

# PICTURED KEY TO SOME ALGAE OF SOUTHERN AUSTRALIA: RED ALGAE WITH NARROW BRANCHES. 2<sup>nd</sup> EDITION

**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 to verify identifications.

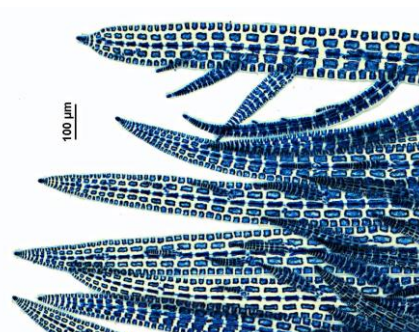
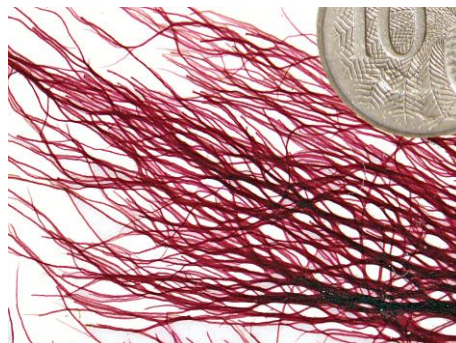
**Scale:** the coin used as a scale is 24 mm or almost 1" wide. Microscope images of algae are usually blue stained.

This key is *restricted* to algae with

- branches  $\leq 4$  mm wide
- *cylindrical* (terete) branches, circular in cross section, *or* those with narrow, *slightly compressed* branches, ovoid in cross section
- *forked, radial or irregular* branching patterns

and *excludes*:-

- species with a structure based on a single row of naked cells – the uniseriate and filamentous (thread-like) algae. (Figs 1, 2). These are covered in the “*Pictured Key to some common filamentous red algae of southern Australia: Master Key*”.
- those with limey or calcified, inflexible outer coatings that may be stony or have jointed branches such as *Jania* (Figs 3, 4). See “*Pictured Key to some common Coralline red algae of southern Australia*”
- those with *feathery* or “*fishbone*” (pinnate) branching patterns with *broad* axes. (Figs 5-7). See “*Pictured Key to feathery, flat-branched red algae*”
- those where branches are pinched into sections or segments (see Fig. 8). These are found in “*Southern Australian Groups at a glance: bead-like red algae*”



Figs.1, 2: *Platysiphonia delicata*. with filamentous construction, unfortunately only visible under the microscope; *excluded* from this key. For related groups, see “*Pictured Key to some common filamentous red algae of southern Australia: Master Key*”

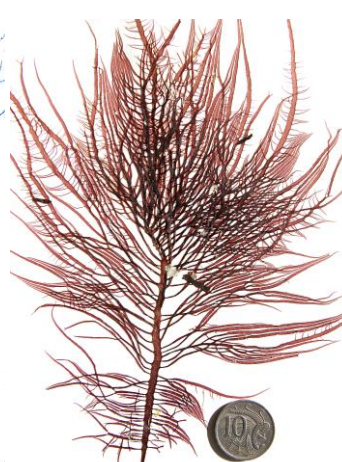
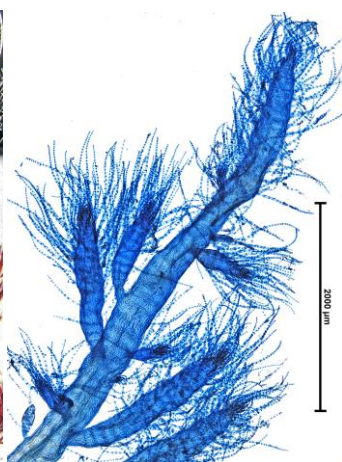


Fig. 3: *Jania verrucosa* with limey, jointed branches, *excluded* from this key. For similar species, see “*Pictured Key to some common Coralline Red Algae of southern Australia*”



Fig. 4: *Jania micrarthrodia*, enlarged to show jointed branches, *excluded* from this key. For similar species, see “*Pictured Key to some common Coralline Red Algae of southern Australia*”

Unavoidably, many steps in the key require microscope investigation, including cross sections of branches.



Figs 5, 6: *Spyridia squalida*; with feathery branching, the filamentous construction only visible under the microscope, and *excluded* in this key. For related groups see “*Pictured Key to filamentous red algae*”

Fig. 7: *Grateloupia subpectinata* with feathery branching. For related groups see “*Pictured Key to feathery, flat-branched red algae*”

Fig. 8: *Rhabdonia clavigera* with jointed branching. For related groups see “*Southern Australian Groups at a glance: bead-like red algae*”



## PICTURED KEY

- 1a. plants slimy **or** with a limy, dust-like coating (effervescing in acid), **or** with the *surface faintly fuzzy*; branches worm-like. Tissue squashes show a core of microscopic, colourless, twisted threads and surface (cortex) layers of **loose bunches** of small, outwardly-pointing cells. Figs 9-12.

See "Pictured Key to some common Red Algae of southern Australia: Order: Nemaliales"

- 1b. plants not slimy, although some may have smooth surfaces; branches soft, leathery, gelatinous or gristly, cylindrical (terete) or flattened, a few coated in lime. If microscopic threads are present in tissue squashes, then cells of the surface tissues (cortex) are **tightly** held together ..... 2.

- 2a. cores seen in cross section consist entirely or partly of fine, microscopic threads ..... 3.

- 2b. cores in cross section contain mainly equal-sided cells ..... 17.

- 3a. branches **hollow** except where short side branches, narrow at their base, arise at right angles to axes; surface layers often have small, bright gland cells amongst larger cells ..... 4.

- 3b. branches generally solid, core threads dense **or** well-spaced, surface layers with or without glands ..... 5.

- 4a. plants form tangled turfs in the upper sub-tidal. Spore patches, viewed microscopically, point inwards. Figs 13-16.

! ..... *Lomentaria monochlamydea* (can be confused with *Gigartina brachiata*; see step 8a below) .

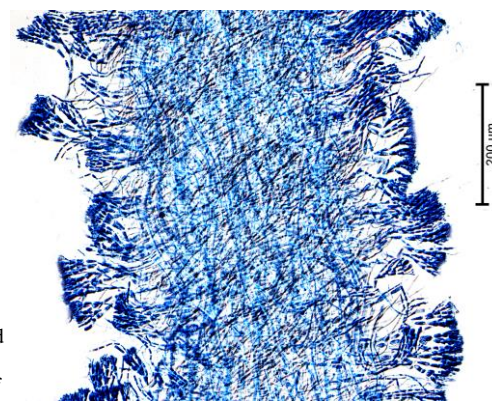
- 4b. plants not forming tangled turfs. Figs 17, 18. ....see Fact Sheets for *Lomentaria* sp and *Semnocarpa*



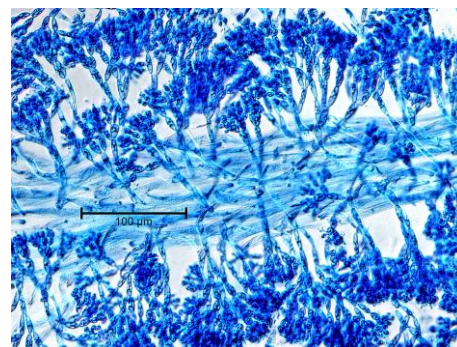
Fig.17: *Lomentaria australis*



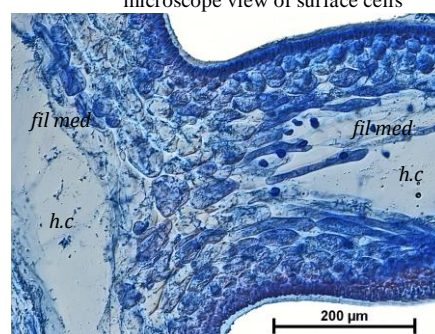
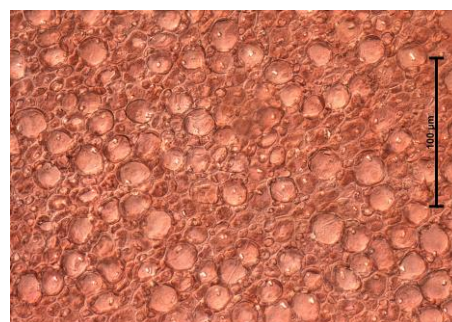
Figs 9, 10: *Helminthocladia doryi*, pressed specimens and a tissue squash showing the wide core of fine threads and surface layers of loose bunches of outwardly pointing cells, some displaced



