TURF AND FOULING ALGAE: 1. THE ECTOCARPACEAE

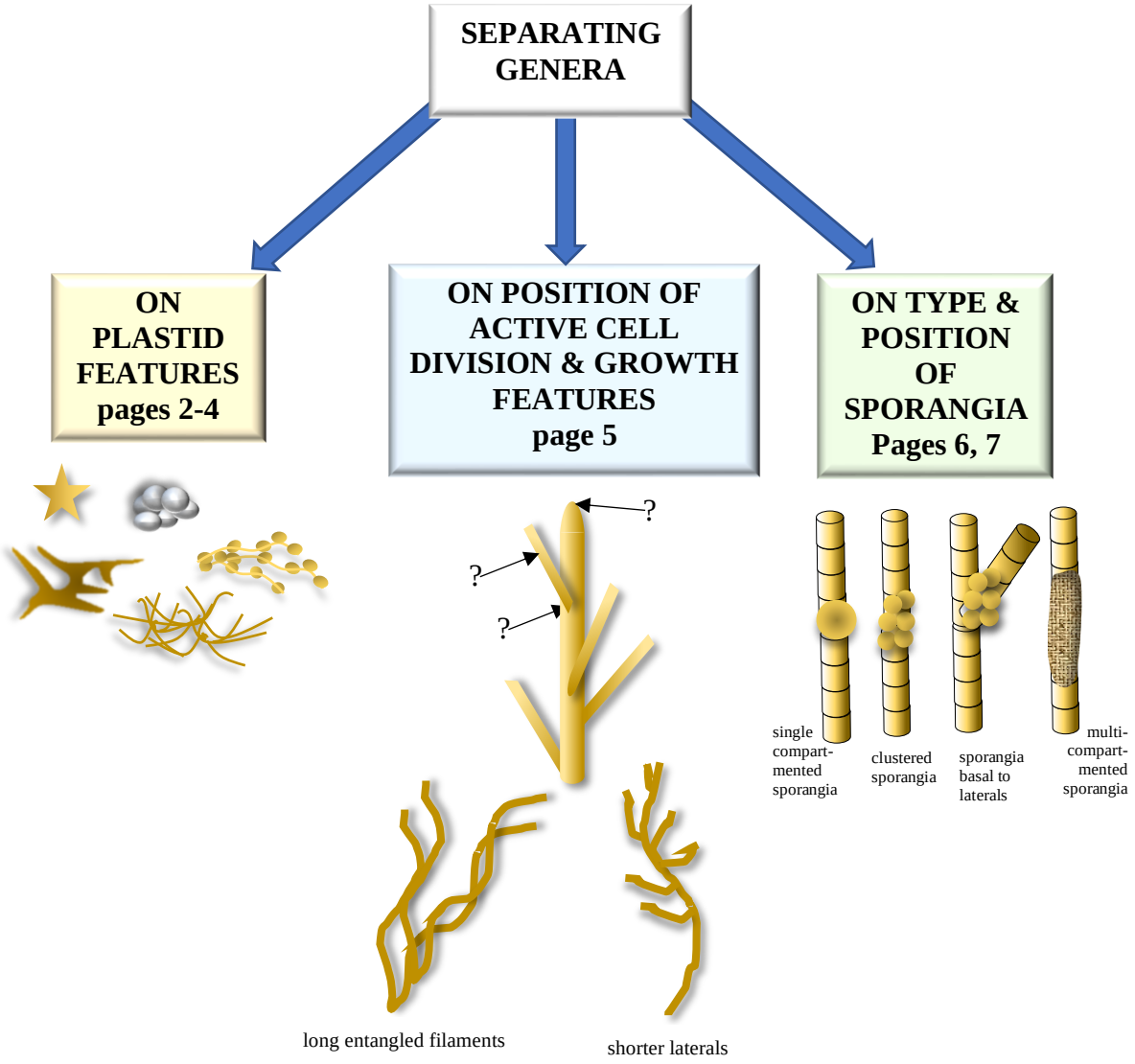
Members of the Family Ectocarpaceae are

- small, marine, filamentous (thread-like), branched brown algae that often grow on other plants (as epiphytes) They are considered "fouling" growth because many attach to harbor structures and boat hulls. One, (*Hincksia sordida*) coats large brown algae towards the end of summer with a cloudy mass locally called "snot weed". This could signal the presence of high levels of nutrients.
- many look greenish rather than brown.
- microscopic features separate the genera and these are illustrated below.
- Only the larger genera of the Family are considered below. The genera *Streblonema, Gononema* and *Kuetzingiella* are tiny plants growing within or just at the surface of host algae and are not shown.

