

Section 6 – ‘Pottiales’; leaves ovate-lanceolate to narrowly lanceolate, *mid-leaf cells isodiametric to very shortly elongate*, often papillose, sometimes strongly (so leaves usually matt); not sinuose. Mainly small plants forming tufts or mats, sometimes cushions. Sometimes with hair-points.

1. a. Leaves mostly lingulate or spatulate, rarely oblong-lanceolate; upper leaf cells with large ‘hobnail boot’ papillae; basal cells hyaline, with thick transverse walls and thin longitudinal walls; calyptra large, ‘extinguisher-shaped’, completely enveloping capsule until maturity.....2.
- b. Leaves various, often narrowly lanceolate; upper leaf cells papillose or not, but papillae small and simple; basal cells differentiated or not, but usually with uniform wall thickening; calyptra smaller, not enveloping whole capsule.....6.

2. a. Plants large, with leaves up to 5 mm long; nerve ending in or below apex, papillose on dorsal side above; filiform axillary propagules often present; sporophytes usually absent; common.....*Encalypta streptocarpa*
- b. Plants smaller, with leaves up to 3.5 mm long; nerve usually percurrent to longly excurrent, or if ending below apex then ± smooth on dorsal side; filiform propagules lacking; sporophytes usually present; less common.....3.

3. a. Leaves lanceolate, tapering from middle to apex; nerve often excurrent in hyaline hairpoint; mid-leaf cells 8-10 µm wide.....*E. alpina*
- b. Leaves lingulate or spatulate; nerve excurrent in hairpoint or not; mid-leaf cells 10-20 µm wide.....4.

4. a. Nerve excurrent, often in a long hyaline point, dorsally papillose above; capsules longitudinally ribbed when moist.....*E. rhaptocarpa*¹
- b. Nerve ending below apex to excurrent, but rarely forming a long hyaline point, dorsally ± smooth above; capsules smooth when moist.....5.

5. a. Calyptra ciliate at base, smooth towards apex.....*E. ciliata*
- b. Calyptra entire (or eroded) at base, papillose towards apex.....*E. vulgaris*

6. a. Small plants on soil, shoots <1 cm tall (usually much less), with spherical or nearly spherical cleistocarpous capsules which are immersed or barely exerted on very short setae up to 1.5 mm (capsules usually present)...7.
- b. Usually larger plants (1-10 cm tall) on various substrates; capsules exerted on a longer seta; if plants smaller, then capsules not cleistocarpous² (capsules present or not).....14.

7. a. Leaf margin toothed, at least near apex.....8.
- b. Leaf margin entire.....11.

8. a. Leaves nerved.....9.

¹ The rare *E. pilifera* may also key out here; its capsule is less strongly ribbed and lacks a peristome.

² *Tortula protobryoides* is cleistocarpous but has an elongate capsule on a longer seta, so keys out here.

- b. Leaves nerveless.....10.
9. a. Leaves narrowly lanceolate; capsules obliquely pointed at apex.....*Ephemerum recurvifolium*³
 b. Leaves ovate; capsules with tiny symmetrical apiculus at apex.....*Acaulon muticum*⁴
10. a. Marginal teeth of leaves straight; spores coarsely papillose, without hyaline membrane.....*E. stoloniferum* ('*E. serratum*')
 b. Marginal teeth of leaves often recurved; spores finely papillose, usually surrounded by hyaline membrane.....*E. serratum* (*E. minutissimum*)
11. a. Capsules immersed.....12.
 b. Capsules exerted on evident seta (up to 1.5 mm long).....13.
12. a. Plants relatively large (1-5 mm high), green; perichaetial leaves enlarged....*Tortula acaulon*
 b. Plants very small (<1.2 mm high), brownish-reddish; perichaetial leaves not noticeably enlarged.....*Microbryum floerkeanum*
13. a. Seta straight, capsule subspherical.....*Microbryum rectum*
 b. Seta curved downward, capsule ovoid.....*Microbryum curvicolium*
14. a. Leaves with silvery-white hair-points, contrasting with green leaves.....15.
 b. Leaves with contrasting hair-points lacking.....23.
15. a. Spherical or ovoid gemmae present on adaxial surface of nerve; leaf margin incurved above.....*Syntrichia papillosa*
 b. Spherical or ovoid gemmae lacking; leaf margin plane to recurved.....16.
16. a. Plants small, shoots usually < 1 cm high; hair-point smooth17.
 b. Plants large, shoots usually ; hair-point at least obscurely toothed, often spinose19.
17. a. 2-4 chlorophyllous lamellae on adaxial side of nerve; leaf margins \pm plane; rare southern plant of calcareous soil and rock.....*Pterygoneurum ovatum*
 b. Lamellae absent; leaf margins recurved; common in various habitats.....18.
18. a. Leaf margins recurved almost from base to apex; capsule longly cylindrical on a seta 1-2 cm long; very common plant on walls etc.....*Tortula muralis*⁵
 b. Leaf margins usually recurved to *ca.* $\frac{3}{4}$ way up leaf; capsule ovate-oblong on a seta *ca.* 2-4 mm long; scarce southern plant of coastal soils.....*T. viridifolia*⁶

