F. Schumm (2026):

Images of Lichens
Vezda Lichenes Selecti Exsiccati part 15

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With this volume, I continue the documentation of Vezda's works on exiccata, now with Lichenes Selecti as part 15. I have chosen the genus names that Vezda used, even though others are now more common. However, I also include the currently used names in the synonym list and the index. In addition, I have again made every effort to add species descriptions to the detailed information on the labels from the literature.

For the descriptions of europaean species I used mainly the excellent descriptions that are provided in Prof. Nimis ITALIC 8 under the URL:
https://italic.units.it/

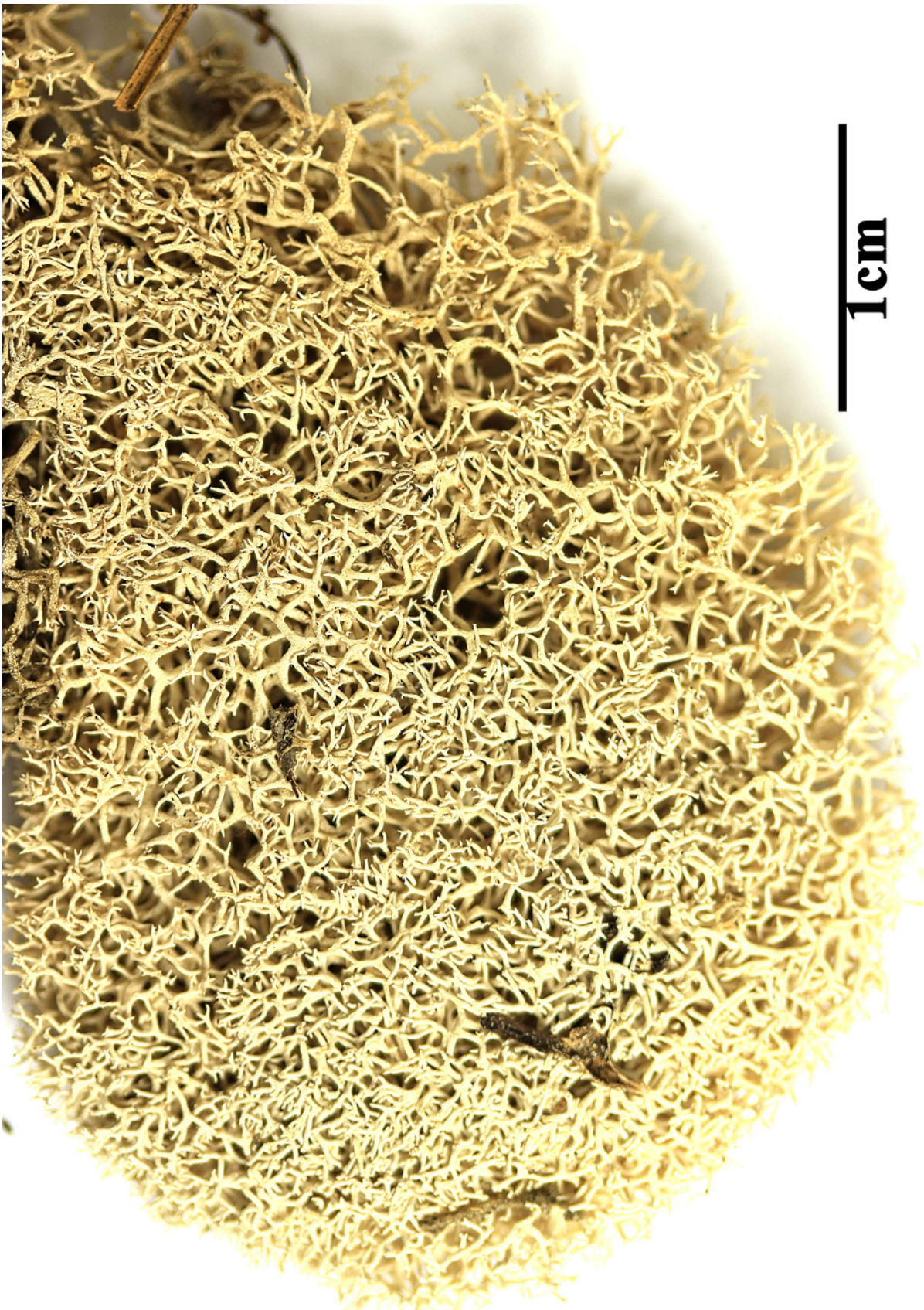
and the Australian Lichenslist under the Url:
https://www.anbg.gov.au/abrs/lichenlist/lichenchecklist_e_o.html

F. Schumm, 2026

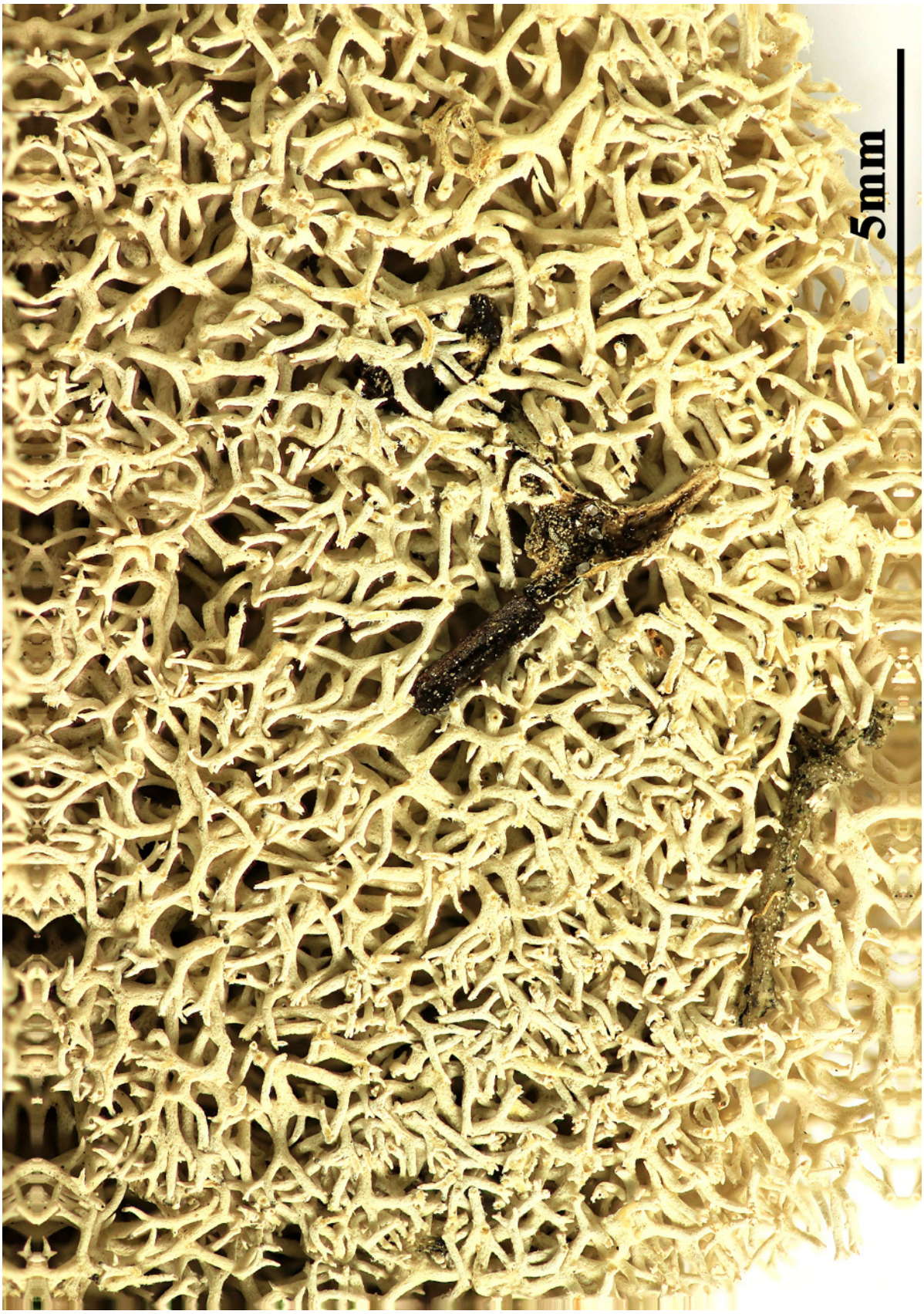
Cladina evansii (Abbayes) Hale & W.L. Culb., Bryologist 73(3): 510 (1970)
= *Cladonia evansii* Abbayes 1939

[VZ2318], USA, Florida. Marion County: Inter Silver Spring et Astor Park. Ad terram arenosam, Leg, W. L. Cilberson (no. 19707). - Annot.: Atranorin, perlatolic acid and a probable trace of anziaic acid by TLC; - anal. C. F. Culberson and A. Johnson. Ex A. VěZDA LICHENES SELECTI EXSICCATI NR. 2318.

Podetia whitish to ashy gray, occasionally with some yellowish tint (best seen in fresh condition), with apical branchlets never conspicuously browned, 3-6 cm tall, extremely densely branched, with rounded heads 2-6 cm wide; branching type very regular dichotomous to (infrequently) trichotomous isotomy; no main axis distinguishable; axils not usually perforated; mature internodes 1-2 mm long; ultimate branchlets bluntish, diverging at a wide angle. Surface layer lax, algal glomerules almost invisible in dry podetia. Podetial wall 80-100 µm; ectal layer 20-40 µm, stereome 50-70 µm; central canal smooth, shiny. Conidiomata globose to ovoid, containing hyaline slime; conidia not studied. Hymenial disks infrequent, 0.5 mm wide, brown; spores not observed. Chemistry: P-, K+ yellow. Perlatolic acid, anziaic acid (trace), atranorin, an unknown red pigment, and trace amounts of unidentified substances, including fatty acids; usnic acid occasionally present n low amounts. Distribution: On open sandy soils and serpentinic gravel at low elevations, rarely on prostrate logs, often in pine woodlands, especially in Prov. Santiago de Cuba, in Cuba, and in the Bahama Archipelago. Outside the area in Florida, Louisiana, Alabama, Mississippi, Georgia, South Carolina, North Carolina, and New York. - *Cladina evansii* is easily recognized by its conspicuous colonies of hemispherical, almost white podetia. The pale yellow color form (containing usnic acid) was recognized by Ahti (1984) as *f. icterica* (Abbayes) Ahti.



Cladina evansii



Cladina evansii

Cladina evansii (Abbayes) Hale & W.L. Culb., Bryologist 73(3): 510 (1970)
= *Cladonia evansii* Abbayes 1939

[VZ1805], USA. North Carolina. Bladen County: 3 km ad orientem versus a Kelley. Ad terram arenarium. Leg, W. L. Culberso (no. 18559) et C. F. Culberson, 24,4,1982. - Annot.: Atranorin and perlatolic acid by TLC, anal. A. Johnson and C. F. Culberson. - Ex A. VěZDA LICHENES SELECTI EXSICCATI NR. 1805.

Podetia whitish to ashy gray, occasionally with some yellowish tint (best seen in fresh condition), with apical branchlets never conspicuously browned, 3-6 cm tall, extremely densely branched, with rounded heads 2-6 cm wide; branching type very regular dichotomous to (infrequently) trichotomous isotomy; no main axis distinguishable; axils not usually perforated; mature internodes 1-2 mm long; ultimate branchlets bluntish, diverging at a wide angle. Surface layer lax, algal glomerules almost invisible in dry podetia. Podetial wall 80-100 µm; ectal layer 20-40 µm, stereome 50-70 µm; central canal smooth, shiny. Conidiomata globose to ovoid, containing hyaline slime; conidia not studied. Hymenial disks infrequent, 0.5 mm wide, brown; spores not observed. Chemistry: P-, K+ yellow. Perlatolic acid, anziaic acid (trace), atranorin, an unknown red pigment, and trace amounts of unidentified substances, including fatty acids; usnic acid occasionally present n low amounts. Distribution: On open sandy soils and serpentinic gravel at low elevations, rarely on prostrate logs, often in pine woodlands, especially in Prov. Santiago de Cuba, in Cuba, and in the Bahama Archipelago. Outside the area in Florida, Louisiana, Alabama, Mississippi, Georgia, South Carolina, North Carolina, and New York. - *Cladina evansii* is easily recognized by its conspicuous colonies of hemispherical, almost white podetia. The pale yellow color form (containing usnic acid) was recognized by Ahti (1984) as *f. icterica* (Abbayes) Ahti.

Cladina evansii

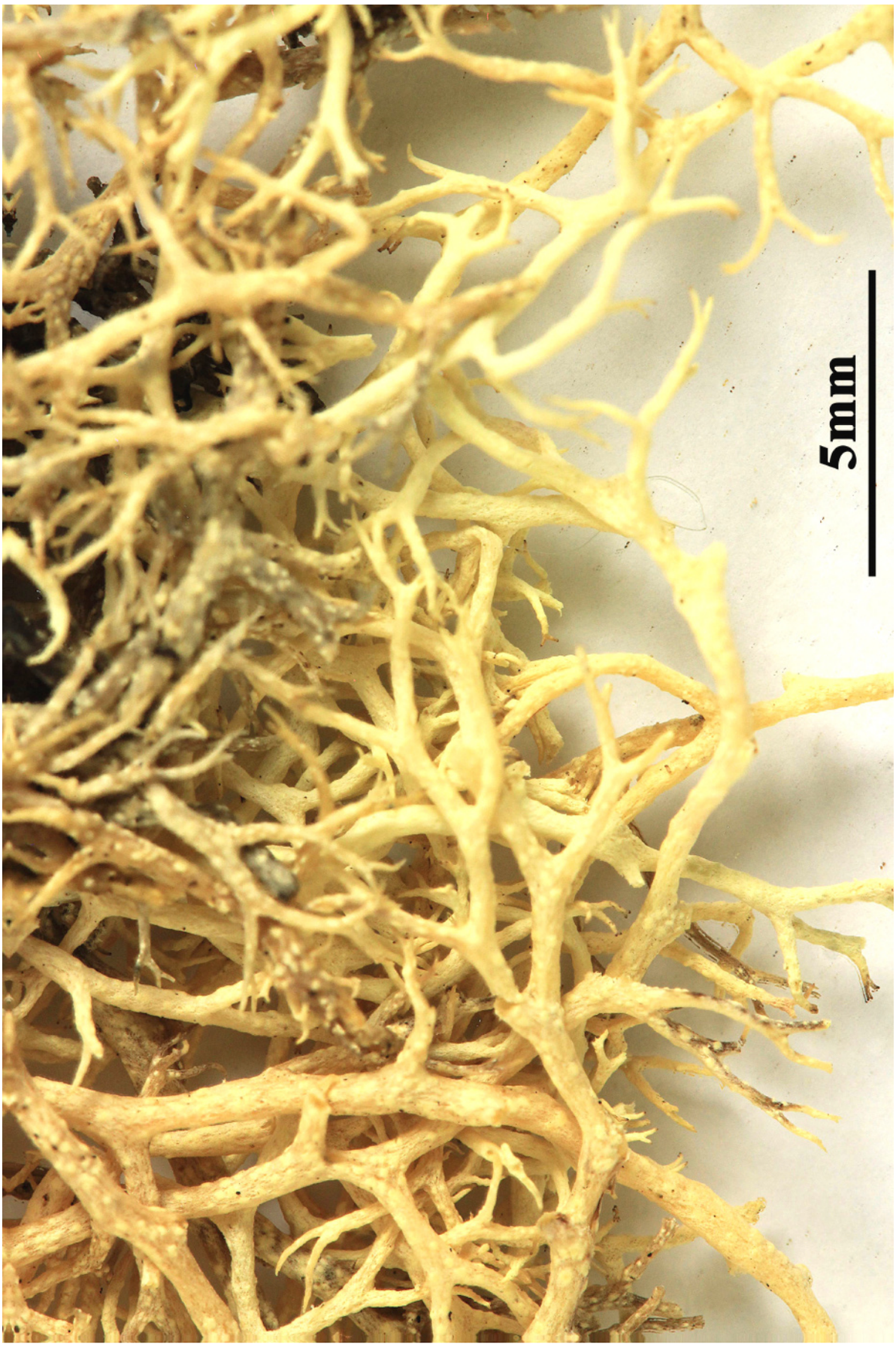
Cladina evansii

Cladina mitis (Sandst.) Mong., Bull. Soc. Agric. Sarthe, ser. 3 7: 118 (1938)
= *Cladonia mitis* Sandst., Cladon. Exsicc.: no. 55 (1918)
= *Cladina arbuscula* subsp. *mitis* (Sandst.) Burgaz, in Burgaz & Ahti, Nova Hedwigia 59(3-4): 400 (1994)
= *Cladonia arbuscula* subsp. *mitis* (Sandst.) Ruoss, Bot. Helv. 97(2): 260 (1987)
= *Cladonia arbuscula* subsp. *stictica* Ruoss, in Ruoss & Ahti, Lichenologist 21(1): 37 (1989)
= *Cladonia arbuscula* var. *mitis* (Sandst.) Sipman, in Hennipman & Sipman, Wet. Meded. K. ned. natuurh. Veren. 124: 43 (1977)
= *Cladonia sylvatica* var. *mitis* (Sandst.) Kušan, Hedwigia 72: 45 (1932)

[VZ2067], Australia, Tasmania. In montibus ad meridiem versus a Mt. Curly, 800 m. Ad turfam in regione subalpina. Leg. G. Kantvilas (no. 79/85) et J. Jarman, 2.11.1985. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2067.

Primary thallus crustose, ephemeral, rarely seen. Podetia shrub-like, hollow inside, esquamulose, ecorticate, the surface compact or finely arachnoid, pale yellowish white, anisotomically (i.e. main branches thicker) mainly trichotomously branched, 4-12 cm tall, the terminal branchlets generally - not always – spreading in all directions, not or only slightly browned at tips. Apothecia rare, brown, convex, very small. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed, on the tips of podetia, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC+ yellow, P-, UV-. Chemistry: mostly usnic, isousnic, rangiformic and norrangiformic acids; rarely rangiformic acid absent. - Note: a typical member of subalpine-alpine tundras, perhaps more common at higher altitudes than C. arbuscula, widespread in the Alps.

Cladina mitis



Cladina mitis

Cladina rangiferina* subsp. *abbayesii (Ahti) W. L. Culb., in Vězda, Lichenes Selecti Exsiccati, Fascicle 76 (Průhonice): 3 (1983)
= *Cladonia rangiferina* (L.) Weber, in Wiggers, Prim. fl. holsat. (Kiliae): 90 (1780)
= *Baeomyces rangiferinus* (L.) Ach., Methodus, Sectio post. (Stockholmiæ): 356 (1803)
= *Biscladinomyces rangiferinae* Cif. & Tomas. [as 'rangiferina'], Atti Ist. bot. Univ. Lab. crittog. Pavia, sér. 5 10(1): 53, 79 (1953)
= *Capitularia rangiferina* (L.) Mart., Fl. crypt. erlang. (Nürnberg): 272 (1817)
= *Cladina rangiferina* (L.) Nyl., Not. Sällsk. Fauna et Fl. Fenn. Förh., Ny Ser. 8: 110 (1866)
= *Cladonia fusca* var. *rangiferina* (L.) Rabenh., Fl. lusit. 2(2): 144 (1840)
= *Cladonia rangiferina* subsp. *abbayesii* (Ahti) Ahti & DePriest, Mycotaxon 78: 501 (2001)
= *Cladonia rangiferina* var. *abbayesii* Ahti, Ann. bot. Soc. Zool.-Bot. fenn. Vanamo 32(no. 1): 94 (1961)
= *Lichen rangiferinus* L., Sp. pl. 2: 1153 (1753)
= *Patellaria foliacea* var. *rangiferina* (L.) Wallr., Naturg. Saulchen.-Fl.: 169 (1829)
= *Patellaria rangiferina* (L.) Wallr., Fl. crypt. Germ. (Norimbergae) 1: 425 (1831)
= *Thamnium rangiferinum* Vent., Tabl. Règne Vég. (Paris) 2: 35 (1799)
= *Verrucaria rangiferina* (L.) Humb., Fl. Friberg. Spec. (Berlin): 40 (1793)

[VZ1883], Respublica Dominicana. La Vega: 22 km ad meridiem et orientem versus a Constanza, 2160 m. Ad terram secus Viam. Leg. W. L. Culberson(no. 18999) et C. F. Culberson, 17.6.1982. - Annot.: Atranorin, Fumarprotocetraric acid, unknown compound Cph-2, and an unidentified fatty acid by TLC. - A. Johnson and C. F. Culberson. EX A. VEZDA LICHENES SELECTI EXSICCATI NR. 1883.

Podetia pale gray to bluish gray, often strongly browned at tips, in dead basal parts turning dark brown but hardly black, to 12 cm tall; predominant branch- ing type anisotomic dichotomy but trichotomy also common; main axes distinct, often robust (1-2 mm thick at base); axils open or closed; mature intemodes 5-10 mm long; ultimate apical branchlets relatively thick and blunt, falcate to erect, forming narrow heads. Surface smooth rather than verrucose, especially near tips, clearly arachnoid. Podetial wall 100-400 pm; ectal layer + medulla up to 60 µm; stereome 100-240 µm. Conidiomata 100-200 µm thick, ovoid or shorter, con- taining hyaline slime; conidia 4-7 µm, falciform. Hymeni-

al disks fairly common, 0.5-1.2 mm wide, peltate; spores 8-15 x 2-3 µm. Chemistry: P+ orange red, K+ yellow. Atranorin, fumarprotocetraric acid, protocetraric acid. confumarprotocetraric acid, sometimes ursolic acid, and unidentified fatty acids. Distribution: Primarily a lichen of paramos and higher levels of cloud forests in the Andes of Colombia (2450-4050 m) and Venezuela, where it is locally frequent at elevations of 2500-3100 m; also at high elevations of Ecuador, Mexico (1900- 2900 m), and Hispaniola (1560-2100 m). In Colombia it is known only from the East- ern Cordillera, between Sierra Nevada del Cocuy and Bogota', mainly from the drier slope of the range (the lowermost records come from subarid areas). Higher in the humid paramos it is mainly found on rocks and in bogs. - *Cladina rangiferina* subsp. *abbayesii* is primarily distinguished from the holarctic-subantarctic subsp. *rangiferina* by the high frequency of dichotomy in branching. In addition, the apical branchlets tend to be erect rather than

Cladina rangiferina subsp. abbayesii

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Cladina rangiferina subsp. abbayesii (Ahti) W. L. Culb., in Vězda, Lichenes Selecti Exsiccati, Fascicle 76 (Průhonice): 3 (1983)
= *Cladonia rangiferina* (L.) Weber, in Wiggers, Prim. fl. holsat. (Kiliae): 90 (1780)
= *Baeomyces rangiferinus* (L.) Ach., Methodus, Sectio post. (Stockholmiæ): 356 (1803)
= *Biscladinomyces rangiferinae* Cif. & Tomas. [as 'rangiferina'], Atti Ist. bot. Univ. Lab. crittog. Pavia, sér. 5 10(1): 53, 79 (1953)
= *Capitularia rangiferina* (L.) Mart., Fl. crypt. erlang. (Nürnberg): 272 (1817)
= *Cladina rangiferina* (L.) Nyl., Not. Sällsk. Fauna et Fl. Fenn. Förh., Ny Ser. 8: 110 (1866)
= *Cladonia fusca* var. *rangiferina* (L.) Rabenh., Fl. lusit. 2(2): 144 (1840)
= *Cladonia rangiferina* subsp. *abbayesii* (Ahti) Ahti & DePriest, Mycotaxon 78: 501 (2001)
= *Cladonia rangiferina* var. *abbayesii* Ahti, Ann. bot. Soc. Zool.-Bot. fenn. Vanamo 32(no. 1): 94 (1961)
= *Lichen rangiferinus* L., Sp. pl. 2: 1153 (1753)
= *Patellaria foliacea* var. *rangiferina* (L.) Wallr., Naturg. Saulchen.-Fl.: 169 (1829)
= *Patellaria rangiferina* (L.) Wallr., Fl. crypt. Germ. (Norimbergae) 1: 425 (1831)
= *Thamnium rangiferinum* Vent., Tabl. Règne Vég. (Paris) 2: 35 (1799)
= *Verrucaria rangiferina* (L.) Humb., Fl. Friberg. Spec. (Berlin): 40 (1793)

[VZ2107], Venezuela. Estado Tachira: Páramo de los Colorados (Páramo de El Zumbador), 3100m. Ad terram. Leg. M. Lopéz-Figueiras (14333), 10.12-1977, det. T. Ahti. EX A. VěZDA LICHENES SELECTI EXSICCATI NR.2107.

Podetia pale gray to bluish gray, often strongly browned at tips, in dead basal parts turning dark brown but hardly black, to 12 cm tall; predominant branch- ing type anisotomic dichotomy but trichotomy also common; main axes distinct, often robust (1-2 mm thick at base); axils open or closed; mature intemodes 5-10 mm long; ultimate apical branchlets relatively thick and blunt, falcate to erect, forming narrow heads. Surface smooth rather than verrucose, especially near tips, clearly arachnoid. Podetial wall 100-400 pm; ectal layer + medulla up to 60 µm; stereome 100-240 µm. Conidiomata 100-200 µm thick, ovoid or shorter, con- taining hyaline slime; conidia 4-7 µm, falciform. Hymenial disks fairly common, 0.5-1.2 mm wide, peltate; spores 8-15 x 2-3 µm. Chemistry: P+ orange red, K+ yellow. Atranorin, fumarprotocetra-

ric acid, protocetraric acid. confumarprotocetraric acid, sometimes ursolic acid, and unidentified fatty acids. Distribution: Primarily a lichen of paramos and higher levels of cloud forests in the Andes of Colombia (2450-4050 m) and Venezuela, where it is locally frequent at elevations of 2500-3100 m; also at high elevations of Ecuador, Mexico (1900- 2900 m), and Hispaniola (1560-2100 m). In Colombia it is known only from the East- ern Cordillera, between Sierra Nevada del Cocuy and Bogota', mainly from the drier slope of the range (the lowermost records come from subarid areas). Higher in the humid paramos it is mainly found on rocks and in bogs. - *Cladina rangiferina* subsp. *abbayesii* is primarily distinguished from the holarctic-sub-antarctic subsp. *rangiferina* by the high frequency of dichotomy in branching. In addition, the apical branchlets tend to be erect rather than deflexed, and the color is generally very pale when compared to the dominant variants of subsp. *rangiferina*.

Cladina rangiferina subsp. abbayesii

Cladina rangiferina subsp. abbayesii

Cladina rangiferina subsp. abbayesii

Cladonia anomaea (Ach.) Ahti & P. James, in Ahti, Lichenologist 12(1): 128 (1980)
= *Cladonia ramulosa* (With.) J.R. Laundon, Lichenologist 16(3): 225 (1984)
= *Baeomyces anomaeus* Ach., Methodus, Sectio post. (Stockholmiæ): 349 (1803)
= *Capitularia pityrea* Flörke, Mag. Gesell. naturf. Freunde, Berlin 2(2): 135 (1807)
= *Cenomyce anomaea* (Ach.) Hook., Fl. Scot. (London) 2: 63 (1821)
= *Cenomyce gonorega* f. *anomaea* (Ach.) Ach., Syn. meth. lich. (Lund): 259 (1814)
= *Cenomyce gonorega* var. *anomaea* (Ach.) Ach., Lich. Univ.: 552 (1810)
= *Cenomyce pityrea* (Flörke) Ach., Syn. meth. lich. (Lund): 254 (1814)
= *Cenomyce pityrea var. scyphifera* Delise, in Duby, Bot. Gall., Edn 2 (Paris) 2: 627 (1830)
= *Cenomyce squamosa* var. *anomaea* (Ach.) Delise, in Duby, Bot. Gall., Edn 2 (Paris) 2: 626 (1830)
= *Cladonia degenerans* f. *anomaea* (Ach.) Flörke, De Cladoniis, Difficillimo lichenum genere, Commentatio nova (Rostock): 43 (1828)
= *Cladonia degenerans* f. *pityrea* (Flörke) Bosch, Prodr. fl. Batav., Fungi: 143 (1853)
= *Cladonia degenerans* var. *anomaea* (Ach.) Rabenh., Deutschl. Krypt.-Fl. (Leipzig) 2(1): 105 (1845)
= *Cladonia degenerans* var. *furfuracea* Fr. ex Flot., Übers. Arbeiten Veränd. Schles. Ges. Vaterl. Cult. [27]: 32 (1849)
= *Cladonia degenerans* var. *pityrea* (Flörke) Schaer., Lich. helv. spicil. 6: 304 (1833)
= *Cladonia fastigiata* (Delise) Zopf, Hedwigia 35: 323 (1896)
= *Cladonia furcata* f. *isignyi* (Delise ex Nyl.) Boistel, Nouv. Fl. Lich. (Paris) 2: 12 (1903)
= *Cladonia furcata* subf. *lamarckii* (Delise ex Nyl.) Boistel, Nouv. Fl. Lich. (Paris) 2: 12 (1903)
= *Cladonia isignyi* (Delise ex Nyl.) Nyl., in Hue, Rev. Bot. 5: 28 (1886) [1886-87]
= *Cladonia lamarkii* Delise ex Nyl., Flora, Regensburg 58: 447 (1875)
= *Cladonia lamarkii* f. *isignyi* Delise ex Nyl., Flora, Regensburg 58: 447 (1875)
= *Cladonia lepidula* var. *foliolosa* Müll. Arg., Flora, Regensburg 66(2): 19 (1883)
= *Cladonia leucocephala* Müll. Arg., Flora, Regensburg 74(1): 110 (1891)
= *Cladonia pityrea* (Flörke) Fr., Nov. Sched. Critic. Lich. (Lundae): 21 (1826)
= *Cladonia pityrea* f. *hololepis* (Flörke) Cromb., Grevillea 15(no. 74): 44 (1886)

= *Cladonia pityrea* f. *lamarckii* (Delise ex Nyl.) Sandst., Rabenh. Krypt.-Fl., Edn 2 (Leipzig) 9(4.2): 472 (1931)
= *Cladonia pityrea* f. *scyphifera* (Delise) Vain., Acta Soc. Fauna Flora fenn. 10: 354 (1894)
= *Cladonia pityrea* var. *foliolosa* (Müll. Arg.) Müll. Arg., Flora, Regensburg 69(16): 253 (1886)
= *Cladonia pityrea* var. *hololepis* Flörke, De Cladoniis, Difficillimo lichenum genere, Commentatio nova (Rostock): 83 (1828)
= *Cladonia pityrea* var. *scyphifera* (Delise) Kieff., Bull. Soc. Hist. Nat. Metz 19: 28 (1895)
= *Cladonia pyxidata* * *pityrea* (Flörke) Nyl., Not. Sällsk. Fauna et Fl. Fenn. Förh., Ny Ser. 5: 50 (1861)
= *Cladonia pyxidata* subsp. *pityrea* (Flörke) Th. Fr., Lich. Scand. (Upsaliae)(1): 90 (1871)
= *Cladonia pyxidata* subvar. *squamulosa* Mudd,: 17 (1865)
= *Cladonia pyxidata* var. *pityrea* (Flörke) Leight., Lich.-Fl. Great Brit. Irel. Chann. Isl.: 60 (1871)
= *Cladonia sparassa* f. *anomaea* (Ach.) M. Choisy, Bull. mens. Soc. linn. Lyon 20: 12 (1951)
= *Cladonia squamosa* f. *anomaea* (Ach.) Kovář, Věstn. Klubu Přírod. Prostějov 5: 140 (1912)
= *Cladonia squamosa* var. *anomaea* (Ach.) Linds., Trans. & Proc. Bot. Soc. Edinb. 22: 160 (1861)
= *Cladonia squamosa* var. *pachypoda* Müll. Arg., Bull. Herb. Boissier 4: 88 (1896)
= *Lichen anomaeus* (Ach.) Sm., in Smith & Sowerby, Engl. Bot. 26: tab. 1867 (1808)
= *Lichen ramulosus* With., Bot. arr. veg. Gr. Brit. (London) 2: 723 (1776)
= *Scyphophorus anomaeus* (Ach.) Hook., Engl. Fl., Mosses, Hepaticae, Lichens, Characeae and Algae (London) 5(1): 238 (1833)

[VZ1768], Cuba, Prov. Habana, Sierra del Rosario, Las Terrazas, in septentriones et orientem ab Esación, 300 m,in pluviisilva umbrosa. Leg. T. Pócs et D. Reyes (9042), 26.10.1978, det. T. Ahti. EX A, VěZDA LICHENES SELECTI EXSICCATI NR. 1768.

