This key is restricted to algae with a slimy/mucilaginous/"gooey" consistency.

Although this characteristic is pretty subjective and includes widely different and un-related groups it can get you a possible species or genus name. Unavoidably, as with many algae, microscope work will be needed to separate species.

PICTURED KEY

1a. a cross section shows large oval or equal-sided cells (parenchyma) in the core of branches. See Figs 1, 6.
   …………………………………… 2.

1b. a cross section or a tissue squash shows fine threads or filaments in the core of branches. See Fig. 2.
   …………………………………… 6.

2a. plants flat, leafy; major branches (axes) >10mm wide, fronds sparsely fringed with microscopic teeth; small cells appear in vague rings (rosettes) about larger, deeper cells in surface microscope views. Figs 3-7.
   …………… Gloiophyllis barkeriae
   Family: Cystocloniaceae (in part)

2b. axes flat or cylindrical, <10mm wide, teeth absent, although female reproductive structures (cystocarps) may have horns; rosettes absent.
   ……………………………………3.
   Family: Rhodymeniaceae (in part)

Fig. 3: Gloiophyllis barkeriae
Fig. 4: Gloiophyllis barkeriae
Fig. 5: Gloiophyllis barkeriae, detail of minute teeth along blade edges and dark female structures (cystocarps) embedded in the blades
Fig. 6: (left) Gloiophyllis barkeriae cross section, large oval cells in the frond core (medulla, med)
Fig. 7: (right) Gloiophyllis barkeriae, cells in surface view show patterns of small cells ringing larger lower ones (rosettes)
3a. branches generally flat, 4-10 mm wide, smaller side branches arise from branch edges .................. 4.

3b. branches cylindrical or slightly flanged, generally radially branched, 1-2 mm wide. Figs 8, 9.

.................. *Gloiocladia fructiculosa*

4a. branching mainly forked, small proliferations on margins and blade surfaces often occur. Figs 10-12.

.................. *Gloiocladia polycarpa*

4b. branching in 2 rows from branch edges (pinnate) ...................... 5.

5a. branching irregular, plants usually growing on sea-grasses. Figs 13, 14.

.................. *Gloiocladia australis* (as *G. australe* in the Benthic Flora)

5b. branching regular, branches narrowing near tips, plants usually on rocks. Figs 15, 16.

.................. *Gloiocladia halymenioides*

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Fig. 8: *Gloiocladia fructiculosa*  
Fig. 9: *Gloiocladia fructiculosa*, cylindrical branches, female reproductive organs (cystocarps) with 2-4 horns

Fig. 10: *Gloiocladia polycarpa*, main branches forked  
Fig. 11: *Gloiocladia polycarpa*, detail of small proliferations  
Fig. 12: *Gloiocladia polycarpa*, horned cystocarps at branch margins

Fig. 13: *Gloiocladia australis*, attached to a seagrass  
Fig. 14: *Gloiocladia australis* flat branches without proliferations, female reproductive organs (cystocarps) horned, at branch edges

Fig. 15: *Gloiocladia halymenioides*  
Fig. 16: *Gloiocladia halymenioides*, narrow branch endings, spiky cystocarps

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6a. branches cylindrical (terete, circular in cross section), or narrow-compressed (ovoid in cross section), \( \approx 4 \text{ mm wide.} \) See Fig. 17, but also step #14a for \textit{Gibbimithia womersleyi}, a species in which the branches flatten on drying

6b. algae consisting of flat blades (foliose) \( \geq 10 \text{ mm wide.} \) See Fig. 18.

7a. branches internally a core of loose microscopic threads, embedded in gel, ending in bunches or chains of outward-pointing cells, readily separated when making a tissue squash for microscopic examination. See Fig. 19.

7b. tissue squash shows a large central thread in the branch core, mixed with fine rhizoids and radiating threads in rings, ending in outward pointing bunches of small cells. See Fig. 20.

8a. outer layers (cortex) ending in relatively compact hemispherical cells; cores, initially of branched threads, may become hollow. Figs 21,22.

8b. outer layers loosely held together; branches not truly hollow, although the sparsity of core filaments can give that impression in cross sections

9a. no star-shaped (stellate) cells found in tissue squashes

9b. stellate cells found in tissue squashes see Fig. 23.
10a. plants thin, with long, worm-like main branches (axes). Figs 24, 25

Figure 24: Grateloupia intestinalis
Family: Halymeniaceae

Figure 25: Grateloupia intestinalis, tissue squash, star-shaped cells (st c)

10b. plants with broad, flat axes and feathery (pinnate) shorter side branches. Figs 26-30.

Figure 26: Halymenia floresia ssp. floresia

Figure 27: Halymenia floresia ssp. floresia, cross section

Figure 28: Halymenia floresia ssp. harveyana

Figure 29: Halymenia floresia ssp. harveyana, cross section

Figure 30: Halymenia floresia ssp. harveyana cross section
11a. plants “stringy”, branching sparsely and irregularly forked, usually from near the plant base, Figs 30, 31.

............... *Nemalion helminthoides*

*Helminthora lindaurei*

Family: Liagoraceae

11b. branching more dense, branches either regularly forked and wide or in 2 rows from the edge of axes.

Figs 32-37.

