

Porpidia Körber
(LECANORALES: PORPIDIACEAE)

After Gowan, 1989

Rev. 5/94

Thallus thick to inconspicuous, tartareous, continuous to areolate-cracked, whitish, grayish, or ochraceous to orange; medulla I+ violet or I-; prothallus absent, or present (especially between adjacent thalli), black or sometimes orange, thin; soredia present or absent, either forming irregularly and diffusely in cracks in thallus, or more commonly forming discrete, regular, round soralia. Photobiont chlorococcoid. Usually containing long-side chain orcinol depsides, β -orcinol depsidones, or sometimes dibenzofurans (substances include stictic, norstictic, 2'O-methylsuperphyllinic, 1'O-methylmicrophyllinic, confluent and 2'O-methylperlatolic acids).

Apothecia scattered to clustered, sometimes in concentric rings, hemiangiocarpic, emerging from small pruinose dots on thallus, subimmersed or becoming sessile, sometimes rather large (to 4 mm diam.); disc dark brown to black, pruinose or naked, with a distinct true exciple (sometimes excluded with age); thalline exciple absent; true exciple dark brown (outer edge dark green in some species), but sometimes paler brown in inner part, composed of conglutinated, radiating hyphae often to 5 μ m or more in diameter, often K+ reddish; hypothecium dark brown to brown-black, K- or K+ reddish in parts; hyphae irregularly arranged; subhymenium hyaline. Hymenium 80-150 μ m tall, colorless or pale greenish above, I+ blue; epithecium usually distinct, brown to greenish brown, rarely blue-green, N+ rose pink to purple. Paraphyses septate, often branched in the upper region, anastomosing, netlike, conglutinate, slightly swollen at apices but without dark apical caps. Asci 8-spored, clavate to subcylindrical, *Porpidia*-type, lightly cross-striated or smooth, the outer wall amyloid; spores simple, rather large (often over 13 μ m long), \pm ellipsoid, occasionally with one or both ends acuminate; perispore well developed, 2-7 μ m thick.

Pycnida rare; conidiogenous cells elongate-ampulliform, in a single layer, enteroblastic, acrogenous; conidia bacilliform. On siliceous, rarely calcareous, rocks, rarely on bark, wood, or artificial materials, mainly boreal-montane, in various habitats.

Very close to *Amygdalaria*, and perhaps a synonym of it.

I. Thallus with soredia

(if cephalodia present, also see *Amygdalaria*)

- 1. Thallus mostly orange, rarely with minor gray patches. ...2**
- 1. Thallus mostly gray, at most patchily orange.8**

- 2. Thallus very thin (to 0.2 mm); soralia irregular and often confluent, 0.2-1.0 mm diameter.** Eastern boreal.cf. P. soredizodes
- 2. Thallus thicker (0.2-0.8 mm); soralia regular, roundish and mostly remaining discrete.**3
- 3. Soralia 0.3-1.0 mm diameter; soredia white or flecked with gray; lacking confluent acid; thallus more or less continuous, often finely cracked but rarely subrimose to rimose.** Mainly western alpine; rare in arctic and eastern temperate mountainous regions.P. pseudomelinodes
- 3. Soredia 0.2-0.8 mm diameter, green-grey to blue-grey, flecked with black; containing confluent acid; thallus subrimose to rimose.** Apothecia to 1.5 mm, pruinose or not. Spores 15-25 x 6-12 um. Epithecium \pm olive or brown-black. Hymenium 100-200 um. Thallus \pm thick. Arctic.P. flavocaerulescens
- 4. Containing stictic or norstictic acid, or both** (medulla K+ yellow to red). Eastern temperate or arctic-alpine. ...5
- 4. Lacking stictic and norstictic acid.** Eastern boreal.7
- 5. Soralia pale yellow; norstictic acid present but stictic acid absent (medulla K+ red); thallus continuous only when young, becoming dispersed areolate on a well developed prothallus.** Arctic-alpine.cf. Porpidia sp.
- 5. Soralia pale gray; stictic acid present with norstictic acid as a minor constituent (medulla K+ yellow or orange); thallus continuous.** Rare in the eastern temperate zone.6
- 6. Thallus thick (0.6-1.0 mm); soralia regular in shape, mostly not confluent.**P. albocaerulescens
- 6. Thallus thin (to 0.2 mm); soralia irregular in shape, often confluent.**P. cf. P. soredizodes
- 7. Medulla IKI-; soralia irregular, forming along cracks in the thallus. Containing 2'-O-methylsuperphyllinic acid.** Thallus bluish grey or white. Apothecia rare. Spores 18-25 x 7.5-10 um. Oceanic.P. glaucophaea
- 7. Medulla IKI+ strong blue-violet, K-.** Soralia round, forming discrete patches, whitish or pale yellow-green. Ch: confluent acid, and unknown(s). Thallus grey or grey-green, or patchily oxidized reddish orange; continuous or patchy, rimose-areolate or verrucose-areolate on black hypothallus. Apothecia occasionally present, 0.4-2 mm, disc pruinose. Spores 13-18 x 6.5-11 um. Oceanic or continental.P.