³ Some very rare species of *Ephemerum* may also key out here.

⁴ The very rare *A. triquetrum* has triangular shoots and a curved seta.

⁵ Beware forms of this very common species without a hair-point! Also the rare southern species *T. canescens* will key out here, distinguished by its peristome teeth being united in a tube for 1/3-1/2 their length.

⁶ Some other rare species of *Tortula* have an excurrent nerve that might be interpreted as a hyaline hair-point.

19. a. Leaves not 'waisted'; margins recurved from base to apex.....20.
 b. Leaves 'waisted'; margins plane to recurved to $\frac{3}{4}$ way up leaf.....21.
20. a. Leaf apex acute, tapering gradually into hair-point.....*Syntrichia ruraliformis*
 b. Leaf apex obtuse or rounded, the hair-point abruptly excurrent*S. ruralis*
21. a. Hair-point sparsely toothed or nearly smooth; gemmae resembling minute leaves
 sometimes present..... *Syntrichia laevipila*
 b. Hair-point strongly toothed.....22.
22. a. Plants small (*ca.* 1-2 cm high); basal leaf cells 20-40 μm long; nerve in TS with 1-2 rows of
 stereids abaxially.....*Syntrichia virescens*
 b. Plants larger (1-4 cm high); basal leaf cells 50-80 μm long; nerve in TS with many rows of
 stereids.....*S. montana*⁷
23. a. Ovoid or discoid gemmae present on specialised structures at shoot apices.....24.
 b. Gemmae sometimes present, but not on specialised structures at shoot apices.....25.
24. a. Gemmae ovoid, in clusters on long terminal stalks like
 drumsticks.....*Aulacomnium androgynum*⁸
 b. Gemmae discoid, in a terminal cup formed from enlarged leaves forming a
 'nest'*Tetraphis pellucida*
25. a. Leaves ovate, obovate or lingulate, \pm narrowed at base, widest near or above middle,
 contracted \pm abruptly to broad, blunt or sometimes acute apex.....26.
 b. Leaves \pm narrowly triangular to linear-lanceolate, not narrowed at base, widest at or very
 near base, tapering gradually to acute or sometimes obtuse apex.....57.
26. a. Leaves coarsely and irregularly toothed, at least above.....27.
 b. Leaves entire or papillose-crenulate.....32.
27. a. Leaf cells smooth or slightly mamilllose; upland rock crevices.....28.
 b. Leaf cells distinctly mamilllose or papillose; damp or peaty soil, or gravel (if cells only
 faintly papillose, then plant halophytic and coastal).....29.
28. a. Leaves lingulate, strongly toothed, lamina 9-14 cells wide on either side of nerve in middle
 of leaf; upper leaf cells 12-20 μm wide.....*Rhabdoweisia crenulata*
 b. Leaves narrowly lingulate, weakly toothed, lamina 6-12 cells wide on either side of nerve
 in middle of leaf; upper leaf cells 8-12(-14) μm wide.....*Rhabdoweisia crispata*

⁷ The rare *S. princeps* is synoicous and has leaf cells *ca.* 12-20 μm wide (dioicous and *ca.* 8-10 μm wide in *T. montana*).

