

TURF AND FOULING ALGAE: 1. THE ECTOCARPACEAE

Introduction:

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.

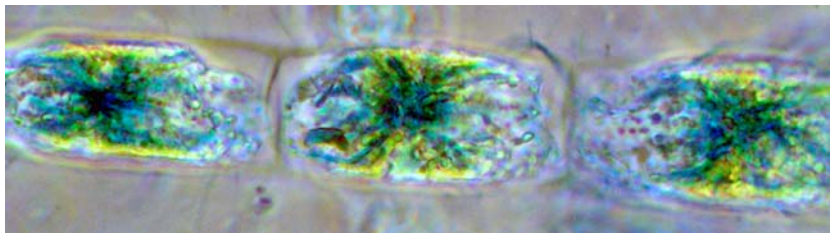
Many look green rather than brown.

Microscopic features separate the genera and these are illustrated below.

Only the larger members of the Family are considered. (The genera *Streblonema*, *Gononema* and *Kuetzingiella* are tiny plants growing within or just at the surface of host algae, and are not shown.) 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, generated by Professor Womersley and his workers over some 60 years.

I. Identification of genera using plastid features

☆ Star-shaped masses present ☆

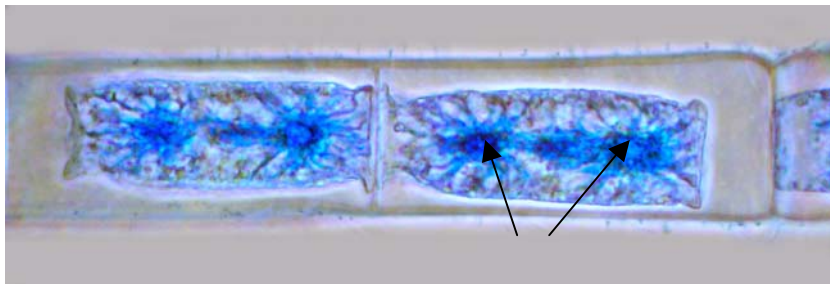


Asteronema

Plastids radiate from the centre of the cell forming a star-shaped mass.



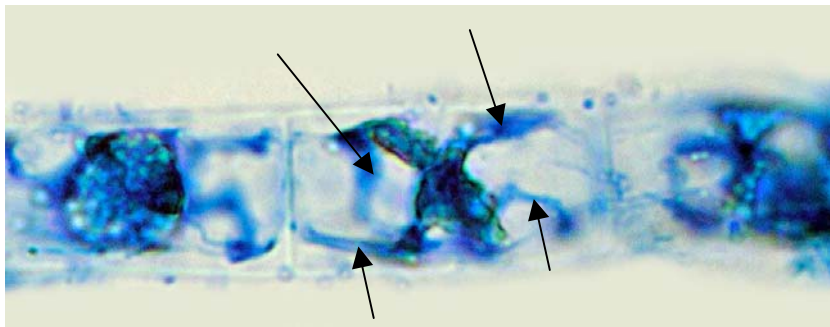
Old or preserved specimens may show merely a central layered mass



Bachelotia

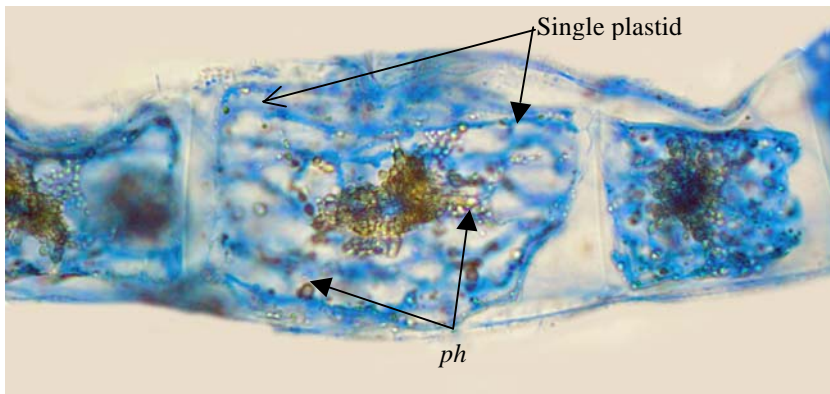
One or two masses of star-shaped plastids (arrowed) are present.

