

Lecanactis Fr.
(ARTHONIALES: OPEGRAPHACEAE S. LATO: "LECANACTIDACEAE")

After Egea & Torrente (1994), Harris (1990), and others

Rev. 6/95

I've faked my way through the Spanish of Egea & Torrente's book only when necessary; there's a lot more info. there.

Thallus endo- or epi-phloedal, or occasionally epilithic, thin, continuous, scurfy or cracked, to irregularly areolate or verrucose, rarely leprose, effuse or delimited by a dark brown hypothallus; cortex absent or poorly differentiated. Photobiont Trentepohlia.

Ascomata disc-like, usually roundish, mostly sessile, black under pruina; margin and disk mostly densely whitish pruinose. Thalline exciple absent. True exciple well developed, often persistent, raised, inside dark brown, laterally becoming paler. Epithecium pale to dark brown; exciple and hypothecium dark brown; pigment usually K+ greenish. Hymenium I+ reddish or blue. Paraphysoids strongly branched and anastomosed, not separating, with \pm swollen apices. Asci 8-spored, narrowly clavate to cylindrical, fissitunicate. Spores narrowly clavate, fusiform or acicular-fusiform, mostly 3- or more septate, colorless, but old spores becoming brown-warted in some species; not breaking apart. Pycnidia usually prominent, cylindrical and white pruinose; walls dark brown, usually K+ greenish. Conidia simple, (usually?) bacilliform. Thallus usually containing various substances, especially schizopeltic or lecanoric acids. Mostly on humid, yet dry, shaded rocks and dry recesses of bark.

The above description may have to be modified somewhat to account for recent segregate genera. The genus is easily confused with various other genera in the Arthoniales.

Key to Lecanactis-like Genera

1. **Thalline margin present; proper exciple poorly developed.** 2
1. **Thalline margin absent; proper exciple well developed.** 3
 2. **Thalline margin well developed. Apothecia rather large, circular. Cortex plectenchyma present. Containing psoromic acid.** Thallus white without creamy tinge; ascocarps (discothecia) circular and not or only slightly undulating; conidia bacilliform. Disc pruinose. Apothecial margin epruinose. On bark of various trees and shrubs, in coastal or near-coastal areas. Sigridia
 2. **Thalline margin poorly developed. Ascomata small, usually elongated, cortex plectenchyma absent. Without psoromic acid.** Schismatomma
3. **Apothecia lirelliform, irregular to elongated, , with slitlike to widened disc, not constricted. Ascospores with gelatinous sheath.** 4
3. **Apothecia apotheciod, with widened disc, sometimes constricted. Ascospores with or without gelatinous sheath.** 5
 4. **Asci vulgata-type. Ascomata epruinose. Without hymenial "bandas". Excipulum not extended into the base.** Spores fusiform to acicular, brownish when old; paraphysoids richly branched; excipular hyphae without crystals. Pycnidia immersed to sessile; pycnospores straight or curved. Opegrapha
 4. **Asci grumulosa-type. Ascomata pruinose. With hymenial "bandas". Excipulum extending to the medulla or the substrate.** Pycnidia immersed; pycnospores straight. Lecanographa
5. **Asci Bactrospora-type, cylindrical, easily separated from ascogenous hyphae; without a strongly hemiamyloid inner endoascus. Paraphysoids sparsely and dichotomously branched. Spores cylindrical, acicular or biclavate, with up to 45 septa, easily fragmenting.** Ascomata apotheciod, sessile, constricted at base; disc widened, epruinose; surface of excipular hyphae with crystals; hymenial strands absent (monocarpocentral); spores hyaline at all stages, without gelatinous sheath. Pycnidia immersed to subimmersed; macroconidia absent. Secondary chemical products absent, or occasionally unknown substances present. Usually on bark, in lowland, often coastal areas, tropical to temperate. Bactrospora
5. **Asci and paraphysoids otherwise. Spores not fragmenting.** 6
 6. **Asci grumulosa-type, with the entire endoascus strongly hemiamyloid and the ring little or not differentiated. Ascospores with \pm visible gelatinous sheath.** Lecanographa
 6. **Asci abietina-type, with internal endoascus strongly hemiamyloid and ring well visible. Spores without gelatinous sheath.** 7
7. **Apothecial margin epruinose; excipulum hyphae without crystals soluble in K; pseudoepithecial granules yellowish to reddish, K+ yellow or purple; paraphysoids scarcely anastomosed; internal "d" layer of ascus 2-sublayered, with the internal layer vesiculous (as seen in electron microscope); spores thick-walled, \pm widened at septa; perispore thick; endospore differentiated. Pycnidia \pm immersed, \pm globose; macroconidia absent. No substances, or lecanoric and gyrophoric acids. Thallus \pm limited and dissected by a blackening hypothallus; discs greenish pruinose to epruinose. Cresponea**
7. **Apothecial margin often pruinose; excipulum hyphae with crystals soluble in K; pseudoepithecial granules otherwise, K-; paraphysoids distinctly anastomosed; ascal structure otherwise; spores thin-walled, not widened at septa; perispore thin; endospore**

