



Fungi From Submerged Plant Debris In Water Bodies Of Nagpur District Of Maharashtra

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Abstract: Present study deals with the diversity of freshwater fungi from submerged plant debris in two water bodies namely Khindsi irrigation project and Totladoh Dam of Nagpur district of Maharashtra. Five species were observed from submerged plant debris collected from these two water bodies from Nagpur district of Maharashtra. The species found are *Aniptodera chesapeakensis*, *Annulatascus palmietensis*, *Chaetomastia typhicola*, *Natantispora retorquens* and *Panorbis viscosus*. All these fungi are reported for the first time from Nagpur district. The fungal species observed are illustrated and described in this paper.

Key words: Diversity of fresh water fungi, Nagpur, submerged debris, water bodies Khindsi and Totladoh.

INTRODUCTION

Freshwater fungi represent a ubiquitous and diverse group of organisms that colonize substrates found in semi-aquatic or aquatic environments (Luo *et al.*, 2004; Fryar *et al.*, 2005; Pascoal, Marvanová and Cássio, 2005; Sakayaroj, Phongpaichit and Jones, 2005; Vijaykrishna and Hyde, 2006). These fungi appear to be taxonomically diverse, and flourish in various ecological niches (Shearer, 1993; Goh and Hyde, 1996; Gonzol and Révay, 2003, 2004; Fryar *et al.*, 2004a, b).

Lignicolous freshwater ascomycetes inhabit submerged woody material in lentic (lakes, ponds, swamps, pools) and running water (rivers, streams, creeks, brooks) habitats (Wong *et al.*, 1998a; Luo *et al.*, 2004), playing an important role in recycling organic matter in the ecosystem. Fungal taxa have been isolated from submerged woody substrata in fresh water habitats (Shearer 1993, Goh and Hyde 1996; Hyde and Goh 1998; Tsui *et al.* 2003; Borse *et al.* 2013)

Little work has been done so far on fungi found on submerged plant debris in aquatic habitats in Nagpur district of Maharashtra. This work aims to describe some fungal species from submerged plant debris in aquatic habitats from Nagpur district of Maharashtra.

Topography of the study area:

Khindsi irrigation project: It is popularly known as Khindsi Lake. It was constructed by British in 1923. It is built on Sur River in Ramtek. The length of the dam is 229 m and the height is 22.2 m. The catchment area is 21.3 thousand hectares. The project is surrounded by forest on all sides. Maximum / Gross storage capacity is 105.13 MCM.

Totladoh Dam: Popularly known as Totladoh Lake. It was built in the year 1989 as a part of hydroelectricity / irrigation project by the government of Maharashtra. The length of the dam is 680m while the height is 74.5 m. It has maximum storage capacity of 1241 MCM. It is located in Pench tiger reserve and wild life sanctuary.

MATERIALS AND METHODS

Samples of submerged wood were collected from different study sites in Nagpur district. The samples thus collected were placed in polythene bags and sealed to prevent moisture loss. Specimens were examined for sporulating structures (conidia, ascospores) in the laboratory. The wooden samples were washed with sterile water to make them free of contamination, and then incubated in plastic boxes. Incubation promotes sporulation of fungi present in substratum as mycelium. Incubation is done in the plastic boxes lined with sterile blotting paper or sand with sterile water.

Samples were examined periodically for any fungal growth. Permanent mounting of the slides were done by using double cover glass method (Volkman- Kollmeyer, 1996). After that necessary observations were made and photographs or drawings were prepared and measurements were taken. A droplet of Lactophenol (with or without cotton blue) was added to the water from the side. The edges of the cover glass were cleaned and sealed with D.P.X. The drop of the D.P.X flattened out and surrounds the edges of small cover glass, thereby permanently covering the dried ring of D.P.X.

RESULTS AND DISCUSSION:

Aniptodera chesapeakensis Shearer and M.A. Miller

Mycologia, 69: 894 (1977).

Ascomata: 135- 285 μm high, 160-300 μm in diameter, immersed, semi- immersed or superficial, globose or sub- globose, hyaline to brown, papillate, ostiolate, solitary or gregarious, membranaceous. **Ostiole:** central, or ascomata lying horizontal to the host surface, and then neck at one end and curving upwards, cylindrical to conical, hyaline to brown, periphysate. **Necks:** 80-320 μm long, 35-75 μm in diameter, cylindrical, periphysate, brown at or below the tip. **Peridium:** 12-15 μm thick composed of elongated, thin-walled cells with large lumina, forming a textura angularis, merging into the pseudoparenchyma of the venter. **Asci:** 65- 120 x 15- 40 μm , 8 spored, clavate, or becomes balloon shaped or swollen, short pedunculate, unitunicate, apically truncate, with apical thickening which has a central pore. **Ascospores:** 20-35 x 8-15 μm , 2-3-seriate, fusiform or ellipsoidal, euseptate, not constricted at the septum, hyaline, smooth, thick-walled, guttulate, with or without polar appendages; appendages filamentous, long or short unfurling in water.

