

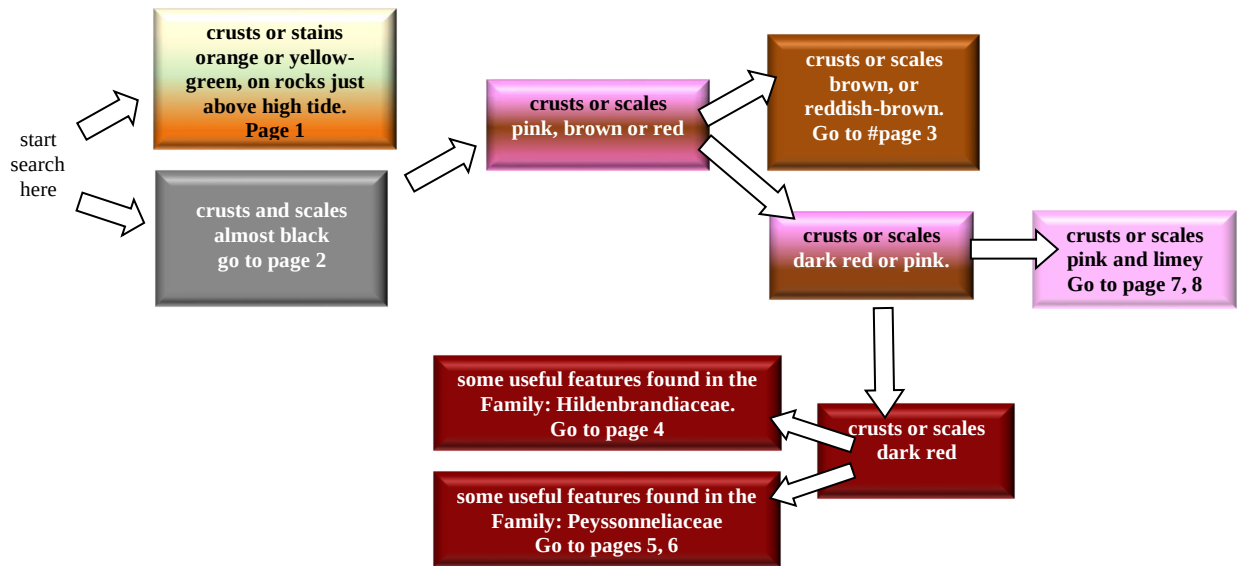
MARINE PLANT CRUSTS, STAINS, SCUMS AND SCALES

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

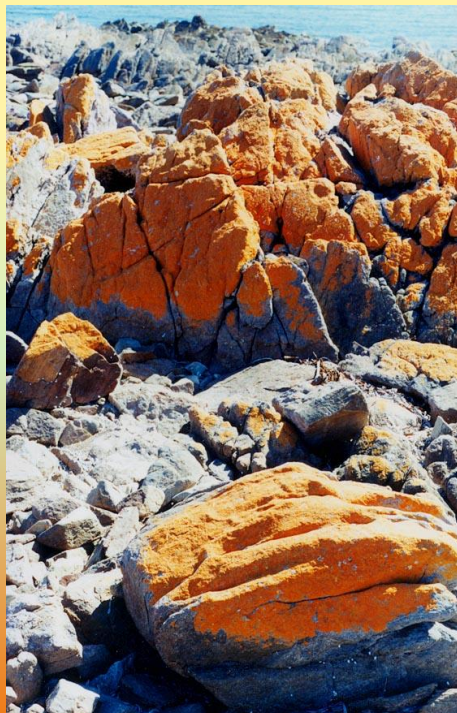
The overall shape (morphology) and internal structure (anatomy) of a few algae are distinctive enough for you to be able to place them in a major group or genus, even though the reproductive stages usually needed to identify them using the Flora may be missing. The pictorial descriptions below rely on 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: **"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.



