RIBBON AND STRAP-LIKE BROWN ALGAE

Brown Algae: Classification is based on detailed reproductive features and life cycles. 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.

Scale: The coin used as a scale is 23 mm or almost 1" wide.

Artefacts: Microscope images of algae are usually blue stained, or have a black background.

This key looks only at plants that

- are relatively small, < 1m tall
- have branches ≈ 4-20 mm wide, and
- have a relatively soft texture

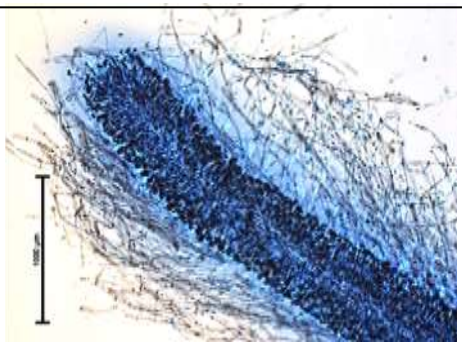
It ***excludes***

- very small, thread- or worm-like, slimy, tufted, turf and fouling brown algae. (see Figs 1, 2). These can be found in the "Turf and fouling algae: I-III"
- algae with stiff and wiry branches usually ending in prominent hair tufts (see Figs 3-5). These can be found in "
- wiry brown algae"
- large plants, with tough main branches (see Figs 7-10). These can be found in "large brown algae". There are also separate keys for *Cystophora* and *Sargassum*, two of the major genera in this category.
- hollow brown algae (see Fig. 6). These can be found in "hollow brown algae shaped like bubbles, balloons or thin tubes"

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

And.....

Because of their size, some of the species appear also in "large brown algae"



Figs 1, 2: *Polycerea*, slimy, worm-like, fouling brown alga - ***excluded*** from this key

Fig. 3: *Perithalia caudata*, wiry plant, - ***excluded*** from this key

Fig. 4: *Sporochnus*, wiry plant - ***excluded*** from this key

Fig. 5: *Sporochnus*, detail of hair tufts at tips - ***excluded*** from this key

Fig. 6: *Colpomenia*, bubble-shaped - ***excluded*** from this key

Figs 7-10: large brown algae: - ***excluded*** from this key. Far left: leafy base of *Sargassum*. Left: downward pointing stubs and side branches of *Cystophora*. Right: root-like base, flexible stalk and divided leafy blade of *Ecklonia*. Far right: *Hormosira*

Baldock, R.N. (2023) ribbon and strap-like brown algae. *Algae Revealed*. 7 pages. Adelaide

PICTURED KEY

1a. upper branches thin, often filmy, flat, generally regularly forked or fan-shaped, growing from a single tip cell or a row of microscopic cells. Internally, core cells are box-shaped. Examples in Figs 11-17.
Go to "Dictyotaceae"

1b. branches often thicker, tip cells ***indistinct*** or replaced by ***tufts of hairs***; core cells are elongate, thread-like, egg-shaped or many-sided; branching is forked, in 2 rows, or tufted ..... 2.

2a. branches thin, 1-2 (-4) mm wide, tips ending in ***hair-tufts***. Scattered, prominent hair-tufts occur on blade surfaces. Fig 18- 21.
.....*Cutleria multifida*
Family: Cutleriaceae

2b. branches thicker, > 2mm wide, tip hair-tufts ***absent***, fertile pustule-like spots present on blade surfaces ..... 3.

3a. plants attached to rock by an expanded pad or several runners; side blades relatively thick, ***leathery***, plants drying almost black ….....…. 4.

3b. plants attached to rock by a single disc or by a root-like holdfast, side blades ***thinner***, drying brown ……..... 5.

Fig. 11: *Dictyopteris muellerii*

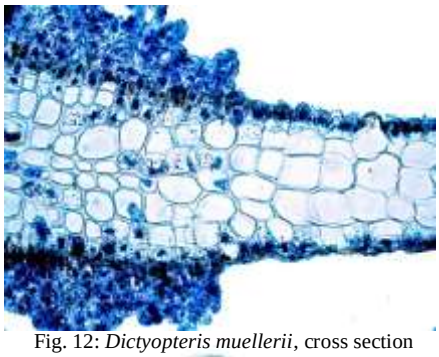


Fig. 12: *Dictyopteris muellerii*, cross section

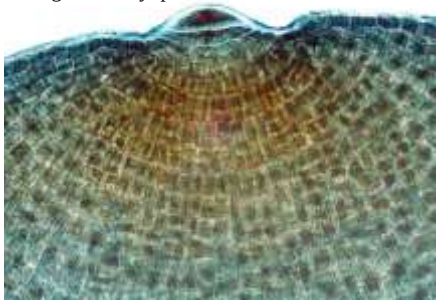


Fig. 13 : *Dilophus tener*, single large tip cell (now *Dictyota gunniana* in Algaebase)

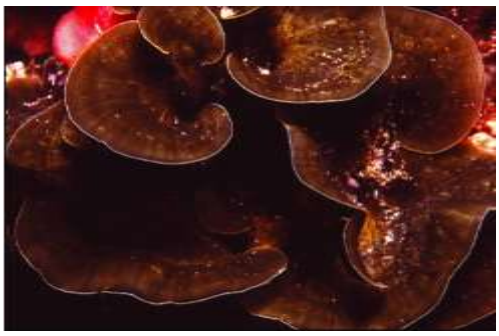


Fig. 14: *Lobophora variegata* Photo: D Muirhead

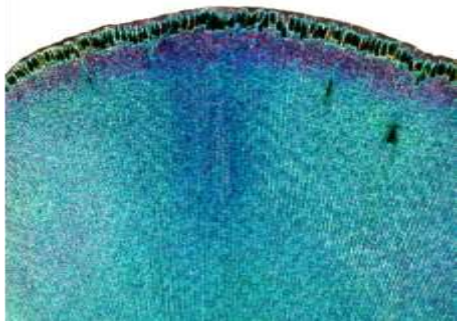


Fig. 15: *Zonaria turneriana*, fringe of actively dividing cells

Fig. 16: *Dictyota diemensis*

Fig. 17: *Dictyota diemensis*, cross section, core cells large, box-shaped

Figs 18-21: *Cutleria multifida*, (upper and lower left) blade tips at 2 magnifications; (below, centre) whole plant; (below, right) plant with broad fronds

