

Hyphomycetes from north Maharashtra

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Abstract

The present paper deals with five species of Dematiaceous Hyphomycetes were collected from the submerged wood samples from the various water bodies in North Maharashtra region. Two species viz. *Camposporidium cristatum* Nawawi and Kuthubutheen and *Dictyosporium quantii* Bhat and Sutton are being recorded for the first time from India. While *Bactrodesmium indicum* Udaiyan and *Diplocladiella longibrachiata* Nawawi & Kuthubutheen are being reported for the first time from Maharashtra state. Brief notes and illustration are given for each taxon. Geographical distribution of each species in India is also provided.

Keywords: Dematiaceous Hyphomycetes, North Maharashtra, India.

INTRODUCTION

The hyphomycetes (mitosporic fungi) are a group of fungi that consists of asexual states of mostly Ascomycetes and some Basidiomycetes. The hyphomycetes (mitosporic fungi) undergo mitotic division to produce microsporidial asexual structures called conidia, which are of various colours, sizes, shapes, and septations. The mitosporic fungi are also traditionally referred to as fungi imperfecti, anamorphic fungi, or the form taxon Deuteromycotina [1]. These fungi in its lifetime can reproduce sexually by producing meiospores (ascospores or Basidiospores) as well as asexually by producing mitospores (conidia) or by producing only meiospores or only mitospores. The mitosporic fungi are classified into two main classes, namely Hyphomycetes and Coelomycetes. The Hyphomycetes produce conidia directly from vegetative structures (hyphae) or on distinct conidiophores (a specialized hypha that bears conidiogenous cells and conidia) whereas, Coelomycetes produce conidia within asexual fruit bodies called pycnidia [2]. Dematiaceous Hyphomycetes are common hyphomycetes with dark conidia or conidiophores [3].

MATERIALS AND METHODS

The survey was undertaken for one year (June 2009- May 2010). Samples of submerged wood were collected from various streams from Sakri, Shirpur, Padmalaya, Toranmal. Samples were transported in a cooling box to the laboratory. After rinsing in tap water, samples were placed in plastic boxes filled with distilled water and aerated by compressed air in an incubator at room temperature. After one week of aeration the samples were examined for the presence of fungal fruiting structures. Then the samples were placed in Petri-dishes with moistened filter paper and incubated at ambient

temp. of 25^o - 30^o C for some weeks to stimulate fungal development.

Approximately 10 ml of foam formed due to fast flowing turbulent water at each site was collected in plastic bottles and fixed in FAA (mixture of 40% Formaldehyde, 10 ml; Glacial acetic acid, 5ml; and 70% Ethyl alcohol, 85 ml) at the collection spot. The samples were brought to the laboratory and examined under a low or high power of microscope to detect the conidia of aquatic Hyphomycetes. 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

Bactrodesmium indicum Udaiyan

Sporodochia: scattered, punctiform, black, shining, mostly 17-54 µm diameter. **Mycelium:** partly superficial, partly immersed, branched, septate, hyaline, subhyaline to light brown. **Conidiophores:** macronematous, mononematous packed closely together to form pulvinate sporodochia. Usually unbranched but rarely branched, mid to dark brown, smooth, septate, 23.5-78 X 1.5-3.5 µm. **Conidia:** gangliar, acrogenous, solitary, clavate, straight to curved, rounded at the tip and truncate at the base, the upper end becoming progressively paler towards the basal cell which is usually sub hyaline, 2- septate with a very dark band at the second septum, smooth 18.5-24 X 6.5-10 µm.

Habitat: Saphrobic on submerged wood.

Description: Based on Udaiyan (1991) [4].

Distribution in India: Tamilnadu (Udaiyan, 1991) [4].

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

Camposporidium cristatum Nawawi & Kuthubudeen

Colonies: effuse, sparse, brown, inconspicuous.

Mycelium: mostly superficial but partly immersed in the substratum composed of branched, septate, pale brown, smooth 1.5-2.5 µm wide hyphae.