............... *Helminthora australis*

*Helminthocladia beaugleholei*,

*Helminthocladia dotyi*,

*Helminthocladia australis*

*Helminthocladia densa*

Family: Liagoraceae

WARNING: correct separation of genera depends on female reproductive features. See individual Fact Sheets in the Web.

See also step #20a of this key

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Fig. 30: *Nemalion helminthoides*

Fig. 31: *Helminthora lindaurei*

Fig. 32 *Helminthora australis*, from a region of moderate water movement

Fig. 33: *Helminthora australis*, from the intertidal exposed to rough water

Fig. 34: *Helminthocladia beaugleholei*

Fig. 35: *Helminthocladia dotyi*

Fig. 36: *Helminthocladia australis*

Fig. 37: *Helminthocladia densa*

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12a. axis 2-5 mm wide; large central thread in the branch core, outer layers (cortex) of loose branches hairs absent. Figs 7, 38-40. 

.................... Acrosymphyton taylori

12b. axis 1-2 mm wide; central thread small, wrapped in fine rhizoids; outer layers (cortex) compact; hairs present .......................... 13.

13a. short icicle-like hairs protrude from tightly packed outer layers. Figs 20, 41-43. 

.................... Dasyphloea insignis

13b. extremely fine, long, single-celled hairs with swollen tips protrude from loosely packed outer layers. Figs 44-46. 

.................... Dudresnaya australis

14a. branches cylindrical but drying flat, 2-30 mm wide, branching mainly from a gristly basal knob up to 10 mm across; tissue squash shows a wide core of fine threads and chains of small cells in outer layers. Figs 47-49.

\[ Gibbista womersleyi \]

\[ Family: Dumontiaceae \]

14b. plants unbranched, or branching forked or arising from edges of a flat axis; basal knob absent

\[................................. 15. \]

15a. blades large, broad, flat, >50 mm wide ........................................ 16.

15b. blades narrower ......................... 20.

16a. plants leaf- or blade-like, blades unbranched, or with small marginal lobes or blades arising mainly from the base of the plant, often drying gristly (cartilaginous)

\[................................. 17. \]

(found also in “Pictured Key to some common broad bladed red algae of southern Australia”)

16b. plants strap-like, forked once or twice, blade edges crinkled, surfaces mottled or marked with faint “rivulets”. Figs 50, 51.

\[................................. Tsengia laingii \]

\[Family: Nemastomataceae \]
17a. plants large, oval-shaped, undivided, arising from a small cylindrical stalk, drying gristly; female structures (cystocarps) embedded in the blade. Figs 52, 53.

Grateloupia ovata
Family: Halymeniaceae

17b. plants branching usually only from the short base

Family: Nemastomataceae (in part)

18a. small lobes at blade edges, blade surface with "rivulet" markings. Figs 54, 55.

Platoma foliosum

18b. small lobes absent, although the blade may be torn into large pieces when old; rivulet markings absent or present

Family: Nemastomataceae (in part)

19a. rivulet markings on surface absent; minute gland cells usually but not always present in the outer cell layer (cortex); female structures sunken, opening by a pore. Figs 56-58.

Schizymenia dubyi

19b. rivulet markings present; gland cells absent, although the blade may be torn into large pieces when old; rivulet markings absent or present

Platoma australicum

Fig. 52: Grateloupia ovata, close-up of the small basal stalk

Fig. 53: Grateloupia ovata

Fig. 54: Platoma foliosum, rivulet markings on the blade surface

Fig. 55: Platoma foliosum

Fig. 56: Schizymenia dubyi

Fig. 57: Schizymenia dubyi, plant base with short stalk, surface mottling absent

Fig. 58: Schizymenia dubyi, cross section, bright gland cells (gl c), cystocarps (cys) with sunken pores

Fig. 59: Platoma australicum

Fig. 60: Platoma australicum, surface mottled, with rivulets

Fig. 61: Platoma australicum, cross section, (cys) sunken, pore absent
20a. main branches (axes) regularly forked, narrow 3-5 mm wide. Figs 67-69.

.......................... Tsengia feredayae
Family: Nemastomataceae

20b. axes wider; short side branches arise at their edges ....................... 21.

21a. spidery (ganglionic) cells *present* in tissue squashes; plants regularly branched in 2 opposite rows (*pinnate*) throughout. Figs 62, 63.

.......................... Gelinaria ulvoidea
Family: Halymeniaceae

21b. ganglionic cells *absent*, main branches (axes) *forked*, with numerous short side branches 2-2 mm wide at edges, giving the plant a fluffy appearance. Figs 64-66.

.......................... Tsengia comosa
Family: Nemastomataceae

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20a. main branches (axes) regularly forked, narrow 3-5 mm wide. Figs 67-69.

.......................... Tsengia feredayae
Family: Nemastomataceae

20b. axes wider; short side branches arise at their edges ....................... 21.

21a. spidery (ganglionic) cells *present* in tissue squashes; plants regularly branched in 2 opposite rows (*pinnate*) throughout. Figs 62, 63.

.......................... Gelinaria ulvoidea
Family: Halymeniaceae

21b. ganglionic cells *absent*, main branches (axes) *forked*, with numerous short side branches 2-2 mm wide at edges, giving the plant a fluffy appearance. Figs 64-66.

.......................... Tsengia comosa
Family: Nemastomataceae