

Hyperphyscia Müll. Arg.
(LECANORALES: PYXINACEAE)

After various authors

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Thallus foliose, lobed, very closely adnate and appressed (to looser on rough bark or mosses), 2-12 cm diam., orbicular to spreading; lobes \pm radiating; upper surface pale brownish gray to olive-gray or dark brown, epruinose, matt; upper cortex paraplectenchymatous; lower cortex \pm distinct (but often difficult to detect) colorless, prosoplectenchymatous, often mixed with the substrate, the cell lumina ca. 2 μ m wide; lower surface if visible pale to dark, brown to black in center, to whitish at lobe tips; attached either directly or by a few, inconspicuous, very short indistinctly delimited rhizines. Medulla [usually?] prosoplectenchymatous, of loosely interwoven hyphae with a gradual transition to the lower cortex. Soralia or isidia present or absent

Apothecia, when present, laminal, sessile, lecanorine; disk round, brown to black, epruinose; margin thalloid, without rhizines on lower surface; hypothecium hyaline or red to orange (skyrin); hymenium colorless, I+ blue; epihymenium pale brown; paraphyses simple or somewhat branched especially above; apices clavate thickened, light brown with a thin, dark brown cap; asci cylindrical, Lecanora-type, unitunicate, I+ blue; tholus I+ blue; spores 8, ellipsoid, 1(-3)-septate transversely (to 6- or rarely 8-septate according to Galloway) brown, thick-walled, Pachysporaria-type; walls thickened towards the apices.

Pycnidia immersed; walls colorless except for brown zone around ostiole; conidiogenous cells arising in branched chains, barrel-shaped to subcylindrical, enteroblastic, acrogenous (fulcrum endobasidial according to Rogers); pycnospores filiform (over 10 μ m long, usually 15-20 x 1 μ m). No substances, or skyrin. Photobiont Trebouxia. On bark or rock, temperate. Type species: H. plinthiza.

Several apparently undescribed species that are common on rocks are very similar to the species known as "Lecanora demissa". I am still struggling to come up with a workable key to such taxa, most of which appear to be undescribed; they are almost always sterile, but R. Riefner (pers. comm.) has recently discovered fertile material in California, that clearly belongs to Hyperphyscia.

There are several other treatments, and my own notes on specimens, that I need to incorporate into this.

1. Without isidia or soredia. Lobes 0.5(-1) mm wide. On bark, widespread in deciduous forests but most common on isolated trees in the prairie-forest states (Minnesota to Texas). Throughout much of the eastern U.S., to south-central Canada; absent from the SE coastal plain according to Hale, but present in Florida according to Harris. [Note: some undescribed species similar to "Lecanora demissa", on rock, will also key out here]. H. syncolla (Tuck. ex Nyl.) Kalb

1. With soredia. Lobes under 0.5 mm wide. Apothecia rare. 2

2. Medulla red to orange (skyrin). Sonora, Mexico. H. pandani (H. Magn.)

Moberg

2. Medulla white (underside or spots in lower medulla occasionally orange due to skyrin). 3

3. On bark or rarely rock. Thallus very delicate and thin, the single rosettes ca. 1-2 cm wide, \pm orbicular, or irregular and confluent with others; marginal lobes very definite, narrow, ca. 0.2-0.5 mm wide, simple to little branched; towards center becoming almost crustose. Ends of shorter lateral branches towards thallus center covered with usually abundant, small, rounded, greenish-white fleck soralia. Upper side brownish-gray or grayish brown to dark brown, darker at lobe margins. Lower side light to sordid dark brown; rhizines short, very sparse, indistinct. Apothecia rare or overlooked, 0.5-0.7(-1.0) mm wide; disks blackish; spores 13-18 x 7.5-9(-10) μ m. Pycnidia immersed; pycnosporos 13-15(-20) x 1 μ m, filiform. On nutrient-rich or -enriched (especially dust impregnated) bark of tree trunks, rarely also on shaded, vertical rock surfaces. Resembles diminutive morphs of Phaeophyscia orbicularis but distinguished by the very adpressed lobes, difficult to detach, and colorless, prosoplectenchymatous lower cortex. (H. adglutinata s. lato--this description is based on European material, and presumably applies to H. adglutinata s. str., although Poelt mentions that the underside can be dark). Galloway questions whether the species belongs in Hyperphyscia. 4

3. On rock. Black hypothallus not conspicuous. Soredia (when present) laminal. H. spp. (Lecanora demissa auct. pr. p.)

4. Lower surface pale to brownish. Black hypothallus lacking. Lobes discrete or \pm contiguous or overlapping; underside pale to brownish (not black as given in many treatments). Single thalli c. 0.5-1 cm diam. Soralia laminal in origin (according to Moberg; marginal according to ?). Florida, Arizona; widely distributed; according to Fink more common E of the Rockies and N of the Gulf States. H. adglutinata (Flörke) Mayrh. & Poelt, s. str.