⌋ Ribbon-shaped plastids ⌋



Ectocarpus

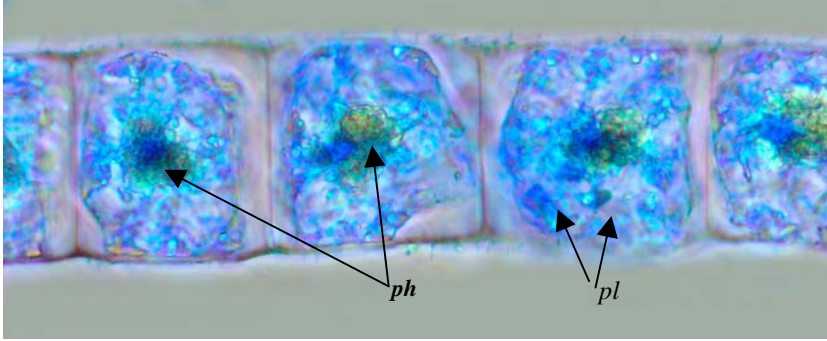
Several relatively **broad, elongate** plastids are present (examples are arrowed)



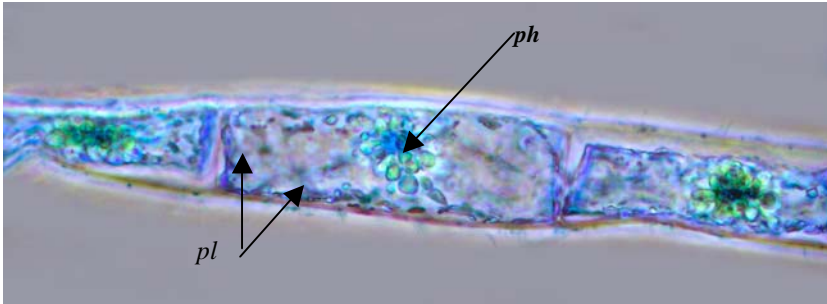
Kuckuckia

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.

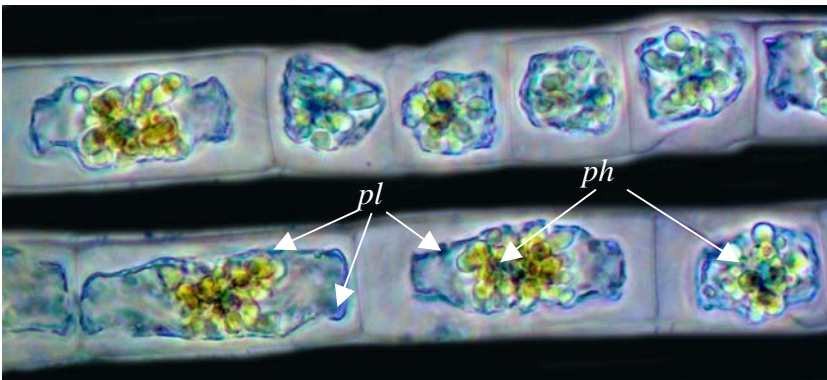
✱ A central mass of bright discs called physodes occurs ✱



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

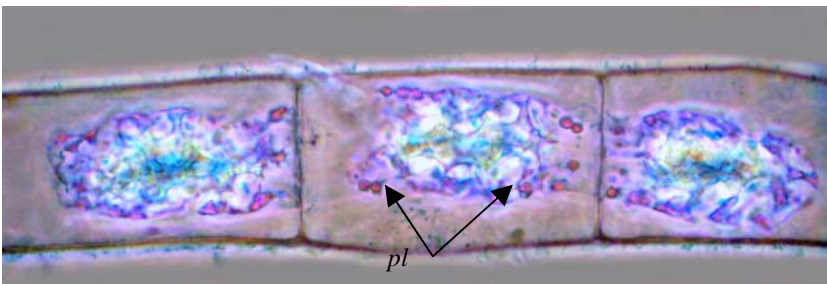


Sorocarpus
Plastids (*pl*) are disc-shaped, scattered in strands, and a central mass of bright structures (physodes, *ph*) occurs

