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Zasmidium persicae comb. nov., a new leaf spotting hyphomycete from Laos

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Abstract

Comprehensive examination of cercosporoid leaf-spotting hyphomycetes was carried out in the southern areas of Laos. During this study, a species of *Stenella* was recorded for the first time from Laos, and according to current taxonomic concepts, this species is transferred to the genus *Zasmidium*.

Key words – anamorphic fungi – cercosporoid hyphomycetes – new record – South East Asia – *Stenella persicae* – taxonomy

Introduction

Stenella was described by Sydow (1930) and recognized by Ellis (1971, 1976), who reduced *Biharia* Thirum. & Mishra (Thirumalachar & Mishra 1953, Misha et al. 1999) to synonymy with this genus. Deighton (1979) followed this concept of *Stenella* and differentiated it from *Mycovellosiella* based on the formation of verruculose superficial hyphae and usually rough-walled, catenate conidia. Up to the present time about 150 species were recorded. The main characters of *Stenella* are verruculose, superficial secondary mycelium and conidia amero- to scolecosporous, mostly verruculose. However, the oldest name *Zasmidium* is available for the whole complex (Crous & Braun 2003). Therefore, all *Stenella* species need to be reassessed, either by molecular methods or by detailed examination of the conidiogenous loci or scar structure. *Zasmidium* species from Laos were first described by Phengsintham et al. (2009, 2010, 2012) and eight species of *Zasmidium* have been recorded from Laos (Phengsintham et al. 2013). In this paper we provide a new record of a *Zasmidium* species from Laos.

Materials & Methods

Marcroscopic characteristics were observed using a stereoscope to check leaf spots and colonies/caespituli. Microscopic characters were observed using a compound microscope.

Where sufficient material was available, 30 measurements were made of mycelia and asexual reproductive structures. The average of the size of each component was calculated by using the formula:

$$(\bar{x} = \frac{\sum M}{n} \text{ µm}),$$

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Notes: $\bar{x}$ = is an average of the size of each component
m = is a size of each component
n = is a number of components

The species of cercosporoid hyphomycetes from Laos were determined on the basis of the current relevant taxonomic publications cited in the references.

Dried specimens were prepared and stored in the herbaria of the Biology Department, Faculty of Natural Sciences, National University of Laos and the Biology Department, Faculty of Sciences, Champasack University of Laos.

Taxonomy

Zasmidium persicae (T. Yokoy. & Nasu) Thapboualy, Souvannasane, Phengsintham & Karunarathna comb. nov. Figs 1–2

MycoBank number: MB 832090

Basionym – *Stenella persicae* T. Yokoy. & Nasu, Mycoscience 41(1): 92 (2000).

Description **–** *Leaf spots* circular to irregular, 0.1–1.6 × 0.1–1.4 mm diam. ($\bar{x}$ = 0.3 × 0.2 mm, n = 30), brown to dark brown in the center, margin yellow-brown. *Caespituli/colonies* amphigenous, small, scattered, brown. *Mycelium* internal and external; external hyphae branched, 1–4 µm wide ($\bar{x}$ = 3.3 µm, n = 8), septate, constricted at the septa, distance between septa 5–30 µm ($\bar{x}$ = 16.8 µm, n = 8), pale olivaceous-brown, wall 0.3–0.5 µm wide ($\bar{x}$ = 0.39 µm, n = 8), smooth or verruculose. *Stromata* lacking. *Conidiophores* solitary, borne on external hyphae, unbranched, cylindrical, 10–160 × 2–6 µm ($\bar{x}$ = 73.1 × 4.3 µm, n = 30), 1–10-septate, distance between septa 4–45 × 2–5 µm ($\bar{x}$ = 30.3 × 2.33 µm, n = 30), brown to dark brown, wall 0.5–0.8 µm wide ($\bar{x}$ = 0.58 µm, n = 30), smooth, 0–2 times geniculate; conidiogenous cells polyblastic, integrated, terminal or intercalary, 5–35 × 1–4 µm ($\bar{x}$ = 20.4 × 2.1 µm, n = 30), cylindrical, pale at the apex; *conidiogenous loci* small, conspicuous, subplanate to planate, 1–1.5 µm wide ($\bar{x}$ = 1.15 µm, n = 10), thickened, darkened. *Conidia* solitary or catenate sometimes subcylindrical, but mostly slightly obclavate, occasionally with lateral branchlets, straight or slightly curved to sinuous, 5–50 × 2–4 µm ($\bar{x}$ = 23.4 × 2.6 µm, n = 30), 0–5-septate, pale olivaceous, wall 0.3–0.5 µm wide ($\bar{x}$ = 0.36 µm, n = 30), smooth or finely verruculose, apex rounded or subtruncate, with a conspicuous hilum, base truncate, hila slightly thickened and darkened, 1–1.5 µm wide ($\bar{x}$ = 1.04 µm, n = 30), wall of hila 0.5–0.8 µm ($\bar{x}$ = 0.52 µm, n = 30) thick .

Known host **–** *Prunus persica* (Rosaceae).

Known distribution **–** Japan, Laos and Taiwan.

Material examined **–** Champasack Province, Paksong District, Phou Ouy Village, on leaves of *Prunus persica* (Rosaceae), 12 October 2015, Phanomxay Thapboualy (CPS 05/2015); ibid., 26 November 2015, Phanomxay Thapboualy (CPS 30/2015).

Discussion

Stenella persicae was originally described as causing mould of peach fruits (*Prunus persica* var. *vulgaris* Maxim.) in Japan (Yokoyama & Nasu 2000, Kirschner & Chen 2007). Another species, *Stenella anomoconis* de Hoog & Boekhout was described from *Prunus* sp.; it differs from *S. persicae* by longer (125–200 µm) conidiophores and non-catenate conidia (Hoog et al. 1983).

