
New species from each of the pyrenomycete genera *Hyponectria*, *Physalospora* and *Trichosphaeria* from Queensland, Australia

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Three new species of ascomycetes each occurring on leaves of *Acacia*, *Eucalyptus* and *Lomandra* respectively in Queensland, Australia are described and illustrated as *Hyponectria acaciae* sp. nov., *Physalospora lomandrae* sp. nov. and *Trichosphaeria eucalypticola* sp. nov.

Key words: *Acacia*, *Eucalyptus*, *Lomandra*, taxonomy, unitunicate ascomycetes.

Introduction

During investigations of undetermined ascomycetes deposited in herbarium BRIP, species belonging to each of the widespread genera *Hyponectria* Sacc. (*Hyponectriaceae*), *Physalospora* Niessl (*Hyponectriaceae*) and *Trichosphaeria* Fuckel (*Trichosphaeriaceae*) were found. These three species could not be matched with any known species in these genera and are therefore described as new.

Materials and Methods

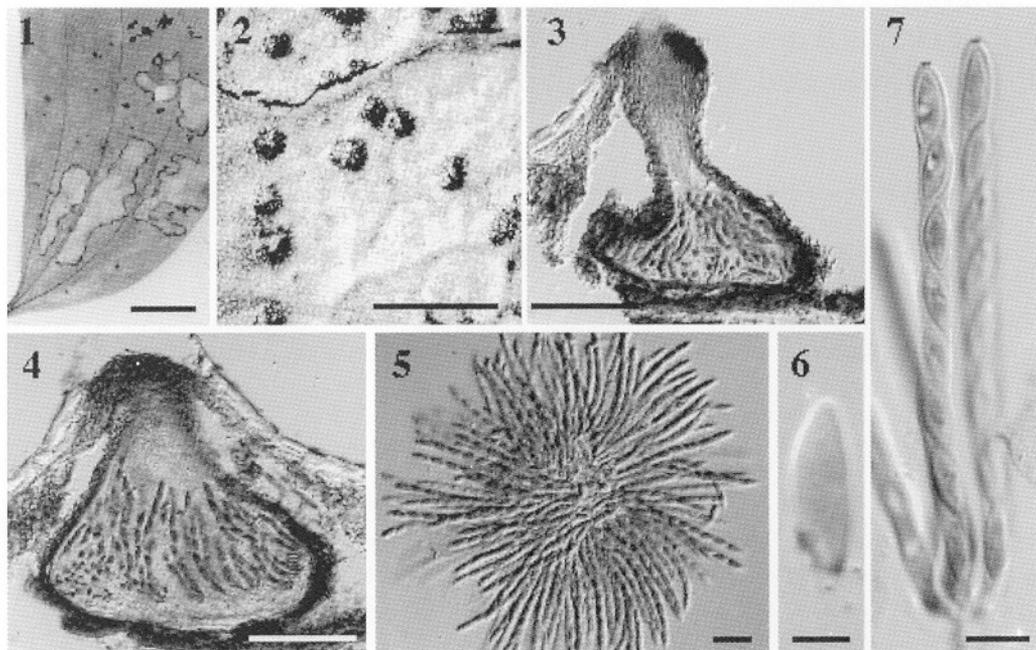
Observations and measurements were made from dried herbarium material. Sections were cut using a freezing microtome, mostly at a thickness of 10 µm, mounted in lactofuchsin and observed using brightfield and Nomarski differential interference contrast microscopy. Photomicrographs were taken using a digital camera (Leica 200 with IM1000 Multifocus Module).

Taxonomy

***Hyponectria acaciae* Sivan. & R.G. Shivas, sp. nov.** (Figs. 1-7)

Etymology: based on *Acacia*, the name of the host genus.

Maculae amphigenae, rotundatae vel ellipticae vel irregulares, pallide albidae vel pallide brunneae, sine margine atrobrunneae vel nigrae, usque 5 mm longae. *Ascomata*



Figs. 1-7. *Hyponectria acaciae* (from holotype). 1. Leaf spots. 2. Ascomata on leaf. 3-4. Vertical sections of ascomata. 5. Asci. 6. Ascospore. 7. Asci with amyloid apical rings. Bars: 1 = 2 cm; 2 = 1 mm; 3-4 = 100 μ m; 5 = 20 μ m; 6 = 5 μ m; 7 = 10 μ m.

perithecia nigra, globosa vel depresso globosa, basalis applanatis, dispersa vel aggregata, amphigena, immersa infra clypeo, rostrata, 180-300 μ m lata, 180-270 μ m alta. Rostra recta, late cylindrica, erumpentia, periphysata, 72-95 \times 7.5-10 μ m. *Clypeus* atrobrunnea, 27-95 \times 7.5-10 μ m. Paries perithecii 9.5-19 μ m lati, 4-5-strati compositus. *Paraphyses* nullae. *Asci* cylindrici, brevipedicellati, tenuitunicati, unitunicati, octospori, 95-135 \times 7-7.5 μ m. *Ascosporae* ovoideae, extremo angustatae, aseptatae, hyalinae, laeves, guttulatae, 11.5-15.5 \times 7-7.5 μ m.

