SOME SOUTHERN AUSTRALIAN ALGAL INTIMATES AT A GLANCE

Algal "intimates":

- **Parasites**: Algae can be parasitized by other algae. These parasites may be colourless and totally dependent on their host for nutrition, or coloured and partially nutritionally dependent, grow within (***endoparasites***) or on the surface (***ectoparasites***) of the host, 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 with the host is not known. Some organisms attach themselves to specific hosts, but may be using them as intimate substrates rather than as food. A comprehensive term for any obligate and intimate connection between organisms is ***symbiosis***, and the organisms are called ***symbionts***.
- **Looser connections**: merely that of attaching to a plant host rather than a rock is called ***epiphytism***, and plants ***and*** animals that do this are ***epiphytes***. These are extremely abundant and varied in marine habitats, but will not be illustrated below ***except*** for a few species that are ***highly specific for the hosts on which they are found.*** Also, most species for which there are few records ("rare" species) have been ***excluded*** for brevity.

Identifying the "intimates"

Unusual bumps, lumps, spots, warty or fuzzy outgrowths that don't seem to fit the usual shape of a plant are often good clues. Identifying the host will generally enable you to find the name of the intimate (parasite/symbiont) as well.

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.

Microscope images of algae are usually blue stained.

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.

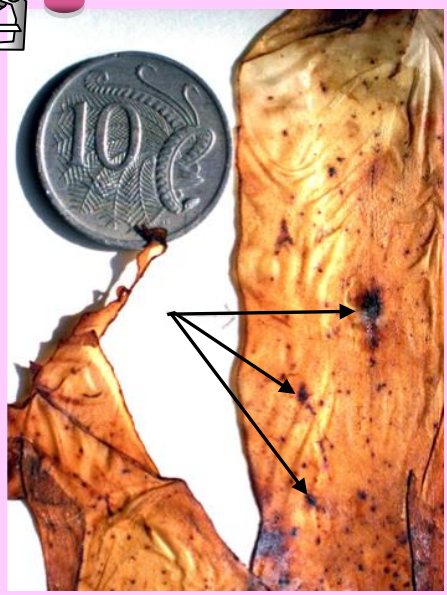
PARASITIC RED ALGAE

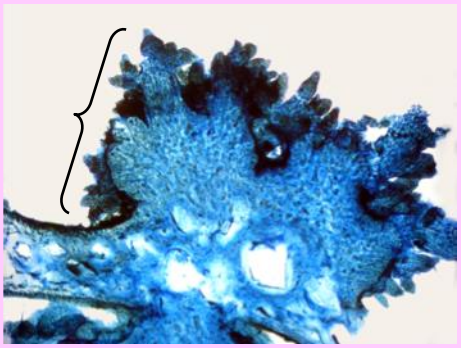
for a summary of red algal intimates see Preuss, M., *et al* (2016). *Synopsis of red algal parasites*…. *in* Botanica Marina vol. 60 issue 1

Warty growths on *Champia viridis*

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

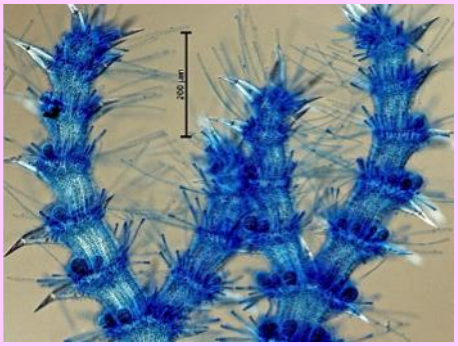
Lenormandia pustules

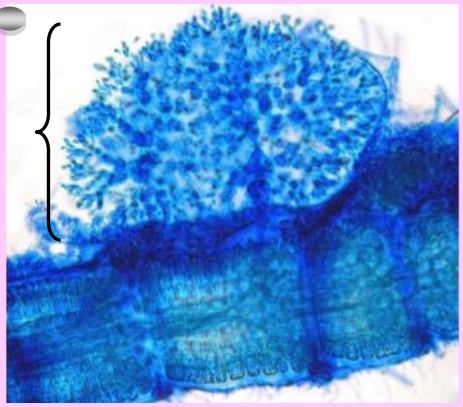




Far left: host plant, *Lenormandia spectabilis*
Centre: detail of host surface with the parasite ***Tylocolax microcarpus*** (arrowed)
Above: section of the host blade with parasite emergent (bracketed)

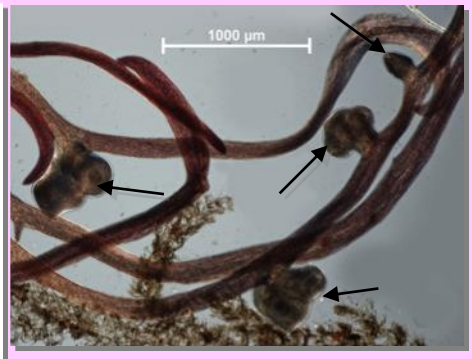
Microscopic cushions on the filamentous red alga, *Centroceros*

