



SOME MARINE FUNGI FROM LAXMANPUR BEACH AT NIEL ISLAND OF ANDAMAN

¹A.R. Tuwar*, ²J.B. Cholake and ³R.K. Aher

¹Arts, Commerce & Science College Sonai, Tal: Newasa, Dist: Ahmednagar.

²Padmashri Vikhe Patil College of Arts, Science and Commerce College Pravaranagar.

³New Arts, Commerce and Science College Parner, Tal-, Parner, Dist -Ahmednagar.

*Corresponding author: tuwarar@gmail.com

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ABSTRACT:

The present study deals with marine fungi from Laxmanpur beach at Niel island of Andaman. The dead, decaying, intertidal and submerged mangrove wood samples were collected from Laxmanpur beach. These samples examined for colonization of marine fungi. Ten species of marine fungi were isolated and illustrated. Out of these marine fungi 5 species of Ascomycota (*Aigialus grandis* Kohlm. and Schatz, *Eutypa bathurstensis* K. D. Hyde and Rappaz, *Savoryella lignicola* Jones and Eaton, *Halorosellinia oceanica* (S.Schatz) Whalley *et al* and *Verruculina enalia* (Kohlm) Kohlm and Volkm.-Kohlm.), while 5 species from Mitosporic fungi (*Alternaria* sp., *Clavatospora bulbosa* (Anastasiou) Nakagiri and Tubaki, *Epicoccum purpurascens* Ehrenb. and Schlecht, *Halenospora varia* (Anastasiou) Jones and *Periconia prolifica* Anastasiou). Out of these fungi *Alternaria* sp is very common fungi reported from most of the wood samples. All ten higher marine fungi were first time reported from Laxmanpur beach of Andaman Island.

Key words: - Mangrove, Marine Fungi, Laxmanpur beach, Niel Island and Andaman.

INTRODUCTION:

Laxmanpur beach is situated at Laxmanpur village at Niel island of Andaman. Laxmanpur beach is located 39 km from Port-blair and 2 km from Neil jetty. Laxmanpur beach is famous beach of Niel Island. Marine fungi play an important role in nutrient regeneration cycle as decomposers of decaying organic matter. A range of fungi occurs in the mangrove ecosystem, although their composition and frequency of occurrence vary with location. Mangroves sustain a wide range of fungi and the fungal diversity reflects the availability of substrate for colonization. Mangroves are the evergreen forest common to tropical and subtropical coastal regions and occur along estuaries, coastal lagoons and backwaters where the regular flow of the tides bring along with mixing of fresh water from

rain and land drainage with marine coastal waters.

An extensive ecological study on mangroves fungi in India were studied by Borse (1988), Ravikumar (1991), Chinnaraj and Untawale, (1992), Ravikumar and Vitthal, (1996), Borse, et al., (2012), Tuwar et al., (2012), However study on Andaman & Nicobar Island is merger. Some extent Chinnaraj, (1993), Baskaran R., et al., (2012) and Tuwar & Cholake., (2013) study the marine fungi from mangroves from Andaman & Nicobar Islands. This data provides information on the distribution of these marine fungi from Mangrove ecosystem of Laxmanpur beach at Niel island of Andaman. The taxonomy, morphology and ecology of these fungi will be illustrated and discussed.

MATERIALS AND METHODS:

Samples of dead and decayed mangrove wood, intertidal wood, driftwood and submerged wood were collected randomly during low tide period from Laxmanpur beach at Niel island of Andaman. 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 sterile seawater and periodically examined for presence of fungal growth.

The permanent slides were prepared as per suggested by Volkmann- Kohlmeyer and Kohlmeyer, 1996 and Kohlmeyer and Kohlmeyer 1972. The measurements of various parts of fungi and their photomicrographs were taken. The identification of the marine fungi was made with the help of Kohlmeyer and Kohlmeyer, 1979; Kohlmeyer and Volkmann-Kohlmeyer, 1991; Hyde and Sarma 2000 and other relevant literature.

RESULTS AND DISCUSSION:

Chinnaraj (1993) isolated 63 marine fungi from mangroves of Andaman and Nicobar Islands. The results of our investigation total ten species of marine fungi were isolated and illustrated. Out of these marine fungi 5 species of Ascomycota (*Aigialus grandis* Kohlm. and Schatz, *Eutypa bathurstensis* K. D. Hyde and Rappaz, *Savoryella lignicola* Jones and Eaton, *Halorosellinia oceanica* (S.Schatz) Whalley *et al* and *Verruculina*

enalia (Kohlm) Kohlm and Volkm.-Kohlm.) and 5 species from Mitosporic fungi (*Alternaria* sp., *Clavatospora bulbosa* (Anastasiou) Nakagiri and Tubaki, *Epicoccum purpurasens* Ehrenb. and Schlecht, *Halenospora varia* (Anastasiou) Jones and *Periconia prolifica* Anastasiou). Out of these fungi *Alternaria* sp is very common fungi reported from most of the wood samples. This data provides information on the distribution of these fungi in India, apart from description and illustrations. The taxonomy, morphology and ecology of these fungi will be illustrated and discussed.

