

Polyblastia Massal.
(VERRUCARIALES: VERRUCARIACEAE)

After Fink, Poelt, and others

Rev. 5/94

Thallus crustose, immersed or superficial, often inconspicuous, smooth to uneven, rarely subsquamulose. Soredia rarely present. Photobiont chlorococcoid. Perithecia superficial or immersed in thalline warts, forming pits in limestone, simple or compound. Involucrellum present or absent. Thalline exciple in a few species. True exciple completely black and friable, or pale below. Periphyses present; paraphyses filiform, richly branched and anastomosing, gelatinizing, absent at maturity. Asci saccate, *Verrucaria*-type, thin-walled. Spores (1-)2-8, muriform or submuriform, \pm ellipsoid or ovate, rarely reniform, colorless to deep brown, sometimes with a well developed gelatinous perispore. Pycnidia rare, immersed; conidia bacilliform, produced terminally from short conidiogenous cells. No substances. On siliceous or calcareous rock, mortar, brick, soil, or mosses, often in and by streams and lakes, rarely on bark.

I. On soil, moss, or humus

1. Spores 2 per ascus, 80-120 μ m. Thallus subsquamulose. Ascocarps with coarsely granular surface. Spores hyaline.(see *Agonimia tristicula*)

1. Spores mostly 8 per ascus. 2

2. Spores soon gray-black to red-brown, (15-)18-28(-36) x (7-)9-15 μ m, transversely several-septate to submuriform with 5-7 transverse and 1 longitudinal septa, elongate-elliptical. Thallus dark, green or dark blackish, thin, subgelatinous, granular, effuse. Perithecia 1/4 to 1/2 immersed, 0.2-0.3 mm diam.; excipulum brown-black; involucrellum absent (brown-black according to Thomson). Asci saccate. On humus and moss, or sometimes mica-schist soil between squamules of *Catapyrenium cinereum*. Arctic, Greenland to Alaska.*P. gothica*

2. Spores hyaline (to finally pale yellow-brown when old). 3

3. Involucrellum lacking. Spores 30-60(-75) x (12-)15-25(-30) μ m. Thallus black, thin to moderately thick, subgelatinous, uneven, composed of small globules, granular or \pm smooth, ash gray, dark green-black or black-brown, effuse; upper cortical layer brown. Perithecia 0.2-0.4 mm wide, totally to semi-immersed, partly crowded or confluent, not surrounded by thalline cuff; apex slightly flattened. Spores 8/ascus, muriform with 1-2 longitudinal septa, 6-7 transverse septa, ellipsoid, colorless, rarely pale yellow brown with age. Excipulum spherical, hyaline or with surface darker, blackish. Ostiole protruding.Periphyses abundant, branched. No involucrellum. Hymenial gel I+ blue then rapidly red. On calcareous, sandy or \pm acid peaty soils, especially in dune systems, in moist sites, occasionally among mosses on tops of old mortar-filled walls. Arctic-boreal, Alaska to Ellesmere Island, south to New Hampshire.*P. gelatinosa*

3. Involucrellum present. 4

4. Spores 15-30 x 9-15 um, muriform with 8-16 irregularly arranged cells, colorless, 8/ascus, ellipsoid. Thallus gray, white to pale red-gray or tinged brown, to 0.5 mm thick, irregularly delimited as scattered, \pm convex granules; granules coarse to subsquamulose, turgid-congested, waxy, cartilaginous; hypothallus black. Perithecia scattered or discrete, sometimes confluent, to 0.15(-0.3) mm wide, 1/2 to 3/4 immersed (to later a little projecting from thallus), the apex flattened, impressed, matt or \pm shiny, black or blue black (covered by a hyaline layer), often mottled brown-black; excipulum spherical, hyaline to pale or black-brown, semi-opaque; involucrellum present, 0.2-0.3 mm diam., opaque, black, covering the upper half or more; periphyses elongate and quite thick; hymenial gelatin I+ red or occasionally blue. On exposed, micareous soils and bryophytes, high elevation. Arctic-alpine, Alaska and Ellesmere Island. P. sendtneri
4. Spores mostly over 30 um long and 14 um wide. 5

5. Perithecia immersed in thallus; exciple thin, dark; involucrellum only over top of perithecium; spores 25-46 x 14-18 um. Thallus mostly gray-white, to 0.5 mm thick, on black hypothallus, minutely granulose or crumbling and disappearing. Perithecia 0.1-0.3 mm wide, sessile (partly immersed according to Fink), subumbonate, covered by dead thallus; superficial portion strongly convex, black; ostiole scarcely visible. Spores 8, finally irregularly arranged, ovoid, 5-7-septate transversely, 3-5-septate longitudinally, 24-46 x 18-28 um. Involucrellum present. Probably a morph of P. cupularis overgrowing mosses. Maine. P. bryophila Lönnr.

