

**Haematomma** Massal.  
(LECANORALES: HAEMATOMMACEAE)

After Staiger & Kalb (1995),  
Culberson (1963), Brodo & Culberson (1986), and others

Rev. 4/96;  
More info. from Staiger & Kalb needs to go in,  
on the pigments and other substances

Thallus crustose, uniform, orbicular to spreading, whitish gray or dull greenish gray, smooth to verrucose-areolate or granular; weakly corticate; cortex of agglutinate thin walled hyphae; attached to substrate by medullar hyphae; prothallus absent.

Apothecia usually sessile, sometimes adnate or immersed, round or somewhat irregular; disc red or pinkish red to orange (or red-brown?), with or without pruina; thalloid margin usually well developed, concolorous with thallus, persistent, entire or crenulate, or becoming excluded; true exciple, if evident, red; hypothecium colorless or pale; hymenium I+ blue; epihymenium K+ violet-purple; paraphyses usually branched or reticulate, the apices not or only slightly swollen; asci cylindrical (according to Rogers) or clavate (according to Coppins & Brightman), unitunicate, thin walled (according to Coppins & Brightman: Lecanora-type, mostly poorly developed, or with a uniformly amyloid apical dome); tholus I+ blue, with ocular chamber and faintly I+ blue axial mass; spores 8, fusiform to broadly acicular, straight or spirally curved with ascus, transversely 3-many-septate (to ca. 25-septate according to Awasthi), hyaline, thin walled.

Pycnidia immersed; ostiole red, K+ magenta, or hyaline, never green; fulcrum endobasidial, little branched or unbranched; conidiogenous cells terminal and intercalary, ampulliform enteroblastic; pycnospores curved-filiform or straight and bacilliform, simple, colorless. Photobiont trebouxoid. On bark or rock, rarely wood. [This description partly includes Loxospora, and needs to be modified]

**1. Thallus P+ orange, K+ yellow, (thamnolic acid). Thallus sorediate, pustulate-sorediate, or isidioid, without apothecia, or without vegetative propagules but apothecia brown or flesh colored. Prothallus absent.** Usually on bark or wood. .... Loxospora and Loxosporopsis

**1. Thallus P-, K+ yellow or K-, without thamnolic acid. Thallus with fine soredia, without apothecia, or without vegetative propagules, and apothecia red to reddish brown. Prothallus often present.** On bark, wood or rock. .... 2

**2. Thallus with soredia; apothecia and pycnidia rare or unknown** (in the latter case therefore assigned to Haematomma

rather tentatively!). ..... 3

**2. Thallus without soredia; apothecia red or red-brown.** ..... 5

**3. Thallus containing sphaerophorin and isosphaeric acid.** On bark, S. Carolina and Georgia. Soralia mostly round and distinctly delimited, sometimes confluent or along cracks. .... H. americanum Kalb & Staiger

**3. Without sphaerophorin and isosphaeric acid.** ..... 4

**4. Thallus soft, leprose or farinose, often wide-spreading, composed of fine soredia, whitish to pinkish gray, K+ yellow, P+ pale yellowish; with atranorin, porphyritic acid and zeorin, usually delimited by a white, cottony prothallus.** (if thallus pale yellow-green or yellow-gray, with usnic acid, = var. ochroleucum). Apothecia rare, at first hidden by thallus granules, later emergent; disc scarlet, K+ purplish; thalline exciple sorediate, often excluded. Pycnidia sometimes present, immersed but upper part scarlet (K+ magenta); conidia 12-20 x 0.5-0.7  $\mu$ m, curved-filiform. On rock (acid or slightly calcareous), on relatively dry, vertical surfaces, rarely on bark. .... H. ochroleucum var. porphyrium (Pers.) Laundon

**4. Thallus at least in younger parts, with delimited soralia; margins usually esorediate; thallus, medulla and soralia P-, K-, KC-, UV+ white (perlatic acid); prothallus smooth, blue-gray.** Thallus pale gray and rather scabrid, with scattered areoles on a smooth blue-gray prothallus; soralia numerous, efflorescent, discrete, 0.2-1 mm diam., or often confluent, whitish to bluish gray; soredia 30-80(-100)  $\mu$ m diam.; external hyphae often blue-gray, N+ red. Apothecia and pycnidia not known. On smooth and rough acid bark and occasionally wood, rarely on shaded acid rocks (vertical surfaces). .... (Mycoblastus caesium)

**5. On rock.** [Note: saxicolous material reported from eastern N. America as H. puniceum also keys out here]. ..... 6

**5. On bark or wood.** ..... 7

**6. Thallus thick, coarsely areolate, yellow or yellow-green (usnic acid); divaricatic acid present (barbatic acid according to Thomson); red pigment in apothecia soluble in acetone, K+ blue.** Medulla P-, K- (or medulla P+ orange-red, with fumarprotocetraric acid, and K+ yellow?). Spores 3-7-septate, 35-55 x 3-5  $\mu$ m. On rock, mainly non-calcareous, arctic-alpine, southward in the eastward mountains in New England, and to Alberta and Washington in the west; also at very high elevation in southern Mexico. .... (Ophioparma lapponicum)