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



Caloplaca sp

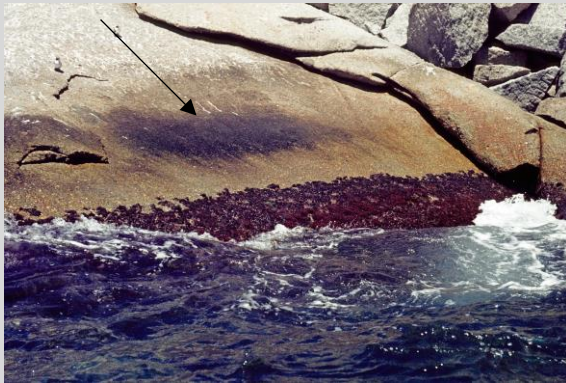
Left: probably *Caloplaca. gallowayi*, a common lichen forming powdery, bright orange coatings on non-calcareous rocks, above the high tide level, and kept moist by occasional wave-splash

Above, right: probably *Caloplaca tomareana* which forms greenish-yellow bunches on granite rocks

A full listing of Lichens, including coastal species and some illustrations, can be found in Kantvilas, G. (2019).

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 (calcareenite). Other marine lichens are brightly coloured, and are found in the appropriate section, below.



Left: [§]*Lichina intermedia* (as *L. pygmaea* in Womersley (1949) in pockets of eroded calcarenite at Yorke Peninsula, S Australia
Right: [§]*Lichina intermedia* 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)

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

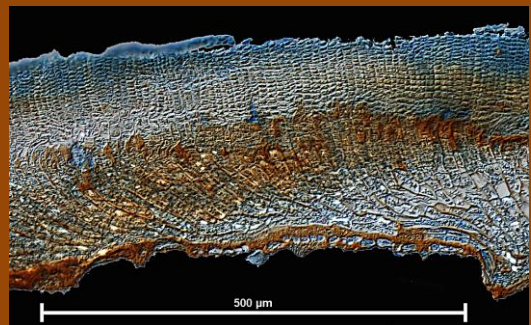
an encrusting Brown alga *Ralfsia verrucosa*
(as *Pseudoralfsia verrucosa* in *Algaebase*)



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

Above right: *Ralfsia* on rock (arrowed). A striped air breather shell (*Austrosipho*) and very small blue snail shells (littorinids) have grazed the alga leaving bare patches on the rocks

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

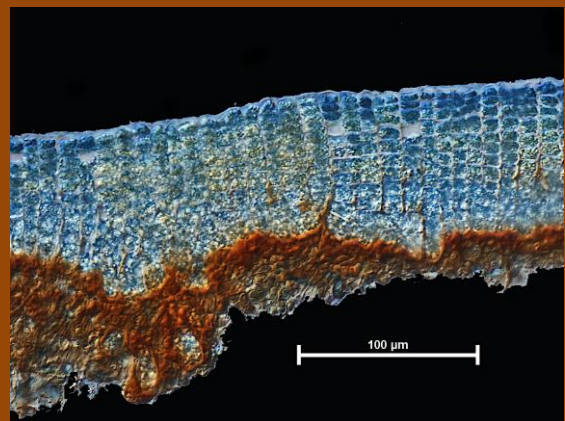


an encrusting Brown alga *Pseudolithoderma australe*



Above: encrusting Brown alga *Pseudolithoderma* (arrowed) on a pebble, mixed with bleached 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



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.

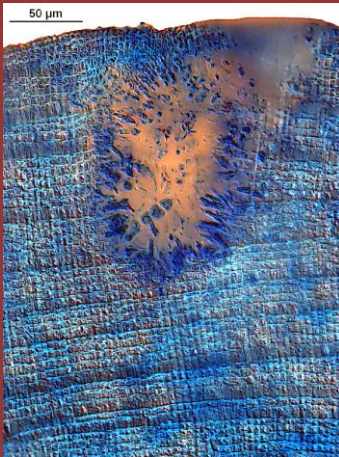
Others in the Family: Peyssonneliaceae that lie flat on rocks but are not closely adherent have been *excluded*.

Each species is separated by details of their microscopic internal structures (anatomy) and reproduction.

For further information, see :

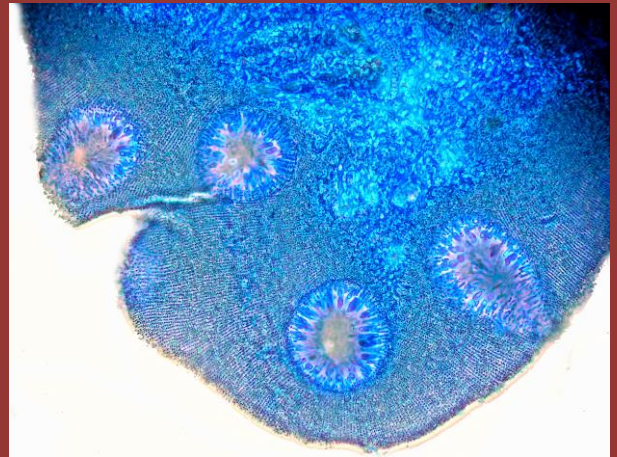
- “Peyssonneliaceae at a glance”,
- “*Hildenbrandia* at a glance” and
- individual fact sheets for each species of both Families