4a. side blades 4-10 mm wide with ***coarse*** saw-tooth edges. Figs 22, 23. ..... *Platythalia quercifolia*
Family: Cystoseiraceae

4b. side blades 2-4 mm wide, edges ***entire*** (saw-teeth absent). Figs 24-26 ……. *Platythalia angustifolia*
Family: Cystoseiraceae

Fig. 22: *Platythalia quercifolia*

Fig. 23: *Platythalia quercifolia*, base and blade details

Fig. 24: *Platythalia angustifolia*, whole plants

Fig. 26: *Platythalia angustifolia*, blade details

5a. basal stalk is often ***short***; flat side-blades are ***without*** a conspicuous mid-rib, teeth ***absent***, tips often notched. Minute fertile "bumps" (conceptacles) spread across the whole of blade surfaces, except for the margins. Figs 27, 28.
..... *Carpoglossum confluens*
Family: Cystoseiraceae

5b. basal stalk is longer and produces, annually, thin side blades, often with a ***distinct*** midrib. Fertile "spots" occur in lines ***or*** are scattered along blades. ..... *Myriodesma* 6
Family: Cystoseiraceae.

6a. blades usually <1.5 mm wide, midribs ***obscure***. Fertile "spots" occur in broken lines on both sides of midribs. Figs 29, 30.
…….…..*Myriodesma leptophyllum*

6b. blades >2 mm wide, midribs prominent; fertile "spots" in 2 rows ***or*** scattered ..... 7.

7a. blades 2-4 mm wide ..... 8.
7b. blades >4 mm wide ..... 9.

8a. blade edges ***distinctly toothed***; lines of fertile "spots" run either side of midlines. Figs 31, 32.
..... *Myriodesma serrulatum*

8b. blade edges ***without*** teeth ***or irregularly*** toothed; fertile "spots" scattered. Figs 33-35 (next page).
..... *Myriodesma integrifolium*

Figs 27, 28: *Carpoglossum confluens* (Succulent seaweed) whole plant (left), branch tips (above) notched, with masses of fertile bumps spreading over most of the blade

Figs 29, 30: *Myriodesma leptophyllum*, whole plant (above), detail of single lines of fertile "spots" along midribs (right)

Fig. 31: *Myriodesma serrulatum*, long perennial base, undivided holdfast

Fig. 32: *Myriodesma serrulatum*, serrated blades, 2 lines of fertile "spots"

Fig. 33: *Myriodesma integrifolium*

Fig. 34: *Myriodesma integrifolium*, branching pattern

Fig. 35 *Myriodesma integrifolium*, detail of scattered fertile "spots"

9a. side blades thick, in 2 regular rows (pinnate), edges finely toothed; holdfast ***divided***, root-like. Figs 36, 37.
…… *Myriodesma harveyanum*

9b. side blades thin, branching ***irregular***; holdfast a simple disc. ..... 10.

10a. blades <10 mm wide, thin, light brown, edges finely toothed; a deep water species, apparently rare. Figs 38-40.
..... *Myriodesma tuberosum*

10b. blades >10 mm wide, thicker, dark brown, edges either coarsely toothed or entire (without teeth) ..... 11.

Figs 36, 37: *Myriodesma harveyanum*, whole plant (left), detail of root-like base (above)

Figs 38-40: *Myriodesma tuberosum*, whole plant (left); blade detail, edges finely toothed (centre); blades eroded to the prominent midrib near the plant base (right)

11a. blades up to 40 mm wide, edges finely ***toothed***. Figs 41-43.
……. *Myriodesma quercifolium* (oak-leaf myriodesma)

11b. blades up to 20 mm wide, edges entire (without teeth). Figs 44, 45.
……..… *Myriodesma calophyllum*

Figs 41-43: *Myriodesma quercifolium*, whole plant (far left); detail of toothed blade edges (left); cross section (above)

Figs 44, 45: *Myriodesma calophyllum*, whole plant (far left); detail of entire blade edges (left)

SPECIES ILLUSTRATED ABOVE

species	author/s	page
Carpoglossum confluens	(R. Brown) Kützing	4
Cutleria multifida	(Turner) Greville	2
Dictyopteris muelleri	(Sonder) Reinbold	2
Dictyota diemensis	Kützing	2
Dictyota gunniana	(J. Agardh) I. Hörnig, R Schnetter & Prud'homme	2
Dilophus tener	J. Agardh	2
Lobophora variegata	(Lamouroux) Womersley *ex* E. Oliviera	2
Myriodesma harveyanum	Nizamuddin & Womersley	4
Myriodesma integrifolium	Harvey	4
Myriodesma leptophyllum	J. Agardh	4
Myriodesma quercifolium	(Bory) J. Agardh	4
Myriodesma serrulatum	(Lamouroux) Endlicher	4
Myriodesma tuberosum	J. Agardh	4
Platythalia angustifolia	Sonder	3
Platythalia angustifolia	Sonder	3
Platythalia quercifolia	(R. Brown *ex* Turner) Sonder	3
Zonaria turneriana	J. Agardh	2