

Lempholemma Körber

After Coppins, et al., Poelt, and Fink;
need to see Henssen, 1968

Rev. 5/94

Thallus crustose-warted, squamulose, foliose or minutely shrubby, blackish, or dark blue green to olivaceous especially when wet, gelatinous, homeomerous, without a well defined cortex. Hormocystangia present or not. Photobiont Nostoc; cells in chains, occasionally compressed and clustered.

Apothecia mainly laminal, \pm globose, \pm immersed to sessile. Thalline exciple conspicuous. Disk pore-like, sometimes later expanding. True exciple usually thin and inconspicuous, rarely more than 20 μ m wide at the sides, colorless, of compacted, parallel hyphae. Hypothecium shallow, colorless. Hymenium colorless, without a distinct epithecium. Paraphyses scanty to numerous, simple or sparingly branched, without swollen apices; gel matrix I+ reddish, K/I+ blue. Asci clavate to cylindrical, without a distinct apical apparatus; wall K/I-, or blue in outer part (? adhering hymenial gel). Spores 8, ellipsoid to globose, simple, colorless, thin-walled but often with a distinct, gelatinous perispore that disperses in K.

Pycnidia mostly laminal, globose, immersed; conidogenous cells slender, cylindrical; conidia acrogenous, bacilliform, or with a swelling at one or both ends, or fusiform, straight or slightly curved, simple, colorless. No substances. On rocks, mortar, bryophytes or soil, usually on substrates that are calcareous or subjected to basic flushing.

The genus is heterogeneous and should be divided; a critical revision of the species is required. Apart from detailed anatomical aspects, the genus can be distinguished from most other gelatinous cyanobacterial lichens with a similar appearance by its Nostoc photobiont. Similar species of Collema have septate ascospores, as do those of Leptogium, which also have a \pm well-defined cellular cortex. The apothecia and pycnidia of Lempholemma species are often inconspicuous and are best observed in moistened thalli.

1. Thallus with strap-like lobes 5-15 mm long and 0.2-0.6 mm wide, \pm channelled, repeatedly dichotomously branched, prostrate, forming rosettes to 2-3 cm diam., or in larger mats. Isidia or lobules clustered, globose to clavate. Upper surface brown to blackish, sometimes with globular hormocystangia; lower surface pale brown or greenish, and often with a central, \pm winged, nerve-like structure and bundles of white attachment hyphae; lobe ends usually with an elongate-clavate swelling. Apothecia, if present, lateral, half-immersed, 0.3 mm wide, with pore-like disc; spores ellipsoid, 13.5-23 x 8-12 μ m. Pycnidia frequent, \pm immersed; pycnosporangia 3-5 x 1 μ m, bacilliform or swollen at one or both ends, sometimes slightly curved. On basic rocks, especially calcareous mica-schists, soil or moribund bryophytes on moist ledges or periodically flushed situations. Alberta. L. radiatum

1. Thallus without strap-like lobes, if lobes minutely shrubby then 0.15-3 mm wide.
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2. Thallus closely adnate to rock, generally on pure limestone or dolomite.