tuberculosa

II. Thallus without soredia

1. **Thallus orange, with occasional gray patches.**2
1. **Thallus gray to white, at most with small irregular orange patches.**3
 2. **Apothecia pruinose, depressed to broadly sessile; thallus 0.2-0.6 mm thick.** Arctic and alpine in the northern Appalachian Mountains.P. flavicunda
 2. **Apothecia nonpruinose, sessile; thallus 0.1-0.3 mm thick.** Arctic to temperate.3
3. **Medulla IKI+ blackish;** exciple with a very heavily pigmented (blackish) marginal layer, sometimes with a hyaline inner layer in young apothecia that may disappear with age; hymenium +60-90 μ m high; subhymenium 30-45 μ m; spores 11-17 μ m long.4
3. **Medulla IKI-;** exciple, hymenium, subhymenium and spores various.5
 4. **Thallus light greenish gray to whitish, more or less continuous; apothecia remaining sunken in the thallus until near maturity, very broadly sessile.** Growing on HCl+ rocks.P. speirea
 4. **Thallus medium gray, patchy; apothecia very soon becoming sessile.** Growing on HCl- or weakly HCl+ rocks.P. grisea
5. **Confluent acid present; stictic acid absent; spores 12-18 x 6-9 μ m;** exciple carbonaceous.6
- 5, **Confluent acid absent; stictic acid present or absent; spores of all species except P. crustulata reaching more than 18 μ m long;** exciple noncarbonaceous except in P. diversa, P. contraponenda, and P. tahawasiana.8
 6. **Apothecia sessile at maturity; thallus very thin to moderately thin (0.1-1.0 mm).**7
 6. **Apothecia depressed in the thallus at maturity; thallus 0.5-1.2(-2.0) mm thick.** Thallus areolate, warty to rimose-areolate. Apothecia to 1.5 mm, flat, often thick-margined, pruinose or not, adnate or almost immersed when young, later convex and immarginate. Spores lacking a hyaline sheath. Exciple uniformly dark and carbonaceous, even in thin sections, radially cracked. Spores 12-18 x 6-8 μ m. Hymenium 70-120 μ m.P. cinereoatra
7. **Apothecia pruinose; thallus moderately thin (0.3-1.0 mm), pale yellowish to whitish.** Arctic.P. lowiana

7. Apothecia nonpruinose; thallus thin (0.1-0.5 mm), olive, greenish or yellowish gray. Appalachian-Great Lakes Region.P. herteliana

8. Thallus consisting of discrete convex areolae, with apothecia developing between the areolae. Thallus \pm effigurate at margin, white. Apothecia to 1.8 mm, brown when wet. Hymenium 120-170 μ m. Exciple K-. Spores 19-33 x 8.5-14 μ m. Arctic.P. superba

8. Thallus medium continuous, bullate to rimose-areolate, with apothecia developing on the thallus. Arctic or shores of Lake Superior.9

9. Thallus having large, bullate verrucae; apothecia often brown. Shores of Lake Superior.P. calcarea

9. Thallus more or less smooth; apothecia black. Arctic.P. zeoroides

10. Discs heavily pruinose; thallus thick (normally 0.5-1.0 mm); excipular cells 2-5 μ m diameter.11

10. Discs nonpruinose; thallus thin; excipular cells 3-9 μ m diameter.12

11. Containing 2'-O-methylsuperphyllinic acid. Boreal West Coast and mountains, oceanic.P. carlottiana

11. Containing stictic or norstictic acid (medulla K+ yellow to red). Thallus thick, smooth, continuous, usually whitish, I+ blue or I-. Apothecia sunken in thallus when young, becoming sessile only with age, 0.3-1.3 mm, disk distinctly pruinose. Exciple K+ yellow. Parathecium red-brown inside. Hymenium 80-140 μ m. Spores 17-26 x 8-12 μ m. Eastern temperate.P. albocaerulescens

