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A New Species of *Scytalidium* Pesante on *Diospyros melanoxylon* Roxb. from Central India

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ABSTRACT

During the mycological survey of Garhpehra forest, Sagar, MP, India, a new species of *Scytalidium* Pesante was encountered on *Diospyros melanoxylon* Roxb. The material was subsequently worked out, described, illustrated and identified. After a thorough survey of literature, it was found to be a novel species of *Scytalidium* which have been named as *Scytalidium melanoxylicola* sp. nov. Photomicrographs and camera lucida drawings of the investigated fungus has also been provided.

Keywords: Arthrospores, Chlamydospores, *Scytalidium*, trichomes

INTRODUCTION

The genus *Scytalidium* Pesante belongs to dematiacious hyphomycetes. Till date only thirty six species are recorded under this genus (http//:www.indexfungorum.org).The genus was established by Pesante in 1957 with its type species as *Scytalidium lignicola* (Ellis, 1971). The type species was first isolated from rotten wood of *Platanus* (Holubova-Jechova, 1990) and further reported to cause subcutaneous phaehyphomycosis in humans (Dickinson *et al*., 1983). The genus *Scytalidium* is characterized by the presence of intercalary or terminal arthrospores and chlamydospores (Ellis, 1971; Sigler and Carmichael, 1976). This fungal genus is quite common on diverse range of substrates, such as soil, plant parts, animals, and on other fungal members (Klingstrom and Beyer,1965; Ellis, 1971; Rao and Hoog, 1975; Soni *et al*., 1989; Kang *et al*., 2010; Dubey and Pandey, 2011; Gautam *et al*., 2015). It has been noticed that species of *Scytalidium* isolated from soil and certain plants hosts e.g. *Pinus and Platanus are* capable to cause severe problems in animals and human beings. *Scytalidium multiseptatum* isolated from soil was also reported to be present in Potato cyst nematode *Globodera rostochiensis* (Holubova-Jacova, 1990). *S. dimidiatum* is a thermotolerent plant pathogen reported to cause chronic cutaneous infections in human beings (Hay,2002; Hay and Moore,1984; Morris-Jones *et al*., 2004; Lacaz, 1999; Oyekaand Okoli, 2003) while some are also responsible for bronchial infections in cattles (Udagawa, *et al*., 1986) *S.aurantiacum* (isolated from *Pinus sylvestris* and *Betula alba*) and *Scytalidium album* (isolated from *Picea abies*) also showed antagonistic activity to other fungal members (Klingstrom and Beyer, 1965). The presence on a wide range of substrates and potential to cause severe infections in humans e.g. onycomycosis, phaeohyphomycosis, mycetoma, subcutaneous abscesses, fungemia, endophthalmitis and bronchial infections in cattles make it worthy of investigation.

Present communication deals with the taxonomic description and illustration of a novel species of *Scytalidium* present on living leaves and leaf trichomes of *Diospyros melanoxylon* Roxb. During the survey of field mycology from South Sagar Forest Division, Madhya Pradesh, India. The comparison of the taxonomic features of the proposed fungus with available literature on allied taxa revealed it to be a novel species of *Scytalidium*, namely *S. melanoxylicola* sp. nov. described and illustrated here in this paper.

MATERIAL AND METHODS

Macro-and Microscopic observations: Specimens with distinct fungal propagules on living leaves of *Diospyros* were collected from Garhpehra forest, Sagar, M.P. India and carried to the laboratory for further processes following standard protocols. Pictures of infection spots were captured using a Sony DSC-X80 camera. Free-hand cut sections and scrap mounts were prepared in clear lacto-phenol cotton blue mixture morphomycotaxonomic observations. Microscopic observations were taken with Leica light microscope. Camera lucida drawings were prepared using Nikken Tokyo camera lucida at different magnifications of a compound light microscope. The measurements of mycelium, arthroconidia, and chlamydospores (with the extremes given in parentheses) were done with the help of ocular micrometer. The holotype was deposited in Ajrekar Mycological Herbarium (AMH), Agharkar Research Institute (ARI), Pune, India and an isotype was retained in the mycological herbarium of the Department of Botany of Dr. Harisingh Gour University (MH-DHSGU), Sagar, M.P., India. The identity of the newly described taxon was verified using relevant literature (Dubey and Pandey, 2011; Ellis, 1971; Holubova- Jacova, 1990; Rao and Hoog, 1975).