not differentiated. Pycnidia in protuberances; macroconidia present. Disc pruinose; hymenial strands present; spores fusiform or spermatoid, becoming brownish when old; with schizopeltic and lecanoric acid. Lecanactis s. str.

Key to Species

1. **On rock.** (If thallus both C- and P-, see Cresponea premnea and Lecanactis abietina). 2
1. **On bark or wood.** 3
 2. **Thallus C-, P+ yellow. Spores 3-septate, fusiform to dactyliform, without gelatinous sheath.** On seashore rocks, 50-75 ft above the sea, California and Baja California. [Note: according to Tehler's description of Sigridia, it occurs only on bark; the description I had of Lecanactis zahlbruckneri is rather different from that of S. californica]. Sigridia californica (syn. L. zahlbruckneri)
 2. **Thallus C+ reddish, P- or P+ yellowish. Ascospores with more than 5 septa, fusiform, surrounded by a thick gelatinous sheath.** Paraphysoids branched and anastomosing; asci grumulosa-type. Pycnidia immersed; pycnosporos straight. Discs grayish pruinose. Coastal, ombrophobic (i.e., in areas sheltered from precipitation). Baja California. [If only the pycnidia C+ reddish, and ascospores without a distinct gelatinous sheath, see Lecanactis abietina]. Lecanographa spp.
3. **Spores mostly over 40 um long.** 4
3. **Spores mostly to 40 um long.** 5
 4. **Spores mostly over 65 um long, less than 5 um wide, in some species fragmenting while in the ascus.** Bactrospora spp.
 4. **Spores (34-)38-65 x 5-7 um, not fragmenting.** Cresponea lepieurii
5. **Thalline margin present (sometimes poorly developed); proper margin poorly developed.** 6
5. **Thalline margin absent; proper margin well developed.** 7
 6. **Thalline margin well developed. Apothecia rather large, circular. Cortex plectenchyma present. Containing psoromic acid.** Sigridia californica (syn. Lecanactis californica)
 6. **Thalline margin poorly developed. Ascomata small, usually elongated, cortex plectenchyma absent. Without psoromic acid.** Schismatomma spp.
7. **Spores mostly under 25 um long.** 8
7. **Spores mostly over 25 um long.** 12
 8. **Spores to 3 um wide.** 9
 8. **Spores over 3 um wide.** 10
9. **Apothecia (usually absent) white-pruinose. Spores 3(-5)-septate, 14-27 x 2-3 um.** (Lecanographa amylacea)
9. **Apothecia always pure dull black, epruinose. Spores 3-4(-5)-septate, 19-20(-30) x (-1.5)2-2.5(-3) um, acicular. Thallus poorly developed, minutely granulose or scurfy, pale ashy to dusky greenish ashy, effuse, K-, C-. Apothecia scattered, sessile, to 0.5 mm, plane to convex, rough, the margin thin, indistinct, paler, uneven. Hymenium I-. Hypothecium hyaline to brownish. Epihyemnum pale grayish brown; paraphyses coherent, hair-like; asci clavate or narrowly spatulate. On bark. Minnesota, California, Washington.** Lecanactis sp. (syn. Bacidia akompsa)
 10. **Apothecial margin epruinose; excipulum hyphae without crystals soluble in K; pseudoepithecial granules yellowish to reddish, K+ yellow or purple; paraphysoids scarcely anastomosed; internal "d" layer of ascus 2-sublayered, with the internal layer vesiculous (as seen in electron microscope); spores thick-walled, ± widened at**