⁸ *A. palustre*, which occasionally produces similar gemmae stalks, may also key out here; it is a larger plant with almost entire leaves (irregularly toothed in *A. androgynum*), growing in wet places (*A. androgynum* grows mainly on wood or rocks).

29. a. Upper leaf cells 10-22 μm wide.....30.
 b. Upper leaf cells 8-10 μm wide.....31.
30. a. Upper leaf cells rounded-hexagonal, strongly papillose; peaty soils, often under
 bracken.....*Leptodontium flexifolium*⁹
 b. Upper leaf cells \pm quadrate, faintly papillose; halophytic/coastal
 plant.....*Hennediella heimii*¹⁰
31. a. Leaves > 4 x longer than wide, finely toothed; capsules incline.....*Dichodontium pellucidum*
 b. Leaves < 4 x longer than wide; irregularly and coarsely toothed; capsules
 erect.....*D. flavescens*
32. a. Leaves with distinct border, either of elongate thick-walled cells, or multistratose.....33.
 b. Leaves without border (but margins often recurved or incurved).....36.
33. a. Leaf margins with a border of elongate thick-walled cells; not aquatic.....34.
 b. Leaf margins strongly thickened with a border of multistratose cells; \pm aquatic.....35.
34. a. Leaves 3.5-7 mm long; peristome united in a tube in lower 2/3.....*Tortula subulata*
 b. Leaves < 2 mm long; peristome free to base.....*Tortula marginata*
35. a. Large, trailing, well-branched plants up to 12 cm long; leaf cells faintly papillose; capsule
 immersed.....*Cinclidotus fontinaloides*¹¹
 b. Smaller, sparsely branched plants up to 5 cm high; leaf cells strongly papillose; capsule
 exerted on seta 8 mm or more long.....*Dialytrichia mucronata*
36. a. Leaves broadly spatulate, up to *ca.* 3 mm long; mainly on silt-encrusted trees, walls and
 rocks by rivers.....*Syntrichia latifolia*
 b. Leaves obovate to ovate-lanceolate, up to *ca.* 2 mm long; on soil.....37.
37. a. Leaf margins recurved to revolute.....38.
 b. Leaf margins plane or incurved.....46.
38. a. Leaf cells strongly papillose; leaves oblong-lanceolate to lingulate; seta >5 mm long,
 capsule long and narrow.....39.
 b. Leaf cells smooth to faintly papillose; if more strongly papillose, then leaves ovate-
 lanceolate and seta 1-4 mm long; capsule short and oval.....41.

⁹ The rare oceanic species *Chionoloma recurvifolium* will key out here: it is a larger, laxer plant, typically growing by streams and waterfalls, with shoots up to 10 cm long; the leaves are bordered with a distinct pale zone of smooth cells contrasting with the darker papillose cells elsewhere.

¹⁰ The rare introduced species *H. microphylla* and *H. stanfordensis* have strongly papillose cells, with a distinct margin of pale, smooth elongate cells.

¹¹ *C. riparius*, restricted to the banks of the R. Teme, has capsules slightly exerted on a seta 3-6 mm long.