TAXONOMIC DESCRIPTION

Scytalidium melanoxylicola N. Awasthi, A. Dubey, S. Bhardwaj and A.N. Rai **sp. nov.** (**Fig. 1-4**)

MycoBank no.: **Mb835460**

Diagnosis: Proposed species of *Scytalidium* differs from other allied species in having branched superficial and septate mycelium which is documented climbing around and sometimes present inside the lumen of trichomes, and the presence of spherical to ellipsoidal, thick walled broad arthroconidia and with highly thick walled chlamydospores.

Etymology: The species epithet is derived from the name of the host species.

Description: Leaf spots amphigenous, sub circular to irregular, dark black. Colonies effuse, hypophyllous, dark black, localized, velvety. Mycelium branched superficial, brown to dark brown, septate, 4–6 µm, creeping and climbing around trichomes, sometimes present inside the lumen of the trichomes, mid brown to dark brown, thick-walled, smooth,

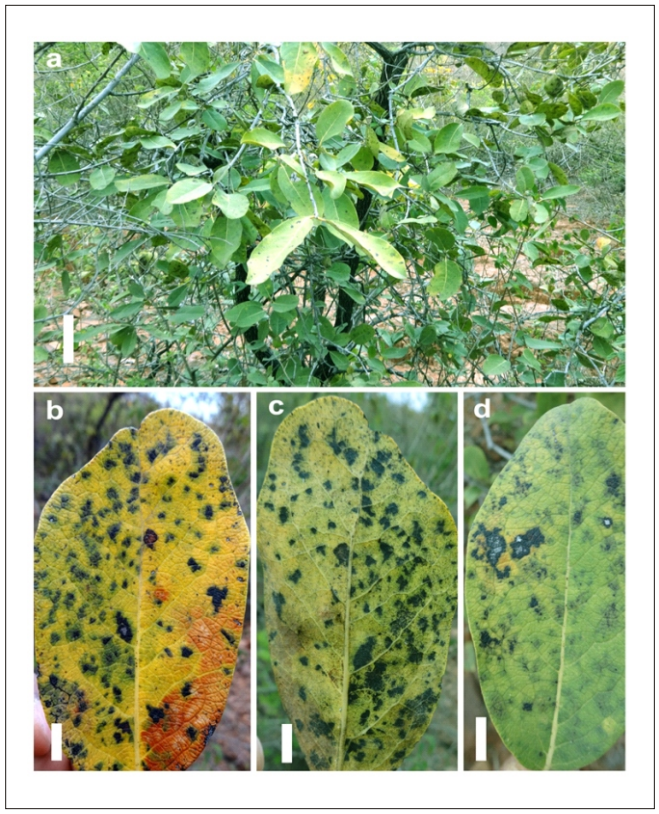

Fig. 1: Symptoms of *Scytalidium melanoxylicola* on *Diospyros melanoxylon* (Holotype AMH 9682). **a**. Infected host plant; **b-d**. Infection spots on upper and lower surface. Scale bars: **a-d.** 10 mm

