

Sarea

S. difformis

Scutula Tul.

After Hawksworth, 1983, Keissler, and Triebel et al. 1997

THALLUS lichenicolous, endokapylic or epikapylic, sometimes causing damages to the host photobiont; **vegetative hyphae** colorless, non amyloid.

ASCOCARPS sessile, erumpent, narrowly attached, constricted at the base, round, scattered to \pm aggregated, subgelatinous, globose then round and cup-shaped, flat and thin-margined, then convex and immarginate; disc plane to convex, cream or pale brown to dark brown or black, matt to shiny; margin distinct to very distinct, pale brown to dark brown or black; **exipulum** prominent, composed of parallel, regularly radiating, branched, anastomosing, strongly agglutinated hyphae, outermost parts colorless, pale brown to dark reddish brown, apically with an unevenly distributed granular, greenish brown to greenish black pigment; inner parts colorless to greenish brown or red-brown; **Hypothecium** thick, composed of loosely intricate hyphae, colorless to brown; **subhymenium** colorless. **Hymenium** colorless, sometimes pale brownish to greenish black in upper parts; gel hemiamyloid, I+ blue then (especially at higher concentrations of iodine) reddish brown to red. **Epihymenium** not continuous, with an unevenly distributed granular, greenish brown to greenish black pigment which occasionally follows the paraphyses downward. **Paraphyses** filiform or very sparingly branched with a few anastomoses, septate, the tips slightly thickened to clavate and colored. **Asci** ovoid or clavate, thick walled especially above, Scutula-type, with amyloid tholus and diffuse non-amyloid axial body; 8-spored. **Spores** narrowly to broadly ellipsoid, ends usually attenuated, sometimes with oil droplets, thin-walled, smooth, colorless, (0-)1(-3)-septate, hyaline, often with oil drops, biserially arranged.

PYCNIDIA globose, subimmersed to sessile; wall apically colorless, red to dark brown, blackish brown or greenish black, basally colorless to pale brownish, \pm pseudoparenchymatic; **conidiophores** short, composed of 2-5 cells, sparingly branched; cells cylindrical to short-rectangular, colorless; **microconidia** non-septate, bacilliform to filiform, sometimes curved, colorless; **mesoconidia** of Libertella-type; **macroconidia** of Karsteiniomyces-type.

1. Hymenium I+ blue then violet. Spores 11-20 x (3-)3.5-6(-6.5) μ m. On Stereocaulon. Epihymenium brown. Apothecia 0.15-0.3 mm diam.; epithecium dark reddish brown; hypothecium pale yellowish brown. "S". stereocaulorum

1. Hymenium I+ blue then wine red. Spores 7-15 x 4-7 μ m. On Peltigera. Epihymenium sooty brown.S. tuberculosa

ADD:

Growing on the Peltigera canina and P. horizontalis groups. 1

1. Ascospores 11.5-14.1 x 4.8-5.8 μ m. Ascospores never 3-septate. Microconidia 7.6-9.3 x 1.0-1.2 μ m; mesoconidia absent; macroconidia 13.6-19.2 x 3.5-5.0 μ m. Thallus not epikapylic. Mutualistic.. On Peltigera, Minnesota, Colorado, New Mexico, British Columbia S. milliaris (Wallr.) Trevis.

1. Ascospores to 3.9-4.2 μ m wide. 2

2. Ascospores 9.9-11.3 x 3.6-3.9 μ m, never 1-septate. Microconidia averaging 0.5-1 μ m wide; mesoconidia averaging 5.9-6.5 x 2.2-3.1 μ m; macroconidia present, averaging 8.3-10.5 x 2.1-2.8

um. Thallus epikapylic. Saprophytic? on dying host thallus. On Peltigera, Minnesota..... S. dedicata Triebel, Wedin & Rambold
 2. Ascospores 8.6-12.6 x 2.9-4.2 um, occasionally 3-septate. Microconidia averaging 1.0-1.4 um wide; mesoconidia averaging 6.2-8.0 x 1.7-2.3 um; macroconidia absent. Thallus not epikapylic. Parasitic. On Peltigera, Minnesota, Colorado, New Mexico S. epiblastematica (Wallr.) Rehm

Literature

Triebel, D., M. Wedin & G. Rambold. 1997. The genus Scutula (lichenicolous ascomycetes, Lecanorales): species on the Peltigera canina and P. horizontalis groups. Symb. Bot. Ups. 32(1): 323-337.