39. a. Leaves strongly and broadly revolute ('rams-horn' shape in TS of leaf).....*Pseudocrossidium revolutum*
 b. Leaves recurved at margins only.....40.
40. a. Nerve excurrent; leaf margins recurved almost to apex.....*Barbula unguiculata*
 b. Nerve ending below apex; leaf margins recurved below.....*Streblotrichum convolutum*¹²
41. a. Plants very small, 1-2 mm high, with leaves up to *ca.* 1.5 mm long; setae 1-4 mm long; leaf cells papillose.....42.
 b. Plants larger, up to 15 mm high, with leaves up to *ca.* 2 mm long; setae 2-6 mm long; leaf cells smooth to faintly papillose.....43.
42. a. Spores coarsely warty.....*Microbryum starckeanum*
 b. Spores densely papillose to spiny.....*M. davallianum*
43. a. Peristome teeth well developed.....44.
 b. Peristome teeth rudimentary or absent.....45.
44. a. Leaf margins strongly recurved \pm from base to apex, nerve thickened in upper part of leaves.....*Tortula atrovirens*
 b. Leaf margins recurved below; nerve not thickened in upper part, but with inflated cells over adaxial surface.....*T. lindbergii* (*T. lanceola*)
45. a. Capsule cleistocarpous, held just above leaves on seta 2-3 mm long.....*Tortula protobryoides*
 b. Capsule dehiscent, held well above leaves on seta 4-7 mm long.....*T. caucasica* (*T. modica*)¹³
46. a. Very thick-textured plants (like miniature *Polytrichums*!), multistratose or with outgrowths on adaxial surface; margins plane or \pm strongly incurved47.
 b. Thin-textured plants; leaves unistratose, and no outgrowths on adaxial leaf surface; leaf margins \pm plane50.
47. a. Leaves multistratose but without outgrowths, narrowly lingulate, with plane margins; capsule disproportionately large ('grain of wheat'!), oblique and \pm immersed among ciliate perichaetial leaves.....*Diphyscium foliosum*
 b. Leaves with many green outgrowths on adaxial surface, lingulate to orbicular, with \pm strongly incurved margins; capsule normal sized and narrowly ellipsoid, \pm symmetrical and longly exserted.....48.

¹² *S. convolutum* var. *commutatum* is larger, with undulate leaf margins.

¹³ The rare southern species *T. wilsonii* may also key out here, with smaller and more papillose leaf cells (13-17 μ m v. 17-22 μ m) and smaller spores (19-26 μ m v. 27-34 μ m).

48. a. Marginal cells near leaf base elongate, hyaline, thin-walled, forming distinct border.....*Aloina rigida*¹⁴
 b. Marginal cells near leaf base quadrate or rectangular, if hyaline then thick-walled, not forming distinct border.....49.
49. a. Basal membrane of peristome not projecting above mouth of capsule; spores 18-25 μm*Aloina aloides*
 b. Basal membrane of peristome projecting above mouth of capsule; spores 12-16 μm*Aloina ambigua*
50. a. Small plants, with leaves < 1mm long; if longer, then leaves ovate to ovate-lanceolate...51.
 b. Larger plants with leaves >1 mm long; if shorter, then leaves \pm lingulate/ligulate.....53.
51. a. Very small, with obtuse leaves ca. 0.25 mm long; leaf cells opaque with papillae.....*Gymnostomum viridulum*¹⁵
 b. Small, with acute leaves ca. 0.75-2 mm long; leaf cells smooth or weakly papillose.....52.
52. a. Leaf cells papillose; perichaetial leaves larger and wider than vegetative leaves, concave; capsules widest in middle; scarce.....*Pottiopsis caespitosa*
 b. Leaf cells smooth; perichaetial leaves not differentiated from vegetative leaves; capsules widest at mouth; common.....*Tortula truncata*
53. a. Hyaline basal cells ascending up margin of leaf, producing a \pm abrupt V-shaped transition from basal to upper cells.....54.
 b. Hyaline basal cells not ascending up leaf margin, transition not abrupt or V-shaped.....55.
54. a. Leaves fragile, upper part of leaves usually broken off; transition between lower hyaline cells and upper green cells gradual.....*Tortella nitida*
 b. Leaves not fragile, leaves usually intact; transition between lower hyaline cells and upper green cells very abrupt.....*Tortella flavovirens*¹⁶
55. a. Leaf apices cucullate.....*Trichostomum crispulum*
 b. Leaf apices plane.....56.
56. a. Nerve excurrent in stout mucro; margins finely crenulate above.....*Trichostomum brachydontium*¹⁷
 b. Nerve ending in or below apex; margins crenulate, sinuose, notched or obscurely toothed above.....*Chionoloma cylindrotheca*

¹⁴ The rarer *A. brevirostris* has shorter leaves (2-3.5 x longer than wide v. 4-6 x longer than wide) and larger spores (18-22 μm v. 10-16 μm).

