Two new records of Phyllachora species on sedges (Cyperaceae) in Australia are recorded and described. Phyllachora cladii-glomerati which occurs on Baumea spp. was known previously only from New Zealand, and P. schoenicola on Schoenus apogon was recorded only from the Philippines. Each is widely distributed in Australia.

Introduction

During a recent survey of phyllachoraceous fungi in Australia for the Australian Biological Resources Study (Pearce & Hyde 2001, Pearce, Reddell & Hyde 1999, 2000, 2001), two previously unrecorded species of Phyllachora on sedges were discovered. Both were found while examining dried specimens of Cyperaceae in plant herbaria. Comparison of the foliicolous tar spots with type specimens confirmed their identity as Phyllachora cladi-glomerati and P. schoenicola. Phyllachora cladi-glomerati has previously been recorded only on Baumea rubiginosa in New Zealand. Phyllachora schoenicola has previously been recorded only on Schoenus apogon in the Philippines. Both taxa are described in this paper and illustrated with photomicrographs.

Material and methods

The holotypes of P. cladi-glomerati and P. schoenicola were borrowed from herbaria PDD and S and compared with specimens found on sedges in herbarium collections at AD, BRI, BRI (MBA), MELU and PERTH. Key
Phyllachora cladii-glomerati Hansf., Proceedings of the Linnean Society of New South Wales 82: 221 (1957)

Colonies: containing several perithecia beneath a common clypeus on culms, clypei 1–4.5 × 0.5–2.5 mm, black, shiny, ellipsoidal, elongate, parallel with leaf veins, sometimes slightly raised and flattened, ostioles minute and indistinct, occasionally surrounded by a narrow halo of reddish brown discoloured host tissue, up to 1 mm wide. Anamorph: not known.

Teleomorph: Ascomata immersed in the host parenchyma tissue, 136–420 μm diam., 294–600 μm high, usually ellipsoidal, occasionally globose, with a cylindrical to wide conical ostiolar canal, lined with fine hyaline peripheries. Upper peridium clypeate, consisting of deeply melanised, dark brown to black host epidermal cells and occasionally cuticle, often infiltrating the host parenchyma adjacent to the ostiolar canal, generally amorphous, but sometimes resembling textura intricata, up to 130 μm thick and extending laterally up to 1 mm from the ostiole, usually not involving host vascular bundles. Peridium also strongly melanised, comprising multiple layers of brown to brown-black, elongate, thin-walled, flattened cells, sometimes resembling textura intricata, c. 40–90 μm thick, merging inwardly with a hymenium consisting of several layers of hyaline, thin-walled, flattened cells, 5–10 μm thick. Peridium laterally merges with a narrow region of compressed host cells. Paraphyses numerous, filiform, as long as asc, 2.5–4 μm wide, tapering to rounded apices, thin-walled, hyaline, not constricted at the septa. Asci 114–194 × 9–16 μm, 2–4–6-spored, rarely 8-spored, narrow-cylindrical, short-pedicellate, thin-walled, unitunicate, apex truncate with an opaque, cup-shaped, ring-like, apical apparatus, 4–5 μm wide, 2.5 μm thick, non-reactive in Melzer’s reagent. Ascospores arranged uniseriately, often oblique, rarely overlapping, 17–26 × 5–10 μm, oblong, poles rounded, occasionally slightly ovoid or slightly inequilateral, aseptate, hyaline, thick-walled, enclosed in a clear mucilaginous sheath up to 13 μm thick. Plate 1.

Known host: Baumea rubiginosa (Spreng.) Boeck., B. teretifolia (R. Br.) Palla.

Known distribution: Australia, New Zealand.

Material examined: Australia, W.A.: south side of Toodyay Rd, 9 km from Great Northern Highway (just north of Northam), on culms of B. rubiginosa, 30 Nov. 1975, A.M. George (14) PERTH 02091267; Walpole-Nornalup National Park, Monastery Road, 1.4 km from junction with Gully road, on culms of B. rubiginosa, 2 Dec. 1992, J.R. Wheeler 3666 and S.T. Patrick PERTH 03823393; Yeaganup Lake, 34°32'S, 115°52'E., on culms of B. rubiginosa, 13 May 1991, C.J. Robinson (620) PERTH 03555593. Qld: Cape York Peninsula, 2.4 km north of Harmer Creek on track from Spencer’s Lease to Heathlands, Mapping Site SBN 13, 11°57'S, 142°54'E, on living culms of B. teretifolia, 12 Oct. 1991, J.R. Clarkson (JRC144) and V.J. Neldner BRI MBA.


