

Ophioparma Norman

After May (1997) and various other authors

Rev. November 12, 1997

Thallus crustose, corticate, yellow (in N. American species) or pale to dark gray or \pm intensely suffused yellow-green. Photobiont trebouxoid. Apothecia to 2 mm diam., round or somewhat irregular, sessile; discs red. Thalline exciple present or absent. True exciple thick, concolorous with disk. Paraphyses slightly thickened at the tip, rarely branched or anastomosed. Asci clavate, with shallow, uniformly K/I+ blue apical dome, lacking a distinct ocular chamber or apical cushion. Spores 8, \pm spirally arranged in ascus, fusiform, transversely multiseptate, colorless. Pycnidia immersed, visible as black dots 100-400 μ m diam.; wall colorless except for dark green (K-, N+ red) zone around ostiole; conidiogenous cells arranged in chains, sometimes branched, subcylindrical, enterblastic, acro- to pleurogenous; conidia rod-shaped, simple, colorless. Thallus with thamnolic acid, sometimes divaricatic or usnic acid). Apothecia and sometimes parts of the medulla contain ventosin, an orange-red, K+ blue pigment. On well-lit, hard siliceous rock, montane or alpine, or on bark or wood.

Haematomma, which also has a \pm red apothecial disc and acicular transversely septate spores, differs in having a thin true exciple, a Lecanora-type ascus, thin, richly branched and anastomosed paraphyses not thickened at the tips, and partly a different chemistry.

1. On rock. 2

1. On bark or wood. O. rubricosa

2. Spores less than 30 μ m long, L:W < 6, very narrowly ellipsoid to subfusiform (when immature, sometimes asymmetrically tapered, irregular, or curved), simple or 1-septate at maturity, arranged sub-parallel or diagonally to the long axis of the ascus. O. lapponica

2. Spores greater than 30 μ m long, even when mature, L:W > 6, asymmetrically tapered, with one end blunt or fusiform and one end subulate (broadly acicular) to acicular, or sometimes becoming narrowly spatulate (with a "tail"), 3-7-septate at maturity, sometimes arranged helically in the ascus. 3

3. Thallus never granular, sub-isidiate or sub-sorediate, often much more than 2 mm thick in the center, with a distinctly rimose-areolate surface, occasionally dispersed areolate, with almost all areoles larger than 0.2 mm, usually much larger, areoles smooth, cracked, microsquamulose, or verrucose; spores 4-6 μ m wide, 3-7-septate at maturity, often helically arranged in the ascus, but also often found subparallel to the long axis of the ascus. On rock. O. ventosa

3. Thallus almost always granular in part, sub-isidiate to sub-sorediate, the granules 0.1-0.2 mm diam., lighter than the non-granulose part of the thallus, or occasionally in part consisting of tiny dispersed but crowded convex areoles 0.1-0.2 mm diam., not lighter than the rest of the thallus; thallus less than 2 mm thick when on rock (less than 0.5 mm thick on wood or bark, but appearing thicker due to irregularities in the substrate), rimose to barely rimose-areolate in the thickest part; when not granular, areoles verrucose or rugose, sometimes slightly overlapping; spores 3-4 μ m wide, normally 3-septate at maturity

(occasionally 4- or 5-septate), always arranged subparallel to the long of the ascus. Usually on bark or wood, occasionally on rock. O. rubricosa

O. lapponica (Rasanen) Hafellner & W. Rogers

THALLUS crustose, pale yellow to pale greenish yellow or grayish greenish yellow, rimose-areolate, occasionally with a few dispersed areoles at the margin, sometimes delimited by a white or faintly zoned gray prothallus, evenly thickened to quite variable within a single thallus, to 7 mm thick where groups of areoles form convex heaps, but more typically 2-5 mm thick. **Areoles** usually moderately convex, sometimes almost flat, to 2.5 mm across, generally matt, with a smooth, finely verruculose (0.1 mm), beaded, or micro-rugulose surface. Areoles sometimes resting directly on the substrate, especially near the thallus margin or in relatively thin thalli, more typically areoles and mounds of areoles resting on a thin to thick layer of fungal tissue (hypothallus), often incorporating grains of rock. **Cortex** generally extending into the wider thalline cracks, sometimes extending far under the areoles, the latter thus becoming stalked and micro-umbilicate; cortex often not extending into the narrower cracks. Hypothallus and lowest part of areoles white to dark gray where exposed. Cortex 50-90 µm thick, a net of thickly gelatinized hyphae; **algal layer** c. 65-90 µm; algae to 14 µm; **medulla** with hyphae 2-5 µm diam., encrusted with crystals (presumably of secondary compounds), the lumina 1/4-1/3 the diameter. When areoles partly underlain by cortical tissue, tongues of medullary tissue extending down into the hypothallus, giving the areoles the appearance, in cross-section, of icebergs floating on water.