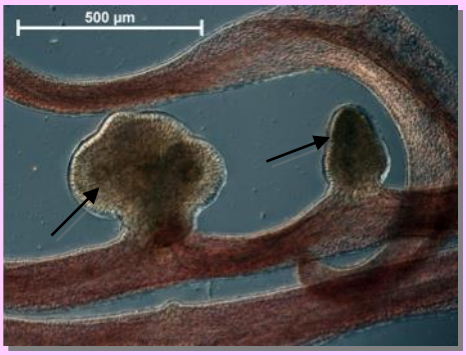




Above: host plant, *Centroceros*
Centre: detail of host plant tips
Right: microscopic view of the parasite, ***Episporium centroceratis*** (bracketed), a male plant

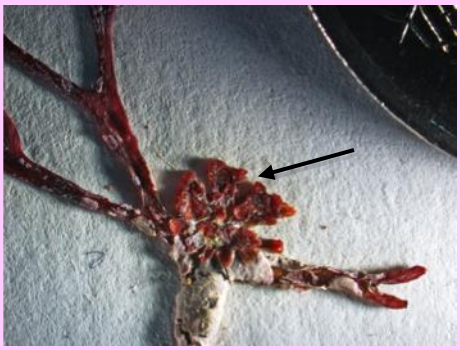
colourless bumps on *Hypnea* species





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

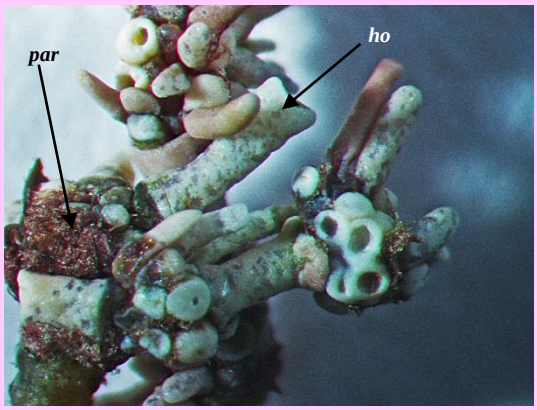


Left: host plant, *Laurencia filiformis*
Centre: parasite, ***Janczewskia tasmanica*** (arrowed) in the fork of the host branches
Right: detail of the parasite

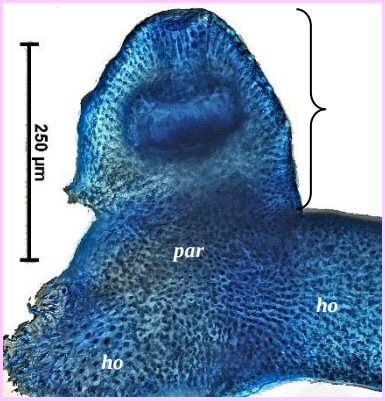
Internal parasite of mainly *Rosy Coralline, *Haliptilon roseum*

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

Right:
Detail of the host branching pattern

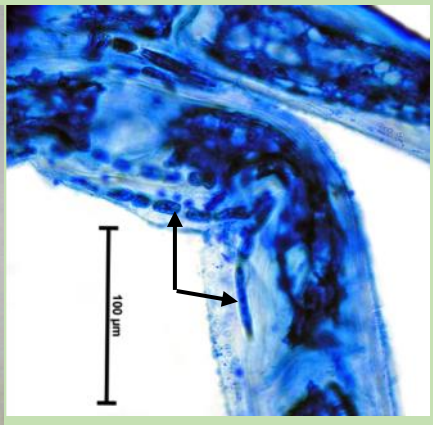


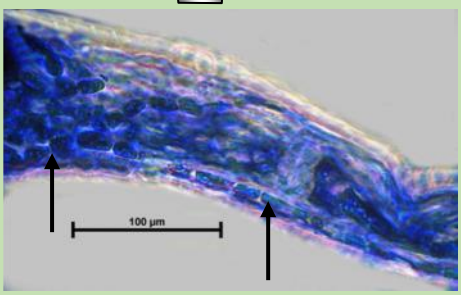
Left:
Host, (*ho*) and parasite, ***Choreonema thuretii*** (*par*)



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 AND SCALES ON OTHER ALGAE (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

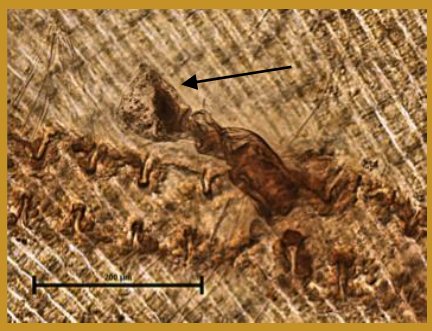
Centre: magnified appearance of the green bladders of the host without epiphyte

Right: magnified appearance of the green bladders of the host ***with*** epiphyte

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

BROWN ALGA AND EPIPHYTIC HYDROID ANIMAL

The brown algal host, *Zonaria crenata*



Images on the right:

