Phyllopsora Müll. Arg.

Mostly after Brako, 1991 and Harris 1995

Rev. 4/96;
Need to fill in the species descriptions

Thallus crustose to squamulose-subfoliose, of minute, pubescent squamules or granules, ± coralloid or isidiate, not? sorediate; (usually?) C-; squamules ± corticate; prothallus usually distinct. Upper surface smooth, greenish to brown; squamules generally adnate. Isidia or lobules often present. Cortex type 1 (heavily gelatinized hyphae with narrow, net-like lumina), 2 (lumina much broader and rarely appearing net-like, or 1-2 (intermediate). Photobiont green, coccoid (Pseudochlorella). Apothecia ± convex and often tuberculate, Phyllopsora-type, biatorine or occasionally lecanorine (or lecideine?), becoming immarginate; disc pale brownish to brown-black, brown or red-brown, epruinose, often deeply fissured. Thalline exciple absent; true exciple often inconspicuous except occasionally when young, of radially oriented, thick-walled, gelatinized hyphae, some extending outwards into thallus. Hypothecium pale, very thick (150-250 um), intensely gelatinized, appearing chondroid; hyphae interwoven, narrow. Hymenium I- or faintly blue. Epihymenium poorly differentiated, reddish brown, never greenish or purplish in K. Paraphyses thin, mostly simple or sparingly branched, short-celled, coherent, each surrounded by a gel coat, apices not swollen, colorless. Asci clavate, Bacidia-type. Spores 8, ellipsoid to oblong-ellipsoid or narrowly fusiform, simple or thinly septate, colorless, thin-walled, 7-20 x 2-5 um, without a thick perispore.

Pycnidia resembling incipient apothecia; pycnospores bacilliform, colorless, simple. Argopsin, pannarin, zeorin, other terpenoids, fatty acids. On bark or wood. Mostly tropical-subtropical, a few present in oceanic, temperate regions.

Similar to Biatora, but differing in the thallus form and in the slightly different ascus structure.

1. Thallus P-. 2
1. Thallus P+ orange (argopsin agg. or pannarin). 14
2. Prothallus dark, abundant. 3
2. Prothallus pale (in North America rarely darkening in old, abused specimens). 4
3. Squamules minute, ca. 0.1 mm wide, inconspicuous; thallus dominated by long slender isidia; furfuracein; ascospores 6-12 x 2-2.5 um. Apothecia containing an orange-brown substance. Thallus thin, smooth to scurfy, obscurely chinky, ashy gray. Apothecia 0.5-1 mm across; disk flat to convex, dark reddish or nearly black; exciple disappearing; hypothecium yellowish and darkening; spores ellipsoid, 10-16 x 5-8 um.

Thallus P-. On trees, Florida and Louisiana; Mexico. ..... P. furfuracea (Pers.) Zahlbr.

3. Squamules/areoles large, tightly adjoined, fomring an almost continuous crust, separated by white lines formed by fibrils. Isidia absent (sparse, short and cylindrical according to Harris 1995). Prothallus red, abundant. Thallus placodioid, with squamules peripherally 0.3-0.7 mm wide, strongly pubescent and fibrillose. Cortex ill-defined type 2. Prothallus red. Excipulum and hypothecium deep brownish red throughout. Spores 10-13 x 3-4 um. Thallus P-. Atranorin, fatty acids, triterpenoids. Louisiana. ..... P. halei (Tuck.) Zahlbr. (syn. Pannaria halei)

4. Squamules with marginal proliferations ± parallel to the substrate, flattened to some degree and not distinctly cylindrical; proliferations initially simple but usually repeatedly branched or proliferate. 5

4. Squamules with ± globose to cylindrical isidia or squamules lacking isidia and marginal proliferations. 10

5. Squamules large; lobes more than 0.5 mm wide. Thallus complanate, squamulose to subfoliose; margins deeply incised. Spores 7-13(-15) x 2-4 um. Thallus P-. Southeastern U.S., to Florida; Mexico. Fink's concept of this species, which he reports as occurring from New Jersey to Florida and W to California, includes P. corallina. 6

5. Squamules minute to medium-sized; lobes mostly 0.1-0.5 mm wide. 7

6. Marginal proliferations usually abundant, narrow, mostly ecorticate, forming a distinct white fringe; cortex less than 50 um thick; ascospores ellipsoid to short fusiform, 8-12.5 x 2-3 um. Florida. ..... P. parvifolia (Pers.) Müll. Arg. var. parvifolia

6. Marginal proliferations scarce, broader, similar to primary squamules; cortex over 50 um thick; ascospores ovoid, 7-10.5 x 2.5-4 um. Alabama. ..... P. parvifolia var. breviuscula (Nyl.) Brako

7. Squamules adnate, with proliferations narrow in respect to squamules, initially ± ovate becoming elongated, with constrictions or branched. 8

7. Squamules erect, with proliferations broad in respect to squamule; or squamules adnate with proliferations coarse and inflated-looking, not much elongated. 9

8. Cortex type 2; very irregular, ± non-linear proliferations usually abundant and forming overlapping layers. Ascospores 8.5-12 x 2.5-3 um. Squamules deeply incised; cortex type 2, more than 20 um thick. Squamules adnate; proliferations narrow in respect to squamule, initially ± ovate becoming elongated, with constrictions or branched. Thallus P-. Florida. ..... P. confusa Swinscow & Krog

8. Cortex type 1; proliferations less abundant, less commonly elongated; ascospores 7.5-11.5 x 2-3 um. Florida. ..... P.

corallina (Eschw.) Mull. Arg. var. corallina

9. Squamules ± erect with broad, flat lobules. Spores ovoid, 4-6.5 x 2-3 um. Thallus P-. Florida. Harris 1995 treats this species as having somewhat flattened marginal proliferations rather than isidia. ..... P. parvifoliella (Nyl.) Müll. Arg.

