

## RESEARCH ARTICLE

# Submerged aquatic Hyphomycetes *Canalisporium* from Madhya Pradesh

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| <p>Available online on <a href="http://www.ijlsci.in">http://www.ijlsci.in</a></p> <p>ISSN: 2320-964X (Online)<br/>ISSN: 2320-7817 (Print)</p> <p><b>Editor: Dr. Arvind Chavhan</b></p> <p><b>Cite this article as:</b><br/>Damyanti R, Patil KB and Borse KN (2015) Submerged aquatic Hyphomycetes <i>Canalisporium</i> from Madhya Pradesh, <i>International J. of Life Sciences</i>, Special Issue, A3: 144-146.</p> <p><b>Copyright:</b> © Author, This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derives License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.</p> | <p>The present paper deals with four species of freshwater submerged aquatic Hyphomycetes, encountered in foam samples collected from Khandwa District of Madhya Pradesh, Viz <i>Canalisporium caribense</i> (Hol.-Jech and Mercado) Nawawi and Kuthub. <i>Canalisporium exiguum</i> <i>Canalisporium pallidum</i> and <i>Canalisporium pulchrum</i>, Nawawi and Kuthubutheen are being reported for the first time from Madhya Pradesh. The data collected provide information on the biodiversity and Geographical distribution of these fungi from freshwater habitats of India, apart from description and illustrations. This data will assist in the compilation of freshwater fungal biodiversity of India.</p> <p><b>Keywords:</b> Submerged aquatic hyphomycetes, Foam, Madhya Pradesh.</p> <p><b>INTRODUCTION</b></p> <p>Submerged aquatic hyphomycetes were first addressed by Ingold (1975), growing on submerged decaying plant material. Most of the species are found on wood litter blocked by rocks in fast flowing streams or babbling brooks. They colonize stem, branches and leaves, fall on the water. It plays an indispensable role of plant substrates in various ecosystems, but aquatic Fungi have been relatively neglected group until the last 4 decades. They play an important role in freshwater food webs as organic matter decomposers and contributors to nutrients cycling, as symbionts with plants, some of the many important roles play by freshwater fungi that help to maintain the energy balance of the ecosystems (Barlocher, 1992a). The aquatic fungi which typically decompose leaf litter and wood with a hyphal network are the polyphyletic group known as "aquatic hyphomycetes". With the aid of an array of extracellular enzymes, aquatic fungi are able to degrade most of the polymeric substances in leaves (hemicelluloses, cellulose, starch, pectin and to some extent lignin; Krauss <i>et al.</i>, 2011). The present paper deal with the 4 species of submerged aquatic lignicolous fungi encountered on the decaying wood and foam.</p> <p><b>MATERIALS AND METHODS</b></p> <p>Approximately 10 ml of Foam formed due to the fast flowing turbulent water at study area were collected at morning and evening time. Samples were made with a ladle and placed in clean wide mouthed plastic bottles and kept</p> |

for 24 hours to enable the foam to dissolve. It was fixed by adding FAA (Formaldehyde + Acetic Acid + Alcohol prepared as 90 ml. of 70 % Alcohol + 5 ml. Formaldehyde + 5 ml. Acetic Acid) to yield 5% foam solution. The samples were brought to laboratory and examined under low power or high power of a microscope to detect the conidia. The slides were made permanent by using double cover glass method given by Volkmann-Kohlmeyer and Kohlmeyer (1996).

## TAXONOMIC ACCOUNT

**1) *Canalisporium caribense*** (Hol.-Jech and Mercado, 1984) Nawawi and Kuthub (1989) (Fig.1) *Berkleasium caribense* Hol.-Jech and Mercado(1984).

**Mycelium:** septate **Conidiophores:** micronematous, fasciculate, simple or sparsely branched, smooth, hyaline, up to 25  $\mu\text{m}$  long, 2-3.5  $\mu\text{m}$  wide **Conidia:** acrogenous, solitary, broadly ellipsoidal, obpyriform to subglobose, flattened, muriform, olivaceous, brown, reddish brown to dark brown, smooth, with dark, thick-walled transverse and longitudinal septa, basal cell cuneiform, thin-walled, sub hyaline to light brown. Cell lumen connected by narrow canals, flattened, with a single, straight or slightly curved column of vertical septa and 3-5 transverse septa, pale brown to brown septa darkly pigmented, 9-11 cells per conidium, 18-28 x 13-15 x 5-8  $\mu\text{m}$  wide.

**Habitat:** Conidia in foam samples; ( Bakhatgarh) Narmada River, 10 July 2011; ( Siloda) Chhoti Abna River, 20 Aug. 2012; BAFK-55; Leg., D. K. Patil .

