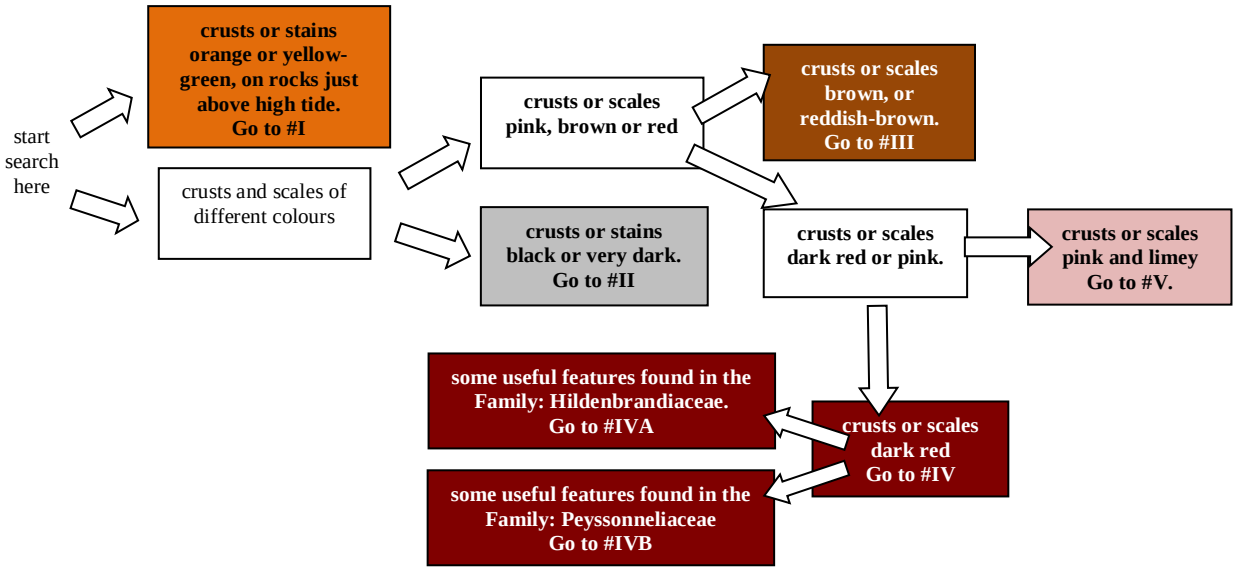
GROUPS AT A GLANCE: MARINE PLANT CRUSTS, STAINS, SCUMS AND SCALES

(microscope views are in blue; the coin scale is 24mm or almost 1" wide)

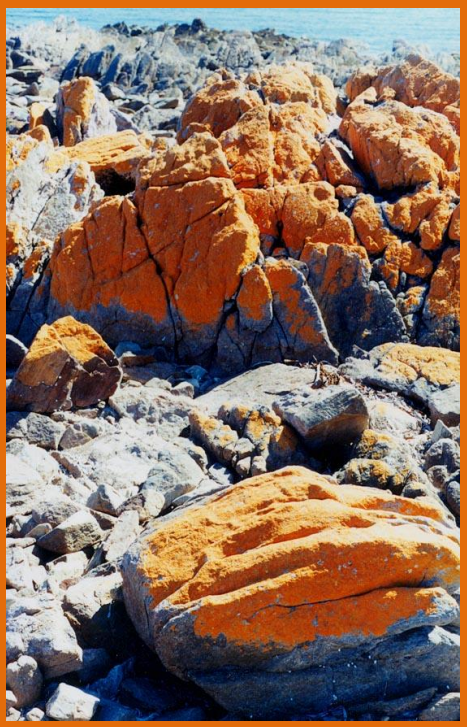
The overall shape (morphology) and internal structure (anatomy) of a few algae are distinctive enough for you to be able to place them in a major group or genus, even though the reproductive stages usually needed to identify them using the Flora may be missing. The pictorial descriptions below rely on this possibility. But, this is only a first step in identifying a species, and you should always, finally, refer to a complete description to ensure valid identifications.