Habitat: On submerged wood in aquatic environment. Khindsi irrigation project, 18 November

2012, Totladoh dam, 20 November 2012, Leg., R.T. Jadhav.

Annulatascus palmetensis Goh, K.D. Hyde and Steinke In: Hyde et al., S. Afr. J. Bot., 64: 151, 1998.

Ascomata: 155-350 µm in diam., dark brown to black, ellipsoidal or sub globose, immersed, semi-immersed, occasionally superficial, solitary, ostiolate, and beaked coriaceous,. **Necks:** up to 200 µm long, 75 µm wide and periphysate, conical or cylindrical, centric, slightly curved, perpendicular to the surface of the substratum.

Peridium: up to 20 µm thick consist of several layers of brown-walled, irregular, angular cells. **Asci:** 100-130 x 7-12 µm, 8-spored, cylindrical, thin-walled, pedicellate with a relatively massive refractive, subglobose apical ring, 4 - 4.5 µm diam., 3- 5 µm high. **Ascospores:** 20-23 x 6-7 µm, 1-2 seriate, short fusiform, ends blunt, 3- septate in mature specimens, hyaline, appearing smooth-walled.

Habitat: On submerged wood. Khindsi irrigation project, 10 June 2013, Leg., R.T. Jadhav.

Chaetomastia typhicola (P. Karst) M. E. Barr

Mycotexon, 34 (2): 514 (1989)

Ascomata: Separate or gregarious, immersed, ovoid or globose sometimes ellipsoidal. 255- 425 µm diam.

Peridium: 16-24 µm wide, surrounded by tomentum of interwoven hyphae. **Asci:** 85-140 x 15-20 µm

Ascospore: Yellowish brown becomes dark brown, asymmetric slightly curved 3 -7 or 9 septate, 25- 40 x 7- 11 µm surrounded by gel coating.

Habitat: On submerged wood in Totladoh dam, 22 November 2012, Khindsi irrigation project, 20 November 2013,, Leg., R. T. Jadhav.

Natantispora retorquens (Shearer and J. L Crane) J. Campb. Anderson and Shearer

Mycologia, 95: 543 (2003).

= *Halosarpheia retorquens* Shearer and Crane, Bot. Mar., 23: 608 (1980).

Ascomata: superficial to immersed, Solitary to gregarious, globose to subglobose, hyaline at first, becoming black, ostiolate, 145- 334 x 150-340 µm **Necks:** dark at base, hyaline at apex cylindrical, periphysate, 158-374 x 14- 35.5 µm. **Asci:** unitunicate, clavate, thin-walled, deliquescing. 55- 145 x 15- 25µm. **Ascospores:** ellipsoidal, hyaline, 1-septate, appendiculate, 20-35 x 7-12 µm, appendages bipolar, composed of single, coiled or folded filament, at first hamates, finally unwinds in water to produce a long filament.

Habitat: On submerged wood; Khindsi irrigation Project, 14 June 2013, Totladoh dam, 12 August 2013, Leg., R.T. Jadhav.

Panorbis viscosus (I. Schmidt) J. Campb. J. L., Anderson and Shearer

Mycologia, 95: 544 (2003).