Figs 11, 12: *Liagora harveyana*, pressed specimens with characteristic chalky surface, and a tissue squash showing a narrow core of fine threads and surface layers of loose bunches of outwardly pointing cells, (the limey or chalky deposits dissolved away during the staining process)



Figs 13, 14: *Lomentaria monochlamydea*: turf on the West Beach, Adelaide marina wall, and microscope view of surface cells



Figs 15, 16: *Lomentaria monochlamydea*: section through the solid junction between a main and side branch, hollow core (h.c), threads (fil med); section through a spore patch, spore clusters pointing inwards

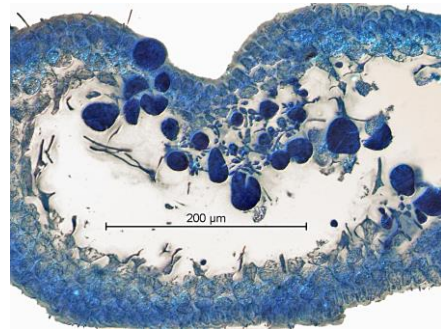
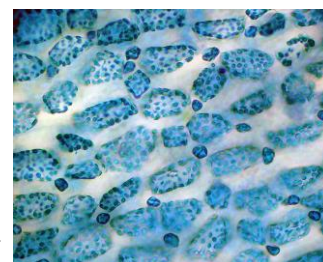


Fig.18 *Lomentaria australis*, microscopic, stained preparation showing dark gland cells on the edges of surface cells





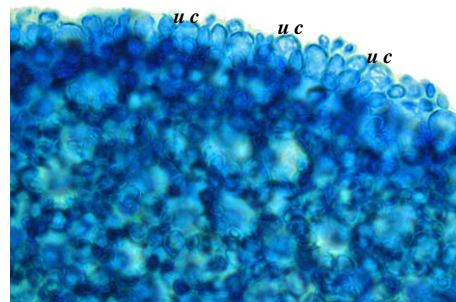
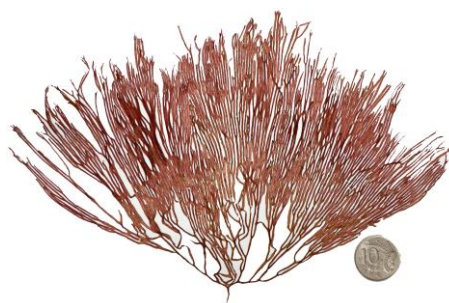
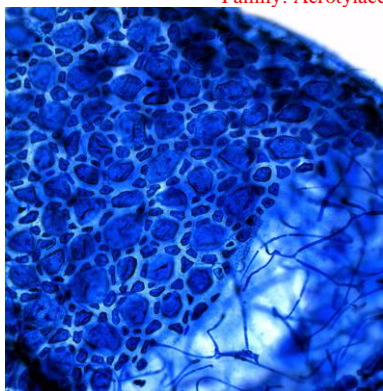
- 5a. surface microscopic views show rings (rosettes) of small cells around larger ones ..... 6.  
 5b. no cell rosettes, although bunches of small cells below surface cells may be visible ..... 7.

- 6a. plants red, branching forked (dichotomous). Rosette cells surround balloon-like (utriculate) cells. Figs 19, 20.

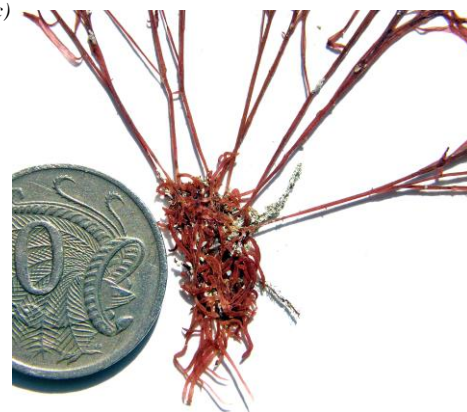
..... *Scinaia australis*  
 Family: Galaxauraceae in the Flora, recently merged with Scinaiaceae

- 6b. plants dark red, drying almost black, branching radial, wiry, tangled branches at plant base. No balloon-shaped cells. Figs 21-23.

..... *Antrocentrum nigrescens*  
 Family: Acrotyleaceae



Figs 19, 20: *Scinaia australis*. Whole plant and oblique microscopic surface view of rosettes and some protruding utriculate cells (*u c*)



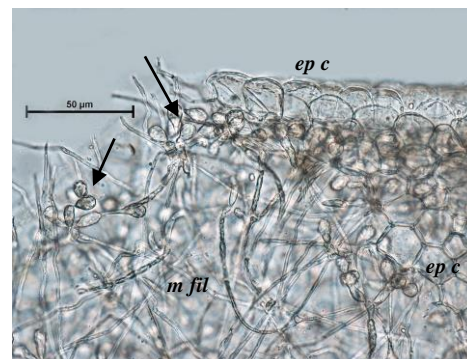
Figs 21-23: *Antrocentrum nigrescens*.

Left: oblique view of cell rosettes and underlying core threads.  
 Centre: plant tips, showing wiry branching.  
 Right: tangled plant base.

- 7a. plants soft, bunches of droplet-shaped cells terminating core threads may appear beneath 6-sided colourless surface cells. (Branches of some plants may be pinched into segments). Figs 24, 25.

..... *Scinaia tsinglanensis*  
 Family: Galaxauraceae in the Flora, recently upgraded to Scinaiaceae

- 7b. plants tougher, surface cells not as above ..... 8.

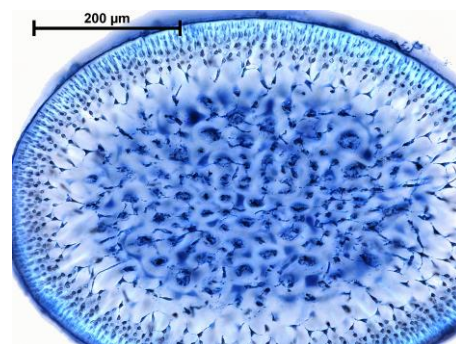


Figs 24, 25: *Scinaia tsinglanensis*. Whole plant and oblique cross section showing colourless surface cells (*ep c*), some in surface view, core threads (*m fil*) some ending in droplet-shaped cells (arrowed)

- 8a. plants grow in dense, tangled **turfs** in the lower intertidal/upper subtidal. Branches cylindrical, tips pointed, side branches short, spreading, white-banded when fertile, cores wide, consist of threads. Figs 26-28.

..... *Gigartina brachiata*  
 Family: Gigartiniaceae  
 (May grow intermingled with *Lomentaria monochlamydea*, see step #4a, above)

- 8b. plants not as above ..... 9.



Figs 26-28: *Gigartina brachiata*. Left: detail of divergent side branches and fertile white bands in an underwater image of plants amongst a flat-bladed Brown alga: photo D. Muirhead  
 Centre: tangled mat. Right: cross section, with wide core of branched threads

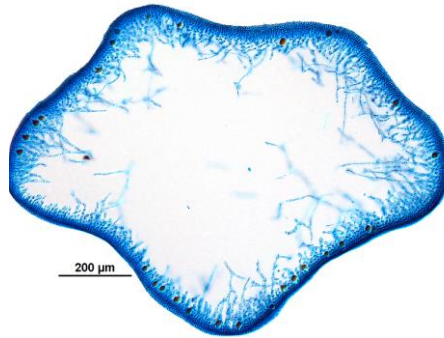


- 9a. cross sections show only fine threads  
in the core of mature branches ..... 10.
- 9b. cross sections of mature branches  
show a prominent central thread ..... 15.
- 10a. plants flat-branched (complanate),  
fairly regularly forked  
(dichotomous), tips usually rounded ..... 11.
- 10b. plants radially or irregularly  
branched, tips usually pointed ..... 14.