The presentation below ***does not*** include algae that are low, turf-like, or form spreading mats. For these, see the:
"PICTURED KEYS OF COMMON SOUTHERN AUSTRALIAN MARINE PLANTS: turf and fouling algae, II mat and turf species"

Only algae forming crusts, scum- or scale-like layers are included below. These might seem trivial differences compared with plant turfs and mats, but reference to the images should separate them reasonably well. Microscopic examination is often necessary to make certain of identifications.



I. ORANGE OR YELLOW-GREEN CRUSTS OR STAINS ON ROCKS JUST ABOVE HIGH TIDE



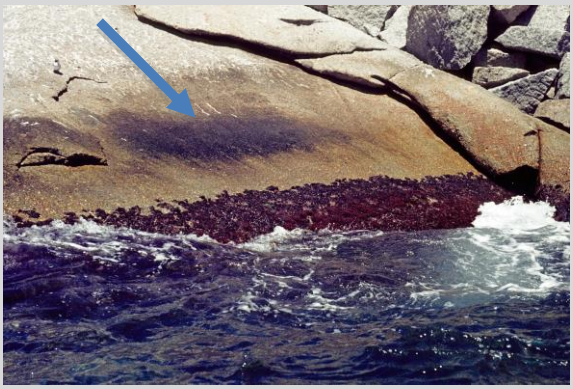
Caloplaca sp
Left: probably *C. gallowayi*, a common lichen forming powdery, bright orange coatings on non-calcareous rocks, above the high tide level, and kept moist by occasional wave-splash
Above, right: probably *Caloplaca tomareana* which forms greenish-yellow bunches on granite rocks

A full listing of Lichens, including marine species and some illustrations, can be found in
Kantvilas, G. (2019). *An annotated catalogue of the lichens of Kangaroo Island, South Australia*. **Swainsona** 32:1-97

Baldock, R.N. (2019) Groups at a glance: marine plant crusts, stains, scums and scales. 8 pages. "*Algae Revealed*". Adelaide, State Herbarium of South Australia. flora.sa.gov.au/algae_revealed

II. BLACK OR DARK CRUSTS OR STAINS ON ROCKS JUST ABOVE HIGH TIDE OR EXPOSED AT LOW TIDE IN THE UPPER INTERTIDAL

Calothrix fasciculata – a blue-green alga



Above: *Calothrix* (arrowed) staining the granite rocks above a red algal turf, at West Island, S Australia

Left: *Calothrix* on a rock from the Port River estuary, Port Adelaide

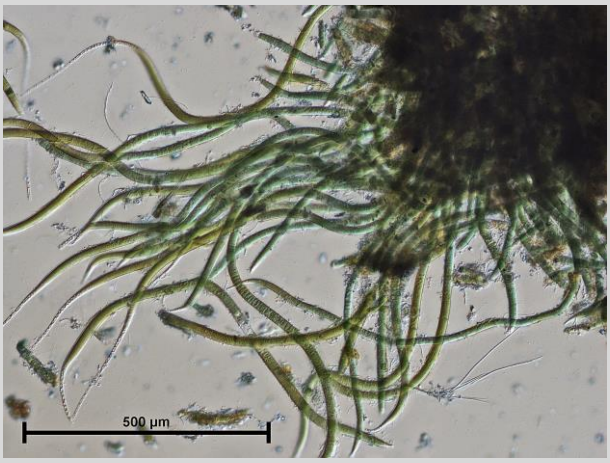
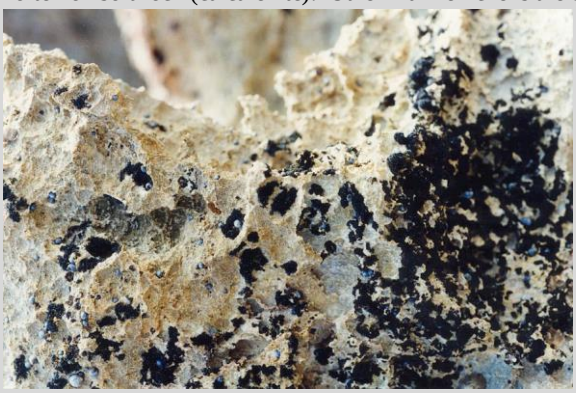


Figure 2: highly magnified scraping from a crust

Right:
DON'T CONFUSE ***Calothrix*** with ***Rivularia australis*** (formerly *Rivularia firma*) – also a blue-green alga but forming hard, dark green lozenges at a similar level on crystalline rocks

Below:
DON'T CONFUSE ***Calothrix*** with ***Lichina***, a lichen (combination of a fungus and alga) found just above the intertidal often on soft rock (calcarenite). Other marine lichens are brightly coloured, and are found in the appropriate section, below.



