

**Schaereria** Th. Fr.  
(LECANORALES: SCHAERERIACEAE)

After Hawksworth, 1992, and others

Rev. 1/94

Thallus areolate (areoles often somewhat dispersed and convex) to  $\pm$  squamulose, mostly dark (gray or reddish brown to brown), C+ red (gyrophoric acid) or C-; prothallus often well developed, black. Photobiont Trebouxia. Medulla I-.

Apothecia lecideine or lecanorine,  $\pm$  immersed or sessile, plane, marginate; thalline exciple absent; true exciple persistent, black, darkish brown in section, paler inside, K-, of  $\pm$  globose cells, without algae; hypothecium  $\pm$  dark brown; subhymenium usually hyaline; hymenium I+ weakly blue (ascus walls); paraphyses free (at least in K), mostly simple, occasionally branched above, 1.5-2  $\mu$ m wide, not anastomosing; apical cells often swollen and sometimes  $\pm$  moniliform; epihymenium greenish and K+ purple (or occasionally with purplish granules that are K+ intense violet, HCl+ green), or violet and K+ bright green; occasionally discolored brown in old material. Asci of the Schaereria-type,  $\pm$  cylindrical or rarely clavate, thin-walled, with a single wall layer, not thickened apically, the tholus more or less non-amyloid and reduced, only the outer gelatinous layer faint bluish in concentrated iodine; discharge by splitting of the apex; spores globose to short ellipsoid, not halonate. Spores simple, uniseriately,  $\pm$  biseriately or irregularly arranged, colorless, smooth, lacking a distinct epispore.

Pycnidia immersed; conidogenous cells subcylindrical, enteroblastic, acrogenous; pycnosporos bacilliform, simple, colorless. On siliceous rocks, especially granite and schists, sometimes overgrowing mosses (or soil?), upland to montane.

A segregate from Lecidea. Distinguished from other  $\pm$  squamulose lichens with lecideoid or aspicilioid apothecia by the thin- and single-walled cylindrical asci which lack any distinct apical thickening (tholus).

**1. Thallus sorediate. Apothecia rare (to moderately frequent). On bark. .... S. corticola Muhr & Tonsberg**

**1. Thallus not sorediate (or rarely sparsely so in S. fuscocinerea). Apothecia usually common. On rock or soil. .... 2**

**2. Spores  $\pm$  globose, (6-)7-9(-12)  $\mu$ m diam. Hypothecium brown to brown-black, at least below. Thallus squamulose (sometimes compacted and confluent into an areolately divided crust); squamules  $\pm$  bullate (verruculose), not clearly lobate, 1-2.5(-3) mm long, 0.5-1 mm wide, 1-1.5 mm thick. .... S. cinereorufa**

**2. Spores (8-)12-16(-18) x 5-6(-8)  $\mu$ m, elongate-ellipsoid to broadly obpyriform. Hypothecium hyaline. Thallus crustose, areolate; areoles flat to  $\pm$  convex or bullate, (0.2-)0.3-0.6(-0.8) mm diam., usually under 0.5 mm thick. Thallus gray-brown to brown, in particularly exposed situations sometimes black, Soralia rare, blackish, convex, ca. 0.1-0.4 mm diam. Apothecia black, immersed then becoming sessile; disc concave, then  $\pm$  flat and finally convex; proper exciple usually soon excluded, dark brown, thin; hymenium 90-110(-120)  $\mu$ m; asci  $\pm$  cylindrical, 55-75 x 10-12(-15)  $\mu$ m. Spores  $\pm$**

biseriately arranged. On hard siliceous rocks, especially schists, in sunny, exposed situations. ....S. fuscocinerea s. lato

Note: Hawksworth includes S. endocyanea and S. tenebrosa under S. fuscocinerea; other authors distinguish the three as follows:

1. Spores 8-9 x 5-5.5 um, partly globose 5-6.5 um diam. ....S. fuscocinerea s. str.  
1. Spores 11-14 um long. .... 2

2. Thallus rather thick, rimose-areolate to here and there verrucose, pale to dark gray. Hymenium 80-90 um; epihymenium often violet; paraphyses tips not thickened or darkened; spores 12-14 x 5-6 um, ellipsoid. ....S. endocyanea

2. Thallus thin to moderately thick, areolate-verrucose, the verrucules continuous or discrete, gray-blackish to gray brown. Hymenium 90-130 um; epiphymenium blue-black to green-black; paraphyses tips often thickened and darkened; spores oblong to ellipsoid or broadly ellipsoid, 11-14 x 5-8 um. .... S. tenebrosa

## Detailed descriptions:

### **S. cinereorufa (Schaerer) Th. Fr.**

Thallus gray brown to deep red-brown; prothallus black, well developed.

Apothecia 0.5-1.2 mm wide, immersed to  $\pm$  sessile, black; disc concave to flat; true exciple mostly persistent, dark brown, thick; hymenium 90-120  $\mu$ m tall; asci 55-65 x 8-10  $\mu$ m, cylindrical. Spores uniseriately arranged.

Pycnidia usually numerous, immersed; wall dark brown, K-; conidiogenous cells 6-11 x 1.5  $\mu$ m; conidia 3.8-6 x 0.8  $\mu$ m. Thallus and medulla P-, K-, C $\pm$  pink, KC- or KC+ pink, with gyrophoric acid. On granite, hard sandstones and schists, more rarely over mosses, montane.

