Pictured Key to some common red algae of southern Australia with rough, sponge-covered surfaces

Red Algae. With some 800 species, many of which are endemic (found nowhere else), southern Australia is a major centre of diversity for red algae. Classification is based on detailed reproductive features. Many species unrelated reproductively have similar vegetative form or shape, making identification very difficult if the technical systematic literature is used.

This key Fortunately, we can use this apparent problem to advantage - common shapes or morphologies will allow you to sort ***some*** algae directly into the level of genus or Family and so shortcut a systematic search through intricate and often unavailable reproductive features. The pictured key below uses this ***artificial*** way of starting the search for a name. It's designed to get you to a possible major group in a hurry. Then you can proceed to the appropriate fact sheets within this website.

Scale: the coin used as a scale is 24mm or almost 1" wide. Microscope images of algae are usually blue stained

The algae in this key have numerous small outgrowths, a surface layer of sponge or both outgrowths and sponge that give the surface a unique ***roughened appearance***. Sponge can be recognised from microscopic examination of cross sections. Glassy "needles" – spicules making up the sponge skeleton – can be seen on the algal surface (Fig. 1).

1a. plants a meshwork of threads obscured by whitish sponge, forming flat-branched, rounded lobes. arising from a prominent base. Figs 2, 3
…….. *Codiophyllum flabelliforme*
⚠ W.A. only Family: Halymeniaceae

1b. plants with roughened flat-bladed or cylindrical branches ……..…….. 2.

2a. branches yellowish to red underwater, dark red and flecked when dry, thick, strap-like, about 10mm wide, often twisted spirally, bluntly toothed at edges, tongue-like side branches from the midlines of blades. Figs 4-6
…….…. *Osmundaria prolifera*
Family: Rhodomelaceae

2a not as above ……..…… 3.

3a. main branches flat-bladed, but usually obscured by sponge except at tips and edges where small, filmy, comb-like (pinnate) blades are exposed. Figs 7-9
……..….. *Ptilophora prolifera*
⚠ W.A. only Family: Halymeniaceae

3b. not as above …….. 4.

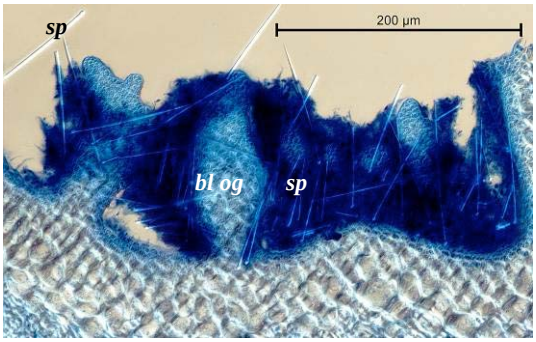

Fig. 1 cross section of a *Thamnoclonium dichotomum* blade edge: blade outgrowths (*bl og)* and sponge tissue (*sp t*) with glassy, needle like spicules (*sp*)

Fig. 2: *Codiophyllum flabelliforme*

Fig. 3. *Codiophyllum flabelliforme*: detail of branch lobes

Fig. 4. *Osmundaria prolifera* (arrowed) growing with green and brown algae and a sponge

Fig. 5: *Osmundaria prolifera*

Fig. 6. *Osmundaria prolifera*: side branches from the midlines of roughened strap-like branches

Fig. 7: *Ptilophora prolifera*

Fig. 8. *Ptilophora prolifera*: detail of filmy side blades

Fig 9. *Ptilophora prolifera*: comb-like small blades from edges and midlines of main branches

4a. small leafy, filmy outgrowths at tips of branches ……...5.

4b. leafy outgrowths ***absent***, branches flat, slightly thicker at edges, shaped like furry, elongate tongues. Figs 10-13
…… *Epiglossum smithiae*
Family: Rhodomelaceae

5a. plant with numerous cylindrical to slightly flattened, forked (dichotomous) branches produce small outgrowths that harbour sponge; small leafy fertile blades protrude from the sponge coating at branch tips. Figs 14-16
……. *Thamnoclonium dichotomum*
Family: Halymeniaceae

5b. plant coated with a thick sponge to 10mm thick; filmy, narrow, forked (dichotomous) blades protrude from the sponge. Figs 17-18
……. *Carpopeltis spongiiplexa*
as *Carpopeltis spongeaplexus* in the Flora
Family Halymeniaceae

Fig. 10: *Epiglossum smithiae*

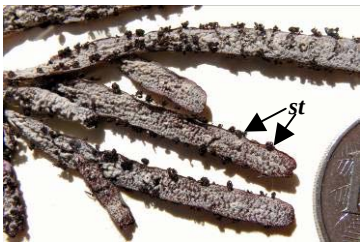

Fig. 11. *Epiglossum smithiae*: detail of rough surface with dark tufts of sporangial structures (stichidia. ***st***))

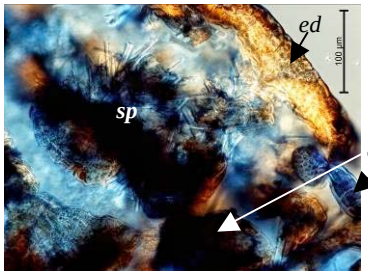

Fig.12. blade surface of *Epiglossum smithiae*: thickened edge (*ed*), outgrowths (*o gr*) and sponge skeleton (*sp*)

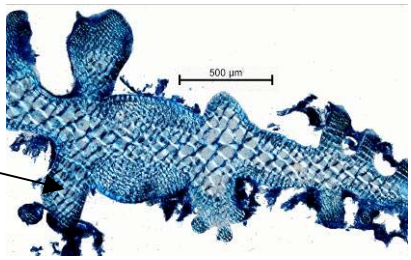

Fig. 13. cross section of *Epiglossum smithiae*: outgrowths (o gr*)*

Fig. 14: *Thamnoclonium dichotomum*

Fig. 15 *Thamnoclonium dichotomum*:

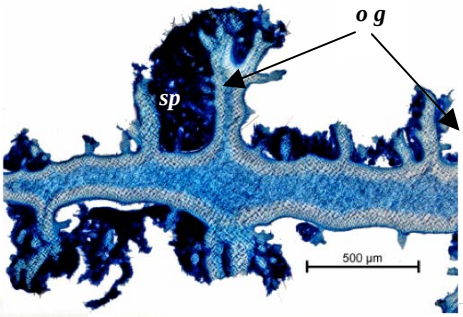

Fig. 16. Cross section of *Thamnoclonium dichotomum* showing outgrowths (*og*) harbouring sponge (*sp*)

Figs 17, 18: *Carpopeltis spongiiplexa*

LOOK-ALIKE ALGA

Haloplegma (Fig. 19) has a felty surface similar to a sponge-covered alga. On microscopic inspection there are no sponge spicules present. At least at the blade edges, interlocking threads or filaments of naked cells can be seen which produce the felty appearance (Fig.20). The construction is thus quite different to the sponge-covered algae found in the key above).

Fig. 19: *Haloplegma duperryi*

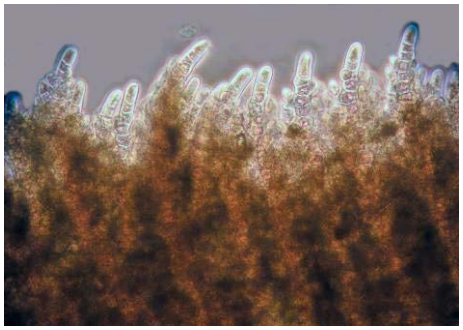

Fig. 20: edge of a blade of *Haloplegma duperryi* viewed microscopically