Skytella

After Rambold & Triebel, 1990

HELOTIALES

Apothecia pale orange to yellowish, 0.3-0.7(-1) mm diam., immarginate, sessile, arthonioid; apices of asci I-; ascospores (8.5-)10-12(-14) x 2.5-3.5(-5) μ m. On Peltigera. British Columbia, California, Massachusetts. S. mulleri (Willey) D. Hawksw. & R. Sant.

Skyttea

After Triebel, et al., 1991 and Hawksworth, 1983

ONDONTREMOID

Apothecial disc urceolate, the opening pore-like or cruciate, the recurved exciple margin extending into hairs. Spores under 10 um long.

On saxicolous and corticolous individuals of Tephromela atra and Lecidea s. lato, sometimes causing gall-like formations. Ascus apex constantly with an internal apical beak. Hairs extending from exciple margin 40-50 x 2.5-3 um. Spores 7-8 x 3.5 um. Arizona. S. elachistophora (Nyl.) Sherw. & D. Hawksw. (syn.: Rhymbocarpus elachistophora)

Sphaerellothecium

After Triebel, et al., 1991

PYRENOMYCETES. Ascocarps extremely small (40-80 μm diam.). Spores 1-3-septate. Pseudothecia without hair-like protrusions. Growing obligately within the epinecral layer of crustose lichens, forming a characteristic net of dark brown, thick-walled hyphae.

1. Spores to 8.5 x 4 μm 2

1. Spores over 8.5 x 4 μm 3

2. On Teloschistes. Ascospores brown. Mycelium thick-walled. Spores (6.5-)7.5-8(-8.5) x 3-3.5 μm . Ascomata perithecioid, growing entirely superficially, black, \pm spherical, ca. 25-35(-40) μm diam.; walls brown, ca. 5-10 μm thick, of 1-2 layers of thick-walled pseudoparenchymatous cells; cells tangentially somewhat flattened, 4-5 x 3-4 μm diam. Hamathecium absent. Asci broadly saccate, only 2-3 per ascoma, thick-walled, bitunicate-fissitunicate, with ocular chamber, ca. 16-20 x 8-9 μm . Spores irregularly arranged, 1-septate, not or slightly constricted at septum, brown, smooth-walled, ellipsoid, with rounded apices. Vegetative hyphae superficial, brown, torulose, branched and anastomosed, forming a reticulum; cells subglobose to quadrangular, dark brown, 4-6 μm diam., especially the outer cell wall thickened. Epiplasma orange ("dextrinoid reaction") in Lugol's iodine, K-. On thallus and apothecia of Teloschistes chrysophthalmus. Baja California. S. subtile Triebel & Rambold

2. On Acarospora schleicheri. Ascospores hyaline. Mycelium thin-walled. British Columbia. S. gowardii Alstrup & M. Cole

3. Spores small, 9.5-10.5 x 5-5.5 μm ; ascomata small. On species of Lecidea and Immersaria. Spores 1-septate. Alberta; Wyoming, Colorado, Utah, California., Arizona S. abditum Triebel

3. Spores 11.5-14 x 5-6.5 μm ; ascomata slightly larger. On Protoparmelia badia, Sporastatia testudinea, Tephromela armeniaca, Rhizoplaca melanophthalma. Sometimes in the epihymenial gallertic layer of decaying apothecia. Wyoming, Colorado, Arizona. S. contextum Triebel

ADD:

On Ochrolechia. British Columbia. Mycelium verruculose. Spores not very constricted. S. araneosum (Arnold) Zopf

S. gowardii

Mycelium reticulate, dark brown, 5-7 μm thick, cells 7-10 μm long, smooth-walled. Perithecia semi-immersed, globose, 40-60 μm diam. Exciple composed of two layers of irregularly arranged, isodiametric cells 6-8 μm diam., dark brown around ostiole, paler brown lower down, inner layer paler than outer one. Hamathecium absent. Asci broadly ellipsoid, with distinct ocular chamber, 8-spored, 22-26 x 13-15 μm . Ascospores hyaline, 1-septate, markedly constricted at septum, ends rounded, 7 x 4 μm .