The conidiophores and conidia of *Stenella persicae* as described by Yokoyama & Nasu (2000) and of the Laos specimens are compared in Table 1, along with morphological details of *S. anomoconis*. The conidiophores of *Zasmidium persicae* from Lao collection has more varied septation (1–10 septa) compared to 3–8 septa from Japan. The Lao specimen was described directly from leaf spots of *Prunus persica* while from Japan it was described from a water agar culture.

Table 1 Comparison of conidiophores and conidia of *Zasmidium persicae* and *Stenella anomoconis* from *Prunus*.

	Conidiophores		Conidia	
	Length and width	**Septation**	**Length and width**	**Septation**
Stenella anomoconis (Hoog et al. 1983)	125–200 × 3.0–3.8 µm	3–12- septate	7.5–12.5 × 2.8–4.0 µm	1–5-septate
Stenella persicae (Yokoyama & Nasu 2000)	(20–)68–102(–111) × (3–)3.5–4 µm	3–8- septate	(4–)9–34(–55) × 2–4 µm	0–3-septate
Zasmidium persicae (this paper)	10–160 × 2–6 µm ($\overline{x}$ = 73.1 × 4.3 µm)	1–10-septate	5–50 × 2–4 µm ($\overline{x}$ = 23.4 × 2.6 µm)	0–5-septate

Fig. 1 – *Zasmidium persicae* on *Prunus persica* from leaf spots: 1 Leaf spots. 2 Caespituli. 3 Hyphae. 4–8 Conidiophores. 9–17 Conidia. Scale bars: 3–17 = 10 µm.

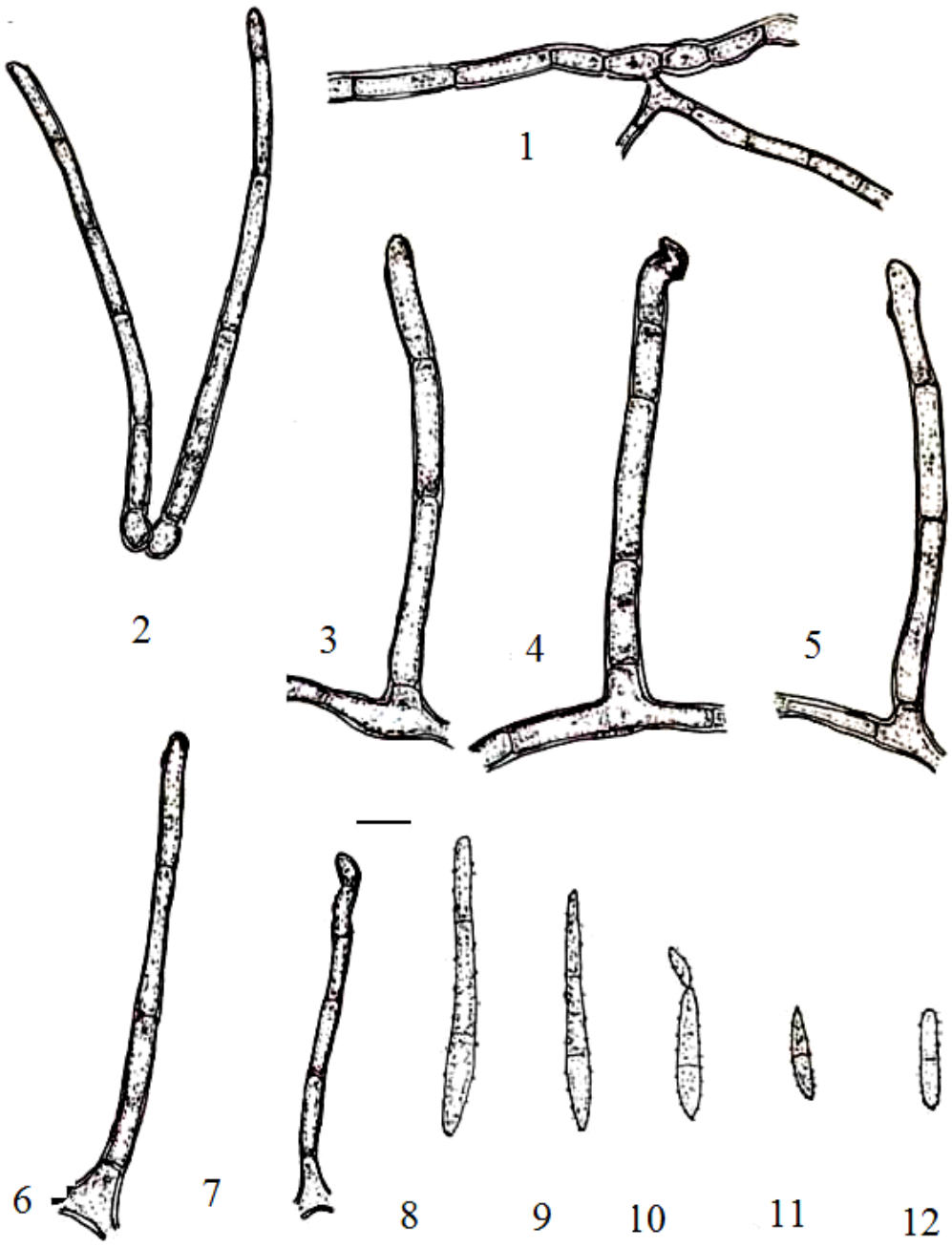

Fig. 2 – *Zasmidium persicae* on *Prunus persica* from leaf spots: Line drawing: 1 External mycelium. 2–7 Conidiophores. 8–12 Conidia. Scale bars: 1–12 = 10 μm.

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