

Mycobilimbia Rehm in Rabenh.
(LECANORALES: BIATORACEAE? PORPIDIACEAE?)

After Hafellner, Harris, Brodo, and others

Rev. 4/96

Thallus crustose to slightly squamulose, gray to pale greenish to brown. Photobiont chlorococcoid. Apothecia sessile, pale rose-brown to black; marginate only when young, becoming convex and marginate; true exciple distinct in section, biatorine (leceine according to Awasthi). Hypothecium colorless or pale (to brown-black according to Awasthi). Paraphyses slightly branched and anastomosed, with clavate tips, thickish (at least in M. sabuletorum). Asci "lecanoral", thick-walled (at least in M. sabuletorum), with well developed I+ blue tholus containing an I+ darker blue ring structure; outer gelatin somewhat I+ blue (according to Coppins, the asci are Porpidia-type in the M. hypnorum group, Biatora-type in M. tetramera, and Bacidia-type in M. sabuletorum). Spores mostly 8, simple to multiseptate, fusiform-ellipsoid to almost "stäbchen"-form; perispore, when mature, hyaline, finely warted, not always distinct. No substances. Mostly on soil, mosses or bark, rarely lichenicolous. Type species: M. fusca (as M. obscurata) [= M. tetramera].

Coppins synonymizes this under Biatora, but treats most of the species included in Mycobilimbia by Hafellner under Lecidea or Bacidia where they were placed previously. Printzen accepts Mycobilimbia as a separate genus, but his concept differs somewhat from that given above. I do not really understand the genus at the moment.

Coppins, 1992 cites Hafellner (including his 1989 Mycobilimbia treatment) as his source, and lists "Mycobilimbia" as a synonym without giving any justification; however, Coppins does not include the species that Hafellner considered to belong to that genus. Coppins states that "Bacidia sabuletorum" (treated by Hafellner under Mycobilimbia), as well as "Toninia lobulata", differ from Biatora in having thick-walled asci, broader paraphyses, ascospores with a warted perispore, and purplish and greenish pigments in the apothecia. He also states that the "Lecidea hypnorum group" (also treated by Hafellner under Mycobilimbia) differs from Biatora in having Porpidia-type asci. According to Printzen, Mycobilimbia should be reserved for species with mostly 1-3-septate spores; it differs from Biatora especially in that the apothecia are from the start sessile, strongly convex and immarginate, soon becoming globular and strongly constricted at the even when the disks have scarcely opened up (but asci have already developed when the disc has begun to open up).

I. Spores mostly distinctly 3- or more septate.

Mycobilimbia s. str.

Hypothecium hyaline or pale. Paraphyses rather slender. Asci rather thin-walled. Spores without oily yellowish content. Upper part of hymenium brown. Proper exciple absent. Spores without warted perispore.

1. Thallus sorediate. Thallus K-, C-, KC-, P-, without lichen substances. Spores 0-3(-5)-septate. Thallus pale, gray green or gray, immersed or thinly granular-verrucose, with irregular, often confluent, soralia; soredia 20-60 µm diam. Apothecia 0.4-1.2 mm diam., sessile and ± turbinate, later hemispherical to subglobose, gray brown to red-brown; upper hymenium and upper true exciple pale brown; hypothecium hyaline; subhymenium hyaline to red-brown. Spores 17-25(-30) x 4.5-7 µm, fusiform. Thallus P-, K- (no substances). Over bryophytes or on bark of mossy trunks of old deciduous trees in ancient woodlands, rarely on mossy rocks in wooded ravines. "Biatora" epixanthoides (Nyl.) Diedrich

1. Thallus not sorediate. 2

2. Spores to 6(-7) µm wide, to 23 µm long. 3

2. Spores mostly over 6 µm wide, and often over 23 µm long. Spores smooth, (1-)4-celled, (17-)21-27 x (4.7-)6-7 µm. Paraphyses slender (1.5-2 µm). Apothecia 0.4-1.2 mm diam., at first sessile and ± turbinate, later hemispherical to subglobose; disk tan to yellow-brown, red-brown or black; margin disc-colored or paler. Hypothecium hyaline, or upper part (subhymenium) pale reddish brown. Epihymenium and upper part of true exciple pale brown, K-. Spores fusiform. Thallus granulose-verrucose, whitish, green-white or pale gray, esorediate. On bryophytes over bark, or on small shrubby plants and plant debris on or amongst rocks in alpine situations. M. tetramera (de Not.) W. Brunnbauer (syn. M. fusca (Massal.) Hafellner & V. Wirth in V. Wirth, M. obscurata (Sommerf.) Rehm, Biatora tetramera (de Not.) Coppins)