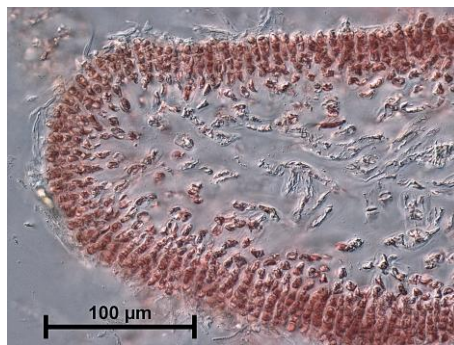
Figs 29, 30: *Adelophycus corneus*, whole plant; detail of branch tips with scattered patches of spores and a slight constriction (arrowed)

- 11a. bright, microscopic **gland cells**  
present in the outer layers (cortex),  
branches wrinkling on drying, some  
with irregular constrictions; spores  
in scattered patches. Figs 29-32.  
..... *Adelophycus corneus*  
Family: **Nemastomataceae**
- 11b. bright, microscopic glands **absent**.  
plants leathery or soft, or almost  
slimy. .... 12.



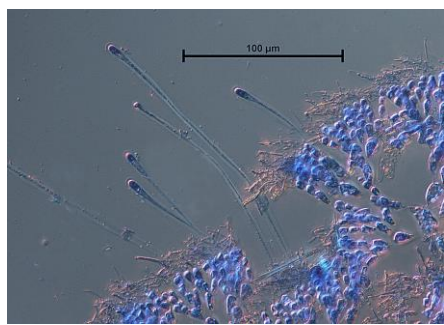
Figs 31, 32: *Adelophycus corneus*, cross section of a slightly wrinkled branch and detail of the cortex with bright gland cells

- 12a. plants small, 10-30 mm tall, grow on  
the seagrass *Amphibolis*. Numerous  
microscopic surface hairs with  
slightly **expanded tips** are present.  
Spores are produced in a very small,  
totally different-looking, encrusting  
plant. Figs 33-37.  
..... *Kraftia dichotoma*  
Family: **Dumontiaceae**
- 12b. plants larger, grow on rock or other  
marine plants. Surface hairs **absent**  
or without expanded tips ..... 13.



Figs 33, 34: *Kraftia dichotoma*  
Left: cross section through a blade edge

Right: whole plant



Figs 35-37: *Kraftia dichotoma*  
Left: tissue squash, displaced surface hairs (arrowed)

Centre: detail of surface hairs

Right: sporangial plants on a *Amphibolis* stem



- 13a. spores, in swollen “bags” (nemathecia) at branch tips, in stacks of 4 (zonate). Numerous extra side branches (adventitious branches) may arise in some plants. Figs 38-42.

..... *Acrotylus australis*  
See also “[Acrotylaceae at a glance](#)”

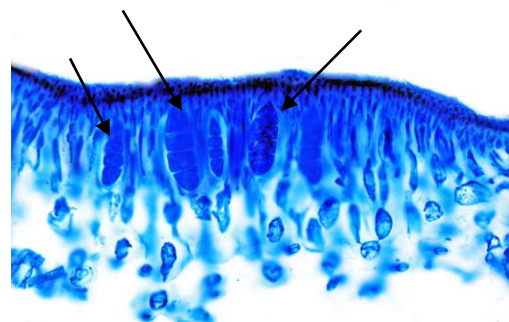
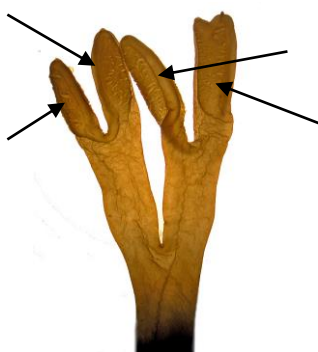
- 13b. spores formed in patches, amongst hairs (= chains of small cells), divided in a cross-pattern (cruciate). Branching usually regularly forked. . Figs 43-48.

..... *Polyopes constrictus*  
*P. tenuis*

Go to “[Southern Australian Groups at a Glance: Halymeniaceae](#)”  
(*P. tasmanicus* has numerous short, radial side branches around axes)



Figs 38-39: *Acrotylus australis*. Left: whole plant. Right: initial, regular, flat-forked branching pattern.

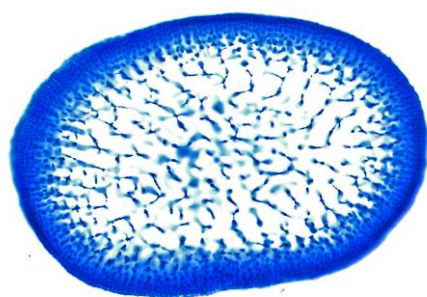


Figs 40-42: *Acrotylus australis*.

Left: extra (adventitious) branches

Centre: preserved (bleached) branch tips with spore “bags” (arrowed)

Right: cross section of outer layer, stacks of 4 spores (zonate sporangia, arrowed), bright gland cells *absent*.



Figs 43-45: *Polyopes tenuis*.  
Left: cross section



Centre: whole plant



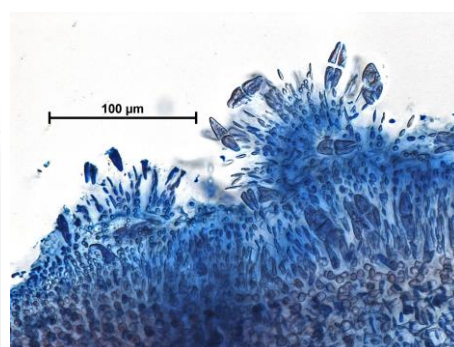
Right: detail of branching pattern



Figs 46-48: *Polyopes constrictus*  
Left: whole plant



Centre: detail of branching



Right: cross section of spore patch.  
Some chains of cells and  
cruciately-divided spores extruded



14a. **single** cells at tips. Cross sections only of young branches have a single central thread, cores of mature branches with many thin threads; often. Also, **thick yellow threads** often present. Figs 49-53.

..... *Rhabdonia coccinea*

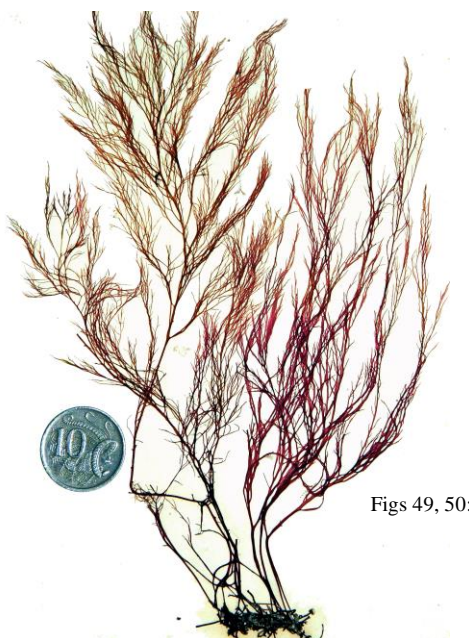
Family: Areschougaceae

Other *Rhabdonia* species are jointed

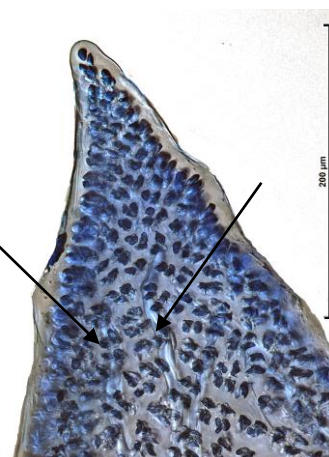
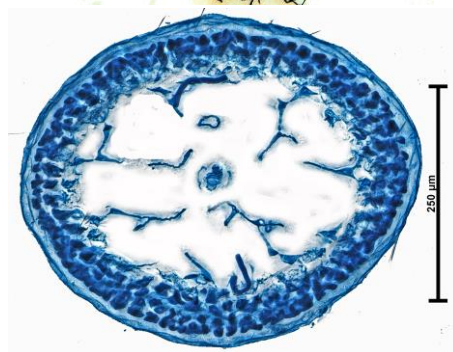
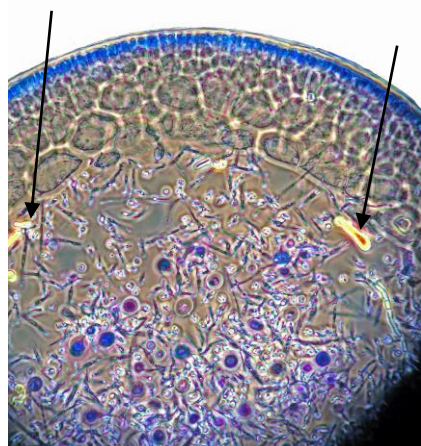
14b. **numerous** threads lead away from several, obscure tip-cells. Yellow threads **absent**. Figs 54-59.