Taxonomic Account of Fungi

1. *Aigialus grandis* Kohlm. and S. Schatz, *Trans. Br. Mycol. Soc.*, **85**: 699, 1985.

Ascomata: 244-470 μm thick, globose, ostiolate, carbonaceous to coriaceous, black, gregarious. Peridium: two-layered; composed of elongate, more or less irregular cells. Ostioles: 32-80 μm diam., Pseudoparaphyses: 1-2 μm in diam., trabeculate, unbranched at the base, embedded in a gelatinous matrix. Asci: 290-380 μm x 30-34 μm , eight-spored, cylindrical, long-pedunculate, thick-walled, fissitunicate, with a refractive apical plate in the ectoascus and a refractive apical ring in the endoascus. Ascospores: 88-92 μm long, 20-22 μm broad, 12-16 μm thick, biseriate, ellipsoidal to broadly fusiform in frontal view, in side

view flat on one side, convex on the other, muriform, with 14-16 trans-septa and 1-3 longisepta in all but the end cells, slightly constricted at the septa, yellow-brown except for the hyaline or light brown apical cells, glabrous, 2-3 μm thick, with a gelatinous cap, around the apical and sub-apical cells.

2. *Eutypa bathurstensis* K. D. Hyde and Rappaz, *Mycol. Res.* **97**: 861, 1993.

Ascomata: 0.2-0.6 mm high, up to 0.8 mm wide, spherical to flattened, submerged in the wood, Necks: up to 0.3 mm long, Peridium:

30-43 μm wide or wider near the ostiolar canal. Ostioles: poorly developed or conical, up to 280 μm high, 129-177 μm diam., Paraphyses: numerous, persistent. Asci: clavate, 26-42 μm x 7.5-9.5 μm , eight-spored, Ascospores: 7 x 2-3 μm . and olive-brown.

3. *Halorosellinia oceanica* (Schatz) Whalley, Jones, Hyde and Laessle, *Mycol. Res.*, **104**: 368, 2000.

Hypoxylon oceanicum Schatz, *Mycotaxon*, **33**: 413, 1988. Pseudostromata: 0.5-0.7 μm diameter, single, or in clusters, linear to suborbicular, Ascomata: 620-770 μm x 730-960 μm , subglobose to hemispherical, soft to leathery, black, ostioles papillate. Peridium: 25-32 μm wide, Paraphyses: 2-3 μm wide at the base, abundant, persistent, remotely septate. Asci: eight-spored, 170-210 μm long, spore-bearing part 135-139

μm long, stipe 40-76 μm long, cylindrical, unitunicate, Ascospores: dark grey-olive to opaque brown, more or less inequilaterally ellipsoid, upper end broadly rounded, lower end slightly pointed, one-celled, 16-18 μm x 6-8 μm , biguttulate, wall smooth and relatively thick, without appendages.

4. *Savoryella lignicola* Jones and Eaton, *Trans. Br. Mycol. Soc.*, **52**: 161, 1969.

Ascomata: 214-290 μm high, 122-260 μm in diameter, globose, subglobose or ellipsoidal, ostiolate, papillate, membranous and pale to dark brown. Necks: 76-140 μm long and upto 70-72 μm in diameter, brown with periphyses. Peridium: brown, Paraphyses present but sparse. Asci: 108-176 μm x 18-24 μm , 8-spored, cylindrical or clavate, short stalked, unitunicate, persistent, Ascospores: 28-34 μm x 10-20 μm , uni or triseriate, ellipsoidal, triseptate, constricted at the septa, central cells brown, apical cells smaller and hyaline.

5. *Verruculina enalia* (Kohlm) Kohlm. and Volk.-Kohlm., *Mycol. Res.* **94**: 689, 1990.

Didymosphaeria enalia Kohlm, *Ber. Destch, Bot. Ges.*, **79**: 28, 1966.

Ascomata: 2868-490 μm high, 268-470 μm in diameter, subglobose, ampulliform or depressed, ellipsoidal, partly or completely immersed, ostiolate, papillate, black, solitary. Peridium: 10-12 μm thick, thick-walled cells, with usually small lumina, merging on the outside into thick, brown, hyphae or stromatic structures. Papillae: 74-142 μm long, 136-308 μm in diameter, Pseudoparaphyses: 1-2 μm in diameter, septate, rarely branched, Asci: 120-130 μm x 12-14 μm , eight-spored, cylindrical, pedunculate, bitunicate, thick-walled, Ascospores: 18-22 μm x 7-9 μm , obliquely uniseriate, ellipsoidal, one-septate, dark brown.

