

Freshwater Ascomycetes from Pachmarhi Biosphere Reserve (M.P., India)-II

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Abstract: The present paper deals with 6 species of freshwater Ascomycetes from Pachmarhi Biosphere reserve (M.P.). These include viz. *Caryospora putaminum*, *Natantisporea retorquens*, *Neomassariosphaeria typhicola*, *Panorbis viscosus*, *Savoryella aquatica*, *S. fusiformis*, These fungi were encountered on decaying submerged wood samples. Some of these Ascomycetes are being recorded for the first time from Madhya Pradesh. The data provide information on the distribution of these fungi in India, apart from description and illustrations. The taxonomy, morphology and ecology of these fungi are discussed.

Keywords : Freshwater Ascomycetes, submerged wood, *Caryospora*, *Savoryella*.

I. INTRODUCTION

Freshwater Ascomycetes are defined as Ascomycetes which have been recorded in freshwater habitats and which complete part, or the whole of their lifecycle within freshwater environments (Wong et al. 1998). Lignicolous freshwater Ascomycetes inhabit submerged woody material in lentic (lakes, ponds) and lotic (rivers, streams) habitats, playing an important role in recycling organic matter in the aquatic ecosystem. They comprise a diverse taxonomic assemblage of about 622 species (Cai et al. 2014; Shearer et al. 2014). These fungi are mostly saprobic on submerged woody and herbaceous debris and are important in aquatic food webs as decomposers and as a food source to invertebrate grazers (Simonis et al. 2008).

Freshwater Ascomycetes from India were compiled by Borse et al. (2014, 2016) and from Madhya Pradesh were studied by Agrawal et al. (1991) and Upadhyaya et al. (2012). Recently, Singh et al. (2014), Patil et al. (2014a, b) and Chaudhari et al. (2016) recorded some freshwater Hyphomycetes from Madhya Pradesh.

In the present studies 18 species of freshwater Ascomycetes from Pachmarhi Biosphere reserve (M.P.) were encountered on decaying submerged woody debris samples. The data provide information on the distribution of these fungi from Madhya Pradesh and India, apart from description and illustrations

II. MATERIALS AND METHODS

Sample of submerged decaying woody debris were collected from various localities along major streams and water reservoirs from PBR. The survey was undertaken for two years during 2014-2016. The sample analysis was done by the following method:

Monthly random collections of fifty submerged; partially decomposed woody debris (twigs or branches, 1-5 cm diam. and 30 cm length) were made from selected study sites along rivers and reservoirs from PBS (MP). The samples were returned to the laboratory keeping in plastic bags in the field and immediately examined with a dissecting microscope to locate fungal fruiting bodies. After the first observation, samples were incubated for three months on a moist paper towels in sterile plastic boxes at ambient temp. of 25-30°C to stimulate fungal development. Incubated samples were examined on day 15 and then over three months under a dissecting microscope for fungal fruiting bodies. The fungal taxa present on the wood samples were identified with the help of Borse et al. (2016) and relevant literature.

The slides were made permanent by using double cover glass method (Volkman-Kohlmeyer and Kohlmeyer, 1996). The measurement of various parts like ascocarps, asci, ascospores etc. were taken and used in the identification of different species. Reports of fungi from India and M.P. state were confirmed with the help of Bilgrami et al. (1979, 1981, 1991), Sarbhoy et al. (1975, 1986, 1996), Jamaluddin et al. (2004), Borse et al. (2016) and other relevant literature.

III. TAXONOMIC ACCOUNT

1. *Caryospora putaminum* (Schwein) De Not.

Micromyc. Ital. Dec., 9: 7 (1956).

Ascospores: (50-) 80-120 (-150) x (35-) 40-54 (-65) μm , length : width ratio ca 2 : 1, reddish brown, dark brown, finally opaque in age, symmetric, broadly ellipsoidal or biconic, tapering to pointed or rounded tips, often paler at tips, primary septum median, occasionally with thin septa at the tips, constricted, with large

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globule in each cell, wall thick (3-5 μm), surrounded by narrow gelatinous coating 4-12 μm wide layer when young and this drying down to form toughened with granular deposit that may appear on surface.

Habitat: On submerged wood, Pachmarhi, 11 Nove., 2015; leg. S.A. Chaudhari

Distribution in India: Maharashtra (see Borse et al. 2016); Madhya Pradesh: Present study.

2. *Natantispora retorquens* (Shearer & J.L. Crane) J. Campb. et al. *Mycologia*, 95: 543 (2003).

Ascospores: 20-34 x 7-11 μm , ellipsoidal, hyaline, 1-septate, appendaged. Appendages: bipolar, composed of single, coiled or folded filament, at first hamate, finally unwinding in water to produce a long fine filament.