5. Perithecia projecting in part, up to one third showing over thallus; exciple dark above, pale below; involucrellum containing down beside exciple; spores 44-80 x 20-35 um. Thallus granular-warty to chinky-areolate or nearly squamulose, gray-white, greenish gray, or brownish gray. Perithecia immersed in raised warts of thallus, at first only ostiole showing, then later up to one-third of perithecium showing above thalloid portion; perithecium black; exciple dark brown to black above, pale below, upper part fused with black involucrellum from which it becomes free below, although involucrellum continues downward to wrap around perithecial base; gelatin I+ red; spores hyaline, muriform with many cells, up to 16-septate transversely, 4- or 5-septate longitudinally, very large, 44-80 x 20-35 um. On rocks and soil in calcareous habitats, also on invading mosses. Arctic. P. terrestris

II. On rock

1. Spores mostly over 50 um long and 20 um wide, hyaline to pale brownish, or sometimes dark brown. Cephalodia often present. 2

1. Spores mostly under 45 um long and under 20 um wide, hyaline to pale brownish. Cephalodia (as far as known) absent. 5

2. Thallus superficial, film-like, \pm gelatinous and dark and oily when wet, \pm cracked when dry, dark brown, or gray- or green-brown. Cephalodia absent. On wet surfaces. Perithecia prominent, 0.5-0.8 mm diam.; thalline exciple well developed; involucrellum black on outer side, paler on inside; true exciple colorless. Spores 8/ascus, 50-80 x 25-40 x 25-40 um, muriform, ellipsoid, pale brown, some colorless ones often also present. On inundated and \pm submerged, siliceous rocks and stones in unpolluted streams, more rarely along sheltered lake margins. P. cruenta

2. Thallus not oily when wet. Cephalodia present. Mostly on \pm dry surfaces. 3

3. Spores 45-65(-80) x 20-28(-35) um, muriform, many celled, colorless to pale yellow-brown, \pm ellipsoid. Thallus gray-white to pale gray-green or tinged brown, effuse, very thin, or becoming subsquamulose, warted, coarsely granular to \pm smooth, \pm widely and irregularly cracked; cephalodia present. Perithecia immersed in thalline verrucae, 0.4-0.75 mm wide, 1/2 to almost fully enveloped by a thalline exciple, or the top 1/3 gradually becoming exposed. Involucrellum 0.5-0.8 mm diam., extending to base, \pm protruding, the lower part free and distinct from excipulum, the upper part fused with it. True exciple \pm colorless or brownish, especially towards outer surface. Periphyses elongate, slender; hymenial gel I+ wine red. On calcareous or \pm basic, friable rocks and stones, derived, soil, spreading to moribund bryophytes. Arctic. Alaska. P. terrestris

3. Spores mostly over 60 um long and 30 um wide. 4

4. Spores dark, 60-84(-100) x (30-)35-45(-60) um, fully muriform with many cells, without thick epispore, 8/ascus, ellipsoid. Thallus thick, whitish or sometimes reddish tinged, verrucose-areolate to scurfy or nearly obsolete; cephalodia present; upper cortex 30-40 um, hyaline and poorly structured. Perithecia 0.8-1.0 mm broad, in warts in the thallus with the flattened and deepened ostiole \pm free, becoming adnate on the thallus with only the base inserted; involucrellum present, dark, lacking below; excipulum spherical, pale, surface often black especially near ostiole. Periphyses very long and slender. On dry rock, usually with calcareous content. Arctic (and boreal?), Alaska. P. theleodes