Anamorph: unknown.

Leaf spots amphigenous, rounded, elliptical or irregular and variable, pale white to pale brown with a brown to black margin, necrotic, up to 5 mm long. *Ascomata* perithecial, black, globose to depressed globose, with a flattened base, scattered to aggregated, solitary, amphigenous, immersed beneath a clypeus, beaked, soft, 180-300 μ m wide, 180-270 μ m high. *Neck* erect, broadly cylindrical, erumpent, periphysate, 72-95 \times 7.5-10 μ m. *Clypeus* dark brown, 27-95 \times 7.5-10 μ m. *Peridium* 9.5-19 μ m wide, composed of 4-5-layers of dark brown cells forming a *textura angularis*. *Paraphyses* not seen in mature perithecia. *Asci* cylindrical, short-stalked, thin-walled, unitunicate, 8-spored, 95-135 \times 7-7.5 μ m, with an amyloid apical apparatus. *Ascospores* ovoid with narrowing ends, aseptate, hyaline, smooth, guttulate when young, 11.5-15.5 \times 7-7.5 μ m.

Holotype designated here: AUSTRALIA, Queensland, Lannercost, on leaves of *Acacia* sp., 9 April 1996, M.N. Self, QFRI 8879 (P117) [BRIP 27826].

Host: *Acacia* sp.

Known distribution: Australia.

Notes: Barr (1977) recognised and provided a key to nine species of *Hyponectria* from North America. Six more species were added to the genus by Barr (1993), Cannon (1996), Katumoto (1981), Samuels *et al.* (1984) and Yuan and Barr in Yuan (1996). The genus contains an assemblage of taxa with amyloid or non-amyloid asci and is in need of revision. In Australia, two species are known and they are *H. grevilleae* Z.Q. Yuan & M.E. Barr and *H. syzygii* Z.Q. Yuan & M.E. Barr (Yuan, 1996). In these species the asci are presumably non-amyloid as no mention was made of them as either amyloid or non-amyloid in the descriptions. The ascospores are 12-16 × 4-6 µm in *H. grevilleae* and 12-19 × 3.5-5 µm in *H. syzygii*. The ascospores in *H. acaciae* are slightly smaller and much wider than in these two species from Australia. There are no reports of any *Hyponectria* described on *Acacia*. It may be necessary to accommodate this species in a new genus when a revisionary study of all the species in *Hyponectria* is undertaken, as it clearly differs from the type species of the genus in its ascomatal and ascus characters (Wang and Hyde, 1999).

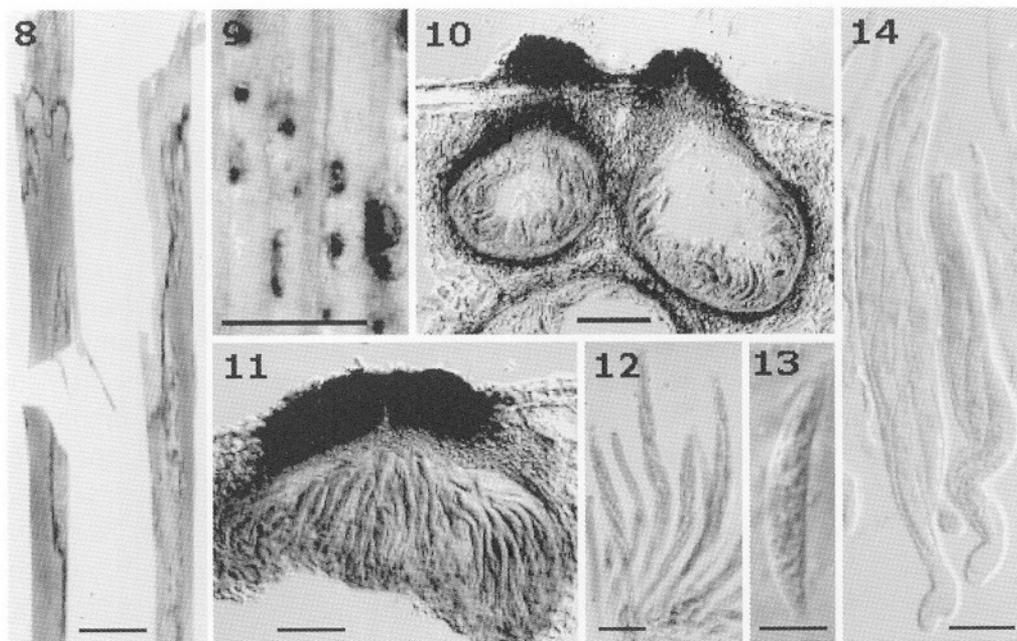
***Physalospora lomandrae* Sivan. & R.G. Shivas, sp. nov.** (Figs. 8-14)

Etymology: based on *Lomandra*, the name of the host genus.

