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A new Pseudocercospora species on Passiflora setacea

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Abstract — A new *Pseudocercospora* species, *P. passiflorae-setaceae*, was detected causing severe leaf spotting on *Passiflora setacea* in Brasília, Distrito Federal, Brazil. The new species is described, and differences from other *Pseudocercospora* species on *Passiflora* are discussed.

Key words — cercosporoid fungi, Mycosphaerellaceae, tropical fruits, wild passion-fruit

Introduction

Native Passiflora L. species are common in the Cerrado as well as in other Brazilian Biomes (Cervi 1997, Nunes & Queiroz 2001, Vieira & Carneiro 2004). Among them *P. setacea* DC. deserves attention being now domesticated for fruit production. Mendes et al. (1999) listed fungal species associated with Passiflora in Brazil, but among them species of Pseudocercospora Speg. were not mentioned. Crous & Braun (2003) revised the names of hyphomycetes previously referred to as Cercospora Fresen. and Passalora Fr. and published numerous new combinations with updated descriptions of known cercosporoid fungi including those on Passiflora species [viz., two Passalora species (Passalora biformis (Peck) U. Braun & Crous and P. fuscovirens (Sacc.) U. Braun & Crous), four Cercospora species (C. granadillae Chupp, and three belonging to C. apii Fresen. s. lat. (viz., C. passifloricola Chupp, C. regalis Tharp, C. truncatella G.F. Atk.), and three *Pseudocercospora* species (*P. calospilea* (Syd.) Deighton, P. passiflorae U. Braun & Crous, and P. stahlii (F. Stevens) Deighton)] (Chupp 1954, Deighton 1976, Ellis 1976, Crous & Braun 2003). However, the fungus on P. setacea is quite distinct from the Cercospora and Passalora species mentioned, which possess conidiogenous cells and conidia conspicuously

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cicatrized. Furthermore, the new species does not coincide with the known *Pseudocercospora* species occurring on hosts of the *Passifloraceae* (Chupp 1954, Deighton 1976, Braun et al. 1999, Crous & Braun 2003, Farr et al. 2008). The specimen studied revealed unique features sufficient to be described as a new *Pseudocercospora* species.

Materials and methods

Leaves of *P. setacea* showing strong yellow leaf spotting were collected from a passion-fruit nursery at Embrapa Cerrados in Brasília. The sample was dried, numbered and deposited in the Mycological Collection of the Herbarium of the University of Brasília (UB- Col. Micol.). Studies under the stereomicroscope were followed by observations of squash preparations and sections made with a freezing microtome. The morphological features were described, measured, and documented using a Leica DM 2500 microscope coupled with a Leica DFC 490 digital camera connected to a microcomputer. Image capture, editing, and measurements were made with the help of Leica QWin V3 software. In some cases, the samples were stained with lacto-glycerol cotton blue and the slides sealed with nail polish, but most of the photographic work was done without staining using Nomarski optics. A minimum of fifty replicates of spore and hyphal measurements were made.

Taxonomy

Pseudocercospora passiflorae-setaceae A.C. Dianese, A.M. Costa & Dianese, sp. nov. Figs. 1-11.

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Pseudocercosporae passiflorae similis, sed stromatibus majoribus, (49-) 60–166 (–195) μ m diam., hyphis superficialibus cum conidiophoris solitariis evolutis et conidiis longioribus et latioribus, ad 129 x 5.5 μ m, ad 15-septatis.

LESIONS adaxial, widespread, formed as irregularly scattered yellow solitary leaf spots, later coalescing into light brown necrotic areas with central black dots; grayish irregular downy spots on the abaxial surface. IMMERSED MYCELIUM septate, light brown, within the mesophyll, forming epiphyllous stromata and hypophyllous superficial mycelium. STROMATA (49–)60–(102)–165(–195) µm diam, epiphyllous, subglobose to globose, brown to dark brown, subepidermal, erumpent, textura angularis. SUPERFICIAL MYCELIUM exclusively hypophyllous, strongly branched, intricate, abundant, light grayish brown to brown, giving rise to conidiophores and conidiogenous cells; hyphae 4–6 µm diam, subhyaline to light bown, septate, smooth, thin-walled. EPIPHYLLOUS CONIDIOPHORES 7–(14)–21(–31) x 2.5–(4)–5 µm, numerous, densely fasciculate,



