

Features of the Family: Sarcomeniaceae:

- plants often have a gelatinous texture and **rapidly decay** after collecting
- they have a basic **filamentous construction**. Cells grow in a single line (algae are *uniserial*), although this may be visible only near plant tips, or by cutting a cross section to find a central filament microscopically
- **tip cells** protrude and are obvious. There are no delicate, branched hairs (trichoblasts) associated with tip cells as there are in the Family: Rhodomelaceae which some species closely resemble
- near plant tips, **4 cells** (pericentral cells), equal in length to each axial cell give filaments a characteristic **banded appearance**. This may later be obliterated by additional cells (cortical cells) or rhizoids running between or on top of existing cells
- in some plants, additional **pairs of flanking cells** are produced from each pericentral cell near branch tips
- fine, unbranched chains of cells (**monosiphonous filaments**) protruding at the surface of some species
- plants have **flask-shaped** mature female structures (cystocarps) or special lance-shaped branches (**stichidia**) containing tetrasporangia and both features are shared with the Rhodomelaceae. Tetrasporangia occur in **2 definite columns** and are not spirally arranged as in the Rhodomelaceae

SCALES

The coin used as a scale is 24 mm or almost 1" wide.

MICROSCOPE IMAGES

are usually blue stained

LOOK ALIKE ALGAE

Check in the "algal look-alikes" on page 6 to exclude other filamentous algae with cortication and bands of pericentral cells.

NAMES

are from Womersley 2003 as this continues to provide the most accessible and comprehensive descriptions of species. Recent name changes from the Web page *Algaebase* have been added.

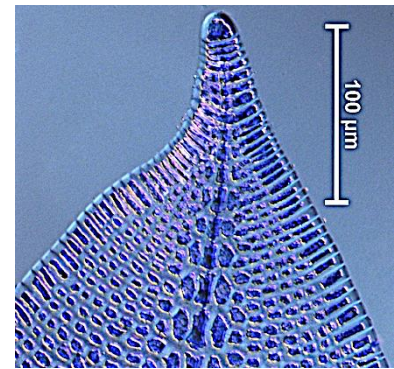
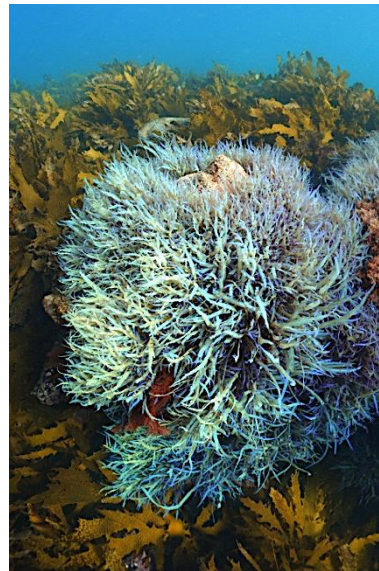
KEY

- 1a. plants grey-iridescent under water, rose-red and decomposing when collected, fronds **strap-like** with central mid-rib and flat, filmy flanges, to 30mm wide. Side branches arising between mid-rib and frond edge, narrow at base, reproductive structures on frond surfaces. Figs 1-4.

..... *Sarcomenia delesserioides*
also found in "**strap-like red algae**"

- 1b. plants completely filamentous/cylindrical. At plant tips, rings of cells equal in length to each filament cell (**pericentral cells**) give filaments a **banded appearance**. Some plant bases are thickened (corticated) with additional cells. Branching is forked or tufted, reproductive structures are within the filaments

..... 2.



Figs 1, 2: *Sarcomenia delesserioides*:
Left: plant fluorescing underwater, in a meadow of brown Ecklonia, Pandalowie Bay, S Australia
Image: F. McQueen
Above: blade tip showing filamentous construction



Fig. 3: *Sarcomenia delesserioides*
Insert: detail of origin of side branches



Fig. 4: *Sarcomenia delesserioides*
detached side frond with stalked mature female structures (cystocarps) on the surface

- 2a. main branches (axes) cylindrical or slightly compressed, additional, minute, hairlike, unbranched (**monosiphonous**) filaments, one cell wide occur on plant surfaces 3.
- 2b. main axes compressed; monosiphonous filaments **absent** 6.
- 3a. plants in a variety of habitats and may decompose rapidly, pairs of additional (flanking) cells, equal in length to pericentral cells occur 4.
- 3b. from calm waters, rare? or overlooked; grey-iridescent, rapidly decomposing on collection. At branch tips additional flanking cells **absent** except in special tetrasporangial branches (stichidia). Figs 5-8. *Malaconema roeanum*

