

Fresh Water Fungi from Tapi River, Dist. Jalgaon Maharashtra

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Abstract: The present paper deals with Three species of fungi encountered on submerged woody debris in freshwater habitats. Among them *Canalisporium caribense* (Hol.-Jech. & Mercado.) Nawawi and Kuthubudheen, *Delortia palmicola* Pat. are new records for the fungi of India. *Sporoschisma saccadoi* Mason and Hughes, are being recorded for the first time from Maharashtra state. The data provides information on the distribution of these fungi in India, apart from their description and illustrations.

Keywords: Freshwater, Hyphomycetes, submerged wood, Tapi River

1. Introduction

The "Submerged freshwater Hyphomycetes" is one of the ecological groups of freshwater mitosporic fungi, first addressed by Ingold (1975), represent a heterogeneous assemblage of fungi growing on submerged decaying plant materials. These fungi can be classified into two main types based on Park (1972), namely indwellers and immigrants. Species in several genera of freshwater mitosporic fungi like *Aquaphila*, *Camposporidium*, *Canalisporium* etc., can be classified as indwellers because they have been reported only from freshwater habitats. Whereas, species that belong to genera such as *Delortia*, *Sporoschisma*, etc. can be classified as immigrants because they are reported from terrestrial as well as freshwater habitats. Goh and Tsui (2003) provide a key to some common genera of freshwater dematiaceous mitosporic fungi that have been reported from worldwide.

Recent biodiversity studies have revealed a number of undiscovered "Submerged freshwater Hyphomycetes" from different parts of the world (Su et al., 2011; Yang et al., 2012; Liu and Cai, 2013). The present paper deals with six species of fungi encountered on submerged woody debris in freshwater habitats. Among them *Delortia palmicola* Pat. are being recorded for the first time from India. *Canalisporium caribense* (Hol.-Jech. & Mercado.) Nawawi and Kuthubudheen, Mason and Hughes, and *Sporoschisma uniseptatum* Bhat and Kendrick are new addition to the fungi of Maharashtra state which are described and illustrated in the present paper.

2. Materials and Methods

Samples of submerged woody debris were collected randomly during 2012-13 from different lentic and lotic habitats from North Maharashtra region. The samples were placed in plastic bags. On returning to the laboratory, samples were incubated in plastic boxes and kept moist by spraying with distilled water and periodically examined for presence of fungal growth. Permanent voucher slides of fungi were prepared according to the method "double cover glass" provided by Volkmann-Kohlmeyer and Kohlmeyer (1996). Identifications of isolated fungi were confirmed with the help of Nawawi & Kuthubudeen (1989), Goh, et al.

(1998), Goh and Hyde (1997), Chan et al. (1991), Goh et al. (1997), and Bhat and Kendrick (1993).

Reports of fungi studied were confirmed with the help of Bilgrami et al. (1991), Jamaluddin et al. (2004) and relevant literature.

3. Systematic Account

1) *Canalisporium caribense* (Hol.-Jech. & Mer.) Nawawi & Kuthubudeen
Mycotaxon, **34**: 477 (1989).

Sporodochia: scattered, punctiform, pulvinate, granular, black, shining, up to 200 diam. *Mycelium*: mostly immersed in the substratum, composed of irregularly branched, septate, smooth, subhyaline to pale brown to brown hyphae 1.5-2.5 µm wide. *Stromata*: none or rudimentary consisting of irregularly branched, short, intertwined hyphae. *Conidiophores*: semi-macronematous to macronematous, mononematous, fasciculate, erect to ascending, unbranched to sparsely branched, hyaline to subhyaline, smooth up to 20 µm long x 2-3.5 µm wide. *Conidiogenous cells*: integrated, terminal, determinate, cylindrical, or swollen. *Conidial secession*: schizolytic. *Conidia*: acrogenous, solitary, flattened, one-cell thick, smooth, thick-walled, broadly ellipsoidal to obovoid in surface view, fusiform to obclavate in lateral view, muriform, with a single, slightly curved longitudinal septum and 3-6 straight transverse septa, slightly constricted at the septa, evenly brown to reddish dark brown, 28-41 µm long x 21-28 µm wide x 10-14 µm thick. Basal cell is subhyaline to pale brown, cuneiform, with thin-wall, 5-5.5 µm long, 3-3.5 µm wide. Septa are becoming progressively darker with conidial maturity. The left and right cell lumen are connected by narrow canals, each surrounded by a marked ring of pigmentation, visible in surface view as a circular disc 2-2.5 µm diam, barrel-shaped in side view. Canals are also present in the transverse septa, but only on one side of the conidium adjacent to the curved side of the longitudinal septum.

Habitat: On submerged wood; Tapi river (Bhusawal, Dist.-Jalgaon); 15 August, 2011; Leg., V.R. Patil

Distribution in India:- Karnataka: On submerged wood (Sridhar et al., 2010); Maharashtra: Present work.