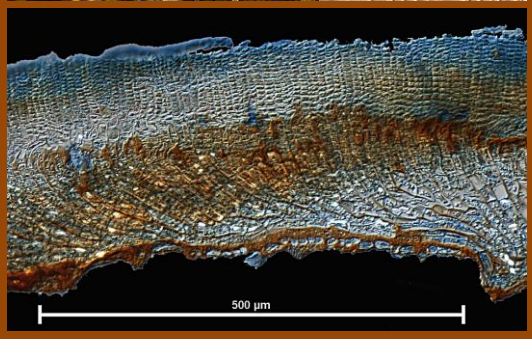
Left: §***Lichina intermedia*** (as *L. pygmaea* in the Flora) in pockets of eroded calcarenite at Yorke Peninsula, S Australia

Right: §***Lichina intermedi***a being grazed by the air-breathing marine snail, *Nodolittorina*

§recent workers consider this lichen to be quite separate from its European counterpart. See Schultz, M. (2017) Morphological and molecular data support *Lichina intermedia* as a distinct austral-marine species in the *L. pygmaea* group. *The Lichenologist* 49 (**1**):321-332

III. BROWN TO RED-BROWN CRUSTS ON ROCKS EXPOSED AT LOW TIDE

an encrusting Brown alga ***Ralfsia verrucosa***

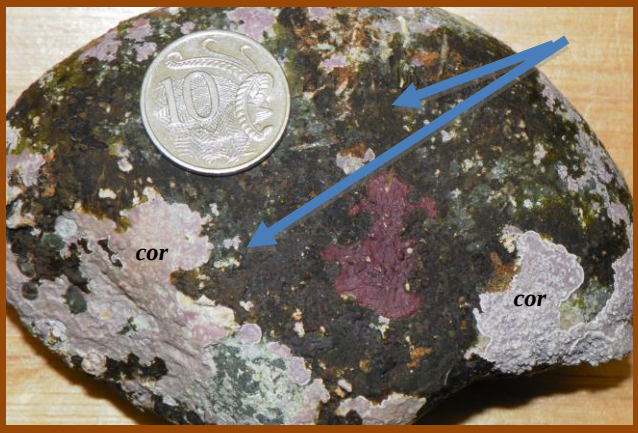


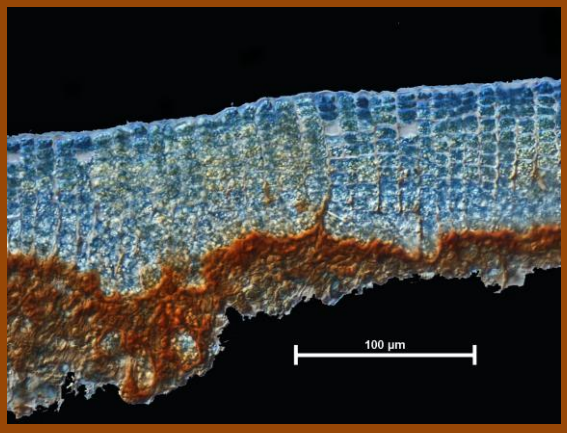
Above: encrusting Brown alga *Ralfsia verrucosa* on a limpet shell, *Cellana*

Above right: *Ralfsia* on rock (arrowed), mingled with white patches of sand. A striped air breather shell (*Austrosipho*) and very small blue snail shells (littorinids) that graze the alga are also present