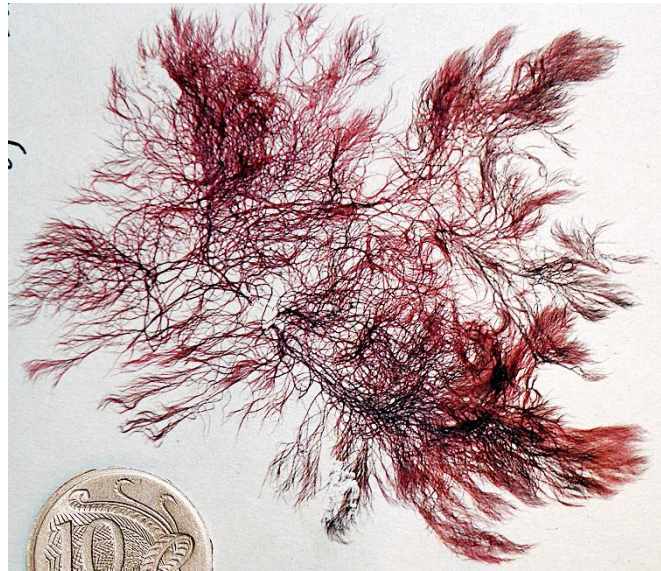
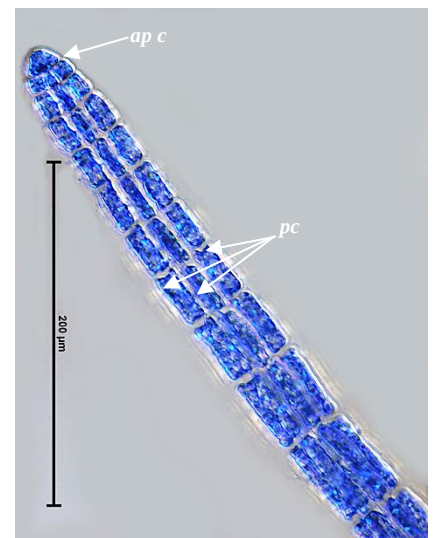
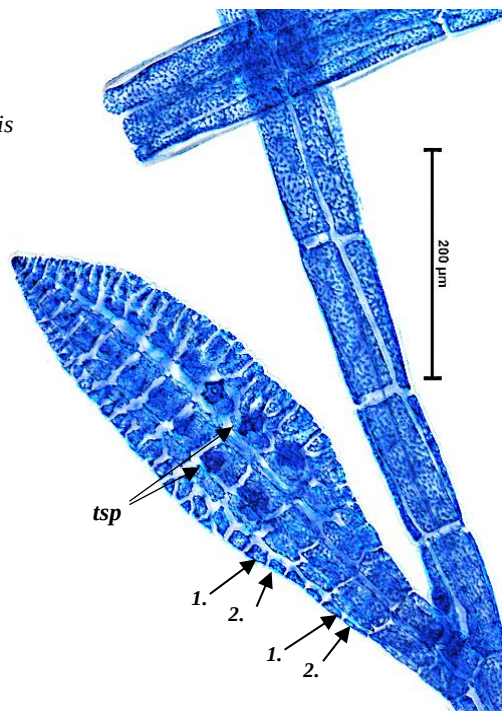
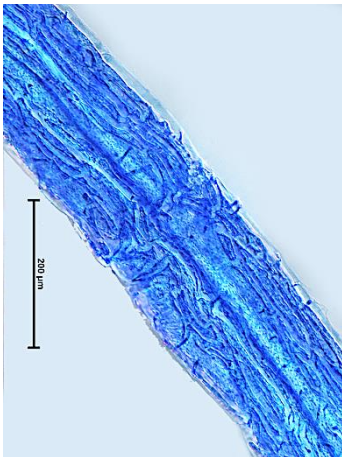


Fig. 5: *Malaconema roeanum*

- 4a. branch ends curved, additional hair-like (monosiphonous) filaments on their inner sides, in pairs, arising from the cells of the central filament. Possibly an introduced species (see also the fact sheet on this species). Figs 9-11. *Cottoniella fusiformis*
- 4b. branch ends relatively straight, additional monosiphonous filaments in 2 or 4 rows, arising from the upper of each pair of flanking cells 5

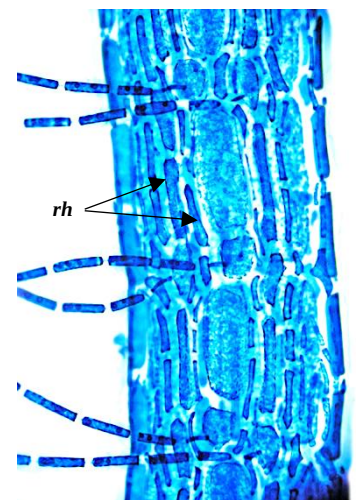


Figs 6-8 *Malaconema roeanum*:
far left: plant base, filament cells covered with rhizoids
centre: tetrasporangial branch (stichidium, *stich*). Young sporangia (*tsp*) in 2 columns; **pairs** of flanking cells (**1, 2**) formed from pericentral cells
above: filament tip, flanking cells **absent**

