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A comparative account of backwater and brackish water marine mycoflora of North Malabar (Kerala) India

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Abstract

The backwater system of Kerala is well known. In the present investigation, we have tried to explore the marine fungal diversity of selected backwater and brackish water habitats of the North Malabar region of Kerala, India. A total of 30 marine fungi were isolated, which include 19 Ascomycetes, 1 Basidiomycete, and 10 Mitosporic fungi. *Periconia prolifica* emerged as the most dominant one in terms of percent frequency of occurrence and percent relative abundance. **To cite this article: G.R. Nambiar et al., C. R. Biologies 331 (2008).**

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1. Introduction

A chain of backwater systems connects the south-western coast of India, bordering the state of Kerala. The backwater system is the largest and the most important inland water resource of Kerala. The backwater system consisting of the estuaries of the rivers, the lower reaches within the tidal influx, the brackish water lakes and backwater along with their estuaries comprises about 68% of the inland water resources of the state. Sharing the characteristics of both freshwater and marine habitats makes the backwater system a unique

ecosystem. The backwater of Kerala, sprawling the entire coastal length of Kerala, is rich in biodiversity of fauna and flora [1].

The biodegradation of the dead remains of plants and animals in the backwater system is carried out by an immense variety of microorganisms. Marine fungi are one such microbiota, which play a crucial role in the breakdown of organic matter and transfer the energy to the higher trophic level. The present paper deals with the marine fungal diversity of selected backwater and brackish water of the Kerala. Although there are earlier reports [2–8] about the marine mycology in the Kerala coast, it is not so exclusive with the coastal regions; therefore, in the present investigation, we have tried to explore the marine fungal diversity of selected backwater and brackish water habitats of the North Malabar region of Kerala, India.

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Table 1
List of marine fungi isolated

Name of marine fungi	Backwater		Brackish water	
	FO	RA	FO	RA
<i>Aigialus grandis</i> Kohlm. et Schatz	4.67	3.23		
<i>Aigialus mangrovei</i> Borse			2.20	1.98
<i>Aigialus parvus</i> Schatz et Kohlm.			1.10	0.99
<i>Aniptodera chesapeakeensis</i> Shearer et Mill	12.50	8.60		
<i>Aniptodera salsuginosa</i> Nakagiri et Ito			4.40	3.96
<i>Dactylospora haliotrepha</i> (Kohlm. et Kohlm.) Hafellner			3.30	2.97
<i>Halosarpheia abonnis</i> Kohlm.			2.20	1.98
<i>Halosarpheia ratnagiriensis</i> Patil et Borse	3.13	2.15		
<i>Halosarpheia viscosa</i> (I. Schmidt) Shearer et Crane ex Kohlm et Volkm. Kohlm, <i>comb nov.</i>			3.30	2.97
<i>Leptosphaeria australiensis</i> (Cribb et Cribb) Hughes	4.67	3.23	4.40	3.96
<i>Lignincola longirostris</i> (Cribb et Cribb) Kohlm.			6.60	5.94
<i>Lignincola tropica</i> Kohlm.	6.25	4.30		
<i>Lulworthia grandispora</i> Meyers			7.70	6.93
<i>Marinosphaera mangrovei</i> Hyde	4.67	3.23		
<i>Pleospora pelagica</i> Johnson	6.25	4.30		
<i>Savoryella lignicola</i> Jones et Eaton	10.94	7.53	8.80	7.92
<i>Savoryella paucispora</i> Cribb et Cribb) Koch.	9.38	6.45	7.70	6.93
<i>Salsuginea ramicola</i> Hyde	7.81	5.38	5.50	4.95
<i>Verruculina enalia</i> (Kohlm.) Kohlm. et Volkm. Kohlm.	12.5	8.60	8.80	7.92
<i>Halocyphina villosa</i> Kohlm.	9.38	6.45	5.50	4.95
<i>Ascochyta</i> sp.	1.56	1.05		
<i>Cirrenalia macrocephala</i> (Kohlm) Meyers et Moore			2.20	1.98
<i>Cirrenalia pygmaea</i> Kohlm.	7.81	5.38	6.60	5.94
<i>Clavatospora bulbosa</i> (Anast) Nakagiri et Tubaki	10.94	7.53		
<i>Cumulospora marina</i> I. Schmidt	6.25	4.30		
<i>Dendryphiella salina</i> (Sutherland) Pugh et Nicot	3.13	2.15	4.40	3.96
<i>Periconia prolifica</i> Anastasiou	14.06	9.68	12.09	10.89
<i>Phoma</i> sp.	3.13	2.15		
<i>Trichocladium achrasporum</i> (Meyers et Moore) Dixon	6.25	4.30	7.70	6.93
<i>Trichocladium alopallonellum</i> (Meyers et Moore) Kohlm. et Volkm. Kohlm.			6.60	5.94

Percent frequency of occurrence (FO) = Number of isolates of a particular species divided by total number of wood samples collected from all the location $\times 100$.

Percent relative abundance (RA) = Number of particular species obtained divided by total number of fungal isolates obtained from all the locations $\times 100$.

