

KEYS TO SOME COMMON BENTHIC (ATTACHED) MARINE ALGAE OF SOUTH EASTERN AUSTRALIA

Common names marked with * come from G. Edgar, 2008

A 10c piece is often used in the images as a scale: it is 22mm across, almost an inch in diameter

I. The Benthic Green Algae — Phylum: Chlorophyta

- 1a. The plant body (thallus) is flat, thin or filmy, consisting of narrow ribbons or a broad sheet, like a lettuce leaf. Edges may be ruffled or wavy
..... (go to step) 2
- 1b. The plant body (thallus) is **not** as above
..... (go to step) 3
 - 2a. The thallus is bright green, filmy, 2 cells thick, like a very thin lettuce leaf. Plants often grow in the **intertidal**.
..... (Sea lettuce), *Ulva* species
(A key to the 6 south eastern Australian species is in Womersley 1984, p.140)
 - 2b. The thallus is yellow-green, thin-walled, hollow, often branched at the base. Plants often growing in masses in the **intertidal** near freshwater soaks or sites with high nutrient levels
..... *Enteromorpha* species
(8 local species, difficult to identify, can be found in Womersley 1984, p. 152)
 - 2c. The thallus is dark green, thicker, saddle-shaped or with an irregular lobed appearance and wavy edge, and is strongly attached to rocks in the **subtidal**, often on the underside of rock overhangs
..... (*Liverwort seaweed),
Dictyosphaeria sericea



- 3a. Plants are beaded like a necklace (moniliform), 10–40cm long, each consisting of an unbranched chain of large, round, glistening cells about 2mm in diameter.....
(Mermaid's Necklace), *Chaetomorpha coliformis*



- 3b. Plants are **not** beaded; and are of various sizes
 - 4a. Plants have tubular runners (stolons) attached by small root-like holdfasts to rock or sand. Erect branches arise from the stolon and have a variety of shapes
..... *Caulerpa* species
(Of some 70 species found worldwide, mostly in tropical waters, 19 are local. Womersley 1984, p. 254–5 has a species key. The erect branches may be flat and comb-like [*C. scalpelliformis*]; cactus-like [*C. cactoides*]; grape-like [*C. geminata*]; like a bottlebrush [*C. longifolia*]; like plastic Xmas trees [*C. flexilis*]; or consist of cylinders of tightly packed, tiny bristles [*C. brownii*] or tiny green bubbles [*C. simpliciuscula*]. Many are easily recognised from photos. – see Edgar 1997, pp.35-42.)



- 4b. Tubular runners are **absent**
..... 5

5a. Plants are hair-like masses of thin threads (filaments) consisting of microscopic cells and **no** central stalks.

- Threads are much-branched, consisting of chains of many box-shaped cells one cell wide

..... *Cladophora* species

(The key to 18 local species is in Womersley 1984, pp 186–88. A microscope is necessary for identification. Some species grow prolifically in polluted waters and smother sea grasses)

- Threads are branched and several cells wide

..... *Enteromorpha paradoxa*, *E.clathrata*

- Threads are only occasionally branched, and consist of extremely long, undivided cells

..... *Derbesia*

(The key to the 2 species is in Womersley 1984, p 288. The sexual stages are balloon-shaped plants, previously placed in the genus *Halicystis*)

5b. Plant are not hair-like but thick and solid, **or** if delicate, then a central thicker stalk producing finer side tufts or a "parasol" (ring) or spray of branches at the tip is present..... 6

6a. Plants are firm, rubbery or velvety, **large** (about 40cm high) made of repeatedly forked (dichotomous) cylindrical branches, **or** smaller (about 5cm across) and cushion- or ball-shaped

..... *Codium* species

(The key to 16 local species is in Womersley 1984, p. 225. The ball-shaped species, *Codium pomoides* is relatively easily recognised, although it can be confused with some dark green sponges or the colony of the blue-green bacterium *Calothrix firma*. Other species can only be identified from their microscopic structures.)

6b. Plants are usually smaller (5–10cm high). The thallus is a simple stalk crowned by an umbrella of bright green, club-shaped branches **or** has a central stalk with side tufts of threads

7a. Thallus feather-like, with central stalks bearing fine, tufted side branches of dark green cells just visible to the unaided eye. Plants grow on rock in moderately rough water

..... *Bryopsis* species

(The key to 7 local species is in Womersley 1984, pp 275–6.)

7b. Thallus tree-like, with a single, glassy, cylindrical "trunk" ringed with joints, branching at the tip like a straw broom; cells yellow-green and easily visible to the unaided eye. Plants grow on rock in moderately rough water

(*green brushweed) *Apjohnia laetivirens*

7c. Thallus palm-like, or like an umbrella blown inside out. A single whitish stalk is tipped by bright green club-shaped branches about 1mm long. Plants grow on shells in sand in calm, shallow waters such as the Coorong.....

Cup-tops, *Acetabularia*

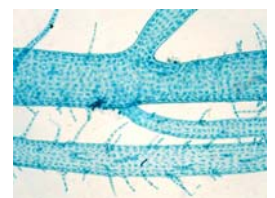
(*Acetabularia calyculus* has an apical "umbrella" of branches closely adhering at their edges, and microscopic, colourless, hair-like branches found lower on the stalk give it a cloudy appearance in water. *Polyphysa peniculus* is palm-like with an apical spray of separate branches and no apparent hairs)

References:

- Edgar, G.J., (2008). **Australian Marine Life: the plants and animals of temperate waters.** 2nd Ed. Reed-New Holland
- Womersley, H.B.S., (1984). **The Marine Benthic Flora of Southern Australia. Part I.** Govt. Printer, S. Australia.



Cladophora feredayi



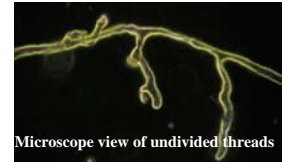
Enteromorpha paradoxa

Specimens stained blue and viewed microscopically

Cladophora albida



Derbesia tenuissima



Microscope view of undivided threads



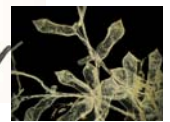
Codium pomoides



Codium spongiosum



Codium fragile



Microscope view of a scraping of surface "balloons" or utricles, needed for accurate identification



Bryopsis plumosa



Bryopsis vestita



Apjohnia laetivirens



Denuded plants of *Apjohnia laetivirens* are common. The jointed bases regrow the apical tufts



Acetabularia calyculus



Microscope view