

Diversity of *Savoryella jones* and *eaton* from north Maharashtra

S. Y. Patil and B. D. Borse

P. G. Department of Botany, S.S.V.P.S.L.K., Science College, Dhule (M.S.), India.

Abstract

The present paper deals with three species of ascomycetous genus *Savoryella* viz. *Savoryella fusiformis* Ho, Hyde and Hodgkiss, *Savoryella grandispora* Hyde and *Savoryella limnetica* Chang and Hsieh were collected from the submerged wood samples from the various water bodies in North Maharashtra region. All the three species are being recorded for the first time from India. Brief notes and illustration are given for each taxon. Geographical distribution of each species in India is also provided.

Keywords: *Savoryella*, Ascomycetes, India.

INTRODUCTION

Biological diversity (biodiversity) encompasses the variety of life forms occurring in nature, from the ecosystem to the genetic level, as a result of evolutionary history [1]. The idea that fungi form a kingdom distinct from plants and animals gradually became accepted only after Whittaker (1969) [2]. Presently, the "fungi" as a mega-diverse group span three kingdoms, most belonging to the Kingdom Fungi (Eumycota), while others are classified in the Kingdom Protozoa and Kingdom Chromista (Straminipila) [3 and 4]. The word "fungi" (in lower case and not in italics) is commonly used as a collective term for organisms traditionally studied by mycologists from all three kingdoms [5].

Freshwater ascomycetes comprise a diverse taxonomic assemblage of about 577 species [6]. 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 [7].

Manoharachary and Rao (1972) [8] first discovered new freshwater ascomycetous genus *Subbaromyces* with *Subbaromyces aquaticus* as its type species from South India. Udaiyan (1989) [9] reported 10 ascomycetous species from water-cooling towers from South India. Recently Borse and Pawara (2007) [10] reported *Savoryella aquatica* and *S. lignicola* from north Maharashtra region. Recently, Sridhar et al. (2010) [11] recorded some freshwater ascomycetes from Karnataka.

MATERIALS AND METHODS

The survey was undertaken for two years (2008-2010). Monthly random collections of fifty submerged; partially decomposed woody debris (1-5 cm diam. and 30 cm length) were made from the various sites viz. Tapti river, Panzara river, Latipada Dam, Aner Dam.

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 few months on a moist paper towels in sterile plastic boxes at ambient temp. of 25^o-30^o C for three months to stimulate fungal development. Incubated samples were examined on day ten and then over three months under a dissecting microscope for fungal fruiting bodies. The fungal taxa present on the wood samples were recorded, identified and isolated. 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.

TAXONOMIC ACCOUNT

Genus: *Savoryella* E.B.G. Jones and Eaton

Ascomata: solitary to gregarious, immersed, partly immersed to superficial, ostiolate, periphysate, papillate, membranous and brown, Peridium of *textura angularis* when viewed from the surface and in section composed of several layers of angular cells. Paraphyses presents in young ascomata, wide and septate. Asci: 2 to 8-spored, cylindrical to clavate, short pedunculate, unitunicate, persistent, with a non-amyloid apical thickening containing a pore. Ascospores: ellipsoidal, 3-septate, central cells brown, end cells hyaline, with or without polar appendages.

Type species: *Savoryella lignicola* Jones and Eaton

Habitat: On submerged wood.

Description: Based on Jones and Eaton (1969) [12].

Savoryella fusiformis Ho, K.D. Hyde and Hodgkiss

Ascomata: 130-190 μ m long, 70-90 μ m diam., immersed or superficial, coriaceous, pyriform, dark-brown, ostiolate, papillate, axis horizontal to the host surface, solitary or gregarious. Necks: 70-120 μ m long, 35-50 μ m diam., cylindrical, slightly tapering towards the apex, brown, periphysate, mostly pointing upwards with a hyaline apex. Peridium: thin, brown, of *textura epidermoidea* when viewed from the surface. Paraphyses: septate. Asci: 80-120 x 9-14 μ m, 8-spored, cylindrical or clavate, unitunicate, thin-walled, short pedicellate, persistent, with non-amyloid apical ring ca 1.44 μ m

Received: Oct 12, 2011; Revised: Oct 29, 2011; Accepted: Nov 16, 2011.

*Corresponding Author

S. Y. Patil

P. G. Department of Botany, S.S.V.P.S.L.K., Science College, Dhule (M.S.), India.

Email: sambhajiyip@rediffmail.com

high, 4.8 μm diam. *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: Saprobic on submerged wood.

Description: Based on Ho et al. (1997) [13].

