



Note: some species key out in several places, as they are very variable in their growth form. Basal squamules of species which produce podetia, and very young specimens of most species, may be difficult or impossible to identify.

- 1 Podetia (upright hollow structures, pointed or branched or cup-shaped) absent, whole plant consists of basal squamules, which may be leaf-like or scale-like, creeping, overlapping or held upright **2**
- 1a Podetia present, as erect points, antlers, complex branched structures, or cups. **4**
- 2 Squamules up to 1cm wide, grey-green, rounded, forming loose mats. White fine-powder beneath, orange toward base underneath. K+ yellow, P+ orange. *Cladonia digitata*
- 2a Squamules smaller, with crisped or incised edges, usually brighter green, often forming tight neat cushions. Not white-powdery beneath. **3**
- 3 Squamules 5mm x 2mm, cushion-forming, with incised edges. Fruits often present, pink-brown rather gelatinous blobs on short white stalks, looking rather like tiny mushrooms. K-, P+ red *Cladonia caespiticia*
- 3a Tiny squamules with frilly or densely incised edges, often so small as to appear like granules to naked eye. K+ yellow, P+ orange. On trees, logs and stumps. *Cladonia parasitica*
- 4 Red fruits present on tips of podetia branches or round edges of cups **5**
- 4a Fruits brown or absent **9**
- 5 Cups present on podetia, either widening gradually from the base, or more rapidly at the top of the stalk. **6**
- 5a Podetia not widening into cups, simple or branched spikes or club-shaped **7**
- 6 Podetia short and broad. Cups wider than deep, often with large red fruits all around the edges. Usually simple, often rather irregular or lopsided, sometimes with one upper tier. Whole podetia covered in smooth-surfaced rounded granules, and yellowish tinge to the green colour. K-, P- *Cladonia coccifera*
- 6a Podetia slender, much taller than wide. Cups narrow, often with smaller cups or points arising from their edges. Surface of podetia covered with fine, flour-like powder, white or greyish. K+ yellow, P+ orange-red *Cladonia polydactyla*
- 7 Surface covered in granules, not fine powder. Often with squamules over much of podetia, which are usually rather stout and blunt. Usually K- P- *Cladonia floerkeana*
- 7a Surface of podetia covered in fine, flour-like powder. Upper parts of podetia usually without squamules, often narrowly tapering. K+ yellow, P+ orange-red **8**
- 8 Podetia tall and slender, usually simple and unbranched. *Cladonia macilenta*
- 8a Short and/or branched, often dividing into several branches at one point, and often with irregular narrow cups developing on some podetia, each usually with points around its edges. *Cladonia polydactyla*
- 9 Squamules present at base and sometimes on podetia. Podetia usually clearly growing from a bed of squamules (beware specimens where only podetia have been collected!). Podetia may be cup-shaped, or simple and unbranched, or antler-like. **10**
- 9a Squamules absent. Whole plant an interwoven mat of tubular podetia, growing at their tips and often not clearly attached at base, supported by other vegetation or by adjacent lichens. Usually much-branched and 'tree-like'. **29**