Examples Three common species are illustrated on the last page. Identification of the many other species of the Ectocarpaceae will need reference to the Marine Benthic Flora of southern Australia

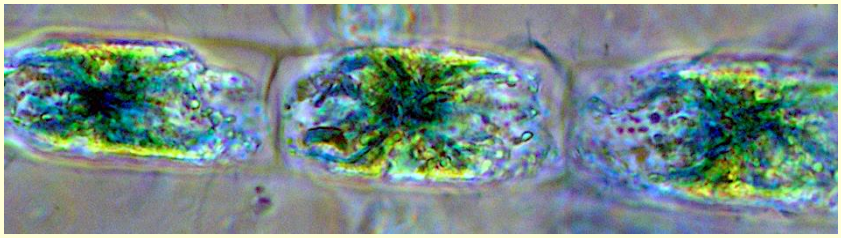
Images Specimens have been stained with aniline blue. Images with dark backgrounds indicate phase contrast microscopy has been used to highlight transparent structures. All images have been selected from the extensive slide collection of the algal laboratory, State Herbarium of South Australia, generated by Professor Womersley and his workers over some 60 years

Names These follow Womersley, H.B.S (1987) *The marine benthic algal flora of southern Australia: part II Brown algae* as this continues to provide accessible and comprehensive descriptions of southern Australian species.

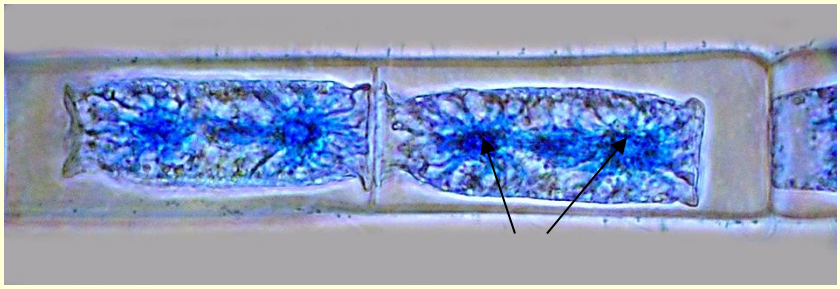


IDENTIFICATION OF GENERA USING PLASTID FEATURES

Star-shaped plastids present

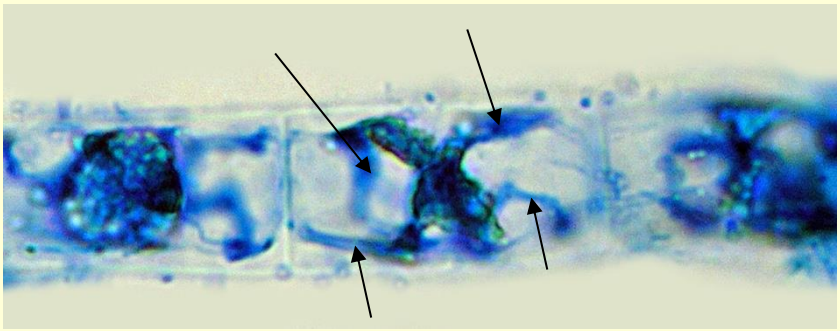


Asteronema
plastids radiate from the centre of the cell forming a star-shaped mass.
Note: old or preserved specimens may show merely a central layered mass

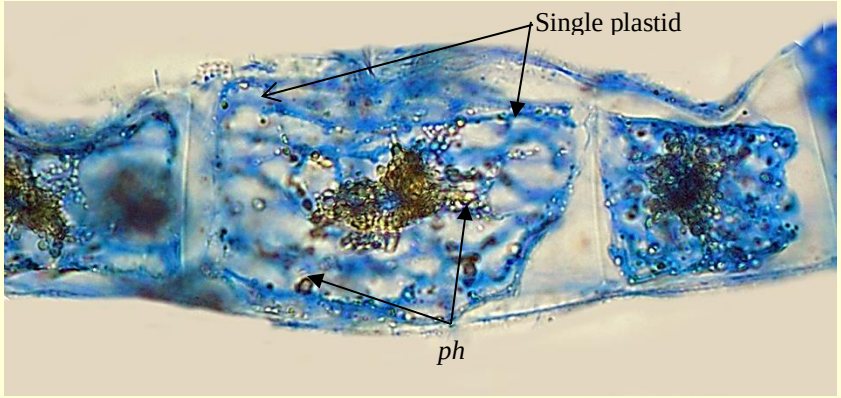


Bachelotia
one or two masses of star-shaped plastids (arrowed) are present.

