

Brigantiaea Trevisan
(BRIGANTIACEAE)

After Hafellner (1997), and Purvis (1992)

Rev. 6/95

Thallus crustose, uniform, spreading, granular to somewhat uneven-verrucose, rarely smooth, greenish white or pale gray-white; lobulate isidia sometimes present; hypothallus usually present. Photobiont protococcoid; cells 6-14 μ m diam.

Apothecia sessile to \pm pedicellate, usually constricted at the base, to 4 mm diam., biatorine, rarely lecideine; discs \pm flat to subconvex, bright orange-yellow, ochraceous, or fulvous brown to brown-black, with predominantly yellowish tint, \pm pruinose, often contorted with sterile tissue; margin prominent, persistently swollen, or sometimes thin, yellow, orange, ochraceous or rarely black, entire to crenate or \pm inflexed. True exciple composed of thick, radiating hyphae, K+ violet-blue. Epihymenium K+ violet. Paraphyses relatively thin, ca. 1.5 μ m, usually simple, with a few branches and anastomoses, not or only slightly thickened at the ends. Asci clavate to cylindrical, Brigantiaea-type, thick walled, the outer wall layer thick, strongly I+ blue, the inner layer weakly I+; tholus extending to the base of the ascus as an amyloid sheath, I+ strongly blue; without an external apical cap. Spores 1(-2), ellipsoid, richly muriform, colorless, thin-walled, large (to as much as 150 μ m long when mature). Epihymenium and excipulum with yellowish, K+ red to blue-violet, dissolving crystalline inclusions.

Conidiomata unknown. Thallus K+ yellow (atranorin and chloratranorin); apothecia K+ red-violet (anthraquinones). On bark or rock, or over mosses or plant remains. Mostly tropical to subtropical, but at least one species boreal-arctic.

Segregated from Lopadium, which differs in lacking a distinct I+ blue tholus, having paraphyses distinctly enlarged at the apices, and black apothecia lacking parietin. It differs from Letrouitia in that the thallus is whitish, gray to greenish, K+ yellow, and the asci have a single richly muriform ascospores.

This genus is a segregate of Lopadium, but superficially it is most likely to be mistaken for Caloplaca because of the bright yellow-orange to reddish, K+ purple apothecia.

1. On bryophytes (including bark-inhabiting mats) and plant remnants. Apothecia sometimes infrequent, 0.4-0.9(-2) mm, sessile to subpedicellate, flat becoming \pm convex, gold to olive-yellow or orangish or tinged olive-black; surface pruinose; margin often prominent, thick, bright orange, becoming irregularly wavy and inflexed. Thallus whitish to yellowish white or gray-green, smooth to granular-verrucose or minutely squamulose. Spores 1 per ascus, 48-100 x 24-55 μ m, 23-35-septate transversely, 7-17-septate longitudinally, ellipsoid. Hymenium to 250 μ m tall, I+ blue. Paraphyses to 1.5 μ m wide. Hypothecium hyaline to pale brownish. Thallus P-, K+ yellow, KC+ yellow, C- (atranorin and chloratranorin). Encrusting mosses and low-growing plants, occasionally on rocks or soil. Arctic, S to Washington. B. fuscolutea (Dickson) R. Sant. in Poelt & Vezda

1. On bark or occasionally wood. 2

2. Crystals in apothecium orange, penetrating into the exciple, therefore also orange

inside. Apothecia sessile, basally constricted, to 2 mm diam.; margin concolorous with disc, fragile. Ascospores 85-100 x 30-45 um. Thallus rarely with diffuse patchy soralia. Eastern U.S. (New Jersey to Texas); SE Mexico B. leucoxantha (Sprengel) R. Sant. & Hafellner

2. Crystals in apothecium rusty brown to rusty red, mainly superficially deposited. Apothecia broadly sessile, commonly constricted at the base, to 1 mm diam.; margin often darker than the disc. Ascospores 60-80 x 20-35 um. Thallus frequently (always?) with diffuse soralia. On bark. Montana, British Columbia. B. praetermissa Hafellner & St. Clair

B. fuscolutea

THALLUS white to gray-white (to yellowish white or gray-green acc. to Purvis), uniformly crustose, smooth to granular-verrucose or minutely squamulose, spreading, patches up to 10 cm diam.; vegetative diaspores unknown