Below right: cross section of a piece of *Ralfsia* lifted off the rock, showing basal threads that sweep upwards and vertical rows of upper cells

an encrusting Brown alga ***Pseudolithoderma australe***





Above: encrusting Brown alga *Pseudolithoderma* (arrowed) on a pebble, mixed with pink coralline red algal crusts (*cor*)

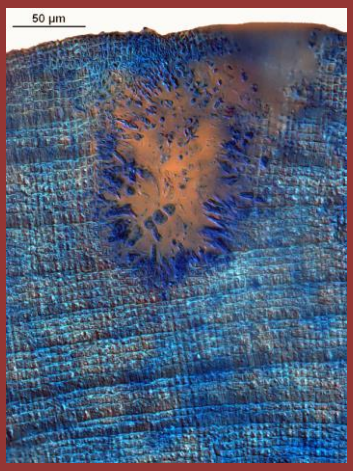
Above right: cross section of a piece of *Pseudolithoderma* lifted off the rock, showing vertical basal threads that separate this species from *Ralfsia*, and vertical rows of upper cells

IV. RED OR RED-BROWN CRUSTS CLOSELY ATTACHED TO ROCKS – RED ALGAE IN THE FAMILIES PEYSSONNELIACEAE AND HILDENBRANDIACEAE

Species illustrated below adhere ***closely*** to rocks and shells.
Others in the Family: Peyssonneliaceae that lie flat on rocks but are not closely adherent are *excluded*.
Each species is separated by details of their internal structures (anatomy) and reproduction, requiring microscope investigation.
For further information, see :

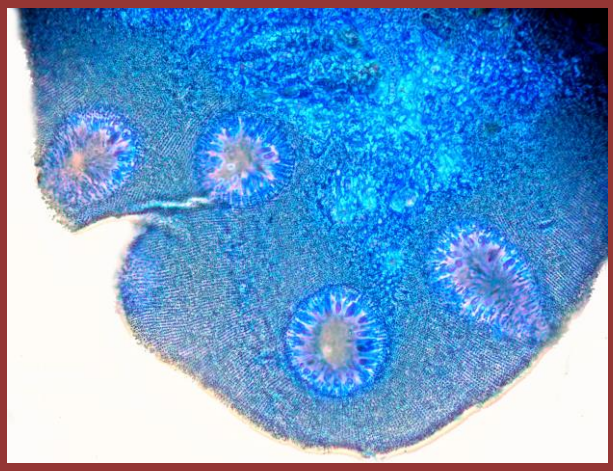
- **"Peyssonneliaceae at a glance",**
- **"*Hildenbrandia* at a glance" and**
- **individual fact sheets for each species of both Families**

IVA. SOME USEFUL FEATURES FOUND IN THE FAMILY: HILDENBRANDIACEAE



Left:
cross sections show rows of box-shaped cells. Spores are found around the edges of small cavities ("crypts")

Right:
surface view shows rings of spores around the edges of cavities



THE SPECIES OF *HILDENBRANDIA*

Hildenbrandia crouaniorum very thin; found in the intertidal

Hildenbrandia lecanellieri has nobbly protrusions; found in pools and the subtidal

Hildenbrandia patula (*as H. expansa* in the Flora) is thick and smooth; found in pools and subtidal

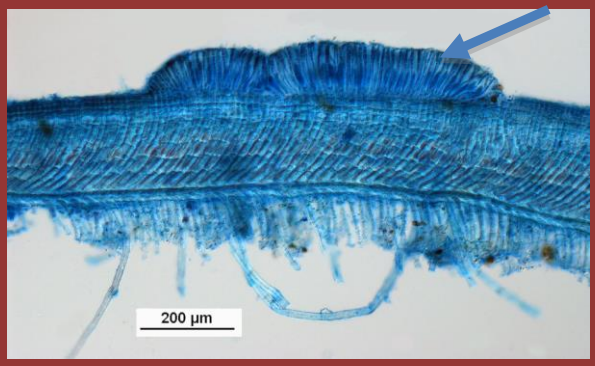
Hildenbrandia rubra (with surf barnacles, *Chthamalus*) – very thin; found in the intertidal

There is also a freshwater species, *H. rivalis*, that stains rocks bright red, mainly in sub-tropical streams