Ribbon-shaped plastids

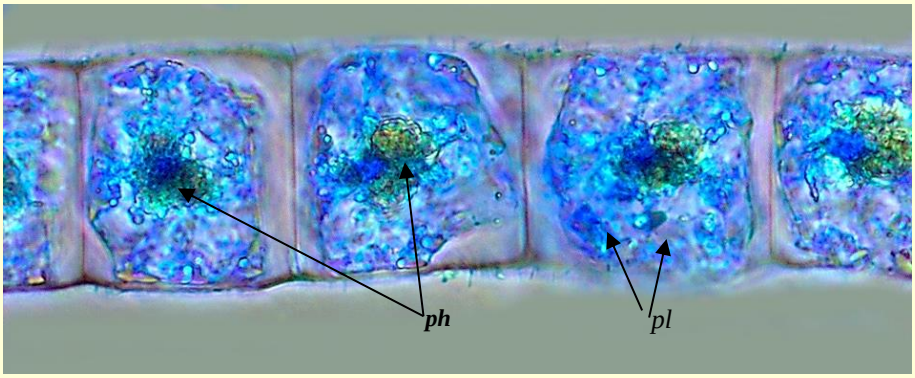


Ectocarpus
several relatively **broad, elongate** plastids are present (examples are arrowed)



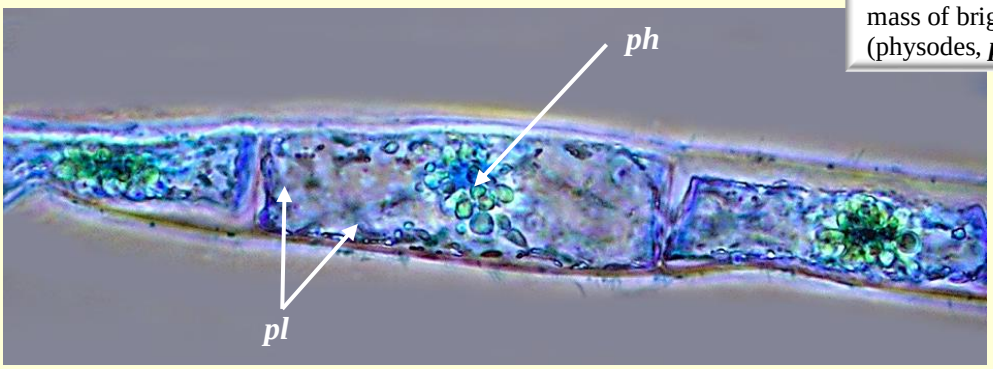
Kuckuckia
plastids are **thread-like** (sometimes spiral) and lie the **full length** of the cell (one example is arrowed). Bright structures called physodes (***ph***) may be prominent.

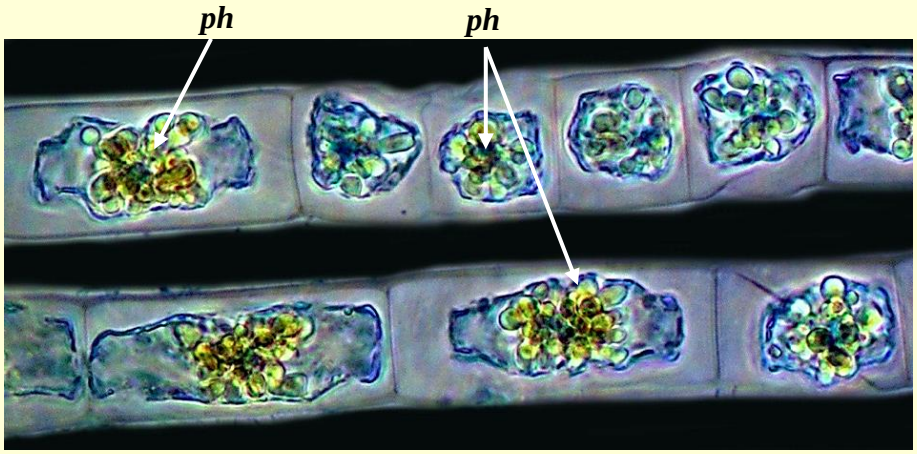
central mass of bright discs called physodes is present



Feldmannia
plastids (***pl***) are disc-shaped, scattered in strands, and a central mass of bright structures (physodes, ***ph***) occurs