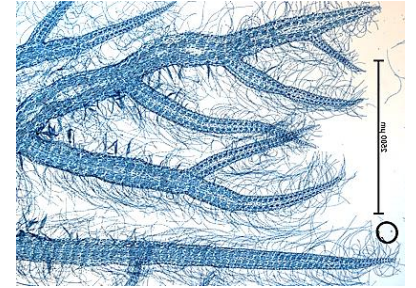
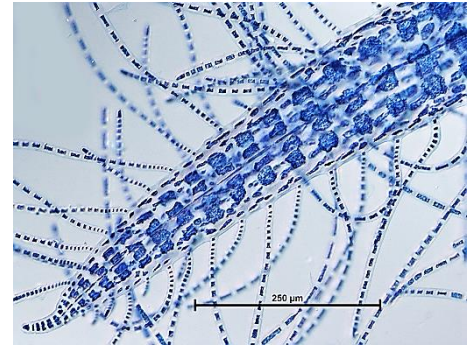


Figs 9-11 *Cottoniella fusiformis*

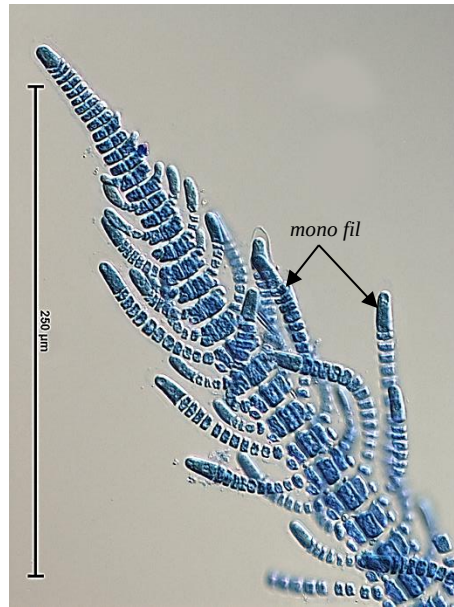
- left: whole plants
centre: curved axes near plant tips, additional filaments formed on one side
right: pairs of young additional filaments, axis with rhizoids (**rh**)



- 5a. corticated main branches (axes) soft, stout about 2mm wide, cylindrical, hairy with numerous monosiphonous filaments near axis tips, arising in 4 rows from outer cells. Figs 10-12
 *Sarcotrichia tenera*
- 5b. axes soft, thin, generally < 2mm wide, less hairy, monosiphonous filaments near axis tips in 2 rows from outer cells. Figs 13-15
 *Sarcotrichia dolichocystidea*
- 6a. plants about 15mm tall, not or only slightly wrapped with corticating filaments at the bases. Figs 18-21 (**next page**)
 *Platysiphonia delicata*
- 6b. plants 60-400mm tall, axes corticated basally.
 7.
- plants slender, branches wrapped with corticating filaments only near their bases.
 Figs 16, 17 *Platysiphonia mutabilis*
- 7b. plants more robust, main branches (axes) 1-2mm wide below; branches corticated close to the tips. Figs 22-25 (**next page**)
 *Platysiphonia victoriae*



Figs 10-12 *Sarcotrichia tenera*:
 Above, left: pressed plant
 Above, right: hairy axis tips
 Right: numerous monosiphonous filaments at tips



Figs 13-15 *Sarcotrichia dolichocystidea*

Left: whole plant

Middle: prominent tip cells; monosiphonous filaments (*mono fil*) from the upper cell of pairs of flanking cells, in 2 opposite rows

Right: two developing tetrasporangial structures (stichidia) and axis wrapped in corticating cells



