## Aquatic fungi from North Maharashtra-XV: foam spora



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#### **INTRODUCTION:**

Freshwater Hyphomycetes are characterized as those dwell in freshwater ecosystems for all or part of their life cycle. Nonetheless, this definition is vague, as it includes all fungi that may be present in a freshwater environment regardless of their origin with the broadened concept of "aquatic fungi" given by Thomos (1996). Goh and Hyde (1996) categorized the freshwater Hyphomycetes into four biological groups namely, 1) Ingoldian Hyphomycetes, 2) Aero-aquatic Hyphomycetes, 3) Submerged-aqatic-Hyphomycetes, 4) **Terrestrial-aquatic** Hyphomycetes. Conidia of these fungi are encountered in

#### ABSTRACT

The article reports the occurrence of seven species of Hyphomycetes species viz, Camposporium antennatum Harkness, Ceratosporella deviata Subram., Clavariana aquatica Nawawi, Flabellocladia tetracladia (Nawawi) Nawawi, Helicomyses colligatus R.T. Moore, Hydrometrospora symmetrica J. Gonczol & Revay, and Phalangispora nawawii Kuthub. conidia of which were encountered in foam samples collected from different streams in North Maharashtra region (India). All the fungal species are being recorded for the first time from Maharashtra state except Flabellocladia tetracladia. The data provides information on the range distribution of these fungi in India. Descriptions of conidia and illustrations are provided.

Keywords: Freshwater, Hyphomycetes, foam samples

#### **SHORT PROFILE**

Patil V. R. is working as a Associate Professor at Department of Botany in R. P. S. P. Ms. Shri. V.S. Naik Arts, Commerce and Science College, Raver (M.S.) India. He has research experience of 9 Years and teaching experience 22 years. foam samples from flowing streams (Jones et al., 2014). Materials and Methods:

Approximately 10 ml of foam formed due to fast flowing turbulent water from study area (Panzara, Kan and Jamkheli rivers, Tal.-Sakri, Dist.- Dhule, Maharashtra state) were collected in plastic bottles and kept for 24 hours to enable the foam to subside. It was fixed in FAA to yield 5 % foam solution at the collection spot or fixed in FAA taking 4 ml foam solution and 1 ml FAA. The samples were brought to the laboratory and examined under high power of research microscope to detect the conidia. Identifications of isolated species were confirmed with

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the help of Descals et al. (1976), Gonczol and Revay (1984), Hyde et al. (1998), Moore (1954), Nawawi (1973, 1095), Kuthubutheen (1982) and Subramanian (1957, 1971). Reports of fungi studied were confirmed with the help of Bilgrami et al. (1991) and Jamaludeen et al. (2004).

### Systematic account:

#### 1) Camposporium antennatum Harkness,

Bull. California Acad. Sci., 1: 37-38 (1951).

Conidia: solitary, acropleurogenous, smooth, 4-15 -septate, pale brown, end cells paler, 45-75 x 7-9  $\mu$ m, cylindrical, obconically truncate at the base, apex rounded or slightly attenuate and bears 1-3 divergent, non-septate, hyaline, up to 40  $\mu$ m long appendages.

Habitat: Conidia in foam samples; Panzara river (Latipada); 15 August, 2014; Leg. B.D. Borse

Distribution:- Karnataka: Conidia in foam samples (Rajashekhar and Kaveriappa, 2003); Madhya Pradesh: On submerged leaves (Upadhyaya et al., 2012); Gujarat: Conidia in foam samples (Borse et al., 2015).

Remark: The present fungus is being recorded for the first time from Maharashtra state (Jamaludeen et al., 2004).

#### 2) Ceratosporella deviata Subram.,

Proc. Indian Acad. Sci., Sect. B. 46: 327 (1957).

Conidia: pale to mid brown, each consisting of a turbinate or pyriform basal cell 10-15  $\mu$ m long, 6-8  $\mu$ m thick in the broadest part, 2-3  $\mu$ m at the base and 2-4 (mostly 3) divergent, subulate, septate arms 15-40  $\mu$ m long, 5-7  $\mu$ m at the base.

Habitat: Conidia in foam samples; Kan river (Dahivel); 26 January, 2014; Leg. B.D. Borse

Distribution:- Madhya Pradesh: On submerged leaves (Upadhyaya et al., 2012).

Remark: The present fungus is being recorded for the first time from Maharashtra state (Jamaludeen et al., 2004).

#### 3) Clavariana aquatica Nawawi

In: Descals et al., Trans. Br. Mycol. Soc., 67: 217 (1976).

Conidia: holoblastic, obpyriform to broadly clavate, 5-8  $\mu$ m wide at the base, broadening to 24-33  $\mu$ m above; three arms are more or less of the same length develop from its crown, 53-160  $\mu$ m long, 3-5  $\mu$ m at its widest point and tapering to 2-2.5  $\mu$ m at the apex, 0-2septate; forth arm arises through the detachment scar with same length as the rest of the arms, with age the central body becomes highly vacuolated.