12. Containing methyl 2'-O-methylmicrophyllinate.13

12. Containing stictic acid or lacking secondary products.14

13. Epithecium usually aeruginose, less commonly olive green or olive brown; apothecia rarely over 1.0 mm diameter. Eastern temperate.P. diversa

13. Epithecium usually olive green to olive brown, less commonly aeruginose; apothecia commonly to 1.5 mm diameter. Western boreal, oceanic.P. contraponenda

14. Exciple completely dark and carbonaceous; apothecial margins becoming radially cracked. Eastern boreal (Appalachian-Great Lakes Region).P. tahawasiana

14. Exciple pigmented brown; cells visible in thin hand sections; apothecial margins not radially cracked.15

15. Excipular cells 4-9 um diameter; hymenium 65-90(-100) um high; spores 10-17(20) x 5-9 um. Thallus thin, continuous to weakly rimose. Apothecia mostly under 1 mm wide, non pruinose, long remaining flat to moderately convex, with thin, raised margin. Spores with a visible hyaline sheath (best seen with ink). Exciple paler internally in thin sections, non-carbonaceous, not cracked. Apothecia 0.3-0.8 mm. Hyaline sub-hymenial area usually ca. 15-20 um thick. Eastern temperate.P. crustulata

15. Excipular cells 3-6(-8) um diameter; hymenium (70-)80-120 um high; spores (13-)16-23 um long.16

16. Excipular cells about two times longer than broad; exciple darkly pigmented. Arctic, alpine, or on the west coast.P. thomsonii

16. Excipular cells about 1.5 times longer than broad; exciple moderately to weakly pigmented. Temperate to boreal, not on the West Coast. Hymenium 90-200 um. Apothecia 1-2.5(3.5) mm wide, often constricted at base. Exciple brown-black, pale ochre brown inside, K+ red-violet or K-. Discs mostly non-pruinose. Thallus whitish to grey, rimose to rimose-areolate, or endolithic. Spores 17-33 x 7-14 um.P. macrocarpa

ADD? (unpublished species? from Gowan's thesis):

1a Thallus bearing large, tuberculate, brownish grey cephalodia-like structures containing green algae. Thallus of large, convex, usually contiguous areoles. Apothecia sunken in areoles, lightly pruinose. Ch: confluent acid, and unknowns. Nova Scotia.P. sp.

1b Thallus without cephalodia-like structures. Thallus greyish, whitish or not evident. Epithecium (mostly?) olive or brown.

2a Medulla K+ yellow or red (stictic or norstictic). Thallus thin, usually grey. Apothecia sessile, 0.3-0.8 mm diameter, disc at most weakly pruinose. Spores 10-17 x 5-10 um. Medulla K+ yellow to orange. Containing stictic and constictic acids and unknown PQ-4, with only traces of norstictic acid, and no atranorin. Nova Scotia.P. sp.

2b Medulla K- (lacking stictic and norstictic acid).

3a On wood. Thallus continuous, verrucose-areolate. Apothecia non-pruinose, sunken into thallus, or sessile, to ca. 1.2 mm. Ch: no lichen substances. Nova Scotia.P. sp.

3b On rock. Thallus l-. (Gowan's key includes 4 unknown taxa from Nova Scotia that belong somewhere below; 3 of these contain either confluent acid or an unknown substance). Thallus not effigurate. Apothecia (mostly?) black even when wet. Exciple K-.P. sp.

ADDITIONAL UNKNOWN TAXA FROM GOWAN

P. sp. "#1"

P. sp. "#2"

P. sp. "#4"

P. sp. "#6"

ADDITIONAL PUBLISHED SPECIES:

P. pseudomelinodes

Literature

Galloway, D. and B. Coppins. 1992. Porpidia. In: Purvis, et al.. Lichen Flora of Great Britain and Ireland.

Gowan, S. 1988. Porpidia. [Need to add more info. from this].