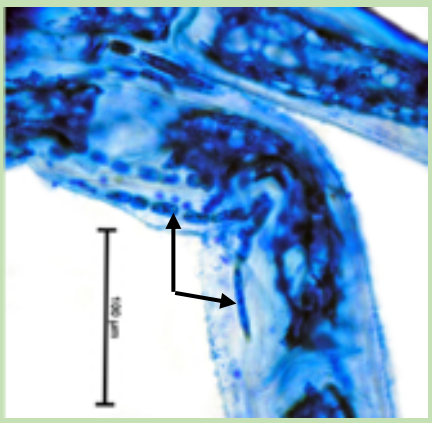
Right:
detail of the host branching pattern

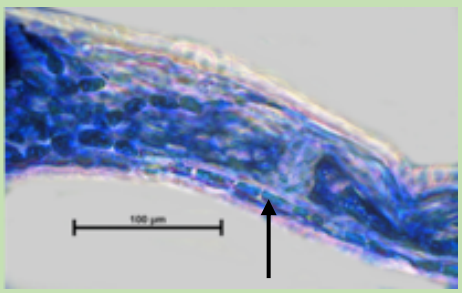
Left:
host, (*ho*) and parasite, ***Choreonema thuretii*** (*par*)



Right:
section through the emerging female reproductive structure (bracketed) of the parasite ***Choreonema thuretii*** with parasite tissue (*par*) penetrating the host (*ho*)

GREEN ALGAL ENDOPHYTE (true Green algal parasites are generally found on land plants)





Left: the green algal host, ***Rhizoclonium***
Centre: stained host cells with the green "parasite" ***Entocladia viridis*** thread (arrowed) running through the host's thick cell wall
Right: branched threads of ***Entocladia viridis*** in the host's wall

RED CORALLINE ALGAE FORMING EPIPHYTIC CRUSTS, SCALES OR BUTTON SHAPED DISCS ON OTHER PLANTS

(found also in the "Pictured Key to Common Coralline Red Algae")

Left:
flaking pink scales of ***Pneophyllum* spp**, found on algae (as in this image) and also seagrasses

Right:
thin leaves of the Eelgrass, ***Heterozostera***, with chalky scales of ***Hydrolithon farinosum***

Pink scales, ***Melobesia membranacea*** on the green alga, ***Caulerpa simpliciuscula***

Left: upper parts of the host, with the epiphyte
Centre: magnified appearance of the green bladders of the host without epiphyte
Right: magnified appearance of the green bladders of the host ***with*** epiphyte

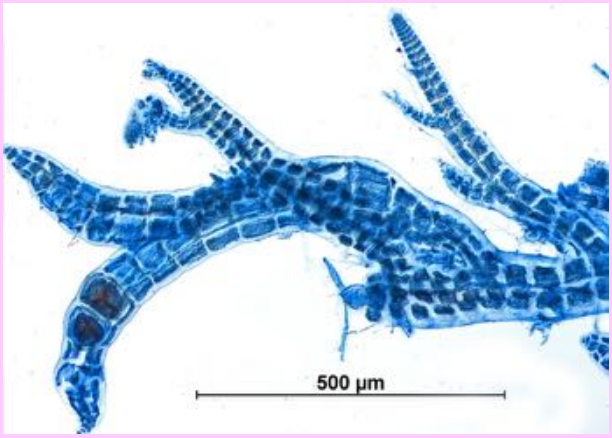
§Button coralline, ***Synarthrophyton patena*** on the red alga, *Ballia callitricha*

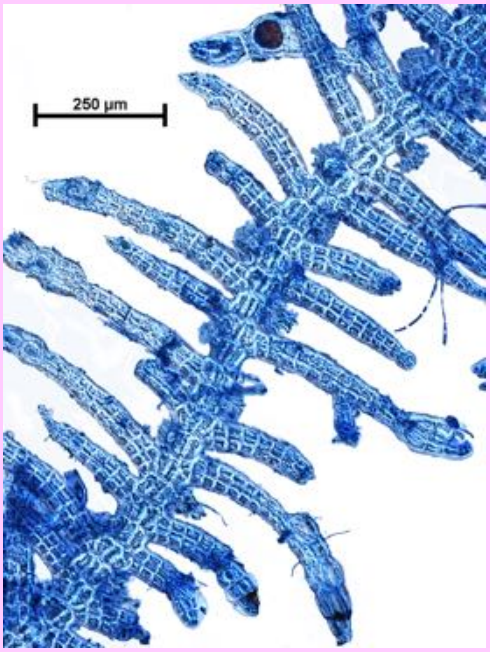
CREEPING RED THREADS ON FAN-SHAPED BROWN ALGAE, often *Lobophora variegata*

