

**Squamarina** Poelt (s. str.)  
(LECANORALES: SQUAMARINACEAE)

After Poelt, and others, including Ryan, unpubl.

Rev. 5/94; condensed version

**THALLUS** wide squamulose-lobed, mostly somewhat loosely attached to substrate, usually at least 1.5-2.5 cm wide, often to many cm wide, very thick (1 mm or more); **thallus center** rimose-areolate to squamulose; **lobes** usually large (mostly 25 mm or more in largest dimension); **upper surface** ± greenish yellow, often pruinose; **consistency** usually very stiff; **lower surface** tightly to loosely appressed, attached by with rhizine strands; **upper cortex** evenly very thick, sharply delimited, without dead algal cells; **algal layer** well-delimited, continuous, rather narrow; algal cells trebouxiioid; **medulla** prosoplectenchymatous, thick, chalky; hyphae strongly conglutinate, more or less thick-walled, strongly conglutinated, with wide to narrow lumina; **lower cortex** absent.

**APOTHECIA** lecanorine to occasionally biatorine (often varying on the same thallus), large to very large (often 12 mm diam., to 5 mm or more in some species); **discs** epruinose to pruinose, mostly yellow-brown to red-brown; **thalline margin** usually present at least when young, but sometimes soon disappearing; **proper margin** sometimes developed; **hypothecium** hyaline, thick; **hymenium** colorless, I+ blue; **epihymenium** yellowish brown, with granules interspersed or on surface; **paraphyses**: septate, simple to branched above; **asci** clavate, Bacidia-type, with uniformly I+ blue tholus; **spores** 8, simple, hyaline, ± ellipsoid, 9.5(19) x 4.5(7.5) µm, (usually?) thin-walled, biserially arranged.

**SPERMOGONIA** immersed; **fulcra** exobasidial; **spermatia** filamentous, ± curved.

**SPOT TESTS AND CHEMISTRY:** **Cortex:** usually KC+ yellow (usnic acid, sometimes only in traces); sometimes K+ yellow (with atranorin as an accessory compound); **Medulla:** often P+ yellow (psoromic acid).

**DISTRIBUTION AND ECOLOGY:** On soil or rock, usually rich in calcium, in dry areas.

**Type species:** Squamarina gypsacea (Sm.) Poelt.

The genus Squamarina Poelt as originally circumscribed by Poelt (1958) consisted of two groups of taxa that differ in ascus structure and other features. As discussed by Ryan (1990), the genus Squamarina Poelt as originally circumscribed by Poelt (1958) consisted of two groups of taxa that differ in ascus

structure and other features. The species originally placed in Squamarina sect. Petroplaca Poelt, which have a Lecanoratyp ascus, are being treated in separate articles, in collaboration with Vnsk and Timdal. The present key focuses on the core group of Squamarina (family Squamarinaceae Hafellner), as represented in North America.

The S. cartilaginea and S. lentigera/S. kansuensis complexes are major disaster areas at present; for "splitter versions" to the latter complex, see separate keys after this main one.

- 1. Medulla P+ yellow (psoromic acid). . . . . 2
- 1. Medulla P (without substances). . . . . 4

2. Squamules scattered to contiguous, strongly concave, 12 mm across, not at all lobelike or radiating; upper surface deep yellow, mostly epruinose except for edges; lower surface slightly blackened. Apothecia to 2 mm diameter; discs pale, pruinose. Chem: containing unknown and zeorin in addition to usnic and psoromic acids. Baranca, Mexico. A good species, for a change quite distinct from any other member of the genus I've seen or read descriptions of. . . . . S. "barancae" Ryan & Nash ined.

2. Squamules contiguous to imbricate, plane to convex or slightly concave, the marginal ones often lobelike and radiating; upper surface yellowish to bluish or brownishgreen, often strongly pruinose. Apothecia to 34 mm but usually smaller, sometimes absent; discs pale to dark, epruinose (to weakly pruinose). Chem: usnic and psoromic acids only. . . . . 3

3. Thallus definitely producing rosettes, not imbricate or bullatesquamulose, to 12 mm thick, usually tightly attached and not forming mats; thallus center continuous to areolate; marginal lobes 24 mm long, 0.52 mm wide, radiating; upper surface usually strongly pruinose in thallus center and on raised lobe margins; lower surface pale. Apothecia to 12 mm diameter; margin thin, soon excluded; hymenium 4050 um (or more?). (I may split this up, or I may lump it; basically it's very similar to S. lentigera except for being P+, with psoromic acid, and perhaps it should be lumped as a subspecies of that). . . . . S. cf. kansuensis Magn. sensu lato

3. Thallus at best rosetteforming when very young, soon irregularly to imbricate squamulose, often forming very thick (to 5 mm or more) easily detachable mats; thallus center squamulose; marginal lobes usually 35(7) mm long, (1)23(5) mm wide; upper surface brownish, greenish, or yellowish, epruinose to partly or

completely pruinose; lower surface dark brown. Apothecia to 34 mm diameter (but often smaller); discs usually deep or dark brown; margin often thick when young, persistent or soon excluded; hymenium 70  $\mu$ m. Eurasia; not definitely known from North America. The nomenclature of the varieties of S. cartilaginea is screwed up; my understanding is that the type of the species is P, so the P+ strain needs a new name. .... [S. cartilaginea var. cartilaginea auct.]

