



## ACANTHOTHECIS<sup>1</sup>

Gintaras Kantvilas<sup>2</sup>

*Acanthothecis* Clem., *Genera of Fungi*: 59 (1909).

Type: *A. pachygraphoides* (Vain.) Clem.

Thallus crustose; cortex absent or poorly developed; calcium oxalate sometimes present. Photobiont *Trentepohlia*, with cells ellipsoid, 10–20 × 9–15 µm, in short chains. Ascomata apothecia, lirelliform, concolorous with the thallus or paler, with a rough and mealy margin. Disc slit-like or slightly exposed. Proper exciple not, or at most only slightly carbonised, very thin and poorly developed, sometimes with spinous or warty periphysoids. Hypothecium hyaline to pale yellowish brown. Hymenium hyaline, non-amyloid, not inspersed. Asci elongate-clavate, (2–)8-spored, of the *Graphis*-type: non-amyloid, with a slightly thickened apex and ± truncate ascoplasm. Paraphyses simple, straight and parallel; apices hyaline, warty or spinous. Ascospores ellipsoid to oblong, transversely septate or muriform, hyaline, I– or faintly I+ pale blue, with a thin, rather incomplete, gelatinous halo; locules mostly ± cylindrical to lens-shaped. Conidiomata unknown. Chemistry: mostly depsidones, especially stictic acid and related compounds.

A genus of approximately 35–40 species, found mostly on bark (rarely on rocks) in tropical and warm temperate latitudes. The combination of non-carbonised exciple, paraphyses and periphysoids with spinous apices, and ellipsoid ascospores with only a thin halo and chiefly cylindrical locules, distinguish it from other lirellate lichens belonging to the family Graphidaceae. The most closely related genus is *Fissurina*, which also has a non-carbonised exciple and paraphyses with spinous apices, but differs by having a corticate thallus, and ovoid ascospores with a thick halo and rounded lumina. The spinous paraphyses can be difficult to observe, even under high power, but the whitish lirellae with mealy margins mean that *Acanthothecis* has few confusing genera in the Tasmanian lichen flora.

Key references: Staiger & Kalb (1999); Staiger (2002); Archer (2009); Kantvilas (2010).

1 Thallus white; ascospores distinctly muriform

Thallus pale olive-grey; most ascospores transversely septate only

1 *A. gyridia*

2 *A. virgulicola*

### 1 *Acanthothecis gyridia* (Stirt.) A.W.Archer

*Telopea* 11: 70 (2005); —*Graphis gyridia* Stirt., *Trans. & Proc. Roy. Soc. Victoria* 17: 77 (1881); *Graphina gyridia* (Stirt.) Zahlbr., *Cat. Lich. Univ.* 2: 408 (1923).

Thallus white, continuous, 20–40 µm thick, forming widely spreading, diffuse patches to c. 10 cm wide; calcium oxalate present. Lirellae scattered or loosely clustered, simple or branched, straight or serpentine, 0.3–3 mm long, 0.3–0.6 mm wide; margin white, cracked and eroded, occasionally striate, extending well above the thallus surface; disc mostly slit-like and obscured by the margin. Exciple often visible from above as a very thin, grey border, in section 10–20 µm thick, pale yellowish brown, poorly differentiated from adjacent tissues, not carbonised; periphysoids not observed. Hypothecium pale yellowish brown, 20–30 µm

1 This work can be cited as: Kantvilas G (2023). *Acanthothecis*, version 2023:1. In MF de Salas (Ed.) *Flora of Tasmania Online*. 3 pp. (Tasmanian Herbarium, Tasmanian Museum and Art Gallery: Hobart). <https://flora.tmag.tas.gov.au/lichens/genera/acanthothecis/> (accessed 21 September 2022).

2 Tasmanian Herbarium, Tasmanian Museum & Art Gallery, PO Box 5058, UTAS LPO, Sandy Bay, TAS 7005, Australia.

thick. Hymenium 70–90  $\mu\text{m}$  thick; asci 8-spored, 60–75  $\times$  10–15  $\mu\text{m}$ ; paraphyses 1.5–2  $\mu\text{m}$  wide, with apices expanded to 2–3  $\mu\text{m}$ , warty and/or with minute spines. Ascospores 1–, non-halonate, ellipsoid, muriform, typically rather acute at the distal end, (13–)14–18.4–23(–26)  $\times$  (5–)6–6.6–8.5(–9)  $\mu\text{m}$ , with 5–7 transverse and 0–2 longitudinal septa; locules cylindrical or  $\pm$  rounded in the muriform parts of the spore.

Chemistry: stictic and constictic acids; thallus K+ yellow, KC–, C–, P+ orange.

Recognised by the conspicuous white thallus, liberally scattered with white lirellae with mealy, eroded margins, and by the muriform ascospores. The habitat and superficial appearance of the thallus are similar to *Phlyctis subuncinata*, which also contains stictic acid but has  $\pm$  immersed, apothecial ascomata and fusiform, 7-septate ascospores. *Acanthothecis gyridia* is known from a single Tasmanian collection from the bark of *Pomaderris apetala* in open eucalypt forest behind dunes on the south coast. It also occurs in Victoria.