..... *Solieria* 2 spp

Go to "Southern Australian Groups at Glance: Areschougaceae"



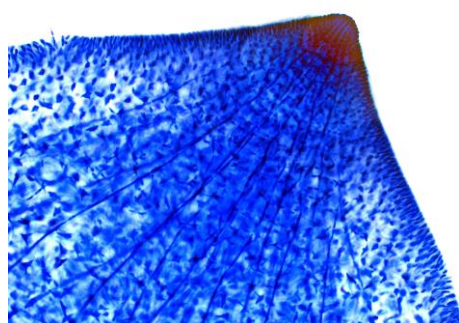
Figs 49, 50: *Rhabdonia coccinea*  
Two plants with contrasting branching patterns



Figs 51-53: *Rhabdonia coccinea*,  
Left: cross section mature branch, numerous core threads, bright, thick-walled yellow threads (arrowed)

Centre: cross section young branch  
central filament apparent

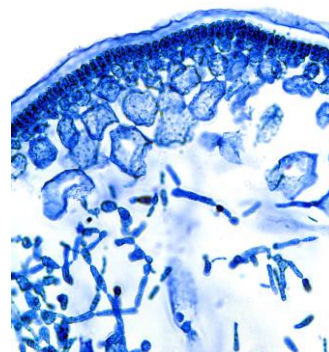
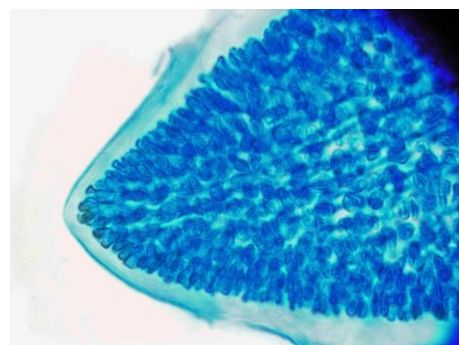
Right: single tip cell, bright, thick-walled yellow threads (arrowed)



Figs 54-56: *Solieria robusta*,  
Left: branch tip, many threads leading away from several tip cells, yellow threads **absent**

Centre: whole plant

Right: fresh, soft cylindrical branches in detail



Figs 57-59: \**Solieria filiformis* (previously *S. tenera* in the Flora, and probably an introduced species)  
Left: branch tip

Centre: whole plant

Right: cross section



15a. in **lengthwise sections** or tissue squashes of **young** branches, a central large thread can be seen producing a **single** diverging thread from each of its cells. Later additional, numerous threads obliterate this pattern ..... 16.

15b. in **lengthwise sections** or tissue squashes of **young** branches, **2-4** radiating threads arise from each cell of a prominent central thread. Figs 60, 61.

..... *Nizymenia* 3 spp  
(Includes 2 spp under *Stenocladia* in the Flora)  
Go to "[Southern Australian Groups at Glance: Nizymenia](#)"



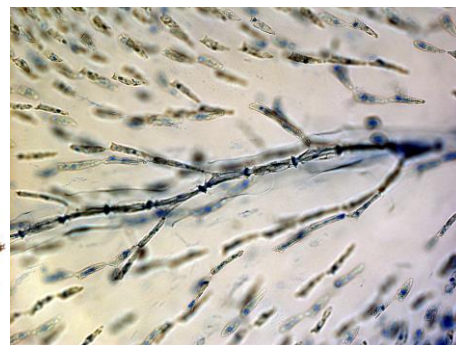
Figs 60, 61: *Nizymenia conferta*, whole plant and lengthwise view of a dissected central thread with diverging pairs of threads from each of its cells

16a. plants dark red-brown, much-branched, forming **dense mats**; branches cylindrical, upper ones  $\leq 0.3$  mm wide. Figs 62, 63.

..... *Melanema dumosa*  
Go to "[Southern Australian Groups at Glance: Areschougiaceae](#)"

16b. plants dark- or light-red, main branches distinct, cylindrical to slightly flattened, 2-4 mm wide. Figs 64-69.

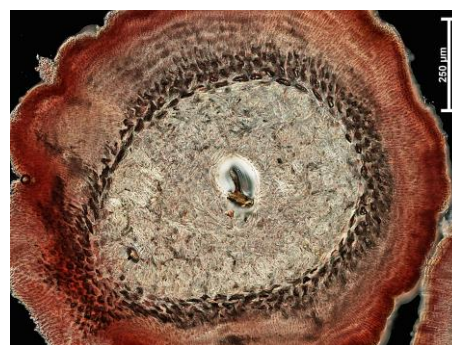
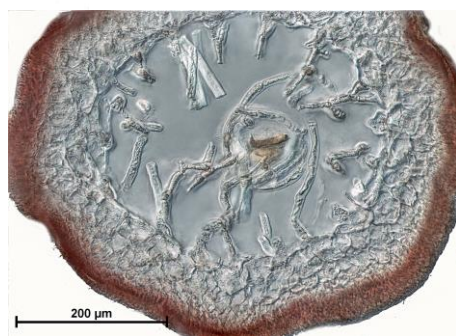
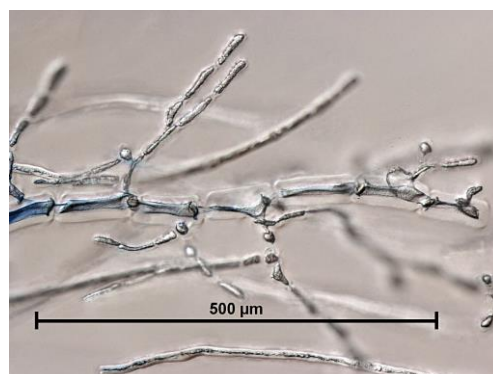
..... *Areschougia* 3 spp  
Go to "[Southern Australian Groups at Glance: Areschougiaceae](#)"



Figs 62, 63: *Melanema conferta*, turf and lengthwise view of a dissected central thread with a single thread from each of its cells



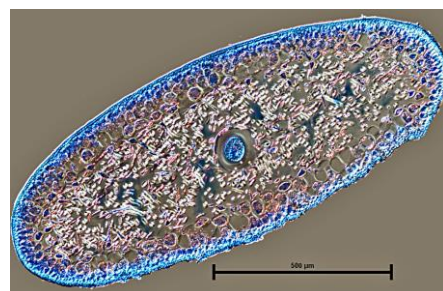
Figs 64, 65: *Areschougia congesta* whole plant and lengthwise view of a dissected central thread with a single thread arising from each of its cells



Figs 66, 67: *Areschougia congesta* cross sections of a young (left) and old, thickened branch (right) showing the central thread still prominent



Figs 68, 69: *Areschougia stuartii*.  
Left: whole plant  
Right: cross section of compressed branch





from step #2b - cores in cross section contain mainly equal-sided cells

17a. branch tips **come to a point** with a single tip cell, branches have a single, prominent, central thread ..... 18.

17b. branch tips **rounded or dimpled**, with obscure single cells **or** many cells; branch cores with many cylindrical cells **or** fine threads ..... 24.

18a. plants form dense mats or turfs in the lower intertidal or in shallow water at reef edges. Branches cylindrical **or** compressed, arise essentially in 2 rows. Cross sections show clusters of small **thick-walled cells** (rhizines). Branches bearing spores are **beaked** or cross-shaped. Figs 70-73 ..... *Gelidium* in part, *Capreolia implexa*

Go to "[Southern Australian Groups at a glance: Gelidiaceae](#)"

18b. not as above ..... 19.