Habitat: On submerged wood, Pachmarhi, 11 Nove., 2015; leg. S.A. Chaudhari

Distribution in India: Marine Habitats: West Coast: Maharashtra, Karnataka, Kerala (see Borse et al. 2012, 2013). Freshwater Habitats: Maharashtra (see Borse et al. 2016); Madhya Pradesh: Present study.

3. *Neomassariosphaeria typhicola* (P. Karst.) Yin, Zhang, F. Fourn. & K.D. Hyde

In: Zhang et al., *Studies Mycology*, 64: 96 (2009).

Ascospores: 34-52 x 7-10 μm , bi- or tri-seriate in the upper part of the ascus, uni-seriate below, fusiform, 7-11-septate, slightly constricted at the septa, particularly around the thickest cell (4th or 5th from the top), straight or curved, at first hyaline, becoming light brown (or golden brown) and verrucose in age, surrounded by a gelatinous, 2 to 4 μm thick sheath.

Habitat: On submerged parts of *Typha angustata* Chaub. & Bory, Pachmarhi, 11 Nove., 2015; leg. S.A. Chaudhari

Distribution in India: Andhra Pradesh, Maharashtra (see Borse et al. 2016); Madhya Pradesh: Present study.

4. *Panorbis viscosus* (I. Schmidt) J. Campb., J.L. Anderson & Shearer

Mycologia, 95: 544 (2003).

Ascospores: 13-20-26 x 4.4-6.6-8.4 μm , hyaline, 1-septate, ellipsoidal, appendaged. Appendages: bipolar, composed of a single, coiled filament, at first hamate and unwinding in water to produce a long fine filament.

Habitat: On submerged wood, Pachmarhi, 11 Nove., 2015; leg. S.A. Chaudhari

Distribution in India: Marine Habitats: West Coast: Maharashtra, Karnataka, Kerala; East Coast: Tamil Nadu, Andhra Pradesh (see Borse et al. 2012; 2013); Freshwater Habitats: Maharashtra (see Borse et al. 2016); Madhya Pradesh: Present study.

5. *Savoryella aquatica* K.D. Hyde

Aust. Syst. Bot., 6: 162(1993).

Ascospores: 29-38 x 13.5-17 μm , ellipsoidal, biseriate, hyaline to olive-green when immature, central cells dark brown when mature, end cells hyaline, constricted weakly at the septa, central septa appearing as a band and highly guttulate.

Habitat: On submerged wood, Pachmarhi, 11 Nove., 2015; leg. S.A. Chaudhari

Distribution in India: Maharashtra, Gujarat (see Borse et al. 2016); Madhya Pradesh: Present study.

6. *Savoryella fusiformis* W.H. Ho, K.D. Hyde & Hodgkiss

Mycol. Res., 101: 804 (1997).

Ascospores: 25-35 x 6-9.6 μm , fusiform, biseriate, 3-septate, slightly constricted at the septa, smooth, thin-walled; central cells brown, apical cells 4-4.8 μm long, 4-4.8 μm wide, hyaline.

Habitat: On submerged wood, Pachmarhi, 11 Nove., 2015; leg. S.A. Chaudhari

Distribution in India: Maharashtra, Gujarat (see Borse et al. 2016); Madhya Pradesh: Present study.

IV. RESULT AND CONCLUSION

Securely ensured locales for preserving natural decent variety, observing negligibly circulated biological systems and undertaking non-dangerous research and another low-sway utilizes, (for example, the eco-the travel industry and training). A well-characterized cushion zone usually encompasses or abuts the center zones and is utilized for agreeable exercises good with sound biological works on, including natural instruction, diversion, and applied and fundamental research. An adaptable progress region or region of participation: May contain an assortment of farming exercises, settlements and different uses and in which neighborhood networks, the executives' offices, researchers, non-administrative associations, social gatherings, monetary interests, and different partners cooperate to oversee and economically build up the zone's assets.

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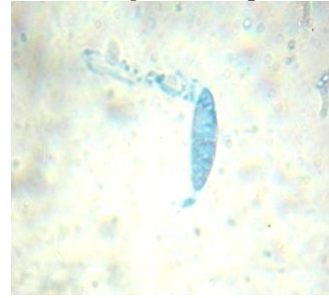
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Photographs Ascospore(s)

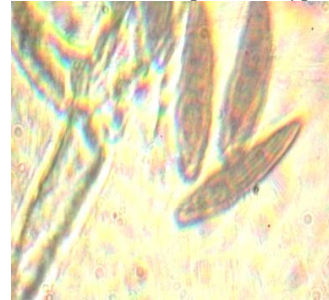
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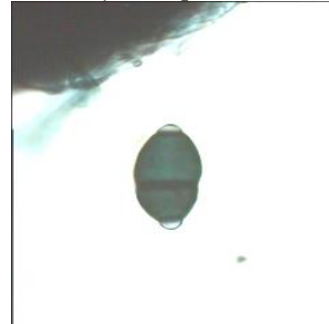
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