- 2. Thallus usually not closely adnate to rock (except in L. umbella), usually over mosses or soil, crustose, squamulose or foliose, or cushion-like; lobes less than 0.5 mm long. Thalloid margin of apothecia without cortex; apothecial disc becoming widely opened. Isidia and lobules absent. 4**
- 3. Thallus umbilicate shield-form, yet often lobed or proliferating, or squamulose-warty and then appearing dwarf fruticose, with very short branches; with isidiate branches decumbent on the margins of ascending to erect branches. Without hormocystangia. On rock. L. isidioides**
- 3. Thallus minutely shrubby, to 5 mm diam.; lobes 1-2 mm long and 0.15-0.2 mm wide. Without isidia. With hormocystangia.** Ends of some lobes swollen, with globular hormocystangia 0.15-0.3 mm diam., which eventually burst and become cup-shaped. Thallus at first a rosette of short, flattened squamules which eventually elongate into cylindrical, \pm dichotomously branched, minutely wrinkled lobes. Apothecia, if present, terminal or lateral, 0.1-0.4 mm diam., with blackish convex disc; spores 15-20 μ m diam., globose. On low, flat, acid rock outcrops, or on calcareous rock by a waterfall. L. cladodes
- 4. Thallus minute to small, cushion-like. Apothecia slightly immersed to adnate, the discs red-brown to brown, becoming flat. Spores oblong, 16-25 x 7-9 μ m. On rocks, Alabama and Iowa. L. umbella**
- 4. Thallus small to middle-sized, lobed. Apothecia, if present, at first punctiform, later wide open, with mostly urn-shaped concave disc. Spores globose to broadly ellipsoid, or if more narrowly ellipsoid, then 10-13 μ m wide. Usually on soil or moss, less often directly on rock. 5**
- 5. Thallus forming small cushions or tufts to 5 mm diam., with minute flattened squamules or short cylindrical lobes to 0.5 mm long.** Ends of some lobes swollen, with globular to cup-shaped hormocystangia. Apothecia and pycnidia often absent. (L. cladodes)
- 5. Thallus forming a spreading granular, nodular or membranous crust, sometimes with marginal lobes to 3 mm wide. Apothecia and/or pycnidia usually present. 6**
- 6. Ascospores globose, 9-14 μ m diam. or ("L. chalazanodes") broadly ellipsoid, (8-)9-16(-20) x 8-12(-15) μ m.** Thallus dark olivaceous to blackish (brownish when wet), typically spreading, \pm lobate, to 5 cm diam. (resembling moribund Collema auriforme), spreading to 5 cm diam. or more and then often with irregularly rounded lobes (to 3 mm wide) at the edge; center of thallus membranous but with irregular ridges which are often warted; some forms ("L. chalzanellum") much reduced and nodular-granular. Apothecia 0.2-0.3 mm diam., often aggregated along the ridges or lobe ends, \pm globose, almost fully to 1/4 immersed, with red-brown pore-like to expanded disc; hymenium 100-130 μ m; paraphyses numerous, 1.5-2 μ m wide; asci cylindric to cylindrical-clavate; spores uniseriate at least in upper part of ascus. Pycnidia frequent; pycnospores 2-3 x 0.5-1 μ m, bacilliform. On limestone and mortar, usually over mosses. Eastern. L. myriococcum s. lato
- 6. Similar to the above but ascospores 20-33 x 10-13 μ m, ellipsoid (mostly at least twice as long as broad), thallus blackish green when wet, irregularly lobed, to 1(-1.5) cm across, with smooth or granular surface; apothecia often urn-form sunken, reddish, with**

thick thalline margin. On mosses or crumbly mortar, occasionally on bare calcareous soil. Southern California. L. chalazanum (see Hasse for more info.)

ADD:

L. fennicum (Rasanen) Degel.

Thallus black, small, forming tufts 2-6 mm broad, of 1-2 mm tall fruticose lobes; lobes cylindrical, blunt-tipped, I-.

Apothecia lecanorine, concave; disk brown, to 0.2 mm broad; hypothecium hyaline; hymenium 40-50 μ m, I+ red; asci subcylindrical; spores 8, hyaline, simple, spherical to slightly ovate, 10-12 x 9-12 μ m. Conidia 4-4.5 x 1.5 μ m. On steep rocks, shales or slates, and on trickle surfaces. Greenland.

L. oblique-peltatum (Eschw.) Dodge

L. vesiculiferum Henssen

Descriptions

L. isidioides

Thallus consisting of \pm circular, slightly umbilicate, 0.5-3 mm large cushions, in larger individuals 0.1 mm wide lobules are found, which are sometimes branched or thickened at apex. On sun-exposed, inundated calcareous pavement.

Literature

Coppins, B. J., O. L. Gilbert and P. M. Jorgensen. 1992. Lempholemma. In: Purvis, et al., Lichen Flora of Great Britain and Ireland.

Fröberg, L. 1989. The Calcicolous Lichens on the Great Alvar of Öland, Sweden. Institutionen för Systematisk Botanik. Lund. 109 pp.

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