19a. plants dark-red, often almost black when dry, tree-shaped, with 1-several central main branches (axes), sometimes thick and trunk-like; wiry or fine cylindrical side branches ..... 20.

19b. not as above ..... 23.

20a. plants often large (300 mm tall), ultimate branches thin, with internal cells producing a "brick-wall" pattern. Old axes > 10 mm wide, covered in sponge or encrusting animals. Branched hairs (trichoblasts) may protrude from pointed tips. Cross sections show a ring of 5 cells (pericentral) **sharply defined** from small outer cells. Figs 74-77.

..... *Cladurus elatus*  
Family: Rhodomelaceae, Tribe: Chondrieae

20b. ultimate branches without a brick-like pattern. Trichoblasts present or absent ..... 21.



Fig. 70: *Gelidium pusillum*



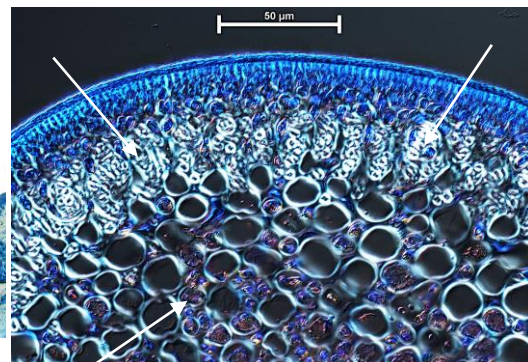
Fig. 71: *Capreolia implexa*,



Figs 72, 73: *Gelidium asperum*

Left: microscopic view of a cross-shaped side branch bearing spores

Right: partial cross section, packets of thick-walled rhizines (arrowed)



Figs 74-76: *Cladurus elatus*

Left: cross section, 5 sharply defined pericentral cells

Above: whole plant, sponge on the upper axis

Right: microscopic view of a pointed tip with emergent trichoblast

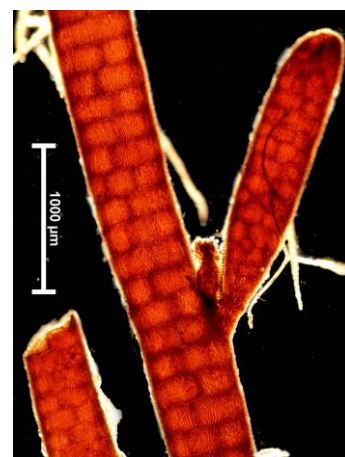
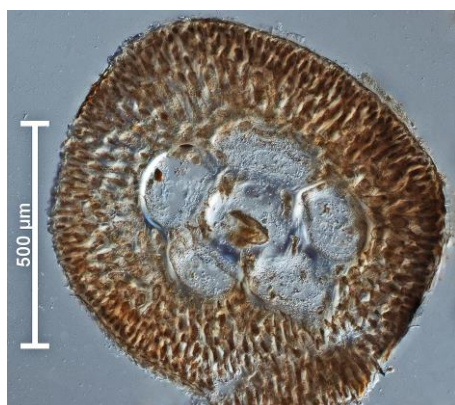


Fig. 77 *Cladurus elatus*  
backlit microscopic view of the "brick-wall" cell pattern of internal cells showing through





- 21a. side branches short, in **clusters**, arising from the one level (umbellate). Figs 78-81.

..... *Heterocladia umbellifera*

Family: Rhodomelaceae

Tribe: Heterocladieae

- 21b. side branches short, long and wiry or spine-like, radially or irregularly arranged ..... 22.

- 22a. several axes present. Cross sections show a small central thread encircled by 4 (pericentral) cells. Figs 82-84.

..... denuded plants of

*Chiracanthia arborea*

Family: Rhodomelaceae

Tribe: Polysiphonieae

remnant hair tufts (trichoblasts) and spine-like short branches may be present

- 22b a single, trunk-like axis is present. Cross sections with only the central filament prominent. Figs 85-87.

..... *Gonatogenia subulata*

Family: Rhodomelaceae

Tribe: Lophothalieae

(remnant microscopic hairs –trichoblasts- with multicellular bases may be present)



Figs 78, 79: *Heterocladia umbellifera*

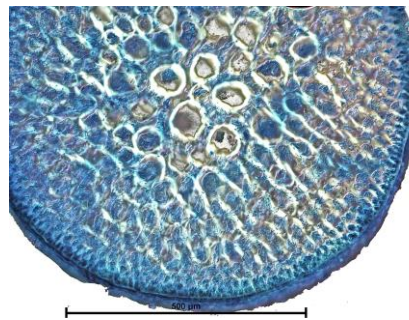
Left: whole plant. Right: detail of umbellate side branches



Figs 80, 81: *Heterocladia umbellifera*

Left: plant with dense side branches obscuring the umbellate branching pattern.

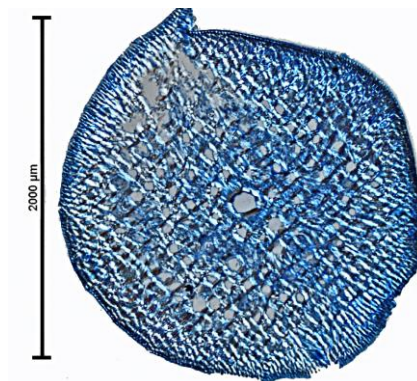
Right: cross section of a young branch



Figs 82-84: *Chiracanthia arborea*

Above: denuded, wiry plant. Right, above: cross section with 4 prominent pericentral cells

Right: short side branches from a plant that has not been denuded



Figs 85-87: *Gonatogenia subulata*

Left: denuded, tree-like plant. Centre: cross section with prominent central thread

Right: remnant trichoblast from a branch that has not been denuded



23a. microscopic hair tufts (trichoblasts) present, although easily shed. Internal cells (pericentral cells) show through surface layers and form visible bands along young branches. Cross sections of young branches show a prominent central thread surrounded by 5 equal-sized (pericentral) cells, some with bright crescents or cap-shaped **wall thickenings**. Figs 88-93.

..... *Chondria* spp (in part)  
See "Pictured Keys: *Chondria* and *Husseyia*"  
Family: Rhodomelaceae, Tribe: Chondrieae

23b. hair tufts **absent**, wall thickenings **absent**; cross sections show a prominent central thread surrounded by large oval cells of **mixed sizes**. Figs 94-97.

..... *Hypnea* spp  
See "Southern Australian Groups at Glance: Hypneaceae"



Fig. 88: *Chondria bulbosa*

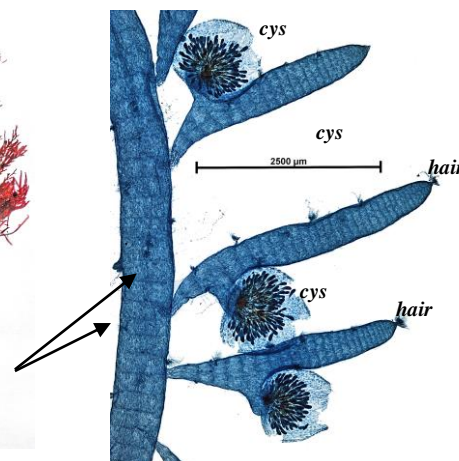


Fig. 89: *Chondria bulbosa*, pointed tips, hair tufts (hair), blocks of cells visible internally (arrowed), female structures (cystocarps, cys)

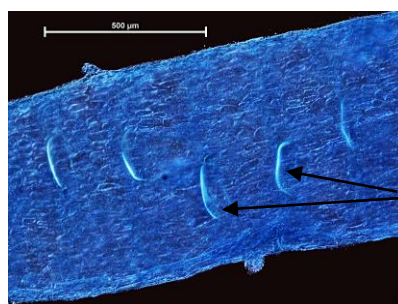


Fig. 90: *Chondria bulbosa*, crescent-shaped, bright end-wall thickenings (arrowed)