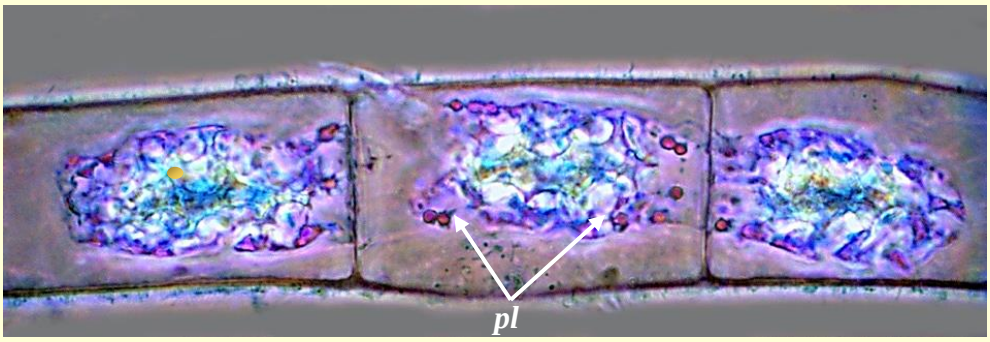
Sorocarpus
plastids (***pl***) are disc-shaped, scattered in strands, and a central mass of bright structures (physodes, ***ph***) occurs



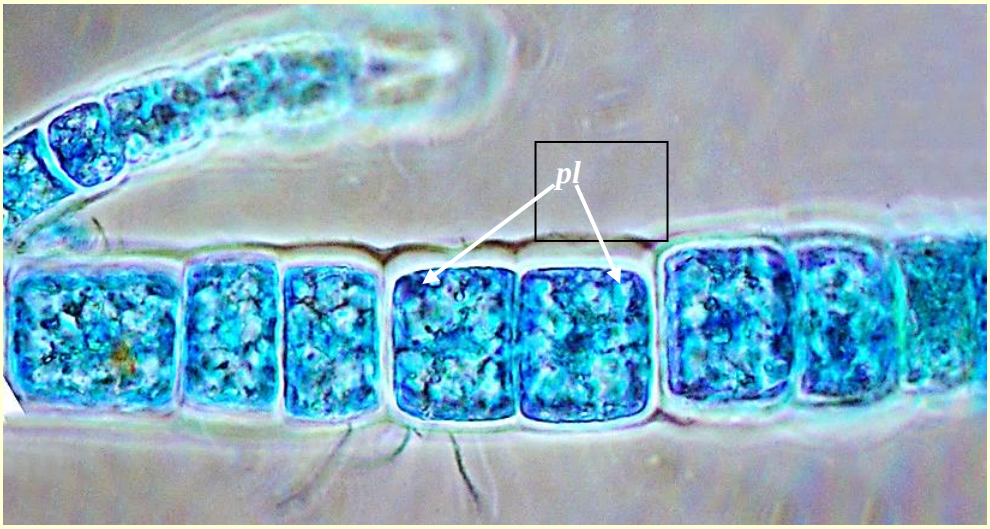


Zosterocarpus
plastids (***pl***) are disc shaped, scattered in strands, and a central mass of bright structures (physodes, ***ph***) occurs

strings of numerous disc-shaped plastids

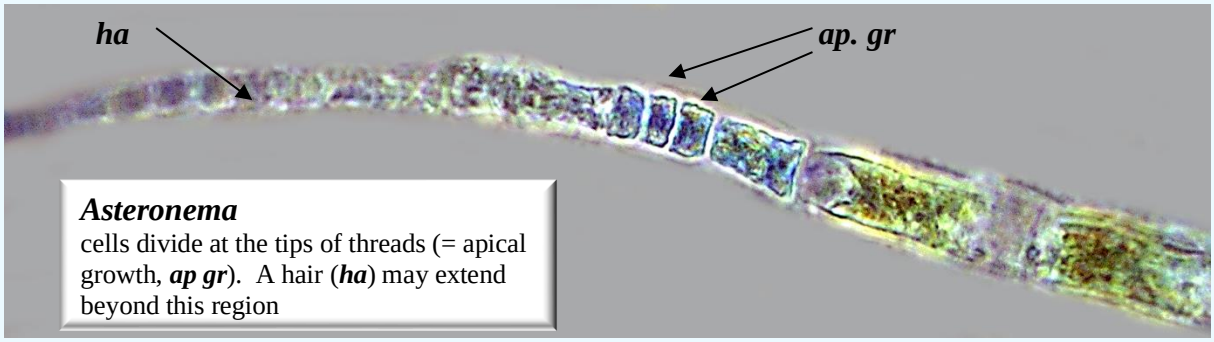


Hincksia (as ***Giffordia*** in the Marine Benthic Flora Part II) Numerous disc-shaped plastids (***pl***), each with a bright pyrenoid occur in strands