**Distribution in India: Karnataka:** (Sridhar *et al.*, 2011); **Maharashtra:** (Patil *et al.*, 2014).

**2) *Canalisporium exiguum*** Goh *et al.* 1998 (Fig. 2)

**Sporodochia:** on natural substratum punctiform, minute, scattered, granular, black, glistening, up to 140  $\mu\text{m}$  in diameter **Mycelium:** immersed, branched, septate, subhyaline to pale brown, 1.5-3  $\mu\text{m}$  wide, smooth. **Conidiophores:** micronematous or semi-macronematous, fasciculate, simple or sparsely branched, smooth, hyaline to subhyaline, up to 30  $\mu\text{m}$  long 2-3.5  $\mu\text{m}$  wide. **Conidia:** acrogenous, solitary, flattened, one cell thick, smooth, thick walled, broadly ellipsoidal, to obovoid in surface view, cylindrical to clavate in lateral view, pale olivaceous brown to pale pinkish brown, muriform, comprising of a single straight to slightly curved column of vertical septa and 2-4 rows of transverse septa, slightly constricted at the septa; septa becoming progressively darker with

conidial maturity, cell lumen connected by narrow canal, basal cell subhyaline to pale brown, cuneiform Conidia are 18-32 x 12-15  $\mu\text{m}$  2-4  $\mu\text{m}$  wide with thinner wall.

**Habitat:** Conidia in foam samples; (Gutighat) Tapi River, 2 Sept. 2012; BAFK-56; Leg., D. K. Patil

**Distribution in India: Maharashtra:** (Borse *et al.*, 2008).

**3) *Canalisporium pallidum*** Goh *et al.* (1998) (Fig. 3)

**Sporodochia:** on natural substrate punctiform, scattered, granular, dark grey, up to 200  $\mu\text{m}$  wide.

**Mycelium:** mostly immersed in the substrate, composed of branched, septate, sub-hyaline, 1.5-2.5  $\mu\text{m}$  wide, smooth hyphae. **Conidiophores:**

micronematous or semi-macronematous, mononematous, fasciculate, simple or sparsely branched, smooth hyaline or sub-hyaline, up to 25  $\mu\text{m}$  long and 2-3  $\mu\text{m}$  wide. **Conidiogenous cells:** integrated, terminal, determinate, cylindrical or slightly vesiculate. Conidial succession rhexolytic.

**Conidia:** 25-39 x 16-22 x 8-10  $\mu\text{m}$  acrogenous, solitary, one cell thick and flattened, smooth, more or less ellipsoidal or obovoid in surface view, slightly curved, cylindrical or broadly clavate in lateral view, pale olivaceous very olivaceous brown, muriform, mostly with a slightly curved single column of vertical septa and 4-5 rows of transverse septa, occasionally 1-2 vertical septa, septa unpigmented, thin and canal clearly visible, basal cell cuneiform, sub hyaline, 2.5-3.5  $\mu\text{m}$  wide, thin walled.

**Habitat:** Conidia in foam samples; (Puran pura) Bhandaria River, 2 Sept. 2012; BAFK-57; Leg., D. K. Patil

**Distribution in India: Maharashtra:** (Patil *et al.*, 2014).

**4) *Canalisporium pulchrum*** (Hol. Jeck, and Mercado<sup>2</sup>) Nawawi and Kuthubutheen, (1989) (Fig. 4) =*Berkleasium pulchrum* Hol.-Jeck, and Mercado, (1984).

**Mycelium:** immersed, composed of branched, septate, smooth, sub-hyaline to pale brown. **Conidiophores:** micronematous or semi-macronematous, mononematous, fasciculate, simple or sometime branched, septate, hyaline to very pale brown, smooth, up to 25  $\mu\text{m}$  long, 2-4  $\mu\text{m}$  wide. Conidial secession rhexolytic. **Conidia:** solitary, acrogenous, sub-globose, complanate, one cell thick, flattened, broadly ellipsoidal or pyriform in surface view, narrowly ellipsoidal to date in lateral view, muriform, with 4-6



1. *Canalisporium caribense* (Hol.-Jech and Mercado) Nawawi and Kuthub.
2. *Canalisporium exiguum* Goh et al.
3. *Canalisporium pallidum* Goh et al.
4. *Canalisporium pulchrum* (Hol. Jeck, and Mercado) Nawawi and Kuthubutheen.

rows of transverse septa and 2 straight columns of vertical septa, slightly constricted at the septa, smooth. Apical row of cells darker than the basal rows, dark and thick banded at the septa, canal in the septa obscured by dark pigmentation, supported by a cuneiform three thin walled, pale, small basal cell in a row, visible septal canal, 25-50 x 17.5-35 µm wide.

**Habitat:** Conidia in foam samples; (Kharuwa) Kharkuli River; 2 Sept. 2013; BAFK-58; Leg., D. K. Patil

**Distribution in India: Maharashtra:** (Borse et al., 2008); **Andhra Pradesh:** (Vasant Rao, 1986.

## DISCUSSION

Fungi are an important component of biodiversity in aquatic environment the planktonic taxa is an integral part of food chain .They play an important role in fresh water food web as organic decomposers and contributors to nutrient cycling ,as symbionts with plants aquatic fungi are important for industrial and pharmaceutical use.

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