Primary thallus persistent, consisting of small, im- bricate, ascending squamules 2-4 x 0.5-2 mm, crenulate at margins, slightly granulose. Podetia slender, 0.8-2 cm tall, 0.3-0.8 mm thick, greenish gray, browning somewhat in very exposed habitats, not melanotic, at first unbran-

ched, subulate or blunt, but each podetium soon developing a single (rarely more), very narrow (0.5-1.5 mm, rarely to 4 mm), shallow scyphus, which readily forms stipitate hymenial disks so that the podetium appears branched at tips (occasionally some dichotomous branching may take place before the scyphus develops); branchlets terete to flattened; scyphus usually disappears in the course of development into a fertile podetium, on which it is often seen as a lateral, rudimentary cup with a few empty conidiomata. Surface at first rather loosely granulose, corticate granules resembling soredia, but when mature (fertile) the podetial surface is more continuously corticate but still rough and verrucose, without a distinct smooth basal zone, usually not or only very slightly squamulose, sometimes densely microsquamulose. Podetial wall rather firm, 100-150 µm; cortex 0-20 µm; medulla 10-40 µm; stereome 90 - 120 µm, distinctly delimited; surface of central canal grooved. Conidiomata common, ca. 200-220 x 100-200 µm, present both on basal squamules and at tips of podetia, more frequently on or near margins of scyphi, black, pyriform to subspherical, strongly constricted at base, sessile to shortly stalked, containing hyaline slime; conidia 7 x 1 µm, falciform. Hymenial disks frequent, forming on most podetia at an early stage (primordia with trichogynes seen on very short young podetia and on scyphus margins), 1-10 on each, medium to dark brown, on stalks 1-4 x to 2 mm; spores fairly abundant and large, fusiform, 15-17 x 2.5-3.5 µm. Illustration. Fleig et al., 1995: fig. 29. Chemistry. P+ red, K-. Fumarprotocetraric acid and trace amounts of protocetraric and confumarprotocetraric acids, more rarely convirensic acid. Distribution: Widespread in the Neotropics, but mainly recorded from Central America, southeast Brazil, Paraguay, and Uruguay. In open habitats, such as sand dunes and road banks, often forming extensive colonies, rarely on wood. From sea level to at least 1600 m (Minas Gerais). A widespread temperate to tropical species. *Cladonia ramulosa* is a widespread, variable species that is difficult to characterize and deserves further taxonomic study. The populations in southeast Brazil and surrounding areas are possibly somewhat different in being usually abundantly fertile and having very narrow, rudimentary scyphi on the fertile podetia. However, highly fertile specimens from Europe are very similar.

Cladonia anomaea

Cladonia anomaea

Cladonia anomaea

Cladonia cyanipes (Sommerf.) Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 95 (1858) [1857]
= *Cenomyce carneopallida var. cyanipes* Sommerf. 1826

[VT1771], Suecia. Härjedalen: Tännäs Peroecia, prope deversorium Ramundberger, 700 m. Supra tectum horrei vetusti. Leg. R. Santesson (no. 28745), 29.7.1979. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1771.

Primary thallus squamulose, the squamules usually ephemeral, small to middle-sized, up to 6 mm long (usually much less) and c. 1 mm broad, narrowly laciniate, crenate, ascending, yellowish green above, white or yellowish-white below, the underside often sorediate. Podetia yellowish-green in upper part, greyish-green below, often with a necrotic, blue-black base, bacilliform, 2-5(-8 cm) tall, 0.5-2 mm thick, usually cupless or rarely with narrow cups, non squamulose, thin and elongate, simple or sparingly branched above, covered with farinose soredia tending to fall off easily, leaving wide naked areas. Apothecia infrequent at the tip of the podetia, very pale ochraceous brown to yellowish brown, convex. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia pale brown, at the tips of podetia, subcylindrical to ovoid, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC+ yellow, P-, UV- or UV+ faintly white. Chemistry: usnic, barbatic and 4-0-demethylbarbatic acids, and occasionally zeorin. - Note: a mainly boreal-montane, perhaps circumpolar species found in open heaths and forest glades amongst bryophytes and on organic soil, much more rarely on wood, in areas with siliceous substrata near and above treeline.

Cladonia cyanipes

Cladonia cyanipes

Cladonia dimorphoclada Robbins, in Sandstead, Cladon. Exsicc. 13: no. 1882 (1929)

[VZ2106], USA, Illinois. Pope County: Ad meridiem et orientem versus ab Eddyville, prope locum dictum Indian Kitchen. Ad saxum arenareum horizontalem. Leg. W. L. Culberson (no. 19720) - Annot.: Usnic acid by TLC; anal. A. Johnson et C.F. Culberson. Ex A. VěZDA LICHENES SELECTI EXSICCATI NR. 2106.

Primary thallus not seen. Podetia 1-5 cm tall, 0.4- 2 mm thick, pale yellowish green, with tips very little browned, forming branched, loose colonies; branching type irregular, anisotomic dichotomy and trichotomy, often with many short outgrowths; axils usually closed, in old podetia occasionally perforated; fertile podetia much thicker, with expanded apical whorls of branchlets that resemble scyphi; in sterile podetia apices acute, rather slender, erect, producing minute needlelike crystals on the surface after preservation in herbarium. Surface matt to slightly shiny, pruinose near tips, uneven, maculate, areolate but not cracked. Podetial wall 150-250 µm; cortex rudimentary, 7-12(- 25) µm; medulla 60-170 mm; stereome represented by a network of separate strands, often 70-80 µm in diam., not continuously surrounding inner cavity; in interior surface strands are visible as network of narrow, smooth bands, with spaces between appearing rough or arachnoid. Conidiomata terminal, containing hyaline slime; details not studied. Hymenial disks infrequent, pale brown; spores not seen. Chemistry. P-, K-. Usnic acid. An unknown terpenoid compound deposited as crystals at tips of podetia. A psoromic-acid chemotype is known from North Carolina, South Carolina, Georgia, New Jersey, and New York, and a squamaticacid chemotype from Alabama (R. C. Harris, in litt.). Distribution: Mexico and Cuba, rare. Eastern United States, from Florida to Maine, west- ward to Arkansas, Missouri, and Wisconsin, mainly on sandy soils. In Mexico on sandstone rocks, in Cuba on littoral white sand. - This species is a member of a still poorly under- stood complex of taxa around *Cladonia caroliniana* Tuckerman and *C. uncialis*, concentrated in the south- east United States. One of them, *C. psoromica*, is here reduced to a psoromic-acid strain of *C. dimorphoclada*.

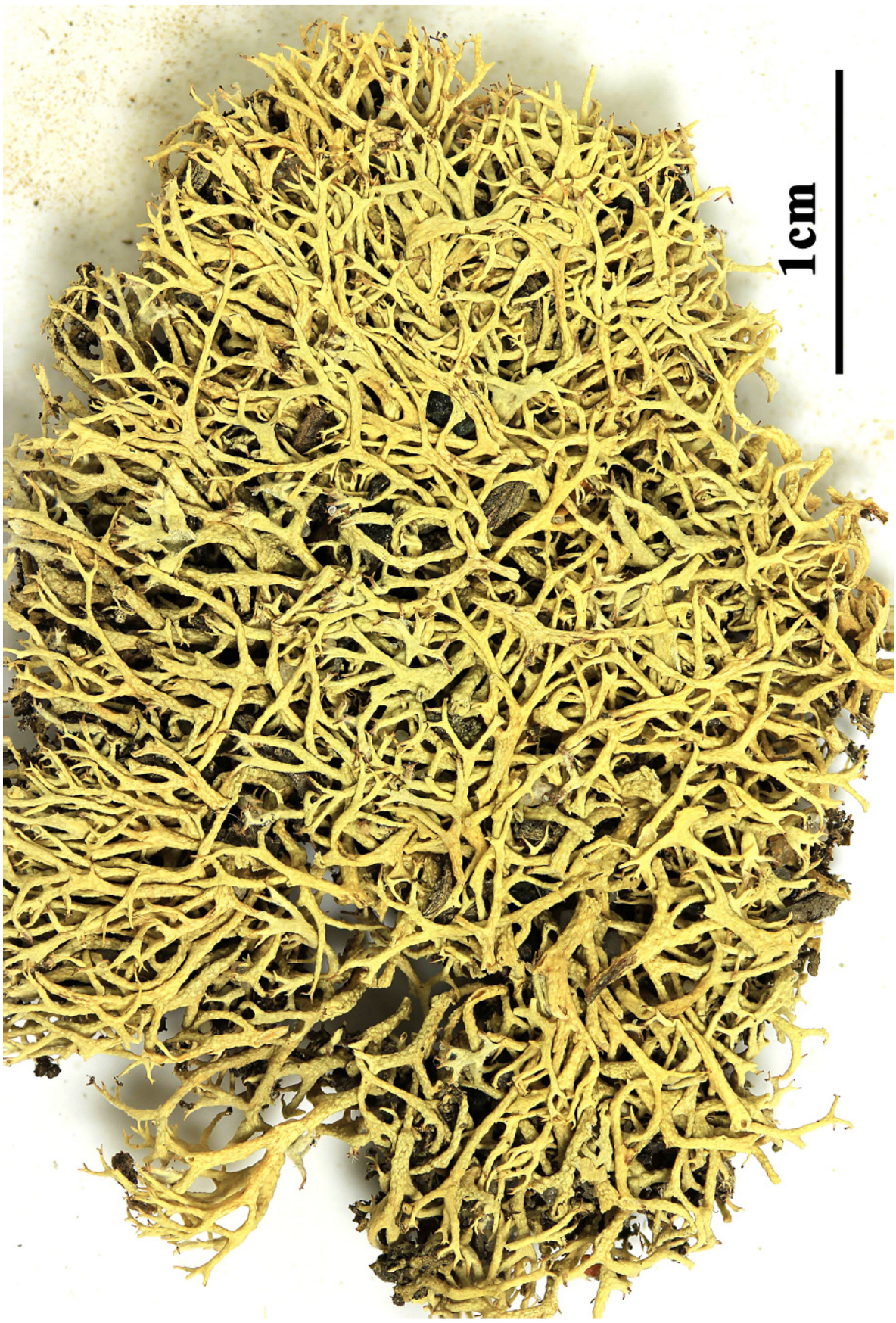
Cladonia dimorphoclada

Cladonia dimorphoclada

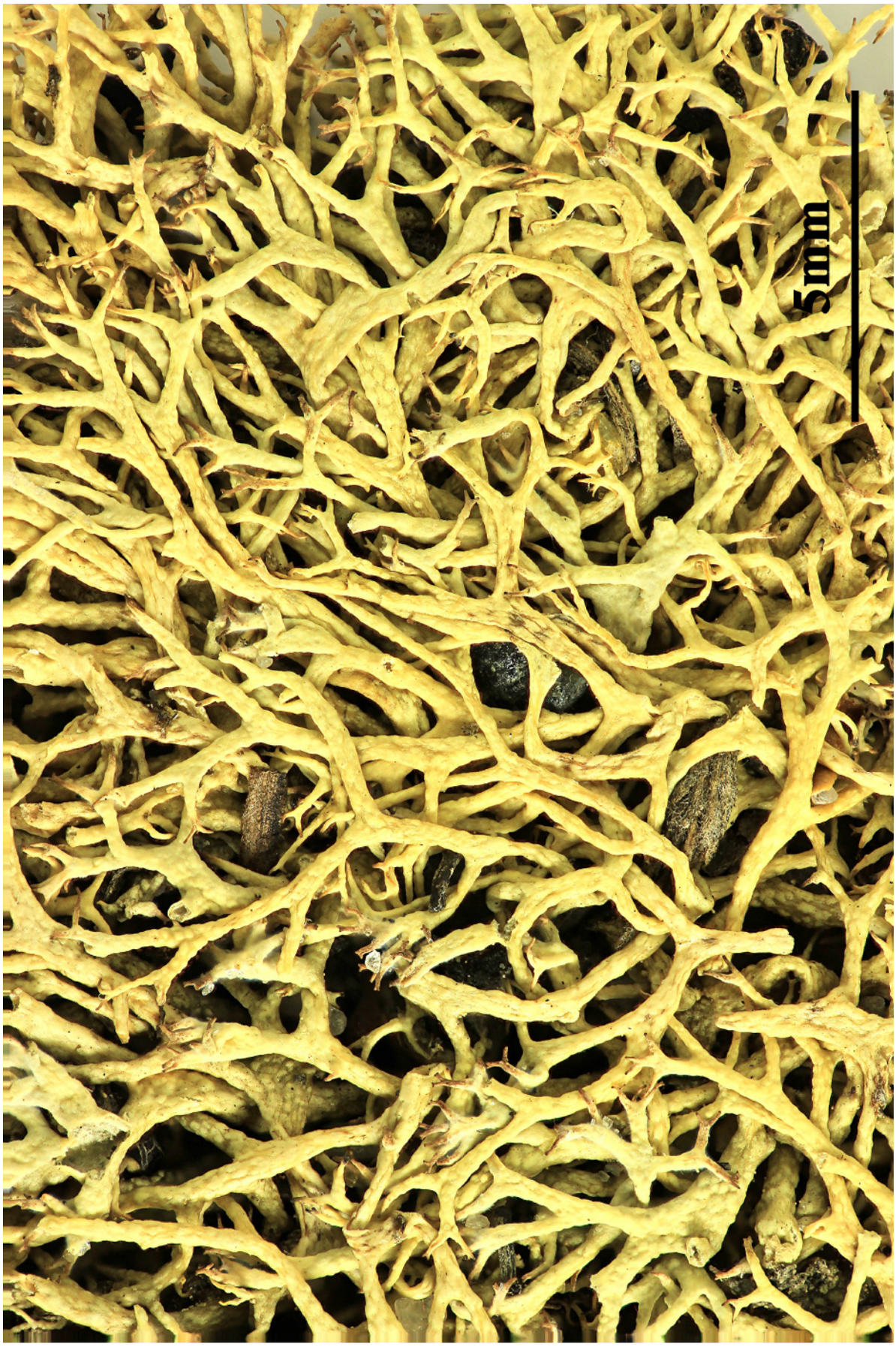
Cladonia dimorphoclada Robbins, in Sandstead, Cladon. Exsicc. 13: no. 1882 (1929)

[VZ2133], USA, New Jersey, Burlington County: Inter Green Bank et Chatsworth, secus viam dictam Route 563. Ad terram arenariam locis apricis. Leg. W. L. Culberson (no. 20115), 9.8.1986. - Annoz.: Usnic acid and a trace of an unidentified aliphatic compound by TLC; anal.: C. F. Culberson and A. Johnson. - EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2133.

Primary thallus not seen. Podetia 1-5 cm tall, 0.4- 2 mm thick, pale yellowish green, with tips very little browned, forming branched, loose colonies; branching type irregular, anisotomic dichotomy and trichotomy, often with many short outgrowths; axils usually closed, in old podetia occasionally perforated; fertile podetia much thicker, with expanded apical whorls of branchlets that resemble scyphi; in sterile podetia apices acute, rather slender, erect, producing minute needlelike crystals on the surface after preservation in herbarium. Surface matt to slightly shiny, pruinose near tips, uneven, maculate, areolate but not cracked. Podetial wall 150-250 µm; cortex rudimentary, 7-12(- 25) µm; medulla 60-170 mm; stereome represented by a network of separate strands, often 70-80 µm in diam., not continuously surrounding inner cavity; in interior surface strands are visible as network of narrow, smooth bands, with spaces between appearing rough or arachnoid. Conidiomata terminal, containing hyaline slime; details not studied. Hymenial disks infrequent, pale brown; spores not seen. Chemistry. P-, K-. Usnic acid. An unknown terpenoid compound deposited as crystals at tips of podetia. A psoromic-acid chemotype is known from North Carolina, South Carolina, Georgia, New Jersey, and New York, and a squamaticacid chemotype from Alabama (R. C. Harris, in litt.). Distribution: Mexico and Cuba, rare. Eastern United States, from Florida to Maine, west- ward to Arkansas, Missouri, and Wisconsin, mainly on sandy soils. In Mexico on sandstone rocks, in Cuba on littoral white sand. - This species is a member of a still poorly under- stood complex of taxa around *Cladonia caroliniana* Tuckerman and *C. uncialis*, concentrated in the south- east United States. One of them, *C. psoromica*, is here reduced to a psoromic-acid strain of *C. dimorphoclada*.



Cladonia dimorphoclada

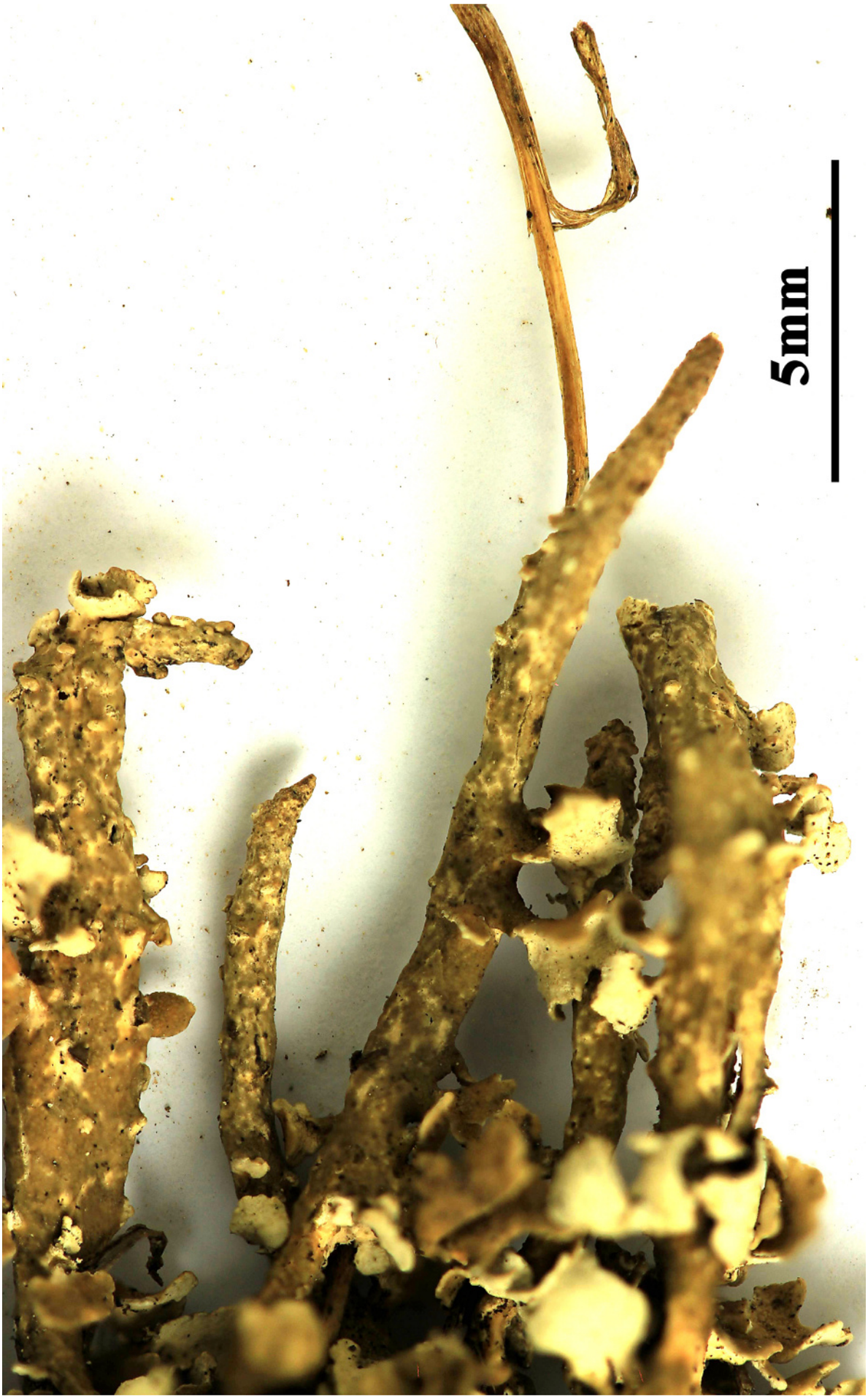


Cladonia dimorphoclada

Cladonia ecmocyna (Ach.) Leight., Ann. Mag. nat. Hist., Ser. 3 18: 406 (1866)
= *Cenomyce ecmocyna* Ach., Lich. Univ.: 549 (1810)
= *Cladonia elongata* var. *ecmocyna* (Ach.) Räsänen, Ann. Mo. bot. Gdn 20: 18 (1933)
= *Cladonia gracilis* var. *ecmocyna* (Ach.) Vain., Acta Soc. Fauna Flora fenn. 10: 125 (1894)
= *Scyphophorus ecmocynus* (Ach.) Gray [as 'Scyphophora'], Nat. Arr. Brit. Pl. (London) 1: 421 (1821)

[VZ2111], Bohemoslovacia. Slovacia septentrionalis, Carpates, Tatra Magna: in parte superiore vallis Hlinská dolina, 2080 m. Ad terram humosam in *Saliceto herbaceae*. Leg. E. Farkas, Z. Kyselová et A. Vězda, 25.6.1986. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2111.

Primary thallus squamulose, ephemeral, the squamules middle-sized, 1-4(-5) mm long, greenish brown to greenish grey above, pure white beneath. Podetia elongate, hollow inside, dull glaucous green, greenish grey or greenish brown in sun-forms, sometimes browned or weakly pruinose at the tips, often yellowish at the emorient bases, 5-10 cm tall, 0.5-4(-5) mm thick, cupless or with narrow (1.5-5 mm wide) cups, esquamulose or sparsely squamulose in lower parts, the cortex subcontinuous to checkered-areolate, the areoles often separated by a network of white medullary interspaces. Apothecia rare, brown to almost black, convex, developing along the margins of cups. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, pyriform, semi-immersed along the margins of the cups, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K+ instantly yellow, C-, KC-, P+ red; yellow pigment at the base K+ red. Chemistry: atranorin, fumarprotocetraric acid, and terpenoids. - Note: a mainly boreal-montane to subarctic-subalpine, circumpolar lichen found on organic soil and amongst bryophytes in cool depressions with a late snow lie near or above treeline.



Cladonia ecmocyna

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= *Cladonia elongata* var. *ecmocyna* (Ach.) Räsänen, Ann. Mo. bot. Gdn 20: 18 (1933)
= *Cladonia gracilis* var. *ecmocyna* (Ach.) Vain., Acta Soc. Fauna Flora fenn. 10: 125 (1894)
= *Scyphophorus ecmocynus* (Ach.) Gray [as 'Scyphophora'], Nat. Arr. Brit. Pl. (London) 1: 421 (1821)

[VZ1957], Groenlandia occidentalis. Disko:Lyngmark, ad latera australia montis Lyngmarksfield, 100-150 m. In angello nivium diu persistentium. Leg. J. Poelt et H. Ullrichj, 256.7.1983, det. J. Poelt. EX A. VEZDA ěLICHENES SELECTI EXSICCTI NR. 1957.

Primary thallus squamulose, ephemeral, the squamules middle-sized, 1-4(-5) mm long, greenish brown to greenish grey above, pure white beneath. Podetia elongate, hollow inside, dull glaucous green, greenish grey or greenish brown in sun-forms, sometimes browned or weakly pruinose at the tips, often yellowish at the emorient bases, 5-10 cm tall, 0.5-4(-5) mm thick, cupless or with narrow (1.5-5 mm wide) cups, esquamulose or sparsely squamulose in lower parts, the cortex subcontinuous to checkered-areolate, the areoles often separated by a network of white medullary interspaces. Apothecia rare, brown to almost black, convex, developing along the margins of cups. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, pyriform, semi-immersed along the margins of the cups, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K+ instantly yellow, C-, KC-, P+ red; yellow pigment at the base K+ red. Chemistry: atranorin, fumarprotocetraric acid, and terpenoids. - Note: a mainly boreal-montane to subarctic-subalpine, circumpolar lichen found on organic soil and amongst bryophytes in cool depressions with a late snow lie near or above treeline.

Cladonia ecmocyna

Cladonia ecmocyna

Cladonia evansii Abbayes 1939
= *Cladina evansii* (Abbayes) Hale & W.L. Culb., Bryologist 73(3): 510 (1970)

[VZ1684], Cuba. Oriente. Prov. Holguin, ad latera septentronalia montis Cerro Galano, 200-300 m. Ad terram serpentinaceam in silva clara. Leg. T. Pócs (no. 9025) et L. Catasús, 18.10.1978, det. A. Vězda. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1684.

Podetia whitish to ashy gray, occasionally with some yellowish tint (best seen in fresh condition), with apical branchlets never conspicuously browned, 3-6 cm tall, extremely densely branched, with rounded heads 2-6 cm wide; branching type very regular dichotomous to (infrequently) trichotomous isotomy; no main axis distinguishable; axils not usually perforated; mature internodes 1-2 mm long; ultimate branchlets bluntish, diverging at a wide angle. Surface layer lax, algal glomerules almost invisible in dry podetia. Podetial wall 80-100 µm; ectal layer 20-40 µm, stereome 50-70 µm; central canal smooth, shiny. Conidiomata globose to ovoid, containing hyaline slime; conidia not studied. Hymenial disks infrequent, 0.5 mm wide, brown; spores not observed. Chemistry: P-, K+ yellow. Perlatolic acid, anziaic acid (trace), atranorin, an unknown red pigment, and trace amounts of unidentified substances, including fatty acids; usnic acid occasionally present n low amounts. Distribution: On open sandy soils and serpentinic gravel at low elevations, rarely on prostrate logs, often in pine woodlands, especially in Prov. Santiago de Cuba, in Cuba, and in the Bahama Archipelago. Outside the area in Florida, Louisiana, Alabama, Mississippi, Georgia, South Carolina, North Carolina, and New York. - *Cladina evansii* is easily recognized by its conspicuous colonies of hemispherical, almost white podetia. The pale yellow color form (containing usnic acid) was recognized by Ahti (1984) as *f. icterica* (Abbayes) Ahti.