- 10** Podetia widened toward their tips, forming cups or ‘wine-glasses’. **11**
- 10a** Podetia not widened into cups: simple or branched spikes or club-shaped **19**
- 11** Podetia dark green-brown, neat and regular, with 2-4 tiers of cups, each arising from the middle of the previous layer. Up to 5cm tall. *Cladonia cervicornis verticillata*
- 11a** Podetia usually pale green- grey or yellowish. If cups are proliferating, the upper ones arise from the margins of lower cups, never from middle. **12**
- 12** **THREE CHOICES**
- 12a** Surface of podetia covered in fine, flour-like powder. Upper parts of podetia (cups) usually without squamules. Usually regularly wineglass- or goblet-shaped, often narrowing suddenly into a slender stalk. Cups usually simple, rarely proliferating, though sometimes with little spikes round edges of cups. **13**
- 12b** Surface covered in larger, rough granules, not fine powder. Often with squamules over much of podetia, sometimes on cups too. Cups sometimes irregular, often more or less triangular, tapering more gradually into the slender stalk. Often proliferating, with smaller cups arising from edges of larger ones. **14**
- 12c** Surface of podetia smooth, not powdery or granular, sometimes with a few squamules, and often with a network of white lines, with darker or green raised areas in between, like crazy paving. Cups usually rather narrow, and whole plant often tall and slender. **25**
- 13** Cups very short, 5-7mm. Tapering to a very short narrow stalk, the basal 1-2 mm of which is smooth and corticated (lacking fine powder). *Cladonia humilis*
- 13a** Cups often taller, up to 15mm, with a longer slender stalk. Cup contracting rapidly into slender stalk, so golf-tee or champagne-goblet shaped. Whole podetia covered in fine powder, right down to the base. *Cladonia fimbriata*
- 14** Podetia short and broad. Cups wider than deep, often with wide red fruits all around the edges (in field, look around for similar cups with fruits). Usually simple, often rather irregular or lopsided, sometimes with one upper tier. Whole podetia covered in smooth-surfaced rounded granules, and yellowish coloured. *Cladonia coccifera*
- 14a** Podetia variable in shape, may be tall and slender. Cups variable, often with wine-glass shape (tapering to a slender stalk), or narrowly triangular, and often with 2 or more tiers. Surface of podetia covered with fine, flour-like powder, or coarser granules, often with squamules up the stalk, white or greyish. **15**
- 15** Squamules present up the podetia, often on outside and round rim of cups. **16**
- 15a** Squamules mainly at base. Cups covered in fine powder or granules, or decorticate in upper parts. **18**
- 16** Cups wide, much wider than stalk, with a hole in middle, and often with holes or gashes down rest of podetia. Either K- P-, or sometimes K+ yellow, P+ orange (var. *subsquamosa*) *Cladonia squamosa*
- 16a** Cups narrow and podetia tall and almost parallel-sided. Cups and podetia without holes. K-, P+ red. **17**
- 17** Podetia finely powdery over much of surface, with a few decorticate patches and a few scattered squamules. Corticate and smooth for a few mm at base. Up to 4cm tall, unbranched. *Cladonia ochrochlora*
- 17a** Podetia largely decorticate and with scattered granules. Not powdery soresiate. Up to 3cm, often branched once or twice. Squamules often large and conspicuous. K-, P+ red. *Cladonia ramulosa*
- 18** Cups wineglass-shaped, tapering fairly rapidly into slender parallel-sided stalks. Often proliferating from margins. Granules medium. *Cladonia chlorophaea*
- 18a** Cups rather triangular, tapering fairly evenly from top of cup to base. Seldom proliferating. Granules very coarse. *Cladonia pyxidata*