Perithecia solitaria, immersa, subepidermalia, amphigena, globosa vel subglobosa, aliquando basalis applanatis, ostiolata, erumpentia, clypeata, 160-250 µm lata, 190-230 µm alta. *Clypeo* nigra, 115-130 µm longa, 24-38 µm lata. Ostium periphysatum. Paries perithecii usque 23 µm lata, externo 3-4-strato e cellulis angularibus vel polygonalis, crassitunicatis, brunneis, usque 9.5 µm crassis, interno minus crassitunicatis, compressis, rectangularis, brunneis compositus. *Paraphyses* hyalinae, septatae, simplices, filiformes, usque 1 µm latae. *Asci* cylindrici, brevipedicellati, unitunicati, octospori, tenuitunicati, evanescenti, 90-106 × 8.5-10 µm. *Ascospores* aseptatae, fusiformes, latissime median, apicibus attenuatus, rectae vel curvatae, aliquando guttulate, imbricate biseriatae, hyalinae vel aliquando pallide brunneae ad maturitatem, 22-25 × 3.8-6 µm.

Anamorph: unknown.

Perithecia solitary, immersed, subepidermal, amphigenous, globose to subglobose, sometimes with the base flattened, ostiolate, clypeate, 160-250 µm wide, 190-230 µm high. *Clypeus* black, 115-135 µm long, 24-38 µm thick around the periphysate ostiole. *Peridium* up to 23 µm thick is composed externally of 3-4-layers of angular to polygonal, thick-walled, brown, up to 9.5 µm thick cells, internally less thick-walled, compressed, rectangular brown cells. *Paraphyses* hyaline, septate, unbranched, filiform, up to 1 µm thick, deliquescent. *Asci* cylindrical, short-stalked, unitunicate, 8-spored, thin-walled, evanescent, 90-106 × 8.5-10 µm. *Ascospores* aseptate, fusiform, wider in the



Figs. 8-14. *Physalospora lomandrae* (from holotype). **8.** Leaves with necrotic spots bearing ascomata. **9.** Ascomata on leaf. **10-11.** Vertical sections of ascomata. **12.** Asci. **13.** Ascospore. **14.** Ascus. Bars: 8 = 1 cm; 9 = 1 mm; 10-11 = 100 μ m; 12 = 20 μ m; 13 = 5 μ m; 14 = 10 μ m.

middle, narrowing to attenuated ends, hyaline, sometimes becoming pale brown at maturity, sometimes guttulate, straight to curved, overlapping biseriate, 22-25 \times 3.8-6 μ m.

Holotype designated here: AUSTRALIA, Queensland, Lamington Plateau, on leaves of *Lomandra longifolia*, 29 November 1977, J.L. Alcorn 7781 [BRIP 12485].

Host: *Lomandra longifolia* Labill.

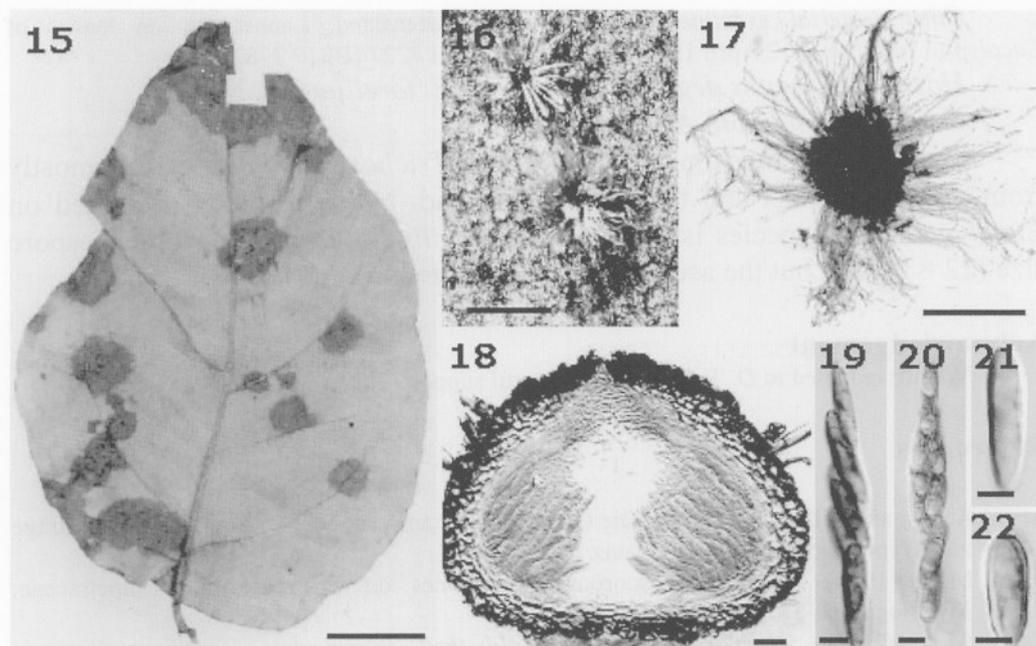
Known distribution: Australia.