Common host, the Brown alga, ***Lobophora variegata***, on the reef edge, Pt Willunga SA

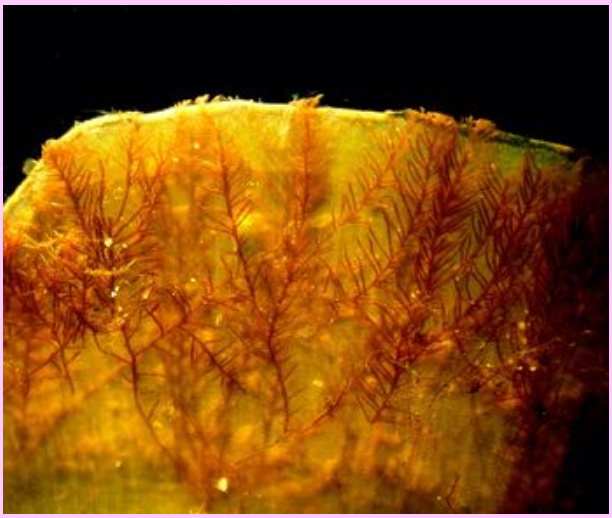
Red algal epiphyte, ***Lophosiphonia prostrata*** creeping across the surface and curling over the rim of the fan-shaped host Brown alga

(Right) ***Lophosiphonia prostrata*** stained blue and viewed microscopically





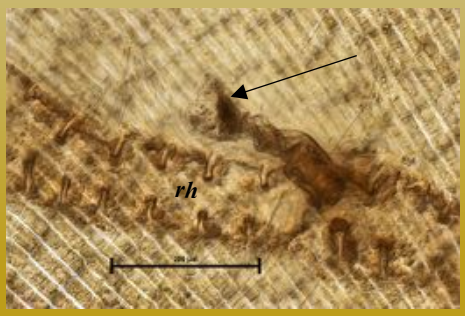
Ditria expleta stained blue and viewed microscopically, showing the feathery branching pattern



Ditria expleta creeping across the blade of the host, ***Lobophora variegata***

HYDROID ANIMAL EPIPHYTE, usually on the fan-shaped Brown alga, *Zonaria crenata*

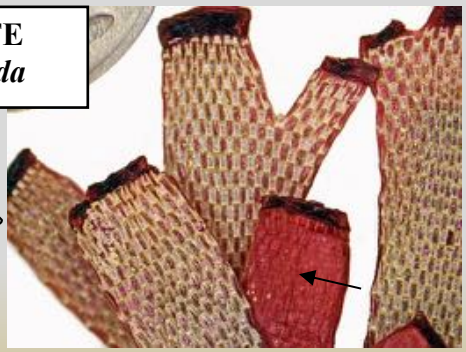
The brown algal host, *Zonaria crenata*



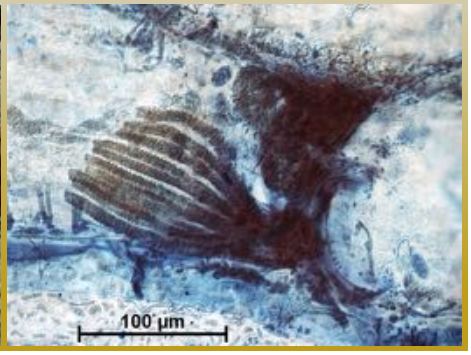
Images on the right:
Top colourless network of the hydroid animal ***Scoresbia daidala*** on the surface of the blades of ***Zonaria crenata***
Centre detail of the network of the epiphyte ***Scoresbia daidala***
Bottom: single cup-shaped hydroid (arrowed) attached to the colony rhizome (***rh***) lying on the host blade

BRYOZOAN ANIMAL EPIPHYTE on the Red alga, *Amansia pinnatifida*

Host ***Amansia pinnatifida*** ,
lower parts covered by whitish Bryozoan epiphyte ***Bathypora nitens*** (arrowed)