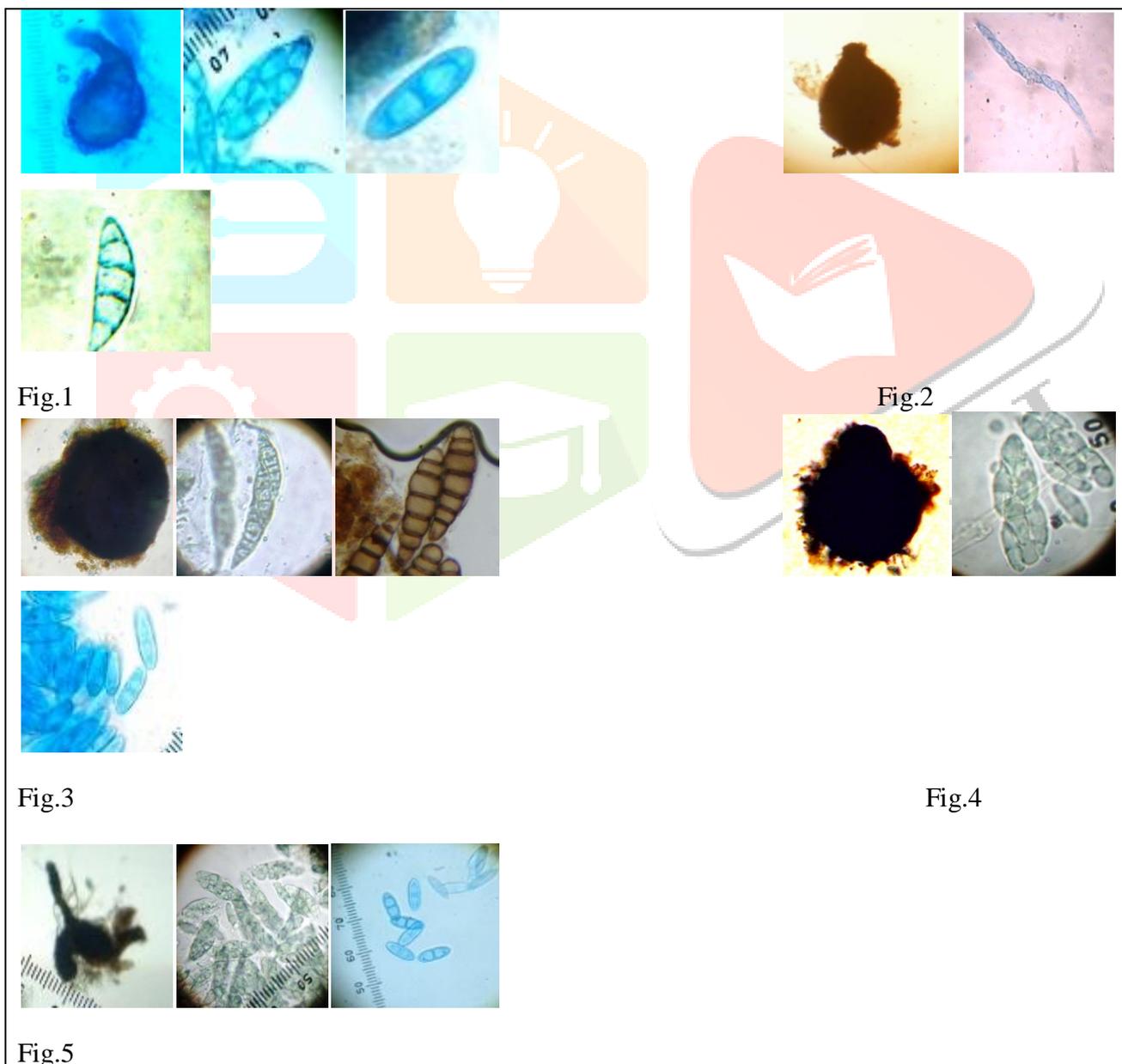
= *Halosphaeria viscosa* I. Schmidt, Natur and Naturschutz, Mecklenburg, 12: 70 (1974) 1979 and Mycotexon, 24: 420 (1985).

= *Halosphaeria viscosa* (I. Schmidt) Shearer and J. L. Crane, Bot. Mar., 23: 608 (1980).

Ascomata: globose to subglobose, at first hyaline becoming black, ostiolate, immersed to superficial, 72-250-435 x 70-248-390 μm **Necks:** dark at base becoming hyaline at the apex, long cylindrical, periphysate, 73-245-630 μm x 20-38-52 μm **Asci :** unitunicate, ellipsoidal to clavate, thin-walled, deliquescent, 35-64-115 x 9-12-25 μm **Ascospores:** 12-20-25 x 4.5- 6- 9 μm ellipsoidal, hyaline, 1-septate, appendiculate bipolar composed of single coiled or folded filament, at first hamate to irregular, finally unwinds in water to produce a long, fine filament.

Habitat: On submerged wood; 18 May 2014 Khindsi irrigation project dam, 22 July 2014, Totladoh dam, 12 Sept 2014, Leg., R.T. Jadhav.

PHOTO PLATES:



- 1) Aniptodera chesapeakensis Ascomata , Ascus ,Ascospore 2) Annulatascus palmetensis Ascomata, Asci, Ascospore
- 3) Chaetomastia typhicola Ascomata, Ascus. Ascospores 4) Natantispora retorquens Ascomata, Asci ,Ascospores
- 5) Panorbis viscosus Ascomata, Asci, Ascospores

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