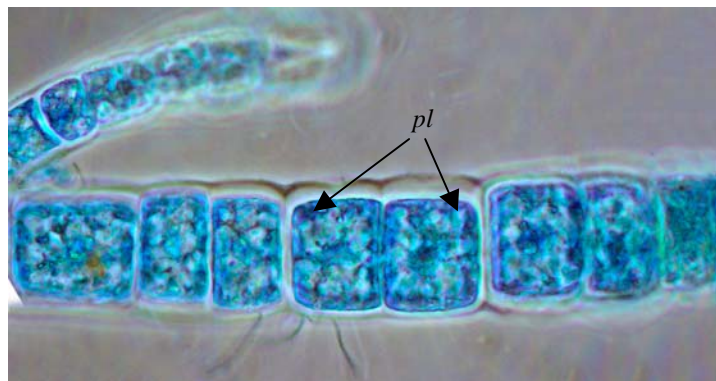


Zosterocarpus
Plastids (*pl*) are disc-shaped, scattered in strands, and a central mass of bright structures (physodes, *ph*) occurs

Strings of disc-shaped plastids occur; there is no central physode mass

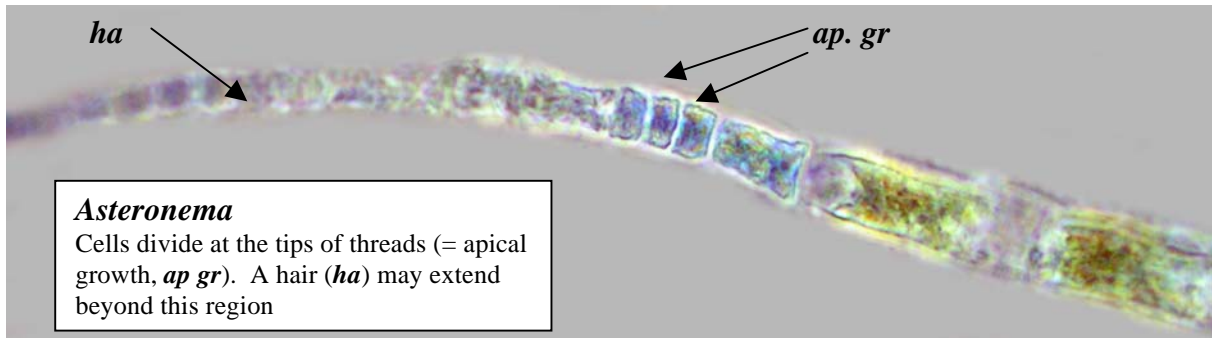


Hincksia (as *Giffordia* in the Marine Benthic Flora Part II)
Numerous disc-shaped plastids (*pl*), each with a bright pyrenoid occur in strands



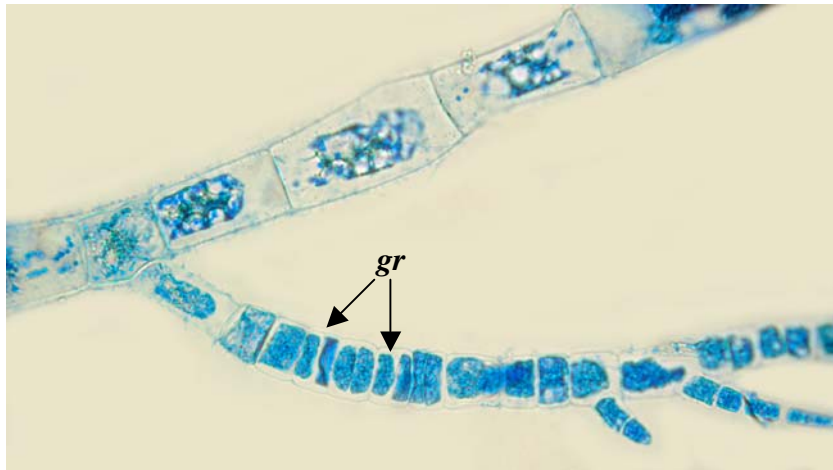
Pilayella
Numerous disc-shaped plastids (*pl*), each with a bright pyrenoid occur in strands