¹⁵ Some small, broad-leaved forms of *G. calcareum* or *Gyroweisia tenuis* may also key out here; see below; both have longer, more tapering leaves than *G. viridulum*.

¹⁶ The rarer *T. inclinata* may also key out here; it has consistently smooth elongate cells on the adaxial side of the nerve (isodiametric and papillose in *T. flavovirens*).

¹⁷ Some rarer species of *Weissia* (see below) with unusually broad leaves may key out here, but they have incurved, rather than plane, leaf margins.

57. a. Leaf margins recurved.....58.
 b. Leaf margins plane or incurved.....83.
58. a. Leaf cells completely smooth, pellucid.....59.
 b. Leaf cells papillose, mamilllose or striate, often opaque.....63.
59. a. Leaves recurved almost from base to apex; plants forming scattered patches or mats, usually on ground; very common.....*Ceratodon purpureus*¹⁸
 b. Leaves recurved below or in middle; plants usually forming ± neat cushions on rocks or trees.....60.
60. a. Leaf cells 11-22 µm wide; capsules striate.....*Cynodontium jenneri*
 b. Leaf cells 6-14 µm wide; capsules smooth.....61.
61. a. Leaves ovate-lanceolate to broadly ovate, imbricate and not crisped when dry.....*Didymodon luridus*¹⁹
 b. Leaves lanceolate to narrowly lanceolate, strongly crisped when dry.....62.
62. a. Large plants with leaves *ca.* 4 mm long, coarsely and distantly toothed above; usually on rocks.....*Ptychomitrium polyphyllum*
 b. Small plants with leaves 1-3 mm long, entire; usually on trees but sometimes also on rocks.....*Dicranoweisia cirrata*
63. a. Large pale green plants with orange-brown tomentum on stems; leaf cells mamilllose, pellucid; wet places, usually with *Sphagnum*.....*Aulacomnium palustre*
 b. Small mid to dark green plants lacking tomentum; leaf cells usually papillose, often opaque; usually on rocks, walls or relatively dry soils.....63.
64. a. Leaves strongly and broadly revolute ('rams-horn' shape in TS of leaf).....65.
 b. Leaves recurved at margins only.....66.
65. a. Leaves acuminate; mid-leaf cells 10-14 µm wide; scattered patches on paths etc.....*Pseudocrossidium hornschuchianum*
 b. Leaves obtuse and apiculate; mid-leaf cells 8-10 µm wide; cushions on rocks.....*Pseudocrossidium revolutum*
66. a. Leaf margins toothed, crenulate-denticulate or irregularly notched towards apex.....67.
 b. Leaf margins without teeth or notches near apex (but often regularly and minutely papillose-crenulate).....69.

¹⁸ The very rare *Didymodon cordatus* may also key out here; it has numerous axillary gemmae, smaller, rounder leaf cells, and is restricted to a single site in Devon.

¹⁹ The very rare *D. acutus* may also key out here; it has narrower leaves with a sharply acute leaf apex.