6. *Alternaria* sp.

Conidiophores: cylindrical, septate, simple or irregularly branched, straight or curved, basal cell occasionally swollen, smooth, yellowish to brown, singly. Conidia: enteroblastic-tretic, ovoid, obclavate, obpyriform or ellipsoidal, with a basal pore, tapering or not into an apical beak, muriform, constricted at the septa, smooth or rough, olivaceous to brown.

7. *Clavatospora bulbosa* (Anast.) Nakagiri and Tubaki, *Bot. Mar.*, **28**: 489, 1985.

Clavariopsis bulbosa Anastasiou, *Mycologia*, **53**: 11, 1961.

Hyphae: 2-4 μm in diameter, septate, ramose, and fuscous. Conidiophores: 19-76 μm x 2-4 μm , cylindrical, septate, simple or branched, hyaline. Conidia: tetra radiate, septate, slightly constricted at the septa, hyaline to light brown, basal arm one-septate, proximal cell 8-14 μm x 4-8 μm ellipsoidal or ovoid, truncate at the base, light brown, distal cell 7-12 μm x 6-14 μm , cylindrical or shortly three branched, fuscous, three divergent arms arising simultaneously from the inflated distal cell of basal arm, 22-60 μm x 4-6 μm , cylindrical, one-to-five septate and light

brown. One armed conidia: Conidia consisted of only single arm also observed, these are grey brown, 5-10 celled, 56-60 μm x 6-9 μm , constricted around septa, basal and apical cells lighter color.

8. *Halenospora varia* (Anastasiou) E.B. G. Jones, *Fungal Diversity*, **35**:154, 2009. *Zalerion varium* Anastasiou *Can. J. Bot.*, **41**: 1136, 1963 (as *Z. Varia*).

Hyphae: septate, branched, immersed, hyaline, Conidiophores: up to 30 μm long, 2-3 μm in diameter, micronematous, simple, cylindrical, septate, sometimes absent, superficial, hyaline to light olive colored. Conidia: 16-60 μm x 13-44 μm , solitary, irregularly helicoid or coiled in three planes, forming a knot or ball of about 10 to 28 cells. Conidial filament lateral, rarely branched or subtending an additional conidium, thick-walled, smooth, brown to dark brown, appearing black in mass. Cells 6-13 μm x 4-11 μm .

9. *Periconia prolifica* Anastasiou, *Nova Headwigia*, **6**: 260, 1963.

Conidiophores: 5-18 μm x 3 μm ; cylindrical, septate, simple or branched, hyaline. Conidiogenous cell: ellipsoidal or ovoid, hyaline, produced acrogenously. Conidia: 6-8 μm in diameter, one-celled, subglobose or ovoid, smooth, thick-walled, light brown with a reddish or dark brown, developing basipetally, catenulate, cells finally separating.

10. *Epicoccum purpurascens* Ehrenb. and Schlecht *Synopsis Plantarum Cryptogamarum*, 136, 1824.

Conidiophores: 4-14 μm x 3-6 μm macronematous or semimacronematous mononematous, forming a dense layer on the surface of the stroma, septate, simple or sometimes branched, short, straight or curved, smooth or verrucose, hyaline to light brown. Conidiogenous cells: monoblastic, integrated, terminal, determinate, cylindrical. Conidia: 16-

22 μm subglobose to pyriform, muriform with a basal scar surrounded by a light-colored protuberant basal cell, verrucose, dark golden brown, acrogenous solitary.

SUMMARY AND CONCLUSION:

In the present investigation ten species of marine fungi were isolated and illustrated. Out of these marine fungi 5 species of Ascomycota (*Aigialus grandis* Kohlm. and Schatz, *Eutypa bathurstensis* K. D. Hyde and Rappaz, *Savoryella lignicola* Jones and Eaton, *Halorosellinia oceanica* (S.Schatz) Whalley *et al* and *Verruculina enalia* (Kohlm) Kohlm and Volkm.-Kohlm.) and 5 species from Mitosporic fungi (*Alternaria* sp., *Clavatospora bulbosa* (Anastasiou) Nakagiri and Tubaki, *Epicoccum purpurascens* Ehrenb. and Schlecht, *Halenospora varia* (Anastasiou) Jones and *Periconia prolifica* Anastasiou). Out of these fungi *Alternaria* sp is very common fungi reported from most of the wood samples.

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