II Identification using the position of active cell division



Asteronema

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



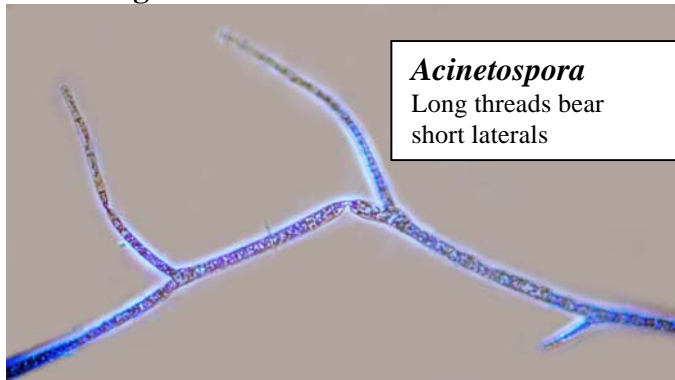
Hincksia

The growing regions (*gr*) occur at the base of side branches.



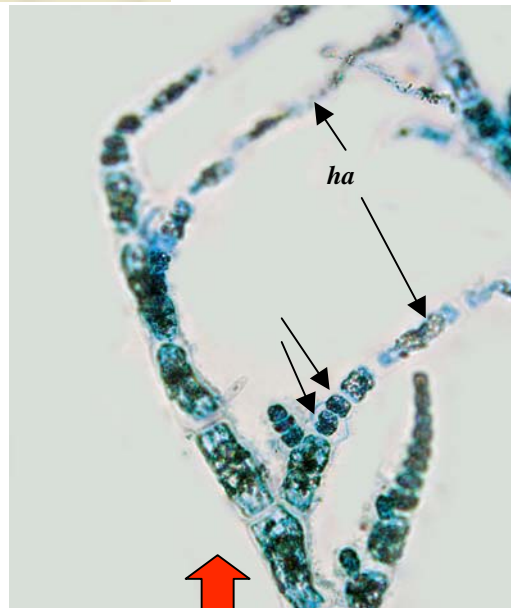
This feature may be difficult to find

III other growth features



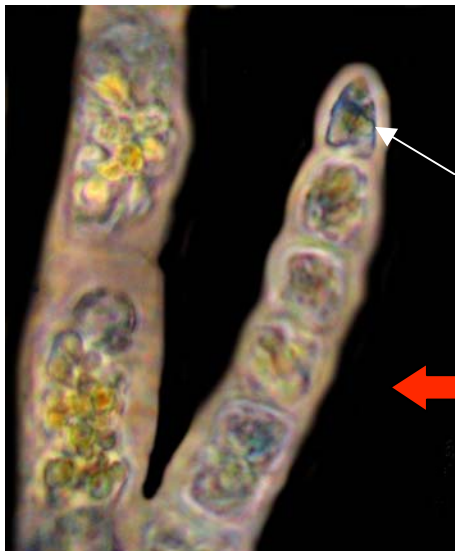
Acinetospora

Long threads bear short laterals