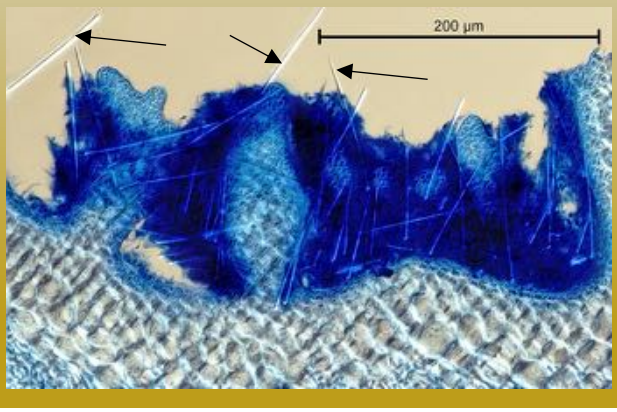


Left: Host, *Amansia pinnatifida* practically covered by colonies of the Bryozoan (Sea Moss) ***Bathypora nitens***. One blade without the epiphyte is arrowed
Left, below:
Comparison of red algal host cells (left) and large Bryozoan animal chambers (zooecia) of ***Bathypora nitens***
Below:
Microscope view of a single animal (zooid) of ***Bathypora nitens***, with tentacles contracted to the base of its zooecium



SPONGE EPIPHYTES of RED ALGAE

One example is figured below. For others, see "Pictured Key to some red algae of southern Australia with rough, sponge-covered surfaces" "



Thamnoclonium dichotomum

Above: whole plant

Right, above: close up view of the warty sponge covered surface and small leafy tips of the host appearing only at the plant tips

Right, below: section through the host showing deeply stained sponge lying between host outgrowths and some detached, glassy slivers of the sponge skeleton (arrowed)

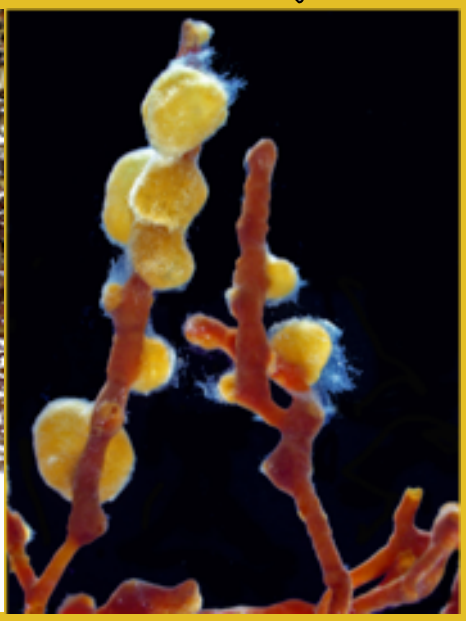
BROWN ALGAL PARTIAL PARASITE - §Neptune's String, ***Notheia anomala*** on §Neptune's Necklace, ***Hormosira banksii***

Left: partial parasites, "stringy" ***Notheia***, growing from the reproductive "bumps" (conceptacles) of the bead-like host, ***Hormosira***

Right: enlarged view of the parasite (left) growing from the host. Shorter side branches are often actually separate parasite plants developing from the conceptacles of the founding ***Notheia*** plant, and not strictly part of it. Hair tufts emerging from the conceptacles are prominent.

BROWN ALGAE ON OTHER PLANTS (found also in "Pictured Keys of Common Southern Australian Marine Plants: Turf and fouling algae, III thread and wormlike brown algae")

Corynophora spp**:** fuzzy balls on ***Cystophora***



Far left: typical host plant, *Cystophora brownii* can be infested
Centre: magnified view of the epiphyte, ***Corynophloea cristata*** on ultimate branchlets of *Cystophora moniliformis*
Right: microscopic detail of ***Corynophloea*** with dark spores

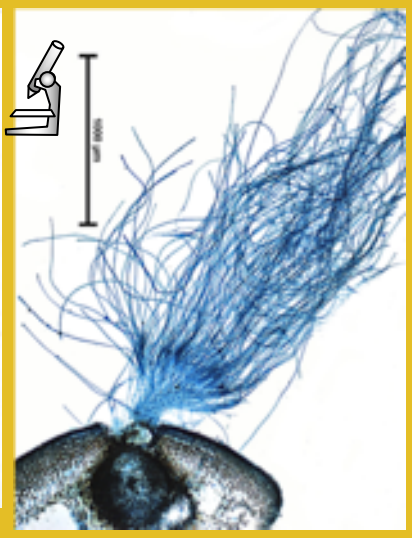
found on a variety of ***Cystophora*** species