Remarks: The present fungus is rare in occurrence. The descriptions and measurements of conidia and conidiophores are completely agreed with that of *Canalisporium caribense* (Hol.-Jech. & Mer.) Nawawi & Kuthubudeen (1989).

Therefore, it is assigned to that species. It is an addition to the fungi of Maharashtra state.

2) *Delortia palmicola* Pat.

Bull. De la Soc. Mycol. De France, **4**: 7-46 (1888).

Conidiomata: sporodochial, tuberculiform, gelatinous and milky white when fresh, up to 1 cm diam. becoming much smaller, amber-coloured, hard and inconspicuous when dried, composed of hyaline, septate, branched hyphae embedded in a gelatinous matrix. *Conidiophores*: arise laterally as alternate or opposite branches of the vegetative hyphae near the surface of the sporodochium, multiseptate, hyaline thin-walled, determinate to indeterminate, 1.5-3 µm wide, up to 100 µm long, bearing terminal or lateral conidiogenous cells. *Conidiogenous cells*: intergrated, terminal or lateral, slightly inflated, clavate to ampulliform, 8-13 x 4-5 µm, each producing a single conidium. *Conidia*: holoblastic, acrogenous, thin-walled, hyaline, surrounded by hyaline gelatinous sheath, (2-) 3 (-4) septate, 8-12 µm wide, tightly coiled, U- or horseshoe-shaped, 15-22 µm diam., the distal end rounded and the proximal end somewhat towards a wide flat, thin-walled, basal scar *ca.* 1.5 µm diam.

Habitat: On submerged decaying parts of palms Tapi river (Bhusawal, Dist.- Jalgaon); 15 August, 2011; Leg., V.R. Patil

Distribution in India:- Maharashtra: On submerged wood (BDB, Unpublished).

Remarks: The present fungus is occasional in occurrence. The descriptions and measurements of conidia and conidiophores are completely agreed with that of *Delortia palmicola* Pat. as provided by Goh and Hyde (1997). Therefore, it is assigned to that species. It is being reported for the first time from India.

3) *Sporoschisma saccadoi* E.W. Mason & S. Hughes

Mycolo. Pap., **31**: 20 (1949).

= *Sphaeria hemipsila* Berk. & Br., *Fungi of Cylon*, Thwaites, Nr. 1098 (1875).

= *Lasiosphaeria hemipsila* (Berk. & Br.) Sacc., *Syl. Fung.*, **2**: 198 (1883).

= *Chaetosphaeria hemipsila* (Berk. & Br.) Petch, *Am. R. Bot. Gard., Peradenijia*, **6**: 336 (1917).

= *Chaetosphaeria coelestina* Hohn., *Akad. Der Wissens. In Wein*, **118**: 275-452 (1909).

Colonies: effuse, velutinous, composed of mixed tufts of conidiophores and sterile capitate hyphae. *Mycelium*: immersed, composed of pale to dark brown hyphae 2.5-4 µm wide. *Capitate setae*: pale brown, becoming paler towards the apex, straight or slightly flexuous, 1-3-septate, 150-200 µm long and 5-6.5 µm wide below the terminal swelling which is 10-12 µm wide and subhyaline, arising from a bulbous stroma 45-60 µm diam. *Conidiophores*: solitary or rarely in groups of 2-3, also arising from stroma, often with one or two capitate hyphae, 250-270 µm long, 9-13 µm wide below and 17-21 µm wide above, venter up to 22 µm wide, dark brown, paler at the torn apex. *Conidia*: formed enteroblastically inside the tubular collarete of the conidiogenous cell and emerging in a 'false chain', doliiform, (-32)42-48 x (10-) 12.5-15 µm, 5-septate, often constricted at the septa, the four inner cells dark brown and the two end cells much paler, shorter and somewhat truncate, giving the appearance of constriction between successive conidia of a chain. Two central cells are 6.5-8 µm

long, penultimate cells 6.5-9 µm long. Thus the four inner cells are of almost equal length, but penultimate ones are often slightly longer than the two central ones.

Habitat: On submerged wood; Tapi river (Bhusawal, Dist.- Jalgaon); 15 August, 2011; Leg., L.C.Nemade

Distribution in India:- Karnataka: On submerged wood (Sridhar et al., 2010).

Remarks: The present fungus is occasional in occurrence. The descriptions and measurements of conidia and conidiophores are completely agreed with that of *Sporoschisma saccadoi* Mason & Hughes as given by Goh et al. (1997). Therefore, it is assigned to that species. It is an addition to the fungi of Maharashtra state.

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Photo Plate

- P. 1: Conidium of *Canalisporium caribense*
P. 2: Conidium of *Delortia palmicola*
P. 3: Conidia of *Sporoschisma saccadoi*



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