APOTHECIA broadly sessile to constricted, to 3.2 mm diam., often crowded and irregular in shape, sometimes partially subdivided. **Discs** plane to moderately convex, deep reddish brown to very deep red. **Margin** 100-500 µm thick, sometimes raised, smooth to finely rugose, often strongly and deeply crenulate, shiny to matt, pale yellow to orangish yellow or occasionally concolorous with thallus, lacking algae except occasionally a few in the outer basal area of mature apothecia where the margin meets the thallus, usually separated from these algae by a small infold of cortex. A blue-green pigment (same as that in the ostioles of conidiomata) sometimes present in the margin, giving the false impression of an algal layer. Interior part of margin sometimes covered with red pigment and outer part of hymenium sometimes with very few asci, giving the false impression of a 2-layered margin. Margin of radiating, highly branched, \pm anastomosing hyphae originating from the hypothecium, cells 7-12 µm, the outer, shorter cells forming a compact gelatinous corticel layer interspersed with granules. **Hypothecium** hyaline, continuous with and grading into the hypothallus or more compact and separated from it by cortex. **Hymenium** 60-80 µm, strongly agglutinated, interspersed at the surface and half or all the way down with crystals of deep orange pigment, hyaline, I+ blue in lower part. Subhymenium hyaline, 60-96 µm. **Paraphyses** \pm simple above, moderately branched halfway down, slightly anastomosing, multiseptate, cells 7-13 x 1-2 µm, uniformly thickened to somewhat beaded, not or barely swollen at the tips. **Asci** clavate, 50-60 x 14-18 µm, 8-spored. **Spores** frequently found immature, but with a few mature spores almost always present, 12-25 (rarely to 30(-38) x 4.0-6.7 µm, L:W < 6, very narrowly ellipsoid to subfusiform (when immature, sometimes asymmetrically tapered, irregular, or curved), with rounded ends, less commonly fusiform or teardrop shaped, occasionally slightly bent, never tapering into narrow "tails", simple or 1-septate at maturity (rarely to 2-3-septate), arranged sub-parallel or diagonally to the long axis of the ascus, walls c. 0.5 µm thick, not ornamented.

PYCNIDIA immersed, of variable shape, often in compact groups with up to 20 or more

closely adjacent ostioles, the group sometimes occurring in distinctive tubercles up to 2.5 mm diam., sometimes occurring in "discs" which resemble apothecia, sometimes in concave hollow; lateral and base walls hardly pigmented or strong brown to medium reddish brown, K+ intensifying; ostioles dark green, K+ intensifying, 50% N+ strong reddish brown, appearing black from above; the groups of ostioles often forming circular or lengthwise gray to black patches on the surface of areoles, also dark green in section, but lacking algae. **Conidiophores** similar to Type VI of Vobis (1980); **conidia** bacilliform, straight to slightly curved, 7-9(-11) x 1.0-1.4 μ m.

CHEMISTRY: Cortex and medulla K-, C-, P- (possibly K+ and/or P+ if depsidones present); medulla UV+ whitish. Usnic and divaricatic; occasionally with psoromic, norstictic, atranorin, or stictic acid and atranorin in addition.

ECOLOGY AND DISTRIBUTION: On siliceous rocks, 20-2000 m, Arctic (Alaska and Canada), to subarctic in eastern Canada.

Similar to the divaricatic/usnic acid chemotype of O. ventosa, but spores much shorter and simple to 1-septate, differently shape and never spirally arranged.

O. rubricosa (Muell. Arg.) S. Ekman

Thallus 4-7 cm across, almost always granular in part, sub-isidiate to sub-sorediate, the granules 0.1-0.2 mm diam., lighter than the non-granulose part of the thallus, or occasionally in part consisting of tiny dispersed but crowded convex areoles 0.1-0.2 mm diam., not lighter than the rest of the thallus; thallus less than 2 mm thick when on rock (less than 0.5 mm thick on wood or bark, but appearing thicker due to irregularities in the substrate), rimose to barely rimose-areolate in the thickest part; when not granular, areoles verrucose or rugose, sometimes slightly overlapping; whitish gray to seafoam-yellow or pale pinkish buff.