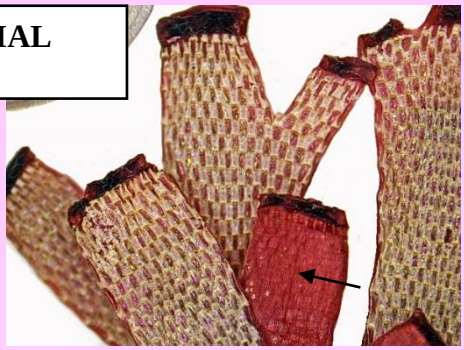
Top — colourless network of the hydroid animal ***Scoresbia daidala*** on the surface of the blades of *Zonaria crenata*

Centre — detail of the network of the epiphyte ***Scoresbia daidala***

Bottom: — single cup-shaped hydroid (arrowed) attached to the rhizome lying on the host blade

RED ALGAL BRYOZOAN ANIMAL EPIPHYTE

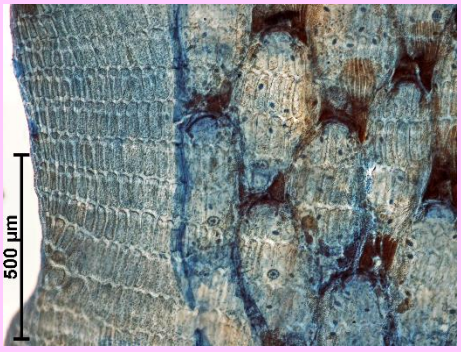
Host *Amansia pinnatifida* ,
lower parts covered by whitish Bryozoan epiphyte ***Bathypora nitens***

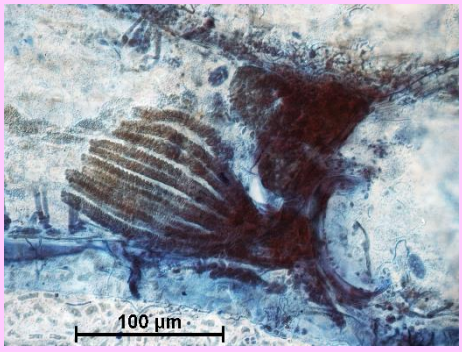


Left: Host, *Amansia pinnatifida* practically covered by colonies of the Bryozoan (Sea Moss) ***Bathypora nitens***. One blade without the epiphyte is arrowed

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 with tentacles (zooid) of ***Bathypora nitens***, contracted to the base of its zooecium





Baldock, R. N. (2019). Some algal intimates at glance. 8 pp. *Algae Revealed*. Adelaide: State Herbarium of South Australia flora.sa.gov.au/algae_revealed

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

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

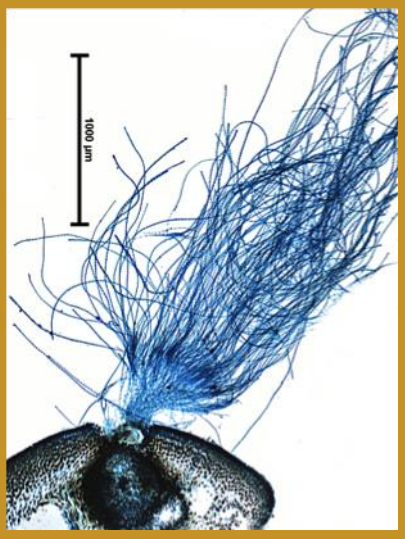
found on a variety of *Cystophora* species

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

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

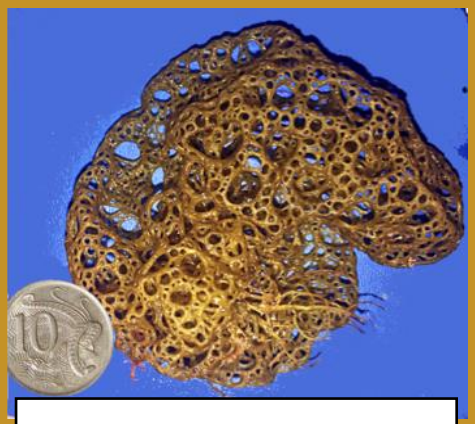
Host: Ecklonia parasitized by ***Elachista orbicularis*** (as ***Elachista nigra*** in the flora)

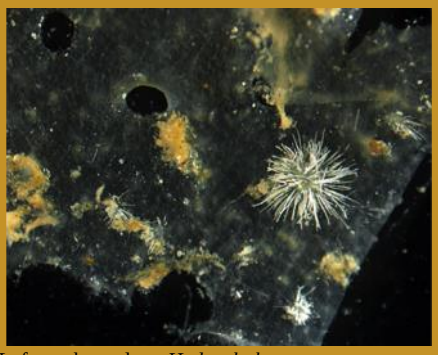
Host: *Sargassum* "leaf" parasitized by ***Elachista claytoniae***



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





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

on *Lace Ballweed, *Hydroclathrus*

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

hairy surfaces on *Colpomenia*, *Caulocystis*, and *Myriodesma*

Left: host, *Smooth Ballweed *Colpomenia*

Above: host, *Grapeweed, Caulocystis

Right, above: host, *Myriodesma*

Above: fuzzy surface of the parasite, ***Myriactula haydenii*** on *Caulocystis tips*

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