septa; perispore thick; endospore differentiated. Pycnidia \pm immersed, \pm globose; macroconidia absent. Cresponea

10. Apothecial margin often pruinose; excipulum hyphae with crystals soluble in K; pseudoepithecial granules otherwise; paraphysoids distinctly anastomosed; ascal structure otherwise; spores thin-walled, not widened at septa; perispore thin; endospore not differentiated. Pycnidia in protuberances; macroconidia present. 11

11. Containing schizopeltic acid. Florida. Spores 4-celled, 20-24 x 4 μ m. Ascomata similar to those of L. subattigens (gray-brown, white pruinose, strongly constricted at base, round, irregular or slightly elongate). L. sp. (Harris, 1990, 1995)

11. Without lichen substances. California. Thallus mostly endophloeal, whitish, continuous, poorly delimited, very thin; surface farinose, effuse, without visible hypothallus; 80 μ m thick; medulla not differentiated. Ascomata rounded to somewhat elongated, not branched, 0.2-0.5 mm diam., sessile; disc pale or somewhat convex, slightly pruinose; margin somewhat prominent, smooth. Excipulum with hyphae visible in outer part, branched and interwoven, with reddish walls, granulose or verrucose, occasionally incrustated with granules or crystals insoluble in K. Hymenium 50-60 μ m, I+ pale blue; subhymenium 10-15 μ m; paraphysoids 1-1.5 μ m thick, apical cells enlarged, 4-5 μ m, pigment in outer part, reticulate; asci clavate, 40-50 x 11-16 μ m. Spores fusiform, with walls thin and uniform or somewhat enlarged at the septum, 16-23 x 3-4 μ m, with 3(-4) septa. Pycnidia not seen. Thallus K-, C-, KC-, P-. No substances. On bark, Santa Catalina Island, California. L. dubia G. K. Merr.

12. Spores with gelatinous sheath. Apothecia irregular, often elongate, constricted at base in age, gray-brown, white pruinose; margin raised. Spores 30-35 x 3-4 μ m.

Containing traces of unknown(s). Texas. Opegrapha ravenelii

12. Spores without gelatinous sheath. Apothecia rounded, or flexuous but not elongate. 13

13. Spores 7-9-septate, 30-40 x 3-4 μ m, fusiform, curved. Ascomata numerous, strongly constricted at base, 0.3-1.5 mm diam., round, often slightly undulating, irregular or slightly elongate; disc flat to slightly convex, gray-brown, white pruinose; proper exciple level with disc; hyphae brown to dark brown, slightly paler towards surface. Hypothecium extending down to substrate. Hymenium 50-60 μ m high. Epithecium brown, 15-25 μ m high; hyphae slightly clavate, 1-2 μ m diam., smooth, brown. Asci 40-50 x 10-15 μ m. Pycnidia not seen. Thallus C-, K-, P-, containing schizopeltic and protocetraric acids (protocetraric in too low amounts to give P reaction?). Disc C-; hypothecium K+ olive black, I-, K/I- but with blue-violet extension; hymenium K-, I+ blue in lower part, K/I+ blue; epithecium K-, I- or + blue between brownish hyphae, K/I+ blue. Thallus epiphloeal, tomentose to compact, smooth to very finely rugose, creamy gray-greenish, often with a yellowish tinge, 0.01-0.03 mm thick; thalline hyphae verrucose from adhesive crystals, thin walled, hyaline, 2 μ m diam.; prothallus when free-living not seen, when contiguous crust-like and black; calcium oxalate absent. On rough bark of trees such as Liriodendron and Quercus. Florida. L. subattigens (Nyl.) R. C. Harris [This is the name Esslinger lists, but according to Egea & Torrente, 1994, this is a synonym of L. epileuca (Nyl.) Tehler, which Harris (1995) reports from Florida]