Cladonia evansii

Cladonia evansii

Cladonia furcata (Huds.) Baumg., Fl. Lips.: 577 (1790)
= *Baeomyces furcatus* (Huds.) Ach., Methodus, Sectio post. (Stockholmiæ): 357 (1803)
= *Baeomyces spinosus* var. *palamaeus* Ach., Methodus, Sectio post. (Stockholmiæ): 359 (1803)
= *Capitularia furcata* (Huds.) Mart., Fl. crypt. erlang. (Nürnberg): 272 (1817)
= *Cenomyce furcata* (Huds.) Ach., K. Vetensk-Acad. Nya Handl. 31: 302 (1810)
= *Cladonia fruticosa* var. *furcata* (Huds.) Schaer., Lich. helv. spicil. 1: 41 (1823)
= *Cladonia furcata* f. *palamaea* (Ach.) Arnold, Verh. Kaiserl.-Königl. zool.-bot. Ges. Wien 30: 115 (1881) [1880]
= *Cladonia furcata* f. *pinnata* (Vain.) M. Choisy, Bull. mens. Soc. linn. Soc. Bot. Lyon 20: 14 (1951)
= *Cladonia furcata* subsp. *pinnata* (Vain.) Fink, Contr. U.S. natnl. Herb. 14(1): 118 (1910)
= *Cladonia furcata* subsp. *subrangiformis* (L. Scriba ex Sandst.) Pišút, Acta Facultatis Rerum Naturalium Universitatis Comenianae, Botanica 6: 525 (1961)
= *Cladonia furcata* subvar. *pinnata* (Vain.) Maheu, Bull. Soc. Bot. France 54(4): 235 (1907)
= *Cladonia furcata* var. *cancellata* Müll. Arg., Flora, Regensburg 65(19): 296 (1882)
= *Cladonia furcata* var. *palamaea* (Ach.) Nyl., in Vainio, Acta Soc. Fauna Flora fenn. 4(no. 1): 347 (1887)
= *Cladonia furcata* var. *pinnata* Vain., Acta Soc. Fauna Flora fenn. 4(no. 1): 332 (1887)
= *Cladonia furcata* var. *subrangiformis* (L. Scriba ex Sandst.) Hennipman, Persoonia 4(4): 427 (1967)
= *Cladonia furcata var. tenuicaulis* Müll. Arg., Flora, Regensburg 65(19): 295 (1882)
= *Cladonia glauca* f. *furcata* (Huds.) Kieff., Bull. Soc. Hist. Nat. Metz 19: 24 (1895)
= *Cladonia narkodes* Kremp., Verh. Kaiserl.-Königl. zool.-bot. Ges. Wien 30: 330 (1881) [1880]
= *Cladonia palamaea* (Ach.) Fink, Lich. Fl. U.S.: 255 (1935)
= *Cladonia pinnata* (Vain.) Anders, Beih. Botan. Centralbl., Abt. B 54: 451 (1936)
= *Cladonia scabriuscula* f. *cancellata* (Müll. Arg.) Sandst., Rabenh. Krypt.-Fl., Edn 2 (Leipzig) 9(4.2): 220 (1931)
= *Cladonia subrangiformis* L. Scriba ex Sandst., Abh. naturw. Ver. Bremen 25: 165 (1922)
= *Lichen cornucervi* Neck., Method. Muscor. Illustr. (Upsaliae): 64 (1771)

= *Lichen furcatus* Huds., Fl. Angl.: 458 (1762)
= *Lichen subulatus* var. *furcatus* (Huds.) Huds., Angl., Edn 2: 556 (1778)
= *Scyphophorus furcatus* (Huds.) Trevis., Lichenoth. Veneta 3-4: no. 89 (1869)
= *Verrucaria furcata* (Huds.) Humb., Fl. Friberg. Spec. (Berlin): 41 (1793)

[VZ1616], USA. Virginea. Giles County: Prope laboratorium Mountain Lake Biological Station, in loco dicto Stonehenge, In sxosis arenaceis locis umbrosis. Leg, W. L. Cilberson (no.11182), 7.1963. - Annot.: Fumarprotocetraric and protocetraria acids and a trace of an unidentified substance (possibly salazinic acid) by TLC, anal. C. F. Culberson ans A. Johnson. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1616.

Primary thallus squamulose, the squamules mostly ephemeral, middle-sized, 1-4 mm long, 1-3 mm wide, crenate, ascending, glaucescent above, white beneath. Podetia elongate, hollow inside, anisotomically branched, up to 8(-10) cm tall, 0.7-2 mm thick, greenish-grey to brown in sun-forms, forming irregular and loose tufts, with pointed apices and a smooth surface, sparsely squamulose, the squamules 2-3 mm long and c. 2 mm wide; fertile podetia thicker, often perforate, the tips longitudinally fissurate, flattened, sometimes forming a pseudo-cup with involute margins. Algal layer continuous or forming a mosaic intersected by thin white lines, or dispersed in scattered (not raised) clusters. Apothecia rare, dark brown, convex, sometimes arranged in corymbose clusters. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed on the tips of podetia, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests and chemistry: chemically variable, with the following chemotypes (all of them C-, KC-, UV-): 1) K- or K+ yellowish slowly turning brown, P+ red (fumarprotocetraric acid complex, sometimes with traces of physodalic and/or hypoprotocetraric acids), 2) K- or K+ yellowish slowly turning brown, P+ red (fumarprotocetraric acid complex and bourgeanic acid), 3) K- or K+ yellowish slowly turning brown, P+ red (fumarprotocetraric acid complex, psoromic and conpsoromic acids), 4) K+ yellow sometimes slowly turning brownish, P+ red (atranorin, fumarprotocetraric acid complex), 5) K+ yellow, P+ yellow (atranorin, psoromic and conpsoromic acids), 6) K-, P+ yellow (psoromic and conpsoromic acids), 7) K+

yellow, P– (atranorin and bourgeanic acid, with traces of fumarprotocetraric acid). - Note: a holarctic, temperate to boreal-montane lichen found on soil, amongst mosses, sometimes on bark and lignum, in areas with calcareous or siliceous base-rich rocks, with a wide altitudinal range. The species, in the present circumscription, is heterogeneous.

Cladonia furcata

Cladonia furcata

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= *Baeomyces spinosus* var. *palamaeus* Ach., Methodus, Sectio post. (Stockholmiæ): 359 (1803)
= *Capitularia furcata* (Huds.) Mart., Fl. crypt. erlang. (Nürnberg): 272 (1817)
= *Cenomyce furcata* (Huds.) Ach., K. Vetensk-Acad. Nya Handl. 31: 302 (1810)
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= *Cladonia furcata* f. *palamaea* (Ach.) Arnold, Verh. Kaiserl.-Königl. zool.-bot. Ges. Wien 30: 115 (1881) [1880]
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= *Cladonia furcata* subsp. *subrangiformis* (L. Scriba ex Sandst.) Pišút, Acta Facultatis Rerum Naturalium Universitatis Comenianae, Botanica 6: 525 (1961)
= *Cladonia furcata* subvar. *pinnata* (Vain.) Maheu, Bull. Soc. Bot. France 54(4): 235 (1907)
= *Cladonia furcata* var. *cancellata* Müll. Arg., Flora, Regensburg 65(19): 296 (1882)
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= *Cladonia furcata* var. *pinnata* Vain., Acta Soc. Fauna Flora fenn. 4(no. 1): 332 (1887)
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= *Cladonia scabriuscula* f. *cancellata* (Müll. Arg.) Sandst., Rabenh. Krypt.-Fl., Edn 2 (Leipzig) 9(4.2): 220 (1931)
= *Cladonia subrangiformis* L. Scriba ex Sandst., Abh. naturw. Ver. Bremen 25: 165 (1922)
= *Lichen cornucervi* Neck., Method. Muscor. Illustr. (Upsaliae): 64 (1771)

= *Lichen furcatus* Huds., Fl. Angl.: 458 (1762)
= *Lichen subulatus* var. *furcatus* (Huds.) Huds., Angl., Edn 2: 556 (1778)
= *Scyphophorus furcatus* (Huds.) Trevis., Lichenoth. Veneta 3-4: no. 89 (1869)
= *Verrucaria furcata* (Huds.) Humb., Fl. Friberg. Spec. (Berlin): 41 (1793)

[VZ2137], Venezuela. Estado Mérida: Sierra Nevada de Santo Dominigo, páramo de Mucubají, inter Los Patos et Laguna Negra, 3500 m. Ad terram. Leg. M. Lopez-Figueira (32537), 4.11.1986. Ex A. VěZDA LICHENES SELECTI EXSICCATI NR. 2137.

Primary thallus squamulose, the squamules mostly ephemeral, middle-sized, 1-4 mm long, 1-3 mm wide, crenate, ascending, glaucescent above, white beneath. Podetia elongate, hollow inside, anisotomically branched, up to 8(-10) cm tall, 0.7-2 mm thick, greenish-grey to brown in sun-forms, forming irregular and loose tufts, with pointed apices and a smooth surface, sparsely squamulose, the squamules 2-3 mm long and c. 2 mm wide; fertile podetia thicker, often perforate, the tips longitudinally fissurate, flattened, sometimes forming a pseudo-cup with involute margins. Algal layer continuous or forming a mosaic intersected by thin white lines, or dispersed in scattered (not raised) clusters. Apothecia rare, dark brown, convex, sometimes arranged in corymbose clusters. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed on the tips of podetia, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests and chemistry: chemically variable, with the following chemotypes (all of them C-, KC-, UV-): 1) K- or K+ yellowish slowly turning brown, P+ red (fumarprotocetraric acid complex, sometimes with traces of physodalic and/or hypoprotocetraric acids), 2) K- or K+ yellowish slowly turning brown, P+ red (fumarprotocetraric acid complex and bourgeanic acid), 3) K- or K+ yellowish slowly turning brown, P+ red (fumarprotocetraric acid complex, psoromic and conpsoromic acids), 4) K+ yellow sometimes slowly turning brownish, P+ red (atranorin, fumarprotocetraric acid complex), 5) K+ yellow, P+ yellow (atranorin, psoromic and conpsoromic acids), 6) K-, P+ yellow (psoromic and conpsoromic acids), 7) K+ yellow, P– (atranorin and bourgeanic acid, with traces of fumarproto-

cetraric acid). - Note: a holarctic, temperate to boreal-montane lichen found on soil, amongst mosses, sometimes on bark and lignum, in areas with calcareous or siliceous base-rich rocks, with a wide altitudinal range. The species, in the present circumscription, is heterogeneous.

Cladonia furcata

Cladonia furcata

Cladonia grayi G. Merr. ex Sandst., Cladon. Exsicc.: no. 1847 (1929)
= *Cladonia chlorophaea var. grayi* (G. Merr. ex Sandst.) P.A. Duvign., Bull. Soc. R. Bot. Belg. 70: 39 (1937)
= *Cladonia pyxidata subsp. grayi* (G. Merr. ex Sandst.) V. Wirth, Stuttg. Beitr. Naturk., Ser. A (Biol.) 517: 62 (1994)

[VZ2134], USA. Carolina Borealis, Mitcheli County: In monte Roan Montain, loco Round Bald dicto, secus viam Appalachian Trail, 1760 m. Supra muscos et plantas destrctas in prato aprico. Leg. W. L. Culberson (no. 19971) et C. F. Culberson, 8.7.1984. - Annot.: Grayanic acid, 4-O-demethylgrayanic acid (trace), fumarprotocetraric acid, and fain traces of protocetraric acid, unknown compound Cph-2 an unidentified aliphatic acid; anal. C.F. Culberson and A. Johnson. EX A. V ěZDA LICHENES SELECTI EXSICCATI NR. 2134.

Primary thallus squamulose, usually persistent, forming a small crust, the squamules ascendent, small to middle-sized, 1-2(-3) mm, crenulate, white beneath. Podetia goblet-shaped, hollow inside, brownish-green to brownish grey, 0.5-2(-3) cm tall, 0.5-1.5 mm thick, with broad (up to 7 mm), subglobose cups gradually tapering to a rather long stalk, regular or proliferating marginally, abundantly covered with granular soredia immixed with schizidia and phyllidia (40-130 µm in diam.), especially in upper parts and inside the cups, the stalk corticate and often microsquamulose at least in lower parts. Apothecia infrequent, on the margin of the cups, brown, convex, usually stalked. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed along the margins of cups, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC-, P- or P+ red, UV+ ice-blue. Chemistry: grayanic acid (major), sometimes with congrayanic and demethylgrayanic acids, or with additional fumarprotocetraric acid. - Note: a holarctic, rather northern representative of the *C. pyxidata-chlorophaea*-complex found on soil rich in humus, peat and rotting wood, more rarely on bark at the base of trunks, in upland areas.

Cladonia grayi

Cladonia grayi

Cladonia grayi G. Merr. ex Sandst., Cladon. Exsicc.: no. 1847 (1929)
= *Cladonia chlorophaea var. grayi* (G. Merr. ex Sandst.) P.A. Duvign., Bull. Soc. R. Bot. Belg. 70: 39 (1937)
= *Cladonia pyxidata subsp. grayi* (G. Merr. ex Sandst.) V. Wirth, Stuttg. Beitr. Naturk., Ser. A (Biol.) 517: 62 (1994)

[VZ1806}, USA. North Carolina. Columbus County: 6.5 km ad meridiem et orientem versus a Tabor City. Ad terram arenariam. Leg. W. L. Culberson (no. 18588) et C. F. Culberson, 25.4.1981. Annot.: Grayanic acid and traces of several unidentified compounds including a fatty acid.; amal. A. Johnson and C. F. Culbersun. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1806.

Primary thallus squamulose, usually persistent, forming a small crust, the squamules ascendent, small to middle-sized, 1-2(-3) mm, crenulate, white beneath. Podetia goblet-shaped, hollow inside, brownish-green to brownish grey, 0.5-2(-3) cm tall, 0.5-1.5 mm thick, with broad (up to 7 mm), subglobose cups gradually tapering to a rather long stalk, regular or proliferating marginally, abundantly covered with granular soredia immixed with schizidia and phyllidia (40-130 µm in diam.), especially in upper parts and inside the cups, the stalk corticate and often microsquamulose at least in lower parts. Apothecia infrequent, on the margin of the cups, brown, convex, usually stalked. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed along the margins of cups, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC-, P- or P+ red, UV+ ice-blue. Chemistry: grayanic acid (major), sometimes with congrayanic and demethylgrayanic acids, or with additional fumarprotocetraric acid. - Note: a holarctic, rather northern representative of the *C. pyxidata-chlorophaea*-complex found on soil rich in humus, peat and rotting wood, more rarely on bark at the base of trunks, in upland areas.

Cladonia grayi

Cladonia grayi

Cladonia impexa Harm., Lich. Fr. 3: 232 (1907)
= *Cladonia portentosa* (Dufour) Coem. 1865

[VZ1095], Bohemoslovacia. Moravia occidentalis. Distr. Třebič, in valle fluvii Jilavka prope molam Třebenický mlýn dictam, 370 m. As terram in silva clara. Leg. J. Suza. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1095.

Primary thallus crustose, ephemeral and rarely seen, consisting of subglobular, small warts. Podetia densely branched and shrubby, hollow inside, pale grey, greenish grey or yellowish green, anisotomically (i.e. main branches thicker) (mainly) trichotomously branched, 4-10 cm tall, ecorticate, with an arachnoid-fibrose surface. Main axis usually distinct at least in lower parts, tips of ramifications subulate, often curved, browned or bluish in exposed situations, erect or mostly spreading in all directions, the axils usually open. Apothecia rare, brown, convex. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed on the tips of podetia, with a colourless slime. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests and chemistry: three chemotypes (all of them K-, C-, KC-, UV+ bluish white): 1) P- (perlatolic and usnic acids), 2) P– (perlatolic acid only), 3) P+ red (fumarprotocetraric, perlatolic and usnic acids). Chemotype 3) is known only from oceanic parts of Atlantic Europe. - Note: a mainly cool-temperate, western species found on acid soil in open situations, such as in *Calluna*-heaths or *Corynephorus canescens*-grasslands, more rarely on wood.

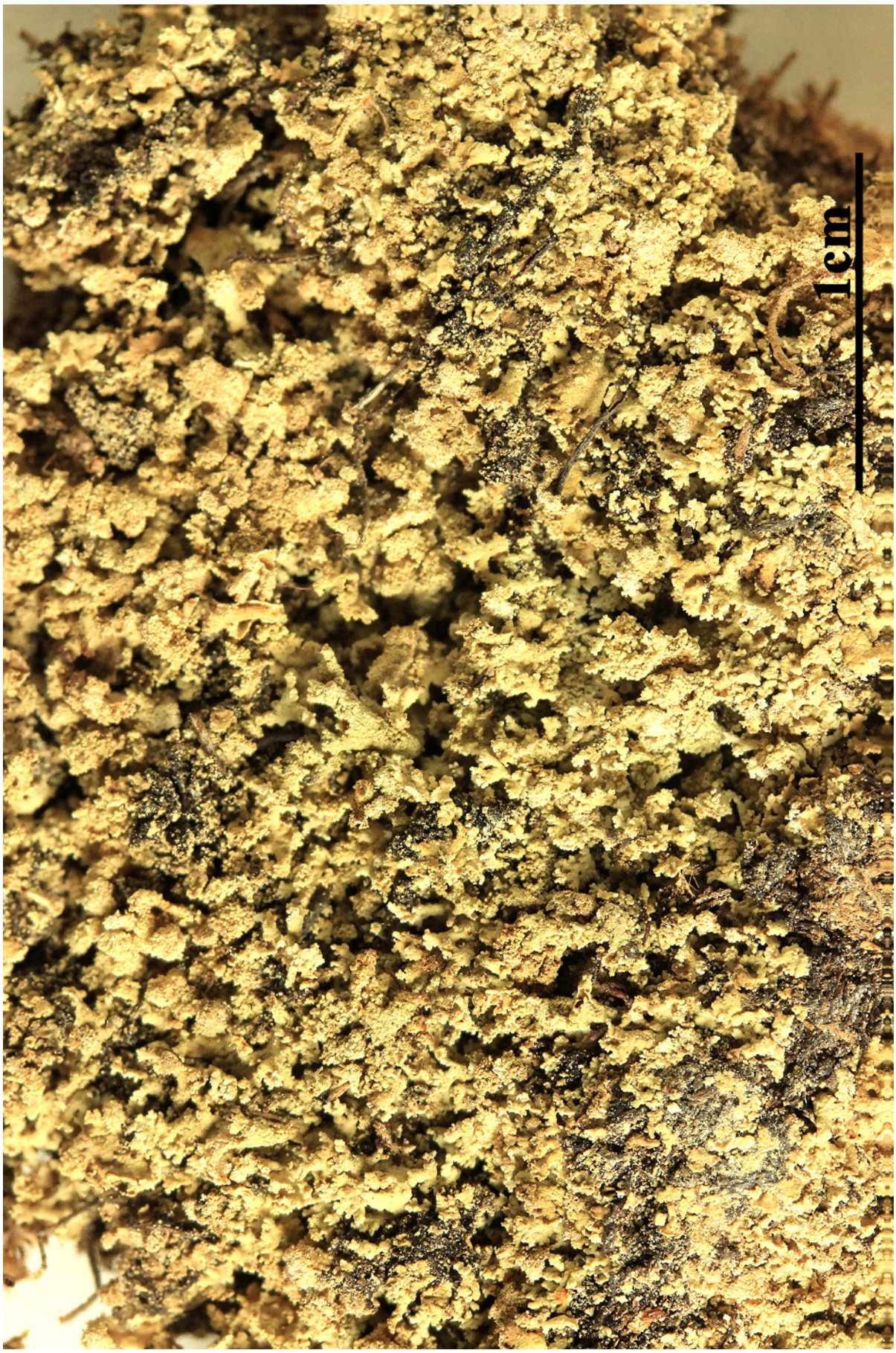
Cladonia impexa

Cladonia impexa

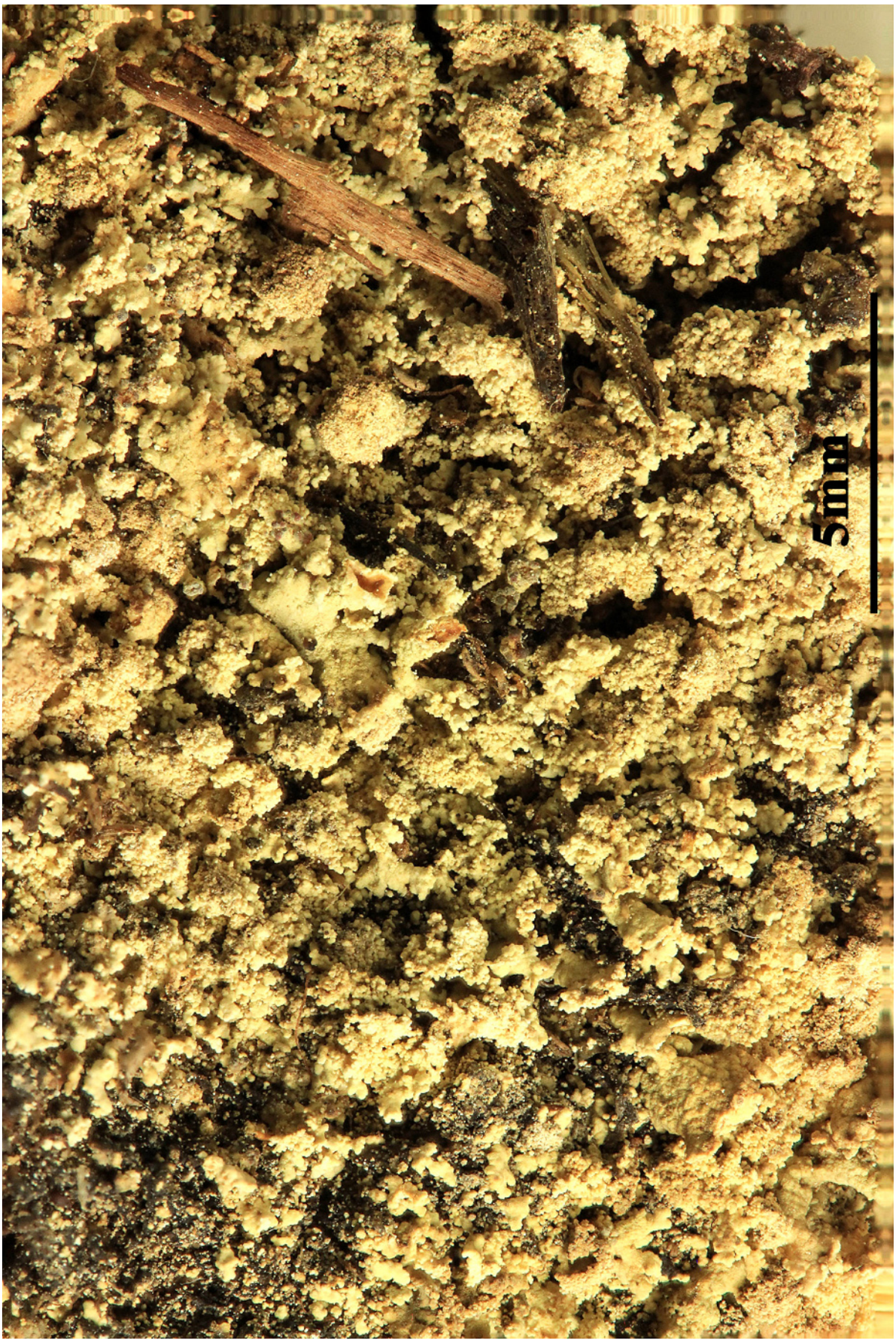
Cladonia incrassata Flörke, Clad. Comm.: 21 (1827)
= *Cladonia brebissonii* f. *incrassata* (Flörke) M. Choisy, Bull. mens. Soc. linn. Soc. Bot. Lyon 24: 213 (1955)
= *Cladonia coccifera* f. *incrassata* (Flörke) Th. Fr., Lich. Scand. (Upsaliae)(1): 71 (1871)
= *Cladonia cornucopioides* var. *incrassata* (Flörke) Fr., Summa veg. Scand., Sectio Prior (Stockholm): 110 (1845)

[VZ1698], Suecia. Värmland: Rudskoga, Iserud, 100 m. Ad latera fossarum, supra terram turfosam. Leg. S. W. Sundell, 24.6.1976. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1698.

Primary thallus squamulose, the squamules very small, 1-3(-4) mm long, 0.9-2 mm wide, crenulate-incised, often contorted, densely sorediate especially along the margins and on the lower surface, sometimes dissolving into greenish to brownish masses of soredia, yellowish green above, white beneath. Podetia rare, yellowish grey in upper part, often orange yellow at the base, usually simple to very sparsely branched in upper part, often deformed, more or less flattened or club-like, 1-4(-7) mm tall, 0.3-1(-2) mm thick (but luxuriant specimens may be up to 3 cm tall and much branched in upper part), with a partly corticate, partly granulose-verruculose, sometimes partly farinose-sorediate surface, rarely squamulose. Apothecia rather rare, scarlet red, at the tips of podetia, often confluent and to 2.5 mm across. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia scarlet red, semi-immersed in the primary squamules, with a red jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC- or KC+ yellow, P-, UV+ white. Chemistry: usnic, squamatic and didymic acids; some rare strains contain also grayanic acid; rhodocladonic acid in apothecia and pycnidia. - Note: a cool-temperate to boreal-montane species with a fragmented circumpolar range, found on peaty and humus-rich soil and on strongly weathered lignum.



Cladonia incrassata



Cladonia incrassata

Cladonia klementii Oxner, Herzogia 1: 142 (1969)
= *Cladonia rangiformis* Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 114 (1796) [1795]
= *Baeomyces rangiformis* (Hoffm.) Hepp, Lich.-Fl. Würzburg: 87 (1824)
= *Capitularia rangiformis* (Hoffm.) Mart., Fl. crypt. erlang. (Nürnberg): 271 (1817)
= *Cenomyce rangiformis* (Hoffm.) Flörke, Deutsche Lich. 1: 12 (1815)
= *Cladina rangiferina* f. *foliosa* (Flörke ex Vain.) Knoche, Flora Balearica, Division: Lichenes (Montpellier): 197-213 (1921)
= *Cladonia aetnensis* Tornab., Atti Accad. Gioenia Sci. Nat. Catania, Ser. II 6: 104 (1850)
= *Cladonia fruticosa* var. *rangiformis* (Hoffm.) Schaer., Lich. helv. spicil. 1: 41 (1823)
= *Cladonia furcata* var. *rangiformis* (Hoffm.) Schaer., Enum. critic. lich. europ. (Bern): 202 (1850)
= *Cladonia pungens* var. *rangiformis* (Hoffm.) Flot., Übers. Arbeiten Veränd. Schles. Ges. Vaterl. Kultur [27]: 116 (1850) [1849]
= *Cladonia rangiferina* f. *foliosa* (Flörke ex Vain.) Pau, Anales de la Sociedad Española de Historia Natural 28: 215 (1899)
= *Cladonia rangiformis* f. *foliosa* (Flörke ex Vain.) H. Olivier, Expos. Lich. Ouest France 1: 70 (1897)
= *Cladonia rangiformis* var. *foliosa* Flörke ex Vain., Acta Soc. Fauna Flora fenn. 4(no. 1): 366 (1887)
= *Scyphophorus rangiformis* (Hoffm.) Trevis., Lichenoth. Veneta 3-4: no. 91 (1869)

[VZ1524], Peria borealis. Rescht, Bandar - Pahlavi, 7 km ad occidentem versus, in litore maris Caspii. Ad terram arenaceam. Leg. J. Soják, 25.6.1977, det. A. Vězda. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1574.

Primary thallus squamulose, persistent in young specimens, then often evanescent, the squamules middle-sized, 2-4 mm long, 1-2 mm wide, ascending or often forming rosettes, grey green above, white beneath. Podetia shrubby, hollow inside, 2-6 cm tall, richly branched, forming dense tufts, greenish grey to whitish grey, with pointed apices (except in fertile specimens) and a corticate, sparsely to densely squamulose surface, without medullary outbursts at the base. Algal layer markedly discontinuous, the algae forming dispersed, raised, green areoles separated by conspicuous white lines. Apothecia rare, terminal, dark brown, convex, sometimes gathered in subcorymbose clusters. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly

blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed on the tips of podetia, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests and chemistry: three chemotypes (all of them C-, KC-, UV-): 1) K+ yellow, P– (atranorin, rangiformic and norrangiformic acids), 2) K+ yellow, P+ red (atranorin, rangiformic, norrangiformic acids and fumarprotocetraric acid complex), 3) K+ yellow, P+ yellow (atranorin, rangiformic and psoromic acids). Chemotype 3) is hitherto known only from Spain and the Balkan Peninsula. - Note: a mainly temperate species found on calciferous to acidic soil in open habitats, with optimum in dry grasslands.

Cladonia klementii

Cladonia klementii

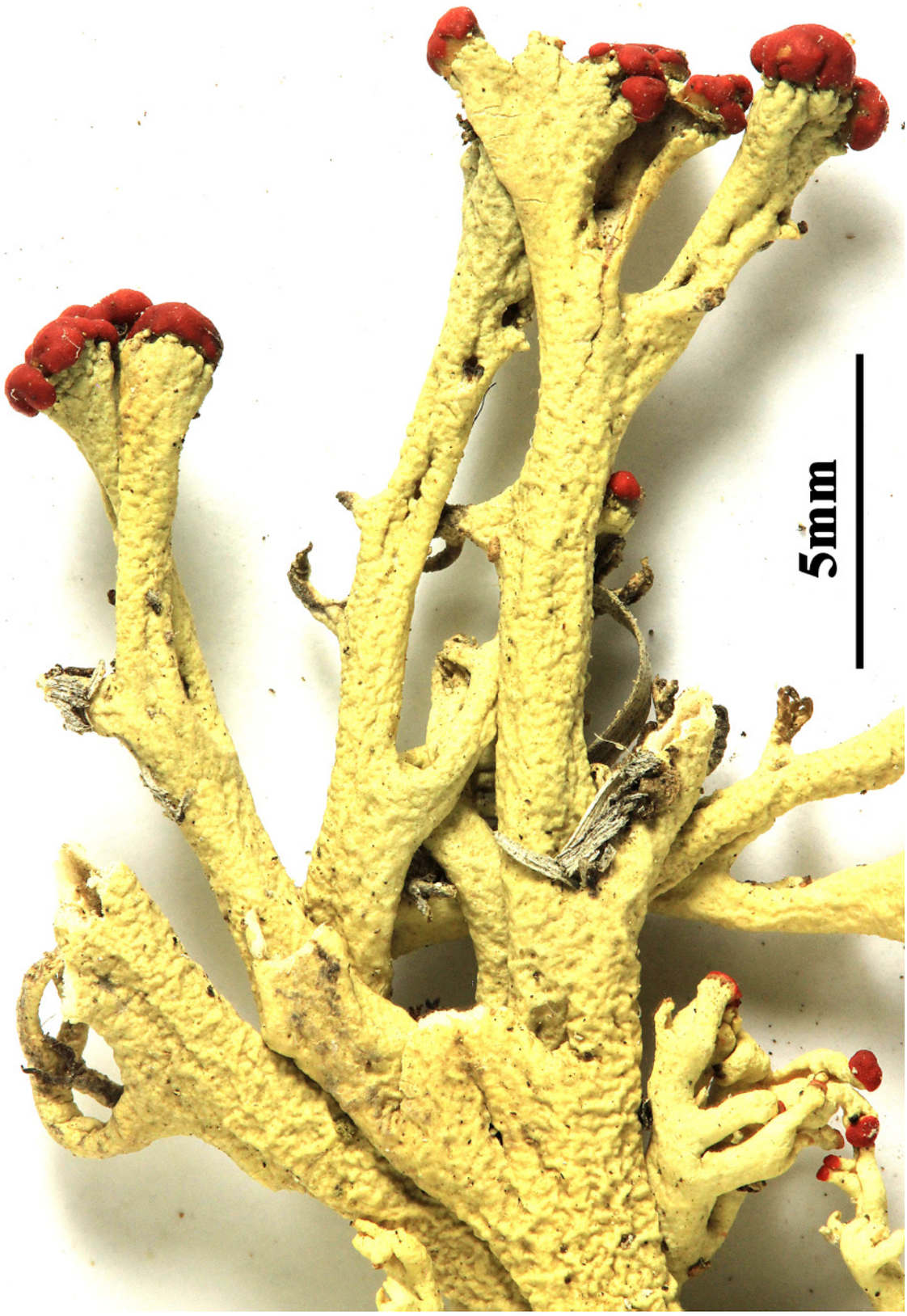
Cladonia klementii

Cladonia leporina Fr., Lich. eur. reform. (Lund): 243 (1831)

[VZ1620], USA. Georgia. Johnson County: prope oppidum Kita. Ad terram arenaceum in silva sparsa (*Quercus laevis*). Leg. W. L. Culberson (no. 17387), 21.8.1978. - Annot.: Usnic, didymic, baemomycetic, squamatic, and rhodocladonic acids by TLC; anal.: C. F. Culberson and A. Johnson. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1620.