19 THREE CHOICES

- 19a** Surface of podetia covered in fine, flour-like powder. Upper parts of podetia usually without squamules and tapering to a sharp-looking point. **20**
- 19b** Surface covered in larger, rough granules, not fine powder. Often with squamules over much of podetia, which are often less tapered and rather blunt. **23**
- 19c** Surface of podetia smooth, with neither powder nor granules, and often with a network of white lines, with darker or green raised areas in between, like crazy paving. Squamules usually few and mainly near the base. **25**
- 20** Podetia simple and unbranched, or branching into 1-3 simple points near apex. Basal squamules green. Podetia K-. Fruits almost never present. **21**
- 20a** Podetia often branched several times, often with 5 or more points, sometimes widening into small cups. Basal squamules bluish grey-green on upper surface. Podetia K+ yellow. Red fruits developing. *Cladonia polydactyla*
- 21** On wood. Podetia short (up to 15mm) and simple, often all curving one way, usually squamulose in lower half and tapering in upper half. Podetia usually arising separately at intervals from a bed of dense small squamules. *Cladonia coniocraea*
- 21a** Usually on heathy soil or peat. Podetia usually taller (2-6cm), with a few squamules at base and a long, often branched, tapering point. Often forming dense stands or thickets of podetia which touch each other. **22**
- 22** Podetia usually with a single longitudinal groove running up one side. P- *Cladonia glauca*
- 22a** Podetia without a longitudinal groove. P+ orange-red *Cladonia subulata*
- 23 THREE CHOICES**
- 23a** On peaty or heathy soil. Podetia rather thick, often branching once or twice, hardly tapering. With coarse and fine granules and squamules to apex. Developing red fruits. *Cladonia floerkeana*
- 23b** On soil or wood. Usually irregularly branched, often widening and starting to form cups. Covered with squamules over most of surface right to apex. Often developing brown fruits. *Cladonia squamosa*
- 23c** On wood. Podetia unbranched or with one or two branches. Rarely fruiting. **24**
- 24** Up to 2.5cm tall. Usually simple, pointed and slightly curved, upper half uniformly fine-powdery, lower half thinly squamulose. *Cladonia coniocraea*
- 24a** Up to 4cm tall. Usually blunt-ended, often with small, abruptly widened cups at tip of some podetia. Much of podetia decorticate. *Cladonia ochrochlora*
- 25** Axils of most branches and apex of most podetia with a hole opening to the hollow interior. P- **26**
- 25a** Axils and apices all or mostly without holes. P+ red or P-. **27**
- 26** Dark brown-grey or olive-green with irregular pale reticulation. K- KC- P-. Usually tall and slender, up to 5cm. Apices of podetia often open, and often ending in small, frilly-edged cups which open to the interior, and often form 2-3 tiers of branches or cups. At least a few basal squamules usually present. *Cladonia crispata*
- 26a** Yellowish green, often mottled with white, K-, KC+ yellowish, P-. Podetia relatively short (usually 1-2cm, up to 4cm), spiky, fairly simple (branched 1-2-3 times, usually as a 2-pronged fork), stout and looking rather bloated or swollen, never forming cups. Basal squamules usually absent. *Cladonia uncialis*
- 27** Branches spreading at a wide angle. Surface white with neat and regular patches of green. Often forming tangled spreading mats, up to 5cm tall. K+ yellow. Often on chalk or limestone soils. *Cladonia rangiformis*
- 27a** Branches less widely spreading. Often brown-tinged, and not white with regular green patches (though often mottled green and white). Usually K-. Often more upright and with parallel stems. Usually on acid soils. **28**

- 28** Short and usually matted. Some branches often with a small opening in the axil. Often with scattered peeling squamules. K- or rarely K+ yellow, P-. *Cladonia furcata*
- 28a** Usually taller, up to 6cm, more upright and less branched. Axils never perforate. Podetia often end in small cups. Few squamules. K- P- *Cladonia gracilis*
- 29** Whole lichen brown, its surface smooth and slightly glossy. Often with tiny bristles or short spines on the surface of the branches. Twisted and matted highly branched structures lying over moss or heathy/peaty soils. *Cetraria aculeata*
- 29a** Whole lichen grey or white, often with a bluish, yellowish or greenish tinge. Matt finish, not glossy. No bristles or short spines on surface of branches. Usually growing upright from a base at soil level, and either simply forked or tree-like (beware broken and trampled specimens) **30**
- 30** **THREE CHOICES**
- 30a** Podetia short (usually 1-2cm, up to 5cm), fairly simple (branched 1-3 times, usually as 2-pronged fork, with holes in the axils), stout (about 3mm thick), looking swollen. Yellowish green, often mottled with white. Squamules absent. *Cladonia uncialis*
- 30b** Podetia brown-tinged or olive-green, tall (up to 6cm), slender and only slightly branched, with open axils and sometimes ending in narrow cups. A few squamules usually present. **25**
- 30c** Often taller (up to 15cm), repeatedly and finely branched. Pale, often greyish or yellowish white. Squamules absent. **31**
- 31** Tips of branches pointing in all directions, their final divisions being mostly 2-branched. Whole plant seems to form loose 'heads'. Greyish white. *Cladonia portentosa*
- 31a** Tips of branches mostly curved over in one direction, looking as if blown by the wind, sometimes lining up neatly like a comb. Final divisions 2- 3- or 4-branched. Greyish or yellowish, sometimes tinged purplish. **32**
- 32** Tips mostly 3-4 branched, and whole branches bending in direction which tips face. Rather stout main stems. Green-grey-white, usually with a yellowish tinge. *Cladonia arbuscula*
- 32a** Tips mostly 2-forked. Main branches more or less vertical, and only fine tips curve in one direction. Whole plant often rather slender. **33**
- 33** Whole lichen greyish-white, often tinged purplish at tips. *Cladonia ciliata var. tenuis*
- 33a** Whole lichen yellowish-white. *Cladonia ciliata var. ciliata*

CLADONIA FEATURES