Conidiophores: macronematous, mononematous, solitary, erect, simple, straight or slightly flexuous, smooth, cylindrical, septate, brown to dark brown, paler towards the apex, initially 30-45 µm high, finally up to 245 µm or more long, 4-5 µm wide, often swollen at the

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base to 18 μm wide, with up to 25 or more precurrent proliferations along its length.

Conidiogenous cells: holoblastic, monoblastic, integrated, terminal, cylindrical, proliferating percurrently.

Conidia: acrogenous, solitary, dry, seceding schizolytically, cylindrical, slightly tapered at the rounded apex, truncate at the base, 9-12 distoseptate, verruculose, olivaceous to olivaceous, 75-94 μm long, 9-10 μm at the widest part, 6-7 μm wide at the base, apical cell bearing 4-7 divergent, non-septate, hyaline to subhyaline appendages measuring up to 60 μm long x 1.5 μm wide.

Habitat: Conidia accumulate in foam.

Description: Based on Nawawi and Kuthubudeen (1988) [5].

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

Dictyosporium gauntii Bhat and Sutton

Colonies: punctiform, black, scattered, velvety.

Conidiophores: indistinct arising in fascicles of up to 25 from a basal stroma up to 1 μm wide, erect, 1-2 septate smooth, hyaline, up to 5 μm wide.

Conidiogenous cells: terminal, integrated, oval to ellipsoidal, hyaline, smooth, 10 to 17 μm long 8 to 30 μm wide.

Conidia: 40- 50 X 18- 25 uniformly medium brown, not complanate, consisting of 4- 6 compactly arranged incurved rows of cells in different plane and this appearing muriform, always seceding with the hyaline, swollen conidiogenous cells at the base.

Habitat: Saphrobic on submerged wood.

Description: Based on Bhat and Sutton (1985) [6].

Remark: It has been recorded for the first time in India.

Diplocladiella longibrachiata Nawawi & Kuthubudeen

Mycelium: septate, branched.

Conidiophores: hyaline, usually simple, 40-60 x 2-3.5 μm , producing conidia singly.

Conidia: y- or V- shaped, light brown, 8-celled, consisting of a 2-celled 30-37 μm long main axis and two divergent 25-38 x 10-12 μm , bilaterally symmetrical appendages each with 2- oblique septa with two terminal 34-40 x 1.5-2 μm , hyaline non-septate projections. The basal cell of the axis is 8-9.5 x 3-4 μm .

Habitat: Conidia found in foam samples.

Description: Based on Santos and Betancourt (1997) [7] and Belwal and Sati (2007) [8].

Distribution in India: Uttarkhand [8].

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

Diplocladiella scalaroides Arnaud apud M. B. Ellis

Conidiophores: 25-45 μm long, 3-4 μm thick.

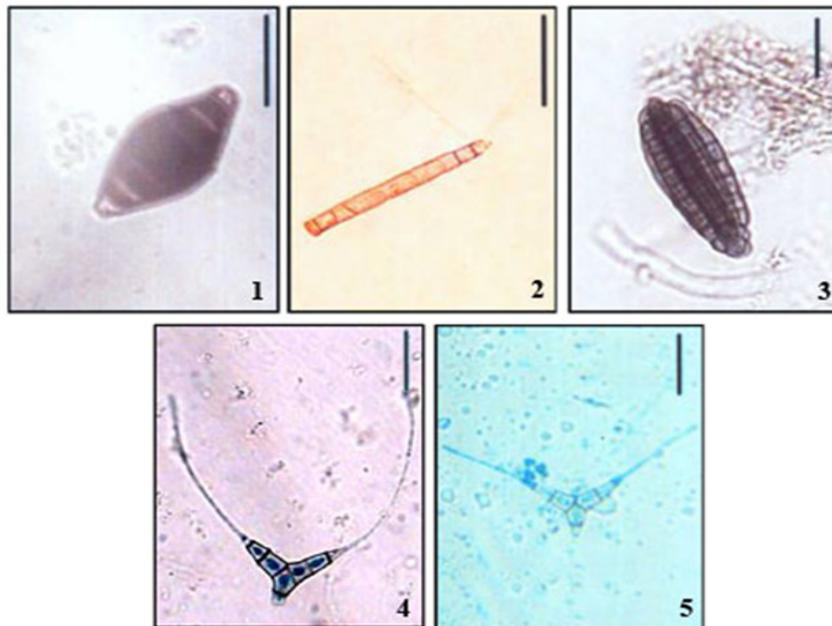
Conidia: Y- or V-shaped, light-brown, 8-celled; consisting of a 2-celled, 30-40 μm long main axis and 2 divergent, 25-54 x 10-15 μm , bilaterally symmetrical appendages, each with 2 oblique septa and with 2 terminal, 35-90 x 1.5-2-5 μm , hyaline, non-septate projections. The basal cell of the axis is 7-11 x 3-4.5 μm and lighter in colour.