**6. Thallus thin, smooth or granulose-verrucose; if areolate the**

**areoles not strongly convex, pale colored, grayish or whitish; divaricatic acid absent; red pigment in apothecia insoluble in acetone, (K+ magenta or purplish?).** Spores 1-3-septate, 20-30(-35?) x 3.5-5 um. Thallus grayish white, thick, continuous, uneven to somewhat granular, areolate-cracked, to 12 cm diam.; margins effigurate. Thallus corticate. Apothecia lecanorine, scattered, broadly sessile or semi-immersed, 1 mm diam.; disc scarlet, matt, epruinose; thalline margin concolorous with thallus, persistent, entire or crenulate. Top of the spermagonia waxy colored. Thallus with sphaerophorin and/or isosphaeric acid, sometimes also with psoromic acid, or with psoromic acid only. Arizona and Mexico. .... H. fenzlianum Massal. (syn. H. subpuniceum)

**7. Red pigment in apothecia soluble in acetone, K+ blue.** Western. On bark or rock. .... (Ophioparma rubricosa)

**7. Red pigment in apothecia insoluble in acetone (K+ magenta or purplish?).** ..... 8

**8. Epihymenium with haematommone.** Thallus and apothecial margins UV-, without lichexanthone. All spores with only transverse septa, to 85 um long and 7 um wide. Thallus without placodiolic and methylisoplacodiolic acids, with isopseudoplacodiolic and isoplacodiolic acids as major metabolites. Spores 5-7-septate. Chiapas and Veracruz. .... H. flexuosum Hillm.

**8. Epihymenium with russulone. Thallus and apothecial margins UV-, without lichexanthone.** ..... 9

**9. Thallus with sphaerophorin and/or isosphaeric acid, with or without psoromic acid.** Spores 5-7-septate. Margina of apothecia not or only slightly crenulate. Apothecia often immersed in the thallus or at least attached to it with a broad base. Disc distinctly red. Southeast coastal plain (Virginia to Florida, west to Texas); California to Baja California Sur, Coahuila, Nuevo Leon. .... H. personii (Fée) Massal.

**9. Thallus with neither sphaerophorin nor isosphaeric acid.** Without usnic acid, but with  $\pm$  placodiolic acid or placodiolic acid derivative. Margin of apothecia always of the same color as the thallus, not evanescent with age; thallus thick,  $\pm$  warty. . .... 10

**10. Spores 7-24-septate.** Thallus with placodiolic acid as a major metabolite. Pycnospores 6-11 um long, straight. Sinaloa, Durango, and Michoacan. .... H. dolichosporum (B. de Lesd.) Kalb & Staiger

**10. Spores 5-7-septate.** Apothecia broadly affixed to the thallus; disc with a brownish to ochraceous tinge, rarely slightly pruinose; margin remaining thick. Sonora. .... H. infusum (Stirt in Bailey) Rogers

ADD:

Growing east of the Rocky Mountains. Spores 7-15-septate, 38-65 x 4-5 um, acicular. Thallus granulate- verrucose, thin, chinky to wrinkled and granulate, greenish gray to pale yellowish green. Apothecia 0.2-0.6(-2) mm diam., crowded, closely sessile; disc flat, bright red (scarlet), epruinose; thalline margin entire to flexuous and crenate, thin, concolorous with thallus. Containing atranorin. On bark or rarely rocks. New Jersey to Florida, W to Texas and Iowa. Has been divided by Asahina into several subspecies. .... H. puniceum auct. non (Sm. ex Ach.) Massal. [This is probably H. persoonii]

Florida. .... (see Schismatomma rappii)

## Descriptions of Species

### H. americanum

Thallus cream-colored to greenish gray, uneven or verruculose, slightly rimose, ca. 0.3 mm thick, sorediate. Soralia mostly round and distinctly delimited, sometimes confluent or along cracks. Apothecia sessile, 0.5-1 mm diam.; disks cinnabar red, epruinose; margin thallus colored, mostly slightly crenulate. Spores 8/ascus, 7-13-septate, 45-54.4-60 x 3-4.1-5  $\mu$ m. Spermogonia not found. Atranorin, sphaerophorin, isosphaeric acid, russulone. On bark, S. Carolina and Georgia.

