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RESEARCH ARTICLE

TRIPOSPERMUM LIMNETICUM SP. NOV. (MITOSPORIC FUNGI) ON SUBMERGED LEAVES FROM FRESHWATER, GUJARAT, INDIA.

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Abstract

Tripospermum limneticum sp. nov. encountered on dead decaying submerged leaves of Eucalyptus sp. and Polygonum glabrum found in Purna River (Dang district), Gujarat, India is described and illustrated here. This species is distinguished by its freshwater habitat, branched conidia arms (mostly four) are horizontal and downwardly directed, perpendicular to the stalk cell, obtuse and hyaline at the tip and here proposed as a new species.

Introduction:-

During a mycological survey of freshwater fungi associated with dead decaying submerged leaves in freshwater habitat in the Dang district of Gujarat state, an interesting fungus was collected on dead decaying submerged leaves of Eucalyptus and Polygonum glabrum. It shows remarkable differences from all previously described species of Tripospermum in branched arms. As per mycobank database a total of 30 species and two varieties (legitimate) have been reported in Tripospermum (Anonymous 1). As per Index Fungorum database a total of 32 species and two varieties (legitimate) have been reported in Tripospermum (Anonymous 2).

Materials and Methods:-

It is a submerged-aquatic hyphomycete found on brown, partially decayed, submerged leaves of *Eucalyptus* sp. and *Polygonum glabrum* from freshwater habitats. After collection they were carried wet in plastic bags to the laboratory and transferred to Petri dishes containing tap water. The incubated water was replaced on every alternate day. After several days of incubation, funguses with pale brown characteristic star-like (5-radiate) conidia were produced on the petioles. The holotype specimens (slides) are deposited in the Herbarium Cryptogamie Indiae Orientalis (H.C.I.O.), Division of mycology and plant Pathology, I.A.R.I., Pusa Campus, New Delhi, India (Holotype: HCIO No. 52064).

Taxonomy

Tripospermum limneticum Patil S.Y., Pawar, N.S. & B.D. Borse sp. nov. MycoBank MB830317; (Figs 1-2)

Etymology:

limneticum from the Latin for streams.

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Sexual morph:
not observed.
Type: India:
Gujarat State:
Purna River, Dang District (Gujarat State), on dead and decaying submerged leaves of Eucaluptus sp. and Polygonum glabrum, 1 May 2010, B. D. Borse (Holotype: HCIO No. 52064).

Description:
Mycelium: composed of septate, pale brown and smooth, 4-5 µm wide hyphae on submerged leafy debris mainly on lamina. Conidiophores: absent. Conidia: produced as lateral outgrowths of the hyphae, composed of a principle axis and three arms, 5-radiate (cells 9-21 or more), constricted at the septa, smooth, brown, solitary; primary axis 3-4-septate, 16-22 µm long, 4-7 µm wide; arms 2-septate, 12-18 µm long, 4-7 µm wide, thick-walled; apical cells of principle axis and arms pale brown; mature conidia 25-35 µm in diam., 8-13 µm thick in the middle region. Mature conidia are typically 5-radiate with a short basal stalk cells. All arms are with obtuse tips, horizontal, curved gently and downwardly directed more or less perpendicular with the stalk cell. Thus in the mature 5-radiate conidium, two arms are contributed by the principle axis and other three by the lateral arms. Occasionally, there are few conidia with fewer or more branches and septate.

Remarks:
Basic plan of conidial development of the present fungus is similar to other species of the genus Tripospermum and also the general characteristics of the present collection fit within the concept of the genus Tripospermum (Spegazzini, 1918). Seifert et al. (2011) stated that Tripospermum to be anamorphic Tripospo-riopsis. However Chomnunti et al. (2011) suggested its status is uncertain. Colonies of the present fungus were observed on the surface of the dead decaying submerged leaves of Eucalyptus sp. and Polygonum glabrum in this part of the country. Conidia belonging to different species of Tripospermum were regularly seen in foam samples e.g. T. myrti, T. camelopardus, are good examples of the species which are able to grow and sporulate on leaf surface of live trees. Tubaki et al. (1985) observed that morning dew was an important factor in stimulating the sporulation of Tripospermum spp. and possibly of other leaf inhabiting fungi. They concluded that most species of the genus were obviously foliicolous rather than aquatic and their habitat could be considered as alternating between "terrestrial" and "aquatic". Recently, some new species in the genus Tripospermum were described by Dubey and Sengupta (2016) from India and Qiao et al. (2017) from China. The most distinguishing characters of the present species are: i) lacking of conidiophores, ii) brown 5-radiate conidia with arms horizontal, perpendicular to stalk cell and, iii) conidial arms are more or less equal in length with obtuse and hyaline tip cells. Thus it is assigned to a new species. Comparison of aquatic and water-borne species of the genus with the present fungus is provided in the following Table.

