

Lichens of Great Britain & Ireland edn 3

Draft genus account version 1.1, February 2018

Prepared by Paul Cannon, based on the LGBI2 account by James & Hawksworth (2009)

THELOTREMA Ach. (1803)

Thallus crustose, superficial, sometimes \pm immersed, colour usually shades of cream or fawn; cortex continuous or exfoliating, sometimes with internal crystals; prothallus absent. **Photobiont** *Trentepohlia*. **Ascomata** apothecia, urceolate to perithecioid, immersed, often in raised warts; disc concave to flat, often gaping, black, sometimes pruinose. **Thalline exciple** distinct, entire or eroding, usually incurved. **True exciple** commonly free from thalline exciple and distinct as an internal ring when viewed from above, colourless or brown above, rarely closely adhering to it, sometimes striate, composed of \pm densely conglutinated, intertwined short-celled hyphae. **Epithecium** colourless to brown or black. **Hymenium** colourless, I-. **Hypothecium** colourless. **Hamathecium** of filamentous, unbranched, rarely septate paraphyses; periphysoids lining the upper inner surface of the true exciple. **Asci** subcylindrical, with a single functional wall layer, abruptly thickened at the apex, sometimes with a minute internal apical beak, K/I-, 1- to 8- spored. **Ascospores** narrowly ellipsoid to broadly fusiform, septate or muriform, colourless or brown, the walls often thick and laminated with the cells \pm lenticular, smooth, lacking a distinct perispore, I+ purplish. **Conidiomata**, when present, pycnidia. **Conidia** bacilliform, simple, colourless. **Chemistry**: very variable, a wide range of depsidones, anthraquinones and unidentified substances reported; however, no lichen substances are detected by TLC in many species. **Ecology**: on bark, wood, or rarely rocks, in humid situations. **Distribution**: c. 100 species, cosmopolitan, particularly apparent and abundant in deep shade in established primary and secondary tropical forests.

As defined on the basis of exciple structure rather than ascospore colour and septation, *Thelotrema* comprises about 100 mainly tropical species. Based on a molecular phylogenetic study by Parmen et al. (2012), *T. petractoides* has been transferred to the monotypic *Crutarndina*, and *T. isidioides* was transferred to the predominantly tropical genus *Leucodecton* by Lücking & Breuss (2012).

Lichenicolous fungi associated with *Thelotrema* include *Opegrapha thelotrematis* (on both species) and *Skyttea nitschkei* (on *T. lepadinum*), and more rarely *Arthonia thelotrematis* and *Taeniolella toruloides*. *Stenocybe septata* is sometimes found growing through the thallus of *Thelotrema* species.

Literature:

- Frisch, A., Kalb, K. & Grube, M. (2006). Contributions towards a new systematics of the lichen family Thelotremataceae III. Molecular phylogeny of the Thelotremataceae. *Bibliotheca lich.* **92**: 517-539.
- James, P.W. & Hawksworth, D.L. (2009). *Thelotrema*. In *Lichens of Great Britain and Ireland* (Smith, C.W., Aptroot, A., Coppins, B.J., Fletcher, A., Gilbert, O.L., James, P.W. & Wolsely, P.A. eds): 891-893. London: British Lichen Society.
- Lücking, R. & Breuss, O. (2012). A new species of *Thelotrema*, a new combination, *Leucodecton isidioides*, and a key to thelotremoid lichens of Macaronesia (lichenised Ascomycota: Graphidaceae). *Österreichische Zeitschrift für Pilzkunde* **21**: 127-133.
- Parmen, S., Lücking, R. & Lumbsch, H.T. (2012). Phylogenetic classification at generic level in the absence of distinct phylogenetic patterns of phenotypical variation: a case study in Graphidaceae (Ascomycota). *PLoS ONE* **7**(12): e51392.

