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Taeniolina echinata-A new species of hyphomycetous (mitosporic) fungus from North India

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ABSTRACT

Taeniolina echinata sp. nov. Collected on dead leaf of *Vanda* sp. is described and illustrated from Chandigarh, North India. It is characterized by integrated, terminal or intercalary, polyblastic conidiogenous cells with catenate, pale olivaceous-brown, echinate, 1 to 3 septate conidia. A synoptic tabular account of all the species of the genus is provided for the comparison.

Keywords: Anamorphic fungi, *Hyphomycetes,* Taxonomy

INTRODUCTION

This communication is in continuation with our previous reports on anamorphic fungi occurring on different substrata from North-Western Himalayas, Chandigarh and adjoining areas (Prasher and Verma, 2012a; b; Prasher and Singh, 2012; 2013; 2014; Prasher and Sushma, 2014). During a survey of microfungi of Union Territory of Chandigarh, North India, a species with morphological characteristics of the genus *Taeniolina* was collected on dead leaves of *Vanda* species. A comparison with the previously described species of the genus revealed it to be an undescribed species.

MATERIAL AND METHODS

Decaying culms, bark, twigs, fallen leaves and dead wood were collected in ziplock plastic bags and taken to the laboratory. The specimens were mounted in 4% KOH, lactophenol and cotton blue 0.01% in lactophenol (Kirk *et. al,* 2008). These specimens were studied microscopically under Matrix stereo trinocular microscope (VL- Z60) and transmission microscope (VRS- 2*f*) for macroscopic and microscopic characters. All measurements were taken with the help of Pro MED software. The specimen was deposited in the Herbarium of Botany Department, Panjab University Chandigarh, India (PAN).

RESULTS

Taxonomy

Taeniolina echinata I. B. Prasher and R. K Verma sp. nov.

Fig. 1(A-L)

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Diagnosis: Mycelium septate, superficial as well as immersed. Conidiophores very short, semi-macronematous. Conidiogenous cell integrated, polyblastic. Conidia dry, single or catenate, echinate, arising acropleurogenously either singly or in cluster.

Etymology: The epithet refers to the echinate type of conidia which is a characteristic feature of this species.

Colonies on the natural substratum effuse, brown to dark brown. Mycelium partly superficial, as well as immersed, composed of septate, pale brown, smooth hyphae up to 4.5 µm thick. Stroma none. Setae absent. Conidiophores very short, semi-micronematous, smooth, septate, pale brown, 10-17.9 × 2.6-3.8 µm. Conidiogenous cell integrated, terminal or intercalary, polyblastic, globose to subglobose, cylindrical, 4.3- 6.3 × 4.4-5.7 µm. Conidia dry, single or catenate, pale olivaceous-brown, echinate, cylindrical, curved, arising acropleurogenously either singly or in cluster from the axis 11.6-21.7 × 5.4-7.1 µm, 1 to 3 septate, sometime slightly constricted at the septa.

Collection examined: I. B. Prasher and R. K. Verma, on the dead leaves of *Vanda* sp. 19 November 2012, Botanical Gardens, Panjab University, Sector 14, Chandigarh, India (30° 45' N along latitude, 76° 45'E along longitude, 365 meter) PAN 32501 (Holotype).

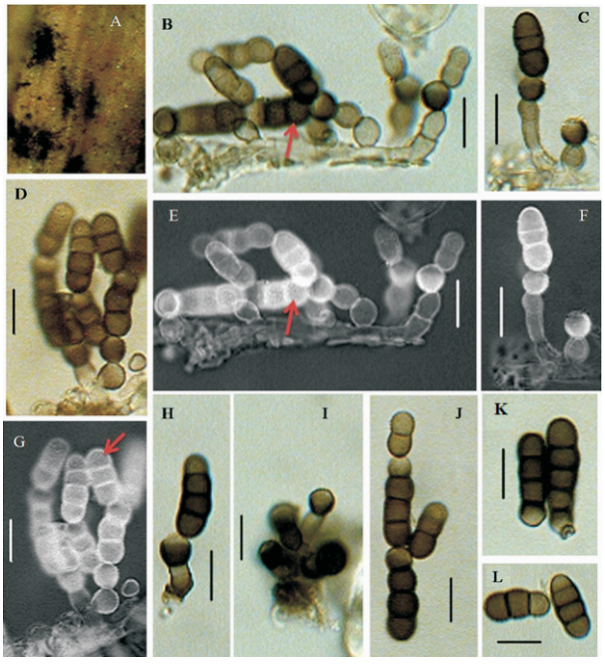

Fig. 1. ***Taeniolina echinata*** A. Colonies on the natural substratum B-H. Conidiophores conidiogenous cells and attached conidia in chains I. Conidiophores with conidiogenous cells J-L. conidia. Scale bar = 10 µm. Arrow head showing the echination.

