Psora Hoffm.
(LECANORALES: PSORACEAE)

After Timdal, 1986

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Thallus squamulose, the squamules usually brown, red, or yellowish above, often whitened by pruina, white or brownish below, the hypothallus pale or absent; upper cortex thick, well developed, of anticlinally oriented, thickwalled hyphae with shortly cylindrical to round lumina, mixed with remnants of dead algae; epinecral layer usually well developed; lower cortex of two types: (1) of ± periclinally arranged, longcelled, closely conglutinated, ± brownpigmented hypahe and lacking crystals of calcium oxalate, or (2) of ± anticlinally arranged, short celled, only partly conglutinated, colorless hyphae densely covered with calcium oxalate; lower cortex sometimes poorly developed to absent; often attached by a well developed hyphal net. Medulla well developed, I. Algae chlorococcoid, in dense, continuous layer.

Apothecia sessile, marginal or laminal, redbrown to black, usually flat or weakly convex when young, later becoming immarginate and strongly convex to semiglobse, K+ blackred or K; pruina white, yellow, or absent. Thalline exciple absent; true exciple annular, colorless to pale brown, of radiating hyphae, usually indisitnct; hypothecium hyaline to pale brown or orangebrown, filled with crystals of calcium oxalate. Hymenium I. Paraphyses simple or sparingly branched, strongly conglutinated, the apical cell slightly swollen. Asci 8spored, clavate, with a well developed, I+ blue tholus containing a deeper I+ blue tube; ocular chamber absent. Spores colorless, simple, ellipsoid, smooth, without a thick perispore. Pycnidia frequent, immersed; ostiole colorless; conidia elongatebacilliform, simple, colorless. Cortex, medulla and exciple often contain calcium oxalate and lichen products. On soil or rock, mostly in desert areas.

Psora lurida differs from the above description in several important characters and will ultimately merit transfer to another genus.

Although many of the species are now fairly easily determined, there are still some problems, especially in material from the Great Basin, where there may be an undescribed species or two.

1. Apothecia attached marginally to the squamules, black; squamules isodiametrical, adnate. 2
1. Apothecia attached laminally to submarginally, brown to black; squamules various. 5

2. Thallus pale yellowish brown to dark brown, sometimes entirely white pruinose; atranorin or gyrophoric acid present. .....3**2. Thallus bright red to brownish red, rarely entirely white pruinose; atranorin and gyrophoric acid absent.** ...4

3. Thallus pale yellowish brown to olivaceous brown or rarely dark brown, densely white pruinose (sometimes entirely so); medulla C; atranorin present (in upper cortex). Common in Great Basin. .....P. cerebriformis
3. Thallus castanceous brown, epruinose; medulla C+ red; gyrophoric acid present (in medulla). Baja California. ..... .P. nitida

4. Squamules up to 10 mm diam., usually with a regular central depression; margin usually downturned, more or less entire. Norstictic acid (K+ yellow then red) almost always present. Arid temperate to subtropical. .....P. crenata
4. Squamules up to 6 mm diam., usually without a regular central depression; margin (especially in young squamules) usually slightly upturned and weakly crenulate. Chemistry various, norstictic acid may be present in arcticalpine areas. Arctic to subtropical. .....P. decipiens

5. Squamules bright yellow, yellowish brown, or yellowish green; i.e., upper cortex containing the pigments rhizocarpic or usnic acid. 6
5. Squamules brown (often white pruinose); upper cortex not containing yellow pigments. 7

6. Squamules adnate, scattered to contiguous; rhizocarpic acid present; arid temperate to subtropical. ....P. icterica
6. Squamules ascending, more or less imbricate; usnic acid present; arcticalpine. .....P. rubiformis

7. Medulla containing norstictic acid, usually K+ red. 8
7. Medulla not containing norstictic acid, K. 10

8. Apothecia dark reddish brown to dark brown; squamules adnate, with a usually downturned, brown margin; arid temperate to

subtropical. .....P. russellii
8. Apothecia black; squamules, or at least margin of squamules, adscending; margin white; arcticalpine. 9

9. Squamules ascending, thin, containing zeorin; lower cortex well developed, composed of mainly anticlinally oriented hyphae. .....P. tenuifolia
9. Squamules usually adnate but with ascending margin, medium thick, not containing zeorin; lower cortex poorly developed or absent. .....P. vallesiaca

10. Squamules containing gyrophoric acid (C+ red). 11
10. Squamules not containing lichen substances, C. ...14

11. Squamules up to 10 mm diam., ascending; margin (and lower side) usually white; lower cortex compopsed of anticlinally oriented hyphae and containing calcium oxalate.....P. nipponica
11. Squamules up to 6 mm diam., adnate to ascending; margin usually brown; lower cortex composed of periclinally oriented hyphae and lacking calcium oxalate. 12

12. Squamules up to 6 mm diam., epruinose, containing bourgeanic acid or a series of anthraquinones; margin usually somewhat downturned; apothecia soon becoming strongly convex, dark brown to black. .....P. californica
12. Squamules up to 3 mm diam., pruinose or epruinose, lacking bourgeanic acid and anthraquinones; margin usually straight or upturned; apothecia usually remaining more or less plane or becoming moderately convex, medium brown to dark brown. 13

13. Squamules more or less ascending, usually pruinose in exposed parts near the margin; undetermined substance related to gyrophoric acid usually present. West coast. .....P. pacifica
13. Squamules more or less adnate, usually epruinose; undetermined substance absent. Montane to alpine. ...P. montana

14. Apothecia usually reddish brown to medium brown; medulla usually containing calcium oxalate (especially in the upper part); lower cortex lacking calcium oxalate. ...15
14. Apothecia dark brown to black; medulla and lower cortex containing calcium oxalate in one species (mainly in the lower part of the medulla and in the lower cortex) 16

15. Saxicolous; squamules up to 4 mm diam., medium brown, distinctly white pruinose along the margin, plane to slightly concave; apothecia reddish brown, usually long remaining plane and marginate. .....P. pseudorussellii
15. Saxicolous or terricolous; squamules up to 6 mm diam., pale brown to medium brown, epruinose to distinctly white pruinose along the margin, convex to slightly concave; apothecia usually reddish brown to medium brown, convex and immarginate even when young. .....P. tuckermannii

16. Squamules distinctly white pruinose along the margin; lower side white near the margin; calcium oxalate present in the medulla and/or the lower cortex. .....P. himalayana
16. Squamules not, or only faintly, pruinose along the margin (but sometimes pruinose on the upper side, especially near the margin); lower side more or less brown; calcium oxalate absent from the medulla and lower cortex. 17

17. Squamules adnate to ascending, becoming more or less imbricate; upper side usually with several fissures; upper cortex 60120 um thick. .....P. globifera
17. Squamules more or less adnate, usually not imbricate; upper side almost without fissures; upper cortex 4070 um thick. .....P. luridella

Literature

Poelt & Vezda. 1981. Erg. II.

Purvis, O. W. and E. Timdal. 1992. Psora. In: Purvis, et al., Lichen Flora of Great Britain and Ireland.

Rogers, 19 . Genera of Australian Lichens.

Schneider, G. 19 . Psora sensu Zahlbr.

Timdal, E. 1986. Psora in North America. The Bryologist. [Need to add fuller descriptions from this].