13. Spores 3(-4)-septate. 14

14. Apothecia 0.3-0.6 mm, round, subsessile; discs flat to slightly convex, black, epruinose to densely white pruinose; exciple thin, becoming crenulate, black; spores 21-29(-36) x (3.5-)4-5(-6.5) μ m, 3(-4)-septate. Hypothecium dark-brown. Thallus

epiphloedal, thin, continuous to rimose, thin, with the surface minutely granulose or finely scaly, ashy to white or sometimes sometimes yellowish gray, effuse, sometimes poorly delimited and reduced to dispersed granules; 100 um thick; medulla not differentiated. Ascomata round or somewhat irregular, sessile, constricted at base, isolated or rarely aggregated; disc plane or somewhat convex. Exciple with hyphae visible in outer part, branched and interwoven, with reddish walls, granulose or verrucose, on occasionally incrustated with granules or crystals insoluble in K. Hymenium 75 um, I+ red; subhymenium 20-30 um, hyaline or pale; paraphysoids little anastomosed, 1.5 um wide; apical cells little or not enlarged, coralloid. Asci cylindrico-clavate, 50-60 x 13-14 um. Spores fusiform with one end slightly attenuated, straight or somewhat curved, with cell wall thin and uniform. Pycnidia not seen. Thallus K- or weak, C-, KC-, P-; no substances. On hardwood trees, southern California. L. salicina Zahlbr.

14. Apothecia 0.8-1.5-2 mm; spores (25-)28-40(-46) x 3-6 um; discs brown-black, thickly whitish to yellowish (occasionally brownish) pruinose. Thallus usually thin, effuse, mauve-gray to whitish gray, \pm powdery or becoming granulose. Apothecia common, sometimes abundant but usually only a few scattered among pycnidia, circular to commonly irregular and flexuous, sessile or \pm adpressed, sometimes appearing almost stalked when flexuous, 0.4-1 mm diam.; disc flat (to convex), sometimes irregular, brown to black under pruina; true exciple prominent, thin to more often thick, black, entire, raised, usually persistent, sometimes disappearing. Hypothecium brownish black; epithecium darkened by pruina granules; hymenium 65-76 um, hyaline to more commonly fulvous; paraphyses coherent. Spores (6-)8 per ascus, hyaline or greenish, fusiform to oblong-fusiform with one end drawn out or attenuated, or acicular, 3(-4)-septate, \pm curved. Pycnidia usually present, often numerous, evenly scattered, 0.2-0.3 mm diam., stalked, 0.1-0.3 mm high, cylindrical, knob-like, black with white pruinose apices; walls 25-50 um thick, dark brown in water mount green-black in K; conidiogenous cells 8-12 x 1.9-2.4 um; conidia hyaline to greenish, "banana-shaped" or cylindrical with one or both ends apiculate, 12-17 x 2-3 um, being extruded as a white powdery mass; pycnidial pruina C+ red, K-. Apothecial pruina and thallus P-, K-, KC-, C-; medulla UV+ yellow- or glaucous-gray (lecanoric and schizopeltic acids, unknown UV+ substances). On dry, often shaded, acid bark and exposed wood in middle-aged to mature woodland, on deciduous or sometimes coniferous trees (especially Thuja), best developed in vertical crevices on N. or N.E. sides of trunks; occasionally in underhangs on acid rocks, or on bryophytes or plant debris. New Hampshire, Massachusetts; Tennessee (?); recurring in coastal areas from California to British Columbia. L. abietina (Ach.) Körber (syn. L. megaspora (G. K. Merr.) Brodo)

ADD:

Thallus orangish-pinkish, powdery, completely ecorticate. Spores very narrow. On bark or wood, west side of Cascades, Washington state. Apparently undescribed or not previously reported for N. America; need to incorporate more of my notes on this. Lecanactis? sp.

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