Primary thallus evanescent, consisting of squamules, appressed or ascending, entire to spar- ingly lobed, <1 mm long. Podetia 3-5 cm tall, to 3 mm thick, greenish yellow, moderately branched; branching pattern anisotomic dichotomy to polytomy; axils closed or open; ultimate branchlets blunt or pointed. Surface glabrous to usually rugu- lose, especially in basal parts, esorediate; rhizinae sometimes produced at tips or on surface. Podetial wall 150-200 µm; cortex 20-25 mm; medulla 130- 175 µm; stereome absent; central canal covered by loosely interwoven hyphae. Conidiomata terminal, ovoid, not constricted at base, 160-200 µm long, 190-230 µm thick, containing red slime; conidia 7- 10 x 1 µm, falciform. Hymenial disks common, red, 0.7-1.5 mm wide; spores oblong, 7-14 x 2.5-5 µm. Distribution: Western Cuba; Florida to New Jersey, Arkansas, Missouri, and Texas. Usually on sandy soil, also on wood. The podetia may be dislodged and transported by wind and water, and continue their growth elsewhere. In Cuba the localities are often on white sands on the coast or in valleys of the Cordillera de Guaniguanico, where it is a dominant lichen with *Cladina evansii. - Cladonia leporina* is a conspicuous, large species, and a typical representative of the Coastal Plainelement of the southeastern United States. It is unusual among the red-fruited Cladoniae by being tall, branched, and ascyphose, and therefore Evans (1947) placed it in a monotypic series Leporinae A. Evans.

Cladonia leporina

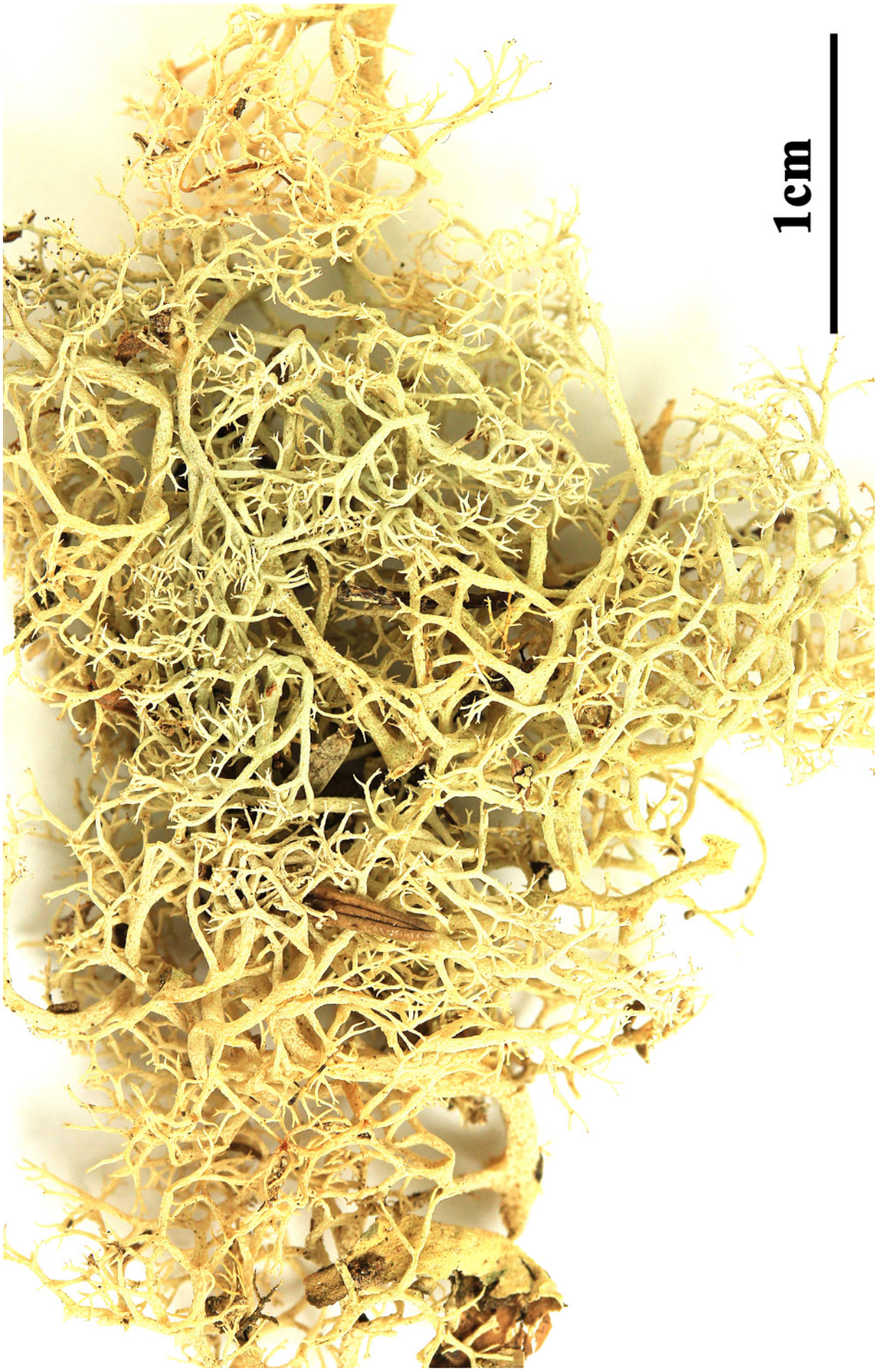


Cladonia leporina

Cladonia macaronesica Ahti, Ann. bot. Soc. Zool.-Bot. fenn. Vanamo 32(no. 1): 37 (1961)
= *Cladonia portentosa* (Dufour) Coëm. Bull. Acad. R. Belg., sér. 2, 19: 43, 1865.
= *Cenomyce portentosa* Dufour - Ann. Gén. Sc. Phys. Bruxelles, 8: 69, 1821.

[VZ2162], Insulae Canarienses. Teneriffa: Sierra de Anaga, loco El Bailadero dicto, 720 m. Ad terram muscosam in laurisilva. Leg. P. L. Nimis, 15.1.1985. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2162.

Primary thallus crustose, ephemeral and rarely seen, consisting of subglobular, small warts. Podetia densely branched and shrubby, hollow inside, pale grey, greenish grey or yellowish green, anisotomically (i.e. main branches thicker) (mainly) trichotomously branched, 4-10 cm tall, ecorticate, with an arachnoid-fibrose surface. Main axis usually distinct at least in lower parts, tips of ramifications subulate, often curved, browned or bluish in exposed situations, erect or mostly spreading in all directions, the axils usually open. Apothecia rare, brown, convex. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed on the tips of podetia, with a colourless slime. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests and chemistry: three chemotypes (all of them K-, C-, KC-, UV+ bluish white): 1) P- (perlatolic and usnic acids), 2) P– (perlatolic acid only), 3) P+ red (fumarprotocetraric, perlatolic and usnic acids). Chemotype 3) is known only from oceanic parts of Atlantic Europe. - Note: a mainly cool-temperate, western species found on acid soil in open situations, such as in *Calluna*-heaths or *Corynephorus canescens*-grasslands, more rarely on wood.



Cladonia macaronesica

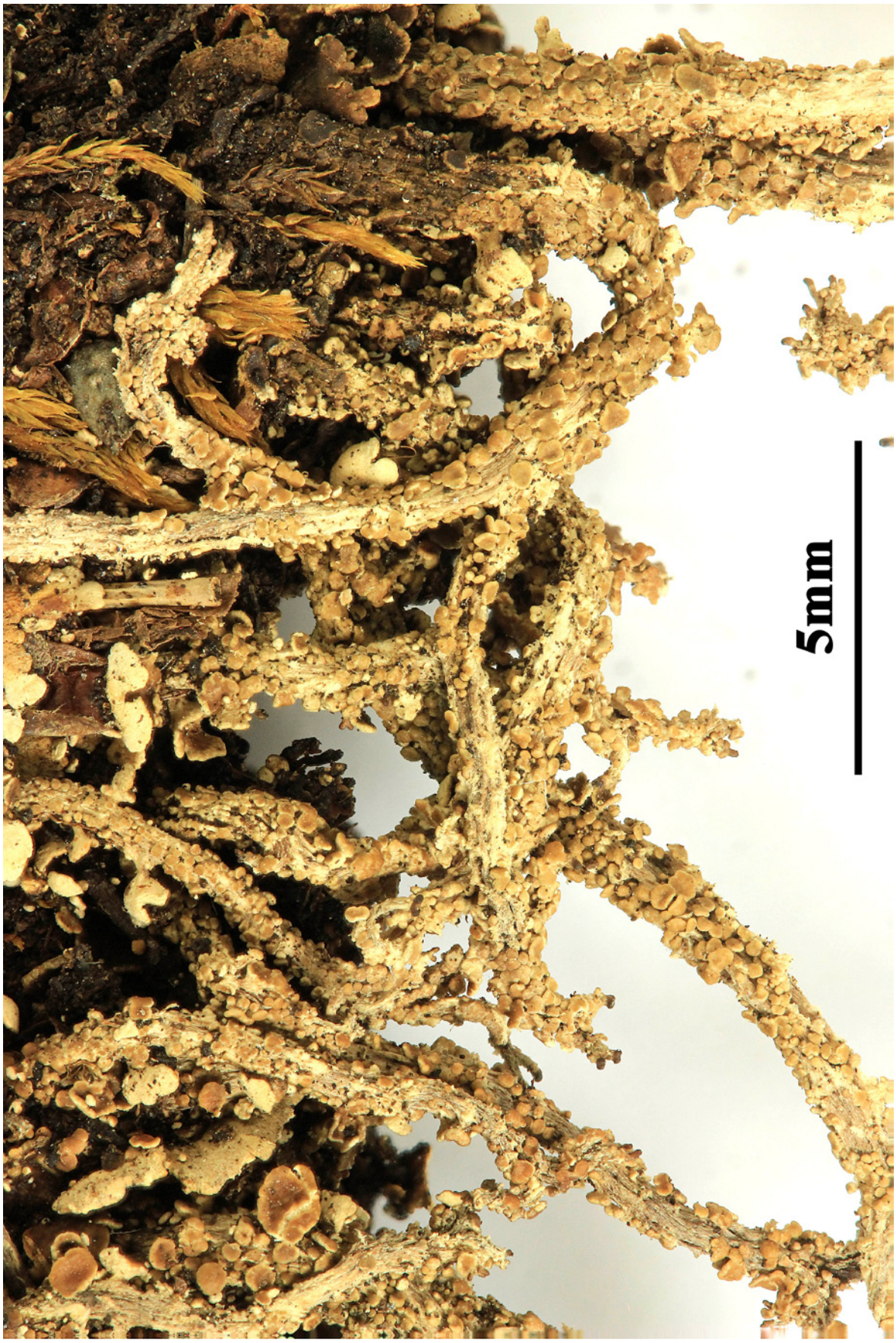
Cladonia macaronesica

Cladonia macrophylla (Schaer.) Stenh., Lich. Suec. exs.: no. 3 (1865)
= *Cladonia alpicola* (Flot.) Vain., Acta Soc. Fauna Flora fenn. 10: 58 (1894)
= *Cladonia alpicola* f. *macrophylla* (Schaer.) Vain., Acta Soc. Fauna Flora fenn. 10: 64 (1894)
= *Cladonia alpicola* var. *macrophylla* (Schaer.) H. Olivier, Mém. Soc. natn. Sci. nat. Cherbourg 36: 140 (1907)
= *Cladonia decorticata* var. *macrophylla* (Schaer.) Th. Fr., Lich. Scand. (Upsaliae)(1): 91 (1871)
= *Cladonia pyxidata* ß *alpicola* Flot., Flora, Regensburg 8(22): 340 (1825)
= *Cladonia squamosa* f. *macrophylla* (Schaer.) J.C. Wei, Enumeration of Lichens in China (Beijing): 79 (1991)
= *Cladonia squamosa* var. *macrophylla* (Schaer.) Rabenh., Deutschl. Krypt.-Fl. (Leipzig) 2(1): 102 (1845)
= *Cladonia ventricosa* var. *macrophylla* Schaer., Lich. helv. spicil. 6: 316 (1833)

[VZ1828], Norvegia. Hordaland: Granvin, in loco dicto Flatjedle. Ad terram. Leg- J. J. Havaas, , 17.8.1937. - Annot.: Psoromic acid, 2'-O-demthylpsoromic acid (trace), rangiformic acid, and unidentified compounds (traces). - A. Johnson and C. F. Culberson. - EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1929.

Primary thallus squamulose, usually persistent and forming large colonies, the squamules 3-6(-10) mm long, 2-6 mm wide, round or weakly elongate, lobate to incised, glaucescent to rarely olive-green and often verruculose or checkered above, white beneath, sometimes darkening towards the attachment point. Podetia rather rare, cupless, hollow inside, elongate, 1-3(-5) cm tall, 0.8-1(-5) mm thick, simple or sparingly branched, with blunt apices, glaucous grey to brownish grey, paler or yellowish towards the base, fissured, with numerous, up to 1 mm (usually less) wide, peltate squamules. Apothecia brown, convex, terminal on podetia, to 5 mm across. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed on the tips of podetia and on the squamules, constricted at base, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC-, P+ yellow, UV-. Chemistry: psoromic, rangiformic and norrangiformic acids, plus minor unknown compounds. - Note: a northern-alpine species found on organic soil and weathered siliceous rocks near or above treeline.

Cladonia macrophylla



Cladonia macrophylla

Cladonia macroptera Räsänen, J. Jap. Bot. 16(3): 149 (1940)

[VZ2433], Sina. Yunnan, montes Yulong Shan, 30 km ad septentriones ab oppida Liklang (= Lijiang), 2000 m. ad terram inter muscos. Leg. J. Soják, 27.7.1990., det. A.Vězda. EX A. VěZDA LICHENRES SELECTI EXSICCATI NR. 2433.

Podetia 5.5-10 cm longa, 2-3 mm lata, cornuta, ascypha, in apicibus subulata, eramosa vel parce ramosa, axillis perviis corticata, 1aevigata, albido-vel pallido-straminea. K-, P+ rubescentis, passim pterygato-squamosa, squamis (= phyllocladiis) dorsiventralis, 3-5 mm longis, stipitatis, anguste lacinitis, esorediatis, superne pal1ido-strain-eis, subtus albidis, K-. P+ prasertim in apicibus rubescentibus. Sterilis. Silmilis *Cladonia squamosa* (Scop.) Hoffm. var. *phyllocoma* Rab., sed podetia P+ rubescentia et squama majores.

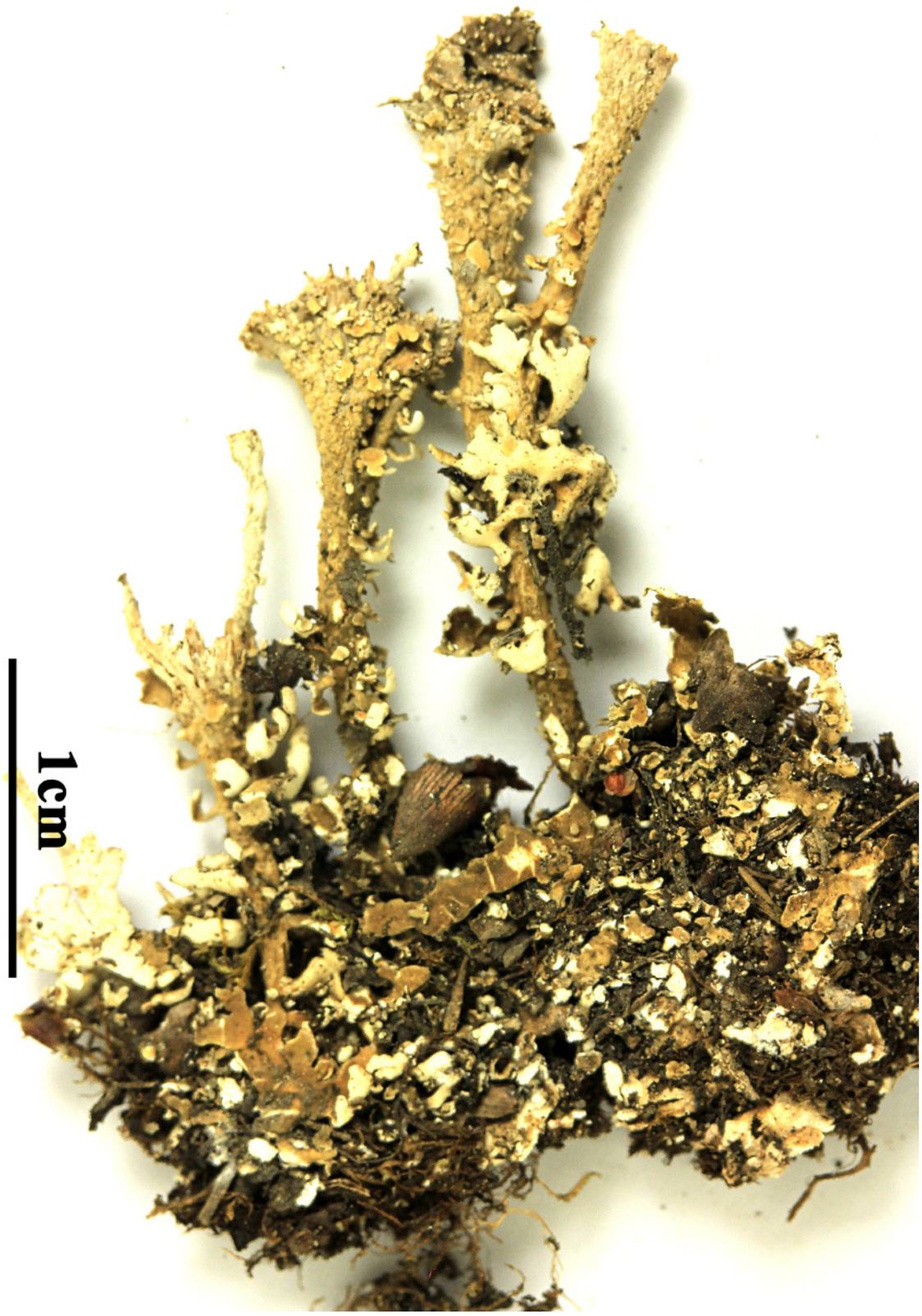
Cladonia macroptera

Cladonia macroptera

Cladonia magyarica Vain. ex Gyeln., Sched. ad Floram Hungar. Exsicc. VIII: 8 (1927)

[VZ1209], Bohemoslovacia. Slovacia merid., distr. Štúrovo. Insilva Čenkovský les dicta, invicinitate Danuvii, 110 m. Ad terram humosam arenaceam subcalcaream, Leg. I. Pišút et A. Vězda, EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1209.

Primary thallus squamulose, persistent. Squamules ascendent, 2-5 mm long × 2-4 mm wide, from subentire to lobated, adnate to ascending, coalescing, margins no sorediate, upper surface glaucous green to olive, below white to somewhat brown, that darkens towards the base, relatively thick. Podetia 7-13 mm long × 2-6 mm wide, scyphose, usually simple, regular, the scyphi are symmetrical, with elongate and narrow base, 1-2 mm wide. Surface of the podetia corticate, quartered and areolate, in mature scyphus the cortex disappears and produces numerous elongate squamules, up to 2 mm wide, microsquamules and peltate flat granules are produced inside and outside the scyphus. Apothecia uncommon, dark brown, arranged at the margin of the scyphus. Pycnidia frequent, dark brown to black, at primary squamules, with hyaline slime.Chemistry.- Pd+ red, K+ yellow, C–, UV–. Atranorin and fumarprotocetraric acid complex. Habitat and distribution.- It has been reported from Turkey on Pinus nigra forest at 1350 m (Kocakaya et al.2018). This species has a restricted distribution to acidic sandy soils of some continental areas of Central Europe especially in the Danube river basin, with some outliers in North America (Litterski & Ahti 2004; Zraik et al. 2016). Mediterranean countries.- Turkey.Remarks.- It is rather similar to some specimens of C. pyxidata but the morphology of podetia, covered with numerous squamules is characteristic. Also molecular results support the monophyly of this species (Stenroos et al. 2019). More studies are required to confirm the presence of this species in Turkey and its total range in general.



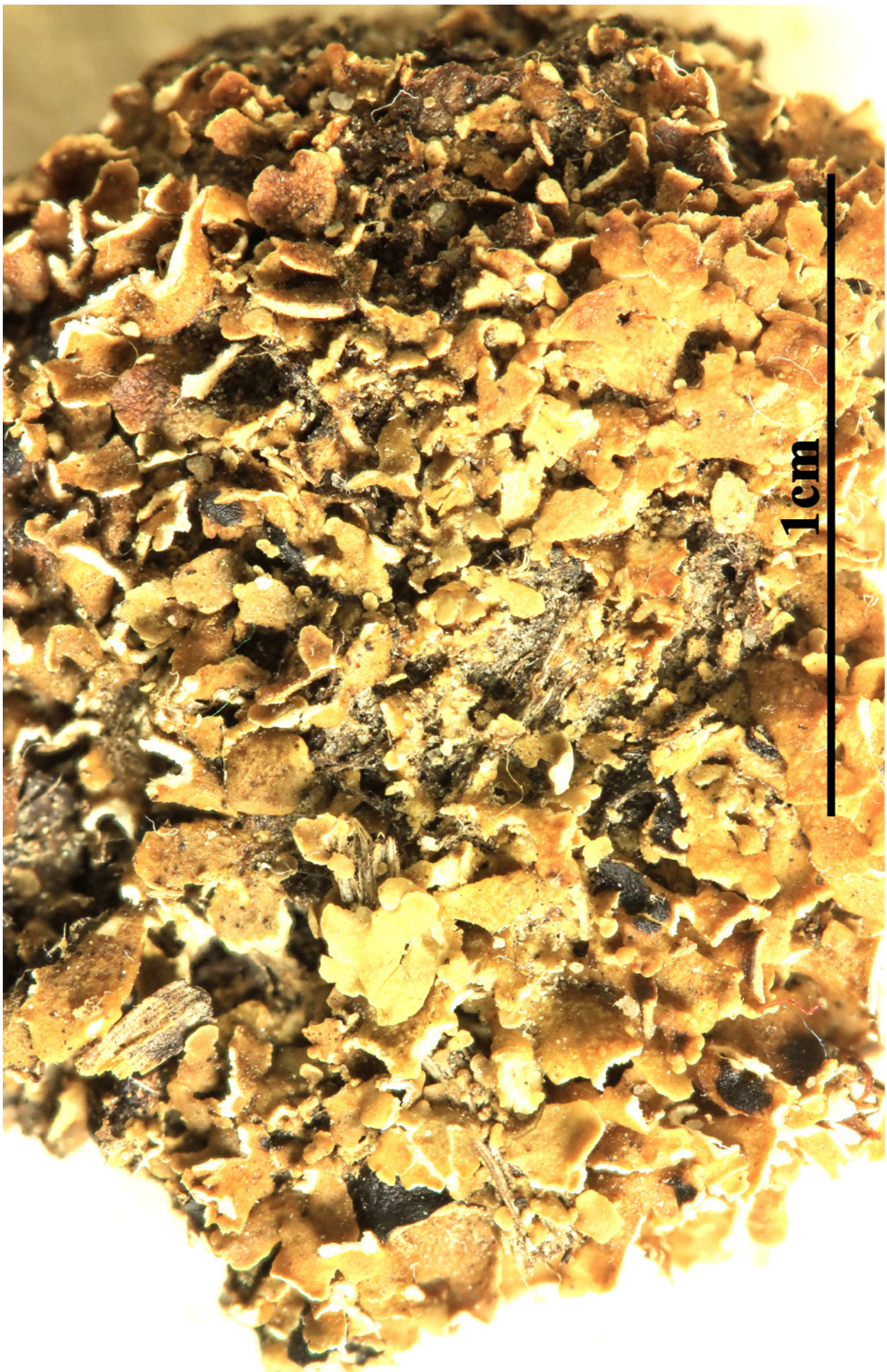
Cladonia magyarica

Cladonia magyarica

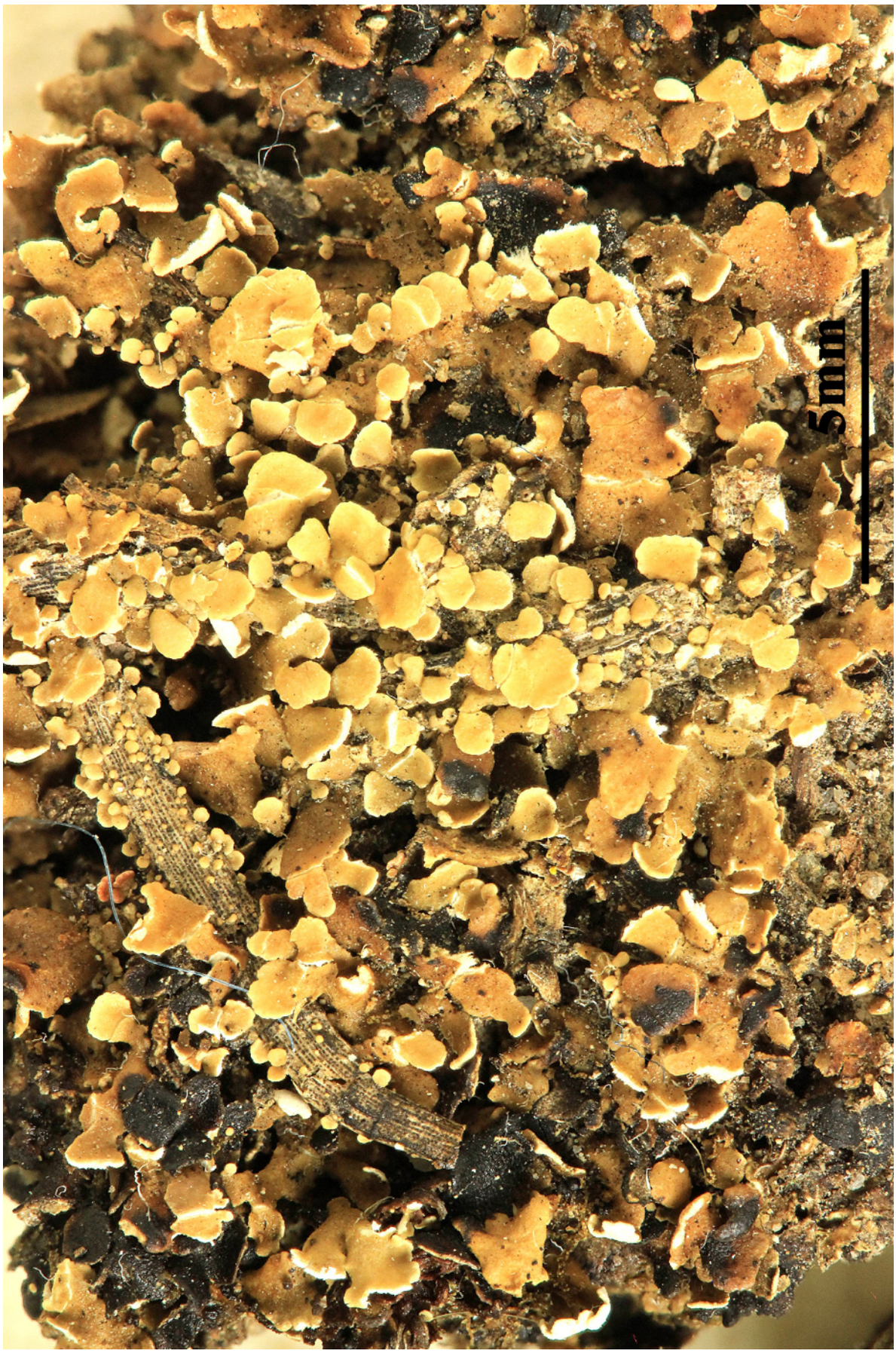
Cladonia mateocyatha Robbins, Rhodora 27: 50 (1925)

[VZ1745], USA. Carolina Borealis, Durham County: Durham, secus viam dictam Shannon Road, 120 m. Ad terram. Leg. W. L. Culberson (no. 18189) et C, F. Culberson.- Annot.: Fumarprotocetraric acid,, protocetraric acid (faint trace), and unknown Cph-2 /trace) by TLC - A. Johnson et C. F. Culberson. - Ex A. VěZDA LICHENES SELECTI EXSICCATI NR. 1745.

Primary thallus persistent, consisting of rather large, broadly oblong squamules 4-8 x 1-5 mm; underside often purplish brown. Podetia often sparingly produced, 0.4-2.2(-3.5) cm tall, with stalk 1-3 mm thick, grayish to brownish green, scyphose; scyphi 2-4(-12) mm wide, usually one per podetium, shallow, commonly irregularly shaped, with broad, flat- tened marginal proliferations, occasionally with central proliferations. Surface unusually smoothly and continuously corticate, but may become areolate and rugulose, sparingly squamulose toward base. Podetial wall 280-360 µm; cortex 20 µm; medulla 160-240 µm; stereome 60-160 µm; surface of central canal coarsely papillate and grooved. Conidiomata either on primary squamules or on scyphal margins, pyriform, constricted at base, to broadly mammiform, subsessile; slime and conidia not observed. Hymenial disks infrequent, reddish brown, to 4 mm wide; spores not observed. Chemistry. P+ red, K-. Fumarprotocetraric acid and traces of protocetraric and confumarprotocetraric acids, possibly occasionally convirensic acid. Distribution Dominican Republic. Its main range is in the eastern United States, from Florida up to Massachusetts. Growing on bare mineral soils rather than humus.- *Cladonia mateocyatha* can be recognized by its smooth, short, robust podetia.



