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AQUATIC FUNGI FROM NORTH MAHARASHTRA-VII

S. Y. Patil¹ and Borse, B. D.^{2*}

¹P. G. Department Of Botany, S.V.P. Sanstha's L.K. Dr. P.R. Ghogrey Science College, Dhule, Maharashtra, India

²Uttamrao Patil College of Arts and Science College, Dahivel, Tq. Sakri, District-Dhule (M. S.) India

Abstract

Conidia of water-borne hyphomycetes are reported in foam samples collected from the river Tapti and Panzara of North Maharashtra. In all, five hyphomycetous taxa assignable to five genera were identified. The foam spora of North Maharashtra represents a mixture of both tropical and temperate fungi. Three species viz. *Anguillospora crassa* Ingold, *Lunulospora curvula* Ingold and *Tetracladium marchalianum* de Wildman are being reported for the first time from North Maharashtra region while two species viz. *Campylospora filicladia* Nawawi, *Clavariopsis azalanii* Nawawi, are being reported for the first time from Maharashtra State. Brief notes and illustration are given for each taxon. Geographical distribution of these fungi in India is also provided.

Keywords: Freshwater hyphomycetes, Ingoldian Fungi, North Maharashtra

Introduction

Ingold (1942) described many unknown aquatic hyphomycetes on decaying *Alnus* leaves. Aquatic hyphomycetes, an interesting group of triradiate, tetraradiate, sigmoid and helicosporus fungi complete their life cycle on the submerged substrate in well aerated water of river and streams (Ingold, 1942). They play a major role in the degradation of submerged leaf litter and nutrient release in the aquatic ecosystems (Barlocher 1992). Now, a vast flora of aquatic hyphomycetes growing on submerged decaying leaves has been reported (Ingold, 1975; Ingold and Webster 1973). To India, the aquatic hyphomycetes were studied by Ingold and Webster (1973), Galiyah and Manoharachary (1987), Agrawal *et.al* (1990), Sridhar *et.al* (1992), Sati and Tiwari (1997), Sati *et.al* (2002) Rajshekhar and Kaveriappa (2003) and Sati and Belwal (2005). In Maharashtra, these fungi were recorded by Thakur (1977), Patil and Kapadnis (1980), Talde (1981,1983), Borse and Patil (2006), Borse and Patil (2007), Patil (2009), Wagh *et.al* (2009), Nemade *et.al* (2009), Pawara *et.al* (2009) and Patil *et.al* (2010).

Materials and Methods

Samples of foam were collected from Panzara and Tapti rivers. Approximately 10 ml of foam formed due to fast flowing turbulent water at each site was collected in clean plastic bottles and fixed in FAA (mixture of 40% Formaldehyde, 10 ml; Glacial acetic acid, 5 ml and 70% ethyl alcohol, 85 ml) on the spot and latter examined under a low or high power field of microscope to detect the presence of conidia of water-borne fungi.

The encountered fungi species were identified with help of Ingold (1975) and Marvanova (1997). The distribution of these fungi were confirmed with help of Kamat *et.al* (1971); Bhide *et.al* (1987) Bilgrami *et.al* (1991), Sarbhoy *et.al* (1986, 1996); Jamaluddin *et.al* (2004) and the relevant literature. Voucher slides of the fungi reported were deposited in the mycology herbarium, P.G. Department of Botany S.S.V.P. Sanstha's L. K. Dr. P. R. Ghogrey science college, Dhule, M.S., India.

Taxonomic account:

1) *Anguillospora crassa* Ingold (Plate-1 fig.1)

Conidia: hyaline, S or L shaped, 120- 200 µm long and 15- 20 µm wide in the middle region, tapering to 8- 10 : hyaline, branched, the main body globose or ovoid at the ends.

Habitat: Conidia in foam samples.

Distribution in India: Maharashtra (Thakur, 1977), Karnataka (Sridhar and Kaveriappa, 1986), Kumaun Himalaya (Sati and Tiwari, 1990), Gujrat (Ahire *et.al* 2009).

Remark: The measurements and descriptions of conidia are completely agree with that of *Anguillospora crassa* Ingold (1958). Therefore, it is assigned to that species.

2) *Campylospora filicladia* Nawawi (Plate-1 fig.2)

Conidium: consist of two distinct halves. The proximal half is triangular, 4 celled, measuring 6-7.5 µm high and 10-12 µm wide. The distal half is allontoids, 4 celled and measures 9-13 µm long, 3-4.5 µm wide. The appendages arising from end cells. The appendages at the top of the conidium

* Corresponding Author, *Email:*

are usually longer (15-35 μm) than the lateral appendages(7-17 μm).

