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Australasian Plant Pathology, 2006, **35**, 739–741

Podosphaera xanthii on *Euryops chrysanthemoides* in Australia

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Abstract. The anamorph of *Podosphaera xanthii* (*Erysiphaceae*) on *Euryops chrysanthemoides* is reported for the first time in Australia. A detailed description of the specimen is given, along with its rDNA internal transcribed spacer sequence.

In May 2005, a powdery mildew was found on the introduced ornamental *Euryops chrysanthemoides* (DC.) B. Nord. (*Asteraceae*) in a home garden in Brisbane, Queensland. Morphological examination revealed the anamorph of *Podosphaera fusca* (Fr.) U. Braun & Shishkoff sens. lat. (≡ *Sphaerotheca fusca* (Fr.) S. Blumer). A rDNA internal transcribed spacer (ITS) sequence was obtained according to Cunnington *et al*. (2003). This confirmed the identity as *P. xanthii* (Castagne) U. Braun & Shishkoff, a member of the *P. fusca* sens. lat. complex. The sequence has been deposited on GenBank under accession DQ205330. A description of the specimen is given below. The features of the specimen were measured in lactic acid.

Oidium anamorph of ***Podosphaera xanthii*** (Castagne) U. Braun & Shishkoff, in Braun & Takamatsu, emend. U. Braun, Shishkoff & S. Takam. Schlechtendalia 7: 50 (2001) on ***Euryops chrysanthemoides*** (Fig. 1*A–P*)

On living leaves. *Mycelium* epiphyllous, *hyphae* superficial, thin-walled, hyaline, substraight to strongly wavy, branched, with a septum near the branching point, 4–12 µm wide, presence of hyphal swellings; mycelial appressoria indistinct to nipple-shape. *Conidiophores* produced from the external mycelium, sometimes two per hyphal cell, hyaline, smooth, foot-cells 26–86 × 10–16 µm, followed by 1–3 shorter cells. *Conidia* with fibrosin bodies, in chain (up to 4 conidia), mature intercalary conidium sometimes present, ovoid, cylindrical, ellipsoid or doliiform, 20–39 × 12–22 µm, l/w ratio 1.3–2.5, hyaline, smooth, crenate edge lines formed by chained immature conidia (*sensu* Shin and La 1993). Germ tube usually small (1 × the length of the conidium), swollen or forked, up to three per conidium, on the shoulder of the conidium. *Teleomorph* not seen.

Material examined

Australia — On ***Euryops chrysanthemoides*** (DC.) B.Nord., Chapell Hill, Brisbane, Queensland, 3 May 2005, J.L. Alcorn (BRIP 46314).

Braun and Takamatsu (2000) merged the genera *Sphaerotheca* and *Podosphaera* and classified powdery mildews with relatively small ascomata, very large peridial cells, mycelioid appendages and a single ascus in the genus *Podosphaera* Kunze emend. U. Braun & S. Takam. sect. *Sphaerotheca* subsect. *Magnicellulatae*. Prior to this, all taxa of this subsection had been included in *S. humuli* var. *fuliginea* (Schltdl.: Fr.) E.S. Salmon, later renamed *S. fuliginea* (Schltdl.: Fr.) Poll. sens. lat. This polyphagous species was subsequently revised by Braun (1987) who concluded that forms on *Veronica* and *Veronicastrum* (*Scrophulariaceae*) should be referred to *S. fuliginea* var. *fuliginea* and *S. fuliginea* var. *sibirica* and the remainder to *S. fusca* sens. lat.

Hirata *et al*. (2000) used rDNA ITS sequences to infer the phylogeny of the group. Based on this data, Braun *et al*. (2001) concluded that *P. fusca* sens. lat should be split into two taxa with broad host ranges, *P. fusca* sens. str. and *P. xanthii* emend., while *P. fuliginea* sens. str. and *P. sibirica* (U. Braun) U. Braun & S. Takam. should only be used for a taxon on *Veronica* and another on *Veronicastrum*, respectively. *Podosphaera fusca* and *P. xanthii* emend. have morphologically identical anamorphs. The teleomorphs differ only by the size of the thin-walled apical portion of the asci (oculus). The ITS sequence obtained in this study is identical to haplotype 15 found by Hirata *et al*. (2000), which correlates to *P. xanthii*. Haplotype 15 contains several specimens collected from the *Asteraceae*, including one from *Euryops pectinatus*, collected in the United States of America.