Kuckuckia

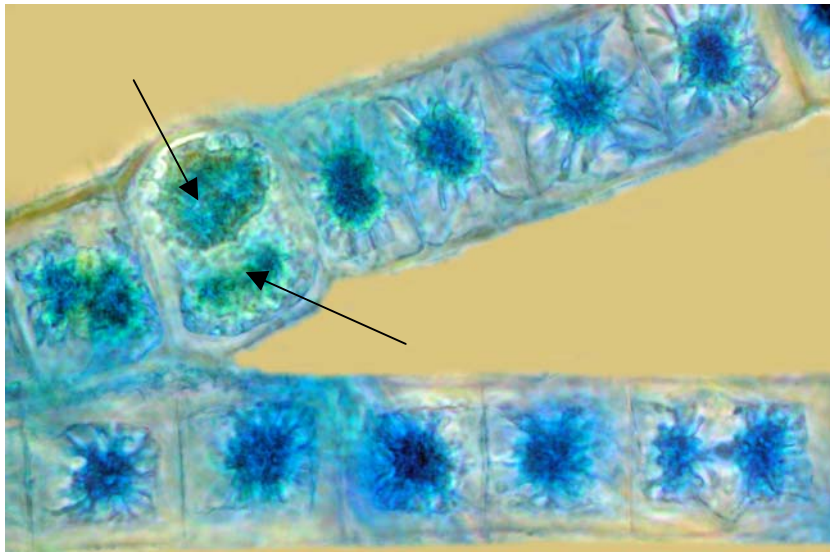
1. Threads taper to special colourless hairs (phaeophycean hairs) with a pair of dividing cells (arrowed) at their bases.
2. Growth of branches occurs irregularly (diffusely) elsewhere.



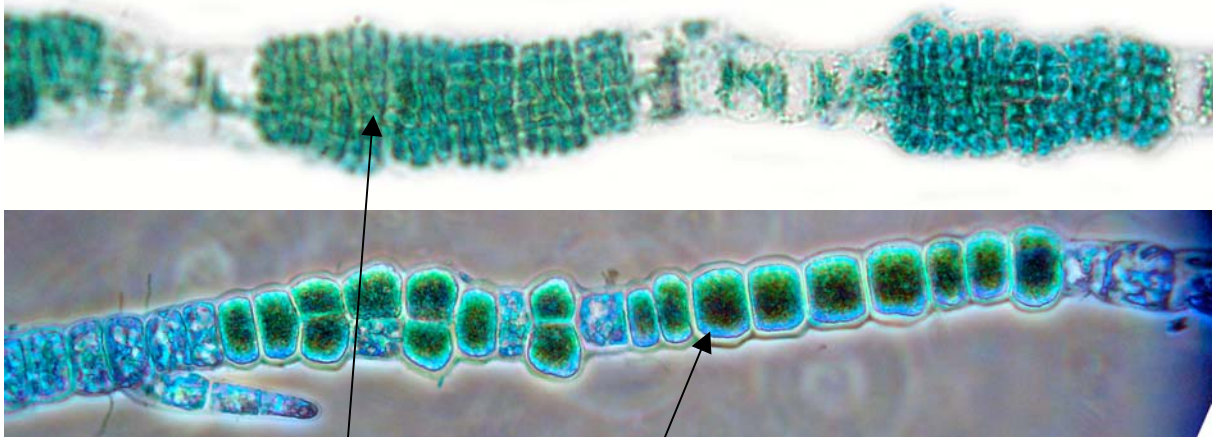
Zosterocarpus

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

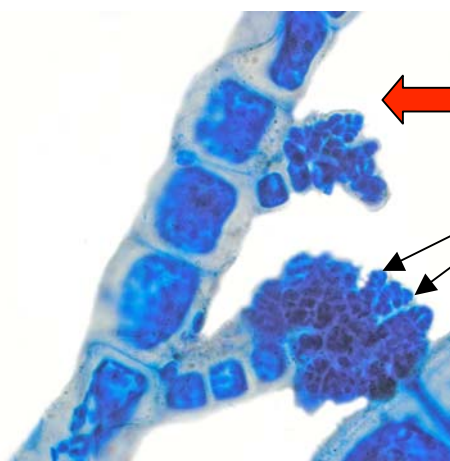
IV Identification using the type and position of sporangia