Habitat: Conidia in foam samples; Jamkheli river (Samode); 15 August, 2014; Leg. B.D. Borse

Distribution:- Uttarakhand: Conidia in foam (Mer and Sati, 1989); Karnataka: Conidia in foam and water samples (Sridhar and Kaveriappa, 1982); Gujarat: Conidia in foam samples (Borse et al., 2015).

Remark: The present fungus is being recorded for the first time from Maharashtra state (Jamaludeen et al., 2004).

## 4) Flabellocladia tetracladia (Nawawi) Nawawi,

Trans. Br. Mycol. Soc., 85: 175 (1985).

Flabellospora tetracladia Nawawi, Malaysian J. Sci., 2:55 (1973).

Conidia: holoblastic, terminal, hyaline, tetraradiate, arms 3-5 (mostly 3); main axis cylindrical, thinner than arms, 60-85  $\mu$ m long, 3.5-5.5  $\mu$ m wide at the base, 9-11  $\mu$ m at the apex, 2-3-septate; arms obclavate to cylindrical, 3-8-septate (mostly 5-6), 93-141  $\mu$ m long, 8.5-10  $\mu$ m at their widest point and taper to 5-6  $\mu$ m at the apex, with or without a terminal swelling; they are constricted at their point of attachment and measure 3.5-5.4  $\mu$ m across the septum isthmus.

Habitat: Conidia in foam samples; Kan river (Dahivel); 15 August, 2014; Leg. B.D. Borse Distribution:- Karnatak: Conidia in foam sample (as Flabellospora tetracladia, Sridhar and Kaveriappa, 1984); Kerala: On submerged leaves, conidia in foam and water samples (Sridhar and Kaveriappa, 1985); Madhya Pradesh: On submerged leaves and conidia in foam samples (as Flabellospora tetracladia var. jabalpurensis, Agarwal et al., 1992); Uttarakhand: On submerged leaves and conidia in foam samples (Belwal and Sati, 2007); Maharashtra: Conidia in foam samples (as Flabellospora tetracladia var. mahabaleshwarensis, Shinde and Pawar, 2009).

Remark: The present fungus is being recorded for the second time from Maharashtra (Jamaludeen et al., 2004).

## 5) Helicomyses colligatus R.T. Moore,

Mycologia, 46:89 (1954).

Conidia: loosely coiled 1-2 times, hygroscopic, multiseptate at maturity, each cell containing one large vacuole or two smaller ones; filament tapering at both ends, the basal end 3.5  $\mu$ m broad, filament enlarging to 8  $\mu$ m broad in the middle and brcoming slightly less at the distal end, easily broken into segments; diameter of coils (32-) 50-60  $\mu$ m.

Habitat: Conidia in foam samples; Panzara river (Pimpalner); 15 August, 2014; Leg. B.D. Borse

Distribution:- Karnataka: Conidia in foam samples (Ramesh, 2002); Gujarat: Conidia in foam samples (Borse et al., 2015).

Remarks The present fungus is being recorded for the first time from Maharashtra state (Jamaludeen et al., 2004).

# 6) Hydrometrospora symmetrica J. Gonczol & Revay,

Nova Hedwigia, 40: 199 (1984).

Conodia: solitary, holoblastic, acrogenous, hyaline, composed of a more or less fusiform, septate, central body 60-90 x 5-6  $\mu$ m, central body, to which an H-shaped, branched formation is attached directly or through a short cell. The branches are septate, with pointed ends, diverging more or less from the central body axis 40-60 x 4-5  $\mu$ m, and connected by a short cell.

Habitat: Conidia in foam samples; Panzara river (Latipada); 15 August, 2014; Leg. B.D. Borse

Distribution:- Karnataka: Conidia in foam samples (Ramesh, 2002); Gujarat: Conidia in foam samples (Borse et al., 2015).

Remark: The present fungus is being recorded for the first time from Maharashtra state (Jamaludeen et al., 2004).

## 7) Phalangispora nawawii Kuthub.

Trans. Br. Mycol. Soc., 89: 419 (1987).

Conidial chains: in yellowish-brown mass becoming brownish-green, consists of 13-19 cells connected by narrow isthmi, with main axis and 2-3 laterals (in culture mostly 1-2 laterals), 6-8 cells in main axis, 2-6 (usually 4-5) cells in lateral branches, 65-90  $\mu$ m (mostly 78-80  $\mu$ m) from base to apex, lateral branches 23-70  $\mu$ m (mostly 45-60  $\mu$ m), basal cells conical and 8-9 x up to 2  $\mu$ m, apical cells conical and 8-12 x up to 2  $\mu$ m, cells along conical chain cylindrical and 10-12 x 1.5- 2  $\mu$ m, light brown.

Habitat: Conidia in foam samples; Panzara river (Pimpalner); 15 August, 2014; Leg. B.D. Borse

Distribution:- Karnataka: Conidia in foam samples (Sridhar and Kaveriappa, 1992); Uttarakhand: On submerged leaves (Sati et al., 2003); Madhya Pradesh: Conidia in foam samples (Patil et al., 2014).

Remark: The present fungus is being recorded for the first time from Maharashtra state (Jamaludeen et al., 2004).

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## **PHOTO PLATE**







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