Elachista **spp:** tufts and bubbles protruding from large Brown algae (kelps)

Host: ***Xiphophora*** parasitized by ***Elachista australis***

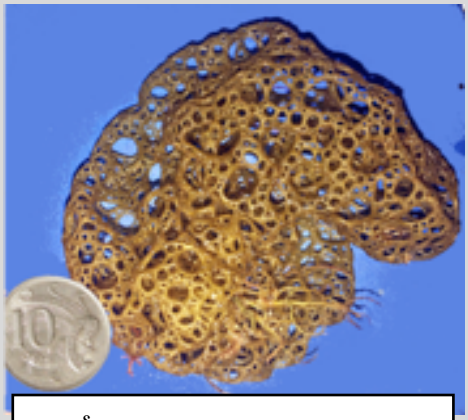
Host: E***cklonia*** parasitized by ***Elachista orbicularis*** (as ***Elachista nigra*** in the flora)

Host: ***Sargassum*** "leaf" parasitized by ***Elachista claytoniae***

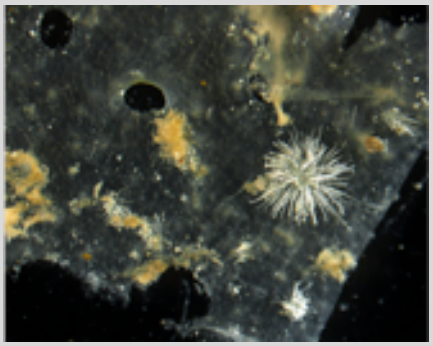


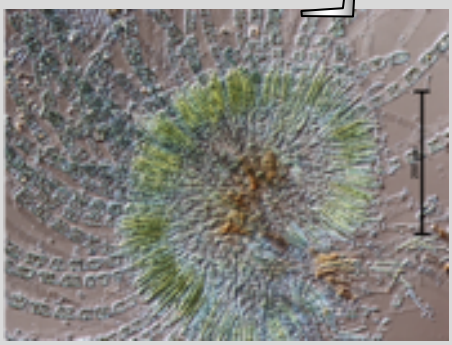
Left ultimate branches of a ***Xiphophora*** infested with ***Elachista australis*** (arrowed)
Above: detail of the tufts and balloon-shaped masses that may develop
Right: section through the reproductive pit (conceptacle) of the host with ***Elachista*** plant emerging

Myriactula spp form hairy tufts on a variety of Brown algae



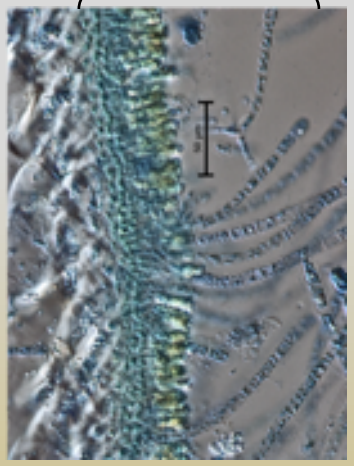
host §Lace Ballweed, ***Hydroclathrus***





Left: host plant, ***Hydroclathrus***
Centre: detail of hairy tuft of the parasite, ***Myriactula arabica*** on the surface of the host
Right microscopic image of a tuft of the parasite extracted from the host, with dense spores at the base of hairs

fuzzy patches on tubular *Stringweed, ***Scytosiphon***



Above: host plant, ***Scytosiphon*** with tufts of the parasite, ***Myriactula caespitosa*** (arrowed)
Centre: detail of fuzzy appearance of the host caused by the parasite
Right: section through the outer part of the host with the parasite (bracketed) on the outer surface

hairy tufts on ***Cystophora***

tufts ***Myriactula filiformis*** (arrowed) on ***Cystophora monilifera***, at two magnifications

Forming a hairy surface on ***Colpomenia***, ***Caulocystis***, and ***Myriodesma***

Left: host, §Smooth Ballweed ***Colpomenia***

Above: host, §Grapeweed, ***Caulocystis***

Right, above: host, ***Myriodesma***

Above: fuzzy surface of host ***Caulocystis*** due to the parasite, ***Myriactula haydenii***