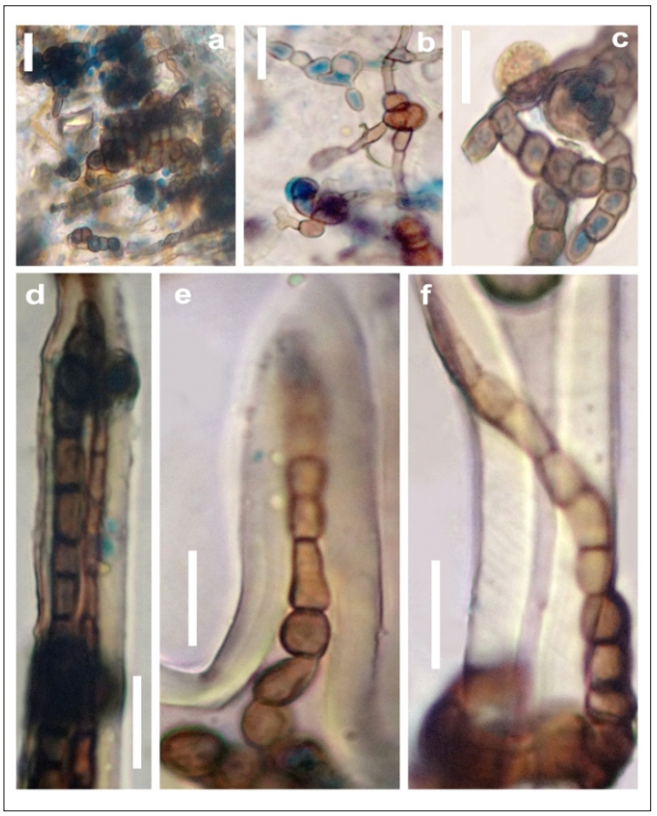

Fig. 2: *Scytalidium melanoxylicola*, photomicrographs (Holotype AMH 9682). **a-c**. Superficial hyphae; **d-e**. Hyphae inside lumen of trichomes; **f**. Creeping hyphae surrounding trichome. Scale bars: **a-f** 10 µm

septate, branched, fragmented to form arthroconidia which are dark brown, thick-walled, spherical to ellipsoidal, smooth, with branched catenation, 0-1(-3)septate, septa thick-walled, 12-15 × 13-16 µm, sometimes intercalary cells form chlamydospores (resting spores) which are circular to oval, very thick-walled, smooth, brown to dark brown, 24–28 × 26–32 µm.

Type: On living leaves of *Diospyros melanoxylon* Roxb. (*Ebenaceae*), Garhpahra forest, South Sagar Forest Division, DHSGU, Sagar, M.P., India, March 2015, leg. N. Awasthi, (Holotype AMH 9682, Isotype MH-DHSGU 8).

DISCUSSION

The presently described species of *Scytalidium* is morphologically quite different from the other known species of the genus. A literature survey and the available information in Mycobank database (http://www.mycobank.org) and Index fungorum (http://www.indexfungorum.org) exhibited that only a limited number of species of *Scytalidium* are reported on a variety of hosts and substrates. However, very few species are reported from plants. Literature survey also revealed that no species of *Scytalidium* has ever been reported on *Diospiros melanoxylon*. However, two species of *Scytalidium*, viz. *S. terminale* Rao & Hoogand, *S. zapotae* Dubey & Pandey (Dubey and Pandey, 2011; Rao and Hoog, 1975) are reported on the plant hosts belonging to order *Ebenales*. The presently described species is quite close to *S. terminale* with which it has been compared (**Table 1**). The presently described species is quite different from the allied species in having branched superficial, brown to dark brown, septate mycelium which can be noticed creeping and climbing around trichomes and sometimes present inside the lumen of trichomes which is not the case in *S. terminale*. The newly proposed species also differs in having spherical to

Table 1: Comparison of *Scytalidium melanoxylicola* sp. nov. with *S.terminale.*

Character	***Scytalidium terminale*** Rao & Hoog (Rao and de Hoog, 1975)	***Scytalidium melanoxylicola*** sp. nov.
Mycelium	Mainly submerged, hyphae smooth-and thin walled, hyaline to subhyaline, 1.5 - 3 µm wide.	Branched superficial, brown to dark brown, septate, 4–6 µm, creeping and climbing around trichomes and sometimes present inside the lumen of trichomes.
Arthroconidia	Single or in chains, rectangular, smooth and thin walled, concolorous with the hyphae, sometimes slightly swollen, usually 10-20 x 2-3 µm.	Catenate, spherical to ellipsoidal, smooth, thick -walled, dark brown, 0–1(–3)–septate, septa thick -walled, 12–15 × 13–16 µm.
Chlamydospores	Single, occasionally in short chains, obovoidal, ellipsoidal or pyriform, smooth and thick walled, pale to dark brown, obovoidal, ellipsoidal or pyriform, usually 15 -25 x 7-9 µm.	Circular to oval, smooth, very thick -walled, brown to dark brown, 24 –28 × 26 –32 µm.