APOTHECIA sometimes infrequent, dispersed or crowded, (0.4-)1-2(-4) mm diam., sessile to subpedicellate, flat becoming \pm convex, disc mustard-yellow to cinnamon (golden yellow occasionally tinged olive-black according to Purvis); surface pruinose; margin often prominent, thick, concolorous with disc but on the outside paler towards the base and there without anthraquinone crystal; becoming irregularly wavy and inflexed, persistent; **exciple** with a cortical layer of anticlinal hyphae and a medullary layer; cortical layer c. 100 um thick, only externally in the upper part covered by brown crystals; medullary layer often with a few algal cells in the substipitate base; algal cells sometimes reaching up to hypothecium; **hypothecium** hyaline to pale brownish, 100-150 um, in larger apothecia often centrally prolonged towards the base; **hymenium** hyaline, clear, to 150-200(-250) um tall, I+ blue; epihymenium with numerous yellow crystals; **paraphyses** with several branches and anastomoses, to 1.5 um wide, tips only slightly thickened and encrusted with yellow-brown crystals; **asci** 120-160 x 30-50 um; **ascospores** (48-)80-105(-120) x 24-45(-55) um, ellipsoid to oblong.

CHEMISTRY: Thallus P-, K+ yellow, KC+ yellow, C- (atranorin and chloroatranorin, unknown 6ABC). Apothecia K+ purple, with unidentified anthraquinones.

ECOLOGY AND DISTRIBUTION: Encrusting mosses and low-growing plants, occasionally on rocks or soil. Arctic (Alaska and NW Territories), S to Washington.

B. leucoxantha

THALLUS whitish, grayish to slightly greenish, thin, effuse, spreading, rarely with diffuse patchy soralia.

APOTHECIA common and dispersed, sessile, basally constricted, 0.8-2 mm diam.; disc flat, vivid orange, often with yellow-orange pruina; margin prominent, swollen, rather fragile, vivid orange, flexuous to deeply sinuate; **exciple** biatorine, cortical layer deeply penetrated by orange crystals, medullary layer hyaline or indistinct; **hypothecium** hyaline to slightly brownish; **hymenium** hyaline, clear, 120-150 um; **paraphyses** with few ramifications and anastomoses, c. 1.5-2 um thick; tips slightly enlarged and encrusted with anthraquinone crystals; **asci** 85-110 x 30-45 um; **ascospores** ellipsoid to oblong, 65-105 x 22-40 um; **spore-borne microconidia** frequent.

PYCNIDIA globose to ovate, 50-100 um diam., of the Umbilicaria-type (Vobis 1980); **conidiophores** consisting of branched rows of cells with intercalary and terminal conidogenous cells (type VII sensu Vobis 1980); **pycnoconidia** produced on indistinct protrusions near the

upper septa, bacilliform to subfusiform, 3-4 x 1 μ m.

CHEMISTRY: Thallus K+ yellow, C-, P-, with atranorin, zeorin, sometimes with further terpenoids; apothecia K+ purple red, with unidentified anthraquinones.

ECOLOGY AND DISTRIBUTION: On hardwood bark, sometimes spreading over bark-inhabiting bryophytes; rarely on wood and exceptionally even on rock.

B. praetermissa

THALLUS thin, whitish to grayish, spreading, often (always?) with dispersed roundish to irregularly confluent soralia.

APOTHECIA common, sessile, basally constricted, to 1 mm diam.; disc \pm plane, becoming slightly convex with age, covered by rust-brown to rust-red pruina; margin prominent, smooth, mostly darker than the disc, not rarely even blackish; **exciple** biatorine; cortical layer of anticlinal conglutinated hyphae with thin lumina and dark red-brown crystals mainly on the surface, medullary layer not always distinct, hyaline; **hypothecium** pale; **hymenium** hyaline, clear, 90-120 μ m; **paraphyses** with few ramifications and anastomoses, c. 2 μ m thick; tips slightly enlarged and encrusted with brown anthraquinone crystals; **asci** 80-110 x 30-50 μ m; **ascospores** ellipsoid to oblong, 60-80 x 20-35 μ m.

CHEMISTRY: Thallus K+ yellow, C-, P-, containing atranorin, zeorin. Apothecia K+ purple, containing unidentified anthraquinones.

HABITAT AND DISTRIBUTION: On conifer bark, Montana and British Columbia. I have collected what is almost certainly this species on rotting wood on the west slope of the Cascades in Washington state.

Literature

Awasthi. 19 . Microlichens of India, etc.

Fink, B. 1935. Lichen Flora of the United States

Galloway, D. 1985. Flora of New Zealand Lichens.

Hafellner, J. 1997. A world monograph of Brigantiaea (lichenized Ascomycotina, Lecanorales). Acta Univ. Ups. Symb. Bot. Ups. 32(1): 35-74.

Poelt & Vezda. 1981. Erg. II.

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