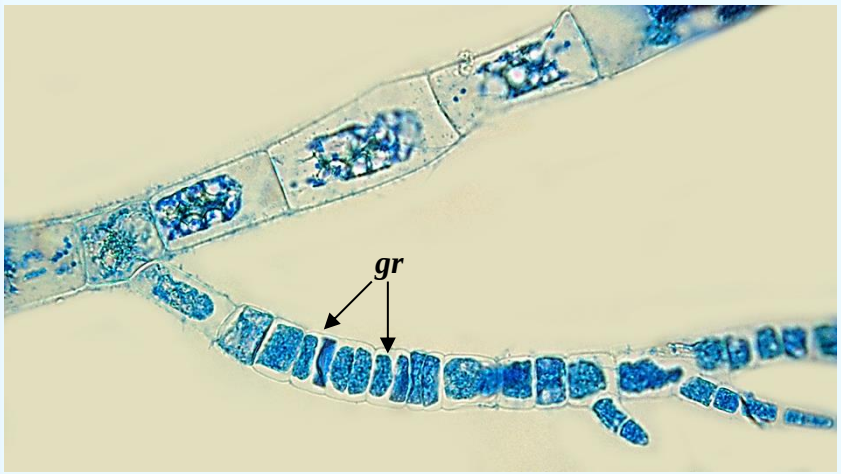


Pilayella numerous disc-shaped plastids (***pl***), each with a bright pyrenoid occur in strands

IDENTIFICATION USING THE POSITION OF ACTIVE CELL DIVISION & GROWTH FEATURES

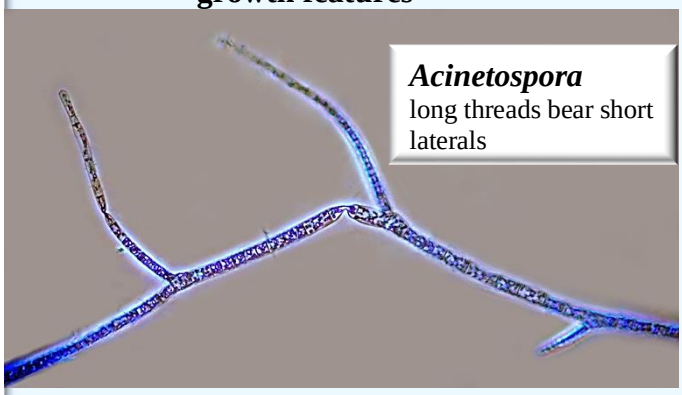


Asteronema
cells divide at the tips of threads (= apical growth, ***ap gr***). A hair (***ha***) may extend beyond this region

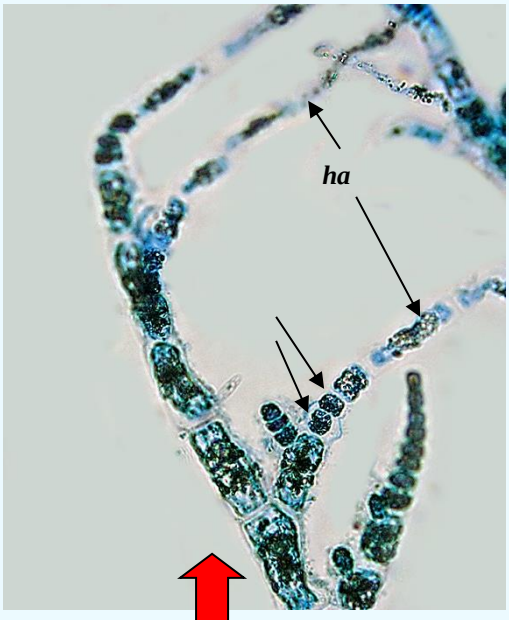


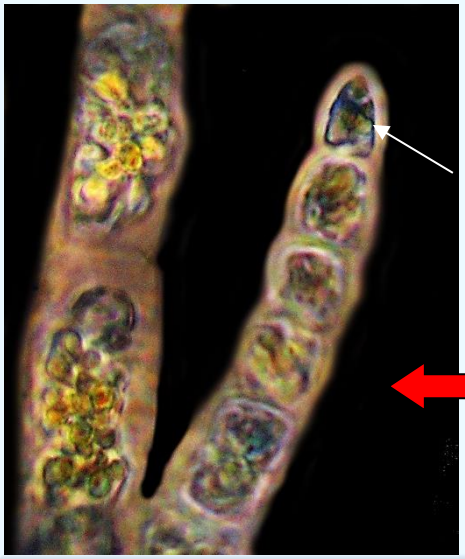
Hincksia
the growing regions (***gr***) occur at the base of side branches. This feature may be difficult to find

