

Biodiversity of Freshwater Mitosporic Fungi from Dhule District (M.S.), India

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Abstract

Five species belonging to two genera of Hyphomycetes were isolated from foam samples and submerged leaves collected from the river Panzara in Dhule district. *Flabellospora acuminata* Descals and Webster is being reported for the first time from India. While *Flabellospora crassa* Alasoadura and *Flabellospora multiradiata* Nawawi are being reported for the first from Maharashtra state.

1. Introduction

Freshwater hyphomycetes were practically untouched until the pioneering work of Ingold (1942), who recognized them as 'Aquatic Hyphomycetes'. Later these fungi have also been described as "Freshwater Hyphomycetes" (Nilsson, 1964) and "Water borne Hyphomycetes" (Webster and Descals, 1979). There are more than 500 named species of hyphomycetes known from freshwater habitats. Most are described from temperate regions and are Ingoldian fungi, while there is little information on tropical species. The North Maharashtra region is rich in biodiversity. However, meager work has been done on freshwater hyphomycetes in this region. Therefore, the present investigation was undertaken.

2. Materials and Methods

Samples of foam and submerged leaves were collected from the river Panzara of Dhule in North Maharashtra.

Foam analysis

In general, the foam formed by the movement of the water against natural barriers like stones, twigs and logs, especially in lotic systems, constitutes a natural trap for the conidia of aquatic hyphomycetes. Foam samples were collected at morning and evening time. Samples were made with a ladle and placed in clean wide mouthed plastic bottles and kept for 24 hours to enable the foam to dissolve. It was preserved by adding FAA. Then samples were brought to the laboratory and observed under compound microscope for the presence of conidia of hyphomycetes.

Leaf litter analysis

Different kinds of submerged leaves were collected randomly from the different sites of Panzara river and brought to the laboratory in

moist condition in polythene bags. They were washed several times in tap water and finally in distilled water. The selected leaves from each site were cut into small bits and incubated separately in Petri dishes containing distilled water at laboratory temperature (25-30°C). The water in the Petri dishes was replaced once in two days to minimize the growth of bacteria and other organisms. The leaf bits were observed initially under stereoscopic Bausch and Lomb microscope at 24-hour intervals for 60 days to detect the water borne fungi appearing on them. Fungi were finally observed under a research microscope.

The permanent slides were prepared as suggested by Kohlmeyer & Kohlmeyer (1996). The measurement and microphotographs of fresh water hyphomycetes were taken at P.G. Department of Botany, S. S.V. P. Sanstha's, L. K. Dr. P. R. Ghogrey Science College, Dhule.

Identification of the freshwater hyphomycetes were confirmed with the help of Nilsson (1964), Ingold (1975), Marvonova (1997), and Cai *et al.* (2003) and other relevant literature. Reports of fungi from India and Maharashtra were confirmed with the help of Kamat *et al.* (1971), Bhide *et al.* (1987), Mahabale (1987), Bilgrami *et al.* (1979, 1981, 1991), Sarbhoy *et al.* (1986, 1996), Jamaluddin *et al.* (2004) and other relevant literature. Vaucher slides of the fungi reported were deposited in the Mycology Herbarium, P. G. Dept. of Botany, S. S. V. P. Sanstha's Late Karmaveer Dr. P. R Ghogrey Science College, Dhule (M.S.), India.

Taxonomic account

Flabellospora acuminata Descals and Webster (Plate-I, Fig. 1)

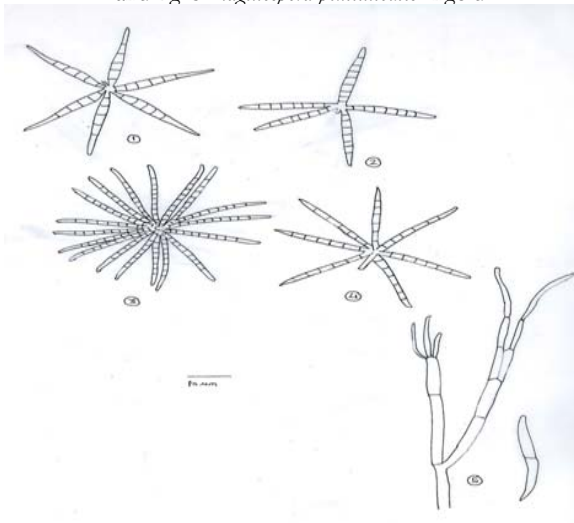
Conidia: Acrogenous, main body clavate, apex capitate 4- 6 µm diameter, base pedunculate, 5- 10 µm long, branches 4 -7 synchronous, 40

- 100 X 7 -15 μm , one branch apical, the rest radiating, slightly retrorsely straight, fusiform, apex greatly extended, cells 3- 10.