Fig 16, 17 *Platysiphonia mutabilis*:
 slender branch tufts



Figs 18-21: *Platysiphonia delicata*

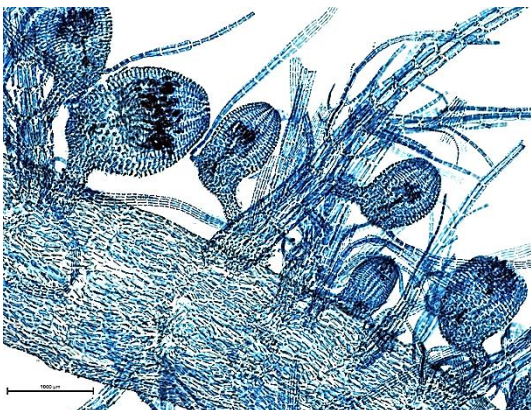
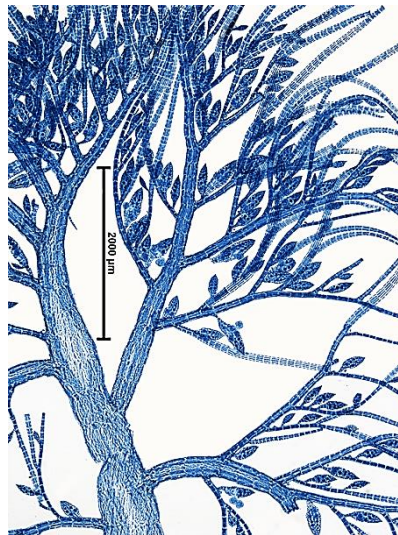
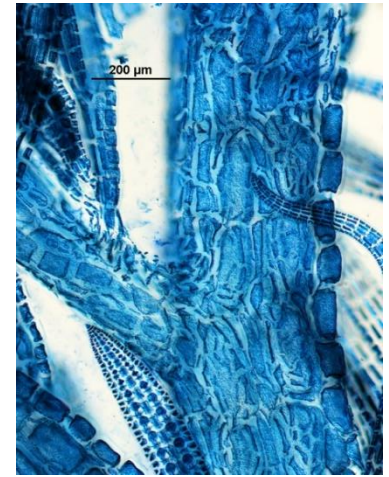
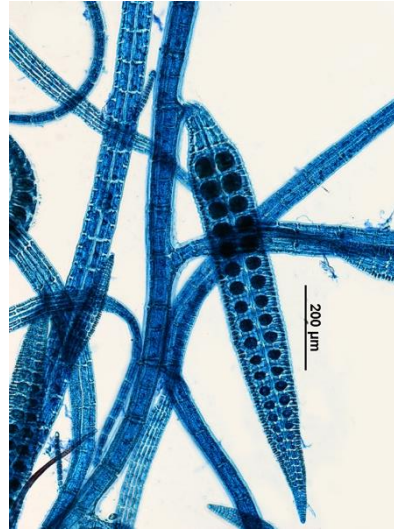
Above, left: plants on a piece of the brown alga, *Caulocystis*

Above, middle: darker coloured plants

Above, right: prominent tip cells, pairs of small flanking cells on only the two opposite pericentral cells, extending the axis sideways

Right: regular columns of tetrasporangia in a lance-shaped branch (stichidium); monosiphonous filaments absent

Far right: plant base with chains of elongate corticating cells running between pericentral cells



Figs.22-25 *Platysiphonia victoriae*

Above, left: whole plant

Above, middle: heavily corticated branch bases; numerous lance-shaped tetrasporangial structures (stichidia)

Above, right: detail of robust and divergent branch tufts

Left: bulbous mature female structures (cystocarps); heavily corticated branch bases

Look-alike algae – filamentous Rhodomelaceae

Filamentous members of this Family may superficially look like the Sarcomeniaceae. They have:-

- pericentral cells, giving filaments a banded appearance, although there are often more than 4 pericentral cells to each central cell
- flask or ball-shaped cystocarps
- tetrasporangia in specialized branches (stichidia), however, sporangia are in a single spiral column in the Rhodomelaceae
- if actively growing, the Rhodomelaceae have unique terminal, delicate, naked, branched filaments called trichoblasts, colourless in *Polysiphonia*

The Sarcomeniaceae differ in having:-

- a prominent tip cell
- pairs of flanking cells on pericentral cells
- some genera with hair-like monosiphonous filaments
- plants that decompose readily



Polysiphonia senticulosa: bands of pericentral cells; stichidia with a single, twisted column of sporangia



Polysiphonia decipiens: colourless trichoblasts at growing tips (shown here also with male structures)

REFERENCES

Algaebase. Listing the world's algae <https://www.algaebase.org/> accessed January 2025

Womersley, H.B.S. (2003) The Marine Benthic Algae of southern Australia Part IIID. ABRIS, & State Herbarium of South Australia

SPECIES ILLUSTRATED IN THE KEY

species	author/s	page/s
<i>Cottoniella fusiformis</i>	Børgesen	2
<i>Malaconema roeanum</i>	(Harvey) Womersley & Shepley	2
<i>Platysiphonia delicata</i>	(Clemente) Cremades	3, 4
<i>Platysiphonia mutabilis</i>	(Harvey) Womersley & Shepley	3
<i>Platysiphonia victoriae</i>	(Harvey ex J. Agardh) Womersley & Shepley	3, 4
<i>Sarcomenia delesserioides</i>	Sonder	1
<i>Sarcotrichia dolichocystidea</i>	(J. Agardh) Womersley & Shepley	3
<i>Sarcotrichia tenera</i>	(Harvey) Womersley & Shepley	3