67. a. Leaves fragile, broken, notched and sinuose above; capsules
unknown.....*Didymodon sinuosus*
b. Leaves not fragile or notched; capsules common.....68.
68. a. Leaves entire except for 2-3 conspicuous teeth at apex; rusty-red tints often present;
capsules narrowly cylindrical; tufts or patches among rocks or on
soil.....*Bryoerythrophyllum recurvirostrum*
b. Leaves crenulate-denticulate in upper part of leaf; entirely green; capsules ovoid; neat
cushions in rock crevices.....*Cynodontium bruntonii*
69. a. Often forming deep, dense and often massive cushions on \pm base-rich rocks in upland or
coastal areas; leaves often very narrow, not or hardly expanded at base; upper leaf cells
sometimes elongate; capsules sometimes only just emergent above leaves.....70.
b. Forming smaller, looser cushions or tufts on rocks and walls; leaves usually \pm triangular,
expanded at base; upper leaf cells always \pm isodiametric; capsules, if present, exerted on a
long seta.....72.
70. a. Leaves lanceolate to linear-lanceolate; upper leaf cells
elongate.....*Hymenostylium recurvirostrum*
b. Leaves ligulate to linear; upper leaf cells isodiametric.....71.
71. a. Basal cells of leaves thin-walled; upper cells strongly papillose with round papillae;
capsules common, only just emergent above leaves.....*Amphidium lapponicum*
b. Basal cells of leaves thick-walled; upper cells faintly striate with oval papillae; capsules
rare.....*A. mougeotii*
72. a. Leaves with distinct and well-marked zone of hyaline cells at base.....73.
b. Leaves lacking distinct hyaline basal zone (basal cells often longer and paler than upper
cells but not forming a distinct zone).....74.
73. a. Plant tinged bright red almost throughout.....*Bryoerythrophyllum ferruginascens*
b. Reddish tinge absent; plants pale green.....*Didymodon umbrosus*²⁰
74. a. Sausage-shaped rhizoidal tubers present; adaxial nerve cells somewhat elongate; small
plants (< 6 mm high, leaves < 0.7 mm long) of arable fields.....*D. tomaculosus*
b. Rhizoidal tubers absent; adaxial nerve cells various; larger plants (up to 3 mm high, leaves
up to 7 mm long) of various habitats.....75.
75. a. Adaxial nerve cells in upper half of leaf \pm isodiametric or slightly elongate.....76.
b. Adaxial nerve cells in upper half of leaf very elongate.....80.

²⁰ *D. australasiae*, recently recorded in Britain, has less strongly differentiated basal marginal cells and no hyalodermis; the very rare *D. glaucus* may also key out here; it has undifferentiated basal marginal cells and unistratose leaf margins (bistratose in *D. umbrosus* and *D. australasiae*).

76. a. Leaf margins bistratose, at least above.....77.
 b. Leaf margins unistratose.....78.
77. a. Leaf tapering to stout subulate apex, blunt at extreme tip; globose gemmae (looking like miniature Brussels sprouts!) abundant in leaf axils.....*Didymodon rigidulus*
 b. Leaf apex acute to obtuse or cucullate; axillary gemmae absent.....*Didymodon nicholsonii*
78. a. Leaves flexuose to crisped when dry, often with 'gyre twist' when viewed from above when moist; leaf margin not recurved in upper half of leaf; adaxial nerve cells in upper half of leaf somewhat elongate.....*Didymodon insulanus*
 b. Leaves appressed to slightly twisted when dry, without 'gyre twist' when moist; leaf margin usually recurved from base to over half way; adaxial nerve cells in upper half of leaf isodiametric.....79.
79. a. Leaf apex grooved adaxially; nerve TS without ventral stereids.....*D. vinealis*
 b. Leaf apex flat adaxially; nerve TS with ventral stereids.....*D. icmadophilus*
80. a. Leaves oblong-lanceolate, usually with obtuse or rounded apex.....*D. tophaceus*
 b. Leaves ovate to ovate-lanceolate, tapering to acute or acuminate apex.....81.
81. a. Leaves strongly recurved to squarrose when moist.....*D. ferrugineus*²¹
 b. Leaves erecto-patent to spreading when moist.....82.
82. a. Leaf margins recurved in upper half; peristome twisted; usually small plants (upper leaves 1.2-2.4 mm long) in various habitats.....*D. fallax*
 b. Leaf margins plane in the upper half; peristome straight; usually larger plants (upper leaves 1.8-4 mm long) among stones by upland streams.....*D. spadiceus*
83. a. Leaf cells completely smooth, pellucid.....84.
 b. Leaf cells papillose, mamilllose or striate, often opaque.....88.
84. a. Leaves broad with obtuse apex, squarrose from sheathing base; strikingly bright pale green plants of flushes, marshes, springs and riversides.....*Dichodontium palustre*
 b. Leaves narrow with usually acute apex, flexuose-spreading or erecto-patent, base not sheathing; plants of rock crevices or open soil.....85.
85. a. Upper leaf cells rhomboidal to narrowly hexagonal; small scattered plants on open soils.....*Archidium alternifolium*
 b. Upper leaf cells isodiametric; tuft- or cushion-forming plants on rocks and in rock crevices.....86.