4. Spores hyaline to straw colored or occasionally partly brown, ovate, 8/ascus, muriform, to 10-septate transversely, 7-septate longitudinally, 70-100 x 30-60 um. Thallus well developed, of raised, grouped, rounded or squamiform areoles, to 1.8 mm broad and high, the surface very rough verrucose with the surficial verrucules gray over a light brown net between them; areoles constricted below; lower side black. Cephalodia present and copious between the areoles, containing Nostoc, the outer layers brown and narrowly corticate. Perithecia immersed in the areoles, usually 1 per areole, the mouth showing as a dark spot in the center of the areole, ca. 0.2-0.7 mm diam.; perithecial warts resembling tiny ornamental gourds, covered by thalline layer with warty surface; exciple

very dark purplish brown all around, the innermost layer pale, the area near the mouth purplish brown; involucrellum lacking; periphyses long, slender, branching, cellular, projecting down into the lumen; hymenial gel I-; asci broadly clavate. On limestone, calcareous sandstone, and conglomerate, 185-1800 m, on dry to moist outcrops and cliffs or on small rock fragments in frost boils. rocks, Alaska, Yukon and British Columbia. P. cucurbitula

5. Perithecia completely immersed in pits in rock, 0.25-0.3 mm wide; no involucrellum; spores 30-45 x 15-24 um, many celled, 2-4-septate longitudinally. Thallus giving a gray color to the stone and within it. Perithecia with only the tips showing, leaving cavities in the rock when they fall out; black; exciple entirely black and slightly widening toward ostiole; involucrellum lacking; gelatin I+ red; spores hyaline to pale yellowish brown, muriform with many cells, 6-8-septate transversely, 1- or 2-septate longitudinally, 30-45 x 15-24 um. On limestone rocks and pebbles. Arctic. P. obsoleta

5. Perithecia semi-immersed. 6

6. Spores 3-5-septate transversely, 1-2-septate longitudinally. On siliceous rock. Spores 22-26 x 13-17 um. Thallus gray or whitish, granular to disappearing. Perithecia 0.2-0.3 mm wide, adnate to the rock or with the base slightly immersed, the apex slightly depressed; excipulum black above, pale below; involucrellum lacking; gelatin I+ red; spores hyaline, muriform with few cells, 3-5-septate transversely, 1- or 2-septate longitudinally. Arctic. P. septentrionalis

6. Spores with numerous cells. On calcareous rock. Hymenium I+ red. 7

7. Spores 30-42 x 18-23 um. Excipulum dark below. Spores 8/ascus, hyaline, ellipsoid, muriform with many cells. Thallus moderately thick, finely chinky-areolate, ashy gray or whitish. Perithecia with the base immersed, hemispherical, 0.3-0.4 mm broad, bare or with involucrellum over entire surface; excipulum spherical, black-brown, thinner at the base. Hymenial gelatin I+ red. On calcareous rocks. Arctic. P. hyperborea (v. macrospora?) [synonym: P. integrascens]

7. Spores under 18 um wide. Excipulum pale below. Involucrellum dimidiate. 8

8. Perithecia 0.2-0.3 mm diameter, at first immersed in the rock, later becoming hemispherical, black, bare, with swollen summit. Excipulum pale brownish below; involucrellum thick, black, dimidiate, spreading away from the perithecium at the base; hymenial gel I+ red. Thallus not distinguishable. Spores 25-27 x 13-17 um, 8/ascus, hyaline, muriform with many cells. On calcareous rocks. Arctic. Alaska. P. hyperborea

8. Perithecia 0.25-0.5 mm diameter, prominent, 1/4 to 1/2 immersed; involucrellum generally well developed, ± pale below or brown tinged; ostiole sometimes depressed. Thallus thin, smooth to faintly chinky, greenish-gray to brownish, effuse or bordered by a thin, black prothallus; often appearing as a dark stain or evanescent. Spores 8/ascus, 20-55 x 10-30 um [28-40 x 13-17 um ("v. intercedens", i.e. v. cupularis?) or 18-24 x 8-12 um (v. aethioboloides (Nyl.) Hasse)], colorless, muriform, broadly

ellipsoid. On hard limestones and basic rocks, perhaps sometimes on mosses, rarely on consolidated calcareous soil, usually in moist or sheltered sites. Southern California.P. cupularis

ADD:

Thallus thin, irregularly warty, whitish or nearly lacking. Perithecia adnate or half-immersed, 0.6-1.0 mm broad; exciple entirely black; involucrellum varying from around the ostiole downward to half of the perithecium, broadening downward; gelatin I+ red; spores brown or blackish brown, ellipsoid or elongate-ellipsoid, tips rounded or pointed, irregularly muriform, 25-40 x 15-25 um. On rock, Greenland, Quebec. P. melasporea Taylor (see Sirois, et al., 1988)

Spores less than 35 um long, remaining hyaline. Similar to P. obsoleta. Newfoundland. P. albida Arnold

Literature

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