



ORIGINAL RESEARCH ARTICLE

AQUATIC FUNGI FROM NORTH MAHARASHTRA-IX: THE MITOSPORIC GENUS *ELLISEMBIA* SUBRAMANIANPatil VR^{1*}, Patil SY² and Borse BD³¹S.V.S. Naik Arts, Comm. & Sci. College, Raver-425508, M.S., India.²S.S.V.P. Sanstha's L.K. Dr. P.R. Ghogrey Sci. College, Dhule, M.S., India.³N.S. Sanstha, Dhule's U.P. Arts & Sci. College, Dahivel-424304, M.S., India.

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Abstract: The present article deals with two species of the mitosporic genus *Ellisembia* Subramanian viz., *Ellisembia adscendens* (Berk.) Subramanian and *Ellisembia repentioriunda* Goh & Hyde isolated from submerged woody debris in freshwater habitats. The first species is being recorded for the first time from freshwater habitats in India and latter species forms a new report to the fungi of India. The data provides information on the distribution of these fungi in India, apart from description and illustrations.

Keywords: Freshwater Hyphomycetes, *Ellisembia*, submerged wood

INTRODUCTION

The submerged aquatic Hyphomycetes is one of the ecological groups of freshwater mitosporic fungi, first addressed by Ingold (1975), represent a heterogenous assemblage of fungi growing on submerged decaying plant materials. Most of the species are found on wood litter blocked in fast-flowing streams or babbling brooks. These lignicolous, or to a lesser extent foliicolous, Hyphomycetes are nearly all dematiaceous and produced relatively thick-walled conidiophores and / or conidia. The conidiophores are distinctly macronematous, frequently in the form of long stipes; however, they may be solitary or synnematous. The conidiogenous loci may be denticulate, cicatrized, tretic or phialidic. Although some species may sporulate under submerged conditions, a vast number sporulate when the substrate are no longer under water. Incubation of such woody substrates in moist chambers yields a great number of different species. The conidia are capable of air dispersal or dispersed by some other mechanisms (Goh and Hyde (1996). Goh and Tsui (2003) provide a key to some common genera of submerged freshwater dematiaceous Hyphomycetes that have been reported from freshwater habitats worldwide.

We have been investigating diversity of freshwater Mitosporic fungi that decay woody debris submerged in the rivers, streams and lakes in the North Maharashtra region (India). Previous studies on the submerged freshwater Hyphomycetes from India were made by Natrajan and Udaiyan, 1978; Talde, 1981; Agarwal et al., 1991; Udaiyan 1991; Udaiyan and Hosagoudar 1991; Udaiyan and Manian 1991a; 1991b; Ramesh, 2002; Borse et al 2008, 2014; Shinde and Pawar, 2008, 2009; Patil and Borse 2012; Sridhar et al., 2010; 2011; Sudheep and Sridhar, 2011; Ghanwat and Reddy, 2011; Upadhyaya et al., 2012. The present article deals with two freshwater dematiaceous mitosporic

species viz., *Ellisembia adscendens* (Berk.) Subramanian and *Ellisembia repentioriunda* Goh and Hyde which are described and illustrated in the present paper.

MATERIALS AND METHODS

Samples of various submerged woody debris supporting freshwater Mitosporic fungi were collected randomly during 2011-14 from different lentic and lotic habitats from North Maharashtra region. The samples were placed in plastic bags and sealed well in order to avoid moisture loss. On returning to the laboratory, samples with debris and fouling organisms were washed thoroughly with running tap water. Surface fouling organisms were scrapped off, following rinsing in tap water. The fresh samples were examined using a stereomicroscope for fungal growth. After initial observations, samples were incubated in plastic boxes and kept moist by spraying with distilled water and periodically examined for presence of fungal growth. Permanent voucher slides of fungi were prepared according to the method "double cover glass" provided by Volkmann-Kohlmeyer and Kohlmeyer (1996). Identification of isolated taxa were confirmed with the help of Goh and Hyde (1999). Reports of fungi studied were confirmed with the help of Bilgrami et al., (1991) and Jamaluddin et al., (2004).

Systematic account

Genus: *Ellisembia* Subramanian (1992).

The genus *Ellisembia* was proposed by Subramanian (1992), with *Ellisembia coronata* (Fuckel) Subramanian, as its type species. The genus is characterized by having, *Conidiophores*: simple, mononematous, brown, septate, proliferation none or percurrent and irregular. *Conidia*: gangaliar, solitary, acrogenous, pseudoseptate, dry.

