

Thelotrema Ach.
(THELOTREMATACEAE)

After Harris, 1990, 1995, and others

Rev. 5/94

Thallus crustose, \pm superficial, sometimes immersed, usually shades of cream or fawn; cortex when present loose to dense, continuous and smooth to roughened and cracked, sometimes splitting or exfoliating, sometimes with crystals internally; medulla thin or lacking; prothallus absent; medulla usually evenly distributed in a layer 2-4 cells thick (10-30 μ m).

Apothecia urceolate to \pm perithecioid, immersed, often in raised, convex-conical warts (often volcano-like, with broad, gaping pore and margins raised above the disk) to strongly emergent; disc concave to flat, black, sometimes pruinose; thalline exciple distinct, entire or eroding, erect to usually incurved or sometimes recurved; true exciple colorless or brown above, closely adhering to thalline exciple or more commonly free from it, then distinct when viewed from above as an internal ring, sometimes striate, composed of \pm densely conglutinated, intertwined short-celled hyphae.

Hymenium colorless, I-; epihymenium colorless to brown or black. Paraphyses filamentous, unbranched, rarely septate. Periphysoids lining the inner face of the true exciple, short; columella always lacking. Hypothecium colorless. Asci subcylindrical, with a single functional wall layer, abruptly thickened at the apex, sometimes with a minute internal apical beak, I-. Spores 1-8, narrowly ellipsoid to broadly fusiform, septate or muriform, colorless or brown, I+ purplish-bluish (or I- according to Awasthi), the walls often thick and laminated with the cells \pm lenticular, smooth, lacking a distinct perispore.

Pycnidia with unbranched conidiogenous cells; conidia bacilliform, simple, colorless. Chemistry very variable, a wide range of depsidones, anthraquinones, and unidentified substances reported, but not substances in many species. On bark, wood or rarely rocks, in humid situations. Mostly tropical to subtropical, but some species common in temperate to boreal areas.

Myriotrema and Ocellularia lack periphysoids on the inner face of the exciple; the exciple is colorless to pale reddish brown in Myriotrema, and black and friable in Ocellularia.

- 1. Thallus isidiate (but isidia often sparse). 2**
1. Thallus not isidiate. 4

2. Thallus P-, K- (no substances), thick, filled with crystals, often separating from the substrate; isidia sparse, coarse; ascospores brown,

submuriform, 16-28 x 7-12 μ m. Thallus greenish glaucous to pale glaucous blue, farinose, thick, epiphloeodal. Apothecia scattered, emergent, ashy white, ecolumellate, chroodiscoid, with wide open, pruinose disc; thalline margin thick, strongly raised, initially convolute and later becoming revolute and lacerate with 3-5 flaps, non-carbonized; proper exciple thin, non-carbonized; spores 8, uniseriate, ellipsoid, with 3-5 transverse septa and one vertical septum, 12-18(-22) x 6-9 μ m. Florida. T. santense Tuck.

2. Thallus P+ yellow (psoromic acid), thinner. 3

3. Ascospores brown, 2-celled, 8-11 x 5-6 μ m, with reticulately wrinkled ornamentation; isidia thick, long, cylindrical and upright when young, becoming crowded and decumbent in age, "branching" by regeneration from upper side; apothecia emergent, 0.5-0.8 mm across; margin doughnut-like, smooth, with a broad pore which becomes plugged in age (by pseudocolumella?); disk white pruinose. Thallus white, continuous, with a thin amorphous, gelatinous cortex and thick white medulla.

Florida. T. eximium R. C. Harris

3. Ascospores hyaline, submuriform, 4 x 4-celled, 15-21 x 9-12 μ m; isidia sparse, initially globose; apothecia emergent, resembling Porina nucula; unknown substance in addition to psoromic acid. Florida. T. halei (Tuck. & Mont. in Mont.) Zahlbr.

4. Ascospores hyaline. 5

4. Ascospores light to dark brown; thallus P- (no substances); apothecia emergent with broad, round pores; exciple pulling away from margin. 14

5. Ascospores transversely septate. 6

5. Ascospores submuriform to muriform; thallus P- (no substances). 11

6. Thallus P-, K-, C- (no substances); ascomata small, immersed. 7

6. Thallus P+ yellow or orange; ascomata larger. 9

7. Ascospores IKI-, 11-14-celled, 24-38 x 6-7 μ m; apothecial disk mostly flush with thallus. Florida, Louisiana. Harris (1995) has a question mark after this name. T. alborosellum (Nyl.) Tuck.