### h. dolichosporum

Thallus whitish to ash-gray, verruculose, rimose, ca. 0.2-0.4 mm thick, without soredia. Apothecia sessile, ca. 1-1.5 mm diam.; disc orange to red-brown, epruinose; margin thallus-colored, rarely the disc color spreading onto it, smooth, shiny, first  $\pm$  thick, later thinner and crowded back, crenate to flexuous. Spores 8 per ascus, 7-11-septate, 45-56.5-75 x 3-4.3-4.4  $\mu$ m. Spermogonia in small, thallus-colored warts, 0.1-0.2 mm diam., with flesh-colored ostioles; spermatophores of type II of Vobis 1980; spermatia 7-11 x 0.9-1.2  $\mu$ m. Atranorin, placodiolic acid and russulone. On bark, especially Quercus, in oak-pine woodlands, western Mexico.

### H. fenzlianum

Thallus cream-colored, brownish-gray, smooth or uneven, rimose to distinctly areolate, ca. 0.3-1 mm thick, non-sorediate. Apothecia immersed or adnate, 0.5-1.5 mm diam.; disc cinnabar red to brick-colored, epruinose, several discs often confluent; margin smooth, often not distinct from thallus. Spores 8/ascus, 3-7-septate, 20-26.0-30 x 3-4.2-5  $\mu$ m. Spermatophores type I of Vobis; spermatia curved, 13-18 x 0.9-1  $\mu$ m. Atranorin, russulone, plus (chemotype a) sphaerophorin and isosphaeric acid, (chemotype b) sphaerophorin, isosphaeric acid and psoromic acid, or rarely (chemotype c) psoromic acid. On siliceous rocks (granite and rhyolite), Arizona, Texas, Mexico.

### H. flexuosum

Thallus cream-colored, pale gray or greenish gray, rather variable, mostly  $\pm$  verrucose, rimose, ca. 0.3-0.5 mm thick, non-sorediate. Apothecia sessile, ca. 0.5-1.5(-2) mm diam.; discs pruple-red, epruinose; margin especially in larger apothecia often crenulate and flexuous. Spores 8/ascus, 5-7(-9)-septate, straight or sigmoid-curved, 33-43.7-55(-65) x 3.5-4.2-5  $\mu$ m. Spermatophores type II of Vobis, 1980; spermatia straight, 708 x 1.5-2  $\mu$ m. Atranorin, isoplacodiolic acid, isopseudoplacodiolic acid, haematommone. On bark of various angiosperms, Chiapas and Veracruz.

### H. infusum

Thallus whitish, cream-colored, pale to greenish-gray, smooth, uneven

or verruculose, slightly rimose, ca. 0.3 mm thick, non-sorediate. Apothecia sessile, mostly 1-1.5 mm diam.; discs scarlet red, often slightly brownish tinged, epruinose; margin epruinose, smooth or crenulate, rarely flexuous. Spores 8/ascus, 5-7-celled, 35-47.6-55 x 3.5-4.3-5  $\mu$ m. Spermatophores type I of Vobis; spermatia slightly curved, 14-16 x 0.8  $\mu$ m. Atranorin, placodiolic acid, russulone, either (chemotype a) without psoromic acid, or with it (chemotype b). On bark, (Acacia, Nothofagus, Quercus). Sonora.

H. ochroleucum var. porphyrium (Pers.) Laundon

Thallus soft, leprose or farinose, often wide-spreading, composed of fine soredia, usually delimited by a white, cottony prothallus. Apothecia rare, at first hidden by thallus granules, later emergent; disc scarlet, K+ purplish; thalline exciple sorediate, often excluded. Pycnidia sometimes present, immersed but upper part scarlet (K+ magenta); conidia 12-20 x 0.5-0.7  $\mu$ m, curved-filiform. On rock (acid or slightly calcareous), on relatively dry, vertical surfaces, rarely on bark. Thallus whitish to pinkish gray, K+ yellow, P+ pale yellowish; with atranorin, porphyritic acid and zeorin.

(if thallus pale yellow-green or yellow-gray, with usnic acid, = var. ochroleucum).

H. persoonii

Thallus rather variable in color, whitish, cream-colored, pale gray, or greenish gray, mostly smooth to verruculose,  $\pm$  rimose, ca. 0.3-0.5 mm thick, non-sorediate. Apothecia immersed, aspicilioid or sessile, 0.3-1.5 mm diam.; discs often confluent, scarlet red to dark cinnabar red, epruinose; margin either distinctly developed, smooth to slightly crenulate or in immersed apothecia very narrow. Spores 8/ascus, straight or sigmoid-curved, 30-38.4-50(-55) x 3.5-4.1-5  $\mu$ m. Spermatophores type I of Vobis, 1980; spermatia curved, 16-20 x 1  $\mu$ m. Atranorin, sphaerophorin, isosphaeric acid, russulone. On bark of a wide variety of trees or shrubs, southeast coastal plane, north to Virginia, southwest to Texas and Coahuila and Nuevo Leon; south-central California south to Baja California Sur and Sinaloa.

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