Cladonia mateocyatha

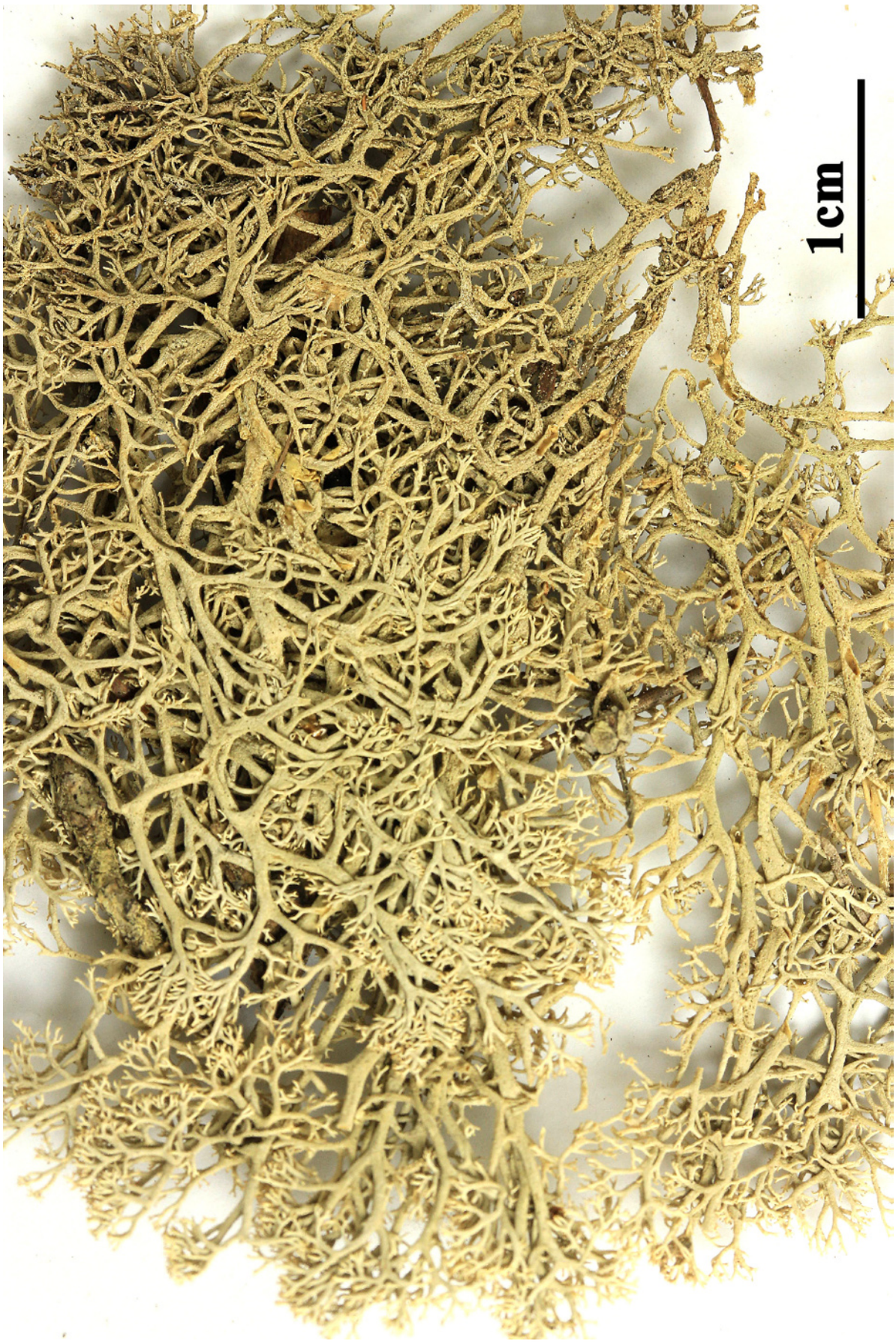


Cladonia mateocyatha

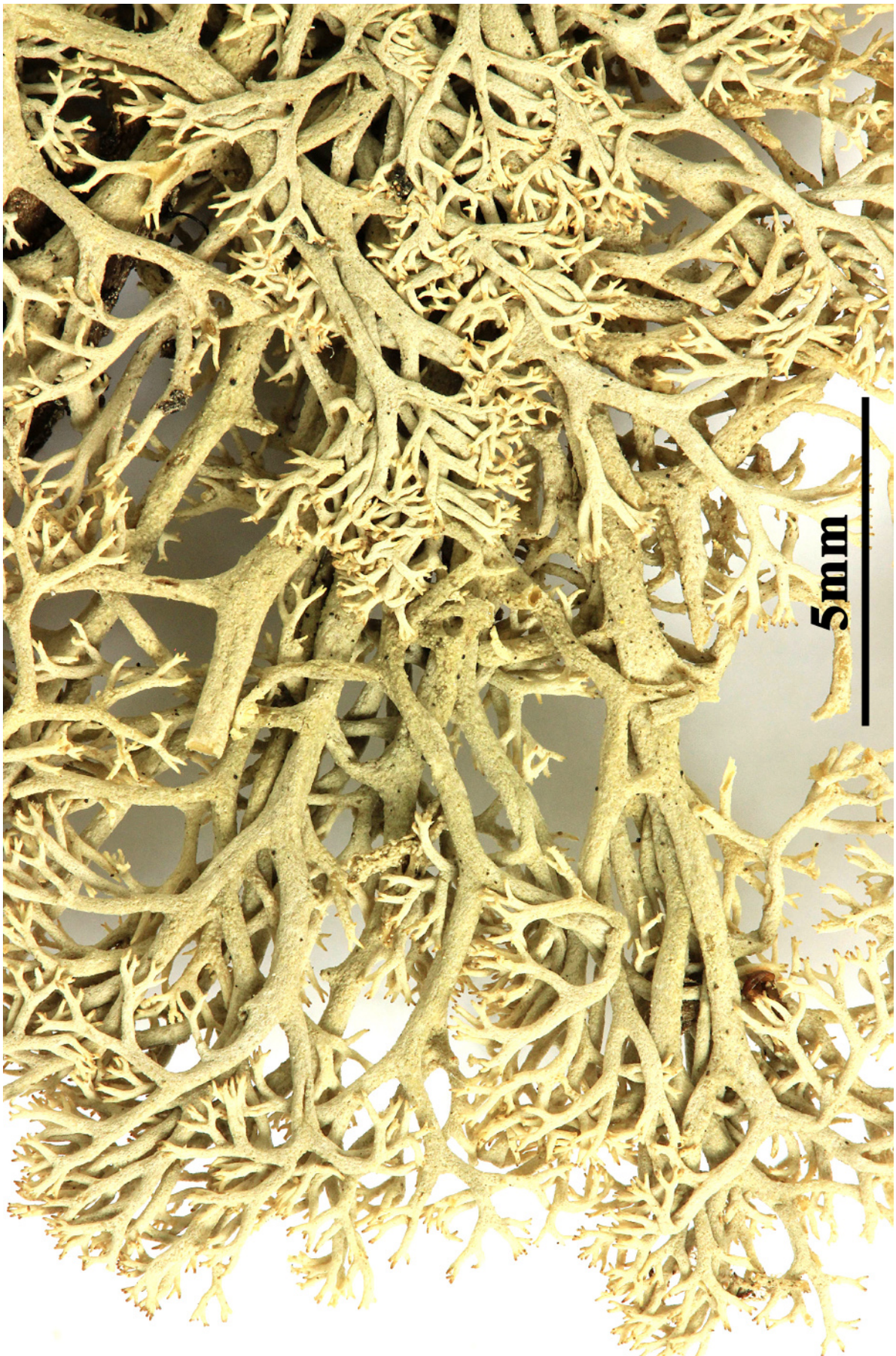
Cladonia mediterranea P.A. Duvign. & Abbayes, Rev. Bryol. Lichénol. 16: 97 (1947)
= *Cladina mediterranea* (P.A. Duvign. & Abbayes) Follmann & Hern.-Padr.

[VZ1142], Gallia. Insula Port Cros (Var), Notre-Dame, 70 m. Ad terram siliceam in *Ericeto arboreae*. Leg. Y. Rondon, 30.9.1872. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1142.

Primary thallus crustose, ephemeral and rarely seen, consisting of subglobular small warts. Podetia shrubby, hollow inside, pale yellowish, loosely attached and dying from the base, without a distinct main axis, mostly isotomically dichotomously branched, 4-8(-10) cm tall, 1-1.8 mm thick, esquamulose, ecorticate, with a finely arachnoid surface, a continuous algal layer and a compact medulla; tips of branchlets mostly spreading in all directions, arranged around a usually close axil. Apothecia rare, brown, convex. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed, on the tips of podetia, with a colourless jelly. Conidia hyaline, straight or most often curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC+ yellow, P-, UV+ bluish white. Chemistry: perlatolic and usnic acids. - Note: a Mediterranean-Macaronesian lichen found in Mediterranean maquis vegetation amongst pleurocarpous mosses in sheltered situations with plenty of diffuse light; presently restricted to a few very humid sites along the Tyrrhenian coast.



Cladonia mediterranea



Cladonia mediterranea

Cladonia miniata G. Mey., Nebenst. Beschäft. Pflanzenk. 1: 149 (1825)

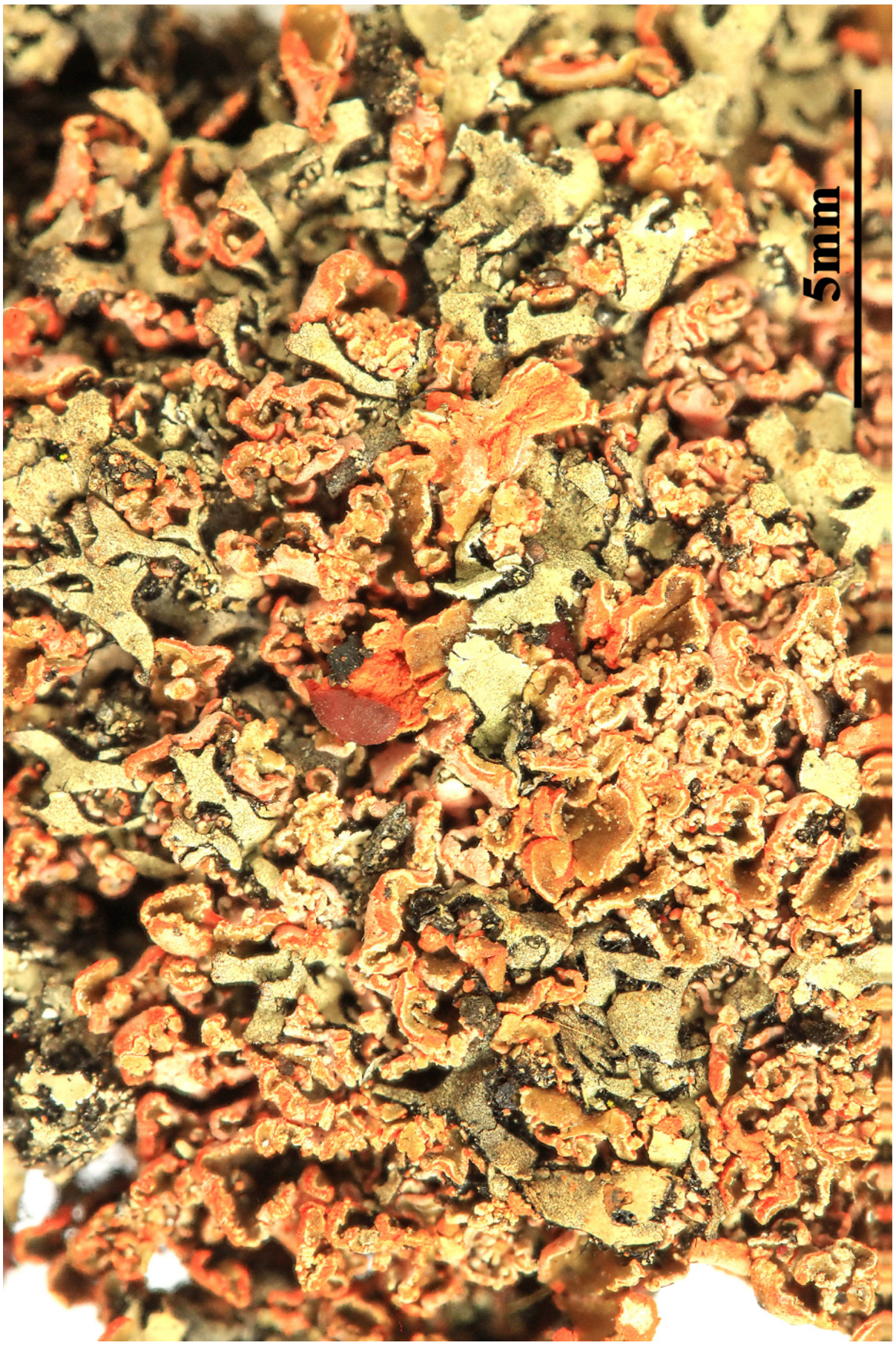
[VZ2090], Venezuela. Laguna Garcia, in vicinitate Pregoneros, 1900 m. In rupibus, Leg, M. López-Figueiras (no. 32452) et A. Morales, 8.7.1985. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2090.

Primary thallus persistent, consisting of sparsely lobed squamules 4-7 x 2.5-4 mm, which are unusu- ally thick, 0.4-0.6 mm, upper surface matt, olive green to brown, verruculose; lower surface bright orange red, very rarely white, often with distinct, longitudinal veins, sometimes with a loose, white net of hyphae at surface; lobe margins often sparsely granulose; cortex 150-250 µm, translucent, hard cartilaginous, with verruculae 100-200 µm high; algal layer distinct, 30-50 µm; medulla 50-380 µm, orange (including a 20-30 µm-thick white layer below algae). Podetia poorly differentiated from squamules, 0.3-1(-3) cm tall, 2 cm wide, mostly flattened, dorsiventral, flabellate, olive green to brown, usually abruptly flaring to 2 cm wide, web-shaped structures, marginal or more rarely laminal on primary squamules, which may elgate and roll up to form tube of podetial stalk; central canal of podetium may remain open on the ventral side of squamules. Surface of podetia continuously corticate, rugulose, often cracked. Podetial wall very thick, 470-900 µm; cortex 150-350 µm; algal layer 20-100 µm; medulla (100-)300-600 ugm (in some parts even thicker, including a 10-20 µm-thick white layer below algae), orange red; hyphae often loosely filling inner podetial cavity; cylindrical stereome absent or poorly developed, skeletal tissue represented by in- ternal, longitudinal strands, which are partly surrounded by medullary hyphae. Conidiomata dolioliform, 200-250 x 150-200 µm, black to red, marginal or laminal on primary squamules, or rarely on podetia, containing red slime; conidia 6-7 x 1 µm, falciform. Hymenial disks commonly produced, red, forming agglomerations to 7 mm wide; primordia on primary squamules; spores, 8-10 x 3-4 µm, oblong. Chemistry. P-, rarely P+ orange red, K-, rarely K+ yellow. Secondary chemistry highly variable (see Stenroos, 1989a), but rhodocladonic acid a constant medullary substance and barbatic acid a subconstant major compound; didymic acid is a rare major substance; accessory minor compounds include rather commonly 4-0-demethylbarbatic and 3-a-hydroxybarbatic acids, more rarely squamatic, baeomycesic, thamnolic, obtusatic, fumarprotocetraric, protocetraric, sekikaic, 4'-O-methylnorsekikaic, condidymic, and subdidymic acids, as well as nine unidentified compounds.). This

is the most variable secondary (primarily phenolic) chemistry reported for any *Cladonia* and is unusual among lichens in general. Distribution Brazilian Highlands, Guayana Highland, northern Andes, Jamaica, at elevations of ca. 1000-2000 m (southeast Brazil), 1200- 2500 m (Guayana Highland), and 1800-3000 m (Andes). Especially on rotting wood, also on trunks of living trees up to 2 m from the ground, on thin soil over rocks or, rarely, on sandy soil. - *Cladonia miniata* was understood in a very collective sense until the group was monographed by Stenroos (1989a). She recognized eight neotropical species in the group. The name *C. miniata* was left for a widespread species that has a conspicuously orange red medulla. This character was earlier supposed to be unique for *C. miniata*, but, very surprisingly, another bright orange red species, *C. salmonea*, turned out to be in the same area in Brazil. The other members of the group as treated by Stenroos have a white medulla, though they have a very thick, cartilaginous cortex, as in *C. miniata*, and red hymenial disks. Stenroos (1989a) also recognized two varieties of *C. miniata*, namely, var. *anaemica* and var. *parvipes*. However, subsequent field studies by Stenroos and me (T. Ahti) in Brazil indicated that these taxa should be recognized at species level. Thus *C. parvipes* is the third species that has a constantly red medulla.

Cladonia miniata

Cladonia miniata



Cladonia miniata

Cladonia murrayi W. Martin, Trans. Roy. Soc. N.Z., Bot. 2: 40 (1962)
= *Cenomyce firma* Laurer, Linnaea 2: 44 (1827)
= *Cladonia firma* (Laurer) Kremp., Verh. Kaiserl.-Königl. zool.-bot. Ges. Wien 18: 309 (1868)

[VZ2068], Australia, Tasmania. In montibus ad meridiem versus a Mt. Curly, 900 m. Ad turfam in regione subalpina, Leg. G. Kantvilas (no. 78/85) et J. Jarman. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2068.

Primary squamules persistent 2-5 mm long, 1.0-1.5 mm wide, erect, palmately and pinnately divided, margins lobate-incised or ± nodular, often in dense cushions 4-10 cm diam., dying at base, upper surface flat or convex, scabrid-areolate or smooth, glaucescent or olive-green or grey-green or yellowish-green, minutely white-pubescent or pruinose towards apices. Lower surface arachnoid, white, yellowish-brown or black at base, not sorediate. Podetia 5-25(-30) mm tall, 1.5-3 mm diam., subcylindrical, arising from surface of primary squamules, decorticate below, partly corticate above, granular or squamulose, grey-green or glaucescent, yellow-brown or blackened at base, without soredia or isidia. Cortex discontinuous, squamulose. Apothecia conspicuous, terminal, globular to often confluent-compound, red above, brownish at base, 0.5-4.0 mm diam., sometimes single, often aggregated. Chemistry: Cortex K+ deep yellow, C-, KC-, P+ orange-yellow. Thamnolic and decarboxythamnolic acids and a yellow pigment.

Cladonia murrayi

Cladonia murrayi

Cladonia norvegica Tønsberg & Holien, Nordic J. Bot. 4(1): 79 (1984)

[VZ1978], Norvegia. Sør-Trøndelag,Melhus, inter montem Loasen et rivulum Loaq,300-400 m, ad septentriones et orientem versus a lacu Benna, 185-200 m. Ad basin abscisam arboris (Picea abies). Leg. T. Tønsberg (no. 6870). - Annot.: barbatic acid and 4-O.demethylbarbatic acid by TLC. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1978. ISOTYPUS.

Primary thallus squamulose, the squamules usually persisting, small, 2-4 mm wide, deeply incised or narrowly lobed, green above, white beneath, often with bright red spots, sometimes sorediate along margins and on the lower side. Podetia bacilliform, slender, hollow inside, 1.5-2(-3) cm tall, usually cupless and pointed, rarely with very narrow cups in fertile specimens, pale green, grey-green or whitish, sometimes with red spots at base, the surface partly corticate and occasionally squamulose in basal parts, otherwise farinose-sorediate, the soredia 20-50 µm in diam. Apothecia rather rare, ochraceous or pinkish brown, subspherical, terminal. Asci 8-spored. Ascospores hyaline, ovoid to oblong, 12-15 x 3-4.5 µm. Pycnidia developing at tips of podetia, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC-, P-, UV+ bluish white. Chemistry: barbatic and 4-O-demethylbarbatic acids; rhodocladonic acid in the red spots on primary squamules and podetia (not in the apothecia!).

Cladonia norvegica

Cladonia norvegica

Cladonia nylanderi Cout., Lichenum Lusitanorum Herbarii: 38 (1916)
= *Cladonia firma* (Nyl.) Nyl., Bot. Ztg. 47: 352 (1861)
= *Cladonia alcicornis f. firma* (Nyl.) Arnold, Verh. Kaiserl.-Königl. zool.-bot. Ges. Wien 30: 116 (1881) [1880]
= *Cladonia alcicornis* var. *firma* Nyl., Syn. meth. lich. (Parisiis) 1(2): 191 (1860)
= *Cladonia foliacea* f. *firma* (Nyl.) Dalla Torre & Sarnth., Fl. Tirol, Vorarlberg, Liechtenstein, IV Band. Die Flechten von Tirol: 73 (1902)
= *Cladonia foliacea* var. *firma* (Nyl.) Vain., Acta Soc. Fauna Flora fenn. 10: 400 (1894)

[VZ1096], Turcia. Anatolia meridionalis. Antalya, prope pagum Okurcalar Kögü ad viam Alanya-Manavgai, 20 m. Ad terram arenosam in Ericeto. Leg. I. Pišút. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1096.

Primary thallus squamulose, the squamules prominent, persistent, forming dense mats, 0.5-2 cm long, 1-4 mm wide, mostly ascending, entire to slightly indented, often curved at apices when dry, glaucous green to grey-green above, reddish grey beneath, often darker toward the base. Podetia rare, hollow inside, greenish grey, funnel-shaped, sometimes proliferating from the center, with a continuous to shallowly areolate cortex. Apothecia extremely rare, dark brown, convex, on the margins of cups. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed along the margins of cups or on the primary squamules, sessile, subglobose to ovoid. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K+ yellow sometimes slowly turning brownish, C-, KC-, P+ red, UV-. Chemistry: fumarprotocetraric acid, atranorin, and variable amounts of rangiformic acid. - Note: a mild-temperate lichen found on mineral, often base-rich soil in open Mediterranean grasslands.

Cladonia nylanderi

Cladonia nylanderi

Cladonia papillaria Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 117 (1796) [1795]
= *Pycnothelia papillaria* Dufour, Bull. Dept. Agr. Govt. Rest. Inst. Formosa 8: 46 (1821)
= *Baeomyces papillaria* Ach., Methodus, Sectio post. (Stockholmiæ): 323 (1803)
= *Baeomyces papillaria* var. *molariformis* Ach., Methodus, Sectio post. (Stockholmiæ): 324 (1803)
= *Biatora epimarta* (Nyl.) Walt. Watson, Census Catalogue of British Lichens: viii (1953)
= *Buellia epimarta* (Nyl.) Malme, Ark. Bot. 21A(no. 14): 8 (1927)
= *Capitularia papillaria* Mart., Fl. crypt. erlang. (Nürnberg): 274 (1817)
= *Cenomyce papillaria* Ach., Lich. Univ.: 571 (1810)
= *Cenomyce papillaria* var. *molariformis* (Hoffm.) Ach., Lich. Univ.: 571 (1810)
= *Cladina papillaria* (Dufour) Nyl., Flora, Regensburg 49(12): 179 (1866)
= *Cladonia madreporiformis* (With.) DC., in Lamarck & de Candolle, Fl. franç., Edn 3 (Paris) 3: 180 (1805)
= *Cladonia molariformis* Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 117 (1796) [1795]
= *Cladonia papillaria [*unranked*] molariformis* Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 117 (1796) [1795]
= *Cladonia papillaria* f. *molariformis* Tuck., Syn. N. Amer. Lich. (Boston) 1: 245 (1882)
= *Cladonia papillaria* var. *molariformis* Nyl., Not. Sällsk. Fauna et Fl. Fenn. Förh., Ny Ser. 5: 50 (1861)
= *Lecidea epimarta* Nyl., Flora, Regensburg 60: 226 (1877)
= *Lichen madreporiformis* With. [as 'madreporæformis'], Bot. arr. veg. Gr. Brit. (London) 2: 726 (1776)
= *Lichen madreporoides* Rutstr., Spic. pl. crypt. Suec.: 16-17 (1794)
= *Lichen papillarius* Ehrh., Beitr. Naturk. 2: 105 (1788)
= *Patellaria papillaria* Wallr., Fl. crypt. Germ. (Norimbergae) 1: 415 (1831)
= *Pycnothelia madreporiformis* (With.) Dufour, Ann. Gén. Sci. Phys. 8: 47 (1821)
= *Pycnothelia papillaria* f. *molariformis* (Hoffm.) Cromb., Grevillea 15(no. 74): 44 (1886)
= *Pycnothelia papillaria* var. *molariformis* Norrl., Bidr. Sydöst. Tavastl. fl. (Helsingfors): 175 (1870)
= *Pycnotheliomyces papillariae* Cif. & Tomas., Atti Ist. bot. Univ. Lab. crittog. Pavia, sér. 5 10(2): 288 (1954)

[VZ1286], B0ohemoslovacia. Slovacia, Carpates, montes Slovenské Rudohorie: Mníšek, in valle rivi Smalník prope Smolnická pila, 500 m. Ad scorias vetustas. Leg. A. Kiszely et A. Vězda. EX A. VěZDA LICHENES SWELECTI EXSICCATI NR. 1286.

Primary thallus crustose, persistent (rarely disappearing in exceptionally well-developed specimens), of ecorticate, greenish grey or whtish granules grouped into 20-40 mm wide rosettes. Podetia wart-like to short-cylindrical, cream-coloured, grey to brownish, hollow inside, 2-5(-10) mm tall, constricted at base, smooth, esquamulose, with rounded, darkened apices, mostly simple, but sometimes sparingly branched in upper part, with frequent, dark pycnidial ostioles at the tips, the internal surface cartilaginous and striate, <0.5 mm thick. Apothecia very rare, terminal, brown, convex, emarginate, 0.3-1 mm across. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores simple or 1(-3)-septate, colourless, fusiform, thin-walled, (7-)9-15 x 2-4(-5) µm. Pycnidia dark, more or less immersed, with a colourless slime. Conidia filiform, curved, 8–15 × c. 0.5 µm. Photobiont chlorococcoid. Spot tests: thallus K+ yellow, C-, KC-, P-; medulla UV+ blue-white. Chemistry: atranorin, and variable amounts of chloratranorin and lichesterinic, protolichesterinic and squamatic acids. - Note: an arctic-alpine to cool-temperate lichen found on clay soil, often in *Calluna*-heaths; most frequent in the Alps, becoming much rarer southwards.

Cladonia papillaria

Cladonia papillaria

Cladonia papillaria

Cladonia parasitica (Hoffm.) Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 127 (1796) [1795]
= *Baeomyces delicatus* Ach., Methodus, Sectio post. (Stockholmiæ): 327 (1803)
= *Capitularia delicata* Mart., Fl. crypt. erlang. (Nürnberg): 273 (1817)
= *Cenomyce delicata* Ach., Lich. Univ.: 569-570 (1810)
= *Cenomyce delicatus* (Ehrh. ex Ach.) Ach., Lich. Univ.: 569 (1810)
= *Cenomyce parasitica* (Hoffm.) Taylor, in Mackay, Fl. Hibern. (Dublin) 2: 80 (1836)
= *Cladonia delicata* Flörke, De Cladoniis, Difficillimo lichenum genere, Commentatio nova (Rostock): 7 (1828)
= *Cladonia squamosa* subsp. *delicata* Nyl., Syn. meth. lich. (Parisiis) 1(2): 210 (1860)
= *Cladonia squamosa* var. *delicata* Fr., Summa veg. Scand., Sectio Prior (Stockholm): 111 (1845)
= Cladonia squamosa *var*. parasitica (Hoffm.) Rabenh., Deutschl. Krypt.-Fl. (Leipzig) 2(1): 102 (1845)
= *Cladonia ventricosa* var. *parasitica* (Hoffm.) Schaer., Lich. helv. spicil. 6: 317 (1833)
= *Helopodium delicatum* DC., in Lamarck & de Candolle, Fl. franç., Edn 3 (Paris) 2: 341 (1805)
= *Lichen delicatus* Ehrh. ex Ach., Lich. suec. prodr. (Linköping): 199 (1799) [1798]
= *Lichen parasiticus* Hoffm., Enum. Lich. Icon. Descirpt. Illustr.: 39 (1784)
= *Scyphophorus delicatus* Mérat [as 'delicatulus'], Nouv. Fl. Environs Paris, Edn 2 1: 209 (1821)
= *Scyphophorus parasiticus* (Hoffm.) Hook., Engl. Fl., Mosses, Hepaticae, Lichens, Characeae and Algae (London) 5(1): 237 (1833)

[VZ1588], URSS. Transcaucasus, Colchis. Distr. Sochi, in valle rivi Macesta, in pago Krajevo Armianskye, 60 m. Ad saepimenta lignea vetusta. Leg. V. Vašák et A. Vězda. EX A. VěZDA LICHE3NES SELECTI EXSICCATI NR. 1588.

Primary thallus squamulose, persistent, the squamules whitish to pale greenish grey, white beneath, 1-3(5) mm long, 0.2-1(-2) mm broad, very finely divided and often with an almost coralloid appearance, granulose along the margins. Podetia rather rare, hollow inside, whitish grey to pale grey-brown, 1-10(-20) mm tall, deformed and very irregularly branched, fissured, with gaping holes, often covered by isidioid granules and partly decorticated, with scattered to usually numerous,

small, dichotomously divided squamules. Apothecia rare, dark brown, convex, often clustered. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed in the upper part of squamules, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K+ yellow, C-, KC-, P+ yellow-orange, UV-. Chemistry: thamnolic acid and variable amounts of barbatic acid, the latter only in the apothecia. - Note: a mainly temperate, probably holarctic species, normally lignicolous, on stumps, sometimes on basal parts of old trunks, with optimum in old *Castanea*-stands.