Notes: This species differs from all known species of *Physalospora* (Arx and Müller, 1954, Barr, 1970) by its characteristic ascospore shape. The ascospores in the other species usually have rounded ends.

***Trichosphaeria eucalypticola* Sivan. & R.G. Shivas, sp. nov.** (Figs. 15-22)

Etymology: based on *Eucalyptus*, the name of the host genus.

Mycelia superficialia ex hyphae pallide brunneae, laeves, septatae, ramosae, usque 5 μ m latae. *Ascomata perithecia* globosa vel subglobosa, basali applanata, superficialia, amphigena, atrobrunnea, setosa, ostiolata, dispersa vel aliquando aggregata, 170-250 μ m lata, 150-230 μ m alta. *Setae* numerosae, pallide brunneae, septatae, laeves, usque 600 μ m longae et 7 μ m latae. *Paries perithecii* usque 26 μ m lati e cellulis polygonalibus vel angularis, atrobrunneis, crassitunicatis in exteriori, sed subhyalinis vel hyalinis, tenuitunicatis et compressis in interiori compositus est. *Paraphyses* deliquescentes. *Asci* cylindrici vel cylindrici obclavati, brevipedicellati, unitunicati, octospori, apicali cum structura parva, haud amyloidea tenua, 70-



Figs. 15-22. *Trichosphaeria eucalypticola* (from holotype). 15. Leaf with necrotic spots. 16. Ascomata on leaf. 17. Ascomata. 18. Vertical section of ascoma. 19-20. Asci. 21-22. Ascospores. Bars: 15 = 2 cm; 16 = 1 mm; 17 = 200 μ m; 18 = 20 μ m; 19-22 = 5 μ m.

95 \times 9.5-11.5 μ m. *Ascospores* anguste ellipticae vel fusiformes, hyalinae, aseptatae, laeves, guttulate, pro parte rectae, aliquando leniter curvatae, oblique uniseriatae vel biseriatae, 16-23 \times 4.5-6 μ m.

Anamorph: unknown.

Mycelia superficial, composed of pale brown, smooth, septate, branched, up to 5 μ m thick hyphae. *Ascomata* perithecial, globose to subglobose with a flattened base, superficial, amphigenous, dark brown, setose, scattered to a few closely grouped, 170-250 μ m wide, 150-230 μ m high. *Setae* numerous, pale brown, septate, smooth, up to 600 μ m long and 7 μ m wide, giving a star-like appearance to the ascoma. *Peridium* up to 26 μ m thick is composed of polygonal to angular, dark brown, thick-walled cells towards the outside, and subhyaline to hyaline, thin-walled, compressed cells towards the interior. *Paraphyses* deliquescent early. *Asci* cylindrical to cylindrical clavate, short-stalked, unitunicate, 8-spored, 70-95 \times 9.5-11 μ m with a non-amyloid apical structure. *Ascospores* narrowly elliptical to fusiform, hyaline, aseptate, smooth, guttulate when young, mostly straight, sometimes slightly curved, obliquely uniseriate to biseriata inside ascus, 16-23 \times 4.5-6 μ m.

Holotype designated here: AUSTRALIA, Queensland, Babinda, on leaves of *Eucalyptus deglupta*, 6 July 2000, M.H. Ivory QFRI 9787 [BRIP 27808].

Other material examined: AUSTRALIA, Queensland, Lannercost, on leaves of *Eucalyptus torelliana*, 12 April 1989, B.N. Brown QFRI 7227 [BRIP 27827].

Hosts: *Eucalyptus deglupta* Blume and *E. torelliana* F. Muell.

Known distribution: **Australia.**

Notes: There are about 25 species of *Trichosphaeria* described mostly from woody habitats and they are widespread. None has been described on *Eucalyptus*. This species is close to *T. notabilis* Mouton (1900) in ascospore size ($22 \times 8 \mu\text{m}$), but the asci are always 4-spored in *T. notabilis*.

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