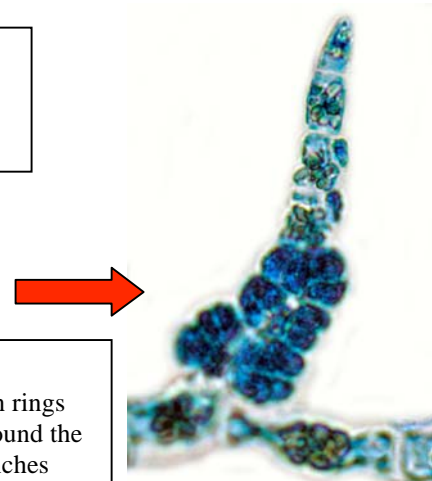
Bachelotia
 Sporangia are found *between cells* of the threads (an intercalary position). Two single-celled (unilocular) sporangia are arrowed



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

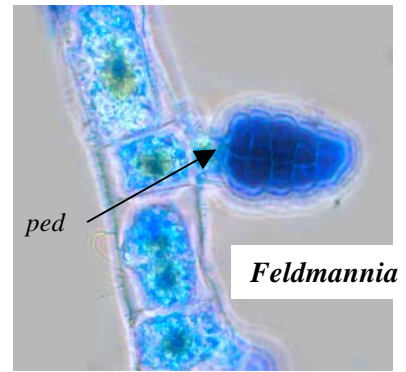
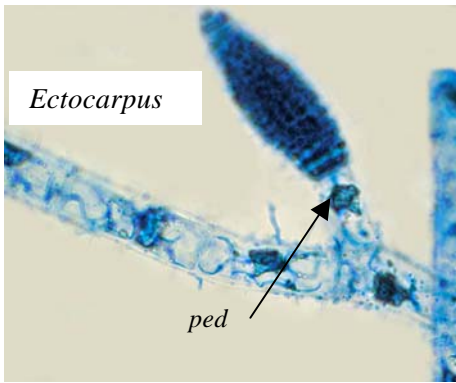


Sorocarpus
 Clusters or sori of sporangia (*sp*) occur

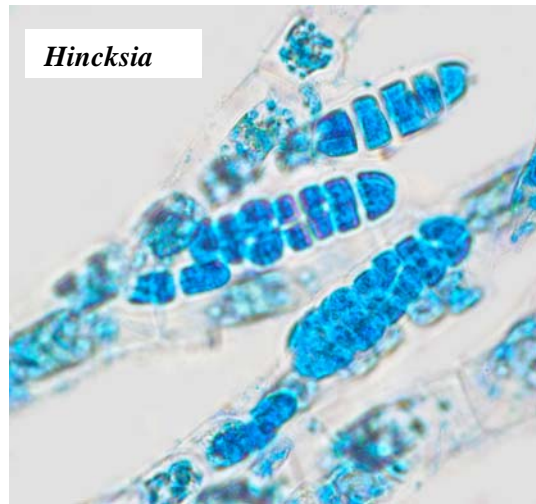
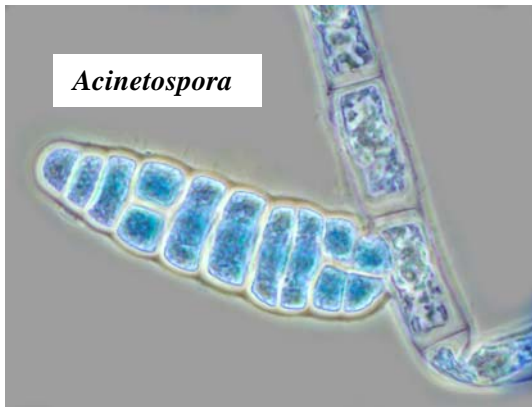


Zosterocarpus
 Sporangia form in rings (*peripherally*) around the bases of side branches

Sporangia are usually stalked (pedicellate, *ped*)



Sporangia are usually stalkless (sessile)



TWO EXAMPLES OF GROWTH FORMS

