

***Placidopsis parva* (lichenized Ascomycota, Verrucariaceae), a new species from siliceous rocks in the Australian Capital Territory**

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Abstract

Placidopsis parva P.M. McCarthy (Verrucariaceae) is described from siliceous rocks in the Australian Capital Territory. It is characterized by a blackish, corticate, microsquamulose thallus, a concolorous, hyphal hypothallus, very small but prominent, simple perithecia (0.07–0.12(–0.15) mm diam., and 1-septate ascospores measuring (13–)17(–21) × (5.5–)7(–8.5) μm.

Introduction

Placidopsis Beltr., a predominantly Northern Hemisphere genus of 14 species, is known from soil and rock at temperate to boreal latitudes and in arid and semi-arid regions (Breuss 1996; Prieto *et al.* 2010a). Closely related to *Catapyrenium* Flotow, it is characterized by the combination of a small- to minutely squamulose thallus attached by loose rhizohyphae or a more prominent hypothallus, verrucarioid perithecia (with or without an involucrellum, and lacking paraphyses but with periphyses) and 1-septate ascospores (Breuss 1996; Prieto *et al.* 2010a, b).

In this paper, a new species of *Placidopsis* is documented from siliceous rocks in the A.C.T., the genus itself being reported for the first time from Australia.

Methods

Observations and measurements of thallus and ascotal 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.

***Placidopsis parva* P.M. McCarthy, sp. nov.**

Fig. 1

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Similar to *P. hypothallina* Aptroot in having a dark, microsquamulose thallus on a hypothallus of blackish hyphae, and diminutive perithecia, but differs in having superficial rather than fully immersed perithecia and discontinuously larger asci and ascospores.

Type: Australia: Australian Capital Territory, Woodstock Nature Reserve, Shepherds Lookout Walk, 20 km WNW of Canberra, 35°14'34"S, 148°58'38"E, 555 m alt., on porphyry pebbles in open *Eucalyptus-Callitris* woodland, *J.A. Elix 46625*, 17.vii.2018 (holotype – CANB).

Thallus epilithic on siliceous rocks, crustose-areolate to minutely squamulose, forming colonies to 1.5(–2) cm wide, greyish black to dull green-black, slightly paler and ± pulpy when wetted; areoles/squamules scattered to contiguous, plane to slightly convex, entire or with a minutely lobate margin, smooth, rounded (when scattered) to ± angular (when contiguous), to 0.08–0.2(–0.33) mm wide, 50–80 μm thick, epruinose, corticate above and below. *Upper cortex* parenchymatous, 8–10 μm thick, usually a single layer (rarely 2 layers) of thick-walled, dark greenish brown-pigmented cells (4–)5–7(–8) μm wide; lower cortex to 20 μm thick, of scattered or clustered, rounded, dark-walled cells (as in the upper cortex), these giving rise to blackish hypothalline hyphae that form a loose to dense reticulum linking adjacent or more dispersed areoles/squamules, and also 'foraging' ahead of the thallus margin as a prothallus; hyphae of dark brown to blackish, thick-walled cells 6–10(–14) μm long and 4–6(–7) μm wide, usually slightly to markedly constricted at the septa. *Photobiont* chlorococcoid; cells green, globose, (7–)8–13(–16) μm diam., evenly dispersed between the upper and lower cortices; interstitial hyphae short-celled, 2.5–3.5(–4) μm wide. *Medulla* not apparent. *Ascomata* peri-