7. Ascospores IKI+ purple. 8

8a. Growing in British Columbia. Thallus forming whitish to pale cream, uniformly thin, often \pm widespreading, effuse or delimited, mainly endophloooooeodal, crustose patches; cortex an ill-defined, superficial layer of necrotic cells mixed with sloughed bark cells, below \pm interwoven hyphae and photobiont in cortex of phorophyte, occasional coarse clusters of crystals

(calcium oxalate) present. Photobiont Trentepohlia. Ascomata 0.4-0.7(-0.8) mm, not immersed in warts, \pm raised and erumpent from the substrate, urceolate, flat; thalline exciple \pm entire or somewhat fractured, often exposing an inner true exciple which is \pm poriform at the apex, \pm radially (stellate) lacerate, with periphysoids on lower surface, partly obscuring the black to \pm densely pruinose disc; hymenium (90-)100-120(-130) μ m; epithecium colorless to pale brown, \pm encrusted with numerous small, irregular crystals; asci (4-)8-spored; ascospores broadly fusiform, colorless, (30-)35-50(-55) \times (7-)8-10 μ m with (7-)9-11(-12) transverse septa only, I+ purplish blue. Thallus P-, K-; no substances. Mainly on smooth-barked trees, in sheltered, damp woodlands. Queen Charlotte Islands, British Columbia. T. petractoides P. M. Jorg. & Brodo

8a. Growing in Florida. 8b

8b. Apothecia 0.4-0.6(-0.8) mm across, flattened, not immersed in warts, erumpent, urceolate; ostiolar opening to 0.3 mm wide; disc pruinose; true exciple free, colorless, \pm striate and covering the disc; hymenium 90-100 μ m tall. ASCI (4-)6-8-spored; thallus poorly developed, not corticate; medulla not obvious; ascospores 9-15-celled, 25-40(-54) \times 6-8(-10) μ m, broadly fusiform, hyaline. Thallus cream, white or pale ochraceous, somewhat immersed, \pm continuous, in section interspersed with crystals. On smooth bark in sheltered woodlands and boggy areas, mainly subtropical, Florida. T. subtile Tuck.

8b. Apothecia 0.2-0.35 mm across; thallus usually well developed, weakly corticate; medulla thick; ascospores 8-13-celled, 25-45 \times 6-8 μ m. Florida. T. lathraeum Tuck.

9. Thallus K-, P+ yellow (psoromic acid); apothecia emergent, round with broad round pore and smooth margin; exciple separating from margin, collapsing on the disk and covering it, pruinose; ascospores 4-6-celled, 13-18 \times 6-7 μ m. Thallus white, continuous, dull or slightly shiny, not corticate. Apothecia concolorous, to 2.0 mm; old apothecia regenerating several hymenia within old margin. Florida. T. floridense R. C. Harris

9. Thallus K+ yellow, P+ orange (stictic acid agg.). 10

10. Apothecia with thick, recurved and split margin ("chroodiscoid"), 1 mm diam.; exciple fused; ascospores (5-)7-10-celled, 30 \times 6-8 μ m. Florida to Louisiana. T. dilatatum (Müll. Arg.) Hale

10. Apothecia emergent with broad round pore, 0.6-0.8 mm diam., solitary or aggregated; exciple free from margin, incurved, forming a conspicuous inner ring; ascospores to 26-30-celled, (60-)120-140 \times (8-)15-20 μ m, I+ blue. Thalline margin of apothecia sometimes flaring. Pore 0.2-0.5 mm diam. Asci 4-8-

spored. Florida. T. porinoides Mont. & v. d. Bosch

11. Ascospores 25-35(-45) x 12-15(-18) um, ellipsoid, IKI-, initially 8/ ascus but several may abort; apothecia small (0.5 mm), immersed, lenticular; margin radially striate and later lacerate; pore broad; disk pruinose. Thallus hypophloedal, ecorticate; Trentepohlia not organized into a discrete algal layer. No substances. Florida to Texas. T. defectum Hale ex R. C. Harris

11. Ascospores large, over 50 um long, 1-4/ascus. 12

12. Ascospores thin walled, 1-2/ascus, (30-)50-80 x (10-)15-20 um; apothecia 0.5-0.8 mm diam, white pruinose with erect, jagged margin; exciple free; thalline rim recurved. Florida. T. leprocarpum (Nyl.) Tuck.