USEFUL FEATURES FOR RECOGNISING CRUST SPECIES OF 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



SPECIES OF *HILDENBRANDIA*



Hildenbrandia crouaniorum very thin;
found in the intertidal



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



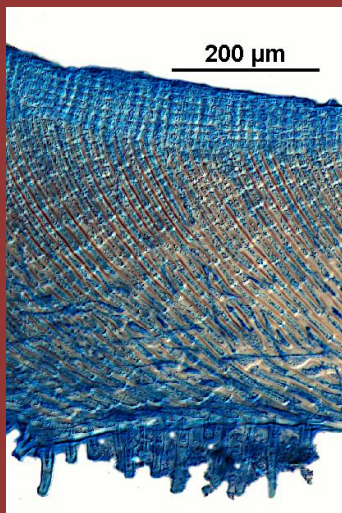
Hildenbrandia patula (as *H. expansa* in Womersley,
1984) is thick and smooth, cracking when dried;
found in pools and subtidal



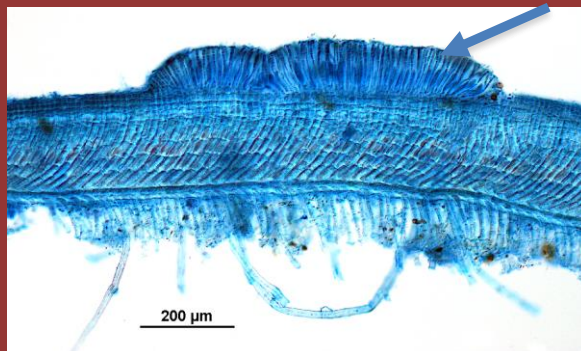
Hildenbrandia rubra (with adjacent surf barnacles,
Chthamalus) is very thin; found in the intertidal

There is also a freshwater species, *H. rivularis*, that stains rocks bright red in sub-tropical streams (as *Riverina rivularis* in *Algaebase*). Go to “freshwater plants”

USEFUL FEATURES FOR RECOGNISING CRUST SPECIES OF 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

SPECIES OF PEYSSONNELIA



Left: *Peyssonnelia boudouresquei* (as *Olokunia
boudouresquei* in Algaebase)
10-30 mm across, completely adherent and often on
large shells



Peyssonnelia dubyi

Above, left: (arrowed) on rock

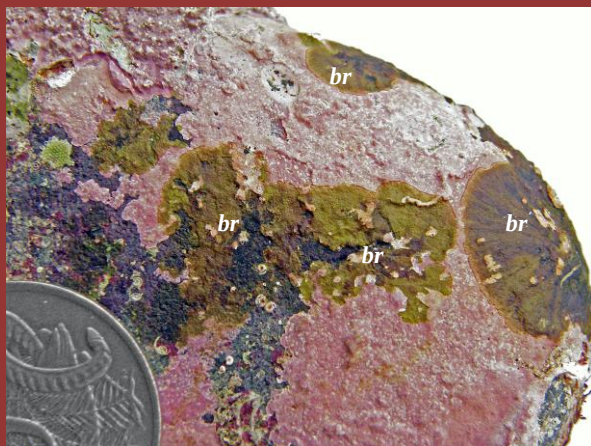
Right: on a *Comminella* shell adjacent to a bleached red coralline algal crust (*cor*)



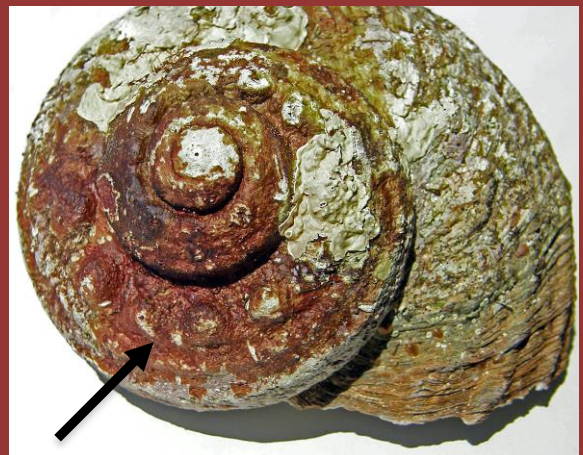
SPECIES OF *PEYSSONNELIA* (CONTINUED)



