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TAXONOMIC STUDY OF MITOSPORIC FUNGI FROM BET DWARKA, GUJARAT (INDIA)

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ABSTRACT

A taxonomic survey was conducted in order to study the marine fungi from Bet Dwarka, (Gujarat) in the year 2018. Interestingly five mitosporic fungi were collected and studied. These were - *Bactrodesmium linderii* (Crane & Shearer) Palm & Stewart, *Cirrenalia basiminuta* Raghukumar and Zainal, *Currenalia pygmaea*, *Clavatospora bulbosa* (Anast.) Nakagiri and Tubaki, *Trichocladium achrasporum* (Meyers and Moore) Dixon in Shearer and Crane *Mycologia*. These fungi were found new to this area according to our research.

Keywords: Marine fungi, mitosporic fungi, Bet Dwarka Drift Wood

INTRODUCTION

Biodiversity of marine fungi of the world is well documented. Diversity of marine fungi of India is documented by several mycologists. During marine mycological survey of the coast of Bet Dwarka, Mitosporic fungi were collected on samples of intertidal wood. Marine Mitosporic fungi (Asexual forms) occur on a wide variety of substrates in oceans and estuaries, submerged parts of mangroves and salt marsh halophytes, intertidal woody debris. All these Mitosporic fungi have been recorded for the first time from Bet Dwarka coast. These have been studied and described here.

Significance of the study:

1. Due to high adaptability and biochemical potential of fungi, the discovery of new fungal species is always significant. These may be used for industrial and pharmaceutical purpose.
2. In the tropics, due to deforestation, and pollution about 1,00,000 km sq. met of forest is lost each year. It would affect the diversity of fungal species. Many fungal species are probably going to be extinct before Mycologists have the opportunity to isolate and describe them.
3. The Knowledge of the general diversity of the native fungi is of utmost importance when considering that each species has its own niche in the habitat.

MATERIALS AND METHODS

The samples of intertidal woody debris were collected at low tide, in polythene bags from the coast of Bet Dwarka and brought to the laboratory. Samples were examined for fungal growth. Then they were incubated at room temperature in plastic boxes for few months and the fungi growing on them were identified. The semi-permanent slides were made. Identification of encountered fungi was done with the help of The monograph of “*Marine Mycology: the higher fungi*”, (Kohlmeyer and Kohlmeyer, 1979) (Kohlmeyer and Volkmann- Kohlmeyer, 1991).

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RESULTS AND DISCUSSION

This paper reveals about five Mitosporic fungi which were collected from Bet dvarca and study. These were - *Bactrodesmium linderii* (Crane & Shearer) Palm & Stewart, *Cirrenalia basiminuta* Raghukumar and Zainal, *Cirrenalia pygmaea*, *Clavatospora bulbosa* (Anast.) Nakagiri and Tubaki, *Trichocladium achrasporum* (Meyers and Moore).

1) *Bactrodesmium linderii* (Crane & Shearer) Palm & Stewart *Mycotaxon*, 15: 319-325, 1982.

Mycelium: composed of branched, septate, at first hyaline, latter sub hyaline to light brown hyphae, *Conidiophores*: macronematous, mononematous, smooth, thin-walled and hyaline or thick-walled and brown. *Conidiogenous cells*: holoblastic, integrated, terminal or intercalary, smooth, cylindrical, determinate. *Conidia*: solitary, subglobose to obpyriform, 1-2 septate, without constriction, 18-27 x 8-18 µm, becoming 3-6 µm wide at base, apical cell larger, dark brown to black, 11-16 µm high, basal and sub-basal cells smaller, light brown, wall unequal in height, hence the base of the conidia become curved.

Distribution in India: East coast: Andhra Pradesh (Sarma and Vittal, 1998-99, 2000, 2001), West coast: Maharashtra (Patil & Borse, 1986; Borse, 1988; Ramesh & Borse, 1989),

2) *Cirrenalia basiminuta* Raghukumar & Zainal *Mycotaxon*, 31: 163, 1988.

Hyphae: 2.5-4.5 µm in diameter, septate, hyaline to pale brown. *Conidiophores*: terminal, integrated, monoblastic, determinate, 8-27 x 1 µm, conidia borne laterally and directly on conidiophore, solitary, helicoid, semi-contorted, 28-38 µm x 20-32 µm. *Conidia*: 3-4 septate, constricted at the septa, cells increasing in size from base to apex, apical cell 10-14 x 10-13 µm, subglobose, basal cell cylindrical and tapering, 7-14 x 2-6 µm, pigmentation of cells increasing from base to apex, the apical cell light brown with a reddish tinge.

Distribution in India: As East coast: Tamilnadu (Ravikumar and Vittal, 1996), Andhra Pradesh (Sarma and Vittal, 2000), Orissa (Borse and Borse, 2005).

3) *Cirrenalia pygmaea* Kohlmeyer *Ber. Disch. Bot. Ges.*, 79: 35, 1966.