Apothecia common, 1-2 mm diam., circular to somewhat irregular, adnate; discs deep rusty red to reddish brown; red pigment in apothecia soluble in acetone; thalline margin thin, concolorous with thallus, soon disappearing; proper margin disappearing with age; disk plane to convex and rugulose at maturity, to 2.5 mm diam. Spores fusiform, usually straight but sometimes curved, 30-53 x (2-)3-4(-5) μ m, normally 3-septate at maturity (occasionally 4- or 5-septate; rarely to 7-septate?), always arranged subparallel to the long of the ascus.

Thallus K-, C-, P-. Usnic, divaricatic, atranorin (low conc.) and unknown substance.

On bark of conifers and hardwoods, or wood (especially Arctostaphylos spp.), occasionally on rock. California (North Coastal Forest and Valley and Foothill Woodland from 2000 to 4000 ft elev.) to Idaho, Montana, and SW Canada.

[This description is based on a combination of the descriptions for Haematomma californicum and H. pacificum, plus information from May, and needs to incorporate information from Staiger & Kalb].

O. ventosa (L.) Norman

THALLUS never granular, sub-isidiate or sub-sorediate, often less than 2 mm thick, but also often much more than 2 mm thick in the center, with a distinctly rimose-areolate surface, occasionally dispersed areolate, with almost all areoles larger than 0.2 mm, usually much larger, areoles smooth, cracked, microsquamulose, or verrucose. Surface shiny or matt, often rather dark, but occasionally light yellowish green. The color, shininess, flatness or lack thereof, thickness, texture, and structure extremely variable.

APOTHECIA sometimes thin; **margin** narrow or occasionally wide, sometimes deeply

crenulate. **Spores** rather strongly variable [check several asci in several apothecial sections], 35-65(-70) x 3.5-6 um, 3-7-septate at maturity (but immature spores often in the majority; aborted and immature spores sometimes simple, sometimes narrower than the range given above, rarely as short as 25-30 um long), asymmetrical, one end narrowed but often with a blunt tip, the other end subulate, acicular, or narrowly spatulate (i.e., strongly tapered partway along the length into a long, narrow, hardly tapering, sometimes segmented "tail". Longer spores often helically arranged in the ascus, but also often found straight and subparallel to the long axis of the ascus. Overmature spores frequently fragment in the ascus, forming short subunits with 0-2 septa, these sometimes germinate inside the ascus.

PYCNIIDIA rarely very obvious, rarely in conspicuous groups.

CHEMISTRY: Usnic and divaricatic acids, \pm hypothamnolic, stictic, norstictic, salazinic, or psoromic acids, atranorin, zeorin, or unidentified triterpenes.

ECOLOGY AND DISTRIBUTION: On rock, Arctic-alpine. Alaska and Canada, south in the mountains to New York in the east, to Oregon in the west, with disjunct occurrences in southern Mexico.

Literature

Hale, M. E. Jr. and M. Cole. 1988. California Lichens. University of California Press.

Hasse.

James, P. W. and F. H. Brightman. 1992. Ophioparma. In: Purvis, et al., Lichen Flora of Great Britain and Ireland. Natural History Museum Publications in association with the British Lichen Society. London.

Kalb, K. and B. Staiger. 1995. Rindebewohnende Arten der Flechtengattung Ophioparma in America. Biblioth. Lichenol. 58: 191-198.

May, P. F. 1997. Ophioparma lapponica--A misunderstood species. Harvard Papers in Botany 2: 213-228.

May, P. F. 1998. Lichen flora of eastern North America: The genus Ophioparma Norman. Lichenographia Thomsoniana p. 77-88.

Rogers, R. W. and J. Hafellner. 1988. Haematomma nad Ophioparma: two superficially similar genera of lichenized fungi. Lichenologist 20: 167-174.

Sigal, L. L. 19_.

Skult, H. 1997. Notes on chemical and morphological variation of the lichen Ophiopama ventosa in eastern Fennoscandia. Ann. Bot. Fenn. 34: (in press). [need to see this]

Staiger, B. & K. Kalb. 199_. Haematomma

Thomson, J. W. 1979. Lichens of the Alaskan Arctic Slope. U. of Toronto Press, Toronto.