Habitat: Conidia in foam samples, Panzara river.

Remark: The descriptions and measurements of conidia are completely agreed with that of *Flabellospora acuminata* Descals and Webster (1982). Therefore, it is assigned to that species. It makes new addition to the fungi of India.

Plate-I: fig.1 *Flabellospora acuminata* Descals and Webster, fig.2 *Flabellospora crassa* Alasoadura, fig.3 *Flabellospora multiradiata* Nawawi, fig.4. *Flabellospora verticillata* Alasoadura and fig. 5 *Flagellospora penicilliodies* Ingold



Flabellospora crassa Alasoadura (Plate-I, Fig. 2)

Conidia: hyaline with four to five arms, 37- 56 μm long, 3.5- 4 μm wide at the attachment, increase in diameter to 5.5- 7.5 μm at the widest part and again narrows gradually towards the tip which is about 3 μm wide, 3- 5 septa, presence of very small central stalk.

Habitat: Conidia in foam samples, Panzara river.

Distribution in India: Karnataka (Sridhar and Kaveriappa, 1982, 1988); Himalaya (Mer and Sati, 1989).

Remark: The measurements and descriptions of conidia are completely agreed with that of *Flabellospora crassa* Alasoadura (1968a). Therefore, it is assigned to that species. It is being reported for the first time from Maharashtra State.

Flabellospora multiradiata Nawawi (Plate-I, Fig.3)

Conidia: consist of a short obpyriform, main axis 9 - 13 μm long and 2 - 3 μm wide at the base, expanding above to form a globose structure. 4 - 6.5 μm diameter. Arms typically 9 - 20, 90 - 140 μm long, 10 - 18 septet.

Habitat: Conidia in foam samples.

Distribution in India: Karnataka (Sridhar and Kaveriappa, 1984, 1988, Ramesh and Vijaykumar 2000), Kerala (Sridhar and Kaveriappa, 1985), Western Ghats (Rajashekhar and Kaveriappa, 2003).

Remark: The measurements and descriptions of conidia are completely agree with that of *Flabellospora multiradiata* Nawawi (1976). Therefore, it is assigned to that species. It is being reported for the first time from Maharashtra State.

Flabellospora verticillata Alasoadura (Plate-I, Fig. 4)

Conidia: multi-rotate, consisting of a main axis and 5 - 10 radiating arms. Main axis 14- 30 X 1.5- 2 μm , 2- 5 septate, with terminal cell obclavate, each arm 8- 14 septate, 50- 90 X 4.5- 5 μm .

Habitat: Conidia in foam samples, Panzara river.

Distribution in India: Maharashtra (Patil and Kapadnis, 1980) Western Ghats (Subramanian and Bhatt, 1981) Kerala (Sridhar and Kaveriappa, 1985) Karnataka (Sridhar and Kaveriappa, 1984, 1986, 1989; Ramesh and Vijaykumar 2000).

Remark: The measurements and descriptions of conidia are completely agreed with that of *Flabellospora verticillata* Alasoadura (1968b). Therefore, it is assigned to that species. It is being reported for the first time from Dhule district.

Flagellospora penicilliodies Ingold (Plate-I, Fig. 5)

Mycelium: septate, branched, hyaline.

Conidiophores: long, septate, 115- 120 X 3.5- 4.5 μm like *Penicillium*, it forms a number of phialides forming a brush like appearance. Each phialide is clavate, producing conidia in succession.

Conidia: small, curved or sigmoid, hyaline, unicellular to single septate, 25- 40 X 2.5- 3 μm in the widest part and tapering towards their apices.

Habitat: Conidia on submerged leaf litter, Panzara river, 14 Jan. 2009, Leg.S.Y.Patil.

Distribution in India: Karnataka (Sridhar and Kaveriappa, 1982), Andhra Pradesh (Manoharachary and Madhusudhan Rao, 1983), Kerala (Sridhar and Kaveriappa, 1985), Madhya Pradesh (Hasija and Shanware, 1986), Kumaun Himalaya (Sati and Tiwari, 1990).

Remark: It has been reported for the first time from Dhule District.

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