Fig. 91: *Chondria bulbosa*

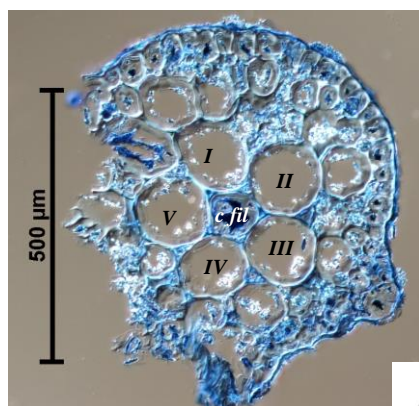


Fig. 92, 93: *Chondria angustissima*.  
Left: partial cross section, central thread (c fil), pericentral cells (I-V)  
Right: plants on a leaf of a seagrass



Fig. 94: *Hypnea ramentacea*, "shepherds-crook" tips and pointed short side branches



Fig. 95: *Hypnea valentiae*, plant with numerous short, spines

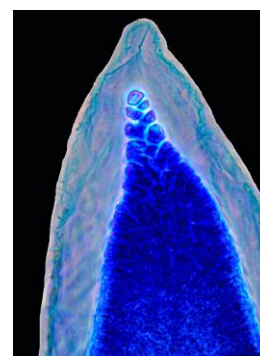


Fig. 96: *Hypnea valentiae*, prominent single tip cell

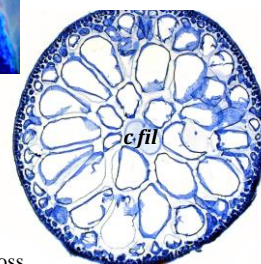


Fig. 97: *Hypnea filiformis*, cross section, central thread (c fil)



- 24a. branch tips *dimpled* with a pit often containing a tuft of hairs or a single sunken tip-cell.  
..... 25.
- 24b. branch tips rounded, without a pit  
..... 26.

25a. cross sections of young branches show a prominent central thread ringed by 5 large (pericentral) cells. Bright microscopic inner cell wall thickenings are common.  
Figs 98-104.

.... *Chondria* (in part) and *Husseyia* spp  
See “**Pictured Keys: *Chondria* and *Husseyia***”  
Family: Rhodomelaceae, Tribe: Chondrieae

25b. the 4 pericentral cells that ring a central thread in cross section of young branches are quickly obscured by additional equal-sized cells. Bright microscopic inner cell wall thickenings are uncommon.  
Figs 105-115.

..... *Laurencia* and *Chondrophycus*  
See “**pictured key to *Laurencia* and *Chondrophycus***”  
Family: Rhodomelaceae, Tribe: Laurenciae



Fig. 98: *Chondria arcuata*

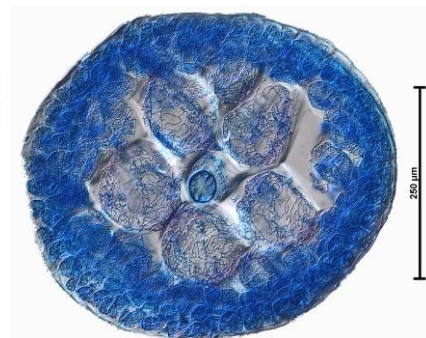


Fig. 99: *Chondria arcuata*. cross section of a young branch

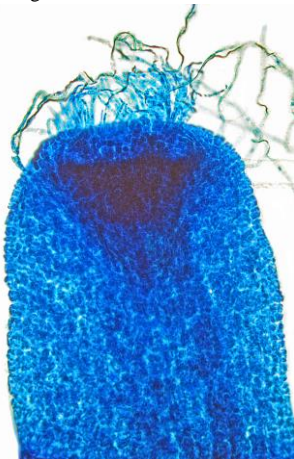


Fig. 100: *Chondria arcuata*, microscopic view of hairs emerging from the dimpled tip



Fig. 101: *Chondria curdieana*. Right: bright inner cell wall thickenings seen in lengthwise view



Fig. 102: *Husseyia rubra*. Cross section of a **young branch**, 5 prominent pericentral cells surrounding a central thread

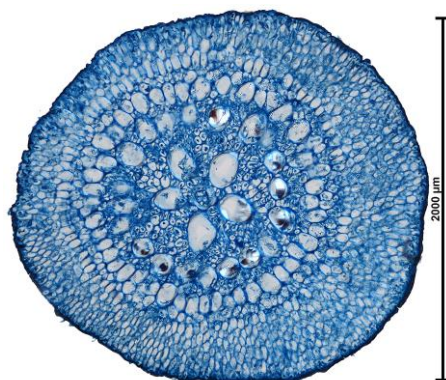


Fig. 103: *Husseyia rubra*. Cross section of a **mature branch**, additional ring of large cells



Fig. 104: *Husseyia rubra*

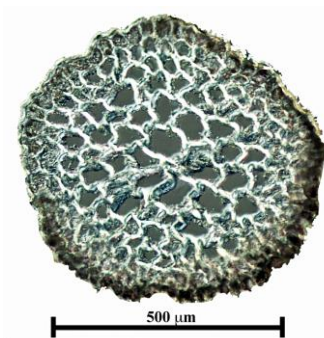


Fig. 105: *Laurencia filiformis*, cross section, indistinct central thread and equally indistinct 4 large, pericentral cells



Fig. 106: *Laurencia aldingensis*



Fig. 107: *Laurencia tasmanica*, short side branches ending in hair tufts sunken in pits





Figs 108, 109: *Laurencia arbuscula*.  
Above: bunches of fertile branches.  
Right: characteristic plant shape



Fig. 110: *Laurencia heteroclada*  
(formerly *L. filiformis* var.  
*heteroclada* in the Flora)



Fig. 111: Left:  
*Laurencia forsteri* on a  
leaf blade of seagrass

Fig. 112: Right:  
surface view, cells  
with bright red bodies  
(*corps en cerise*)  
found only in fresh  
specimens of the  
genus *Laurencia*

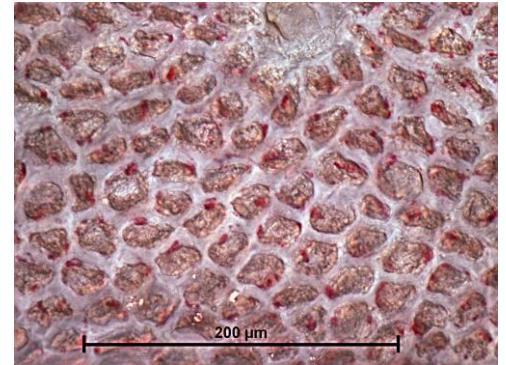


Fig. 113: *Chondrophyucus brandenii*

- 26a. branch cores with at least some  
fine threads present, even if  
obscure ..... 27.  
26b. branch cores of equal-sided cells  
only ..... 28.

- 27a. plants generally small (< 100 mm  
tall), often grow on seagrass stems;  
branch cores have a central mass  
of small cells (actually, threads  
when seen in longitudinal view).  
Figs 116 - 118.

..... *Dicranema* 2 spp

Go to "[Southern Australian Groups at a glance:](#)  
[Dicranemataceae](#)

- 27b. plants usually larger, core cells  
thick-walled, wrapped in cobweb-  
like, extremely fine threads.  
Figs 119-121.