growth features



Acinetospora
long threads bear short laterals

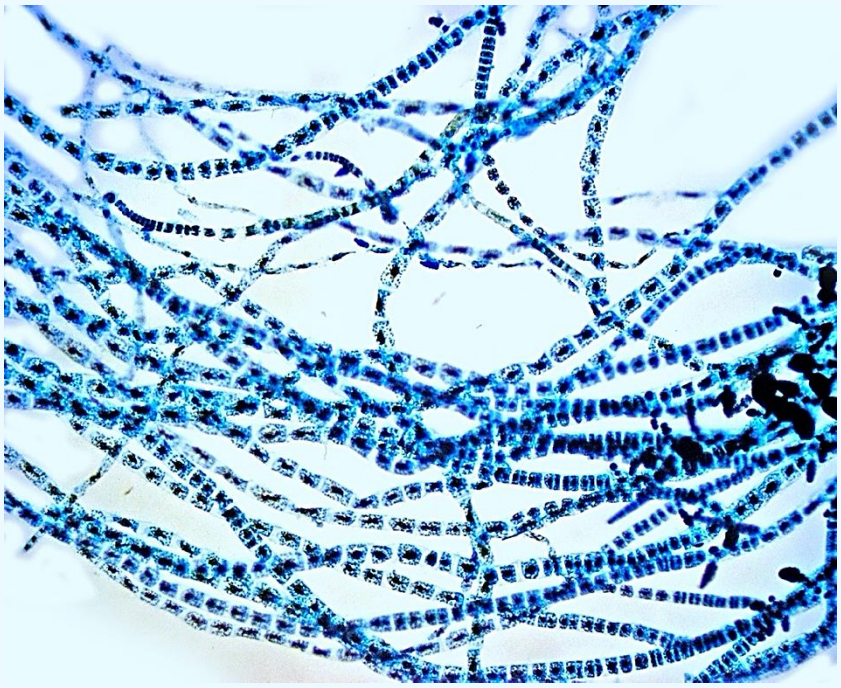




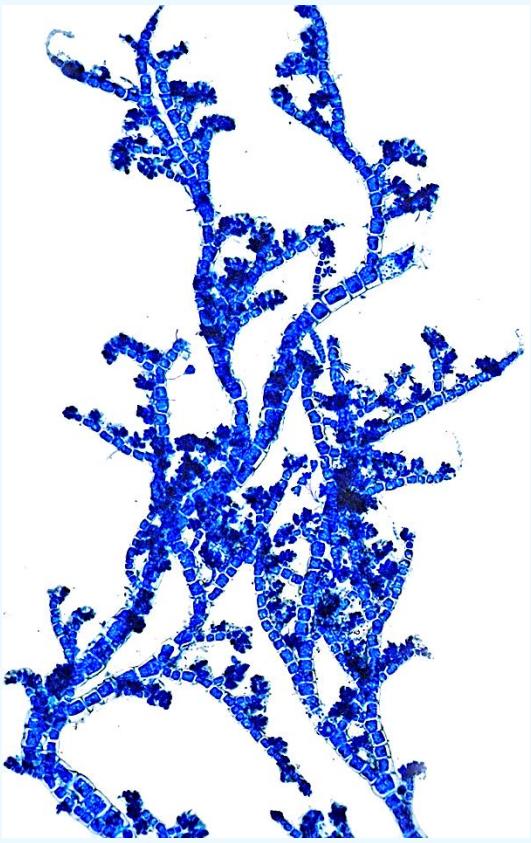
Kuckuckia
1. threads taper to special colourless hairs (phaeophycean hairs) with a pair of dividing cells (arrowed) at their bases.
2. growth of branches occurs irregularly (diffusely) elsewhere.

Zosterocarpus
threads do ***not*** end in hairs. Apical cells (arrowed) are ***conical.***

TWO EXAMPLES OF GROWTH FORMS

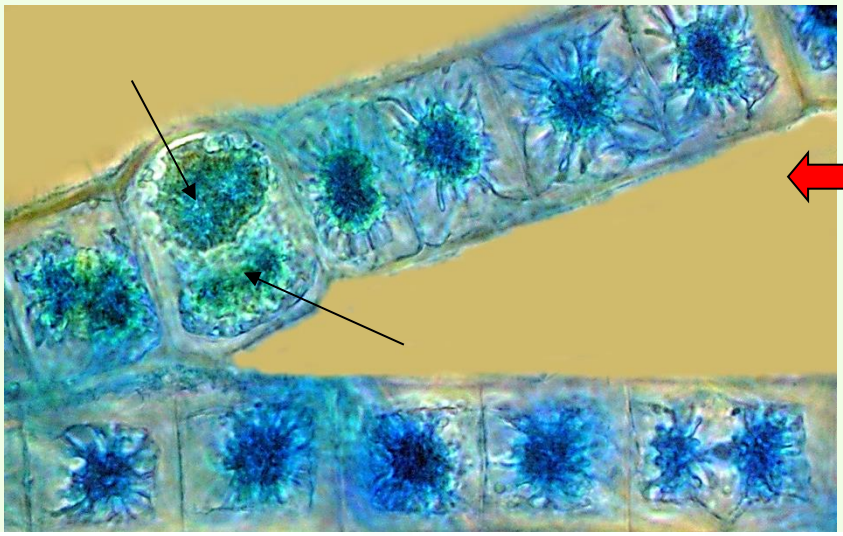


Feldmannia
long, erect filaments (with dividing cells at their bases)