Habitat: Conidia in foam samples.

Distribution in India: Karnataka (Chandrashekher *et al.*, 1990; Sridhar and Kaveriappa,1988; Ramesh and Vijaykumar,2000,2006), Kerala (Subrmanian and Bhat,1981), Western Ghats, Rajashekhar and Kaveriappa 2003).

Remrks: The descriptions and measurements of conidia are completely agree with that of *Campylospora filicladia* (Nawawi, 1974). It has been reported for the first time from Maharashtra.

3) *Clavariopsis azlanii* Nawawi (Plate-1 fig.3)

Conidia: Tetraradiate, hyaline, 2- 3 septate, main axis 58- 93 μm long, 5- 8 μm wide at its tip and 2- 3 μm wide at base, consists of 3- radiating arms, 72- 128 μm long.

Habitat: Conidia in foam samples.

Distribution in India: Karnataka (Sridhar and Kaveriappa, 1989).

Remark: It is being reported for the first time from Maharashtra.

4) *Lunulospora curvula* Ingold (Plate-1 fig.4)

Mycelium: immersed in the tissue of leaf.

Conidiophores: projecting from the leaf, hyaline, septate, up to 150 μm long,2-3 μm in diameter, unbranched except at the tip where up to 3 conidiogenous cell arise.

Conidiogenous cells: short, cylindrical, about 4-5 μm long and about 3 μm wide in groups of 2 to 3 at the apex of the conidiophore. **Conidia:** arise singly from the conidiogenous cells. Each conidium develops at first as an upwardly directed curved extension of the conidiogenous cells. Later backwardly directed curved extension develops from the opposite side of the conidiogenous cells, attached near the mid point

of the two tapering arms or sometimes asymmetrically. The conidia are often curved in more than one point and usually cotains several vacuoles. Mature conidia crescent shaped 60-100 μm long,inflated to 5-7 μm in the middle, tapering to 1.5 μm towards both ends, with a conspicuous attachment scar just below the inflated region of the convex surface.

Habitat: On submerged leaf.

Distribution in India: Tamilnadu (Ingold and Webster,1973),Andhra Pradesh (Madhusudan Rao and Monoharachary,1984),Karnataka (Sridhar and Kaveriappa,1982,1986;Ramesh and Vijaykumar,2000),Kerala (Sridhar and Kaveriappa,1985), Western Ghats, (Rajashekhar and Kaveriappa, 2003), Maharashtra (Patil and Kapadnis, 1980).

Remark: It has been reported for the first time from North Maharashtra.

5) *Tetracladium marchalinum* de Wildeman (Plate-1 fig.5)

Conidia: tetraradiate, hyaline, consisting of four divergent arms. Arms 20- 40 X 3 μm with two spherical to oval knob like processes, 7- 10 X 5 μm , arising above the point of divergence of arms.

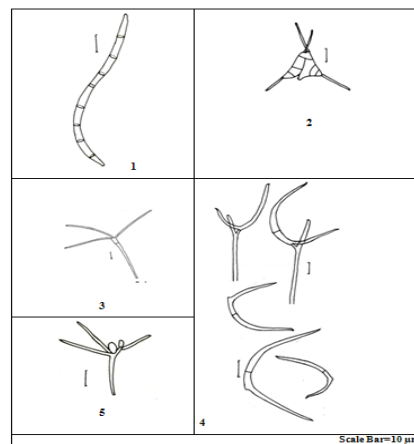
Habitat: Conidia in foam sample.

Distribution in India: Maharashtra (Patil and Kapadnis, 1980); Kerala (Sridhar and Kaveriappa, 1985).

Remark: It is being reported for the first time from North Maharashtra.

Five species of water- borne hyphomycetes were studied in the present study. Conidia of *Anguillospora crassa* Ingold and *Lunulospora curvula* Ingold were observed in most of the samples. Conidia of *Campylospora filicladia* Nawawi, *Clavariopsis azalanii* Nawawi and *Tetracladium marchalianum* de Wildman was rarely observed.

Plate 1 - 1) *Anguillospora crassa* Ingold , 2) *Campylospora filicladia* Nawawi 3) *Clavariopsis azalanii* Nawawi 4) *Lunulospora curvula* Ingold 5) *Tetracladium marchalianum* de Wildman



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