Techniques needed and shape

**Classification**

*Descriptive name*

**Features**

Phylum: Rhodophyta; Order: Gigartinales; Family: Halymeniaceae

- sponge weed

1. plants are red dark brown-red, 100-300mm tall, **tough**, irregularly forked, covered with small, rough **outgrowths** and a **sponge layer**, but denuded at the base
2. branches are **cylindrical** or slightly flattened and when fertile small, thin, naked **leaflets** protrude from the rough surface near the tips

**Occurrences**

- central W Australia coast to NSW and around Tasmania
- on rock from 4-18m deep

**Similar Species**

- unique because of the rough surface and sponge covering

**Description in the Benthic Flora** Part IIIA, pages 214-216

**Special Requirements**

1. cut a cross section of a main branch and view microscopically to find:
   - the core (medulla) of **dense** and **compact** threads
   - outer (cortex) layers of 4-7 cell rows of **spherical** cells; outermost are small, inner ones larger. Old branches may have rings of growth of vertical rows of cells
   - bright (refractive) spidery (ganglionic) cells are **absent**
2. if possible, cut a cross section of female plants to find
   - numerous ball-shaped structures (the intermediate-sized ones are auxiliary cell **ampullae**) in the inner cortex, with an obscure opening (ostiole)
   - each enveloped by numerous chains of small cells (involucre)
3. if possible, cut a cross section of the small, exposed, leaflets of sporangial plants to find patches (nemathecia) of **elongate** tetrasporangia divided in a cross (cruciate) pattern amongst the outer cortical cells

**Details of Anatomy**

1. an edge of a mature branch with dense, compact threads (medulla, **med**) and outer layer of inner, larger cells (inner cortex, **in co**) and outer, smaller compact, spherical cells (outer cortex, **o co**) (A26026 slide 11814)
2. an edge of a fertile sporangial leaflet, showing a core of more open threads (medulla, **med**) and less dense outer layer of spherical cells (cortex, **co**) with developing sporangia (**sp**) (A24872 slide 118110)
3. ampullae in a female leaflet (**amp**) (A22672 slide 118110).
4. ampulla detail with inner dense mass of sporangia (**sp**), dense enveloping threads (involucr, **inv**) and obscure opening (ostiole, **ost**) (A22672 slide 118110).
5. elongate tetrasporangia (**t sp**) in the cortex of a sporangial leaflet (A24872 slide 118110)

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Prepared August 2008

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Cross sections of *Thamnoclonium dichotomum* stained blue and viewed by interference microscopy to contrast cell details:

1. an edge of a mature branch with dense, compact threads (medulla, **med**) and outer layer of inner, larger cells (inner cortex, **in co**) and outer, smaller compact, spherical cells (outer cortex, **o co**) (A26026 slide 11814)
2. an edge of a fertile sporangial leaflet, showing a core of more open threads (medulla, **med**) and less dense outer layer of spherical cells (cortex, **co**) with developing sporangia (**t sp**) (A24872 slide 118110)
3. ampullae in a female leaflet (**amp**) (A22672 slide 118110).
4. ampulla detail with inner dense mass of sporangia (**sp**), dense enveloping threads (involucr, **inv**) and obscure opening (ostiole, **ost**) (A22672 slide 118110).
5. elongate tetrasporangia (**t sp**) in the cortex of a sporangial leaflet (A24872 slide 118110)
6-9. specimens of *Thamnoclonium dichotomum* (J Agardh) J Agardh at different magnifications:

6. 7. from 17-18m deep, East Point, St Francis I., S Australia, with detail of fertile leaflets (arrowed) (A69644)

8. detail of sterile branch tips with rough outgrowths covered in sponge from Encounter Bay, S Australia (A03865)

9. detail of fertile leaflets (arrowed), 3-4m deep, NE end of Boston I., Port Lincoln, S Australia (A 22529)

10. a section through a branch (A24872, slide 11811) stained blue and viewed with interference microscopy to highlight sponge (spo) with bright, needle-like spicules growing between algal outgrowths, algal core (medulla, med) of threads and outer layers (cortex, co) of spherical cells

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