South Cape Bay near South Cape Rivulet, 43°36'S 146°47'E, 3 m, 1990, G. Kantvilas 33/90 (HO).

## 2 *Acanthothecis virgulicola* Kantvilas

*Herzogia* 23:10 (2010). Type: Tasmania, Badger Creek, c. 2.5 km S of Greystone Bluff, 43°06'S 146°02'E, on *Nothofagus cunninghamii* in rainforest, 280 m, 17 February 1989, G. Kantvilas 85/89 (holo—HO!).

Thallus pale olive-grey, effuse, rather patchy, to 40  $\mu\text{m}$  thick, forming small, diffuse, irregular patches to c. 30 mm wide; calcium oxalate not detected. Lirellae scattered, simple or occasionally forked or branched, straight or rarely curved or crescent-shaped, 0.3–2.5 mm long, 0.1–0.2 mm wide; margin sometimes slightly enveloped by thallus at the base, white, cracked and eroded, occasionally striate, extending above the thallus surface; disc mostly slit-like and obscured by the margin, white-pruinose. Exciple in section c. 10–20  $\mu\text{m}$  thick, pale straw-coloured, poorly differentiated from adjacent tissues, not carbonised; periphysoids occurring at the upper part of the exciple, 3–4  $\mu\text{m}$  wide, to 30  $\mu\text{m}$  long, with apices rough and warty. Hypothecium hyaline, 30–50  $\mu\text{m}$  thick. Hymenium 60–75  $\mu\text{m}$  thick; asci 8-spored, 55–70  $\times$  (10–)15–20  $\mu\text{m}$ ; paraphyses 1–2  $\mu\text{m}$  wide, with apices expanded to 2–3  $\mu\text{m}$ , hooked, warty and/or with minute spines. Ascospores 1– or 1+ pale blue, with a very thin, ragged, gelatinous halo to c. 1  $\mu\text{m}$  thick, ellipsoid-fusiform, straight or slightly curved, sometimes rather broader and rounded at one end and tapered at the other, 17–21.4–26  $\times$  5–7.0–9.5  $\mu\text{m}$ , with (5–)6–8(–9) transverse septa and very rarely 1 longitudinal septum; locules  $\pm$  cylindrical to lens-shaped, of unequal size.

Chemistry: stictic, constictic and hypoconstictic acids; no spot tests with standard reagents are reliable due to the extreme thinness of the thallus.

This is a very distinctive and conspicuous species due to its olive thallus with white, non-carbonised lirellae. It is thus easily distinguished from *A. gyridia*, which has a white thallus and consistently muriform ascospores, and from *Fissurina insidiosa*, which has prominent, non-carbonised lirellae with swollen lips and ovoid, 4-locular ascospores with a thick, gelatinous halo. *Acanthothecis virgulicola* is endemic to Tasmania and known from only two localities in cool temperate rainforest where it grew on the young, smooth-barked twigs of *Nothofagus cunninghamii* within the shaded interior of the forest. Both localities are unusual in that they are dominated by ancient, extremely fire-sensitive conifers. At the type locality, the conifer species is *Lagarostrobos franklinii*, occurring in an extremely fire-protected cirque surrounded by pyrogenic button-grass moorland vegetation; at the other locality, the dominant conifer is *Athrotaxis selaginoides*.

Weindorfers Forest, Waldheim, 41°38'S 145°56'E, 1000 m, 1988, G. Kantvilas 43/88 (HO).

## REFERENCES

Kantvilas G (2010) *Acanthothecis virgulicola*, a new Tasmanian lichen. *Herzogia* **23** 9–13.

Staiger B (2002) Die Flechtenfamilie Graphidaceae. Studien in Richtung einer natürlicheren Gliederung. *Bibliotheca Lichenologica* **85** 1–526.

Staiger B, Kalb K (1999) *Acanthothecis* and other graphidioid lichens with warty periphysoids or paraphysis-tips. *Mycotaxon* **73** 69–134.

## INDEX

<b>A</b>	
<i>Acanthothezis</i> .....	1
<i>Acanthothezis gyridia</i> .....	1, 2
<i>Acanthothezis pachygraphoides</i> .....	1
<i>Acanthothezis virgulicola</i> .....	2
<i>Athrotaxis selaginoides</i> .....	2
<b>F</b>	
<i>Fissurina</i> .....	1
<i>Fissurina insidiosa</i> .....	2
<b>G</b>	
Graphidaceae.....	1
<i>Graphina gyridia</i> .....	1
<i>Graphis gyridia</i> .....	1
<b>L</b>	
<i>Lagarostrobos franklinii</i> .....	2
<b>N</b>	
<i>Nothofagus cunninghamii</i> .....	2
<b>P</b>	
<i>Phlyctis subuncinata</i> .....	2
<i>Pomaderris apetala</i> .....	2
<b>T</b>	
<i>Trentepohlia</i> .....	1