2. Materials and methods

Wood materials were collected from the Nadal and Katampally brackish water and Kavvai and Chettuva backwater systems of North Malabar (Kerala) India. A total of 197 wood samples were collected (93 from backwater and 104 from brackish water). The collected decaying wood materials, of sizes in the range 8–12 cm \times 1–1.5 cm, were thoroughly washed and transferred into a sterile polythene bag. Preliminary screening for marine fungi was carried out within a week. The wood samples were incubated at room temperature in the laboratory. Periodical isolation of the

wood materials was carried out for six months. The fungi thus isolated were tabulated and recorded (Table 1).

3. Results and discussion

Altogether 30 marine fungi were isolated during the course of this study (Figs. 1, 2). Among these, 19 were ascomycetes, one was a basidiomycete, and 10 were mitosporic fungi. Twenty marine fungi were obtained from brackish waters, and twenty others from backwaters. Maximum ascomycetes (up to 13) were obtained from brackish water. More mitosporic fungal diversity

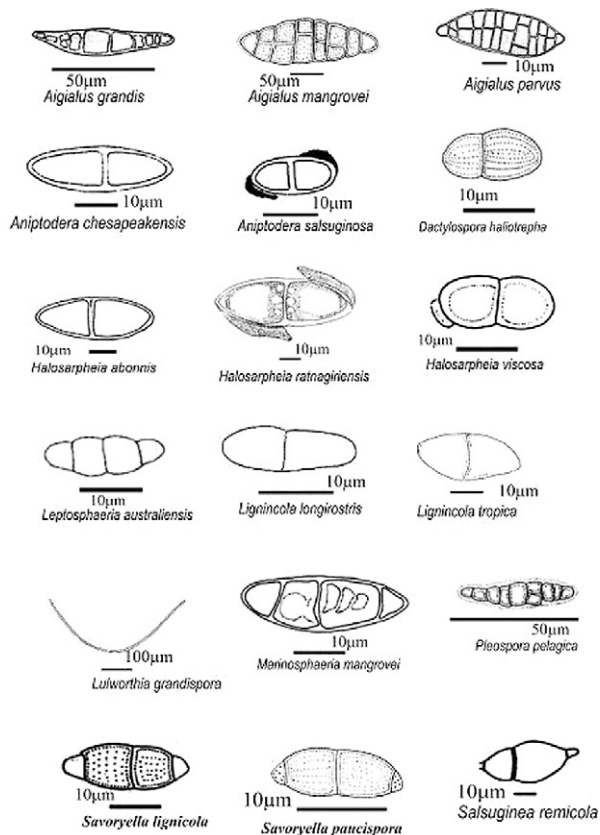


Fig. 1. Isolated backwater and brackish water marine mycoflora of North Malabar (Kerala) India.

was found in backwater. Basidiomycete was represented only by a single isolate from each water body. Ten species that were found common in both water bodies include *Leptosphaeria australiensis*, *Savoryella lignicola*, *Savoryella paucispora*, *Salsuginea ramicola*, *Verruculina enalia*, *Halocyphina villosa*, *Cirrenalia pygmaea*, *Dendryphiella salina*, *Periconia prolifica*, and *Trichocladium achrasporum*.

Periconia prolifica showed maximum percent frequency of occurrence and percent relative abundance from backwater as well as from brackish water. Percent frequency of abundance above 8 was shown by seven and three species from backwater and brackish water, respectively. Three and five species from brackish water and backwater, respectively, showed percent relative abundance above 7. *Aigialus parvus* and *Ascochyta* sp. were the species that were represented by an only single isolate each.

In terms of overall percent frequency and percent relative abundance, backwater mycoflora emerged dominant with respect to brackish water mycoflora. This might be due to various environment conditions like

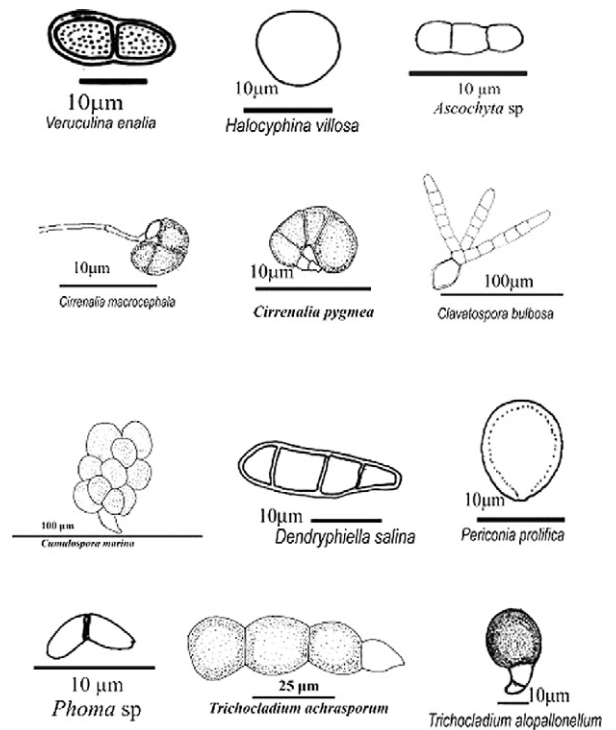


Fig. 2. Isolated backwater and brackish water marine mycoflora of North Malabar (Kerala) India.

salinity fluctuation, availability of host, temperature, pH, dissolved oxygen, etc., which support the distribution of marine fungi.

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