

Pyrenocollema Reinke

After Harris, and others

Rev. November 16, 1998

Thallus immersed or superficial, usually subgelatinous, the hyphae generally vertically oriented. Photobiont a cyanobacterium Gloeocapsa, Hyella, or Nostoc, the cells orange or blue-green). Ascomata perithecioid, usually unilocular. Exciple dark brown; wall \pm cellular, normally heavily melanized. Involucrum usually absent. Hamathecium of sparingly to richly branched and anastomosed pseudoparaphyses, septate, I-. Asci with two functional wall layers and an internal apical beak, fissitunicate, ovate to subcylindrical, usually long-stalked, I-, usually 8-spored. Spores colorless, oblong to ovoid-fusiform, 1-septate, the upper cell usually shorter and broader than the lower, a poorly defined gelatinous perispore sometimes present. Conidiomata pycnidia; conidiogenous cells \pm cylindrical, phialidic; conidia bacilliform or ellipsoid. On calcareous substrata in moist situations, on wet sand, or on acid rocks in freshwater or marine habitats.

The marine species may be confused with the lichenicolous fungus Stigmidium marinum, which occurs on Verrucaria species; it has perithecia 0.15-0.2 mm diam., lacks hamathecial filaments, and has the spores constricted at the septum, 10-15 x 4-6 μ m.

1. Marine, in tidal or spray zone, on rock or shells of barnacles or gastropods.

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1. Fresh water aquatics, semi-aquatics or on rock in moist places.

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2. Thallus with abundant carbonaceous ridges and punctae (jugae), superficial, thin, brown, matt when dry, shiny and translucent when wet; jugae convex, branched and irregularly stellate, typically 0.1 x 0.2-0.5 mm, flattening and broadening at the thallus margin to form a distinct edge. Photobiont cells orange (Hyella). Perithecia immersed in the black ridges, 0.1-0.3 mm diam., flattened and circular, with deeply depressed ostioles, base blackened. Ascospores clavate, the cells unequal, one end pointed, the other rounded, 11.5-18(-20) x 3.5-7 μ m. Pycnidia also immersed in the black ridges. On siliceous or ultramafic rocks in the littoral zone, as tiny patches amongst Verrucaria striatula, the crustose red alga Hildenbrandia, etc. (on Fidalgo Island, WA, forming extensive patches, associated with the red alga Porphyra torta). Washington. P. elegans R. Sant.

2. Thallus without jugae. On rock, barnacles, or mollusc shells. 3

3. Thallus thick (0.1-0.2 mm), deep yellow-brown or olivaceous to dark brown, gelatinous when wet, conspicuous (resembling a marine alga), shiny; photobiont blue-green (but not Hyella) cells large, variable in size, up to 25 μ m in diameter, blue gray, weakly arranged into vertical rows; spores 14-18 x 7-9 μ m. Ascocarps subglobose, immersed, becoming emergent, black, 0.2-0.3 mm diam.; wall carbonized below; asci narrowly cylindrical to narrowly obovate, ca. 80-85 x 17-22 μ m. Spores 14-18 x 7-9 μ m. Microconidia elliptical, 3-4 x 1.2-2 μ m. On non-calcareous rock (including serpentine), upper eulittoral zone (usually associated with the

barnacle Balanus cariosus in Washington). West coast (California to Washington).P. imshaugii R. C. Harris ined.

3. Thallus very thin, inconspicuous. 4

4. On siliceous rock; clypeus laterally spreading; ascomata cracked around ostiole; ascospores 15-20 x 6-9 μ m. Not yet reported for N. America. (P. orustense)

4. On calcareous rocks or shells; clypeus absent or not spreading; ascomata not cracked around ostiole. [The following two taxa were lumped by Taylor, Harris 1975, and Ryan under P. halodytes, but are now considered distinct; probably both are present on both coasts]. 5

5. Perithecia 0.2-0.25(-0.3) mm diam., sessile on siliceous rocks, flattened, with a black ring around the ostiole and apale base (resembling lifebelts, especially when wet), globose and immersed on calcareous substrata, sometimes with a distinct involucrellum. Thallus yellow-brown, often glossy, superficial and to nearly 100 μ m thick on siliceous rocks, but immersed on limestone and shells (barnacles, limpets, etc.), dull brown, scabrid in sheltered sites, subgelatinous; Photobiont cells small, up to 12 μ m in diameter. Spores 12-20(-27) x 5-8(-10) μ m, clavate, the cells unequal in size. Pycnidia 60-80 μ m diam; pycnosporos 2.5-3.5 x 0.5-1 μ m. On various substrates in the littoral zone. P. halodytes (Nyl.) R. C. Harris