²¹ *D. maximus*, known only from limestone hills in NW Ireland, is a larger plant (leaves 2-4 mm long v. 0.8-1.8 in *D. ferrugineus*) with ventral stereids (absent in *D. ferrugineus*).

86. a. Leaves entire; papillose cylindrical gemmae often present; dark green cushions on rock surfaces, usually in strongly oceanic areas.....*Glyphomitrium daviesii*
 b. Leaves usually toothed near apex, at least obscurely; gemmae absent; pale bright yellow-green tufts in rock crevices, not restricted to oceanic areas.....87.
87. a. Leaves narrow, with lamina 3-4(-5) cells wide on each side of nerve 220 µm from apex.....*Rhabdoweisia fugax*
 b. Leaves wider, with lamina 5-7 cells wide on each side of nerve 220 µm from apex.....*Rhabdoweisia crispata*
88. a. Hyaline basal cells ascending up margin of leaf, usually producing a ± abrupt V-shaped transition from basal to upper cells.....89.
 b. Hyaline basal cells, if present, not ascending up leaf margin, transition usually not abrupt and never V-shaped.....94.
89. a. Leaves squarrose from ± erect sheathing base when moist; basal hyaline cells not forming a V-shaped zone, instead ascending margin in a narrow band.....*Tortella squarrosa*
 b. Leaves not squarrose, and base not sheathing; basal hyaline cells forming a V-shaped zone at junction with upper green cells.....90.
90. a. Leaves fragile, upper part of leaves usually broken off.....91.
 b. Leaves not fragile, upper part of leaves intact.....92.
91. a. Transition between lower hyaline cells and upper green cells gradual.....*Tortella nitida*
 b. Transition between lower hyaline cells and upper green cells very abrupt.....*Tortella fasciculata*²²
92. a. Plants always small, 2-6 mm high, leaves < 3 mm long; transition between lower hyaline cells and upper green cells gradual; southern plant of chalk and oolitic limestone fragments.....*Tortella inflexa*
 b. Plants usually larger, up to 8 cm high, leaves usually > 3 mm long; transition between lower hyaline cells and upper green cells very abrupt; widespread on various substrates....93.
93. a. Leaves very long and tapering, strongly crisped when dry; not confined to coast.....*T. tortuosa*
 b. Leaves lanceolate to linear-lanceolate, usually contracted ± abruptly to apex; almost exclusively coastal.....*T. flavovirens*²³

²² *T. pseudofragilis*, rare in the Scottish Highlands, has leaves straight (not curled) in the upper half, and marginal upper leaf cells longer than wide (wider than long in *T. fasciculata*). The very rare *T. fragilis*, confined to Scotland, has an extremely long, straight, fragile, subulate leaf apex in which the lamina and nerve cannot be differentiated.

²³ Both *T. tortuosa* and *T. flavovirens* have the lamina cells continuous over adaxial side of nerve; the much rarer *T. densa* and *T. inclinata* have the elongate nerve cells exposed throughout adaxially. *T. densa* has gradually tapering acuminate leaves, whereas *T. inclinata* is abruptly contracted to an acute or obtuse apex.

94. a. Leaf margins \pm strongly incurved, and/or leaf apex distinctly cucullate.....95.
 b. Leaf margins and apex plane100.
95. a. Leaf apex cucullate; margins plane below; capsules rare.....*Trichostomum crispulum*
 b. Leaf apex usually not cucullate; leaf margins \pm strongly incurved; capsules abundant²⁴96.
96. a. Seta longer than capsules.....97.
 b. Seta shorter than or as long as capsules²⁵99.
97. a. At least a rudimentary peristome present.....98.
 b. Peristome completely absent.....*Weissia brachycarpa*²⁶
98. a. Adaxial cells of nerve papillose, quadrate, at least in patches; common.....*Weissia controversa*²⁷
 b. Adaxial cells of nerve smooth, elongate in upper half of leaf; common only in western coastal areas.....*W. perssonii*
99. a. Perichaetial leaves 3-6 mm long; margins plane or narrowly incurved above....*W. longifolia*
 b. Perichaetial leaves 2.5-3.7 mm long; margins involute above.....*W. angustifolia*
100. a. Hyaline basal part of leaf \pm expanded, sharply toothed at 'shoulders'*Eucladium verticillatum*
 b. Basal part of leaf hyaline or not, expanded or not, but lacking teeth (may be papillose or crenulate).....101.
101. a. Leaves with distinct alar cells; leaf cells striate with weak, elongated ridges; small to medium-sized cushions on base-rich mountain rocks.....*Dicranoweisia crispula*
 b. Distinct alar cells lacking; leaf cells densely papillose; habit and habitat various.....102.
102. a. Small plants, leaves usually < 1.5 mm long (although often forming huge hummocks).....103.
 b. Large plants, leaves usually well over 1.5 mm long (forming small tufts, mats or scattered shoots).....107.
103. a. Leaf apex acute, with smooth apical cell(s) contrasting with the strongly papillose lamina cells below; often forming massive cushions²⁸*Anoetangium aestivum*