Hyphae: 2-4 µm in diameter, septate, ramose, fuscous. *Conidiophores*: obsolete. *Conidia*: acrogenous, solitary, helicoid, contorted ½ or 1 time, three or four septate, not or slightly constricted at the septa, fist-shaped or reniform, black or fuscous, fulgent (upper three cells dark, lower two or three cells light-coloured); cells increasing in diameter from base to apex distinctly dissimilar; spirals 25- 30 x 26-32 µm; terminal cell 14-20 µm in diameter, subglobose to reniform, basally flattened basal cells 3-5.5 µm in diameter, central cells irregularly conical or almost wedge-shaped.

Distribution in India: As East coast: Tamilnadu (Ravikumar and Vittal, 1996), Andhra Pradesh (Sarma and Vittal, 2000), Orissa (Borse and Borse, 2005). West coast: Gujrat (Patil and Borse, 2001), Pirotan Islands (Borse, et al., 2000a), Maharashtra (Borse, 1984, 1988; Patil and Borse, 1986; Ramesh and Borse, 1989), Kerala (Nambiar & Raveendran 2007, 2008a, b, 2009b; Nambiar et al., 2006, 2008), Goa (Nandan, et al., 1993), Pondichery & Mahe (Nambiar & Raveendran, 2008d). Lakshadweep Islands: Chinnaraj (1992).

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

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

Hyphae: 2.5-4 µm in diameter, septate, ramose, and fuscous; *Conidiophores*: 18-78 x 2-4.5 µm, cylindrical, septate, simple or branched, hyaline. *Conidia*: tetra radiate, septate, slightly constricted at the septa, hyaline to light brown, developing by transformation of the inflated apex of the conidiophore, basal arm one-septate, proximal cell 8-16 x 4-9 µm ellipsoidal or ovoid, truncate at the base, light brown; distal cell 7-12 x 6-14 µm, cylindrical or shortly three branched, fuscous, three divergent arms arising

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simultaneously from the inflated distal cell of basal arm, 20-60 x 4-6 μm , cylindrical, one-to-five septate, light brown.

One armed conidia: Conidia consisted of only single arm also observed, these are grey brown, 5-10 celled, 54-60 x 6.5-9 μm , constricted around septa, basal and apical cells lighter colour.

Distribution in India:

Goa (Nandan *et al.*, 1993; Borse and Tuwar, 2006), Gujrat (Patil and Borse, 2001), Mahe Pondicherry (Borse and Pawar, 2005; Nambiar & Raveendran, 2008d). Andaman and Nicobar Islands: Chinnaraj (1993).

5) *Trichocladium achrasporum* (Meyers and Moore) Dixon in Shearer and Crane *Mycologia* 63: 344, 1971.

=*Culcitalna achraspora* Meyers and Moore. *Am.J. Bot.* 47: 349, 1960.

=*Trichocladium achraspora* Dixon, *Trans. Br. Mycol. Soc.* 51: 163, 1968.

Sporodochia: occasionally found, superficial, compact, fuscous to black. *Conidiophores*: absent or short, 0 -to 4 -septate, simple, formed laterally on hyphae, hyaline to light brown or fuscous. *Conidia*: (blastoconidia) 21-32 x 10-19 μm , clavate, ovoid or obpyriform, two-to five-septate, constricted at the septa, straight or slightly curved, increasing in diameter from base to apex, formed singly on the conidiophores; apical cells subglobose, dark brown; basal cells conical or subcylindrical, subhyaline to light brown or fuscous.

Distribution in India:

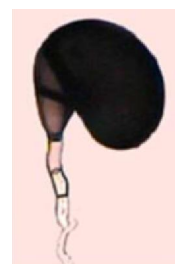
East coast: Tamilnadu (Ravikumar and Vittal, 1996), Andhra Pradesh (Sarma and Vittal, 2000), Orissa (Borse and Borse, 2005) West Bengal (Pawar and Borse, 2005b). *West coast*: Maharashtra (Borse, 1984, 2000b; Srivastava, 1994; Shindikar and Borse, 2002), Goa (Nandan *et al.*, 1993), Karnataka (Prasannarai and Sridhar, 1997), Gujrat (Borse *et al.*, 2000a, Patil and Borse, 2001), Kerla (Prasannarai and Sridhar, 1997). *Lakshadweep Islands*: Chinnaraj (1992). *Andaman and Nicobar Islands*: Chinnaraj (1993).



Bacterodesmium linderi



Cirrenalia basiminuta



Cirrenalia pygmaea



Clavatospora bulbosa



Trichocladium achrasporum

Figure 1: Spores from different marine fungi

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CONCLUSION

It is an occasional in occurrence. The present fungus is being reported for the first time from Bet Dwarka, Gujarat.

These present taxonomic study of marine fungi reveals five mitosporic fungi which were identified as 1) *Bactrodesmium linderii* 2) *Cirrenalia basiminuta* 3) *Cirrenalia pygmea* 4) *Clavatospora bulbosa* 5) *Trichocladium achrasporum*. These were identified with the help of available literature. These were reported for the first time from Bet Dwarka (Gujrat)

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