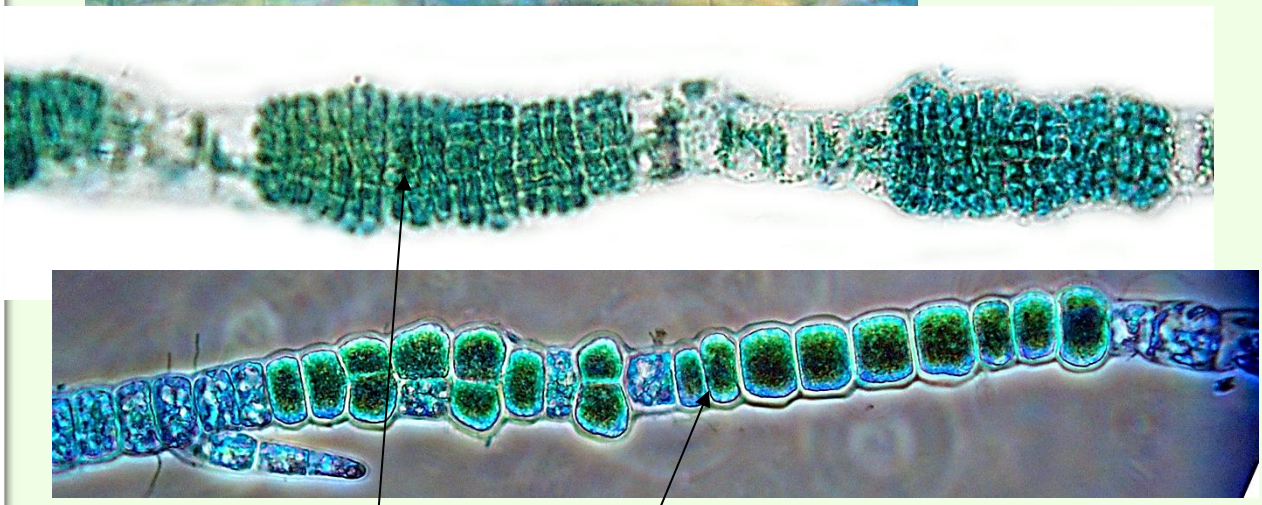


Sorocarpus
tufted & irregularly branched

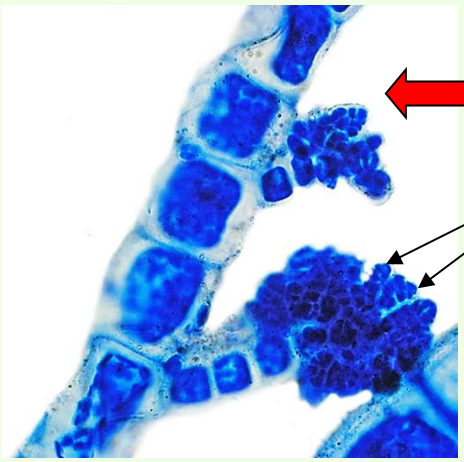
IDENTIFICATION USING THE TYPE AND POSITION OF SPORANGIA



Bachelotia
sporangia are found ***between cells*** of the threads (an intercalary position). Two single-celled (unilocular) sporangia are arrowed)



Pilayella
highly-divided (plurilocular) and undivided (unilocular) sporangia occur ***between cells*** of the filaments (in an intercalary position)

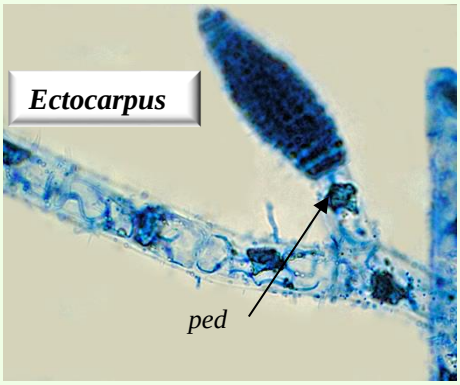


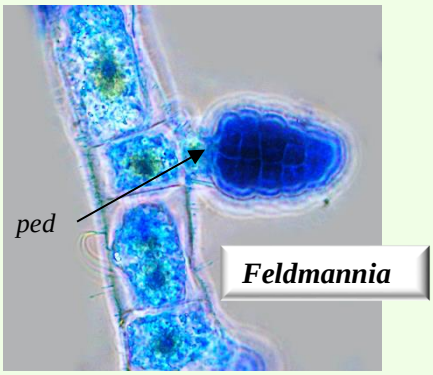
Sorocarpus
clusters or ***sori*** of sporangia ***(sp)*** occur

