SOUTHERN AUSTRALIAN SPECIES OF *PHACELOCARPUS*  
(“SAWTOOTH” ALGAE) AT A GLANCE  
Close up views of preserved material have been colourised; the coin scale is 24 mm or almost 1” across

**BASIC PARTS**  
(using *Phacelocarpus peperocarpos* as an example)

**BRANCH DETAILS**

- basal stalk – *stipe*
- branches ending in a single(*apical*) cell
- middle strut or axis of a branch – the *rachis*
- ultimate branches – *ramuli* – in two opposite rows
- reproductive organs in between *ramuli* (*axillary*)
- central thread visible for a short distance below tip

**MICROSCOPE VIEW OF A BRANCH TIP**

“Algae Revealed: *Phacelocarpus* at a glance”, R N Baldock, State Herbarium, S Australia, May 2013
SOUTHERN AUSTRALIAN SPECIES OF PHACELOCARPUS
(“SAWTOOTH” ALGAE) AT A GLANCE
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I. ultimate branches (ramuli) *shorter than or equal in length to the width of the axis (rachis)*

**Phacelocarpus alatus**
- Ultimate branches tooth-like, axis with raised mid-rib and prominent flanges, reproductive structures lying *between* ultimate branches
- Demoded specimen, mid-rib remaining prominent
- Axis mid-rib less prominent, flanges less prominent, reproductive structures lying *on edges* of ultimate branches; a deep water species

**Phacelocarpus complanatus**
- Ultimate branches (ramuli) shorter than or equal in length to the width of the axis (rachis)
- Ultimate branches tooth-like, axis with raised mid-rib and prominent flanges, reproductive structures lying *between* ultimate branches
- Demoded specimen, mid-rib remaining prominent
- Axis mid-rib less prominent, flanges less prominent, reproductive structures lying *on edges* of ultimate branches; a deep water species

II. ultimate branches (ramuli) *longer than the width of the axis (rachis)*

**Phacelocarpus sessilis**
- All branches cylindrical, ultimate branches *widely separated* (by 2-6x their width), reproductive structures practically *stalkless* on the *axis edges*

“All Algae Revealed: Phacelocarpus at a glance”, R N Baldock, State Herbarium, S Australia, May 2013

“Part II continued next page”

Species intergrade
“Algae Revealed: Phacelocarpus at a glance”, R N Baldock, State Herbarium, S Australia, May 2013
ALGAL LOOK-ALIKES
Some feathery red algae, only distantly related reproductively, superficially resemble Phacelocarpus.

1. Psilothallia
Family: Rhodomelaceae
similar to Phacelocarpus, this genus has
• pinnate, flat
• short side branches with reproductive organs on their edges.
It differs in having:
• rings of fine, branched, hair-like filaments (trichoblasts). Unfortunately, these may be lost with age
• a central filament surrounded by a ring of cells (pericentrals)

Psilothallia striata, cross section, central filament ringed by 8 oval cells (pericentrals) with filamentous branches (trichoblasts) extending beyond the outer layers

Psilothallia striata, filamentous branches (trichoblasts) intact

Psilothallia siliculosus, branches denuded of branched filaments (trichoblasts) and position of female structures (cystocarps) are similar to those of some Phacelocarpus spp

2. Dictyemenia tridens
Family: Rhodomelaceae
This has a flat axis and pinnate, spiky side branches. It has branched, filamentous trichoblasts at branch tips, but these are soon lost. Seen in cross section, a central filament is ringed by 2 opposite, large cells and 4 smaller ones

Dictyemenia tridens

Dictyemenia tridens, cross section, central filament (c fil), large side pericentral cells (lat pc) and smaller pericentrals (1-4)
3. **Rhodocallis elegans**  
**Family: Rhodocallidae**  
This has flat, pinnate branching, but branch edges are toothed, tips have a basic filamentous structure and exposed reproductive organs.

![Rhodocallis elegans](image1)

![Rhodocallis elegans, filamentous tips](image2)

![Rhodocallis elegans, exposed female reproductive organs (cystocarps, cys) at tips](image3)

4. **Diapse ptilota**  
**Family: Rhodocallidae**  
This has irregular flat, pinnate branches, but a basic filamentous structure, although this is not exposed to any extent as it is in *Rhodocallis*. Reproductive organs found at the edges of axes are associated with bunches of branched filaments.

![Diapse ptilota](image4)

![Diapse ptilota, branch tips with densely-staining central filaments showing through smaller surface cells](image5)

![Diapse ptilota, branch edge with sporangia amongst stalked bunches of filaments](image6)