PICTURED KEY TO SOME RED ALGAE OF SOUTHERN AUSTRALIA:
COMMON CORALLINE ALGAE

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, making correct identification very difficult.

Corallines: One group — the corallines, have hard, limy skeletons that make recognition of the group easier. They are pink to grey-pink in colour, bleaching white in the sun. Below is a key to a few of the common ones.

Coralline look-alikes Unfortunately, some odd members of other algal families also resemble corallines. These are posted at the end of this key.

Scale: the coin used as a scale is 23mm or almost 1” wide. Microscope images of algae are usually blue stained.

1a. plants are jointed, with flexible joints between solid segments (see Figs 1 and 19)

1b. plants are un-jointed, pebble-like (see Fig. 2) or leaf-like (see Fig. 8.)

2. side branches in rings from each of the joints. Branch tips have microscopic gelatinous caps. (Fig. 5.) Metagoniolithon

2b. branching forked or feathery .... 3.

3a. side branches arise in a feather-like pattern (branching is opposite, in one flat surface), although tips may be forked. (see Fig. 6.)

3b. branching pattern of the whole plant is forked (dichotomous). (see Fig. 7.)

Fig. 1: magnified view of Corallina showing jointed segments

Fig. 2: knobby, unbranched, pebble-like Lithophyllum

Fig. 3: magnified view of Metagoniolithon radiatum showing forked branching at tips but rings of side branches below

Fig. 4: Metagoniolithon stelliferum, narrow side branches in rings about each joint of the main branches (axes)

Fig. 5: microscope view of gelatinous caps of Metagoniolithon

Metagoniolithon radiatum, Fig. 3, grows on rock. M. stelliferum, (Fig. 4) has many branches at each joint and M. chara has 2-3 branches: both these latter species grow on other plants, often on the seagrass Amphibolis.

See Womersley & Johansen 1996, p.31

Fig. 6: feather-like branching pattern in Corallina

Fig. 7: forked (dichotomous) branching in Jania

Fig. 8: leaf-like branching in Metamastophora flabellata
4a. The solid segments in upper parts of main stems are flat and wedge-shaped, with rounded edges.

4b. The solid segments on the main stems (Figs 9-11), are fairly straight-sided. Forked, cylindrical ultimate branches that look like antennae often occur.

5a. Plants commonly form a dense turf from the lower intertidal to shallow water on reefs, often bleached white in summer and often growing with Haliptilon. Segments de-calcified with acid each show 10-20 dark bands under the microscope. Figs 12-14.

5b. Plants usually grow in low light conditions either at depth or in shaded intertidal pools. Segments de-calcified with acid each show 20-50 bands under the microscope. (see Fig. 16, next page)

6a. Plants 50-120mm tall, main segments about 2mm wide and as tall as wide. Figs 15, 16.

6b. Plants 20-40mm tall, main segments about 1mm wide and 2-4 times taller than wide. Fig. 17.

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**Corallina officinalis**

Fig. 9: *Haliptilon roseum* growing as a turf in shallow water at reef’s edge. Photo: D Muirhead

Fig. 10: Flat segments of main branches and prominent sprays of side branches of *Haliptilon roseum*

Fig. 11: Detail of the fairly straight-sided segments of main branches of *Haliptilon roseum* and cylindrical, antennae-like side branches.

Fig. 12: *Corallina turf* amongst leafy brown *Ecklonia* at the reef edge, Aldinga

Fig. 13: *Corallina officinalis* grows as a turf, from about low water mark.

Fig. 14: Wedge-shaped solid segments of main branches of *Corallina officinalis* when de-calcified with acid show about 20 dark bands (the swellings in side branches are female structures - cystocarps)
7a. solid segments in upper parts are cylindrical and slender. Female organs form swellings in the forks of branches. Figs 6, 18-22

............................. Jania

7b. solid segments throughout the plant are flat or compressed

................................. 8.

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8a. solid segments are shaped like arrow-heads (Figs 22, 23). Female organs (cystocarps) form swellings in the arms of the arrows. 

----------* Cheilosporum sagittatum

8b. solid segments are rectangular or elongate and regularly forked. (Figs 25-27). 

----------** Amphiroa spp

9a. plants consist of thin, fragile discs (Fig. 24) about 10mm wide attached at one edge to red algae (especially *Ballia*) 

---------- Synarthrophyton patena

9b. plants not as above ...................... 10.

10a. plants of thin, upright, brittle, leaf-like branches ......................... 11.

10b. plants pebble-like or form crusts on other plants, or brittle sheets on rocks .................................... 12.

11a. leafy parts curled (Figs 8, 28, 29) 

---------- Metamastophora flabellata

11b. leafy parts flat, tips small, fan-shaped. Fig. 30. 

---------- Mastophoropsis canalculata

12a. plants form scaly patches on other algae or seagrass leaves and stems. (next page) ............... 13.