12. Ascospores thick walled, 2-4/ascus, 65-90 x 15-20 um. 13

13. Apothecia immersed when young, becoming urceolate with low, thick margin; exciple coarse, pinkish tan, often filling the pore and covering the disk. Florida. T. adjectum Nyl.

13. Apothecia with large (ca. 0.5 mm), open pore; margin regular, thinner; exciple fragile, whitish, free from thalline margin, \pm conspicuous when viewed through the ostiole, not striate. Thallus creamy to fawn or pale ochraceous, \pm continuous, in section interspersed with crystals. Apothecia (0.6-)1-2 mm diam., immersed in hemispherical warts, urceolate; thalline margin entire. Hymenium (120-)140-190(-200) um tall. Asci (1-)2-4(-8)-spored. Spores (30-)60-135(-150) x (10-)15-25(-33) um, broadly fusiform, hyaline, with (8-)10-15(-19) transverse and 1-3(-5) longitudinal septa, l- or weakly purple. Thallus and medulla P-, K- (internal crystals \pm yellow then red), C- (no lichen products in TLC). On bark of deciduous trees, and (in the Pacific NW) on Thuja plicata, in humid areas, often riparian, in old woodlands, lowland to montane; rarely on siliceous rocks. Widespread, including Florida and Pacific NW. T. lepadinum (Ach.) Ach.

14. Ascospores densely muriform, 105-140 x 25-30 um, medium brown, 1/ascus, weakly granular ornamented. Thallus whitish, continuous, slightly shiny, ecorticate; medulla with scattered to abundant crystals. No lichen substances. Apothecia weakly emergent, hemispherical, 0.5-1.0 mm; pore broad; disk pruinose; exciple visible, pulling away from margin; margin sometimes weakly carbonized. Florida to Texas. T. monospermum R. C. Harris

14. Ascospores 5-10 transversely septate. 15

15. Ascospores 6-celled, 17-20 x 6-7 um; stictic acid agg.; apothecia with rim recurved and splitting; disk white pruinose. Florida. T. platycarpoides Tuck

15. Ascospores with 7-11 transverse cells, 33-60 x 6-10 um; no substances; apothecia emergent with broad, round pores; exciple pulling away from margin. Spores l-. Apothecia distinctly pored, with an incurved thalline margin, 0.7-1.0 mm diam.; exciple ree, pore 0.2-0.4 mm diam., gaping; thallus thin, rugulose, straw colored. Florida. T. lacteum Krempelh.

ADD:

T. pospositum Nyl.

Thallus pale olivaceous green, warty, mostly evanescent and endophloeodal. Apothecia scattered, semi-emergent, non-lepadidiod, eolumellate; disc wide open, ashy white to slaty in color, 2-4 mm diam.; thalline exciple revolute, white pruinose; proper exciple thin, brown, non-carbonized; spores 8, biseriate, 4-5 loculate, ellipsoid, 10-15 x 4-5 um. Thallus K+ yellow, P+ orange (stictic acid). (See Hale, 1981, but no specimens from N. America definitely seen by Harris). T. platycarpum

ADD:

Thallus thin, smooth to warty and sometimes chinky, continuous or irregularly scattered, closely adnate, yellow to straw-colored. Apothecia 0.3-0.7 mm diam., adnate to sessile round; disk flat, black; exciple concolorous with disk, thin, rarely prominent; thalloid margin thicker, entire to flexuous or stellate; spores 8, ellipsoid to subdactyloid, 3-7-septate, 20-30 x 5-8 um. On trees, San Diego, CA. T. californicum Tuck.

Thallus thin, shiny, pale yellow green. Apothecia few, scattered, semi-emergent, non-lepadinoid, chroodiscoid; disc white pruinose, wide open; columella absent; thalline exciple fused with proper exciple, reflexed; marginal flap conspicuous; spores 8, 3-5-septate, ovate to cylindrical, 12-15 x 6-8 um. Thallus K-, P- (no substances). T. alborosellum (Nyl.) Tuck. (see Wetmore, 1989)

EXCLUDED (According to Harris, 1990):

T. heterosporum = T. santense

T. monosporum (N. American) = T. monospermum

T. ravenellii = Myritotrema ravenelii

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