*Mychodea* 11 spp

Go to "[Southern Australian Groups at a glance:](#)  
[Mychodea](#)"

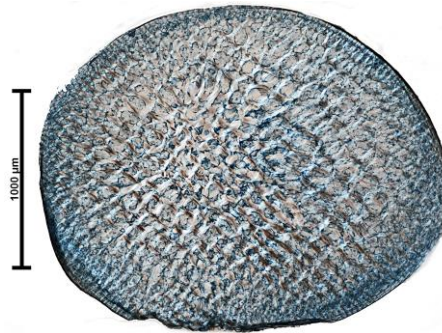


Fig. 114: *Chondrophyucus brandenii*, cross section,  
central thread and pericentral cells  
obliterated by additional cells

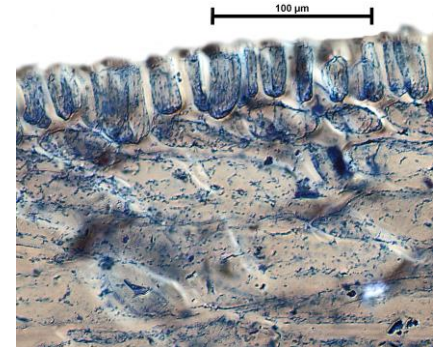
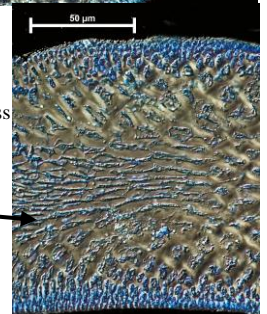
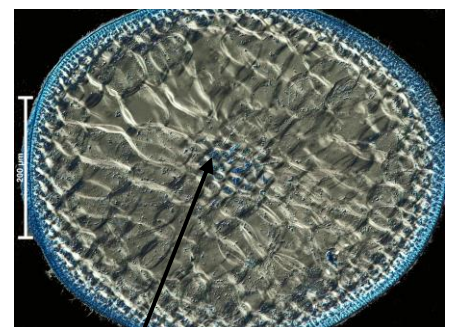


Fig. 115: *Chondrophyucus cruciatus* cross section,  
of the outer cells; fence-like (palisade)  
cells characteristic of the genus

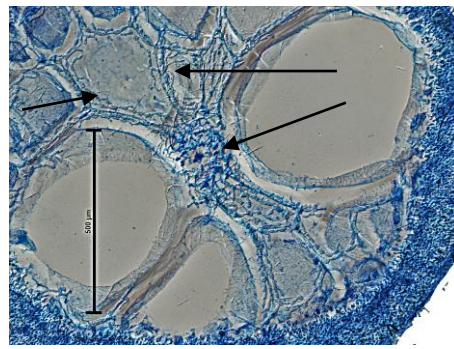
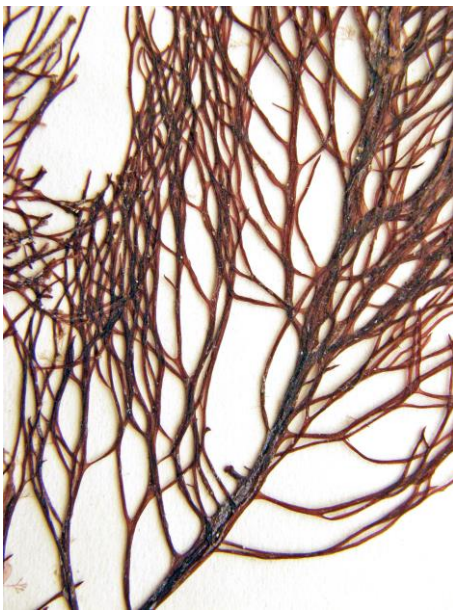


Fig. 116: *Dicranema  
revolutum* on a  
seagrass  
stem



Figs 117, 118: *Dicranema cincinnalis*, cross  
section (upper) and  
lengthwise section (lower),  
central small mass of  
threads (arrowed)





Figs 119, 120: *Mychodea camosa*  
Left: branching pattern  
Above: part of a cross section with extremely fine threads (arrowed) in the centre and also ringing the large, equal-sized cells

Fig. 121: *Mychodea pusilla*, (right) on seagrass stems could be mistaken for *Dicranema*

28a. plants tall, wiry or hair-like or with long, whip-like, cylindrical main branches (axes), forked widely apart. Figs 122-125.

..... *Gracilaria* in part, or *Gracilariopsis*.

separated on minute reproductive features  
"Southern Australian Groups at a glance;  
*Gracilariaceae*"

28b. plants not as above, regularly or densely forked, axes cylindrical or flattened ..... 29.



Figs 122, 123: *Gracilaria chilensis*.  
Left: whole plant.  
Centre: single branch with small, protruding female structures  
Right: cross section

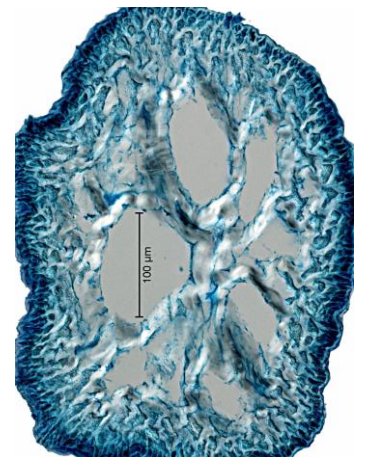


Fig. 124: *Gracilaria secundata*



Fig. 125: *Gracilariopsis lemaneiformis*



- 29a. branches flattened, branching in one plane ..... 30.  
 29b. branches cylindrical; wiry, whip- or hair-like, or thin and densely branched radially, irregularly or on one side ..... 32.

- 30a. tips suddenly ending in spine-like points. Spores scattered, imbedded in branches Figs 126-128.  
 ..... *Gracilaria preissiana*  
 30b. tips rounded or conical. Spores in pustules on the surface of branches. .... 31.

- 31a. branches thin; plants densely branched near tips (although this may be a response due to grazing).  
 ?Restricted to SE Australian waters. Figs 129-131.

*Ahnfeltiopsis humilis*  
 Family: **Phylloporaceae**

- 31b. branches thicker, leathery, regularly and densely forked; distributed near ports, an introduce species. Figs 132-136.

\**Gymnogongrus crenulatus*  
 Family: **Phylloporaceae**



Figs 126, 127: *Gracilaria preissiana*  
 Above: whole plant.



Right: detail of tips

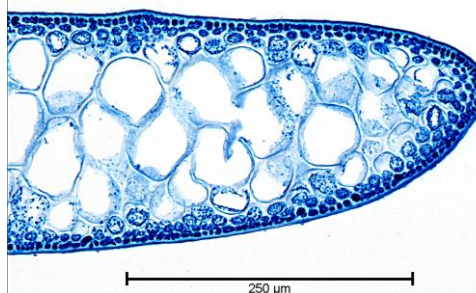
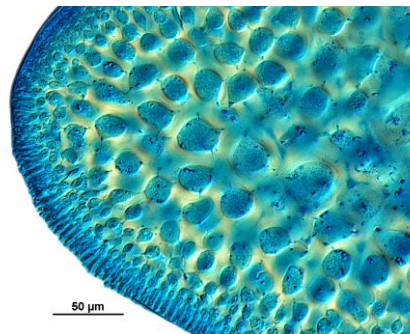


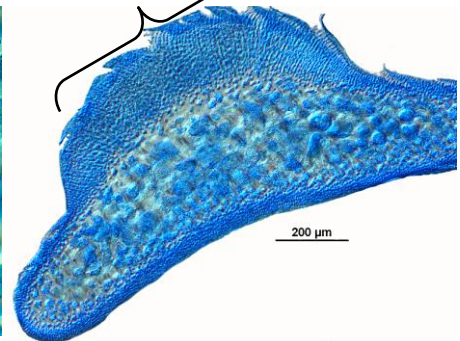
Fig. 128: *Gracilaria preissiana*  
 Partial cross section



Fig. 129: *Ahnfeltiopsis humilis*



Figs 130, 131: *Ahnfeltiopsis humilis*  
 Above: cross section, blade edge



Right: cross section through a pustule (bracketed) with long chains of spores



Fig. 132: *Gymnogongrus crenulatus*, magnified branches with sporangial pustules

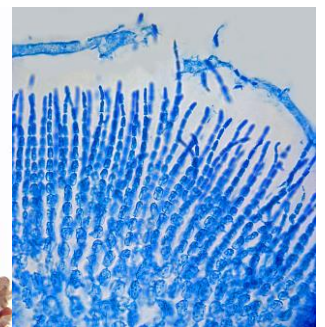
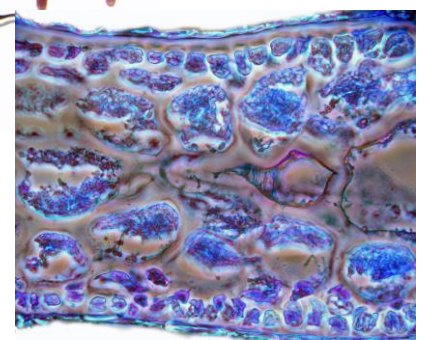