Type species: *Ellisembia coronata* (Fuckel) Subramanian

Habitat: Saprobic on plant debris.

Description: Based on Subramanian (1992).

*Corresponding Author:

Dr. Patil VR,

S.V.S.Naik A.C.S.College,

Raver-425508, Maharashtra, India.



1) *Ellisembia adscendens* (Berk.) Subramanian (1992).
 = *Sporidesmium adscendens* Berk., (1840).
 = *Clasterosporium adscendens* (Berk.)(1886).

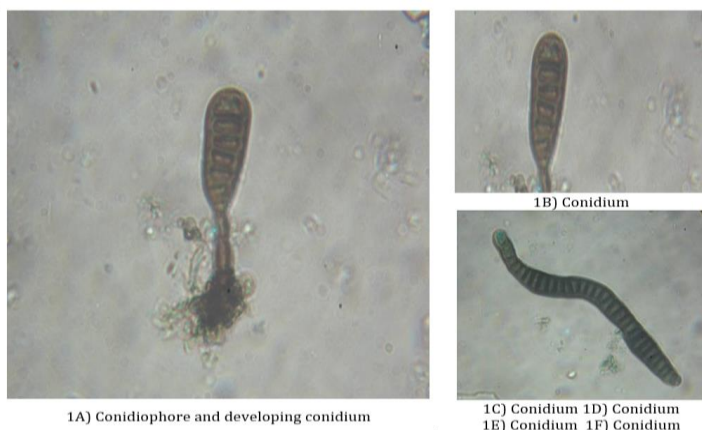
Colonies: hairy, black. **Mycelium:** partly immersed and partly superficial, comprising branched, anastomosing, pale brown, smooth, 2-4 μm wide hyphae. **Conidiophores:** medium to dark reddish brown, solitary or rarely in groups of 2-3, sometimes arising from superficial hyphae, 20-45 x 5-8 μm . **Conidia:** flexuous, cylindrical-obclavate, elongate, pseudoseptate, broadly rounded at the apex, obconically truncate at the base, medium to dark reddish brown, smooth, 150-500 x 14-17(-20) μm .

Habitat: On submerged woody debris, 24th November, 2013, Cipna River, Semadoh, Leg. V.R. Patil

Distribution: Kerala: On dead wood (Rao and Mani Verghese, 1979); Maharashtra: On dead wood (Rao and Mani Verghese, 1980); on submerged wood (present studies); Andhra Pradesh: On dead wood (Rao Venugopal and Manoharachary, 1985); Madhya Pradesh: On dead stem (Sharma et al., 1989).

Remarks: The present fungus is rare in occurrence. The descriptions and measurements of conidia and conidiophores are completely agreed with that of *Ellisembia adscendens* (Berk.) Subramanian as provided by Goh and Hyde (1999). Therefore, it is assigned to that species. It is being recorded for the first time from freshwater habitats in India.

Figure 1: *Ellisembia adscendens* (Berk.) Subramanian



2) *Ellisembia repentioriunda* Goh & Hyde (1999).

Colonies: on natural substrate velvety, olivaceous brown. **Mycelium:** mostly superficial, comprising pale to medium brown, 2-3(-3.5) μm wide, smooth or verruculose, septate, extensively ramifying hyphae. **Conidiophores:** brown on superficial smooth hyphae, with a knot of hyphae, 7-9 μm wide at the base, solitary

or aggregated in groups of 2 to 3, straight flexuous, cylindrical, pale to medium brown, 15-35 x 3.5-4.5 μm , uniform in width and colour, unbranched, smooth, 0-2-septate, not cicatrized, sometimes with one precurrent proliferation. **Conidia:** obclavate, slightly rostrate, straight or slightly asymmetric, pale grayish brown, 30-45 x 7-9 μm , mostly with 6- pseudosepta, rarely 7-pseudoseptate, not constricted at the septa, apical cell usually hyaline, rounded at the tip, usually provided with a hyaline, subglobose (ca. 10-15 μm diam.) mucilaginous sheath, obconically truncate at the base and usually with a slightly darkened hilum.

Habitat: On submerged woody debris, 24th November, 2013, Cipna River, Semadoh, Leg. V.R. Patil

Distribution: Maharashtra: Saprobic on submerged wood (present studies).

Remarks: The present fungus is occasional in occurrence. The descriptions and measurements of conidia and conidiophores are completely agreed with that of *Ellisembia repentioriunda* Goh and Hyde (1999). Therefore, it is assigned to that species. It is being reported for the first time from India.

Figure 2: *Ellisembia repentioriunda* Goh & K.D. Hyde



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