

III TERRICOLOUS/MUSCICOLOUS/LICHENICOLOUS.

After Poelt, and others

Rev. 1/94

1. Thallus and apothecial margins \pm yellow.2

1. Thallus and apothecial margins \pm gray, white, or brownish.6

2. Thallus sorediate, strongly yellow, K+ red, lobate; lobes mostly very short, definitely lifted from substrate, high convex, crowded, each soon breaking up into a wide, deeply hollowed out thallus-colored soralium; old lobes finally almost hollow; K+ red-brownish. Apothecia very rare, with thick, sorediate margin, poorly developed. On non-calcareous, overhanging surfaces. Arctic-alpine.L. reagens

2. Thallus not sorediate. [Note: various members of Lecanora subg. Placodium, with \pm lobed thallus, that normally occur on rock, will also key out here; the only one that is fairly frequent on soil or moss is L. muralis].3

3. Discs \pm dark, often olive or blackish; apothecial margin thick, crenulate, persistent. Thallus \pm squamulose, on a black hypothallus.4

3. Discs pale yellow-orange; apothecial margin thin, soon excluded. Thallus verrucose-granular to weakly lobate. Usnic acid and zeorin. Epithymenium granular.5

4. Apothecia to 1.5 mm diameter. Discs olive, ochre, red-brown or blackish. Thallus granular-squamulose, dispersed to aggregated; squamules convex to subglobose, the margins somewhat crenulate, tending to form an uneven, areolate thallus with somewhat flattened and radiating margins, yellow to yellow-green or greenish straw color; prothallus black. Apothecia (0.4-)1-1.5 mm diam., at first \pm immersed, becoming sessile but not or slightly constricted below; thalline margin persistent, well developed, entire, becoming flexuous, crenate and bead-like in age; discs olivaceous to green-black or black, uneven to slightly convex, often thinly white-pruinose; epithecium yellowish brown, \pm granular, K+ blue-green; hymenium 60-80 μ m tall, yellow-brown above; paraphyses 1.5-2 μ m wide, sparsely branched and anastomosed, apices to 4.5 μ m wide, slightly thickened and brownish; spores (9-)10-13(-15) x (4.5-)6-9 μ m, ellipsoid or narrowly ellipsoid, walls ca. 1 μ m thick. Thallus P- or P+ yellowish, K- or K+ yellowish, C-, containing atranorin, psoromic and 2'O-methylpsoromic acids. On mosses (especially Andreaea) and decaying plant materials, usually in areas of late snow lie.L. leptacina

4. Apothecia to 3-4 mm diameter. Discs olive-black, yellowish pruinose. Thallus squamulose, pale yellow, in herbarium turning pinkish in places. (Subg. Placodium Sect. Dactylon: L. maxima)

5. Thallus \pm thin, verrucose to coarsely granular, non-lobate, pale yellow (straw color) to pale greenish yellow; margin definite or indefinite. Apothecia 0.4-0.75(-1.5) mm diameter,

becoming convex to hemispherical; discs \pm pruinose, pale yellow-orange, blackening, plane then convex or hemispherical; margin thin, lacking algae, similar in color to disc, soon excluded. Epihymenium yellow-green to grayish green, N+ gray-purple-red, K+ pale green, with coarse superficial granules; hymenium hyaline, 60-75(-85) μ m; excipulum radiate, biatorine, hyaline; paraphyses 1.2-2.0 mm thick, branched, free in K, not or weakly capitate; spores narrow-ellipsoid to ellipsoid, (10.5-)12-16.4(-18.5) \times 4.4-6(-6.5) μ m. Thallus K-, C-, P-, KC+ yellow. Chem.: usnic acid, zeorin, other triterpenes, sometimes porphyrillic acid. On calcium-rich soil, arctic.L. luteovernalis

5. Thallus thick, \pm lobate. Paraphyses 2.3-2.7 μ m thick. Spores 11.6-13.5(-14.7) \times (5-5)6.0-6.8 μ m. Apothecia often absent; discs epruinose, persistently pale, the margin at first thick and distinct, containing algae. Often on mossy or peaty, non-calcareous substrates. (Subg. Placodium Sect. Dactylon: L. geophila)

6. Growing on the lichen Dermatocarpon; thallus absent. Apothecia mostly on the edge of the lobes of the host, 1-3 mm wide, at first thick, smooth, highly elevated, forming white verrucae, then enlarging, flexuose-crenulate, often constricted, yellowish below, 0.3-0.5 mm thick; disc plane to undulate, densely pruinose, brownish under the pruina, the margin thick, prominent, flexuous, slightly inflexed. Lower cortex of apothecia 50-70 μ m thick, nubilated in outer 15-18 μ m, paraplectenchymatous, the cells 5-9 \times 4-5 μ m, irregularly, often perpendicularly oblong, with gelatinized walls, at edge narrower; medulla lax, easily torn, the hyphae very loosely intricate, grayish nubilated; algae 10-17 μ m; algal layer ca. 50 μ m thick, reaching the edge; excipulum 20-25 μ m along base with parallel, gelatinized hyphae up to the edge; hypothecium faintly developed; hymenium 70 μ m, I+ dark blue; epihymenium yellow-brown, dissolving in K or C without coloration, with gelatinous cover; paraphyses 1-1.5 μ m, simple, the tips not thickened; asci 45-50 \times 10 μ m, clavate; spores 10-13 \times 7-8 μ m, thin-walled. Pycnidia unknown. Utah.L. thallophila