Notes: Phyllachora cladii-glomerati was originally described from New Zealand by Hansford (1957). The Australian collections differ from the holotype, in having 2, 4, or rarely 6 to 8-spored asc. The asc of Australian collections are also variable in size, and often slightly longer than those of the type, 114–194 × 9–16 μm versus 120–140 × 10–11 μm respectively. The size of the ascospores in the Australian collections are also more variable (17–26 × 5–10 μm versus 22–26 × 7.5–9.5 μm for the type) and in this study have been found with a hyaline, mucilaginous sheath up to 13 μm thick.

Phyllachora cladii-glomerati most closely resembles P. epicladii (Cooke & Massee) Arx, described on Cladium from Port Phillip, Victoria. Although we have been unable to locate the holotype, or any other collections of P. epicladii, Arx (1957) originally reports the asc as being 8-spored, and the ascospores forming a slimy yellow spore mass at the ostiole. Phyllachora cladii-glomerati rarely has 8-spored asc, and the gelatinous ascomatal contents are generally hyaline.

Phyllachora schoenicola Syd., Annales Mycologici 11: 265 (1913)

Colonies: amphigenous, containing several perithecia beneath a common clypeus on culms, clypei 0.4–3 × 0.1–0.8 mm, black, shiny, roughly ellipsoidal, elongate, parallel with leaf veins, sometimes coalescing to form irregular lines, apex slightly to moderately raised and flattened, ostioles minute.
Anamorph: not known.
Andromorph: not known.
Teleomorph: Ascomata immersed in the parenchyma, occupying 1/2 to 3/4 leaf thickness, developing between vascular bundles, sometimes slightly distorted by them, often forming close to adjacent ascomata, up to five in an amphigenous group with ostioles opening to different leaf surfaces, 129–250 µm diam., 130–195 µm high, globose to oblate-sphaeroidal, with a central, or sometimes off-centre, wide conical ostiolar canal, lined with fine, hyaline periphyses. Upper and often lower peridium clypeate, consisting of deeply melanised, brown-black, amorphous host epidermis and adjacent parenchyma, sometimes incorporating the host cuticle, usually not infiltrating the host vascular tissue, up to 52 µm thick. Lateral peridium of variable thickness depending on number of ascomata involved. Single ascomata often thin-walled, lateral peridium 8–13 µm thick, consisting of multiple layers of thin-walled, flattened, light brown cells, sometimes resembling textura intricata, becoming hyaline on the inner hynenial surface. Groups of ascomata have thicker walls, similarly composed, but more deeply melanised, brown-black, 10–25 µm thick. The lateral peridium merges outwardly with a narrow region of discoloured yellow-brown, compressed host cells. Paraphyses numerous, filiform, slightly longer than asci, up to 4 µm diam., tapering to rounded apices, not constricted at septa, no branching observed. Asci 60–104 × 8.5–13 µm, 8-spored, cylindrical to cylindro-clavate, tapering to a rounded apex, short-pedicellate, uniloculate, thin-walled, no apical structure visible. Ascospores arranged obliquely uniseriate, sometimes biseriate and overlapping, 15.5–23 × 3–6.5 µm, fusiform with attenuated poles, sometimes ovoid, slightly inaequilateral, hyaline, guttulate, aseptate. Plate 2.

Known host: Schoenus apogon Roem. & Schult.
Known distribution: Australia, Philippines.


Philippines. Mt. Banahao, on living stems and leaves of S. apogon, 18 Feb. 1913, leg. E.B. Copeland (C.F. Baker no.853) S (holotype); collection site not given, on living foliage of S. apogon, date not given, R.T. Patton MELU 5833F.

Notes: Phyllachora schoenica is the only Phyllachora species described from Schoenus, and was previously known only from the Philippines (Sydow & Sydow 1913). The Australian collections differ from the holotype, in having slightly shorter asci, 60–85 × 8.5–13 µm versus 75–104 × 10–13 µm respectively, and slightly shorter and narrower ascospores, 15.5–23 × 3–6 µm versus 18–23 × 5–6.5 µm respectively.

We recognise six Phyllachora species from sedges in Australia, including P. anceps, P. cladii-glomerati, P. cyperi, P. epicladii, P. fimbristylis and P. schoenica (Pearce 2000).

Acknowledgements
We thank the Australian Biological Resources Study and the University of Hong Kong for funding this research. Laboratory space was provided by the Department of Primary Industries, Mareeba (1996), and the Tropical Forest Research Centre, CSIRO, Atherton (1997–1999). Dr Paul Reddell is thanked for logistical support in Atherton. A.Y.P. Lee and Helen Leung are thanked for technical assistance. Dr Paul Cannon is thanked for the use of his Phyllachoraceae database, which greatly simplified the process of identifying records of phyllachoraceous taxa involved, and locating references. Thanks to the curators of herbaria AD, BRI, BRI (MBA), MELU, PDD, PERTH and S for the loan of fungal collections.

References