thecia, usually very numerous, solitary, scattered, (0.07–)0.12(–0.15) mm diam. [*n* = 50], 1–3 per squamule, subglobose, dull black, smooth, 1/3 immersed to almost superficial, not overgrown by the thallus; perithecial apex rounded, the apices of post-mature ascomata rounded to excavate; ostiole punctiform, in a shallow, central depression. *Involucrellum* absent. *Excipulum* uniformly 15–25(–32) μm thick at the base, sides and towards the apex, greenish black and parenchymatous in thin section, K–; cells rounded to periclinally elongate, thick-walled, 5–7.5 × 3–4(–5) μm. *Subhymenium* pale brown, c. 10 μm thick. *Paraphyses* absent. *Periphyses* sparingly branched, 10–18 × 1–1.5(–2) μm. *Hymenium* I–, KI–. *Asci* 8-spored, broadly obclavate to clavate-cylindrical, with a short, usually abrupt stalk, 42–56 × 16–24 μm [*n* = 20]; ascus wall initially thickened at the apex and with a tall, narrow ocular chamber that all but disappears as the apical wall becomes very thin at maturity, I–, KI–; ascoplasma I+ red-brown, KI+ red-brown. *Ascospores* irregularly arranged or biseriate in the ascus, colourless, 1-septate, narrowly ellipsoid to oblong-fusiform, straight or slightly curved, with a median or suprasedial septum (the distal cell shorter and more rounded than the proximal) and with rounded or subacute ends, slightly to markedly constricted at the septum, (13–)17(–21) × (5.5–)7(–8.5) μm [*n* = 50]; wall thin, smooth, lacking a perispore; contents clear to minutely granulose or small- to large-vacuolate. *Pycnidia* absent.

Etymology: The epithet *parva* refers to the diminutive perithecia of the new species.

Remarks

The new species is characterized by the dark, minutely areolate to microsquamulose, silicolous thallus on a loose hypothallus of blackish hyphae, along with very small, almost superficial perithecia and comparatively large ascospores. Thus, comparing it with other saxicolous species of *Placidopsis*, the Brazilian *P. hypothallina* Aptroot (Aptroot 2002) and *P. porinoides* Aptroot from China (Aptroot & Seaward 1999) have immersed perithecia up to 0.1 mm in diameter and ascospores 8–13 μm long, while *P. minor* R.C. Harris, from eastern U.S.A. and Greenland, has a pruinose thallus and ascospores of 8–10 × 4–5 μm (Harris 1979; Alstrup 1991; Breuss 1996). Furthermore, *P. sbarbaronis* Servit from Italy and *P. cavicola* Etayo & Breuss from Spain have perithecia of broadly similar size to the Australian lichen, the former having perithecia with an apical involucrellum (Servit 1953; Clauzade & Roux 1985), while *P. cavicola* has a hyaline excipulum and ascospores of 13–17 × 6–7 μm (Etayo & Breuss 1994).

Incidentally, when describing the pseudosquamulose *Thelidium robustum* P.M. McCarthy & Kantvilas from limestone in South Australia, the authors speculated that the lichen might actually be referable to *Placidopsis*, given the combination of thallus morphology, simple perithecia and 1-septate ascospores (McCarthy & Kantvilas 2016). However, the outwardly squamulose morphology of *T. robustum* at maturity is derived from crustose thallus initials, and the medulla and algal layer are impregnated with minute rock fragments and crystals, a feature typical of hemiendolithic Verrucariaceae (such as *Thelidium*) and not of taxa in which squamules develop on the substratum (e.g. *Placidopsis*).

The new species is known from comparatively soft to much harder siliceous rocks in dry *Eucalyptus* woodland in the Australian Capital Territory. It appears to be a primary colonizer of freshly exposed surfaces, later forming part of a diverse lichen community that can include various *Caloplaca* and *Xanthoparmelia* species, *Acarospora citrina* (Taylor) Zahlbr. ex Rech., *Aspicilia* spp., *Buellia amandineiformis* Elix & Kantvilas, *B. suttonensis* Elix & A. Knight, *Candelariella vitellina* (Hoffm.) Müll. Arg., *Diploschistes eugeneus* (A. Massal.) J. Steiner, *D. sticticus* (Körb.) Müll. Arg., *Lecanora pseudistera* Nyl., *Lecidea terrena* Nyl., *Lepra erubescens* (Hook. f. & Taylor) A. W. Archer & Elix, *Monerolechia badia* (Fr.) Kalb, *Myriospora smaragdula* (Wahlenb.) Nägeli ex Uloth, *Pertusaria lophocarpa* Körb., *Rhizocarpon geographicum* (L.) DC., *R. reductum* Th. Fr., *Trapelia coarctata* (Sm.) M. Choisy and *Verrucaria aff. nigrescens* Pers.