Cladonia parasitica

Cladonia parasitica

Cladonia parasitica

Cladonia parasitica (Hoffm.) Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 127 (1796) [1795]
= *Baeomyces delicatus* Ach., Methodus, Sectio post. (Stockholmiæ): 327 (1803)
= *Capitularia delicata* Mart., Fl. crypt. erlang. (Nürnberg): 273 (1817)
= *Cenomyce delicata* Ach., Lich. Univ.: 569-570 (1810)
= *Cenomyce delicatus* (Ehrh. ex Ach.) Ach., Lich. Univ.: 569 (1810)
= *Cenomyce parasitica* (Hoffm.) Taylor, in Mackay, Fl. Hibern. (Dublin) 2: 80 (1836)
= *Cladonia delicata* Flörke, De Cladoniis, Difficillimo lichenum genere, Commentatio nova (Rostock): 7 (1828)
= *Cladonia squamosa* subsp. *delicata* Nyl., Syn. meth. lich. (Parisiis) 1(2): 210 (1860)
= *Cladonia squamosa* var. *delicata* Fr., Summa veg. Scand., Sectio Prior (Stockholm): 111 (1845)
= Cladonia squamosa *var*. parasitica (Hoffm.) Rabenh., Deutschl. Krypt.-Fl. (Leipzig) 2(1): 102 (1845)
= *Cladonia ventricosa* var. *parasitica* (Hoffm.) Schaer., Lich. helv. spicil. 6: 317 (1833)
= *Helopodium delicatum* DC., in Lamarck & de Candolle, Fl. franç., Edn 3 (Paris) 2: 341 (1805)
= *Lichen delicatus* Ehrh. ex Ach., Lich. suec. prodr. (Linköping): 199 (1799) [1798]
= *Lichen parasiticus* Hoffm., Enum. Lich. Icon. Descirpt. Illustr.: 39 (1784)
= *Scyphophorus delicatus* Mérat [as 'delicatulus'], Nouv. Fl. Environs Paris, Edn 2 1: 209 (1821)
= *Scyphophorus parasiticus* (Hoffm.) Hook., Engl. Fl., Mosses, Hepaticae, Lichens, Characeae and Algae (London) 5(1): 237 (1833)

[VZ1840], URSS. Transcaucasia, Colchis. Distr. Sochi, in valle rivi Macesta supra pagum Razdolje, 150 m. Ad truncum putridum. Leg. A. Vězda, 25.3.1982. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1840.

Primary thallus squamulose, persistent, the squamules whitish to pale greenish grey, white beneath, 1-3(5) mm long, 0.2-1(-2) mm broad, very finely divided and often with an almost coralloid appearance, granulose along the margins. Podetia rather rare, hollow inside, whitish grey to pale grey-brown, 1-10(-20) mm tall, deformed and very irregularly branched, fissured, with gaping holes, often covered by isidioid granules and partly decorticated, with scattered to usually numerous,

small, dichotomously divided squamules. Apothecia rare, dark brown, convex, often clustered. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed in the upper part of squamules, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K+ yellow, C-, KC-, P+ yellow-orange, UV-. Chemistry: thamnolic acid and variable amounts of barbatic acid, the latter only in the apothecia. - Note: a mainly temperate, probably holarctic species, normally lignicolous, on stumps, sometimes on basal parts of old trunks, with optimum in old *Castanea*-stands.

Cladonia parasitica

Cladonia parasitica

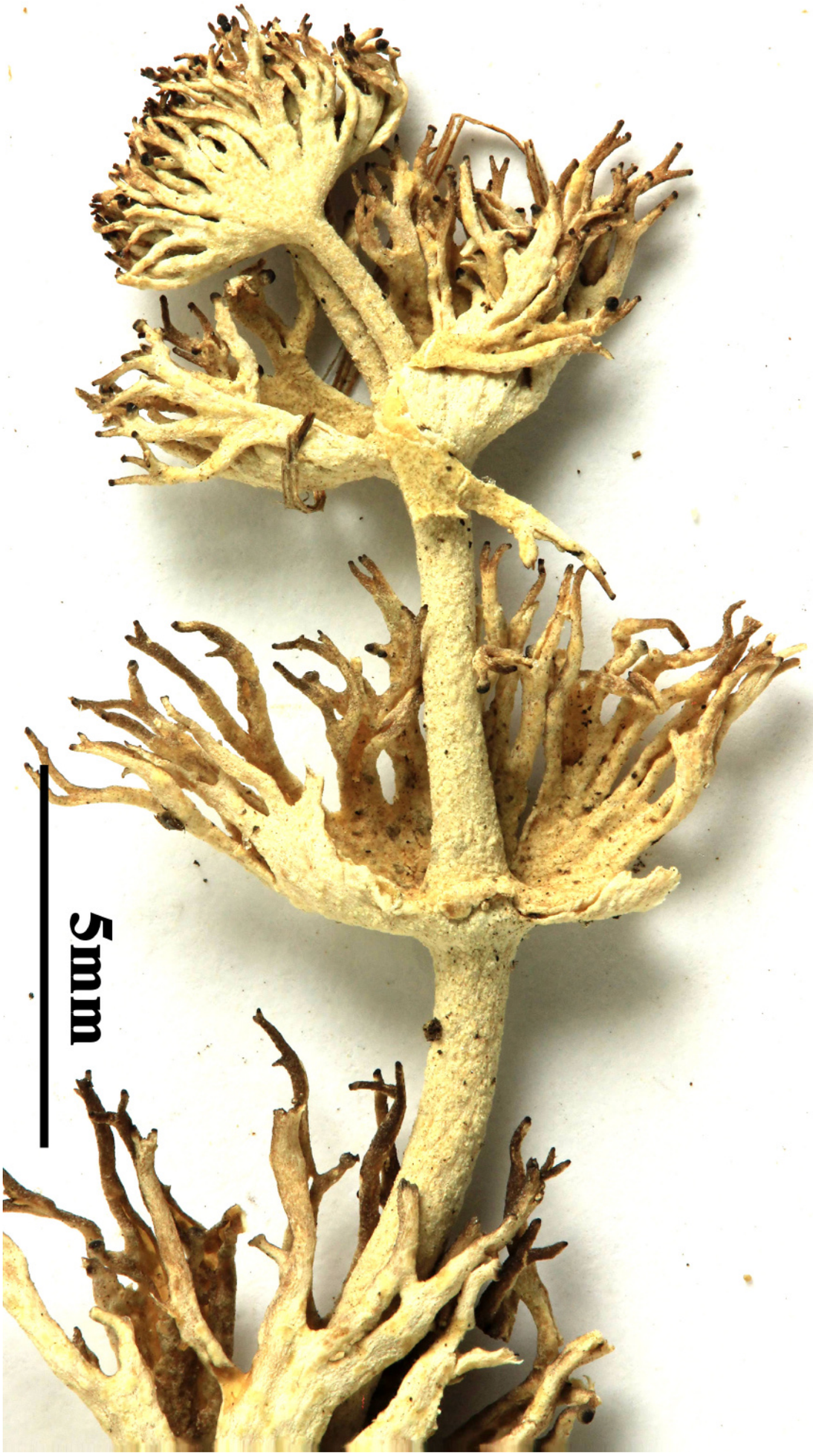
Cladonia parasitica

Cladonia perfilata Hook. f., in Hooker, Icon. plant. 2: tab. CXCII (1837)

[VZ936], Brasilia, Minas Gerais: Serra de Espinhaco at Lapinha, Inter Serro et Diamantina, 1200 m. Leg. D. C. Wasshausen (Irwin no.21835), 23.2.1968, det. M. E. Hale. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 956.

Primary thallus not observed. Podetia 6-15 cm tall, 2-2.5 mm thick, brownish gray, not melanotic at base, slightly branching, scyphose; scyphi 0.8-1.2(-2) cm wide, orbicular, abruptly flaring, centrally proliferating to form 7-9(-12) successive tiers, incurved, low- est scyphi slightly recurved; scyphal margins incised to 1/4 or 1/3 of scyphus radius, lobes terete, hollow, dichotomously branching 1-4 times, with black fibrillose tips but not or very sparsely rhizinate. Surface matt, smooth, slightly arachnoid, especially near tips; upper side of scyphi brown, entire, lower side veined, verruculose, largely ecorticate with corticate patches; podetial squamules absent. Podetial wall 350-400 µm; cortex 25 µm; medulla 250-300 µm; stereome 100 µm; central canal without or with few loose longitudinal strands; surface striate to minutely rugulose. Conidiomata not observed. Hymenial disks not observed. Chemistry. P+ orange red, K-. Fumarprotocetraric acid and traces of protocetraric and confumarprotocetraric acid. Distribution:. A rare endemic of southeast Brazil. On open rock outcrops. - *Cladonia perfilata* is very close to *C. crinita* but is distinguished by its mostly undivided scyphal plates, which give it a distinctive appearance. It is possible that *C. perfilata* is only a local variant of *C. crinita*.

Cladonia perfilata



Cladonia perfilata

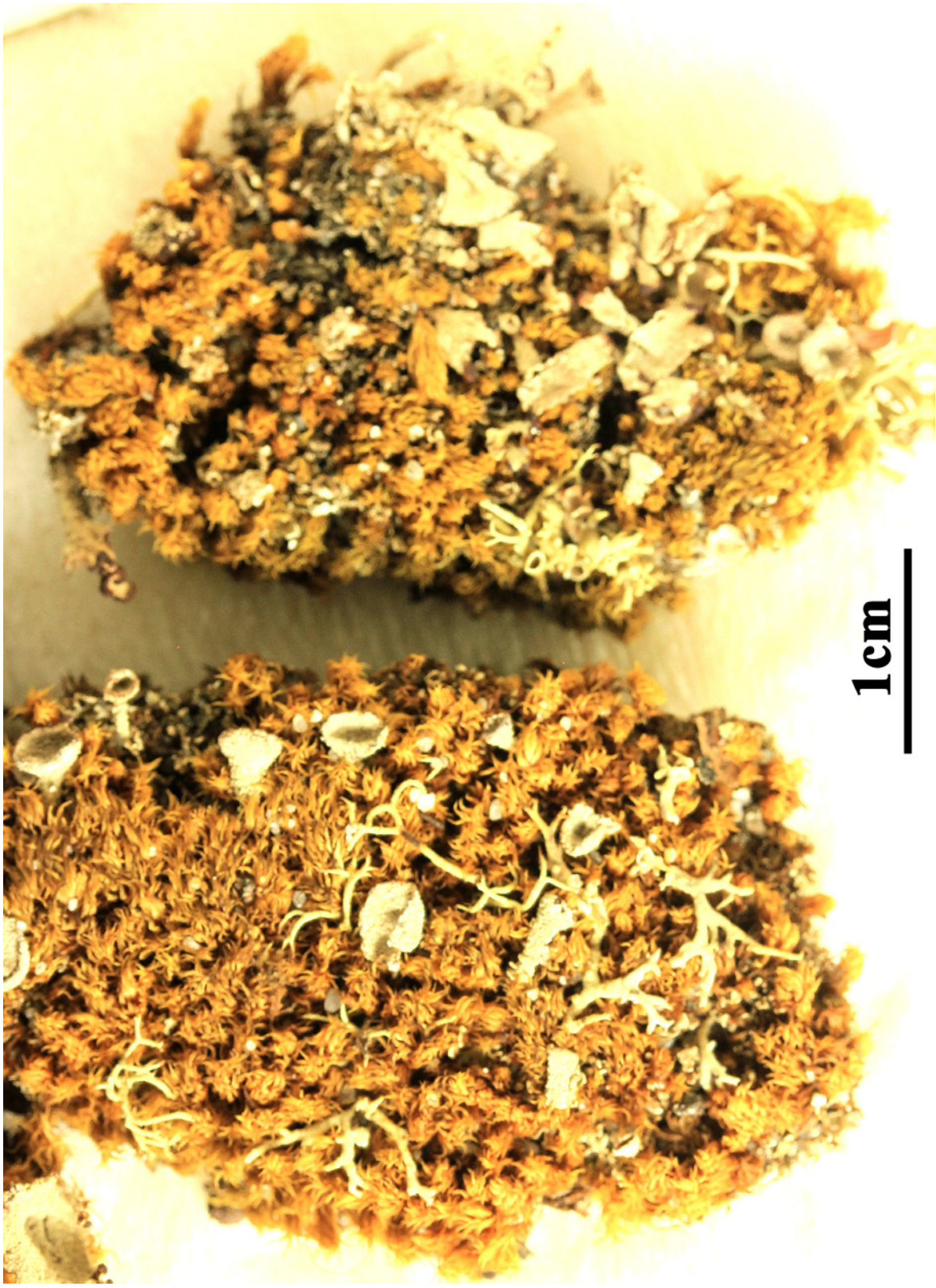
Cladonia perlomera Kristinsson, in Culberson & Kristinsson, Bryologist 72(4): 432 (1970) [1969]

[VZ2037], USA. Carolina Borealis. Bladen County: in vicinitate lacus Singletary Lake dicti, 30 m. >Ad arenam inter muscos (*Dicranum condensatum*) sub arboris parvis (Quercus *laevis*). Leg. W. L. Culberson (no. 19644) et C. F. Culberson, 4.6.1984. - Annot.: Perlatolic, merochlorophaeic, and 4-O-methylcryptochlorophaeic acids and a probable trace of anziaic acid by TLC - C. F. Culberson and A. Johnson. - EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2037.

Squamulae thalli primarii discretae, persistentes; podetia 5-30 mm alta, scyphifera, inferne cortice verruculoso, superne sorediis granularibus (25-)40-130(-160) µm diam., interdum vix squamulosa; podetia junioria simplicia, margine scyphorum integro; podetia senioria latere vel interius vel margine scyphorum prolifera, prolificationibus scyphis aut apotheciis terminatis. Sporae 9-16 X 2.5-3.5 µm; pycnidiosporae curvatae, 5-8 x 0.6-1 µm. Thallus acidum merochlorophaeum, acidum 4-O-methylcryptochlorophaeum, et acidum perlatolicum continens. Primary squamules 0.5-1.5 x 1-2.5 mm, incised or not, dispersed; the upper side gray-green, the lower side white; cortex 15-35 µm thick, prosoplectenchymatous, the cells 4-7 µm thick; the medulla 80-160 µm thick, of pachydermate hyphae 2-3.5 µm thick, algal layer continuous above. Podetia cup-forming, 3-30 mm tall, sometimes producing secondary cups laterally and becoming more or less branched, or from within; the cups 2-8 mm broad, 3-13 mm tall, the margin either smooth, with pycnidia, or with proliferations terminating in apothecia or new cups; cortex verruculose below, some- times slightly squamulose, often becoming granular to sorediate towards the top; inner surface of the cups sorediate to finely granular, or with small corticate squamules, the soredia (25-)40-130(-160) µm in diameter; the podetial medulla very thin, the cartilaginous layer 100-200 µm thick, of longitudinally oriented pachydermate hyphae 2.5-5 µm thick, with some interspaces in the outer part. Apothecia terminal on proliferations, brown, convex; epithecium brown; hymenium colorless or brownish above, 38-45 µm high; asci 8-spored, the spores hyaline, mainly biseriate, oblong-ellipsoid, 9-16 x 2.5- 3.5 µm; hypothecium colorless. Pycnidia brown, small, on the margins of the cups; pycnidiospores hyaline, curved, 5-8 x 0.6-1 µm. Medulla K- or K+ faint red-brown, C-, KC+ wine-red, PD-; perlatolic acid, merochlohophaeic acid, 4-O-methylcrypto- chlorophaeic acid. On sandy soil among mosses or on plant debris. Endemic to

the coastal plain of North Carolina, in maritime forests of *Quercus virginiana* or in open pine-oak forests.- *Cladonia perlomera* is distinguished from the other species of the *C. chlorophaea* group by the production of perlatolic, merochlorophaeic, and 4-O-methylcryptochlorophaeic acids. Chemically it is most closely related to *C. merochlorophaea*, which also produces merochlorophaeic acid and a small amount of the new metadepside 4-0- methylcryptochlorophaeic acid. *Cladonia perlomera* differs from *C. merochlorophaea* by producing the orcinol-type para-depside perlatolic acid, in addition to merochlorophaeic acid and 4-O-methylcryptochlorophaeic acid, and by never containing the Porcinol-type depsidone fumarprotocetraric acid, which is an accessory substance in C. merochlorophaea. Morphologically it is evidently different from Ahti's (1966) "Type I" of *C. merochlorophaea* but more similar to his "Type II." *Cladonia merochlorophaea* is a northern species in North America, and its range is separated from that of *C. perlomera* by some 500 km. Generally, specimens of *C. perlomera* cannot be distinguished from those of other members of the *C. chlorophaea* group in North Carolina on the basis of morphology alone, although morphological differences exist in some plants. Young plants of *C. perlomera* have simple cups and are almost identical to those of *C. grayi* and *C. cryptochlorophaea* except that the insides of the cups are more finely granular than those of *C. cryptochlorophaea*. But in older plants of *C. perlomera* there is a tendency for podetia to branch by producing young cups from without or within the older cups, and from the podetial stalk. Such podetia are rare in *C. grayi* or *C. cryptochlorophaea*, and when they are found they are less well developed. The known range of *C. perlomera* is limited to the coastal plain of North Carolina, a region famous for many other endemic plant species.

Cladonia perlomera



Cladonia perlomera

Cladonia perlomera

Cladonia piedmontensis G. Merr., Bryologist 27: 22 (1924)

[VZ1913], USA. Carolina Borealis. Johnstone County: Ad meridiem et occidentem versus ab Edmundson; secus viam dictam Rt. 210, 50 m. Ad terram. Leg. W. L. Culberson (no. 19160) et C. F. Culberson, 9.3.1983. - Annot.: Usnic acid, fumarprotocetraric acid (in apotheciis only), and an unidentified alophatic compound (in apotheciis only) by TlC, anal. A. Johnson and C. F. Culberson.- EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1913.

Thallus dimorphic. Primary thallus squamulose; squamules irregularly shaped, smooth, yellow-green above, white below; vegetative diaspores absent. Photobiont Asterochloris glomerata alga. Podetia 7-20 mm tall, usually unbranched, corticate, continuous to areolate, or covered by squamules. Ascomata biatorine apothecia, 0.2-4 mm diam., brown, often clustered atop of podetia. Chemistry. K-, secondary metabolites unknown. Substrate and Habitat. On soil, humus or rarely wood. Distribution. Eastern North America; in North Carolina throughout.

Lit.: Brodo, I.M., S. Duran Sharnoff & S. Sharnoff. (2001) Lichens of North America. Yale University Press, New Haven & London. 795 pp.
Fink, B. (1935) The Lichen Flora of the United States. University of Michigan Press, Ann Arbor.
Merrill, G.K. (1924) Some new species of American Cladoniae: With an enumeration and description of some hitherto unrecognized varieties and forms of the older species. The Bryologist 27(2): 21-25 (original description).

Cladonia piedmontensis

Cladonia piedmontensis

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= *Cladonia deformis* var. *pleurota* (Flörke) Flot., Übers. Arbeiten Veränd. Schles. Ges. Vaterl. Kultur [27]: 112 (1850) [1849]
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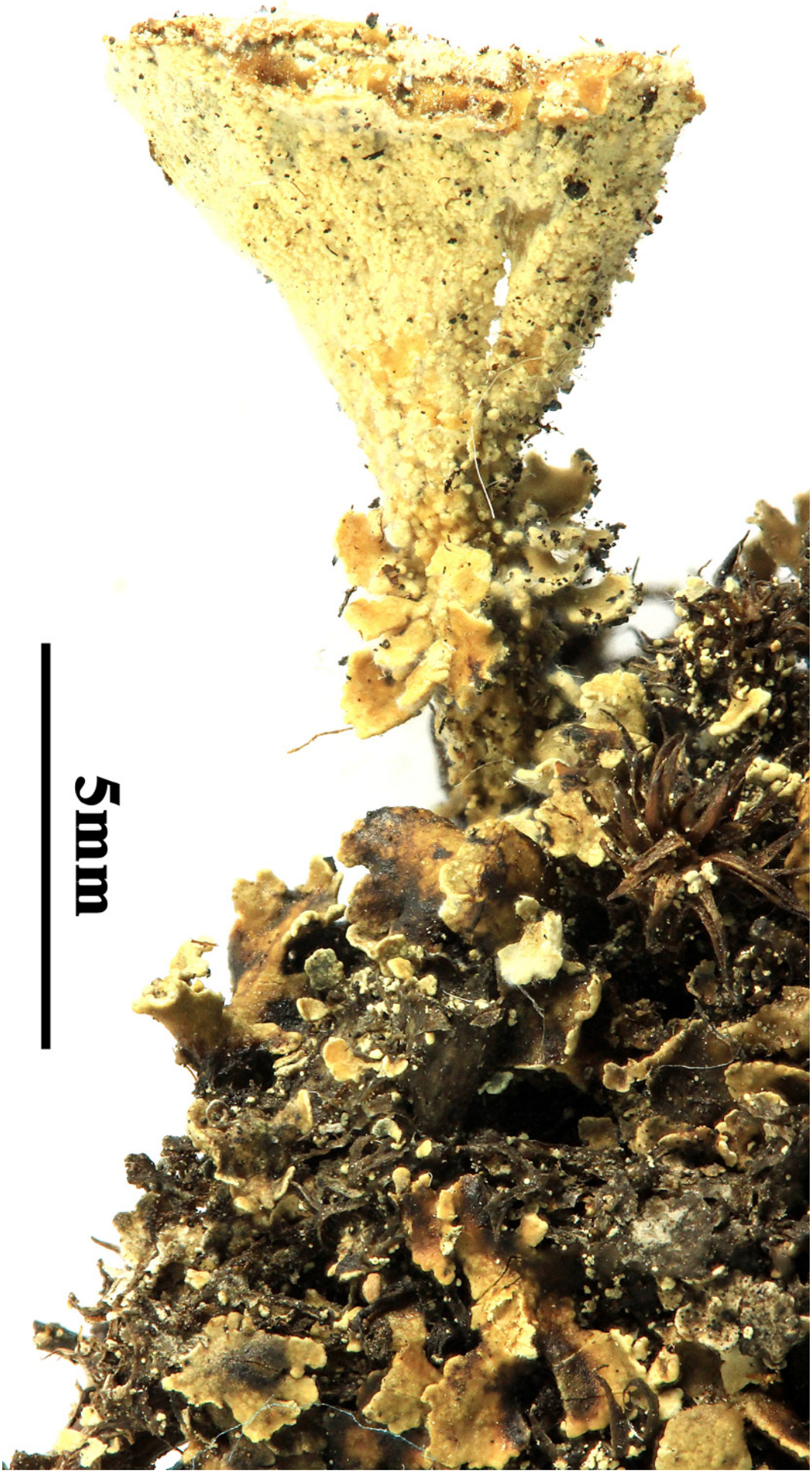
= *Patellaria pleurota* (Flörke) Wallr., Fl. crypt. Germ. (Norimbergae) 1: 420 (1831)
= *Scyphophorus pleurotus* (Flörke) Gray [as 'Scyphophora'], Nat. Arr. Brit. Pl. (London) 1: 424 (1821)

[VZ2408], USA. West Virginea. Tucker County: loco dicto "Dolly Sods", 1060 m. Super muscos et plantas emortuas inter saxa locis apricis. Leg. W. L. Culberson (no. 20562), 8.8.1987. -Annot.: Usnic acid and zeorin by TLC, anal. A. Johnson et C. F. Culberson. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2408.

Primary thallus squamulose, persistent, the squamules variable, rounded to sparsely indented, 1-6 mm long, up to 4 mm broad, irregularly crenate, yellowish green to olivaceous green above, white beneath (sometimes yellowish near the attachment point). Podetia goblet-shaped, hollow inside, yellowish green, 0.5-2(-3) cm tall, with 0.5-1.5 cm broad, regular cups soon flaring into short, 0.5-1.5 mm thick stalks, the margins of cups sometimes dentate or proliferating, esquamulose or sometimes sparsely squamulose at base, corticate only at base (more corticate in fertile specimens), granulose- or almost farinose-sorediate, the soredia 60-100 µm in diam., present also inside and on margins of cups. Apothecia rather rare, scarlet red, often compound and shortly stipitate. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia scarlet red to black, stipitate or semi-immersed along the margin of cups (rarely on the primary squamules), with a red jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC+ yellow, P-, UV-. Chemistry: usnic, isousnic, porphyrilic acids, and zeorin (seen as crystals on the thallus surface in herbarium specimens); rhodocladonic acid in apothecia and pycnidia. - Note: an arctic-alpine to boreal-montane, circumpolar lichen found on soil, rotting wood, more rarely on basal parts of trunks in open habitats, with optimum near or above treeline.

Cladonia pleurota



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[1988], Costa Rica. Cartago: Cerro de la Muerte, 3400 m. As terram humosam. Leg. W. L. Culberson (no, 16823) et C. F. Culberson, 12.12.1976. - Annot.: Usnic acid, zeorin, and an unidentified aliphatic substance by TLC; anal. C. F. Culberson and A. Johnson. - EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1988.

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[VZ2163], Australia. Tasmania. Vale of Belvoir, 840 m. Supra terram turfosam loco humida. Leg. G. Kantvilas (55/87), 18.5.1987. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2163.

Primary thallus squamulose, persistent, the squamules variable, rounded to sparsely indented, 1-6 mm long, up to 4 mm broad, irregularly crenate, yellowish green to olivaceous green above, white beneath (sometimes yellowish near the attachment point). Podetia goblet-shaped, hollow inside, yellowish green, 0.5-2(-3) cm tall, with 0.5-1.5 cm broad, regular cups soon flaring into short, 0.5-1.5 mm thick stalks, the margins of cups sometimes dentate or proliferating, esquamulose or sometimes sparsely squamulose at base, corticate only at base (more corticate in fertile specimens), granulose- or almost farinose-sorediate, the soredia 60-100 µm in diam., present also inside and on margins of cups. Apothecia rather rare, scarlet red, often compound and shortly stipitate. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia scarlet red to black, stipitate or semi-immersed along the margin of cups (rarely on the primary squamules), with a red jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC+ yellow, P-, UV-. Chemistry: usnic, isousnic, porphyrilic acids, and zeorin (seen as crystals on the thallus surface in herbarium specimens); rhodocladonic acid in apothecia and pycnidia. - Note: an arctic-alpine to boreal-montane, circumpolar lichen found on soil, rotting wood, more rarely on basal parts of trunks in open habitats, with optimum near or above treeline.

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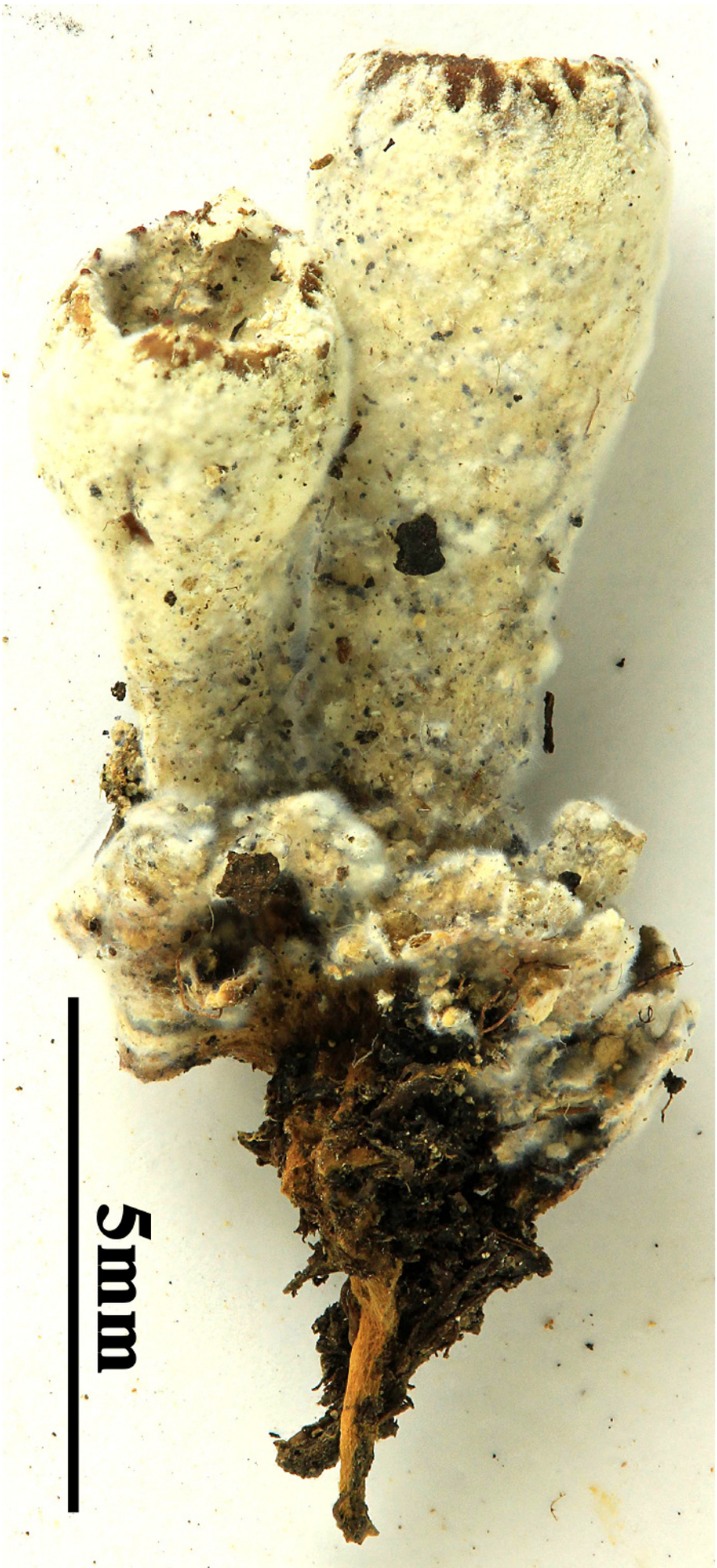
= *Scyphophorus pleurotus* (Flörke) Gray [as 'Scyphophora'], Nat. Arr. Brit. Pl. (London) 1: 424 (1821)

[VZ1853], USA. Carolina Borealis. Avery County: in monte dicto Grandfather. Mountain, 1800 m. Ad humosum. Leg. W. L. Culberson (no. 1577), 30.8.1971. - Annot.: Usnic acid, zeorin, and unidentified triterpenes by TLC, anal. A. Johnson and C. F. Culberson. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1853.

