

***Diploschistes elixii* (Ostropales: Thelotremataceae), an overlooked terricolous species from Western Australia**

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Abstract: The new species *Diploschistes elixii* is described from Western Australia. It is characterized by perithecioid ascomata and large ascospores. It resembles *D. hensseniae* but is readily distinguished by larger ascospores (up to 45 µm), having lecanoric acid as major constituent, and an epruinose thallus surface. It is currently known from several localities in south-western Australia, where it grows on soil.

Key words: Australia, new species, *Ostropales*, taxonomy, *Thelotremataceae*

Introduction

The genus *Diploschistes* Norman is classified in the *Thelotremataceae* (Eriksson 2006) and includes crustose lichens with a dark-pigmented pseudoparenchymatous proper exciple, lateral paraphyses and a trebouxoid photobiont (Lumbsch 1989; Guderley & Lumbsch 1996; Guderley *et al.* 1997). The genus exhibits a remarkable variability in the morphology of the ascomata, varying from perithecioid to urceolate and lecanoroid ascomata (Lumbsch 1989). Despite this variation, the genus is a monophyletic group according to preliminary molecular studies (Frisch *et al.* 2006; Martin *et al.* 2003). The genus is widely distributed in arid and semi-arid regions worldwide. While most species occur on rocks, some are terricolous and a few species are rarely found on wood or bark. Currently, the genus contains approximately 30 species (Guderley & Lumbsch 1996). The Australian species were revised by Lumbsch & Elix (2003) who accepted 15 species. In our continuing revision of *Thelotremataceae* in Australia, we came

across a species that John Elix sent us. The material resembles *D. hensseniae* (Lumbsch & Elix 2003) in its terricolous habitat and ascoma morphology, but differs in having larger ascospores. A subsequent analysis of the material revealed that the specimens belong to an overlooked species that is described below.

Materials and Methods

Specimens are deposited in the herbaria PERTH, CANB and F. Thalli and apothecia were cut using a razor blade and examined in water. The chemical constituents were identified using thin layer chromatography (TLC) and high-performance liquid chromatography (HPLC) (Feige *et al.* 1993; Lumbsch 2002).

The Species

***Diploschistes elixii* Lumbsch et Mangold sp. nov.**

Mycobank no. MB 510570

Diploschistes elixii similis sed ab hac specie ascosporis maioribus differt.

Type: Australia, Western Australia, Bullfinch-Evanston Road, 24.7 km N of Bullfinch, 30°47'S, 119°09'E, *Eucalyptus* woodland with saltbush and shrub understorey, 345 m, on soil, 28 April 2004, J. A. Elix 32458 (PERTH—holotypus, CANB, F—*isotypi*).

(Fig. 1)

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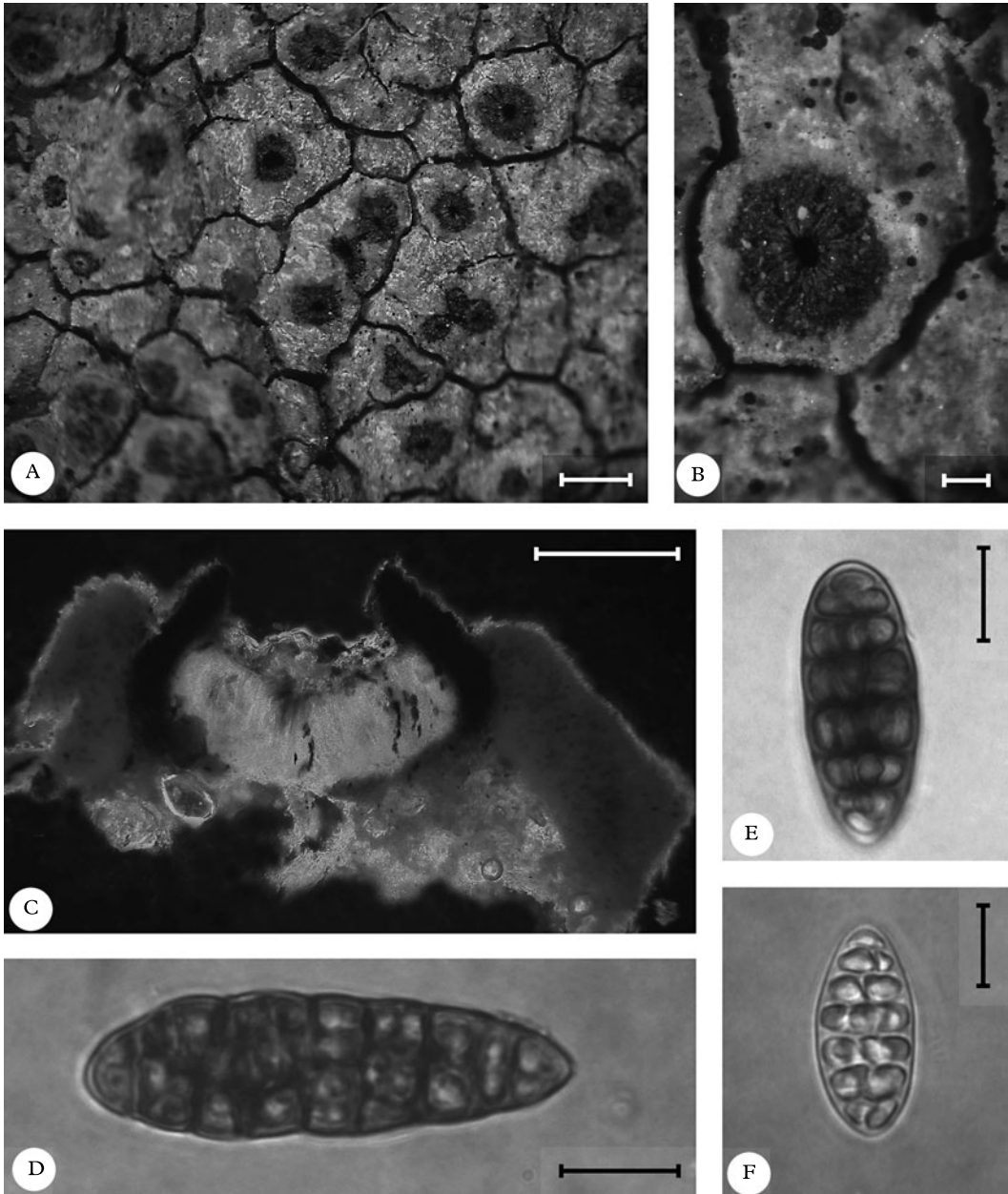