Baldock, R.N. (2019) Groups at a glance: marine plant crusts, stains, scums and scales. 8 pages. "*Algae Revealed*". Adelaide, State Herbarium of South Australia. flora.sa.gov.au/algae_revealed

IVB. SOME USEFUL FEATURES FOUND IN THE FAMILY: PEYSSONNELIACEAE

Left:
cross sections show threads of cells often rising up from basal horizontal ones



Above: spores sit in patches (arrowed) on the surface of the scales

THE SPECIES OF *PEYSSONNELIA*

Left: ***Peyssonnelia bouderesquei*, 10-30 mm across, completely adherent often on large shells**

Peyssonnelia dubyi
Above, left: (arrowed) on rock
Right: **on a** *Comminella* shell adjacent to a bleached red coralline algal crust (*cor*)

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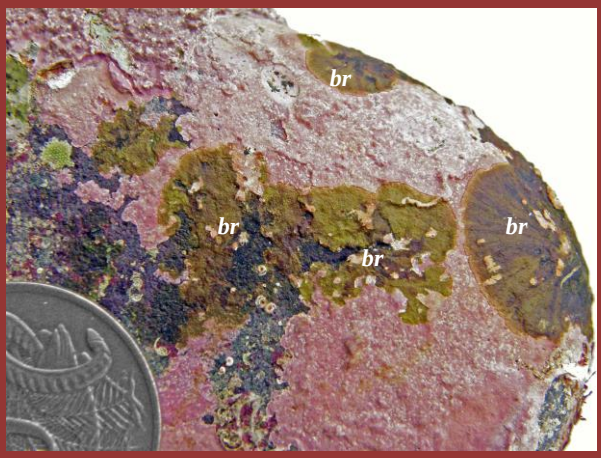
IVB. THE SPECIES OF *PEYSSONNELIA* (CONTINUED)

Peyssonnelia inamoena
Above, left: on rock, edges characteristically lifting
Right: on a bivalve shell , edges lifting



Peyssonnelia splendens on rock, edges not lifting.
A brown alga (***br***) is also present

Peyssonnelia inamoena (arrowed) on a Turban shell (*Turbo*)

Other members of the Peyssonneliaceae are lobed, lie flat on, but are not closely adherent to rocks.

Peyssonnelia capensis

Peyssonnelia foliosa

Peyssonnelia novae-hollandiae

Sonderopelta coriacea

V. PINK, LIMEY CRUSTS ATTACHED TO ROCKS, SEA–GRASSES AND ALGAE − SOME NON-JOINTED RED CORALLINE ALGAE

This is a group of genera with limey walls that effervesce on exposure to acids. A few, illustrated here, have striking shapes or morphologies, but most require intricate microscope investigation to ascertain the species.

See also

- "Pictured key to ..... Coralline red algae"
- Harvey, A. *et al* (2005). Coralline algae of central New Zealand: an identification guide to common "crustose" species. Wellington, New Zealand. NIWA Information Series No. 57. 145p.

Melobesia membranacea forms pink coatings on the cells of some Green algae such as *Caulerpa* and *Apjohnia.*
Left: the Green alga *Caulerpa simpliciuscula* with a pink coating (arrowed) forming on some of the bladder-like cells
Centre: detail of the uncoated cells of the Green alga host
Right: detail of (pressed, dried) cells of the host with *Melobesia membranacea* coating the cells

Synarthrophyton patena
form #1:
fragile, plectrum-like discs growing specifically on the filamentous alga, *Ballia callitricha*.
form #2:
A less fragile form wrapped around stalks of brown algae (*Acrocarpia* seen here) that cannot be separated from other similar genera

Mesophyllum sp, crusts of overlapping layers showing rings of growth. Identification to species level requires sporangial structures

Left:
Hydrolithon sp, probably *H. farinosum* crusts on stems of seagrasses
Above:
young *Hydrolithon* plant growing on a transparent settlement sheet used for underwater surveys, showing the characteristic cell pattern and germination plate

Right:
Pneophyllum sp, probably *P. coronatum* flakes on red algal blades

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