6. Growing on soil, moss, or humus.7

7. Thallus dirty brown to dark grey; apothecial margin brown (concolorous with disc). Apothecial disc brown. Spores narrow, \pm fusiform; asci narrow. Cortical hyphae of apothecia thin. ...(see Bryonora)

7. Thallus and apothecial margin whitish or greyish.8

8. Spores 4-10, subspherical to ovoid, 14-24 \times 9-20 μ m. immersed to adnate. Thallus thin, areolate-squamulose, pale greenish gray, K-, the squamules somewhat wrinkled, subimbricate, loosely attached, angular or with wavy or lobate margins. Apothecia to 0.8 mm, often clustered, the disk flat, black (brick red when wet), the margin thin, concolorous with thallus, becoming subcrenulate. Asci becoming saccate, the apical wall greatly thickened. On soil. (Megaspora verrucosa; "Lecanora glaucopsina" may also key out here)

8. Spores smaller. Apothecia sessile. 9

9. Thallus K+ yellow then red (norstictic acid). Thallus chalky-white to ashy gray, crustose, adhering tightly to the soil, thick, areolate throughout; hypothallus not seen; areoles verruciform to bullate to irregularly expanded upwards and outwards, tightly heaped together, apically

swelling, the cortex thickly pruinose, mealy to crumbly rough, occasionally excavated. Apothecia lecanorine, margin concolorous with thallus, thickly pruinose, soon becoming sinuous; disc fuliginose, weakly pruinose, at first flat to scarcely convex, soon often distinctly convex, when old often cratered or fissured, with white hyphae erupting thorough; hypothecium colorless; hymenium hyaline, ca. 80-90 μ m high; epihymenium yellow-brown; paraphyses septate, branching, occasionally anastomosing, 3-4 μ m wide, proximally straight, distally moniliform-swelling; asci clavate, 60-70 x 15 μ m at the widest, the apical apparatus of the Bacidia-type; spores 8, hyaline, nonseptate, broadly elliptical, 10-14 x 8-10 μ m. Cortex containing norstictic acid. On gypsiferous soil, Utah. L. gypsicola St. Clair & Newberry

9. Thallus K+ yellow or K-. 9b

9b. Thallus relatively thick, K+ yellow. Thallus weftlike or of dispersed, convex, wartlike granules (or areoles?), whitish, soralia when present excavate; soredia coarsely granular, grayish white. Apothecia 1-2(-3) mm diam., sessile, constricted at base, often short-stalked, frequently in dense groups; thalline exciple persistent, entire to crenulate or flexuous, containing small, irregular crystals in the cortex and sometimes the medulla, not dissolving in K; disc dark reddish brown, shiny or sometimes with small clumps of pruina, \pm plane; epithecium reddish brown, sometimes with small oil drops; hymenium 60-85 μ m; paraphyses 1.5-2 μ m, simple or sparsely branched, apices to 3.5 μ m, somewhat swollen, reddish brown; spores (11-)14-18(-19) x (5-)8-9.5 μ m, narrowly ellipsoid. Thallus P-, K+ yellow, C-. Chem.: usually atranorin alone, or also with zeorin. On moss and dead vegetation, rarely lignum; arctic-alpine. L. epibryon (L. subfusca group)

9b. Thallus thin, K-. Spores 4-6 μ m wide. (L. hageni sensu lato).10

10. Discs heavily grey to blue-grey pruinose; apothecia 0.2-0.8 mm. (L. hageni)

10. Discs epruinose or very lightly pruinose.11

11. Apothecial margin cortex \pm uniform in thickness; apothecia 0.5-2 mm. Disc flat to rarely slightly convex, red, red-brown, or blackening. Thallus verruculose or areolate, thin to disappearing, bluish white or ashy. Apothecia to 2 mm, substipitate, the margin thick, pale, entire, with thick cortex of palisade-like hyphae; hypothecium hyaline, I-. Epihymenium reddish or brownish to violet reddish, K-, N-; hymenium 40-65 μ m, hyaline, I+ blue; paraphyses coherent, slender, 1.5 μ m, tips slightly thicker, simple or sparsely branched. Spores 8, oblong to ellipsoid, 9-14 x 4-6 μ m. Thallus K-, C-, P-, I-. Ch: xanthoness. On calcareous rocks, on bones, and occasionally on vegetation. Arctic. L. behringii

11. Apothecial margin cortex thin to absent at upper (lateral) edge, very thick below.12

12. Apothecial margin narrow, broken up, almost disappearing; apothecia extremely crowded, 0.2-1 mm. Spores 9.8-11 x 5-7.2 μ m.(see L. umbrina)

12. Apothecial margin thicker, persistent; apothecia not crowded; discs slightly pruinose.13

13. Apothecia 0.2-0.6 mm, adnate, not constricted; margin often uneven and broken.

.....(L. hageni)

13. Apothecia 0.6-1.6 mm, constricted; margin even, continuous. (Usually?) on wood on the seashore. (L. zosterae)

ADD:

Northwest Territories. At the tips of dead saxifrages. Lecanora sp. (syn. Lecidea lindstroemii Lynge)(see Lynge, 1921, Skr. Vidensk.-selsk. Christiana, Math.-Naturvidensk. Kl. 15: 6)

Literature

Rajvanshi, V., L. L. St. Clair, B. L. Webb and C. C. Newberry. 1998. The terricolous lichen flora of the San Rafael Swell, Emery County, Utah, U.S.A. Pages 399-406 in: Glenn, M. G., R. C. Harris, R. Dirig & M. S. Cole (eds.), Lichenographia Thomsoniana: North American Lichenology in Honor of John W. Thomson. Mycotaxon Ltd., Ithaca, NY.