Distribution: Maharashtra (present study)

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

Savoryella grandispora Hyde

Ascomata: 195-260 μm long, 91-130 μm diam., immersed, semi-immersed or superficial, coriaceous, pyriform, brown or black, ostiolate, papillate, periphysate, solitary or gregarious. *Necks*: short, up to 68 μm diam., hyaline, bending up towards the light. *Peridium*: thin, of *textura angularis* in surface view and brown. *Paraphyses*: few, with round cells. *Asci*: 106-140 x 26-34 μm , 8-spored, clavate, thin-walled, with a short peduncle, apically thickened with a ring and pore/plug, mature successively. *Ascospores*: 46-58 x 14-16 μm , ellipsoidal, biseriate, light brown, central cells dark brown when mature, end cells hyaline, constricted weakly at the septa.

Habitat: Saprobic on submerged wood.

Description: Based on Hyde (1994) [14].

Distribution: Maharashtra (present study)

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

Savoryella limnetica Chang and Hsieh

Ascomata: 251- 301 X 157- 214 μm , partly or fully immersed in wood, oblique to horizontal, dark brown to black, globose to sub-globose, ostiolate and periphysate. *Peridium*: *textura angularis* with brown, septate, unbranched hyphae on the surface and neck. *Necks*: 150- 342 X 57- 92 μm , lateral and periphysate. *Paraphyses* broad, up to 8 μm , deliquescent early, hyaline, rarely branched. *Asci*: 145-150 X 10.4- 11.4 μm , unitunicate, long cylindrical with a short foot, apices truncate with non-amyloid apical thickening containing a pore, pedicellate with an annulus 3.1- 3.4 X 0.2- 0.7 μm . *Ascospores*: 20.1-25.6 X 7- 9 μm , ellipsoidal, 3- septate, non constricted, central cells brown, end cells smaller and hyaline to sub hyaline.

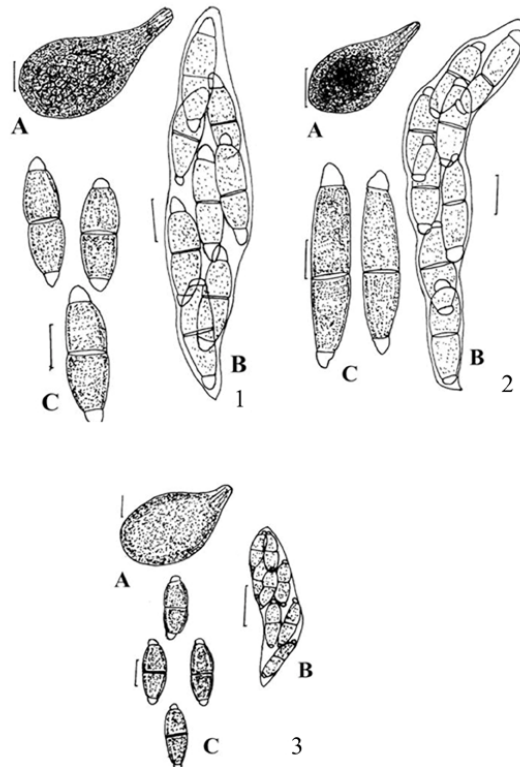
Habitat: Saprobic on submerged wood.

Description: Based on Chang and Hsieh (1998) [15].

Distribution:- Maharashtra (present study)

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

All the three species of *Savoryella* were found rarely.



1) *Savoryella fusiformis* Ho, Hyde and Hodgkiss

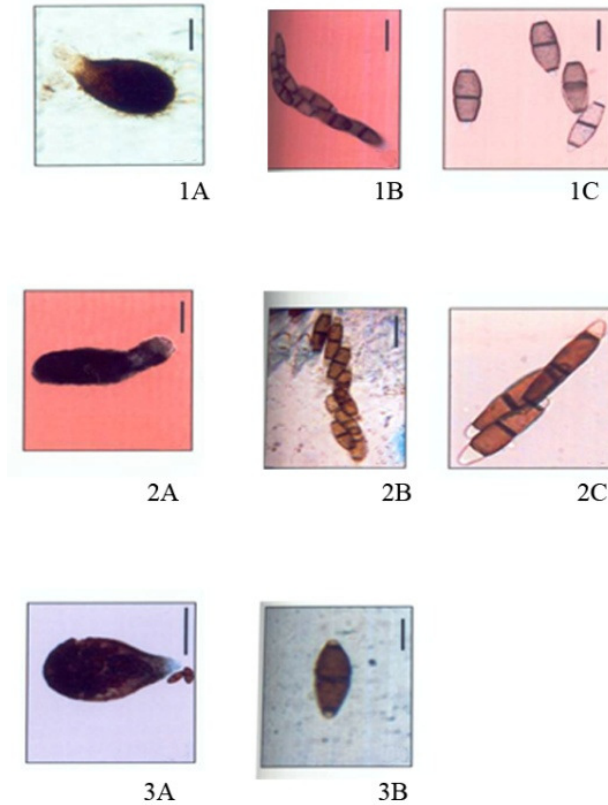
A) *Ascomata* (Scale=25 μm) B) *Ascus* (Scale= 10 μm) C) *Ascospores* (Scale=10 μm)