Primary thallus squamulose, persistent, the squamules variable, rounded to sparsely indented, 1-6 mm long, up to 4 mm broad, irregularly crenate, yellowish green to olivaceous green above, white beneath (sometimes yellowish near the attachment point). Podetia goblet-shaped, hollow inside, yellowish green, 0.5-2(-3) cm tall, with 0.5-1.5 cm broad, regular cups soon flaring into short, 0.5-1.5 mm thick stalks, the margins of cups sometimes dentate or proliferating, esquamulose or sometimes sparsely squamulose at base, corticate only at base (more corticate in fertile specimens), granulose- or almost farinose-sorediate, the soredia 60-100 µm in diam., present also inside and on margins of cups. Apothecia rather rare, scarlet red, often compound and shortly stipitate. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia scarlet red to black, stipitate or semi-immersed along the margin of cups (rarely on the primary squamules), with a red jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC+ yellow, P-, UV-. Chemistry: usnic, isousnic, porphyrilic acids, and zeorin (seen as crystals on the thallus surface in herbarium specimens); rhodocladonic acid in apothecia and pycnidia. - Note: an arctic-alpine to boreal-montane, circumpolar lichen found on soil, rotting wood, more rarely on basal parts of trunks in open habitats, with optimum near or above treeline.

Cladonia pleurota



Cladonia pleurota

Cladonia polycarpia G. Merr., Bryologist 12: 46 (1909)

[VZ1914], USA. Carolina Borealis. Johnston County; Ad meridiem et occidentem versus ab Edmundson, secus viam dictam Rt, 219, 50 m. Ad terram. Leg. W. L. Culberson (no. 19159) et C. F. Culberson, 9.3.1983, - Annot.: Atranorin and stictic, cryptostictic, norstictic, and constictic acids and unknown compound Pcr-1 and unknown fatty acids CS-1 by TLC; anal: A. Johnson and C. F. Culberson. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1914.

Primary thallus persistent, consisting of fairly large squamules, with lobes 3-8(-10) x 0.5-1.5(-5) mm, not much dissected; lobe ends obtuse; necrotic parts inconspicuously blackening. Podetia rarely and sparsely produced (in study area), glaucous gray, usu- ally arising laminally, appearing slender, often flexuose, 0.4-1.5(-2.5) cm tall, 0.8-2.5 mm thick, thickness rather uniform, unbranched or usually soon branched 2-4 times by irregular dichotomy, with axils closed, ascyphose. Surface of podetia continuously corticate, minutely verruculose areolate, esorediate, usually esquamose, matt, slightly arachnoid in upper parts. Podetial wall thick and firm, 200-300 µm; cortex to 30 µm; medulla 20 µm; stereome 150-250 µm; central canal strongly papillose, striately cracked. Conidiomata common, on squamules, 150-300 µm wide, globular, short-stalked to subsessile, constricted at base, containing hyaline slime; conidia 7-10 x 1 µm, falciform. Hymenial disks medium brown, subglobose, regularly present from very early stages on podetia, usually arranged in corymbose manner, finally forming compound disks 1.5 mm wide; spores 8-13 x 2- 3.5 µm, oblong. Chemistry. P+ slowly or rapidly red, or golden yellow, K+ yellow to slowly red or K-. Comprises six major chemotypes (I = C. subcariosa s.str.) atranorin (very rarely absent), norstictic and connorstictic (in- constant) acids, homoheveadride; (II = C. polycarpia) in addition to those in I, stictic, cryptostictic, and constictic acids, stictic acid usually being the major compound besides atranorin; (III = C. polycarpoides) norstictic and connorstictic acids and homoheveadride, rarely with traces of stictic or fumarprotocetraric acid, very rarely atranorin; (IV = C. sobolescens) fumarprotocetraric, protocetraric, and confumarprotocetraric acids, rarely also homoheveadride; (V, unnamed, but called C. subclavulifera Asahina in Japan) norstictic and fumarprotocetraric acids as major substances, connorstictic, protocetraric, and confumarprotocetraric acids as mi- nor substances; (VI = C. brevis) psoromic, 2'-0- demethylpsoromic, and rangiformic acids.

Cladonia polycarpia

Cladonia polycarpia

Cladonia polycarpoides Nyl., in Gasilien, Lich. Fl. St. Omer.: 125 (1894)
= *Cladonia subcariosa* Nyl., Flora, Regensburg 59: 560 (1876)
= *Cladonia verticillata* f. *polycarpoides* (Nyl.) Parrique, Act. Soc. linn. Bordeaux 59: 98 (1904)

[VZ1915], USA. Carolina Borealis, Johnston County: 13.5 km ad occidentem versus a Smithfield, secus viam dictam Rt. 210, 50 m. Ad terram. Leg. W. L. Culberson (no. 19161) et C. F. Culberson, 9.3.1983.- Annot.: Norstictic and connorstictic acids, unknown fatty acid CS-1, and probable a trace of hyposalazinic acid by TLC; anal.: A. Johnson and C. F. Culberson. Ex A. VěZDA LICHENES SELECTI EXSICCATI NR. 1915.

Primary thallus persistent, consisting of fairly large squamules, with lobes 3-8(-10) x 0.5-1.5(-5) mm, not much dissected; lobe ends obtuse; necrotic parts inconspicuously blackening. Podetia rarely and sparsely produced (in study area), glaucous gray, usu- ally arising laminally, appearing slender, often flexuose, 0.4-1.5(-2.5) cm tall, 0.8-2.5 mm thick, thickness rather uniform, unbranched or usually soon branched 2-4 times by irregular dichotomy, with axils closed, ascyphose. Surface of podetia continuously corticate, minutely verruculose areolate, esorediate, usually esquamose, matt, slightly arachnoid in upper parts. Podetial wall thick and firm, 200-300 µm; cortex to 30 µm; medulla 20 µm; stereome 150-250 µm; central canal strongly papillose, striately cracked. Conidiomata common, on squamules, 150-300 µm wide, globular, shortstalked to subsessile, constricted at base, containing hyaline slime; conidia 7-10 x 1 µm, falciform. Hymenial disks medium brown, subglobose, regularly present from very early stages on podetia, usually arranged in corymbose manner, finally forming compound disks 1.5 mm wide; spores 8-13 x 2- 3.5 µm, oblong. Chemistry. P+ slowly or rapidly red, or golden yellow, K+ yellow to slowly red or K-. Comprises six major chemotypes (I = C. subcariosa s.str.) atranorin (very rarely absent), norstictic and connorstictic (in- constant) acids, homoheveadride; (II = C. polycarpia) in addition to those in I, stictic, cryptostictic, and constictic acids, stictic acid usually being the major compound besides atranorin; (III = C. polycarpoides) norstictic and connorstictic acids and homoheveadride, rarely with traces of stictic or fumarprotocetraric acid, very rarely atranorin; (IV = C. sobolescens) fumarprotocetraric, protocetraric, and confumarprotocetraric acids, rarely also homoheveadride; (V, unnamed, but called C. subclavulifera

Asahina in Japan) norstictic and fumarprotocetraric acids as major substances, connorstictic, protocetraric, and confumarprotocetraric acids as minor substances; (VI = C. brevis) psoromic, 2'-0- demethylp-soromic, and rangiformic acids.

Cladonia polycarpoides

Cladonia polycarpoides

Cladonia prostrata A. Evans, Trans. Conn. Acad. Arts & Sci. 38: 281 (1952)

[VZ1989], USA. Mississippi, Jackson County, Horn Island, Chimney Point, Ad arenam litoream. Leg. S. C. Tucker (no. 25310), 11.11.1982. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1989.

Cladonia prostrata, commonly called dune cup lichen or resurrection lichen, is an endangered species of lichen endemic to the U.S. southeast coastal plain where it is known from populations in Florida, Georgia, and Alabama. Primary thallus composed of discrete squamules, or if forming a rosette, then loosely attached and ascending; medulla K– or K+ pale yellow or red (atranorin, sometimes with norstictic acid). Squamules usually forming a radiating rosette, curled up at the margins when dry; Florida and vicinity.

Cladonia prostrata

Cladonia prostrata

Cladonia pyxidata (L.) Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 121 (1796) [1795]
= *Baeomyces neglectus* (Flörke) Wahlenb., Fl. lapp.: 454 (1812)
= *Baeomyces pyxidatus* (L.) Ach., Methodus, Sectio post. (Stockholmiæ): 337 (1803)
= *Capitularia neglecta* Flörke, in Weber & Mohr, Beitr. Naturk. 2: 306 (1810)
= *Cenomyce neglecta* (Flörke) Flörke, Deutsche Lich. 1(1): 13 (1815)
= *Cenomyce pyxidata* (L.) Ach., Lich. Univ.: 534 (1810)
= *Cladonia communis* Schaer., Lich. helv. spicil. 6: 290 (1833)
= *Cladonia conchata* Nyl., Syn. meth. lich. (Parisiis) 1(2): 200 (1860)
= *Cladonia neglecta* (Flörke) Spreng., Syst. veg., Edn 16 4(1): 273 (1827)
= *Cladonia neglecta [*unranked*] scyphosa* Schaer., Enum. critic. lich. europ. (Bern): 192 (1850)
= *Cladonia neglecta* var. *scyphosa* Hepp, Wissenschaftliche Ergebnisse, Flechten: 100 (1862)
= *Cladonia polymorpha* var. *pyxidata* (L.) Willd., Fl. berol. prodr.: 362 (1787)
= *Cladonia polymorpha* var. *tuberculata* (Weiss) Baumg., Fl. Lips.: 573 (1790)
= *Cladonia pyxidata* var. *neglecta* (Flörke) A. Massal., Symmict. Lich.: 82 (1855)
= *Cladonia pyxidata* var. *polyscypha* Schaer., Lich. helv. spicil. 1: 27 (1823)
= *Cladoniomyces pyxidatae* E.A. Thomas ex Cif. & Tomas., Atti Ist. bot. Univ. Lab. crittog. Pavia, sér. 5 10(1): 78 (1953)
= *Lichen polymorphus* var. *pyxidatus* (L.) Roth, Tentam. Fl. German. 1: 511 (1788)
= *Lichen pyxidatus* L., Sp. pl. 2: 1151 (1753)
= *Lichen pyxidatus* var. *tuberculatus* Weiss, Pl. crypt. fl. Gott.: 85 (1770)
= *Lichen tuberculatus* (Weiss) K.G. Hagen, Tentam. Histor. Lichen. praes. prussic. icon. viv. color., Koenigsberg: 117 (1782)
= *Patellaria fusca* f. *neglecta* (Flörke) Wallr., Naturg. Saulchen.-Fl.: 164 (1829), Fl. crypt. Germ. (Norimbergae) 1: 403 (1831)
= *Patellaria pyxidata* (L.) Wallr., Fl. crypt. Germ. (Norimbergae) 1: 400 (1831)
= *Scyphophorus pyxidatus* (L.) Gray [as 'Scyphophora'], Nat. Arr. Brit. Pl. (London) 1: 419 (1821)

[VZ1885], Suecia, Västmanlandia: Sala. Sala gruva, prope secturam "Quenn Christina". Ad terram. Leg. R. Santesson (no. 24336(, 16.6.1973. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1885.

Primary thallus squamulose, persistent, the squamules middle-sized, 2-7 mm long (rarely more) and up to 4 mm wide (usually less), thin (less than 0.4 mm thick), irregularly lobed or incised, the tips rounded, mostly ascending, never forming a subrosulate crust, greenish grey above, white beneath. Podetia goblet-shaped, hollow inside, greenish grey, esquamulose, 0.5-3(-5) cm tall, with broad cups gradually tapering into short stalks, the cups regular or proliferating from margin, with contiguous to scattered, corticate granules or peltate squamules (schizidia), especially inside the cups. Apothecia frequent, brown, convex. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed on the margins of cups, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests and chemistry: four chemotypes are known from Europe (all of them C-, KC-, UV-): K- or K+ yellowish slowly turning brown, P+ red (fumarprotocetraric acid complex, often with additional physodalic acid). 2) K+ yellow, P+ red (atranorin and fumarprotocetraric acid complex). 3) K- or K+ yellowish slowly turning brown, P+ red (fumarprotocetraric acid complex and psoromic acid), 4) K+ yellow, P+ red (atranorin, fumarprotocetraric and psoromic acids). Chemotype 1) is the most frequent. - Note: a widespread, very polymorphic, holarctic species with a wide altitudinal-latitudinal range and a wide ecological amplitude, found both on soil, lignum and bark at the base of trees, which is common throughout in Italy.

Cladonia pyxidata

Cladonia pyxidata

Cladonia pyxidata

Cladonia rigida var. acuta (Taylor) A.W. Archer, in Ahti, Stenroos & Archer, Muelleria 7(2): 175 (1990)
= *Cladonia rigida* (Hook. f. & Taylor) Hampe, Linnaea 28: 216 (1857) [1856]
= *Cenomyce acuta* Taylor, London J. Bot. 6: 186 (1847)
= *Cenomyce pyxidata* var. *rigida* (Hook. f. & Taylor) Taylor & Hook. f ., in Hooker, Bot. Antarct. Voy. Erebus Terror 1839-1843 = 1: 197 (1845)
= *Cenomyce rigida* Hook. f. & Taylor, London J. Bot. 3: 652 (1844)
= *Cladonia acuta* (Taylor) Nyl. ex Hue, Nouv. Arch. Mus. Hist. Nat., Paris, 3 sér. 2: 251 (1890)
= *Cladonia elegantula* Müll. Arg., in Vainio, Monogr. Cladon. 2: 26 (1894)
= *Cladonia rigida* var. *acuta* (Taylor) A.W. Archer, in Ahti, Stenroos & Archer, Muelleria 7(2): 175 (1990)
= *Cladonia squamosa* var. *acuta* (Taylor) Müll. Arg., Flora, Regensburg 71(2): 19 (1888)
= *Cladonia squamosula* Müll. Arg., Flora, Regensburg 66(2): 19 (1883)
= *Cladonia squamosula* f. *elegantula* (Müll. Arg.) Abbayes, Rev. Bryol. Lichénol. 34: 824 (1966)
= *Cladonia subsquamosa* f. *pulverulenta* (Vain.) Zahlbr., Cat. Lich. Univers. 4: 608 (1927)
= *Cladonia subsquamosa* var. *pulverulenta* Vain., Acta Soc. Fauna Flora fenn. 4(no. 1): 449 (1887)

[VZ2492], Australia occidentalis: In reservato Porongorup Rang Natrional Park, 35 km ad septentriones versus ab Albany, secus viam dictam Scenic Drive. Ad lignum putrefactum in silva (*Eucalyptus* ssp.. Leg. W. L. Culberson (no. 21471) et C. F. Culberson, 15.11.1990. Annot.: Homosekikaic acid, sekikaic acid (trace) and thamnolic acid by TLC; anal. A. Johnson and C. F. Culberson. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2492.

var *acuta*: Morphologically similar to var. *rigida* but distinguished from it by the presence of homosekikaic acid.

C. rigida: Basal squamules persistent, 1–3 mm long, 0.5–1 mm diam., subpalmately lobed, with crenate to incised margins. Podetia growing from upper surface of basal squamules, 1–2.5 cm tall, 0.5–1.5 mm diam., simple or rarely branching, cylindrical or tapering towards apices, escyphiferous, ecorticate, squamulose, with tips of fertile podetia often open to interior; squamules c. 0.3 mm long near base of

podetia, becoming smaller and isidioid, 0.1 mm long, near apices; sterile podetia acute. Apothecia terminal on podetia, clustered, 0.5–1.5 mm diam., brown to dark brown. CHEMISTRY: K+ yellow, KC-, P+ yellow. Thamnolic acid (major), sekikaic (minor) and hyperhomosekikaic (trace) acids, and with barbatic acid (major) in the apothecia.

C. rigida: Primary squamules persistent, large, 1-5 mm diam., thick, coriaceous, olivaceous, tinged brown or yellow-brown above, smooth, glossy, wrinkled, white or buff below, margins knobbly or pectinate or with small, clustered, globose isidia. Podetia arising from upper surface of primary squamules, short, 5-15 mm tall, 0.5-1.5 mm diam., simple, tapering to subulate apices, cups absent, ± conical and tapering, grey-green or ashy, tinged brownish at apices, crowded, corticate olivaceous at base (1-5 mm) grey-brown or pale greenish-white tinged brownish above, densely isidiate, or with whitish, pellucid or cartilaginous patches devoid of isidia. Isidia minute, globose to ± palmate and coralloid. Squamules occasional. Apothecia minute, terminal, dark brown, globose, solitary or ± peltate in clusters of 2-4. Chemistry: Cortex K+ yellow, P+ yellow. Thamnolic and decarboxythamnolic acids.

Cladonia rigida var. acuta

Cladonia rigida var. acuta

Cladonia rigida var. acuta

Cladonia robbinsii A. Evans, Trans. Conn. Acad. Arts & Sci. 35: 611 (1944)

[VZ2135], USA. Illinois, Pope County: Prope oppidum McCormick loco dicto Bell Smith Springs. Ad terram inter gramina. Leg. W. L. Culberson (no. 19719), 17.10.1985. - Annot.: Usnic acid, barbatic acid, and traces of 4-O-demethylbarbaric acid and obtusatic acid by TLC; C.F. Culberson and A. Johnson. - EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2135.

Primary thallus persistent, well developed, con- sisting of elongate squamules 5-15(-20) x 1-3 mm, greenish yellow above, cream-colored below, sparingly lobulate and crenulate, rounded at tips, smoothly corticate above; underside ecorticate but rather compact, with some corticate patches, in part rugulose and knobby. Podetia (absent in the South American material) rare, 5-15 mm tall, clavate, ascyphose, usually swollen and irregularly branched in the upper part, always bearing hymenia, 1-2 cm tall. Surface of podetia smoothly corticate, with some slits and grooves. Podetial wall not studied. Conidiomata infrequent, on basal squamules, to 0.2 mm wide, subglobose, constricted at base, containing hyaline slime; conidia 7-9 x 0.5 µgm, falciform. Hymenial disks very rare, dark brown. Illustrations. Thomson, 1968: pl. 6, fig. 31; Hale, 1979: fig. 387. Chemistry. P-, K-. Usnic and barbatic acids and traces of obtusatic and 4-0-demethylbarbatic acids. Distribution Brazil, Uruguay, Chile. Main range warm to cool temperate eastern United States and adjacent southern Canada, westward to Alberta and Kansas, southward to Georgia and Arkansas. On soil in grasslands and on rock outcrops, extending to subarid regions. - *Cladonia robbinsii* was recently reported from Brazil (Fleig et al., 1995) and Chile (Stenroos, 1995), where the species is certainly rare. It can be recognized by its yellowish, elongate squamules, even though podetia are normally absent.

Cladonia robbinsii

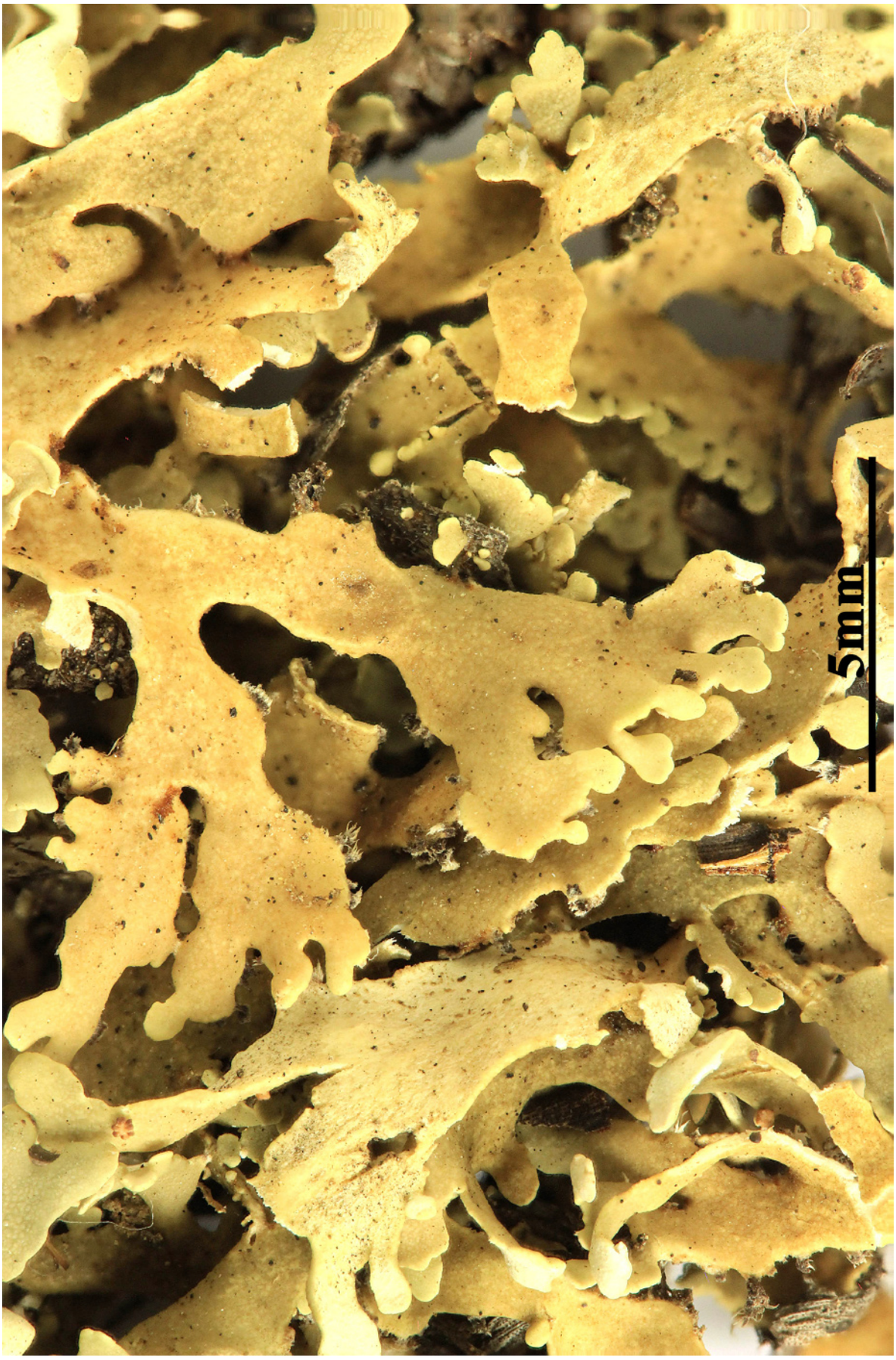
Cladonia robbinsii

Cladonia robbinsii A. Evans, Trans. Conn. Acad. Arts & Sci. 35: 611 (1944)

[VZ1884], USA. Carolina Borealis. Alamance County, 5 km ad meridiem et occidentem versus a Kimesville, 200 m. Ad terram argillaceam in pineto (*Pinus virgininena*). LKeg. W. L. Culberson (no. 19157) et C. F-Culberson, 30.12.1982.- Annot.: Usnic, barbatic, and 4-O-demethylbarbatic acids and a trace of obtusatic acid by TLC; anal. C. F. Culberson and A. Johnson. - EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1884.

Primary thallus persistent, well developed, con- sisting of elongate squamules 5-15(-20) x 1-3 mm, greenish yellow above, cream-colored below, sparingly lobulate and crenulate, rounded at tips, smoothly corticate above; underside ecorticate but rather compact, with some corticate patches, in part rugulose and knobby. Podetia (absent in the South American material) rare, 5-15 mm tall, clavate, ascyphose, usually swollen and irregularly branched in the upper part, always bearing hymenia, 1-2 cm tall. Surface of podetia smoothly corticate, with some slits and grooves. Podetial wall not studied. Conidiomata infrequent, on basal squamules, to 0.2 mm wide, subglobose, constricted at base, containing hyaline slime; conidia 7-9 x 0.5 µgm, falciform. Hymenial disks very rare, dark brown. Illustrations. Thomson, 1968: pl. 6, fig. 31; Hale, 1979: fig. 387. Chemistry. P-, K-. Usnic and barbatic acids and traces of obtusatic and 4-0-demethylbarbatic acids. Distribution Brazil, Uruguay, Chile. Main range warm to cool temperate eastern United States and adjacent southern Canada, westward to Alberta and Kansas, southward to Georgia and Arkansas. On soil in grasslands and on rock outcrops, extending to subarid regions. - *Cladonia robbinsii* was recently reported from Brazil (Fleig et al., 1995) and Chile (Stenroos, 1995), where the species is certainly rare. It can be recognized by its yellowish, elongate squamules, even though podetia are normally absent.

Cladonia robbinsii

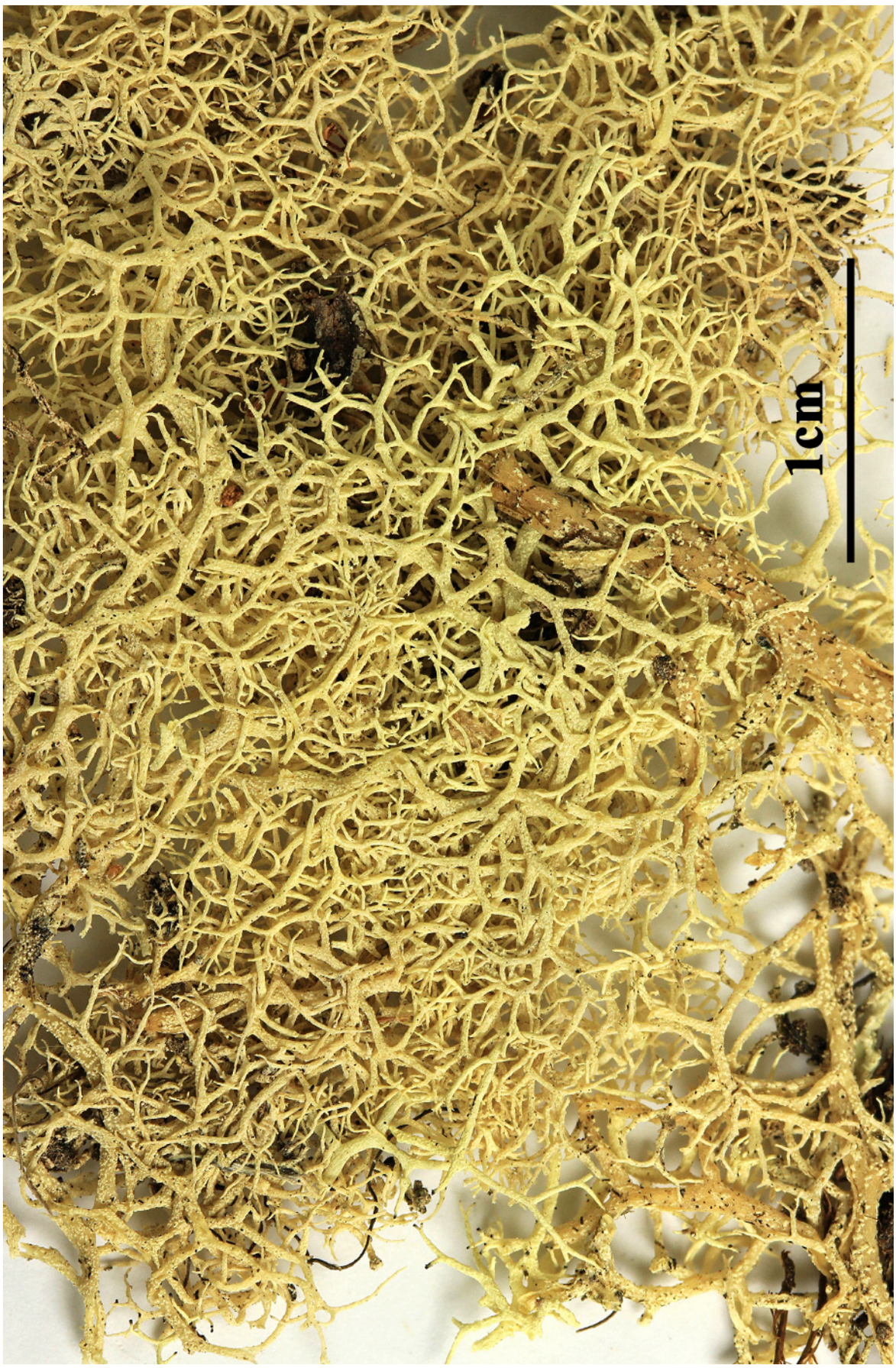


Cladonia robbinsii

Cladonia skottsbergii H. Magn., Ark. Bot. 30B(no. 3): 2 (1942)

[VZ1811], Hawaii Insulae. Hawaii, ad latera merid. montis ignivomi Kilauea - Iki, Hawaii Volcano National Park. Ad terram. Leg. O. et I. Degener (no. 35219), 30.4.1081, det. A. Vězda. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1811.

Apothecia on 0.5-1 mm long stalks, dark brown, half globose, one specimen with practically every apex of the branches apotheciiferous. Hypothecium colourless. Thecium 35-40 µm high, gradually dark yellowish brown towards surface. Paraphyses only in KOH distinct, simple 1-1.5 µm, apices not thickened. Asci 27-32 x 8 µm narrowly clavate. Spores 8-9 x 3 µm, oblong. Thecium I + greenish blue. Pycnidia rarely fully developed, 150(200) µm long, 100 µm broad, hardly narrower at the base, subcylindric. Gelatine colourless. Conidia 1 x 0.7 µm, as a rule distinctly bent. *C. skottsbergii* has the same structure as *C. sandstedei* DES ABB. (Journ. of Bot. 74: 349, 1938; Revis. Monogr. Clad.: 97, 1939) but it is at once separated by the negative Pd-reaction and the ±distinct yellowish colour of the podetia. The K-reaction of *C.sandstedei* is fainter to imperceptible in s*kottsbergii*, although the thallus colour is yellow. Evidently, the species comes near to *C. impexa.* As principal distinguishing characters: the regularly dichotomous and divaricate branching with closed axillae (in impexa tricho- or polytomous), the generally yellowish colour quite to the apices, and the negative chemical reactions. Usually, the surface of the podetia is subscabrid to verruculose, in some specimens very obviously and densely.



