A new species of the lichenicolous genus *Phaeospora* Hepp ex Stein (Verrucariales) from Australia

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Abstract

A pyrenocarpous microfungus, collected from consolidated soil in *Eucalyptus*-dominated woodland in the Australian Capital Territory, proved to be a species of the lichenicolous genus *Phaeospora* Hepp ex Stein (Verrucariales), probably parasitic on the endemic *Sarcogyne terrulenta* P.M.McCarthy & Elix (Acarosporaceae). *Phaeospora australiensis* P.M.McCarthy & Elix has minute, semi-immersed to almost superficial perithecia lacking an involucrellum and paraphyses, but with a uniformly brown-black excipulum, simple periphyses, an amyloid hymenium, (4–8)-spored fissitunicate asci, and 3-septate ascospores that are medium grey or medium brown or brownish grey, lack a perispore, and measure 12–22 × 4.5–8 µm.

Introduction

The lichenicolous fungal genus *Phaeospora* Hepp ex Stein is most diverse in temperate and higher latitudes of both hemispheres. It is characterized by simple, perithecioid ascomata with medium brown or brownish grey, narrowly ellipsoid to oblong-fusiform or oblong, thin-walled and lacking a perispore at maturity, 12–22 × 4.5–8 µm.

Type: Australia. Australian Capital Territory, c. 5 km W of Canberra, Cook, between Bindubi Street and the horse paddocks, 35°16′08″S, 149°04′29″E, 630 m alt., probably lichenicolous on *Sarcogyne terrulenta* on a consolidated soil bank in dry *Eucalyptus* woodland, J.A. Elix 46984, 25iii.2020 (holotype – CANB).

Vegetative hypha indistinct, hyaline. *Ascomata* perithecia, moderately numerous, solitary, scattered, semi-immersed and hemispherical to almost superficial and subglobose, (0.11–) 0.17–0.25 (–0.35)(–0.5) mm diam. [n = 50], jet-black, the surface smooth and dull to glossy; not to slightly or deeply constricted at the septa, initially hyaline, 10–15 µm thick.

Associated species include *Aspicilia*, *Catolechia*, *Diplotomma*, *Evernia*, *Lecidea*, *Micarea*, *Peltigera*, *Rhizocarpon*, *Pseudocyphellaria*, *Sarcogyne*, *Sarcoscypha*, *Trapelia*, and *Verrucaria*.

Phaeospora australiensis P.M.McCarthy & Elix sp. nov. is described from a community of terrolic lichens in the Australian Capital Territory. While the identity of the host lichen is not known with complete certainty, it is probably the endemic, crustose species *Sarcogyne terrulenta* P.M.McCarthy & Elix (Acarosporaceae).

Methods

Observations and measurements of ascomatal anatomy, asci and ascospores were made on hand-cut sections mounted in water and dilute KOH (K). Asci were also observed in Lugol’s iodine (I), with and without pretreatment in K.

Phaeospora australiensis P.M.McCarthy & Elix sp. nov. is described from consolidated soil in *Eucalyptus*-dominated woodland in the Australian Capital Territory. This is the first record of a lichenicolous fungus associated with *Sarcogyne terrulenta* in Australia. *Sarcogyne terrulenta* is a common lichen in the southern parts of the continent, often occurring on areas of endosubstratal thalli, where the host is most effuse and nondescript and where the immersed algae form sparse or rather dense clumps, but not a distinct layer. Cells are chlorococcoid, globose or broadly ellipsoid, thin-walled and (5–)6–11(–12) µm wide, while

Lichenicolous on an immersed, terricolous host, probably depauperate thalli of *Sarcogyne terrulenta* P.M.McCarthy & Elix, with black, semi-immersed to almost superficial, simple perithecia, 0.11–0.25 mm diam., each with a brown-black excipulum, unbranched periphyses (c. 10–18 × 2–3 µm) but without paraphyses. Hymenial gel K+ medium blue. Asci (4–8)-spored, 51–62 × 10–15 µm. Ascospores 3-septate, medium grey or medium brown or brownish grey, narrowly ellipsoid to oblong-fusiform or oblong, thin-walled and lacking a perispore at maturity, 12–22 × 4.5–8 µm.

**Figure 1:** Asci and ascospores of *Phaeospora australiensis* P.M.McCarthy & Elix sp. nov.
the interstitial, mycobiont hyphae (or possibly the vegetative hyphae of the parasite) are hyaline, thin-walled, long-celled and 1.5–2.5 µm wide. *Acarospora tasmaniensis* is a noteworthy record here. Formerly *Polysporina terricola* Kantvilas and endemic to Tasmania (Kantvilas 1998), this is among the first records of the species from mainland Australia (see below).

The type collection of *Phaeospora australiensis* consists of approximately 100 perithecia on about 25 square centimetres of soil crust, and the only indication of a recognizable lichen is a single apothecium of *Sarcogyne terrulenta* inhabiting a consolidated soil bank in dry *Eucalyptus* woodland, *P.M. McCarthy* 4936, 8.v.2020 (CANB).

**ADDITIONAL SPECIMEN EXAMINED**

*Australian Capital Territory.* c. 5 km W of Canberra. Cook, between Bindubi Street and the horse paddocks, 35°16′08″S, 149°04′29″E, 630 m alt., probably lichenicolous on *Sarcogyne terrulenta* inhabiting a consolidated soil bank in dry *Eucalyptus* woodland. *P.M. McCarthy* 4936, 8.v.2020 (CANB).


**SPECIMENS EXAMINED**

*Australian Capital Territory.* c. 5 km W of Canberra. Cook, between Bindubi Street and the horse paddocks, 35°16′08″S, 149°04′29″E, 630 m alt., on a consolidated soil bank in dry *Eucalyptus* woodland. *P.M. McCarthy* 4937, 8.v.2020 (CANB).

*New South Wales.* Southern Tablelands, adjacent to Kings Highway, 12 km E of Bungendore, 35°15′01″S, 149°34′29″E, 865 m alt., on consolidated soil in open *Eucalyptus* woodland, *J.A. Elix* 46920, 20.ii.2020 (CANB).

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**References**


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