Figs. 1-4. *Pseudocercospora passiflorae-setaceae* on leaves of *Passiflora setacea*. 1. Yellow irregular leaf spots on the adaxial face. 2. Gray irregular leaf spots on the abaxial face. 3. Adaxial lesion showing small dots (stromata) in the central portion of the adaxial side. 4. Abaxial lesions covered by velvety gray superficial mycelium.

formed on stromata, geniculate, light brown, septate, smooth, HYPOPHYLLOUS CONIDIOPHORES solitary, arising from superficial hyphae, lateral or terminal, aseptate, i.e. conidiophores reduced to conidiogenous cells. CONIDIOGENOUS CELLS integrated, terminal, 20–50 μ m long, sympodial; conidiogenous loci flattened, inconspicuous. CONIDIA solitary, cylindrical, rarely obclavate-cylindrical, 43–(86)–129 x 3–(3.5)–5.5 μ m, 5–15-septate, solitary, sub-hyaline to light brown, thin-walled, smooth; apex subacute to subobtuse; base truncate to somewhat obconically truncate, 3–4.5 μ m wide; hila neither thickened nor darkened.

SPECIMEN EXAMINED. **BRAZIL**. **DISTRITO FEDERAL**: **Planaltina**. CENTRO DE PESQUISA AGROPECUÁRIA DO CERRADO (CPAC), KM 18, BR-20 HIGHWAY NORTH, on living leaves of *Passiflora setacea*, 12 Feb 2008, *leg. Alexei de Campos Dianese* 95, **holotype**. (UB- Col. Micol. 20872).

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Figs. 5-6. *Pseudocercospora passiflorae-setaceae* on leaves of *Passiflora setacea*. Cross section of stromata with conidiophores on infected leaves showing the trans-mesophyllic mycelium (black arrows), and also the emerging hypophyllous superficial mycelium (white arrow).

Figs. 7-10. *Pseudocercospora passiflorae-setaceae*. 7. Hypophyllous intricate superficial mycelium. 8. Branching of the superficial mycelium with terminal conidiogenous cells. 9. Superficial mycelium (left arrow) bearing a geniculate conidiophore (right arrow) with a 10-septate conidium. 10. Conidia.

Discussion

All three known *Pseudocercospora* species on *Passiflora* are easily segregated from the new species, first of all, because they all lack an external hypophyllous mycelium with solitary conidiophores. Due to well-developed epiphyllous stromata with fasciculate conidiophores and similar conidia, *Pseudocercospora passiflorae* resembles *P. passiflorae-setaceae*, but the stromata are much smaller, and the conidia are shorter and narrower, usually 30–80 x 2–4 μ m, only with up to 10 septa (Crous & Braun 2003). The second species on *Passiflora, Pseudocercospora stahlii*, was originally described from Puerto Rico as *Helminthosporium stahlii* F. Stevens in 1917, and later found in the Virgin Islands and Dominican Republic. This species is also known from 16 countries in Asia and Australia mainly affecting *Passiflora foetida* (Hsieh & Goh 1990, Hyde & Alcorn 1993, Liu 1977, Guo t al. 1998, Shaw 1984, Thaung 1984, Zhuang 2001). *Pseudocercospora stahlii* differs from *P. passiflorae-setaceae* by having amphigenous fasciculate conidiophores, smaller stromata (20–40 μ m), and short, broad conidia with up to seven septa (Deighton 1976). Finally,

P. calospilea is clearly different from the new species by its smaller hypophyllous stromata (25–35 μ m diam.), hyaline to subhyaline, cylindrical-obclavate, 1-7-septate, smaller conidia (20–60 x 2–4 μ m). Based on the clear morphological differences, the introduction of a new species for the *Pseudocercospora* on *Passiflora setacea* is justified.

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