---------- encrusting epiphytic coralline algae

----------* lithothamnions and ** rhodoliths

---------- 14. (see the table, next page)

* lithothamnion = in this key, a general term used for non-jointed, stony or scaly coralline alga. e.g. Figs 34, 37.

** rhodolith = an un-attached, commonly nodular plant body resembling a pebble, that develops by fragmentation or envelopment of a stone or other solid object. e.g. Figs 41, 46.
some encrusting, epiphytic coralline red algae

Fig. 31 *Pneophyllum coronatum* forming pink scaly patches on leaves of sea grasses

Fig. 32 *Pneophyllum coronatum* (arrowed) on the brown alga *Glossophora nigricans*

Fig. 33 *Hydrolithon farinosum* growing as chalky scales on the thin leaves of Eelgrass, *Heterozostera*

Fig. 34 encrusting form of *Synarthrophyton patena* (compare this with the totally different disc-shaped form in Fig. 20). Unfortunately, only detailed microscope investigation can truly separate this encrusting form from several other species

Fig. 35 *Melobesia membranacea* forming a scaly coating on the Green alga *Apjohnia*

Fig. 36 *Melobesia membranacea* showing the highly magnified crater-like reproductive structures by which this species can be distinguished from other encrusting coralline algae

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**PLANTS WITH DISTINCTIVE GROWTH FORMS**

- plants upright, to 230mm tall, of a stalk and spreading, flat, ribbon or fan-shaped leafy branches: *Mastophoropsis canaliculata* and *Metamastophora flabellata* (see also above)
- plants flat on rock (prostrate), forming shiny discs or sheets 20-1500mm across and 1-3mm thick loosely attached to rock, commonly with root-like struts underneath: *Phymatolithon masonianum*
- plants forming overlapping, flat, fan-shaped layers: *Lithophyllum prototypum*
- plants delicate, very thin and encrusting other algae and sea grasses, often in large numbers: *Melobesia membranacea*, *Pneophyllum* spp, *Hydrolithon farinosum*

**PLANTS WITH DISTINCTIVE REPRODUCTIVE STRUCTURES**

- reproductive structure in patches on the surface of bumps: *Sporolithon durum*
- reproductive structures in crater-like bumps, plants often on holdfasts of large algae, of lumpy, layered or with short upright branches: *Mesophyllum macroblastum* and *M. printzianum*

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Woelkerling, W. in the Flora, part IIB page 151 has put together a field guide to some of the non-jointed coralline algae using features observable with a hand lens. The more obvious of such species are illustrated above and in the next page. Identifications made using these images can only be tentative because anatomical investigation, especially of reproductive features, is required for valid identification.
14a. **PLANTS FORM BRITTLE SHEETS LYING ON ROCK**

Fig. 37: *Phymatolithon masonianum* has a shiny surface and can be stripped off the rock on which it lies

Fig. 38: the underside of *Phymatolithon masonianum* often has small projections

14b. **PLANTS FORM LAYERED SHEETS TIGHTLY ADHERING TO ROCK**

Fig. 39: *Mesophyllum* showing layered flat lobes

Fig. 40: *Mesophyllum macroblastos* showing layered flat lobes

14c. **PLANTS ARE PEBBLE- OR BOULDER-LIKE**

Fig. 41: *Sporolithon durum* with a lumpy surface

Fig. 42: the lumps of *Sporolithon durum* magnified, showing sunken patches of spores

Fig. 43: *Lithophyllum corallinae* with knobby, branched ridges similar to animal coral

Fig. 44: the porous *Spongites hyperellus* can form boulder-sized masses of tall branches

Fig. 45: the tall branches and porous nature of *Spongites hyperellus* are exposed in broken surfaces of the plants

Fig. 46: *Neogoniolithon brassicae-florida* with intermediate-sized bumps
Unfortunately, another unrelated genus – *Rhodopeltis* - also has chalky or limey deposits in its tissues and is segmented like the articulated red coralline algae, but has a prominent mid-vein.

Two other groups – the Families Hildenbrandiaceae and Peyssonneliaceae - encrust rocks and may be confused with encrusting red coralline algae, but they do not produce knobby or crater-like reproductive structures.

Go to the separate fact sheets for each of these Families for further information.

Generally:
The members of the Hildenbrandiaceae (Figs 49-52) have no limey material, and are red or dark red rather than pinkish like the corallines.

The members of the Peyssonneliaceae (Figs 53-55) have some lime, but are dark red to red-brown in colour.
Groups of the Order: Nemaliales also have limey representatives. Go to the Fact Sheets for members of these Families for further information.

*Dichotomaria obtusata* has flat segments when dried, and is pink in colour similar to *Amphiroa*. Internally, it has a completely different anatomy, and does not produce stony, pustule-like female structures.

*Tricleocarpa cylindrica* is a rare plant from Rottnest I., WA that looks like a large *Jania* species, but is structurally and reproductively different.

*Liagora* has a chalky surface but the branches are flexible and plants do not produce stony, pustule-like female structures.

References: