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A glimpse of lignicolous marine fungi occurring in coastal water bodies of Tamil Nadu (India)

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Abstract

In the present investigation, a total of 51 marine fungi were obtained from wood samples collected from four locations of Tamil Nadu (Tuthukudi, Chennai, Kanyakumari and Pichavaram), India. Out of these 51, 28 were ascomycetes, one was basidiomycete and 22 were mitosporic fungi. Maximum fungal diversity was encountered from Tuthukudi, followed by Chennai, Kanyakumari, and the minimum from Pichavaram. *Periconia prolifica* was the only species common to all the four locations. **To cite this article:** G.R. Nambiar et al., C. R. Biologies 331 (2008).

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1. Introduction

Woody substrates are considered important sources of carbon and energy in stream ecosystems [1]. Moreover, fungi are known to be the important primary in the degradation of plant materials [2,3]. Marine fungi are one such ecologically, morphologically and physiologically defined group; they are considered intermediaries of energy flow between plant detritus and marine fauna [4]. Marine fungi by soft rot decay (mostly ascomycete) and white rot (Basidiomycete) attack of wood cause more extensive decay of wood in marine

habitat than bacteria [5,6]. Many factors affect the possibility of the presence or absence of the fungi, like salinity, ionic concentration, etc.

Marine fungi colonizing in woody substrates are often referred to as lignicolous marine fungi. Woody substrates colonies include driftwood, intertidal wood, fixed intertidal wood and permanently submerged wood or waterlogged wood. Freshly collected wood material support much less sporulating structure than those submerged for longer durations. Fungal structures are usually confined to an outer layer of a few millimetres unless the wood is at an advanced stage of decay [7].

Earlier reports [8–11] described the collection from the eastern coast of India. The present paper deals with the lignicolous marine fungi isolated from four locations at Tamil Nadu.

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Table 1
List of marine fungi isolated from different coastal water bodies of Tamil Nadu, India

Name of fungi	Chennai	Kanya kumari	Tuthu kudi	Pichava-ram	FO	RA
<i>Aniptodera chesapeakensis</i> Shearer and Mill		*	*		2.38	1.16
<i>Aniptodera indica</i> Ananda and Sridhar			*		2.38	1.16
<i>Aniptodera mangrovei</i> Hyde		*			3.57	1.74
<i>Bathyascus tropicalis</i> Kohlm.	*				3.57	1.74
<i>Corollospora angusta</i> Nakagiri and Tokura	*				1.19	0.58
<i>Corollospora filiformis</i> Nakagiri	*				3.57	1.74
<i>Corollospora maritima</i> Werdermann	*				2.38	1.16
<i>Corollospora pulchella</i> Kohlm. Schmidt and Nair	*				2.38	1.16
<i>Dactylospora haliotrepha</i> (Kohlm. and Kohlm.) Hafellner	*				2.38	1.16
<i>Dryosphaera tropicalis</i> Kohlm. and Volkm. Kohlm.	*				2.38	1.16
<i>Halorossellina oceanica</i> Whallerym Jones, Hyde and Lasees		*		*	3.57	1.74
<i>Lignicola leavis</i> Hohnk		*			1.19	0.58
<i>Lulworthia grandispora</i> Meyers	*				1.19	0.58
<i>Lulworthia</i> sp.	*			*	3.57	1.74
<i>Savoryella appendiculata</i> Hyde and Jones	*				1.19	0.58
<i>Savoryella lignicola</i> Jones and Eaton	*			*	2.38	1.16
<i>Savoryella paucispora</i> (Cribb and Cribb) Koch.	*	*			3.57	1.74
Unidentified ascomycete I		*			2.38	1.16
Unidentified ascomycete II		*			2.38	1.16
Unidentified ascomycete III				*	1.19	0.58
Unidentified ascomycete IV			*		1.19	0.58
Unidentified ascomycete V				*	3.57	1.74
Unidentified ascomycete VI	*		*		5.92	2.91
Unidentified ascomycete VII		*	*		2.38	1.16
Unidentified ascomycete VIII			*		1.19	0.58
Unidentified ascomycete IX		*	*		3.57	1.74
<i>Verruculina enalia</i> (Kohlm.) Kohlm. and Volkm. Kohlm.	*		*	*	7.14	3.49
<i>Zopfella latipes</i> (Lundquist) Malloch and Cain	*		*		2.38	1.16
<i>Halocyphina villosa</i> Kohlm. and Kohlm.				*	7.14	3.49
<i>Cirrenalia pygmaea</i> Kohlm.			*	*	4.76	2.33
<i>Cirrenalia</i> sp.		*	*		7.14	3.49
<i>Cladosporium</i> sp.			*	*	2.38	1.16
<i>Clavatospora bulbosa</i> (Anast) Nakagiri and Tubaki	*	*	*		14.29	6.98
<i>Cumulospora marina</i> I. Schmidt		*	*		2.95	2.91
<i>Curvularia</i> sp.	*	*			4.76	2.33
<i>Dendryphiella salina</i> (Sustherland) Pugh		*		*	5.95	2.91
<i>Helminthosporium</i> sp.			*		2.38	1.16
<i>Periconia prolifica</i> Anastasiou	*	*	*	*	20.23	9.88
<i>Phoma</i> sp. I	*		*		3.57	1.74
<i>Phoma</i> sp. II		*			3.57	1.74
<i>Phoma</i> sp. III		*	*		3.57	1.74
<i>Tetraploa</i> sp.	*		*		5.95	2.91
<i>Trichocladium achrasporum</i> (Meyers and Moore) Dixon	*		*		4.76	2.33
<i>Trichocladium alopallonellum</i> (Meyers and Moore) Kohlm. and Volk Kohlm.	*		*		4.76	2.33
<i>Trichocladium</i> sp.	*	*	*		5.95	2.91
Unidentified anamorph I		*			3.57	1.74
Unidentified anamorph II		*			1.19	0.58
Unidentified anamorph III	*	*	*		3.57	1.74
Unidentified anamorph IV		*	*		2.38	1.16
<i>Zalerion</i> sp.	*		*		3.57	1.74
<i>Zalerion varium</i> Anastasiou			*		3.57	1.74

% frequency of occurrence (FO) = (number of isolates of a particular species/total number of wood samples collected) × 100.

% relative abundance (RA) = (number of isolates of a particular species obtained/total number of fungal isolates obtained from all the locations) × 100.

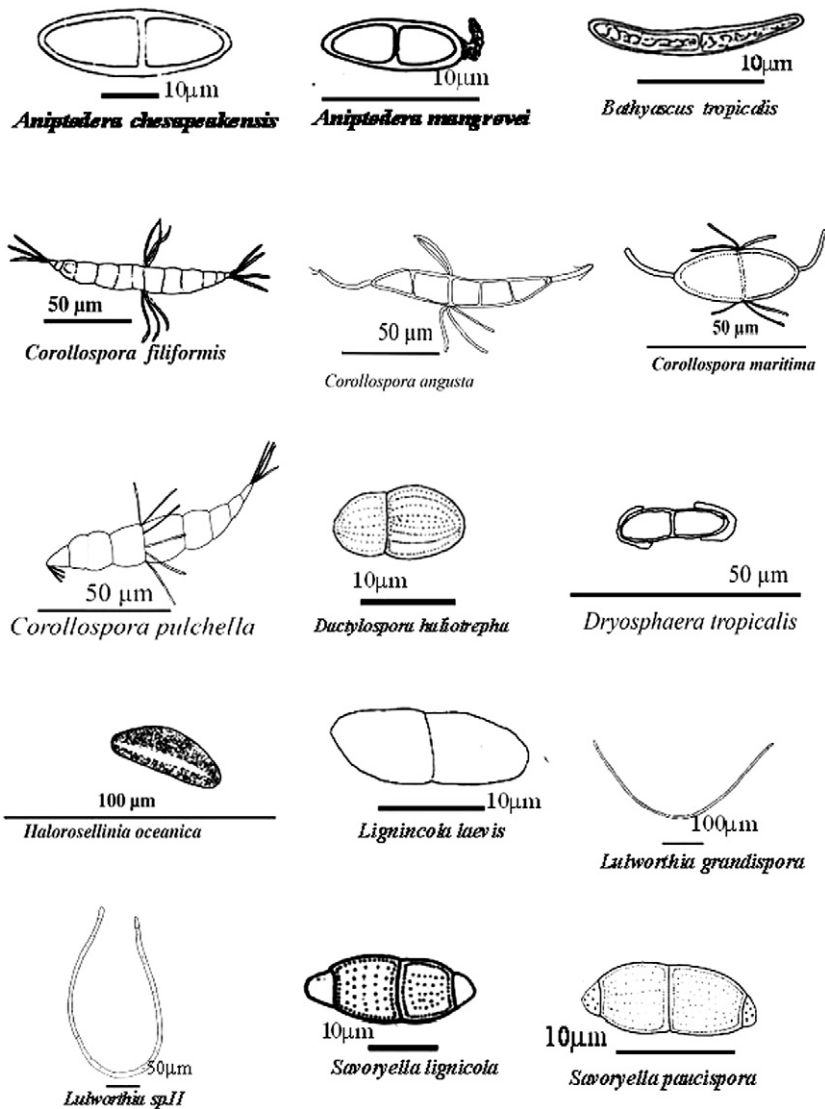


Fig. 1. Marine fungi isolated from different coastal water bodies of Tamil Nadu, India.

2. Materials and methods

Wood materials were collected from the beaches of Chennai, Tutthukudi, Kanyakumari, and from a mangrove forest of Pichavaram. A total of 84 wood substrates were collected. Uniformity in the size of the wood materials was maintained to a certain extent by picking the samples within the size range of 3–10 cm × 0.5–1.5 cm. The collected wood samples were washed thoroughly and placed in sterile polythene bags. After preliminary screening for marine fungi, the wood samples were incubated in sterile polythene bags in the laboratory at room temperature. Periodical examinations of wood material were carried out for six months and fungi thus isolated were registered (Table 1, Figs. 1–3).

3. Results and discussion

Many factors affect the possibility of the presence or absence of fungi, like salinity, ionic concentration, etc.; so, these reasons might have controlled the abundance of fungi in our study area also. A total of 51 marine fungi were encountered during the course of present study. They include 28 ascomycetes, 1 basidiomycete and 22 mitosporic fungi. The maximum fungal diversity was observed from Tutthukudi (27), followed by Chennai (25), Kanyakumari (23) and minimum from Pichavaram (11). *Periconia prolifica* was the only species common to the four localities. Seven species were obtained from only one place without any redundancy. The more ascomycetes were obtained from

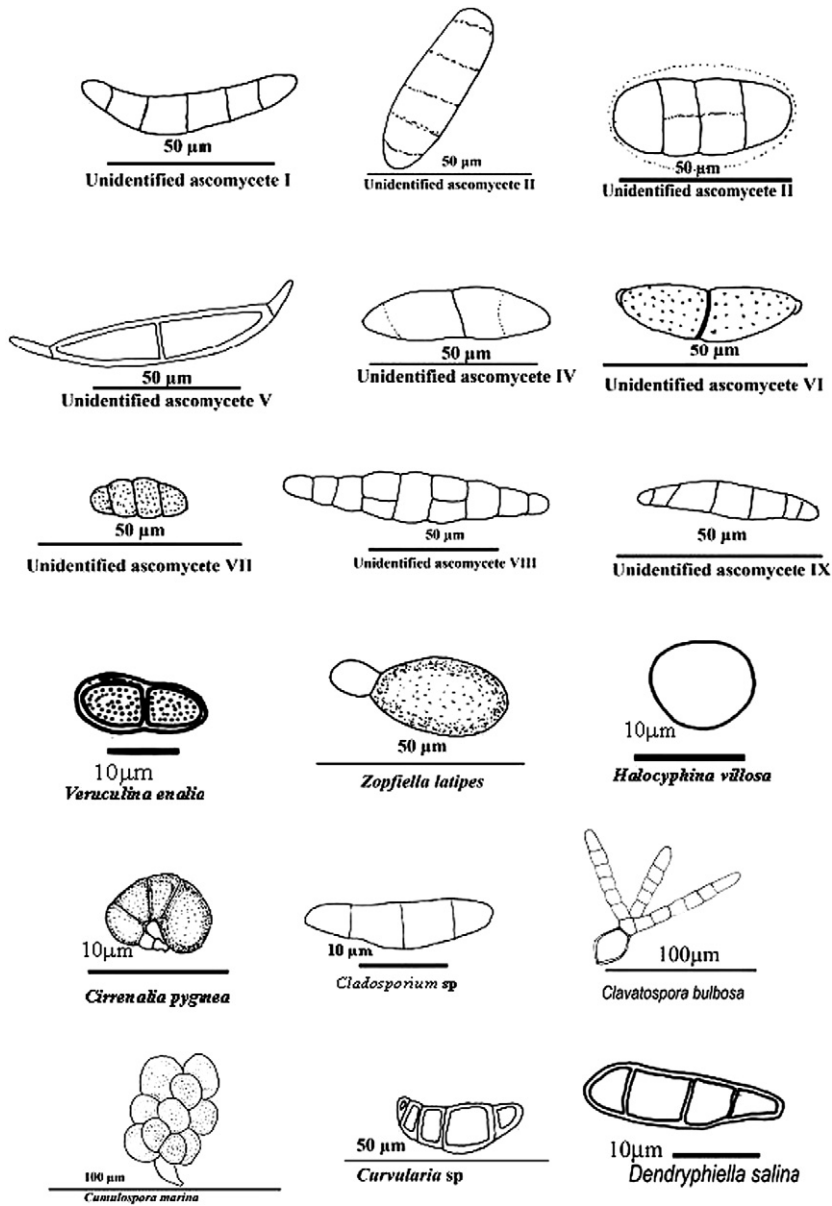


Fig. 2. Marine fungi isolated from different coastal water bodies of Tamil Nadu, India.