Alstrup, V. and M. S. Cole. 1998. Lichenicolous fungi of British Columbia. The Bryologist 101:

221-229.

Sphinctrina

After Poelt & Vezda, Fink, and others

Rev. 1/88

1. Spores ellipsoidal. On thin lichen thalli, e.g., Pertusaria. Baja California.S. tubaeformis Massal.)

1. Spores \pm spherical.2

2. Apothecia sessile or with a very short stalk; excipulum in section reddish, K+ red.
On Pertusaria or rarely Diploschistes, mainly on old oak or beech trees.
Minnesota.S. turbinata (Pers.) De Not.

2. Apothecia with a distinct stalk at least as high as the capitulum; excipulum dull brown, K-.3

3. Stalk about as high as the capitulum, black; spores 7-10 μ m, with distinct ornamentation of minute warts. On various crustose lichens over wood or bark. Minnesota.S. anglica Nyl.

3. Stalk slightly longer than the capitulum (0.8-2.4 times as long), pale to dark brown; spores 4-6 μ m, with indistinct ornamentation. On Pertusaria or Diploschistes, particularly on old deciduous trees.S. leucopoda

ADD: On Lecanora pachysoma on rock, Baja California. S. sp. (= S. tubaeformis?)

Spirographa

On Platismatia. British Columbia. S. fusisporella (Nyl.) Zahlbr.

Holien, H. & D. Triebel. 1996. Spirographa vinosa, a new odontotremond fungus on Ochrolechia and Pertusaria. Lichenologist 28: 307-313.

Steinia

Asci 16-spored. Spores 5-7 um diam. On Peltigera. British Columbia. S. geophana

Stigmidium

After Keissler, Dennis, Zopf, and Hawksworth

Spores hyaline, 8 per ascus.

1. Parasymbiotic in perithecia of marine (intertidal) Verrucaria spp. Ascomata to 0.15 mm diam; periphyses absent; ascospores (10-)14-15(-20) x 4-6 um.S. marinum

1. Parasitic on various non-marine lichens. 2

2. On foliose or fruticose lichens. 3

2. On crustose or squamulose lichens. 4

3. On Dacampia hookeri sensu Poelt (?= Solorina sp.) on soil. Spores 9.5-14 x 2-4.5 um, 2-4-celled, in 2 or 3 rows, elliptic-cylindric, with four oil drops. Pseudothecia spherical, black, scattered or subglobose, to 100 um, immersed in or erumpent from the hymenium of lichen apothecia. Asci clavate or ventricose, thick-walled, subsessile, up to 45 x 15 um. Paraphyses absent.S. schaeferi (Massal.) Trev.

3. On Thamnolia. Ascospores 13-14 x 4.5-5 um. Ascomata mainly less than 0.1 mm diam. S. frigidum

4. On Lecanora. 5

4. On other genera. 6

5. On apothecia and rarely the thallus of corticolous Lecanora spp. (e.g., L. carpinea, L. intumescens, and L. pulicaris). S. congestum (Körber) Triebel

5. On apothecia of saxicolous members of Lecanora, including L. cenisia, L. swartzii and members of subg. Placodium. Very similar to S. schaeferi. Arizona, Colorado, New Mexico, Sonora. S. atryneae (Arnold) Hafellner

6. On brown and yellow species of Acarospora. Ascocarps sessile, black and globose, often in rows along the margins of the host areoles. Arizona; Sonora. S. fuscatae Arnold

6. On Psora or Toninia. 7

7. On Psora crenata or P. decipiens. Alberta; Arizona. S. psorae

7. On Toninia spp. New Mexico, Arizona. S. tabacinae

ADD:

On Peltigera. British Columbia. S. peltideae (Vainio) R. Sant.