3. Spores (0-)1(-3)[-5?]-septate. Thallus gray-green, finely to mealy granular; granules 25-70 µm diam. Apothecia 0.4-0.8(-1.1) mm diam., at first hemispherical, later becoming ± globose, pale to dull orange-pink, or sometimes (especially when old) pale reddish brown, in section without pigmentation. Spores (9.5-)11-17 x 3.5-5 µm, fusiform-ellipsoid. On sheltered, mature deciduous tree trunks (especially Fraxinus and Quercus), often around their bases, in old woodlands, more rarely on mossy rocks in wooded ravines or sheltered gullies. M. sp. (syn. Bacidia sphaeroides (Dicks.) Zahlbr. Catillaria sphaeroides (Massal.) Schuler; non Mycobilimbia sphaeroides D. D. Awasthi [published as a nomen nov. for Bacidia sphaeroides auct. non (Dicks.) Zahlbr.], which = "Bacidia" carneoalbida)

3. Spores mostly 3-septate. Apothecia ivory white, without internal pigmentation. Spores (12-)13-22 x 4-7 µm, mostly 3-septate. Otherwise similar to M. tetramera. On mosses on rock. Canada. ("Bacidia" carneoalbida (Mull. Arg.) Coppins) (= probably Mycobilimbia sp. according to Printzen; it's not clear to me at the moment whether or not the Mycobilimbia sphaeroides should be the nomenclaturally correct name for this species)

ADD:

M. fissuriseda (syn.: Lecidea fissuriseda)

Mycobilimbia sp. (syn. Bacidia exemptilis Arnold, Oesterr. Bot. Z. 46: 286 (1896)) (= close to or identical to Bacidia (Mycobilimbia) tetramera
Newfoundland, on cracked, mossy bark.

II. Spores mostly distinctly 3- or more-septate.

"Bacidia sabuletorum Group"

[These species probably belong in a separate genus]

Hypothecium heavily pigmented. Paraphyses stout. Asci rather thick-walled. Spores with an oily yellowish content when mature. Upper part of hymenium with green pigment. Proper exciple present, its rim covered by a rather thick gelatinous layer that swells markedly (and finally almost dissolves) in K or dilute C solutions. Spores sometimes with a warty perispore (easily detached from the spore).

1. Thallus warted granular to minutely squamulose; squamules 0.2-1 mm wide, mostly contiguous, compacted, horizontal, ill-formed to crenate-lobed, \pm overlapping, whitish gray to gray or fawn, not pruinose; edges \pm pale; underside pale white; upper cortex thin, 5-10 μ m thick, folded, with an epinecral layer, without crystals; photobiont zone discontinuous, confined to zones under exposed areas of cortex; medulla of \pm isodiametric cells, with thin or \pm thickened colorless or pale walls. Apothecia 0.3-1 mm diam., abundant, discrete or often aggregated, black to brown-black, sessile, rounded or occasionally \pm sublobulate, convex, matt or shiny, not pruinose; true exciple excluded from the first, thin, red-brown, opaque, merging with similarly colored hypothecium, K+ intensifying, N+ purple=red; epithecium \pm pale greenish gray, K-, N+ reddish, without crystals; hymenium 70-90 μ m tall, colorless or pale red-brown; paraphyses conglutinated, indistinct, simple, occasionally branched; cells towards apices to 2.5 μ m wide, submoniliform, shortly septate; asci 60-70 x 14-15 μ m; wall thick, to 7 μ m at apex; spores 14-20(-26) x 3-5(-6) μ m, (0-)2-3-septate, ellipsoid-fusiform or clavate, colorless or very pale brown, with finely warted epispore. Thallus K-, C-, KC-, P-, containing zeorin. On soil associated with calcareous rocks or mortar, or on other calcareous substrates. M. lobulata (Sommerf.) Hafellner in V. Wirth (was in Toninia; left there by Timdal)

1. Thallus crustose. 2

2. Parasitic or parasymbiotic on Lecanora cf. impudens. NW

Territories. M. sp.

2. Not parasitic or parasymbiotic. 3

3. Spores mostly 3-septate. Apothecia dark brown to black. Spores 15-23 x 3.5-6 μ m.

Thallus thin to moderately thick, granulose or verruculose, greenish gray to ashy, becoming scattered and often disappearing. Apothecia 0.25-0.7 mm across, appressed, broadly adnate, soon convex and immarginate, dark brown to black; exciple pale (dark brown according to Thomson 1997) and soon disappearing, radiate; hypothecium pale reddish brown; epihymenium dark brown; hymenium 60-70 μ m, I+ blue turning violet-tinged, brownish; paraphyses coherent, 1.5 μ m, tips scarcely thicker; asci often inflated; spores oblong or fusiform, tips blunt or quite acute. On shaded sandstone, Hocking County, Ohio; on moss, humus, and old bone, Arctic; eastern Canada; Michigan.. M. microcarpa (Th. Fr.) Brunnbauer