### **S. corticola Muhr & Tonsb.**

Thallus crustose, endo- to episubstratal in non-sorediate parts, indeterminate, or where a distinct prothallus was developed, delimited, usually forming small patches to a few cm across among other crustose lichens or, rarely, becoming fused with adjacent thalli forming extensive patches to several dm across; prothallus indistinct, or visible as a grayish black, bluish black or brownish stain on pale bark; areoles inconspicuous, often strongly convex, to 0.2 mm diam.; soralia mostly discrete, to 2 mm diam., rarely becoming grouped and  $\pm$  contiguous with the upper parts still discernible, punctiform, usually distinctly convex, medium to dark brown due to a pigmentation of the external soredia, giving thallus a brown over all color, or abrading green; soredia fine, with a distinct cortex, 20-25  $\mu$ m diam.; pigment K+ fuscous brown, N+ reddish brown. Medulla indistinct or absent. Photobiont green, coccoid, to 12  $\mu$ m diam..

Apothecia, when present, sparse to numerous, discrete, irregularly dispersed, lecidieine, black, circular, sessile, 0.15-0.3 mm diam. when mature; margin to 0.05 mm wide, becoming  $\pm$  obscured in convex apothecia; disk plane or, more rarely convex, epruinose. Proper exciple brown, but rim green in upper part, greenish brown in lower part, containing crystals of gyrophoric acid (C+ red); green pigment K-, N+ violet. Subhymenium largely brown, but colorless in upper part, composed of anticlinal hyphae, 60-30  $\mu$ m [sic] deep. Hymenium colorless, 80-110  $\mu$ m, I- except for asci. Paraphyses lax, sparingly branched and interconnected in upper part, 1.5-2.5  $\mu$ m wide; upper cell slightly thickened, to 3  $\mu$ m wide, surrounded by a pigment cap. Asci cylindrical to cylindrical-clavate, I+ blue, K/i+ blue, without tholus, or very rarely, with an indistinct, poorly developed tholus, 8-spored, 80-110 x 10-13  $\mu$ m. Spores uniseriate, broadly ellipsoid to subglobose, (10-)13-16(-20) x (8-)9-12(-14.5)  $\mu$ m, wall 1-2  $\mu$ m thick in water, in K the outer gelatinous part (epispore) swollen,  $\pm$  disrupted and easily detached.

Pycnidia not seen. Thallus C+ rose, containing gyrophoric acid (major) and 5-O-methylhiascic acid,  $\pm$  lecanoric acid. On acidic bark (e.g., Alnus and Betula) in humid coastal lowlands up to 600 m, northernmost California, Oregon, British Columbia, Alaska.

### **S. fuscocinerea (Nyl.) Clauz. & Roux**

### **S. endocyanea (Stirton) Hertel & G. Schneider**

Thallus crustose, black (to pale gray?), slightly shining; areoles 0.3-0.5 mm diam., appressed to substrate; margin smooth; prothallus black. Cortex plectenchymatous, with a dirty

green zone in upper part, hyaline in lower part; epinecral layer hyaline. Algae loosely layered, partly scattered in cortex and medulla. Medulla colorless, I-, with colorless, fine crystals; hyphae ca. 3  $\mu$ m diam., thin walled. Lower cortex absent. Thallus K-, C- and KC- (or C+ red in "Lecidea epiioidiza" according to Lynge), P-, with unknown substances.

Apothecia 0.3-0.5 mm diam., black even when wet, scattered, broadly adnate; disk flat; margin distinct, swollen. Excipulum plectenchymatous, outer edge blue-green, inner part colorless. Epihymenium 10-15  $\mu$ m, violet. Hymenium 80-90  $\mu$ m, at least in upper part violet, I+ blue. Asci cylindrical, 70-80 x 10-12  $\mu$ m. Spores simple, ellipsoid, 12-14 x 5-6  $\mu$ m, smooth, without halo. Paraphyses ca. 2  $\mu$ m thick, thin-walled, almost all simple, strongly coherent; apical cells hyaline and unthickened. Hypothecium colorless. Epithecium and all violet areas K+ green; apothecial parts C-, KC-, P-, I-.

### **S. tenebrosa (Flotow) Hertel & Poelt**

Thallus thin to moderately thick, grayish black or grayish brown, areolate-verrucose, the verrucules contiguous or discrete, 0.2-1 mm wide, plane or convex, I-, K- or almost. Apothecia solitary, 0.3-0.8 mm wide, immersed in the areoles at first, emerging and becoming adnate, or the thallus breaking away; disk at first depressed to plane, remaining plane, black, epruinose; margin usually not visible until maturity, then thin, black. Hypothecium hyaline to  $\pm$  brownish, the hyphae 2.5-5  $\mu$ m diam., with wide lumina, conglutinate or the walls sometimes moderately carbonized, radially arranged or sometimes irregularly arranged below. Exciple thick below surface of thallus, above thinner and sometimes nearly absent, brown-black or greenish black or sometimes hyaline in upper part, below brown externally and hyaline within, the hyphae with brown parallel tips, within 4-5  $\mu$ m diam., with thin walls, irregularly arranged except at the tips. Epihymenium bluish black or sometimes greenish or olivaceous black. Hymenium 90-130  $\mu$ m. Paraphyses easily separable, 1.5-2.5  $\mu$ m diam.; tips sometimes enlarged to 3.5  $\mu$ m and frequently darkened. Spores non-septate, oblong to ellipsoid or broadly ellipsoid, 11-14 x 5-8  $\mu$ m. New York, New Hampshire, New Mexico. [Description from Lowe, based on "Lecidea atrocineria"; need other sources of info.]

## Literature

Hawksworth, D. L. 1992. Schaereria. In: Purvis, et al., Lichen Flora of Great Britain and Ireland.

Tonsberg, T. 1992. The soorediate and isidiate, corticolous, crustose lichens in Norway. *Sommerfeltia* 14.

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