9. Squamules closely adnate, often contiguous and forming + continuous crust; proliferations coarse, appearing inflated. An aberrant population. Mississippi. ..... cf. P. corallina var. corallina

10. Thallus not isidiate or lobulate. ..... (see P. parvifolia var. breviuscula)

10. Thallus isidiate. 11

11. Squamules/areoles minute, ca. 0.1 mm wide; isidia long, cylindrical, tangled; no substances; ascospores 7.5-12.5 x 2-3.5 um. Florida. ..... P. isidiolyta (Vainio) Riddle

11. Squamules medium, 0.1-0.5 mm wide. 12

12. Isidia nearly globose or irregular, not much elongated or weakly elongated by budding; no substances; ascospores 6.5-12.5 x 2-3.5 um. Louisiana and Oklahoma. ..... P. kalbii Brako

12. Isidia cylindrical. 13

13. Isidia common, often obpyriform, constricted at base and broadest just above base; atranorin and parvifoliin; ascospores 6.5-10 x 2.5-3.5 um. Florida. ..... P. corallina var. rappiana Brako

13. Isidia rare, cylindrical; squamules mostly with marginal proliferations; no substances. South Carolina. ..... P. corallina var. corallina

14.Thallus not isidiate, pruinose; squamules large. (P. buettneri (Mull. Arg.) Zahlbr. s. lato)..... 15

14. Thallus isidiate, not pruinose. (P. corallina (Eschw.) Mull. Arg. s. lato). 16

15. Containing argopsin agg.; ascospores 7-12 x 2.5-3 um. Florida. ..... P. buettneri var. glauca (de Lesd.) Brako

15. Containing pannarin, phyllopsorin and zeorin; ascospores 10-12 x 2.5-3 um. Louisiana. ..... P. buettneri var. munda (Malme) Brako

16. Thallus containing vicanicin; argopsin only in trace quantities. Isidia marginal, globose. Florida; Mexico. ..... v. glaucella (Vainio) Brako

16. Thallus containing argopsin agg. as major substances. 17

17. Thallus containing phyllopsorin or chlorophyllopsorin. Ascospores 6.5-12 x 2.5-3.5 um. Isidia mostly marginal. Isidia very long, cylindrical. Florida; Mexico. ..... v. ochroxantha (Eschw.) Brako

17. Thallus lacking above compounds. Ascospores 7-13 x 2.5-3 um. Isidia mostly laminal. Isidia thin and cylindrical. Widely distributed in SE United States; also found in Mexico; strain with argopsin only is restricted (in N. America) to Florida. ..... v. santensis (Tuck.) Brako

ADD:

Spores ovoid, less than 6.5 um long. Mexico. ..... P. glabella (Nyl.) G. Schneider

Varieties of P. parvifolia:

1. Thallus upper cortex type 1-2, greater than 50 um thick. Ascospores ovoid. Alabama. ..... v. breviuscula (Nyl.) Brako
1. Thallus upper cortex type 2, less than 50 um. Ascospores ellipsoid to short fusiform. Widely distributed in SE United States; Mexico. ..... v. parvifolia

Varieties of P. corallina:

1. Thallus P-. 2
1. Thallus P+. 3

2. Thallus containing parvifoliin (incorrectly given as phyllopsorin in Brako's key). Isidia mostly laminal, thin and cylindrical. Florida; Mexico. ..... v. rappiana Brako
2. Thallus lacking parvifoliin. Isidia formed from very tiny squamules, laminal and marginal, cylindrical, sometimes completely covering thallus. Widely distributed in SE United States. ..... v. corallina

3. Isidia elongate, marginal, flattened, horizontal. Containing only argopsin. Caribbean and S. America; not known from N. America. ..... v. phaeobyssina (Vainio) Brako
3. Isidia globose to cylindrical, laminal or marginal, erect, or isidia lacking. 4

4. Thallus containing phyllopsorin or chlorophyllopsorin. Isidia very long, cylindrical and mostly marginal. Florida; Mexico. ..... v. ochroxantha (Eschw.) Brako
4. Thallus lacking above compounds. 5

5. Thallus containing vicanicin; argopsin only in trace quantities. Isidia marginal, globose. Florida; Mexico. ..... v. glaucella (Vainio) Brako
5. Thallus containing argopsin as a major component. Isidia mostly laminal, thin and cylindrical. Widely distributed in SE United States; strain with argopsin only is restricted (in N. America) to Florida. ..... v. santensis (Tuck.) Brako

P. corallina (Eschw.) Mull. Arg.

Spores ellipsoid, 6.5-13.0 um long. Cortex type or 1-2, more than 20 um thick, not extending to the lower surface. Proliferations not very abundant, somewhat infrequently elongated. Squamules adnate; proliferations narrow in respect to squamule, initially ± ovate becoming elongated, with constrictions or branched. Thallus P-. Southeastern U.S., to

Florida; Mexico. Harris 1995 treats this taxon as being isidiate or not.

Literature

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