FIG. 1. *Diploschistes elixii* (holotype). A, habit; B, perithecioid ascoma; C, section through ascoma; D & E, mature ascospores; F, young ascospore. Scales: A=1mm; B & C=200 µm; D–F =10 µm.

Thallus terricolous, uniform, adnate, whitish grey to grey, moderately thick, up to 0.6 mm thick. Surface shiny, glabrous, areolate, verrucose to verruculose, epruinose.

Areoles 0.4–1.0 mm diam., irregularly angular or roundish; hyphae penetrating into the substratum. Thallus covered by an epinecral layer, hyphae 1–2 µm thick. *Photobiont*

trebouxioid, with cells *c.* 20 µm diam. *Vegetative propagules* absent. *Prothallus* not visible.

Ascomata perithecioid, solitary, immersed, blackish, epruinose to slightly pruinose, orbicular, up to 0.8 mm diam. and up to 0.3 mm tall, discs urceolate. *Proper exciple* blackish, 40–65 µm thick, pseudoparenchymatous. *Hypothecium* 10 µm tall, hyaline. *Hymenium* 110–150 µm tall, hyaline, not interspersed. *Epithemium* indistinct. *Paraphyses* 1–1.5 µm thick, simple; apices not thickened. *Asci* cylindrical, apically thickened, non-amyloid, (2–)4–8-spored. *Ascospores* ellipsoid, brown, muriform, 25–45 × 14–20 µm, with 7–10 transverse septa and 1–3 longitudinal septa.

Pycnidia not seen.

Chemistry. Thallus and apothecia K– or K+ yellowish, C+ red, KC–, PD–; containing lecanoric acid (major) and diploschistesic acid (minor).

Etymology. The new species is named after John (Jack) Elix, a distinguished Australian lichenologist and a long-time collaborator in our *Thelotremataceae* studies, who collected all currently known material of this taxon.

Notes. *Diploschistes elixii* is characterized by its large ascospores, the epruinose thallus surface and the presence of lecanoric acid as the major constituent. It is morphologically similar to *D. hensseniae* (Lumbsch & Elix 2003), but this species differs in having smaller ascospores (up to 24 µm long) with fewer transverse septa (5–7), a whitish-pruinose thallus surface and containing diploschistesic acid as the major compound. Other *Diploschistes* species with perithecioid ascomata, lecanoric acid as the major secondary metabolite and an epruinose thallus in Australia include *D. actinostomus*, *D. diploschistoides* and *D. microsporus* (Lumbsch & Elix 2003). These three species occur on siliceous rocks and have not been found on soil. Morphologically, *D. microsporus* differs from the new species in having smaller ascospores (up to 18 µm long), while the ascospores in *D. diploschistoides* are larger

and have a strongly amyloid halo (Guderley & Lumbsch 1996). *Diploschistes actinostomus* is readily distinguished by smaller, broadly ellipsoid ascospores (16–32 × 10–20 µm) and the plane areoles that are never verrucose (Lumbsch 1989).

At present the new species is known from *Eucalyptus* and *Acacia-Eucalyptus* woodlands in south-western Australia, where it grows on siliceous soils at an altitude *c.* 300 to 400 m.

Additional specimens examined. **Australia:** *Western Australia:* Great N Hwy, 72 km NE of Wubin, 29°39'53"S, 117°07'11"E, *J. A. Elix* 33498 (CANB, PERTH); Kurrawang Nat. Reserve, 16.5 km SW of Kalgoorlie, 30°49'40"S, 121°21'58"E, *J. A. Elix* 32354 (CANB, PERTH); Southern Cross—Koolyanobbling road 21.5 km S of Koolyanobbling, 30°48'50"S, 119°28'32"E, *J. A. Elix* 32450 (CANB, PERTH).

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