4. Thallus entirely squamulose, not clearly rosetted, more or less imbricated, forming thick (34 mm) detachable mats; squamules 24 mm long, 12 mm wide, coarsely crenateincised, convex away from tips; margins more or less raised; upper surface deep yellow, mostly epruinose except edges rather weakly pruinose. Apothecia unknown. Cortex containing isousnic acid in addition to usnic acid; medulla containing zeorin and fatty acids. Ladera, Mexico. S. cartilaginea "v. pseudocrassa" (actually the typical chemotype of the species) will also key out here; it is morphologically identical to the P+ strain. .... S. (cartilaginea ssp.?) "laderae" Ryan & Nash ined.

4. Thallus more or less distinctly rosetted, not imbricated, usually thin (12 mm), closely appressed, not forming mats; lobes variable in size, rotund to coarsely crenateincised; edges raised or not; upper surface pale yellowish green to greenish yellow, usually densely pruinose at least in thallus center and on raised edges. Apothecia usually present (except in S. lentigera v. deserti). Cortex containing only usnic acid, or usnic acid and atranorin, or ("S.? mexicana" no substances); medulla with no substances (?). .... 5

5. Cortex and medulla with no substances (?). Mexico. The rest of the genus has at least usnic acid in the cortex, so there is some possibility this belongs in Solenopsora sensu lato, but except for the chemistry it seems very similar to forms of S. lentigera s. lato. .... "S.? mexicana Ryan & Nash ined."

5. Cortex with usnic acid ( $\pm$  atranorin). I will probably split this up somewhat (there may even be at least one distinct species to be pulled out), but for now it's best to call all of this one species. .... S. lentigera sensu lato

**S. cf. kansuensis sensu lato**

(P+ yellow)

Very Preliminary!

1. Rosettes indistinct and irregular; lobes rotund to weakly and coarsely crenateincised, mostly 1.52 mm wide, often partly overlapping each other; margins plane to raised and thickened; upper surface yellowish. Apothecia often absent or rare; discs medium brown or yellowish brown, sometimes slightly pruinose.

..... 2

1. Rosettes mostly distinct and regular; lobes usually rather strongly crenateincised, mostly 11.5 mm wide, not overlapping; margins strongly raised and thickened; upper surface greenish, with grayish or bluish tinge. Apothecia usually common, becoming crowded; discs orangish yellow to strong yellowish brown, epruinose. Southwestern U.S. .... "S. nashii"

Ryan ined.

2. Apothecia common, to 2 mm diameter; discs medium orangish yellow to deep yellowish brown; hymenium 70 um.

Saskatchewan. .... S. "loomanii"

Ryan ined.

2. Apothecia absent or rare, to 1 mm diameter; hymenium 4050 um (or more?). Central Asia or southwestern U.S. .... 3

3. Discs epruinose; hymenium \_\_\_\_\_. Southwestern U.S.

..... "S. wynhoffii" Ryan & Nash ined.

3. Discs often slightly pruinose; hymenium 4050 um. Central Asia. .... [S. kansuensis]

**S. lentigera sensu lato**

(P)

Even more preliminary!

Unfortunately, I haven't seen the type of S. lentigera (and there's nothing on it in the literature), so I don't know what "true" S. lentigera is.

**1. Apothecia (usually?) common.** Hymenium 6570

um. .... 2

**1. Apothecia unknown in North American material.** Thallus irregularly lobed, not forming distinct rosettes, thin, tightly to loosely attached; lobes 34 mm long, 13 mm wide, coarsely crenateincised; edges raised or not; upper surface pale or grayish greenish yellow to pale yellowish green, but densely pruinose except on occasional lobes; lower surface pale. Chem.: usnic acid, zeorin. Utah. .... S. lentigera v. "mccuneii" Ryan ined. (cf. v. deserti)

**2. Apothecia mostly to 12 mm diameter; discs becoming convex, light to medium yellowish brown, epruinose; margins thin (0.10.2 mm), becoming excluded;** spores ellipsoid, 810 x 5 um. Upper surface mostly only pruinose towards the thallus center and on raised edges, rarely epruinose; lobes mostly 34 mm long and wide, but strongly crenateincised; margins mostly swollen and upturned. Cortex K (usnic acid only) [?]. Colorado, Arizona?. .... S. lentigera v. "saximontana" Ryan & Nash ined.

**2. Apothecia mostly to 23 mm diameter, broadly emergent and then more or less impressedsessile; discs concave to plane, mostly medium to deep or strong yellowish brown, epruinose or sometimes whitish pruinose, especially when young; margins thick (0.10.3 mm), sometimes raised when young, persistent.** Spores and thallus characteristics various. .... 3

**3. Upper surface pale greenish yellow but mostly appearing yellowish white, strongly pruinose throughout; lobes mostly rotund, little divided, plump; margins often downward turned, but sometimes raised and thickened. Cortex K (usnic acid only) or K+ yellow (atranorin in addition to usnic acid).**

..... 4

**3. Upper surface pale yellowish green with slightly grayish tinge, mostly only pruinose in thallus center and on raised edges; lobes mostly strongly crenate to incised, thin; margins mostly raised and thickened. Cortex (usually?) K (usnic acid only).** Spores ellipsoid to broadly ellipsoid with rounded ends,

1012 x 56 um. Mexico (N to Utah?). ..... S. lentigera v. "mexicana" Ryan & Nash ined.

**4. Lobe margins mostly raised and thickened (?).** Spores 1113 x 56 um, ellipsoid to oblongellipsoid, sometimes narrowed at one end. BorealArctic (or alpine?), Alaska toAlberta. .... S. lentigera v. "thomsonii" Ryan ined. (cf. S. nivalis)

**4. Lobe margins mostly plane (?).** Spores \_\_\_\_\_. Utah. .... S. lentigera v. "flowersii" Ryan ined.

## Literature

(Squamarina in General, including "sect. Petroplaca")

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