ADDITIONAL SPECIMENS EXAMINED

Australian Capital Territory: ● Woodstock Nature Reserve, Shepherds Lookout Walk, 20 km WNW of Canberra, 35°14'34"S, 148°58'38"E, 555 m alt., on porphyry rocks in open

Eucalyptus-*Callitris* woodland, P.M. McCarthy 4778, 4797, 5.xii.2018 (CANB); • *loc. id.*, P.M. McCarthy 4809, 4810, 17.vii.2018 (CANB); • Mount Ainslie, Canberra, W-facing slope below summit, 35°16'10"S, 149°09'32"E, 846 m alt., on siliceous rock outcrop in dry *Eucalyptus* woodland, P.M. McCarthy 4812, 4815, 4818, 4819, 2.i.2019 (CANB); • Mount Ainslie, Canberra, E-facing slope below summit, 35°15'59"S, 149°09'43"E, 780 m alt., on siliceous rock outcrop in dry *Eucalyptus* woodland, P.M. McCarthy 4821, 4823, 2.i.2019 (CANB); • Kowen Road, Kowen Forest, 11.7 km E of Canberra, 35°19'02"S, 149°15'07"E, 700 m alt., on sandstone outcrops on old road bank bordering dry *Eucalyptus* woodland, P.M. McCarthy 4829, 4838, 4839, 4842, 9.i.2019 (CANB).

References

- Alstrup, V (1991): Variation in *Placidiopsis minor* as shown by a specimen from Greenland. *Lichenologist* **23**, 89–91.
- Aptroot, A (2002): New and interesting lichens and lichenicolous fungi in Brazil. *Fungal Diversity* **9**, 15–45.
- Aptroot, A; Seaward, MRD (1999): Annotated checklist of Hong Kong lichens. *Tropical Bryology* **17**, 57–101.
- Breuss, O (1996): Revision der Flechtengattung *Placidiopsis* (Verrucariaceae). *Österreichische Zeitschrift für Pilzkunde* **5**, 65–94.
- Clauzade, G; Roux, C (1985): Likenoj de okcidenta Eŭropo. Ilustrita determinlibro. *Bulletin de la Société Botanique du Centre-Ouest*, Nouvelle Série, Numéro Spécial **7**, 1–893.
- Etayo, J; Breuss, O (1994): *Placidiopsis cavicola*, a new lichen species (Verrucariaceae) from the Pyrenees. *Österreichische Zeitschrift für Pilzkunde* **3**, 21–24.
- Harris, RC (1979): The genus *Placidiopsis* Beltr. (lichenized ascomycetes) new to North America as *Placidiopsis minor* sp. nov. *Michigan Botanist* **18**, 57–58.
- McCarthy, PM; Kantvilas, G (2016): *Thelidium robustum* sp. nov. (lichenized Ascomycota, Verrucariaceae) from Kangaroo Island, South Australia. *Journal of the Adelaide Botanic Garden* **29**, 37–40.
- Prieto, M; Martínez, I; Aragón, G (2010a): The genus *Placidiopsis* in the Iberian Peninsula and the Balearic Islands. *Mycotaxon* **114**, 463–472.
- Prieto, M; Martínez, I; Aragón, G; Otálora, MAG (2010b): Phylogenetic study of *Catapyrenium* s. str. (Verrucariaceae, lichen-forming Ascomycota) and related genus *Placidiopsis*. *Mycologia* **102**, 291–304.
- Servit, M (1953): Novae lichenum Pyrenocarporum species in Italia inventae (III). *Annali del Museo Civico di Storia Naturale di Genova* **66**, 236–249.