10.1071/AP06067 0815-3191/06/060739

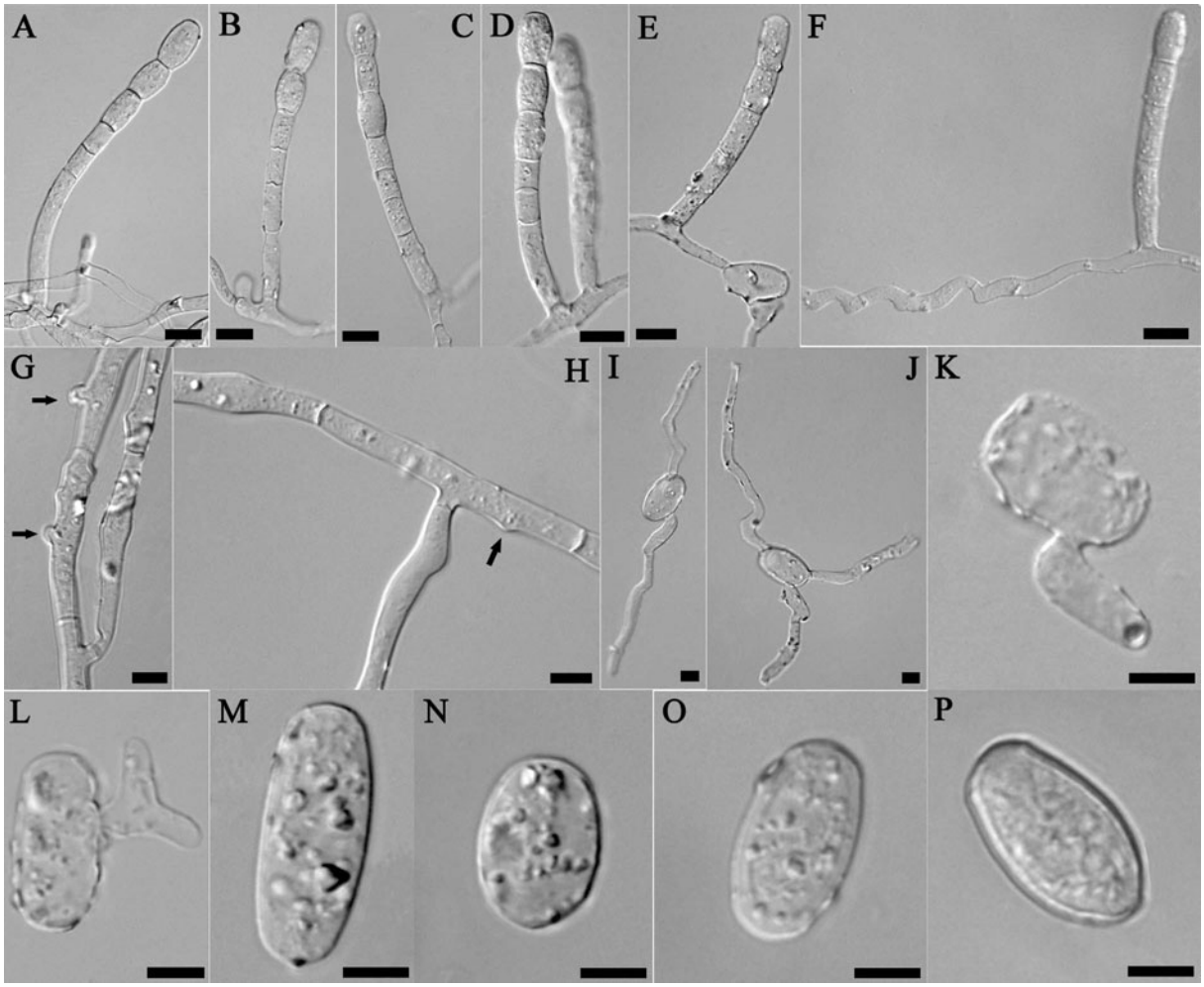

Fig. 1. *Podosphaera xanthii* on *Euryops chrysanthemoides* (BRIP 46314). (*A–F*) Conidiophore and immature conidia in chain (bar = 20 µm). (*G*, *H*) Hypha with nipple-shaped appressorium (arrow) and swollen hyphal cell (bar = 10 µm). (*I–L*) Swollen or forked germ tubes (bar = 10 µm). (*M–P*) Conidium (bar = 10 µm).

Podosphaera xanthii is the second powdery mildew fungus to be recorded from *Euryops* in Australia. Cunnington (2002) determined that specimen VPRI 17738, from *Euyrops linearis*, collected in Box Hill, Victoria, was a member of the *Golovinomyces cichoracearum* complex. These two taxa can be easily distinguished by their anamorphs. Unlike *Golovinomyces* species, the conidial germ tubes of *P. xanthii* are short and broadened, sometimes forked (Fig. 1*K*, *L*). Also, mature intercalary conidia sometimes developed (Fig. 1*C*) and conidia of *P. xanthii* contain fibrosin bodies, which are conspicuous refractive particles ~2–8 µm in diameter that can be visualised using a standard microscope lighting, when fresh conidia are mounted in 3% aqueous potassium hydroxide (Kable and Ballantyne 1963; Braun 1987).

Acknowledgements

The authors express their thanks to the Queensland Herbarium (BRI) for the identification of the plant species and to Dr J. L. Alcorn. J. R. Liberato acknowledges financial support from the Brazilian Fundação Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES).

The Editor apologises to the authors for the fact that this manuscript was mislaid during revision.

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Accepted 19 October 2005