Peyssonnelia inamoena (as *Agissea inamoena* in *Algaebase*)
Above, left: on rock, edges characteristically lifting when dried
Right: on a bivalve shell, edges lifting



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



Peyssonnelia inamoena (as *Agissea inamoena* in *Algaebase*)
(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 (as *Sonderophycus capensis* in *Algaebase*)



Peyssonnelia foliosa



Peyssonnelia novae-hollandiae
(as *Agissea novae-hollandiae* in *Algaebase*)



Sonderopelta coriacea (as *Sonderophycus coriaceus* in *Algaebase*)

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

- “*common Coralline red algae*”
- Harvey, A. *et al* (2005)



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 (utricles)

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)



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



REFERENCES

- 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.
- Kantvilas, G. (2019). *An annotated catalogue of the lichens of Kangaroo Island, South Australia*. **Swainsona** 32:1-97
- 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
- Womersley, H.B.S. (1984). The marine benthic algae of southern Australia. Part I. Adelaide, Government Printer

species	author/s	page	name, if changed	authors
<i>Caloplaca tomareana</i>	S.Y.Kondr. & Kärnefelt	1		
<i>Caloplaca. gallowayi</i>	S.Y.Kondr., Kärnefelt & Filson	1		
<i>Calothrix fasciculata</i>	C.Agardh ex Bornet & Flahault	2		
<i>Hildenbrandia crouaniorum</i>	J.Agardh	4		
<i>Hildenbrandia expansa</i>	Womersley	4	<i>Hildenbrandia patula</i>	Womersley
<i>Hildenbrandia lecancellieri</i>	Hariot	4		
<i>Hildenbrandia rivularis</i>	(Liebman) J. Agardh	4	<i>Riverina rivularis</i>	(Liebman) C.W.Viera & G.W.Saunders
<i>Hildenbrandia rubra</i>	(Sommerfelt) Meneghini	4		
<i>Hildenbrandiaceae</i>		4		
<i>Hydrolithon farinosum</i>	(Lamouroux) Penrose & Y.M.Chamberlain	8		
<i>Lichina pygmaea</i>	(Lightfoot) C.Agardh	2	<i>Lichina intermedia</i>	(C.Bab.) M. Schultz
<i>Melobesia membranacea</i>	(Esper) Lamouroux	7		
<i>Mesophyllum</i>		8		
<i>Peyssonnelia boudouresquei</i>	Yoneshigue	5	<i>Olokunia boudouresquei</i>	(Yoneshigue) Pestana, Lyra, Cassano & J.M.C. Nunes
<i>Peyssonnelia capensis</i>	Montagne	6	<i>Sonderophycus capensis</i>	(Montagne) M.J.Wynne
<i>Peyssonnelia dubyi</i>	P.Crouan & H.Crouan	5		
<i>Peyssonnelia foliosa</i>	Womersley	6		
<i>Peyssonnelia inamoena</i>	Pilger	6	<i>Agissea inamoena</i>	(Pilger) Pestana, Lyra, Cassano & J.M.C.Nunes
<i>Peyssonnelia novae-hollandiae</i>	Kützing	6	<i>Agissea novae-hollandiae</i>	(Kützing) Pestana, Lyra, Cassano & J.M.C.Nunes
<i>Peyssonnelia splendens</i>	Womersley	6		
<i>Pneophyllum coronatum</i>	(Rosanoff) Penrose	8		
<i>Pseudolithoderma australe</i>	Womersley	3		
<i>Ralfsia verrucosa</i>	(Areschoug) Areschoug	3	<i>Pseudoralfsia verrucosa</i>	(Areschoug) Parente, R.L.Fletcher & G.W.Saunders
<i>Rivularia australis</i>	Harvey ex Bornet & Flahault	2		
<i>Rivularia firma</i>	Womersley	2		
<i>Sonderopelta coriacea</i>	Womersley & Sinkora	6	<i>Sonderophycus coriaceous</i>	(Womersley & Sinkora) M.J.Wynne
<i>Synarthrophyton patena</i>	(Hooker f. & Harvey) R.A.Townsend	7		