Chennai (15) and the more Mitosporic fungi were isolated from Tuthukudi. *Halocyphina villosa* was the only Basidiomycete encountered during the present study, and was obtained only from Pichavaram.

In terms of percent frequency of occurrence and percent relative abundance, *Periconia prolifica* emerged as the most dominant, followed by *Clavatospora bulbosa*. Among Ascomycetes, *Verruculina enalia* emerged as the dominant one. Only 11 species had percent frequency of occurrence above five, and five species had a percent relative abundance above three. As

Corollospora angusta, *Lignincola* sp., *Lulworthia grandispora*, *Savoryella appendiculata*, unidentified ascomycete IV, unidentified ascomycete VIII and unidentified anamorph II were represented by a single isolate each, their percent frequency of occurrence and percent relative abundance being minimum (1.19 and 0.58, respectively). In a word, our results echo Schmit and Shearer's [12] right hypotheses that microfungal communities are more similar between locations in the same ocean basin as compared to locations in different ocean basins, and that trees that are more closely

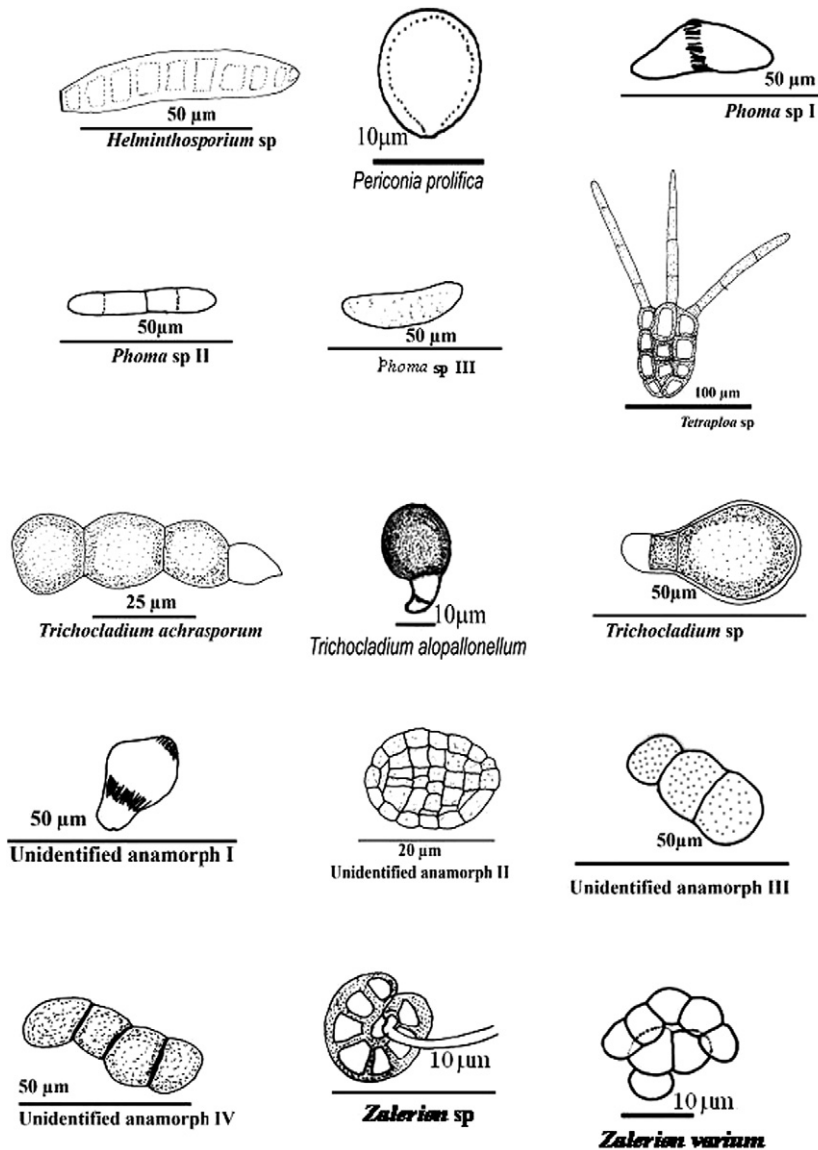


Fig. 3. Marine fungi isolated from different coastal water bodies of Tamil Nadu, India.

related phylogenetically share more similar microfungal communities than those less closely related. Based on our analyses, we concluded that microfungal communities are more similar within a single ocean basin than between ocean basins.

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