4. Lower surface blackish. Black hypothallus conspicuous, or margins of lobes black tinged. Single thalli to c. 4-5 cm diam. Soralia laminal, ca. 0.15-0.3 mm diam., spot-like, sometimes \pm confluent at center of thallus, concolorous or paler. Synonymized under H. adglutinata by Aptroot, but Harris (1990) suggests that further study is needed. Florida. H. minor (Fée) D. D. Awasthi

H. adglutinata (description after Moberg 1987)

Thallus orbicular to irregular, often confluent with other thalli, very variable in size, to 2 cm diam., firmly or closely adnate to the substrate. Upper side gray brown to brown or dark brown, rarely with a pruina. Lobes extremely variable in width, 0.5-2 mm, appressed or ascending at the tips, lobe margins occasionally black. Soralia sparse to abundant and then covering central parts, starting as small protrusions or lobules on the surface of the lobe, usually laminal. The soralia may be maculiform or capitate on the ends of the lobes. Soredia mainly granular. Underside black centrally, paler peripherally, usually white at the lobe tips, rhizinae few or absent. Upper cortex paraplectenchymatous, medulla white, lower cortex indistinct and hardly separable from the medulla, which appears gradually denser and darker towards the underside, often mixed with the substrate.

Apothecia rare, 1 mm diam., margins entire. Spores of Pachysporaria to Physcia-type, 18-23 x 11 μ m. Pycnidia very sparse, conidia filiform, 15-20 x 1 μ m. Traces of skyrin. On bark, occasionally rocks.

H. minor

Thalli to c. 5 cm diam., closely appressed to the substrate, rosetted, becoming confluent into larger masses. Strongly growing lobes without prothallus, weakly growing lobes surrounded by blackish prothallus, older lobes distinctly bordered blackish. Lobes to 1 cm long, continuing to thallus center, pinnately-palmately branched, mostly c. 1-1.5 mm wide, very slightly convex, at the tips often broadened at flattened, mostly densely crowded, frequently in the center arched into elongated ridges, pale brownish, the tips often whitish-brownish, K-. Scattered over the upper surface, especially on the ridges are roundish to elongated mealy soralia. Medulla partly and spottily orange. Underside black. Thalli c. 60-100 µm thick; upper cortex 10-20 µm thick, distinctly paraplectenchymatous with roundish to slightly anticlinally elongated cells, lumina c. 3-6 µm long, 2-4.5 µm wide. Medulla composed of elongated, but frequently branched, rather loose hyphae with distinct outer boundaries and distinctly delimited lumina. Algae scattered through the medulla. Lower cortex tightly bound to the substrate, composed of hyphae partly elongated parallel to the substrate, only on rapidly growing tips pale, otherwise dark walled, c. 2 µm thick, partly forming a roundish-celled plectenchyma, with 2-3 µm thick cells. From the lower cortex flow out hyphae with short to somewhat elongated cells into the substrate. In the places where the medulla is pigmented occur very fine granular deposits in dense masses in the lower part of the medulla.

Apothecia scattered, on some pieces very abundant, mostly 0.5-1 mm diam., roundish, constricted sessile, with brownish-dirty whitish prominent margins and plane, medium brown discs. Apothecial margin with a 10-20 µm thick, paraplectenchymatous cortex, a thick, short-celled, richly beset with algae algal layer, and a c. 20 µm thick, strongly conglomerate parathecium. Hymenium c. 90 µm high; paraphyses 1-2 µm thick, the tips weakly thickened to 3 µm. Spores 8 per ascus, mostly well developed, of *Pachysporaria* type, but without apical chambers, very variable in length, (13.5-)15-23 x 7-9.5 µm, ellipsoid, soon pale brownish, later only slightly darker.

H. pandani

Thallus orbicular, to 3 cm across, sometimes irregular with small lobes covering the substrate, firmly adnate to the substrate. Upper side gray-brown to dark brown, usually paler at the lobe tips, sometimes with a white pruina. Lobes adnate to the tips, to 1 mm broad, rarely broader, broadest closest to the tips. Soralia laminal, maculiform, capitate to crateriform, occasionally confluent and covering central parts of the thallus, often very dark colored or rusty red owing to skyrin. Soredia granular. Underside black, grayish at the lobe tips, rhizinae absent or very rare. Upper cortex paraplectenchymatous, medulla distinctly orange to red or even red-brown, lower cortex indistinct, prosoplectenchymatous, often adjoined to the substrate.

Apothecia not common, to 1 mm across, margins sorediate or irregularly undulate with incipient lobules, hypothecium reddish owing to skyrin, spores of *Pachysporaria* type, 16-18 x 8-10 µm. Pycnidia not common, conidia filiform, 15-20 x 1 µm. Skyrin in medulla. On bark.

H. syncolla

Thallus orbicular, rarely irregular, to 1-2 cm broad, often forming extensive patches; firmly adnate to the substrate, often verrucose in central parts. Rhizines sparse or absent (difficult to determine in most specimens). Lobes closely contiguous, confluent, of very variable width, up to 2 mm, broadest near the tips, sometimes weakly orange colored at the margins. Upper side grayish-brownish to dark brown, sometimes with a weak pruina, occasionally densely

pruinose, K-, often warty or bullate. Soredia and isidia absent. Underside dark brown to black centrally, paler to white towards the lobe tips, sometimes pale orange colored (skyrin). Medulla white or rarely orange. Upper cortex paraplectenchymatous, lower cortex indistinct, prosoplectenchymatous, hardly separable from the substrate.

Apothecia common, to 1.5-2 mm diam.; disc concave then strongly convex, matt, dark brown to black, sometimes pruinose; margin entire to flexuous or weakly crenulate, pale; spores mostly of Pachysporaria type, sometimes of Physcia type, gray then brown, thick-walled, two-celled, (12-)15-18-21 x (6-)7-9-11 um. Pycnidia abundant, conidia filiform, 15-20 x 1 um. Thallus K-, P-. Only traces of skyrin. On bark.

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