5. Perithecia to 0.2-0.6(-1.5) mm diam., on soft chalk, half-immersed by erosion of the substratum, to 1 mm on limestone and then subsessile (even on hard rock); thallus scant to nearly lacking, whitish green. ostioles not prominent. Ascocarps black; involucrellum brown-black, extending part way down over the exciple and spreading; exciple hyaline to pale brown, to 200 μ m diam., containing a much-branched, paraphysoid network which is subpersistent; asci clavate or cylindrical; spores hyaline, elongate-ovate, 1-septate with one cell larger, 12-20(-24) x 5-7(-10) μ m. Thallus entirely immersed, apparently white. On calcareous rocks amongst seaweeds in the sublittoral zone, especially ridges uncolonized by barnacles, and on shells (barnacles and limpets). Arctic, south to California in the west, south to New England in the east. P. sublitorale (Leighton) R. C. Harris

6. Phycobiont a subfoliose species of Nostoc; thallus similar to that of Collema; spores 18-21 x 8-9.5 μ m. Ascocarps immersed. Asci narrowly obovate. Microconidia elliptical, ca. 3 x 1.2 μ m. [Not reported from N. America]. (P. epigloeum)

6. Phycobiont not Nostoc; thallus crustose. 7

7. Algae blue-green in color. 8

7. Algae yellow-brown to brown due to colored sheath (Gloeocapsa-like). [also see P. caesium]. 9

8. Spores (20-)25-30 x 9-12.5 μ m, ovoid to ovoid-fusiform, sometimes with additional pseudosepta. Thallus ashy or greenish gray or reddish brown, immersed or superficial, powdery. Photobiont cells blue-green (or yellowish according to Coppins). Perithecia 0.25-0.4 mm diam., subconical to globose, mostly half-immersed. Pseudoparaphyses richly branched and anastomosed. Asci elongate-clavate to obpyriform. On inundated or flushed limestone or calcareous schist. P. caesium (Nyl.) R. C. Harris

8. Spores 17-23 x 8-11 μ m. Thallus gray, continuous to rimose, epilithic. Photobiont

with cells blue-green, in small groups but without an obvious sheath. Ascocarps sessile to semi-immersed, globose, 0.2-0.25 mm diam. Asci slightly ovate to elliptical. Microconidia elliptical, 3.5-4 x 1.5-2 um. On sandstone and calcareous rocks, Illinois, Louisiana. P. prosperellum (Nyl.) R. C. Harris

9. Spores to 7 um wide. 10

9. Spores 8-11 um wide. 11

10. Spores (19-)20-25 x 4.5-7 um, with a thin perispore, \pm oblong, the upper cell only slightly broader than the lower. Thallus immersed to superficial, gray to reddish brown, often minutely mottled, sometimes clearly delimited. Photobiont cells yellowish (? Gloeocapsa); Trentepohlia often also present. Perithecia 0.1-0.2 mm diam., globose, half-immersed. Pseudoparaphyses richly branched. Asci 65-85 x 17-23 um, clavate, obclavate to subcylindrical. Pycnidia frequent, 60-80 um diam.; pycnospores 4-5 x 0.5-1 um. On shaded, hard limestone. [Not reported from N. America]. (Naetrocymbe saxicola Massal.) R. C. Harris)

10. Spores 16-18(-20) x 5-7 um. On limestone. Florida. P. atlanticum (Vainio) R. C. Harris

11. In moist but not aquatic habitats, on calcareous rocks [\pm aquatic, on a variety of rocks, according to Harris 1995]. Thallus yellow brown to dark brown, epilithic, in drier situations consisting of dispersed groups of photobiont cells, rimose to continuous and somewhat gelatinous in moister habitats. Photobiont yellow-brown, Gloeocapsa-like. Ascocarps globose, immersed in rock or superficial, 0.2-0.25 mm diam. Asci narrowly ovate, narrowly obovate to ovate, elliptic or obovate. Spores lacking an obvious perispore, (18-)20-27 x 8-11 um. Microconidia elliptic to oblong, 3-5 x 1.2-1.5 um. On calcareous rock in moist situations. Michigan, Mexico, Louisiana. P. tichothecioides (Arnold) R. C. Harris

11. Aquatic, on acidic rocks. Thallus dark gray to black, superficial, filmy or cracked. Photobiont cells yellowish. Perithecia 0.2-0.25 mm diam., globose, but covered by a thin layer of thallus. Asci obovate, 85-100 x 19-25 um. Spores 18-25 x 8-12 um, ovoid. On hard acid rocks in streams, associated with, and possibly parasitic on, Verrucaria spp. Michigan. P. strontianense (Swinscow) R. C. Harris

The marine seaweed Pelvetia should be searched for P. pelvetiae (Sutherl.) D. Hawksw., which occurs on it in England and may be likely here also, on the Atlantic coast.

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prosperellum (Nyl.) R. C. Harris Syn.: *Arthopyrenia prosperella*
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sublitorale (Leighton) R. C. Harris ex Fletcher Syn.: *Arthopyrenia sublitoralis*
tichothecioides (Arnold) R. C. Harris Syn.: *Arthopyrenia tichothecioides*

Literature

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Harris, R. C. 1975. The genus Arthopyrenia sensu lato in North America. Ph.D. Dissertation.

Harris, R. C. 1995. More Florida Lichens.

Also see treatments of the marine species by Santesson, Swinscow, and Taylor.