3. Spores 3-5(-7)-septate. Apothecia pale pinkish brown or tan (rarely paler), becoming pale to dark brown or blackish. Spores with outer layer of spore wall (perispore) punctate (best seen in K), (16-)18-27(-50) x 5-7(-9) μ m. Paraphyses stouter (2-3 μ m wide). Thallus granular-warted or scurfy granular, to almost squamulose, whitish or pale gray. Photobiont cells 7-13(-15) μ m. Apothecia 0.3-0.8(-1) mm diam., mostly markedly convex but sometimes \pm flat when young, not shiny; true exciple thick when young, usually dark red-brown in upper parts, otherwise pale reddish brown to colorless, the hyphae 1.5-2.5(-3) μ m wide, bound in dense gel

matrix, the apical cells often clavate to 5 um wide; hymenium 70-110 um, colorless or upper part pale brown, gray, or olivaceous to blue-green, K-, N+ red. Hypothecium usually dark brown (rarely pale), K- or K+ weakly reddish violet in upper part, pale or colorless below. Paraphyses simple or a few forked above, apices to 5(-6) um, often swollen. Spores fusiform, rarely one cell with a longitudinal septum. On bryophytes over bark, soil or calcareous rocks, stonework or turf, rarely directly on rock, occasionally on shaded trunks of old trees (especially Ulmus). Very variable in color of apothecia. Intensely pigmented forms with black apothecia have been referred to as M. accedens (Arnold) V. Wirth ex Hafellner (was in Bacidia; synonymized under M. sabuletorum by Coppins, 1992).M. sabuletorum (Schreber) Hafellner (syn. Bacidia sabuletorum) [including "Bacidia" accedens (Arnold) Lettau

ADD:

"Bacidia" accedens sensu R. C. Harris (1977)

**III. Spores mostly simple, to partly thinly 1(-3)-septate.
"Lecidea hypnorum Group"**

[At least the species in this group with Porpidia-type asci may belong in a separate genus]

1. On rock. Thallus effuse, \pm shiny, thin, continuous or irregularly rimose, pale gray or gray-green; medulla i-. Apothecia (0.2)0.3-0.6(-0.8) mm diam., sessile, reddish brown to brown-black; disc concave to slightly convex; true exciple usually prominent and persistent, the outer edge and hypothecium dark reddish brown; inner exciple pale reddish brown or almost colorless; epithecium colorless or yellowish to pale reddish brown, K-; hymenium 65-80(-90) μ m; hyemnium and hypothecium usually with blue-violet (K+ green) granules. Paraphyses ca. 1.5 μ m wide, apcies to 2.5-3 μ m, simple or sparingly branched and anastomosed, without apical cap or hood. Asci Porpidia-type. Spores 12-17 x (5-)6-7(-9) μ m. Thallus P-, K-, C-, KC-. No substances. On sandstone in a periodic stream bed, Illinois. M. ahlesii

1. On organic substrates. 2

2. Hymenium and hypothecium without blue-violet granules. Asci Biatora-type.

Thallus gray-green, finely to mealy granular; granules 25-70 μ m diam. Apothecia 0.4-0.8(-1.1) mm diam., at first hemispherical, later becoming \pm globose, pale to dull orange-pink, or sometimes (especially when old) pale reddish brown, in section without pigmentation. Spores (9.5-)11-17 x 3.5-5 μ m, fusiform-ellipsoid, (0-)1(-3)-septate. On sheltered, mature deciduous tree trunks (especially Fraxinus and Quercus), often around their bases, in old woodlands, more rarely on mossy rocks in wooded ravines or sheltered gullies. "Bacidia"/"Catillaria" sphaeroides

2. Hymenium and hypothecium usually with scattered blue-violet (K+ green)

granules. Asci Porpidia-type. Paraphyses mostly simple. Thallus P-, K-, KC-, C- (no substances). 3

3. Thallus mostly ca. 200 μ m thick, tartareous, white. Apices of paraphyses clavate to capitate, \pm brown-walled, under 6 μ m wide. Thallus obscuring the form of the substrate; surface of contiguous, granular warts 0.1-0.3(-0.5) mm diam.; medulla I-. Apothecia 0.3-0.9 mm diam., flat and \pm thinly marginate when young, soon convex and immarginate, medium to dark brown or blackish; exciple and hypothecium dark reddsihb rown, but outer edge of exciple colorless, giving the appearance of a thalline exciplel epithecium yellowish brown; hymenium 60-65 μ m tall; Paraphyses 1.5-2(-2.5) μ m wide, mostly simple. Spores (9.5-)11-16(-19) x 4-5(-6) μ m, fusiform-ellipsoid; perispore absent. On bryophytes over \pm calcareous rocks, or on plant remains on exposed turf of mountain ridges or summits. M. berengeriana (Massal.) Hafellner & V. Wirth (was in Lecidea)

3. Thallus whitish or pale gray, sometimes tinged brown, thin and membranous. Apices of paraphyses colorless, gradually widening to 2.5 μ m wide. Thallus effuse; medulla I-.

Apothecia 0.3-1.2 mm diam. (sometimes forming larger tuberculate clusters), dark brown to black, sessile; disc flat to convex; true exciple thin and often flexuose, usually long persistent; exciple and hypothecium dark reddish brown, K-; epithecium pale brown or almost colorless; hymenium 60-70 μ m tall; paraphyses 1.5-1.7 μ m wide, mostly simple. Spores 10-16(-19) x 4.5-6(-7) μ m, ellipsoid, often thinly 1(-3)-septate, mostly with finely warted episore. M. hypnorum (Lib.) Kalb & Hafellner in V. Wirth (was in Lecidea)

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