sp

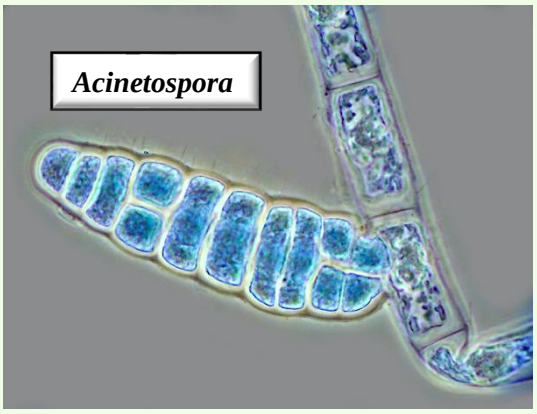
Zosterocarpus
sporangia form in rings (***peripherally***) around the bases of side branches

Sporangia are usually stalked (pedicellate, *ped*)





Sporangia are usually stalkless (sessile)

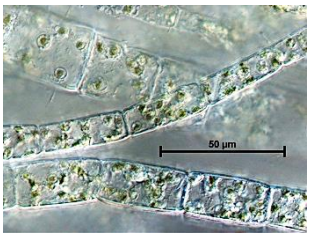


EXAMPLES OF COMMON SPECIES

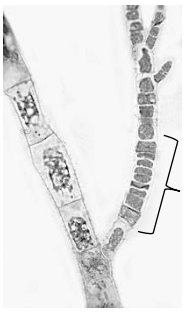
Hincksia sordida (as ***Giffordia sordida*** in the Marine Benthic Flora Part II). "Snot weed"

Above: whole plants on seagrass stems

Left: giant cuttlefish amongst *Hincksia* coating large Brown algae, near Whyalla, SA

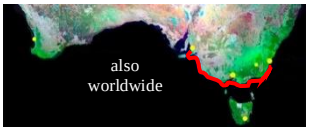


strings of disc-shaped plastids

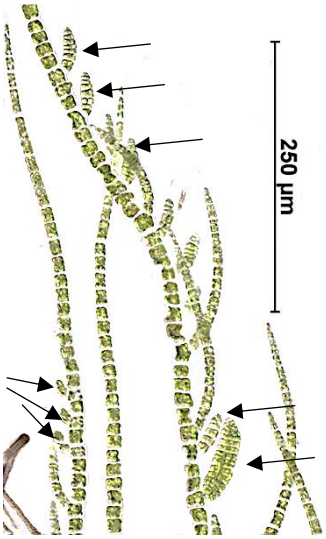


Left: row of dividing cells, base of lateral threads (bracketed)

single, stalkless multi-spored sporangia



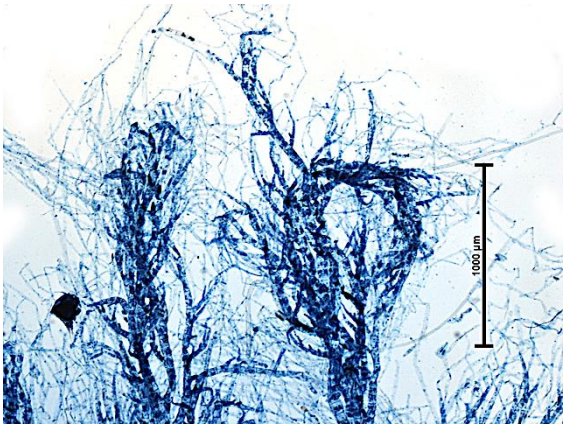
Hincksia sandriana (as ***Giffordia sandriana*** in the Marine Benthic Flora Part II). "Snot weed"



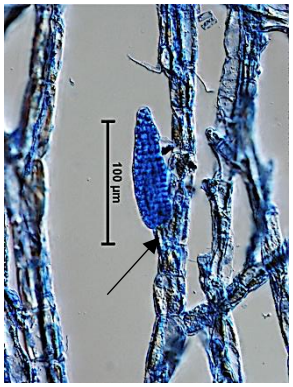
stalkless muti-spored sporangia (arrowed) shown in 3 series along one side of filaments

Ectocarpus siliculosus

much-branched plants, filaments ending in narrow hairs, growing mainly in winter



single-spored sporangium with basal stalk (arrowed)



multi-spored sporangium with basal stalk (arrowed)