
Xenosporium amomi sp. nov. from *Zingiberaceae* in Thailand

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Xenosporium thaxteri and an undescribed species of *Xenosporium* were found as saprobes on dead pseudostems of *Alpinia malaccensis* and *Amomum siamense* in Doi Suthep-Pui National Park, Chiang Mai, Thailand. The new species, *X. amomi* is described, illustrated and compared with similar *Xenosporium* species. The diagnostic characters of the 14 accepted species of *Xenosporium* are provided and the genus is reviewed based on the literature.

Key words: *Alpinia malaccensis*, *Amomum siamense*, anamorphic fungi, secondary conidia

Introduction

The genus *Xenosporium* was described by Penzig and Saccardo (1902) with *X. mirabile* as type. Pirozynski (1966) recognized the close similarity between *Xenosporium* and *Xenosporiella* Höhn. and transferred the four known species names of *Xenosporiella* (Linder, 1929) to *Xenosporium*. He found that the difference between the type specimens of *Xenosporiella* and *Xenosporium* is only one character, i.e. the thickness of the conidial filament. This made their length to width ratio differ, affecting the degree of coiling (coiled or slightly curved). Pirozynski (1966) also provided descriptions of six species with a taxonomic key. Subsequently seven additional species have been described (Panwar *et al.*, 1973; Rao and Rao, 1973; Rao and Varghese, 1977; Hughes, 1978; Vittal, 1981; Holobová-Jechová, 1988; Karandikar and Patwardhan, 1992) and the teleomorph of *X. indicum* has been recognized (Subramanian and Sekar, 1980). Goos (1990) reviewed the genus and updated the key to species.

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There are presently 13 names for *Xenosporium* species in IndexFungorum (<http://www.indexfungorum.org/Names/Names.asp>).

Xenosporium is an anamorphic fungus, producing pale to dark brown dictyospores acrogenously from simple or branched conidiophores that arise from the repent hyphae. The conidia are characteristically incurved, flattened from side to side, and they produce secondary conidia (Penzig and Saccardo, 1902; Ellis, 1963, 1971; Pirozynski, 1966; Goos, 1987, 1990). However, the range of conidial forms described provides a morphological continuum from the dorsiventrally curved form to the nearly globose or ellipsoid forms (Goos, 1987, 1990).

During our investigation of saprobic fungi on the wild ginger, *Alpinia malaccensis* and *Amomum siamense* (Bussaban *et al.*, 2001), we found *X. thaxteri* (Linder) Piroz. and an undescribed species of *Xenosporium*. These two taxa are described and illustrated in the present paper. Diagnostic characteristics of the known species are listed in Table 1.

Taxonomy

Xenosporium amomi Bussaban, **sp. nov.** (Figs. 1-9)

Coloniae effusae. *Mycelium* superficialis, ramosis, septatis, primo hyalina, decorus atrobrunneis. *Conidiophora* ex hyphis oriunda, simplicia, erecta vel flexuosa, pallide brunnea vel brunnea, laevia, usque ad 26 μm longa, 3-3.2 μm crassa. *Conidia* 45-64 \times 15-20 μm , singula ex apice conidiophori oriunda, primo hyalina, ad maturitatem atrobrunnea, ad basim et apicem cylindrica et hyalina, filamentosum conidiorum 2-3, atra, muriformia, curvata. *Conidia secundaria* 1-2 (-3), 6-10 μm diam, subglobose vel globose, muriformia, hyalina vel brunnea.

Etymology: referring to the host, *Amomum*.