Habitat: Conidia found in foam samples.

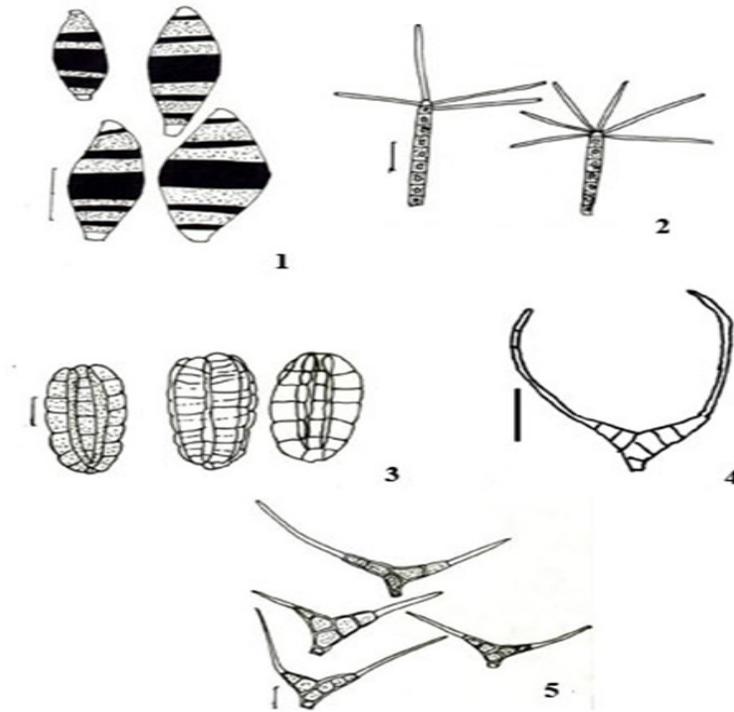
Description: Based on Ellis (1976) [9] and Santos and Betancourt (1997) [7].

Distribution in India: Andhra Pradesh [10] ; Western Ghat [11]; Karnataka [12]. Maharashtra [13].

Diplocladiella scalaroides is frequently found. While *Bactrodesmium indicum*, *Camposporidium cristatum*, *Dictyosporium gauntii* and *Diplocladiella longibrachiata* are found rarely.



- 1) *Bactrodesmium indicum* Conidium (Scale Bar=10 μm)
- 2) *Camposporidium cristatum* Conidium (Scale Bar=40 μm)
- 3) *Dictyosporium gauntii* Conidium (Scale Bar=15 μm)
- 4) *Diplocladiella longibrachiata* Conidium (Scale Bar=20 μm)
- 5) *Diplocladiella scalaroides* Conidium (Scale Bar=20 μm)



1) *Bactrodesmium indicum* Conidia (Scale Bar=10µm)
 2) *Camposporidium cristatum* Conidia (Scale Bar=20µm)
 3) *Dictyosporium gauntii* Conidia (Scale Bar=12µm)
 4) *Diplocladiella longibrachiata* Conidium (Scale Bar=10µm)
 5) *Diplocladiella scalaroides* Conidia (Scale Bar=10µm)

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