DISCUSSION

Five species of *Taeniolina* have been reported till to date (Ellis, 1976; Crane and Schoknecht, 1981; Kirk, 1981; Zhang *et al.,* 2012). A comparison of these species has

Table 1 Comparison of *Taeniolina* species

Species (Reference)	Hyphal diameter [µm]	Conidiophore [µm]	Conidiogenous cell[µm]	Conidia [µm]	Conidial L/W ratio [µm]
T. euryae (Zhang *et al.,* 2012)	1-2	22.5-33.5 × 2-4.5	4-6.5 × 4-6	9.5-22.5 × 4.5-6, 1-4 septate Smooth, pale olivaceous brown	2.5-4.0
T. schimae (Zhang *et al.,* 2012)	2-3	9.5-25 × 2-3	4.5-5.5 × 5.5-8	6.5-19.5 × 3.5-7.5, 1-3 septate Smooth, pale olivaceous brown with sub hyaline apical cell	1.4-2.8
T. deightonii (Crane and Schoknecht, 1981).	_	39-70 × 3.3-4.4	_	11-100(-200) × 4.4 uniformly Pale brown with dark brown septa	_
T. scripta (Kirk, 1981)	1.7-3.3	5.5-12.5 × 1.7- 5	_	6-50 × 4.3-5.5(6.5), 1-10 septate, smooth, Longest conidia is 110 and 18-24 septate. Apical cell of conidia hyaline	_
T. centaurii (Ellis, 1976)	2-4	Very short	_	120-3-5 Smooth formed in dense clusters, much branched septate, olivaceous brown paler at the tips.	_
T. echinata (Present Paper)	Up to 4.5	10-17.9 × 2.6-3.8	4.3-6.3 × 4.4-5.7	11.6-21.9 × 5.7-7.0, 1-3 septate, Slightly constricted at the septa. Echinated, uniformly pale olivaceous brown when mature.	1.5-3.7

been made (**Table 1**) which indicates that *Taeniolina echinata* is markedly distinguished from other *Taeniolina* species in the presence of echinated conidia. *Taeniolina* is similar to *Torula* Pers. (Persoon, 1795) and *Taeniolella* S. Hughes (Hughes, 1958) in conidial morphology. It however, differs from *Torula* in possessing unbranched conidiophores and terminal or intercalary, polyblastic conidiogenous cells. The conidiogenesis in *Taeniolella* is mainly monoblastic, but in *Taeniolina* it is polyblastic. Conidia of several other genera including *Trimmatostroma* Corda (Corda, 1837), *Bahusandhika* Subram. (Subramanian, 1956), *Bahusakala* Subram. (Subramanian, 1958) and *Matsushimaea* Subram. (Subramanian, 1977) share similar morphologies with those of *Taeniolina*. The conidia in *Trimmatostroma* often have longitudinal or oblique septa, while in *Taeniolina* conidia have transverse septa. The Conidia of *Bahusakala* are thallic arthric, whereas those of *Taeniolina* are blastic. The conidiogenous cells in *Taeniolina* are polyblastic along with multiseptate conidia, but *Matsushimaea* has polyblastic sympodial conidiogenous cells and non-septate conidia. Conidia of *Bahusandhika* differ from *Taeniolina* in having the separating cells between two conidia. In conidial morphology *T. echinata* is closely related to *T. schimae* Y. D. Zhang & X. G. Zhang (Zhang *et al.,* 2012) and *T. deightonii* Crane & Schoknecht (Crane and Schoknecht, 1981). However, the conidia of the *T. echinata* (11.6-21.7 × 5.4-7.1 µm) is slightly larger than *T. schimae* (6.5-19.5 × 3.5-7.5 µm) and much smaller than that of *T. deightonii* (11- 100 (-200) × 4.4 µm). The mature conidia of *T. echinata* and *T. deightonii* are uniformly pale brown but in *T. schimae* the apical cell is subhyaline. In addition to this *T. echinata* differ from both the species in having echinated conidia instead of smooth. The conidiophores in *T. euryae* (22.5-33.5 µm) are longer than *T. schimae* (9.5- 25 µm) and *T. echinata* (10-17.9 µm). The conidial L/W ratio of *T. echinata* (L/W= 1.5-3.7 µm) is more than *T. schimae* (L/W= 1.4-2.8 µm) and less than *T. euryae* (L/W= 2.5-4.0 µm). It differs markedly from *T. scripta* in having larger conidiophores (10.- 17.9 × 2.6-3.8 in *T. echinata* as compared to 5.5-12.5 × 1.7-5 µm in *T. scripta*) and Conidia (11.6-21.7 × 5.7-7.0 µm in *T. echinata* as compared to 6-5 × 4.3-5.5 (6.5) µm in *T. scripta*). On the basis of above mentioned characteristics features it is described as a new species.

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