Key to species of *Crutarndina*, *Leucodecton* and *Thelotrema*

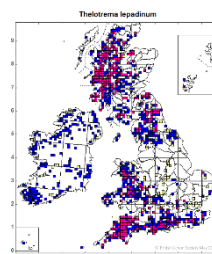
- 1 Ascospores muriform2
Ascospores only transversely septate *Crutarndina petractoides*

- 2(1) Ascospores remaining colourless when mature *lepadinum*
 Ascospores becoming pale brown to brown when mature 3
- 3(2) Asci 1(-2)-spored; true exciple free; ascospores (70-) 90-120 (-160) × (15-) 25-40 (-50) μm,
 with 16-22 (-24) transverse septa *macrosporum*
 Asci usually 8-spored; true exciple ± united with the thallus; ascospores (27-) 34-40 (-45)
 × 13-18 μm, with 7-9 (-11) transverse septa *Leucodecton isidioides*

***Thelotrema lepadinum* (Ach.) Ach. (1803)**

LC

Thallus thin to thick (up to 200 μm in thickness), smooth, ± uneven, usually continuous, greyish fawn to pale ochraceous, mainly superficial, medulla in section with numerous crystals (calcium oxalate) which are particularly well-developed in the thallus margin of the ascomata. Apothecia numerous, discrete, ± evenly dispersed, (0.6-) 1-2 mm diam., immersed in hemispherical warts, urceolate, ostiolar opening to 0.5 mm wide, white; thalline exciple entire; true exciple free, ± conspicuous when viewed through the ostiole, colourless, not striate; disc blackish, often ± white-grey pruinose, normally visible through an irregular hole in the true exciple; hymenium (120-) 140-190 (-200) μm tall. Asci (1-) 2- to 4- (to 8-) spored. Ascospores broadly fusiform, (30-) 60-135 (-150) × (10-) 15-25 (-33) μm, remaining colourless when mature, with (8-) 10-15 (-19) transverse and 1-3 (-5) longitudinal septa, I± weakly purple, with a thick gelatinous coating. Thallus and medulla C-, K-, KC-, Pd-, UV- (lichen products not detected by TLC but sometimes with internal crystals K+ yellow changing to red). **BLS 1410.**



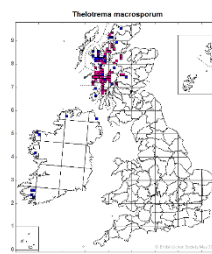
On smooth and sometimes rougher bark of deciduous trees, rarely on siliceous rocks, decreasing due to woodland disturbance. Considered to be an indicator species of ancient woodland sites. Scattered in suitable habitats throughout the British Isles. Europe. Probably cosmopolitan.

The shape of the apothecia is very variable; in dry situations on smooth bark of deciduous trees they are regularly volcano-like, smooth with a narrow opening; in moist, often shaded, sites the apothecia are larger and become more open and ulcerose with a thick, prominent, somewhat scurfy rim. Could be confused with the rarer *Thelotrema macrosporum* in oceanic habitats.

***Thelotrema macrosporum* P.M. Jørg. & P. James (1995)**

LC IR

Thallus pale grey-green, often somewhat white-marbled when fresh, becoming ochraceous when dry, forming small to large superficial patches which are rather thick, (up to 130 μm in thickness); medulla with coarse calcium oxalate crystals. Apothecia (0.7-) 0.8-1.2 (-1.5) mm diam., immersed in hemispherical warts, somewhat flattened at their summits, urceolate, the ostiolar opening usually narrow, 0.2-0.4 (-0.7) mm wide; true exciple colourless, inapparent when seen through the ostiole; thalline exciple entire; hymenium (100-) 140-200 μm tall. Asci 130-170 × 40-55 μm, 1- (to 2-) spored. Ascospores (70-) 90-120 (-160) × (15-) 25-40 (-50) μm, broadly fusiform with rounded ends, opaque grey-brown when mature, with 16-22 (-24) transverse and numerous longitudinal septa, I-, with a gelatinous coat. Thallus and medulla C-, K-, KC-, Pd-, UV- (lichen products not detected by TLC). **BLS 1411.**



A hyperoceanic species on smooth bark, especially twigs of *Corylus* and *Sorbus*, in sheltered, boggy, undisturbed ancient woodlands; very local. W. Scotland, S.W. Ireland. Scandinavia, Macaronesia.

Resembles *T. lepadinum*, but with a grey-green thallus and with apothecia with a narrower opening; microscopic examination is necessary for certain identification. However, the large, dark ascospores are visible with a ×20 lens and are often scattered over the surface of the thallus and particularly around the ostioles. Previously referred to in Europe as *T. monosporum* but that is a species of tropical SE Asia.