Cladonia skottsbergii

Cladonia skottsbergii

= ***Cladonia squamosa* var. *subsquamosa*** (Nyl. ex Leight.) Vain., Meddn Soc. Fauna Flora fenn. 6: 113 (1881)
= Cladonia squamosa Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 125 (1796) [1795]

[VZ2138], Bohemoslovacia. Slovacia, montes Carpates, Tatra Magna: in valle Koprová dolina, in pede montis Opálená, 1000 m. Ad lignum putridum. Leg. A. Vězda, 24.6.1986. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2138.

Primary thallus squamulose, persistent or rarely disappearing, the squamules indented, 2-10 mm long, grey-green above, white beneath, esorediate but sometimes granulose on the lower surface. Podetia extremely variable in shape and size, hollow inside, greenish grey to brown, not melanotic at base, 3-7(-14) cm tall, 0.5-2(-5) mm thick, simple or sparingly branched with open axils, usually expanded in upper parts to form gaping funnels which may proliferate radially, the surface often largely ecorticate exposing the stereome, densely covered with microsquamules, squamules and granules, esorediate. Apothecia infrequent, brown, convex, located at the top of podetia or at the margin of funnels, often clustered. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed on podetial tips, rarely on basal squamules, with a red or colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K+ yellow, C-, KC-, P+ yellow, UV-. Chemistry: thamnolic and barbatic acids, the former mostly present in fertile specimens, and unknown terpenoids. - Note: more hygrophytic than the typical variety, and more bound to higher altitudes, this chemical variety has been often considered as an independent species. According to Aptroot (in litt.) the type material belongs to *C. ramulosa*.
- Apothecien braun. Podetien 1-4 cm hoch, Enden offen, zugespitzt oder schmal trichterig, unberindet, weißlich, feucht fast transparent erscheinend, bedeckt mit stark zerschlitzten, nicht sorediösen Schuppen. Chemie: Thamnolsäure (major), Decarboxythamnolsäure (trace), unbekanntes Triterpen; Schuppen (!) unterseits K+ gelb, P+ gelb, UV-. Bemerkung: Die Hauptform enthält in den Schuppen keine Thamnolsäure, sondern Squamatsäure und reagiert K-, P- UV+ weiß.

Cladonia squamosa* var. *subsquamosa

Cladonia squamosa* var. *subsquamosa

Cladonia stellaris (Opiz) Pouzar & Vězda, Preslia 43: 196 (1971)
= *Baeomyces rangiferinus var. alpestris* (L.) Ach., Methodus, Sectio post. (Stockholmiæ): 356 (1803)
= *Baeomyces sylvaticus* var. *alpestris* (L.) Hepp, Lich.-Fl. Würzburg: 88 (1824)
= *Capitularia rangiferina* var. *alpestris* (L.) Mart., Fl. crypt. erlang. (Nürnberg): 273 (1817)
= *Cenomyce rangiferina* var. *alpestris* (L.) Ach., Lich. Univ.: 564-565 (1810)
= *Cenomyce stellaris* Opiz, Böh. phänerogam. cryptogam. Gewächse (Prague): 141 (1823)
= *Cenomyce sylvatica* var. *alpestris* (L.) Flörke, Deutsche Lich. 8: 14 (no. 157) (1821)
= *Cladina alpestris* (L.) Nyl., Bull. Séanc. Soc. Sci. Nancy, Sér. 2 14: 389 (1896) [1895]
= *Cladina rangiferina* f. *alpestris* (L.) Stizenb., Ber. Tät. St Gall. naturw. Ges.: 294 (1882) [1880-81]
= *Cladina rangiferina* subsp. *alpestris* (L.) Boistel, Nouv. Fl. Lich. (Paris) 2: 28 (1903)
= *Cladina rangiferina* var. *alpestris* (L.) Nyl., Lich. Lapp. Orient.: 111 (1866)
= *Cladina sylvatica* f. *alpestris* (L.) Cromb., J. Linn. Soc., Bot. 17(no. 104): 561 (1880)
= *Cladina sylvatica* var. *alpestris* (L.) Leight., Ann. Mag. nat. Hist., Ser. 3 19(no. 10): 120 (1867)
= *Cladonia alpestris* (L.) Rabenh., in Vainio, Acta Soc. Fauna Flora fenn. 4(no. 1): 41 (1887)
= *Cladonia rangiferina* subvar. *alpestris* (L.) Linds., J. Linn. Soc., Bot. 9: 421 (1867)
= *Cladonia rangiferina* var. *alpestris* (L.) Mérat, Nouv. Fl. Environs Paris, Edn 2 1: 208 (1821)
= *Cladonia sylvatica* f. *alpestris* (L.) Leight., Lich.-Fl. Great Brit. Irel. Chann. Isl.: 73 (1871)
= *Cladonia sylvatica* subsp. *alpestris* (L.) Arnold, Flora, Regensburg 71(6): 85 (1888)
= *Cladonia sylvatica* var. *alpestris* (L.) Bagl., Comm. Soc. crittog. Ital. 1(fasc. 4): 322 (1863)
= *Lichen rangiferinus* var. *alpestris* L., Sp. pl. 2: 1153 (1753)

[VZ2164], Austria, Carinthia: Turracher Höhe, supra lacum Schwarzsee dictum, 1950 m. Ad terram muscosum. Leg. A. Vězda, 13.9.1985. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2164.

Primary thallus crustose, ephemeral and rarely seen, of dispersed, 0.15-0.3 mm wide granules. Podetia densely branched and shrubby, without a clearly defined main axis, hollow inside, pale yellowish white, isotomically-(mainly) tetrachotomously branched, 4-10(-15) cm tall, esquamulose, ecorticate, with an arachnoid surface, darkening but not melanotic at base, most branches of the same thickness, forming compact, rounded, subglobose heads which are 3-5 cm across (top of podetia regularly dome-shaped); axils between branches open or closed; terminal branchlets divergent in a star-like manner. Apothecia very rare, brown, convex, terminal. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed on the tips of podetia, with a reddish jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC+ yellow, P-, UV+ pale blue. Chemistry: usnic, isousnic perlatolic and pseudonorrangiformic acid. - Note: a circumpolar subarctic-subalpine species found in wind-protected sites with a long snow-lie, restricted to upland areas of the Alps.

Cladonia stellaris

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Cladonia stellaris (Opiz) Pouzar & Vězda, Preslia 43: 196 (1971)
= *Baeomyces rangiferinus var. alpestris* (L.) Ach., Methodus, Sectio post. (Stockholmiæ): 356 (1803)
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= *Cenomyce rangiferina* var. *alpestris* (L.) Ach., Lich. Univ.: 564-565 (1810)
= *Cenomyce stellaris* Opiz, Böh. phänerogam. cryptogam. Gewächse (Prague): 141 (1823)
= *Cenomyce sylvatica* var. *alpestris* (L.) Flörke, Deutsche Lich. 8: 14 (no. 157) (1821)
= *Cladina alpestris* (L.) Nyl., Bull. Séanc. Soc. Sci. Nancy, Sér. 2 14: 389 (1896) [1895]
= *Cladina rangiferina* f. *alpestris* (L.) Stizenb., Ber. Tät. St Gall. naturw. Ges.: 294 (1882) [1880-81]
= *Cladina rangiferina* subsp. *alpestris* (L.) Boistel, Nouv. Fl. Lich. (Paris) 2: 28 (1903)
= *Cladina rangiferina* var. *alpestris* (L.) Nyl., Lich. Lapp. Orient.: 111 (1866)
= *Cladina sylvatica* f. *alpestris* (L.) Cromb., J. Linn. Soc., Bot. 17(no. 104): 561 (1880)
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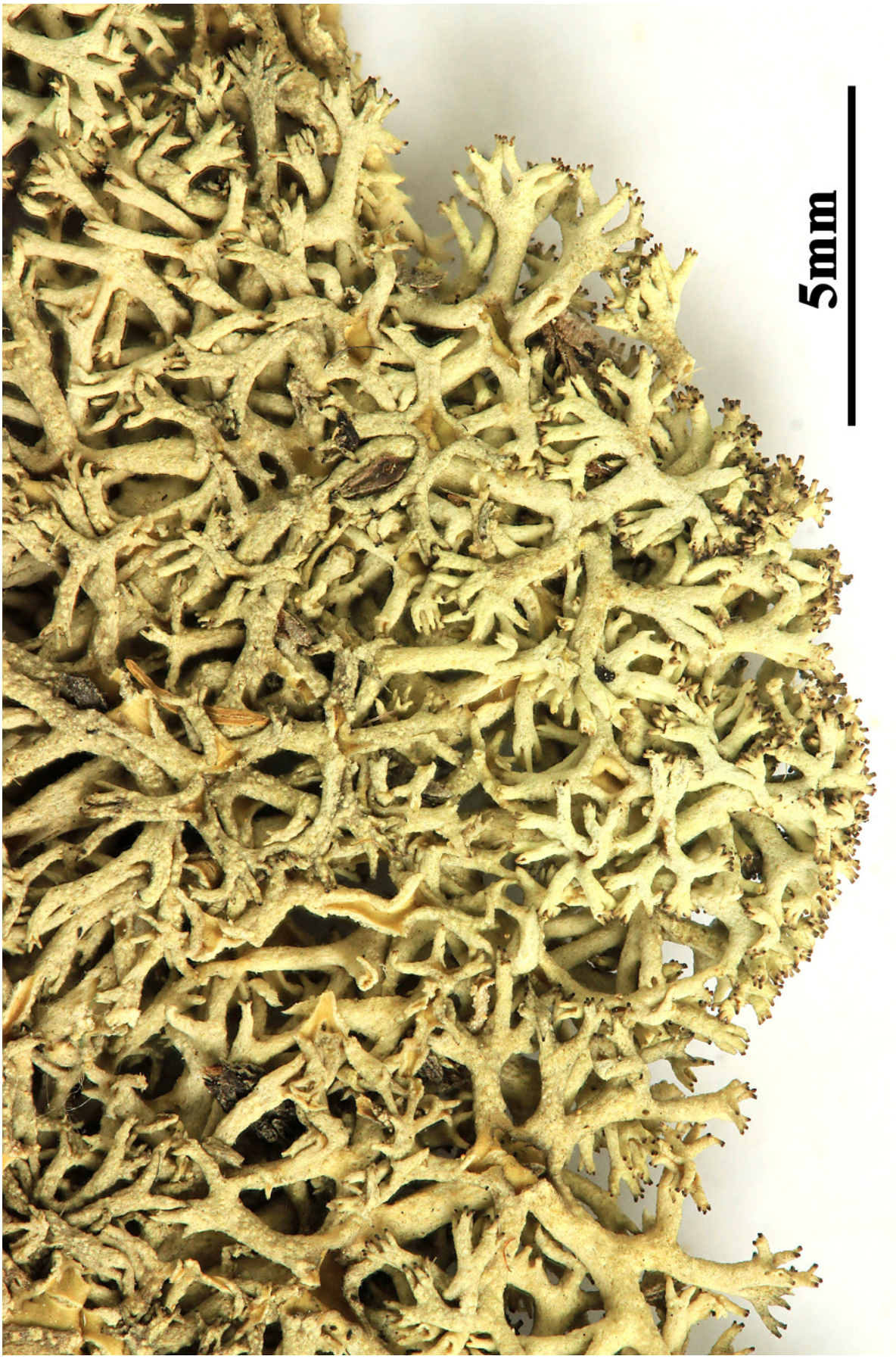
= *Cladonia alpestris* (L.) Rabenh., in Vainio, Acta Soc. Fauna Flora fenn. 4(no. 1): 41 (1887)
= *Cladonia rangiferina* subvar. *alpestris* (L.) Linds., J. Linn. Soc., Bot. 9: 421 (1867)
= *Cladonia rangiferina* var. *alpestris* (L.) Mérat, Nouv. Fl. Environs Paris, Edn 2 1: 208 (1821)
= *Cladonia sylvatica* f. *alpestris* (L.) Leight., Lich.-Fl. Great Brit. Irel. Chann. Isl.: 73 (1871)
= *Cladonia sylvatica* subsp. *alpestris* (L.) Arnold, Flora, Regensburg 71(6): 85 (1888)
= *Cladonia sylvatica* var. *alpestris* (L.) Bagl., Comm. Soc. crittog. Ital. 1(fasc. 4): 322 (1863)
= *Lichen rangiferinus* var. *alpestris* L., Sp. pl. 2: 1153 (1753)

[VZ1646], Bohemoslovacia. Slovacia, Carpatorum montes, Beschidicum occidentale: Suchá Hora, in turfosis " Rudné" dictis, 760 m. Leg.

Z. Pilous, 8. 1936. Ex A, Vězda Lichenes Selecti Exsiccati Nr. 1646.

Primary thallus crustose, ephemeral and rarely seen, of dispersed, 0.15-0.3 mm wide granules. Podetia densely branched and shrubby, without a clearly defined main axis, hollow inside, pale yellowish white, isotomically-(mainly) tetrachotomously branched, 4-10(-15) cm tall, esquamulose, ecorticate, with an arachnoid surface, darkening but not melanotic at base, most branches of the same thickness, forming compact, rounded, subglobose heads which are 3-5 cm across (top of podetia regularly dome-shaped); axils between branches open or closed; terminal branchlets divergent in a star-like manner. Apothecia very rare, brown, convex, terminal. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia dark, semi-immersed on the tips of podetia, with a reddish jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, C-, KC+ yellow, P-, UV+ pale blue. Chemistry: usnic, isousnic perlatolic and pseudonorrangiformic acid. - Note: a circumpolar subarctic-subalpine species found in wind-protected sites with a long snow-lie, restricted to upland areas of the Alps.

Cladonia stellaris



Cladonia stellaris

Cladonia stellaris

Cladonia stereoclada Abbayes, Portug. acta biol., Sér. B 1: 245 (1946)

[VZ2165], Insulae Canarienses. Tenerife: Sierra de Anaga, Las Casas de la Cumbre, 800 m. Ad terram in rupe venti exposita. Leg. P. L. Nimis, 15.1.1985. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 2165.

This lichen is easily overlooked as the common *Cladonia furcata*, but has a distinctive "jizz" and a very restricted main habitat of thin acid humus over rocks and in crevices on coastal slopes on the western coasts of Ireland and Britain. Also found in hummocks in wet *Schoenus nigricans – Erica vagans* heath. Compared to *Cladonia furcata*, the podetia are thinner, more flexose and with fewer and shorter branches plus they have a very distinct shade of grey–green tinged brown. Finally the solid, dense, translucent white to grey-black central axis provides conformation once spotted. Probably very under recorded and should be looked out for on the west coast of Ireland and Britain on exposed rocky headlands with moorland or heathland vegetation. - Like *Cladonia furcata*, but with very thin (0.3–0.5 mm diam.) worm-like flexuose podetia that are only sparingly branched and often entangled, and that are smooth, pale green-grey in shade becoming ± brownish, unevenly corticate in open situations and are uniquely solid within, the central axis dense, translucent white to ± grey-black. Thallus C–, K–, KC–, P+ red, UV– (fumarprotocetraric acid). - On close examination, the combination of thin, flexose and short branched podetia, with a very distinct shade of grey–green tinged brown are give this lichen a distinctive look, compared to *Cladonia furcata*, but it is easily overlooked unless specifically looked for. The solid, dense, translucent white to grey-black central axis provides conformation once spotted. - Habitats: Most records from thin humus on acid rock outcrops and mossy boulders, particularly in crevices in bolder fields in heathy coastal slopes. Also recorded from hummocks in wet *Schoenus nigricans – Erica vagans* heath on the Lizard. Monitoring of habitat restoration in the Lizard heaths has shown that the lichen is fire tolerant and readily regenerates after prescribed fires.
- Species very similar to certain forms of *Cladonia furcata* s.l. or *Cladonia rangiformis* s.l., but which differs by its thinner podetia of 0.3-0.6 mm in diameter, more or less erect and flexuous, forked, a cross section shows a non-hollow, "pencil" structure formed of a thick, dense, whitish outer layer and a more or less gelatinous, grayish central axis

(sometimes, but rarely, the central axis is hollow but then very narrow). External surface smooth, grayish, greenish-gray, brownish-gray, more or less corticate and marbled in appearance in humid weather. C-, K-, CK-, P+ red, UV-. Macaronesian and oceanic species but recorded (rarely) on the south-west coasts of the British Isles in the mossy cracks of coastal rocks and sometimes in damp coastal heaths. To be looked for in France because it is very similar to *Cladonia furcata* s.l. and probably confused with it, if it exists. Two known chemotypes: Chemo I: Fumarprotocetraric acid. Chemo II: Fumarprotocetraric acid and bourgeanic acid.

Cladonia stereoclada

Cladonia stereoclada

Cladonia strepsilis (Ach.) Mont., Annls Sci. Nat., Bot., sér. 2 12: 48 (1839)
= *Baeomyces strepsilis* Ach., Methodus, Sectio prior (Stockholmiæ): 52 (1803)
= *Cenomyce strepsilis* (Ach.) Ach., Lich. Univ.: 527 (1810)
= *Cladonia caespiticia var. strepsilis* (Ach.) Kieff., Bull. Soc. Hist. Nat. Metz 19: 35 (1895)
= *Cladonia cariosa f. strepsilis* (Ach.) Flörke, De Cladoniis, Difficillimo lichenum genere, Commentatio nova (Rostock): 14 (1828)
= *Cladonia pyxidata var. strepsilis* (Ach.) Kremp., Denkschr. Kgl. Bayer. Bot. Ges., Abt. 2 4(2): 106 (1861)

[VZ1932], Bohemoslovacia. Slovacia, montes Tatra Magna: Štrbské pleso, in valle Mýnská dolina, in pede montis Patria, 1700 m. Ad terram in rupibus graniticis. Leg. Z. Kyselová et A. Vězda, 24.8.1983. EX A. VěZDA LICHENES SELECTI EXSICCATI NR. 1932.

Primary thallus squamulose, the squamules persistent, prominent, stiff, elongate-crenate, up to 5 mm long, 0.5-3.5 mm wide, grey-green to bronze-green above, white and corticate beneath, forming dense, often convex, up to 10 cm wide (usually smaller) cushions. Podetia rather rare, small, 0.3-0.8(-1) cm tall, 1-3 mm thick, greenish brown to yellowish brown, irregularly cylindrical to clavate, cupless, continuously corticate, sometimes with small cracks, often squamulose at the base. Apothecia normally present when podetia are well-developed, brown, convex, usually forming aggregates. Asci 8-spored, clavate, thickened at apex, with a K/I+ blue tholus and a K/I+ strongly blue outer gelatinous sheath, Cladonia-type. Ascospores 1-celled, hyaline, ellipsoid. Pycnidia brown, semi-immersed in the basal squamules, with a colourless jelly. Conidia hyaline, curved. Photobiont chlorococcoid. Spot tests: K-, KC-, C+ bright emerald green, P+ yellow, UV+ whitish. Chemistry: baeomycesic and squamatic acids, strepsilin, sometimes traces of barbatic and 4-O-demethylbarbatic acids. - Note: a boreal-montane to tropical lichen found on humus-rich soil overlaying siliceous rocks and amongst bryophytes in humid depressions periodically filled by water, in open situations.

Cladonia strepsilis

Cladonia strepsilis

B

Baeomyces anomaeus Ach..... 19
Baeomyces delicatus Ach..... 104, 108
Baeomyces furcatus (Huds.) Ach..... 42, 46
Baeomyces neglectus (Flörke) Wahlenb..... 146
Baeomyces papillaria Ach..... 100
Baeomyces papillaria var. molariformis Ach..... 100
Baeomyces pleurotus (Flörke) Wahlenb..... 122, 126, 130, 134
Baeomyces pyxidatus (L.) Ach..... 146
Baeomyces rangiferinus (L.) Ach..... 11, 15
Baeomyces rangiferinus var. alpestris (L.) Ach..... 166, 170
Baeomyces rangiformis (Hoffm.) Hepp..... 62
Baeomyces spinosus var. palamaeus Ach..... 42, 46
Baeomyces strepsilis Ach..... 178
Baeomyces sylvaticus var. alpestris (L.) Hepp..... 166, 170
Biatora epimarta (Nyl.) Walt. Watson..... 100
Biscladinomyces rangiferinae Cif. & Tomas..... 11, 15
Buellia epimarta (Nyl.) Malme..... 100

C

Capitularia delicata Mart..... 104, 108
Capitularia furcata (Huds.) Mart..... 42, 46
Capitularia neglecta Flörke..... 146
Capitularia papillaria Mart..... 100
Capitularia pityrea Flörke..... 19
Capitularia pleurota Flörke..... 122, 126, 130, 134
Capitularia rangiferina (L.) Mart..... 11, 15
Capitularia rangiferina var. alpestris (L.) Mart..... 166, 170
Capitularia rangiformis (Hoffm.) Mart..... 62
Cenomyce acuta Taylor..... 150
Cenomyce anomaea (Ach.) Hook..... 19
Cenomyce carneopallida var. cyanipes Sommerf..... 24
Cenomyce delicata Ach..... 104, 108
Cenomyce delicatus (Ehrh. ex Ach.) Ach..... 104, 108
Cenomyce ecmocyna Ach..... 33, 36
Cenomyce firma Laurer..... 91
Cenomyce furcata (Huds.) Ach..... 42, 46
Cenomyce gonorega f. anomaea (Ach.) Ach..... 19
Cenomyce gonorega var. anomaea (Ach.) Ach..... 19
Cenomyce neglecta (Flörke) Flörke..... 146
Cenomyce papillaria Ach..... 100

Cenomyce papillaria var. molariformis (Hoffm.) Ach..... 100
Cenomyce parasitica (Hoffm.) Taylor..... 104, 108
Cenomyce pityrea (Flörke) Ach..... 19
Cenomyce pityrea var. scyphifera Delise..... 19
Cenomyce pleurota (Flörke) Ach..... 122, 126, 130, 134
Cenomyce portentosa Dufour..... 69
Cenomyce pyxidata (L.) Ach..... 146
Cenomyce pyxidata var. rigida (Hook. f. & Taylor) Taylor & Hook. f 150
Cenomyce rangiferina var. alpestris (L.) Ach..... 166, 170
Cenomyce rangiformis (Hoffm.) Flörke..... 62
Cenomyce rigida Hook. f. & Taylor..... 150
Cenomyce squamosa var. anomaea (Ach.) Delise..... 19
Cenomyce stellaris Opiz..... 166, 170
Cenomyce strepsilis (Ach.) Ach..... 178
Cenomyce sylvatica var. alpestris (L.) Flörke..... 166, 170
Cladina alpestris (L.) Nyl..... 166, 170
Cladina arbuscula subsp. mitis (Sandst.) Burgaz..... 8
Cladina evansii (Abbayes) Hale & W.L. Culb..... 2, 5, 39
Cladina mediterranea (P.A. Duvign. & Abbayes) Follmann & Hern.-Padr..... 84
Cladina mitis (Sandst.) Mong..... 8
Cladina papillaria (Dufour) Nyl..... 100
Cladina rangiferina (L.) Nyl..... 11, 15
Cladina rangiferina f. alpestris (L.) Stizenb..... 166, 170
Cladina rangiferina f. foliosa (Flörke ex Vain.) Knoche..... 62
Cladina rangiferina subsp. abbayesii (Ahti) W.L. Culb..... 11, 15
Cladina rangiferina subsp. alpestris (L.) Boistel..... 166, 170
Cladina rangiferina var. alpestris (L.) Nyl..... 166, 170
Cladina sylvatica f. alpestris (L.) Cromb..... 166, 170
Cladina sylvatica var. alpestris (L.) Leight..... 166, 170
Cladonia acuta (Taylor) Nyl. ex Hue..... 150
Cladonia aetnensis Tornab..... 62
Cladonia alcicornis f. firma (Nyl.) Arnold..... 97
Cladonia alcicornis var. firma Nyl..... 97
Cladonia alpestris (L.) Rabenh..... 166, 170
Cladonia alpicola (Flot.) Vain..... 72
Cladonia alpicola f. macrophylla (Schaer.) Vain..... 72
Cladonia alpicola var. macrophylla (Schaer.) H. Olivier..... 72
Cladonia anomaea (Ach.) Ahti & P. James..... 19
Cladonia arbuscula subsp. mitis (Sandst.) Ruoss..... 8

Cladonia arbuscula subsp. stictica Ruoss..... 8
Cladonia arbuscula var. mitis (Sandst.) Sipman..... 8
Cladonia brebissonii f. incrassata (Flörke) M. Choisy..... 59
Cladonia caespiticia var. strepsilis (Ach.) Kieff..... 178
Cladonia cariosa f. strepsilis (Ach.) Flörke..... 178
Cladonia chlorophaea var. grayi (G. Merr. ex Sandst.) P.A. Duvign. 50, 53
Cladonia coccifera f. grandis (Kremp.) Vain..... 122, 126, 130, 134
Cladonia coccifera f. incrassata (Flörke) Th. Fr..... 59
Cladonia coccifera subsp. pleurota (Flörke) Cromb. 122, 126, 130, 134
Cladonia coccifera subvar. pleurota (Flörke) Linds. 122, 126, 130, 134
Cladonia coccifera var. grandis (Kremp.) Müll. Arg. 122, 126, 130, 134
Cladonia coccifera var. pleurota (Flörke) Schaer..... 122, 126, 130, 134
Cladonia communis Schaer..... 146
Cladonia conchata Nyl..... 146
Cladonia cornucopioides f. pleurota (Flörke) Nyl... 122, 126, 130, 134
Cladonia cornucopioides subsp. pleurota (Flörke) Lamy 122, 126, 130, 134
Cladonia cornucopioides var. grandis Kremp..... 122, 126, 130, 134
Cladonia cornucopioides var. incrassata (Flörke) Fr..... 59
Cladonia cornucopioides var. mixta Flot..... 122, 126, 130, 134
Cladonia cornucopioides var. pleurota (Flörke) F. Wilson 122, 126, 130, 134
Cladonia crenulata var. pleurota (Flörke) Flörke..... 122, 126, 130, 134
Cladonia cyanipes (Sommerf.) Nyl..... 24
Cladonia decorticata var. macrophylla (Schaer.) Th. Fr..... 72
Cladonia deformis var. pleurota (Flörke) Flot..... 122, 126, 130, 134
Cladonia degenerans f. anomaea (Ach.) Flörke..... 19
Cladonia degenerans f. pityrea (Flörke) Bosch..... 19
Cladonia degenerans var. anomaea (Ach.) Rabenh..... 19
Cladonia degenerans var. furfuracea Fr. ex Flot..... 19
Cladonia degenerans var. pityrea (Flörke) Schaer..... 19
Cladonia delicata Flörke..... 104, 108
Cladonia dimorphoclada Robbins..... 27, 30
Cladonia ecmocyna (Ach.) Leight..... 33, 36
Cladonia elegantula Müll. Arg..... 150
Cladonia elongata var. ecmocyna (Ach.) Räsänen..... 33, 36
Cladonia evansii Abbayes..... 2, 5, 39
Cladonia extensa var. pleurota (Flörke) Kremp..... 122, 126, 130, 134

Cladonia fastigiata (Delise) Zopf..... 19
Cladonia firma (Laurer) Kremp..... 91
Cladonia firma (Nyl.) Nyl..... 97
Cladonia foliacea f. firma (Nyl.) Dalla Torre & Sarnth..... 97
Cladonia foliacea var. firma (Nyl.) Vain..... 97
Cladonia fruticosa var. furcata (Huds.) Schaer..... 42, 46
Cladonia fruticosa var. rangiformis (Hoffm.) Schaer..... 62
Cladonia furcata (Huds.) Baumg..... 42, 46
Cladonia furcata f. isignyi (Delise ex Nyl.) Boistel..... 19
Cladonia furcata f. palamaea (Ach.) Arnold..... 42, 46
Cladonia furcata f. pinnata (Vain.) M. Choisy..... 42, 46
Cladonia furcata subf. lamarckii (Delise ex Nyl.) Boistel..... 19
Cladonia furcata subsp. pinnata (Vain.) Fink..... 42, 46
Cladonia furcata subsp. subrangiformis (L. Scriba ex Sandst.) Pišút 42, 46
Cladonia furcata subvar. pinnata (Vain.) Maheu..... 42, 46
Cladonia furcata var. cancellata Müll. Arg..... 42, 46
Cladonia furcata var. palamaea (Ach.) Nyl..... 42, 46
Cladonia furcata var. pinnata Vain..... 42, 46
Cladonia furcata var. rangiformis (Hoffm.) Schaer..... 62
Cladonia furcata var. subrangiformis (L. Scriba ex Sandst.) Hennipman..... 42, 46
Cladonia furcata var. tenuicaulis Müll. Arg..... 42, 46
Cladonia fusca var. rangiferina (L.) Rabenh..... 11, 15
Cladonia glauca f. furcata (Huds.) Kieff..... 42, 46
Cladonia gracilis var. ecmocyna (Ach.) Vain..... 33, 36
Cladonia grayi G. Merr. ex Sandst..... 50, 53
Cladonia impexa Harm..... 56
Cladonia incana var. pleurota (Flörke) Schaer..... 122, 126, 130, 134
Cladonia incrassata Flörke..... 59
Cladonia isignyi (Delise ex Nyl.) Nyl..... 19
Cladonia klementii Oxner..... 62
Cladonia lamarkii Delise ex Nyl..... 19
Cladonia lamarkii f. isignyi Delise ex Nyl..... 19
Cladonia lepidula var. foliolosa Müll. Arg..... 19
Cladonia leporina Fr..... 66
Cladonia leucocephala Müll. Arg..... 19
Cladonia macaronesica Ahti..... 69
Cladonia macilenta var. pleurota (Flörke) Rabenh.. 122, 126, 130, 134
Cladonia macrophylla (Schaer.) Stenh..... 72
Cladonia macroptera Räsänen..... 75

Cladonia madreporiformis (With.) DC..... 100
Cladonia magyarica Vain. ex Gyeln..... 78
Cladonia mateocyatha Robbins..... 81
Cladonia mediterranea P.A. Duvign. & Abbayes..... 84
Cladonia miniata G. Mey..... 87
Cladonia mitis Sandst..... 8
Cladonia molariformis Hoffm..... 100
Cladonia murrayi W. Martin..... 91
Cladonia narkodes Kremp..... 42, 46
Cladonia neglecta (Flörke) Spreng..... 146
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