2) *Savoryella grandispora* Hyde

A) *Ascomata* (Scale=50 μm) B) *Ascus* (Scale=10 μm) C) *Ascospores* (Scale=10 μm)

3) *Savoryella limnetica* Chang and Hsieh

A) *Ascomata* (Scale=75 μm) B) *Ascus* (Scale=40 μm) C) *Ascospores* (Scale=10 μm)



- 1) *Savoryella fusiformis* Ho, Hyde and Hodgkiss
 A) Ascomata (Scale=50 μ m) B) Ascus (Scale=20 μ m) C) Ascospores (Scale=15 μ m)
 2) *Savoryella grandispora* Hyde
 A) Ascomata (Scale=50 μ m) B) Ascus (Scale=50 μ m) C) Ascospores (Scale=20 μ m)
 3) *Savoryella limnetica* Chang and Hsieh
 A) Ascomata (Scale=150 μ m) B) Ascospores (Scale=10 μ m)

ACKNOWLEDGEMENTS

The authors are thankful to Dr. S. N. Nandan, Principal and Dr. Sandhya Patil, Head, P. G. Department of Botany, S. S. V. P. Sanstha's L. K. Dr. P. R. Ghogrey Science college, Dhule, M. S. for library and laboratory facilities.

REFERENCES

- [1] Wilson, E.O. 1992. The Diversity of Life, Harvard University Press, Cambridge, Massachusetts, USA.
- [2] Whittaker, R.H. 1969. New concept of kingdoms of organisms. *Science*.163: 150-160.
- [3] Cavalier-Smith. T.1998. A revised six-kingdom system of life. *Biological Review*.73: 203-266.
- [4] James, T.Y., Kauff, F. and Schoch, C.L. 2006. Reconstructing the early evolution of the fungi a six gene phylogeny. *Nature*. 443: 818-822.
- [5] Hawksworth, D.L. 1991. The fungal dimension of biodiversity: magnitude, significance, and conservation. *Mycol. Res*.95: 641-655.
- [6] Shearer, C.A., Fallah, P.M., Ferrer, A. and Raja H.A. 2009. Freshwater ascomycetes and their anamorphs. URL: www.fungi.life.uiuc.edu (accessed Nov. 2009).
- [7] Simonis, J.L., Raja, H.A. and Shearer, C.A. 2008. Extracellular enzymes and soft rot decay: Are ascomycetes important degraders in fresh water ecosystem. *Fungal Diversity*. 31: 450-430.
- [8] Manoharachary, C. and Rama Rao 1972. *Subbaromyces aquaticus*, a new ascomycete from India. *Hydrobiologia*. 49: 745-749.
- [9] Udaiyan, K. 1989. Some interesting ascomycetes from water cooling towers. *Kavaka*.17: 11-16.
- [10] Borse, B.D. and Pawara, C.M. 2007. Fresh water Ascomycetes from North Maharashtra-I: *Bioinfolet*. 4: 107-110.
- [11] Sridhar, K.R., Karamchand, K.S. and Hyde, K.D. 2010. Wood-inhabiting filamentous fungi in high-altitude streams of the Western Ghats by damp incubation and bubble chamber incubation. *Mycoscience*. 51: 104-115.
- [12] Jones, E.B.G. and Eaton, R.A.1969. *Savoryella lignicola* gen. et sp. nov. from water cooling towers. *Trans. Br. Mycol. Soc*.52: 161-174.
- [13] Ho, W. H., Hyde, K. D. and Hodgkiss, I. J. 1997. Ascomycetes from tropical fresh water habitats : the genus *Savoryella*, with

- two new species. *Mycol. Res.* 101:803-809.
- [14] Hyde, K.D. 1994. The genus *Savoryella* from freshwater habitats, including *S. grandispora* sp. nov. *Mycoscience*. 35: 59-61.
- [15] Chang, H.S., Hsieh, S.Y., Jones, E.B.J., Read, S.J. and Moss, S. T. 1998. Aquatic ascomycota: New freshwater species of *Ascotaiwania* and *Savoryella* from Taiwan. *Mycol. Res.* 102:709-718.