²⁴ *Weissia* is a difficult genus which is complicated by extensive hybridisation. Only the more common species are included here. Refer to other literature to be sure of an identification.

²⁵ The rare *W. sterilis*, which is branched, and *W. levieri*, which has a dehiscent capsule, will also key out here.

²⁶ A number of rare species of *Weissia* will also key out here.

²⁷ The rarer *W. rutilans* has larger spores (22-28 μm v. 16-20 μm); also its leaves are plane or only slightly incurved above.

²⁸ *Amphidium mougeotii* (see above) also forms massive cushions, and may key out near here if the recurved lower leaf margins have been overlooked; it has linear-lanceolate dark green leaves with a characteristic silky sheen.

- b. Leaf apex ± obtuse or subacute, with no contrast between extreme apex and lamina cells; forming cushions, tufts or scattered patches.....104.
104. a. Cells in leaf base elongate (ca. 25-50 µm long); forming patches, not cushions.....*Gyroweisia tenuis*
 b. Cells in leaf base shorter (<25 µm long); forming patches or cushions.....105.
105. a. Leaf apex rounded, cells ± quadrate except at extreme base; scattered shoots on wet, usually vertical rock faces.....*Molendoa warburgii*
 b. Leaf apex obtuse to subacute, basal cells rectangular; dense tufts or cushions, usually in rock crevices.....106.
106. a. Bright green; upper leaf cells 5-10 µm wide; nerve 30-45 µm wide near base.....*Gymnostomum calcareum*²⁹
 b. Dull green; upper leaf cells (8-)10-14 µm wide; nerve 60-110 µm wide near base.....*G. aeruginosum*
107. a. Nerve excurrent in stout mucro; upper leaf margins finely papillose-crenulate, not fragile, broken, notched or sinuose*Trichostomum brachydontium*
 b. Nerve ending below apex, or if slightly excurrent not forming a mucro; upper leaf margins sometimes fragile, broken, notched or sinuose.....107.
108. a. Leaf apex narrowly lingulate to subulate, obtuse, fragile, sinuose or notched but not, or only weakly papillose-crenulate; hyaline leaf base moderately defined; southern lowland species*Didymodon sinuosus*
 b. Leaf apex ± acute, not fragile, papillose-crenulate; hyaline leaf base well-defined; western and northern upland species.....109.
109. a. Leaves with expanded sheathing base with distinct 'shoulders'; margins finely and ± regularly crenulate, not notched or sinuose above.....*Chionoloma hibernicum*
 b. Leaves gradually narrowing ± from base to apex, base not expanded or sheathing, without 'shoulders'; margins irregularly crenulate, frequently notched or sinuose above.....*C. tenuirostre*³⁰

²⁹ *Leptobarbula berica*, a scarce southern plant of limestone and walls, also keys out here (*G. calcareum* is more an upland plant of base-rich rocks in ravines etc); it differs in its perichaetial and perigonal leaves being much longer than the vegetative leaves.

³⁰ var. *holtii* has often blackish older parts, upper leaves not longer than lower leaves (so not forming a comal tuft, unlike var. *tenuirostre*), and leaves often breaking along the nerve.