Table 1:-Comparison of morphological characters of Tripospermum limneticum and freshwater species

Species	Conidia colour	Principle axis	Arms	Habitat
T. camelopardus Ingold, Dann & McDougall (1968)	Hyaline to pale brown	4-6-septate, 55-80 x 4-11 µm	2, 0-2-septate, 10-35 x 2.5-5 µm	Frshwater, on decaying submerged leaves, conidia in foam.
T.infalcatum K. Ando & Tubaki (1984)	Hyaline to brown	5-7-septate, 43.5-83.5 x 4.5-6 µm	3, 1-3 (5)-septate, 10-47 x 3.5-5.5 µm	Freshwater, rainwater from Pinus densiflora
T. limneticum sp. nov.	Brown	90-120 x 14-20 µm	3, 1-2-septate, 13-20.5 x 10-14 µm	Freshwater, on decaying submerged leaves.
T. myrti (Lindu) S. Hughes (1951), (Matsushima, 1971)	Hyaline to fuscous	Consist of a stalk cell 9-15 x 3.5-4.5 µm, 1(-2)-celled	4, 4-septate, 17-26 x 3-4 µm	On twigs, leaves and conidia found in freshwater foam samples
T. prolongatum R.C. Sinclair & Morgon-Jones (1979)	Hyaline	4-septate, 39-44 x 1.5-3.5 µm	3, 1-2-septate, 22-30 x 1.5-02 µm	Freshwater, on decaying submerged leaves, conidia in foam.

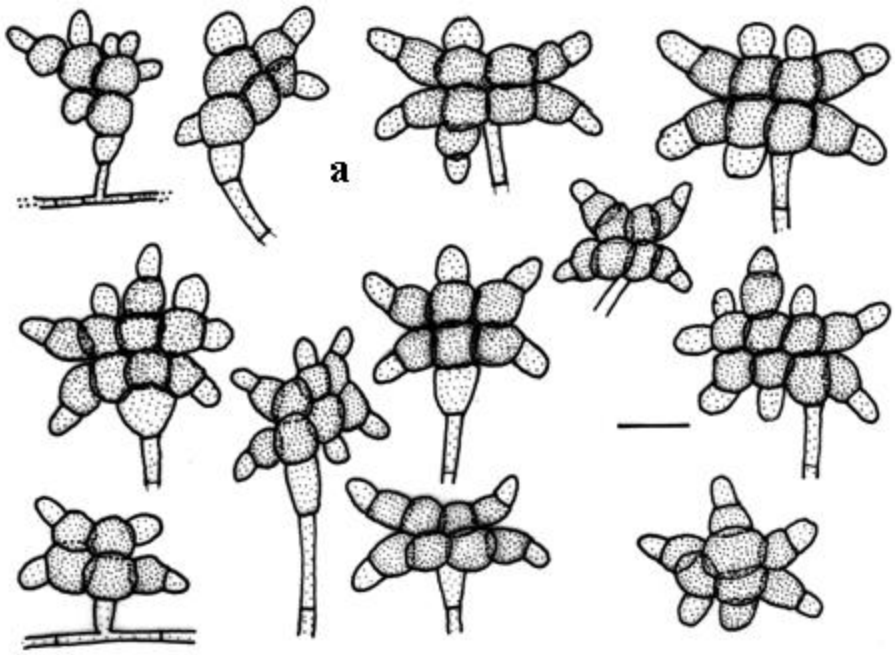

Fig 1:-Tripospermum limneticum, Conidia (scale bars = 10 µm)

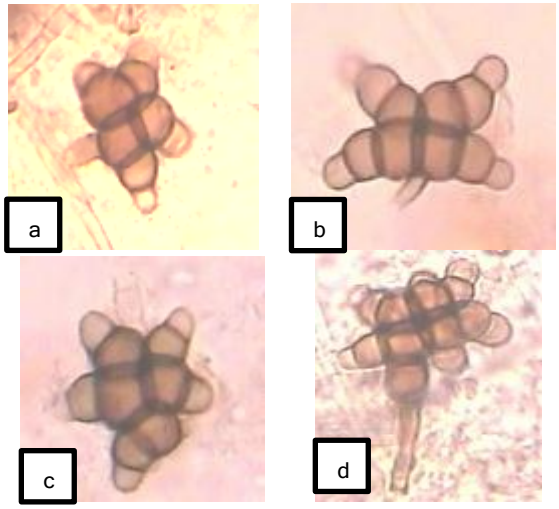

Fig 2:-Tripospermum limneticum, a- conidium attached to the hyphae, b- mature conidium with stalk cell, c- mature conidium, d-mature conidium with stalk cell

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