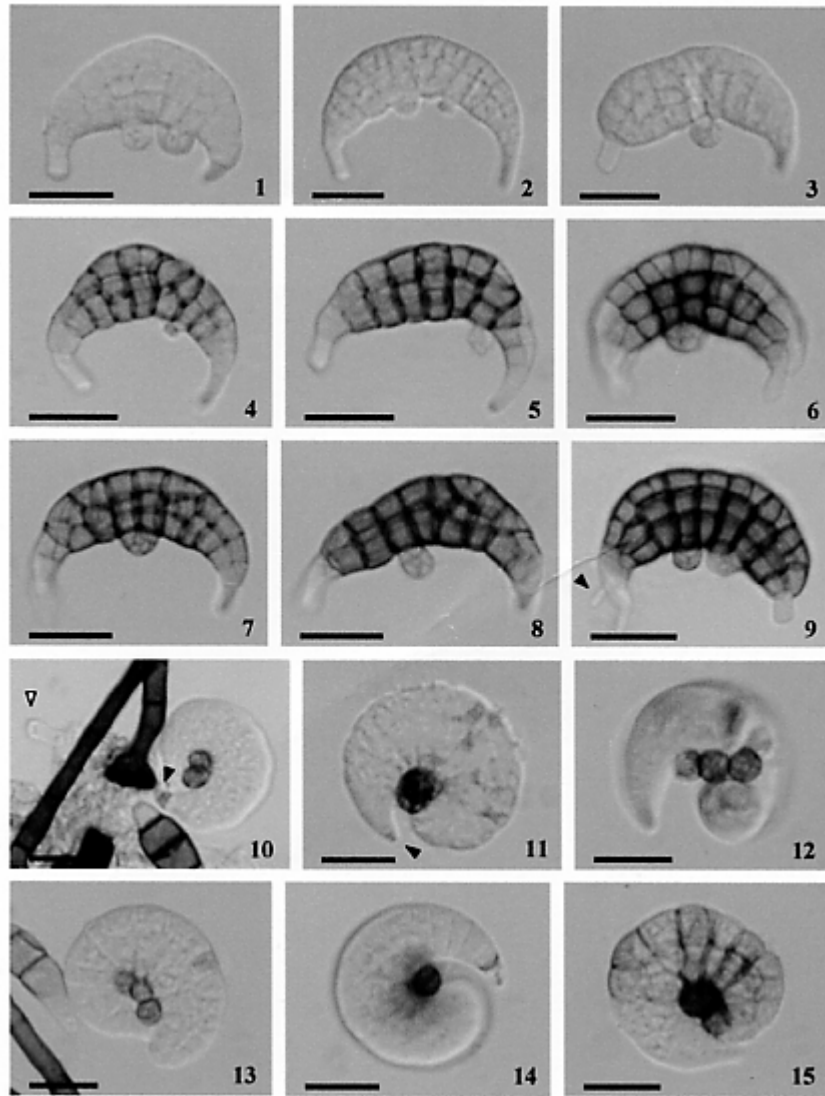
Colonies effuse, at first white with scattered developing conidia, becoming dark brown. *Mycelium* superficial, composed of pale to dark brown, branching, septate hyphae. *Conidiophores* arising laterally from hyphae, erect or flexuous, simple, pale brown to brown, smooth, up to 26 μm long, 3-3.2 μm wide. *Conidia* 45-64 \times 15-20 μm (\bar{x} = 50.7 \times 17.2 μm , n = 30), formed singly at the apex of conidiophore, at first hyaline, becoming dark brown with hyaline, distinctly cylindrical basal and apical cells, composed of 2-3 rows of cells with dark, thickened walls, muriform, curved. *Secondary conidia* 6-10 μm diam, subglobose to globose, 1-2 (-3) formed along the inner curved side of the primary conidia, muriform, hyaline to brown. In the older conidia, the terminal hyaline cell extends into a branching germ tube (Fig. 9).

Material examined: THAILAND, Chiang Mai, Doi Suthep-Pui National Park, on dead pseudostems of *Amomum siamense* (*Zingiberaceae*), 15 October 2000, B. Bussaban CMUZS55-1 (PDD 77014, **holotype**), CMUZS55-2, CMUZS55-3, CMUZS55-4 (**isotypes**); *ibid.*, on dead pseudostems of *Alpinia malaccensis* (*Zingiberaceae*), 20 May 2001, B. Bussaban CMUZS 105.

Table 1. Diagnostic characteristics of the species of *Xenosporium*.