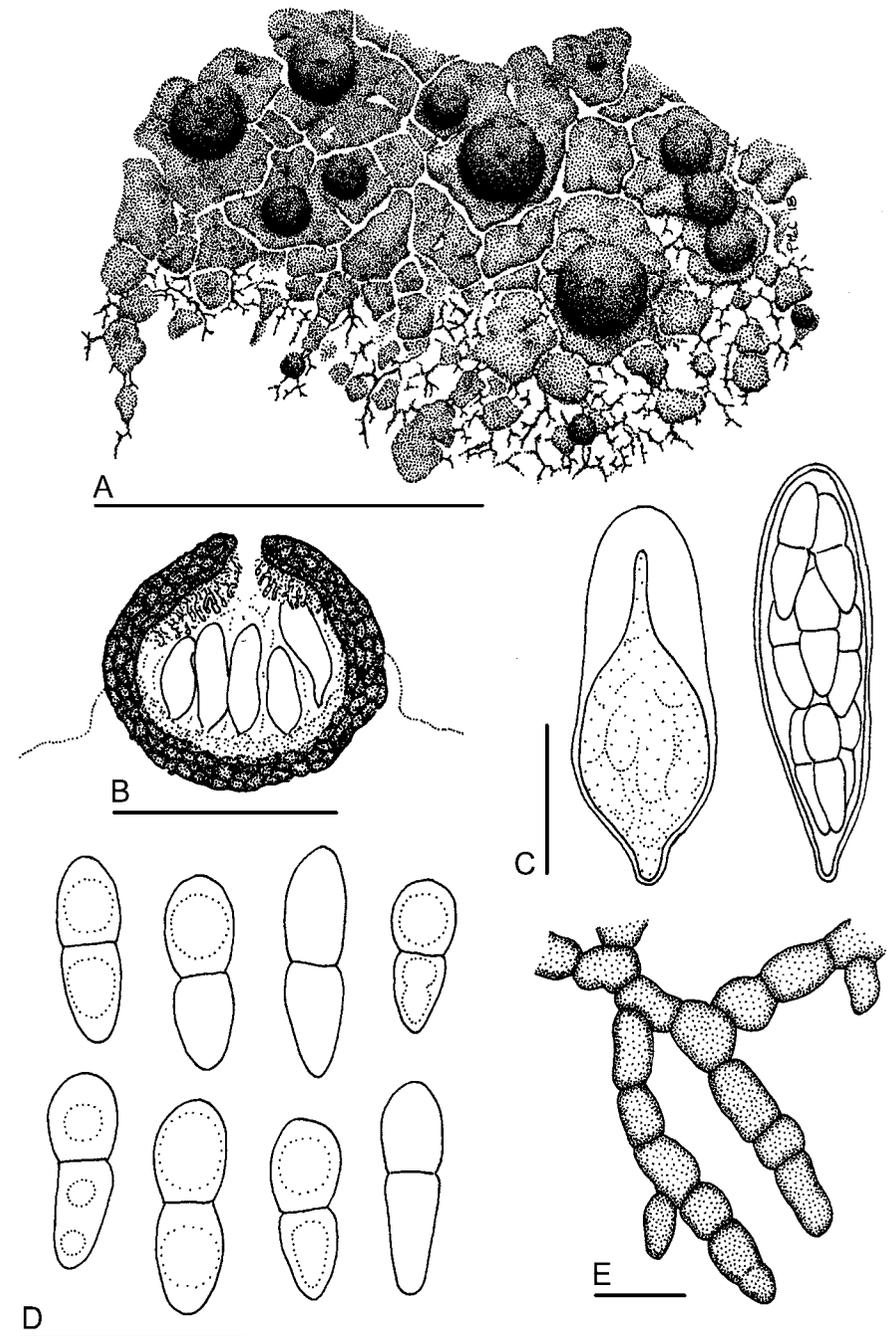


Figure 1. *Placidiopsis parva* (holotype). A, Habit of fertile thallus, the squamules linked by dark hypothalline hyphae; B, Vertical section of an ascoma (semi-schematic); C, Immature (left) and mature asci; D, Ascospores; E, Hypothalline hyphae. Scales: A = 0.5 mm; B = 0.1 mm; C, D = 20 µm, E = 10 µm.