Fig. 133: chains of spores from a pustule

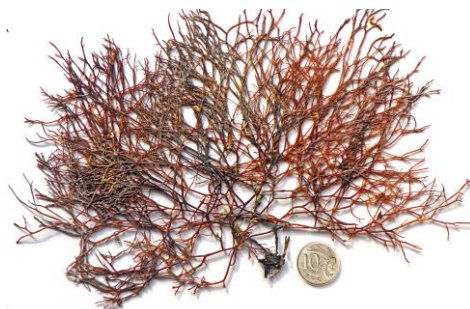


Figs 134-136: *Gymnogongrus crenulatus*  
 Left: cross section through a sporangial pustule  
 Above: whole plant  
 Right: portion of a blade in cross section





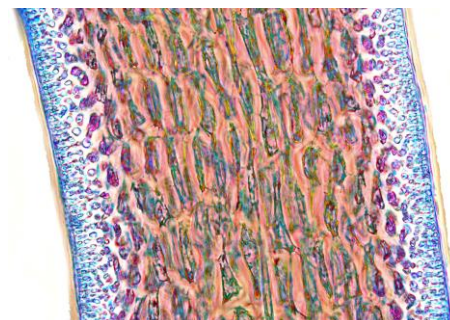
- 32a. branches thin,  $\approx 1$  mm wide  
 ..... 33.
- 32b. branches  $> 1$  mm wide, some  
 leathery (rattle when dry and  
 beaten together), tips rounded,  
 usually with a **dark cap**. Figs 141-  
 145. .... *Melanthalia* 3 spp  
 smaller species with cylindrical  
 branches, *M. obtusata* slightly flattened  
 Go to “Southern Australian Groups at a glance:  
*Gracilariaceae*”



Figs 135-137: *Gracilaria cliftonii*  
 Above: whole plant.  
 Above, right: detail of tips with  
 protruding female  
 structures (cystocarps)  
 Right: cross section



- 33a. cross sections of branches show  
 cells decreasing in size from the  
 centre outwards. Spores scattered  
 and imbedded in outer layers. Figs  
 135-137. .... *Gracilaria cliftonii*  
 (as *G. ramulosa* in the Marine Benthic Flora)
- 33b. cross sections of branches show  
 outermost layers of small cells in  
 short chains. Spores in pustules on  
 the surface of branches. Figs 138-  
 140.  
 .... *Gymnogongrus griffithsiae*  
 Family: *Phylloporaceae*



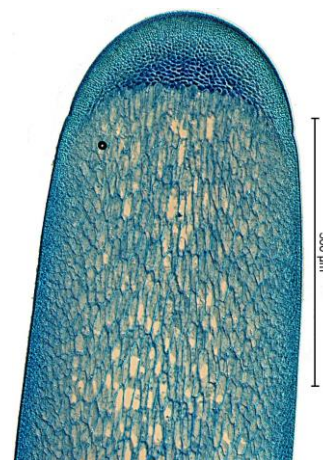
Figs 138-140: *Gymnogongrus griffithsiae*  
 Left: whole plant  
 Centre: lengthwise section  
 with spore pustules  
 Above, right: sectional view



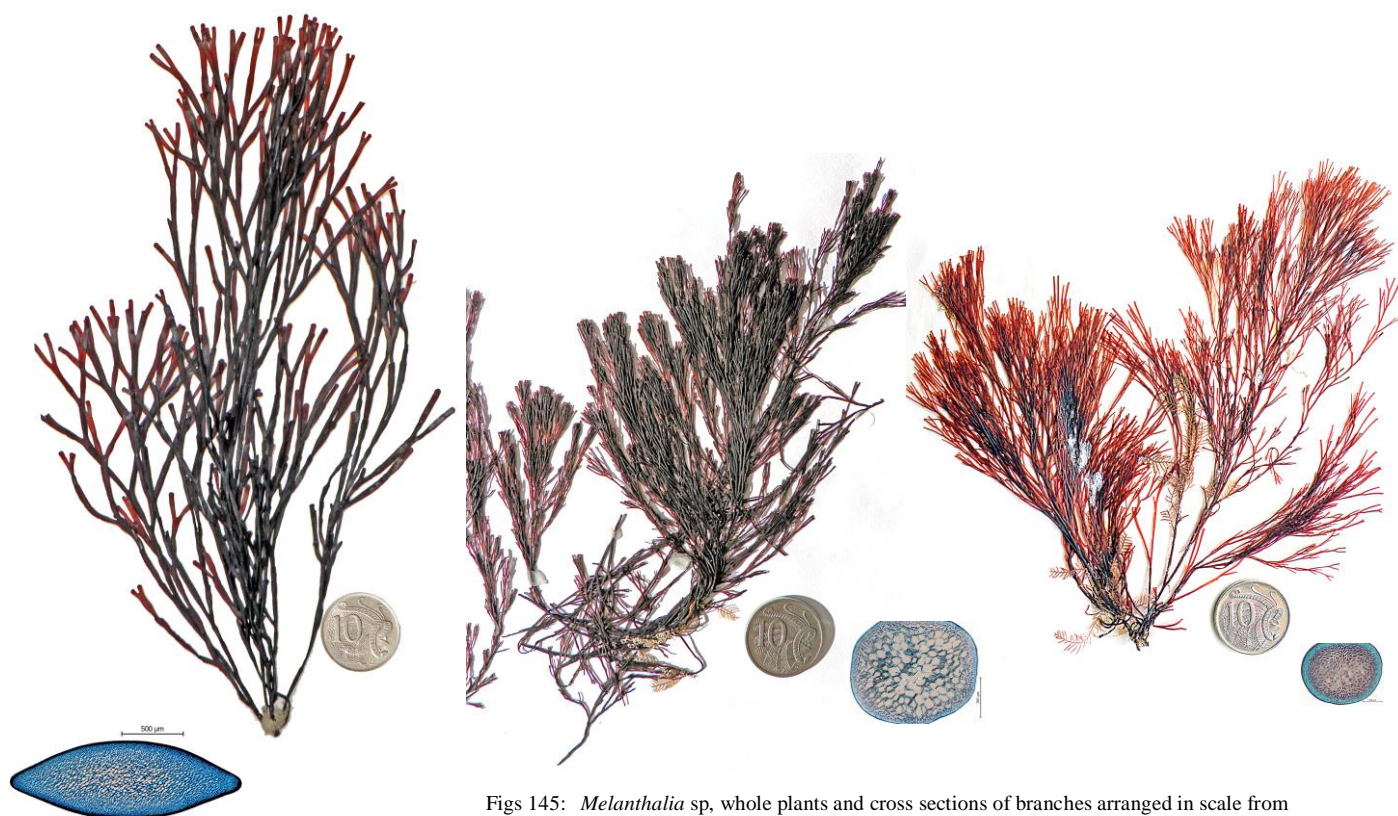
Fig. 141: *Melanthalia* meadows in the upper sub-tidal  
 at Pt Elliot, SA



Figs 142, 144: *Melanthalia obtusata*  
 Above: tips, with darkened caps  
 Right: lengthwise section of a branch tip







Figs 145: *Melanthalia* sp, whole plants and cross sections of branches arranged in scale from largest to smallest species

Left: *M. obtusata* Centre: *M. concinna*

Right: *M. abscissa*

## SUMMARY

Genera/major groups included in this key:

<i>Acrotylus</i>	<i>Helminthora</i>
<i>Adelophycus</i>	<i>Heterocladia</i>
<i>Ahnfeltiopsis</i>	<i>Husseyia</i>
<i>Antrocentrum</i>	<i>Hypnea</i>
<i>Areschougia</i>	<i>Kraftia</i>
<i>Capreolia</i>	<i>Laurencia</i>
<i>Chiracantha</i>	<i>Liagora</i>
<i>Chondria</i>	<i>Lomentaria</i>
<i>Chondrophycus</i>	<i>Melanema</i>
<i>Dicranema</i>	<i>Melanthalia</i>
<i>Gelidium</i>	<i>Mychodea</i>
<i>Gigartina</i>	<i>Polyopes</i>
<i>Gonatogenia</i>	<i>Rhabdonia</i>
<i>Gymnogongrus</i>	<i>Scinaia</i>
<i>Helminthocladia</i>	<i>Solieria</i>