Species	Conidiophore size (µm)	Conidia size (µm)	Secondary conidia		
			Size (µm)	Number	Septation
Conidia dorsiventrally curved*:					
1. <i>X. amomi</i>	up to 26 × 4.8-6.4	45-64 × 15-20	6-10	1-2	Muriform
2. <i>X. berkeleyi</i>	up to 80 × 4.5-8	20-27 × 6.5-11	5-7	1	Unicellular
3. <i>X. cubense</i>	up to 36 × 3.5-5.5	40-53 × 17-30	7-11	1-6	Muriform
4. <i>X. indicum</i>	up to 32 × 3-3.5	18-27 × 8-12	4-6	1	Unicellular
5. <i>X. larvae</i>	up to 70 × 3-5	13-20 × 6-10	3-5	1	Unicellular
6. <i>X. mirabile</i>	up to 105 × 7-11	60-105 × 8-18	7-20	2	Muriform
7. <i>X. pirozynskii</i>	up to 109 × 5-10.5	31-48.5 × 12-15.5	7-10.5	1-4	Unicellular
8. <i>X. pleurococcum</i>	up to 45 × 3-7	25-35 × 11-20	6-11	1	Unicellular
9. <i>X. thaxteri</i>	up to 30 × 5-8	40-55 × 13-22	8-15	2-3	Muriform
Conidia ellipsoid:					
10. <i>X. africanum</i>	up to 60 × 5-9	50-90 × 33-70	5-14	2-4	Muriform
11. <i>X. boivinii</i>	up to 90 × 4-7.2	70-100 × 36-70	12-18	1	Muriform
12. <i>X. intermedium</i>	up to 50 × 5-6	85-105 × 33.5-45	6-7.5	1-3	Unicellular
13. <i>X. subramanii</i>	up to 45 × 4.5-6	64-95 × 34-42	11-17	At least 1	Muriform
Conidia ovate:					
14. <i>X. shoranoorensense</i>	up to 62 × 3.6-7.2	34-54 × 20-35	7-11	1-4	Muriform

*Curved = axis curved through at least 180° in mature conidia.



Figs 1-15. *Xenosporium amomi* and *X. thaxteri*. **1-9.** *X. amomi* (from holotype). **1-3.** Hyaline conidia. **4-8.** Mature conidia with hyaline, cylindrical basal and apical cells. **9.** An older conidium with terminal hyaline cell extending into germ tubes (arrowed). **10-15.** *X. thaxteri*. **10.** Conidiophore (white arrowed) and detached conidium with brown apical cell (black arrowed). **11.** Conidium with brown apical cell (arrowed). **12-14.** Conidia with groups of dictyosporous secondary conidia. **15.** Conidium becoming brown and completely septate from the center outwards. Bars = 20 μ m.

Known distribution: Thailand.

Xenosporium amomi is similar to *X. berkeleyi* (M.A. Curt.) Piroz., *X. indicum* Panwar, Purohit & Gehlot, *X. larvae* (Morgan) Piroz. and *X. pleurococcum* (Höhn.) Piroz. in having curved conidia with few rows of cells. The new species, however, has conidia usually composed of 3 rows of thick-walled cells, and 1-2 secondary conidia. *Xenosporium amomi* has larger conidia than these other species, and it also has distinctly cylindrical basal and apical cells. The secondary conidia of *X. amomi* are multicellular, whereas those of *X. berkeleyi*, *X. indicum* and *X. larvae* are smaller and unicellular (Table 1).

Xenosporium thaxteri (Linder) Piroz., Mycol. Pap. 105: 30 (1966)

(Figs 10-15)

≡ *Xenosporaella thaxteri* Linder, Ann. Mo. Bot. Gard. 16: 320 (1929).

= *Xenosporaella rosea* Talbot, Bothalia 4: 491 (1956).

Colonies effuse, at first covered by a white mass of developing conidia, becoming brown at maturity. *Mycelium* superficial, composed of hyaline to pale brown, branching, septate hyphae. *Conidiophores* arising from hyphae, erect, straight, septate, hyaline to subhyaline, smooth, up to 23 µm long, 4.8-6.4 µm wide. *Conidia* 42-50 × 18-22 µm, tapering at the ends, at first hyaline and indistinctly septate with apical cell sometimes distinctly brown (Figs 10, 11), becoming brown and completely septate from the center outwards (Fig. 15), muriform, twisted to the axis of the conidiophore and 1.5-2.5 times tightly spirally coiled. *Secondary conidia* 8-13 µm diam, dark brown, even on immature hyaline primary conidia, globose, muriform, formed in groups of 3-4 on the inside of the coil.

Material examined: THAILAND, Chiang Mai, Doi Suthep-Pui National Park, on dead pseudostems of *Amomum siamense* (*Zingiberaceae*), 15 October 2000, B. Bussaban CMUZS54-1, CMUZS54-2; *ibid.*, on dead pseudostems of *Alpinia malaccensis* (*Zingiberaceae*), 20 May 2001, B. Bussaban CMUZS 100 (PDD 77015).

Known distribution: South Africa, Tanzania, Trinidad, Thailand.

This species was originally described as *Xenosporaella thaxteri* (Linder, 1929). Our specimens agree with *X. thaxteri* in most morphological characters, with a minor difference in the brown apical cell of immature primary conidia (Figs 10, 11).

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