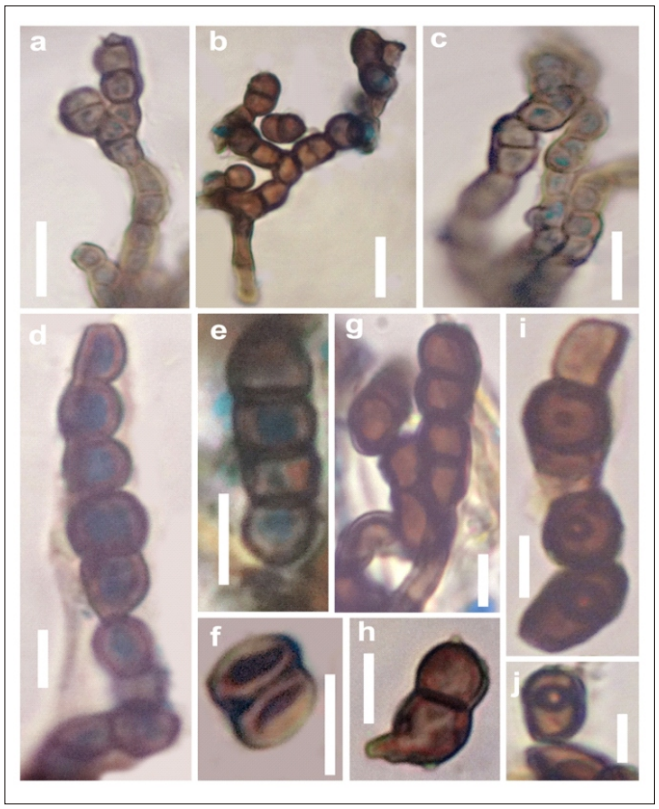

Fig. 3: *Scytalidium melanoxylicola*, photomicrographs (Holotype AMH 9682). **a-g**. Arthroconidia; **h**. Germinating arthroconidia; **i-j**. Chlamydospores. Scale bars: **a-c.** 10 µm, **d-j.** 5 µm.

ellipsoidal, thick walled and broader arthroconidia. The presence of very thick walled and broader chlamydospores in the proposed species is yet another key feature using which a noval species has been described.

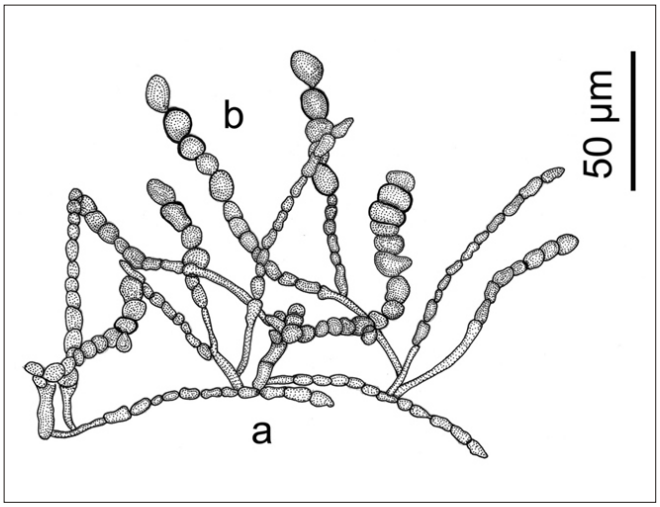

Fig. 4: *Scytalidium melanoxylicola*, Camera lucida drawings (Holotype AMH 9682). **a**. Creeping superfecial mycelium; **b**. Spores (Arthroconidia and Chlamydospores). Scale bar: Scale bar: 50 µm.

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