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Some interesting hyphomycetes from Himachal Pradesh, India

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ABSTRACT

Myrothecium roridum Tode, *Drechslera dematioidea* (Bubák & Wróbl.) Scharif, *Khuskia oryzae* H.J. Huds., and *Alternaria citri* Ellis & N. Pierce (anamorphic fungi- hyphomycetes) collected from Himachal Pradesh (North- Western Himalayas), are being described and illustrated.

Key Words: Anamorphic fungi, Hyphomycetes, Himachal Pradesh, India.

INTRODUCTION

This communication is in continuation with our earlier reports on new species and records of anamorphic fungi from Himachal Pradesh, North-Western Hmalayas and North India (Prasher & Verma 2012a, b, 2014a, b, c, 2015, Prasher & Singh 2014 and Prasher & Sushma 2014). During the surveys of saprobic conidial fungi occurring on dead wood, branches, bark, twigs and leaves from study area, four interesting hyphomycetes *viz* *Myrothecium roridum*, *Drechslera dematioidea*, *Khuskia oryzae* and *Alternaria citri* are being described. *Drechslera dematioidea* first time reported from N. W. Himalayas, *Khuskia oryzae* and *Alternaria citri* are being first time reported from Himachal Pradesh.

MATERIAL AND METHODS

The specimens have been collected from Himachal Pradesh in the year 2011- 2012. The dried specimens were placed in polyethylene bags of suitable size, along with the required data *viz*. collection number, details of locality, host/substrate, date of collection and name of lagator. The various mountants/stains (Kirk *et al.* 2008) used for the taxonomical investigation of fungi are: Amann's Lactophenol: Phenol-20 g, Lactic acid-20 g, Glycerol-40 g, distilled water 20 ml; 5% (used for mounting of microscopic structures); Potassium hydroxide: Potassium hydroxide 5 g, distilled water 100 ml (used for micro-chemical tests and softening of the study materials). The drawings of various structures like Conidia and Conidiophores were made with the help of Camera Lucida manufactured by "Irma" from slide mounts. The dried specimens were deposited in the Herbarium of Department of Botany Panjab University, Chandigarh, India (PAN).

RESULTS

Taxonomic description

Myrothecium roridum Tode, Fung. mecklenb. sel. (Lüneburg) 1: 25 (1790) **Fig. 1A-C**

Sporodochia shallow cupulate discoid or irregular circular, without a pseudoperenchymatous base, sessile, often coalescing to form larger

masses, typically white rimmed, without setae, arising either directly from the mycelium or from a pseudoparenchymatous stroma erupting from the epidermal cells of the dead branches and composed of intertwining groups of conidiophores, 1-1.5 mm. Sporodochial margin wooly, composed of loosely intertwined, unicellular, contorted hyphae with blunt ends arising from below the conidiophores. Conidiophores erect, once or twice branched, septate, hyaline with tapering main axis, 3-4 celled, cells broadening slightly below their distal septa, branches 1-2 celled, arising singly or in pairs or whorls either directly from the terminal cell of the parent axis or immediately below the septum of the intermediate cells, each branch terminating in a whorl of phialides. Phialides slender, clavate, straight, hyaline, usually arranged in whorls of 2-7 at the apices of the main axis and its branches but some time arising singly or in small whorls immediately below a distal septum of an intermediate cell, 15-20 × 1.5-2.7 µm forming a closely packed hymenium like layer. Conidia amero, gloio, hyalo, cylindrical or slightly tapering with rounded ends, 1- celled, hyaline, 4.5- 7.5 × 1.5-3.0 µm.

Collection examined: I. B. Prasher, 30001 (PAN), on angiospermous sticks, Swarghat (H.P.), 1220 m. Aug. 27, 2011.

This species has already been recorded from Sirmaur and solan districts of Himachal Pradesh, but first time reported from Bilaspur district (Bilgrami *et al.* 1991 and Jamaluddin *et al.* 2004).

Drechslera dematioidea (Bubák & Wróbl.) Scharif, *Studies on Graminicolous Species of Helminthosporium* (Tehran): 81 (1963) **Fig. 1 D,E**

Colonies effuse, black, superficial on the substratum forming stromatoid masses, made up of mycelium, thick-walled, brown, extensively branched (branches close), short celled, bear erect vertical conidiophores. Conidiophores 36-234 × 6.4-9 µm, brown, short or elongate, cylindric, straight or slightly curved, septate, pigmented opaque, with a swollen basal cell, bear conidiogenous cell. The conidiogenous cell is raduliform, colorless above, straight or flexuous, geniculated, geniculations thickened, poroid. Conidia phragmo, ceteri, phaeo, few having papilla at the apex, pale brown, 21-46 × 11.4-14.8 µm, thick-walled, smooth, mostly cylindrical, (1-4 celled) with transverse septa only, not constricted at the septum, septa thick walled, distinct, apical cell round, basal cell more or less triangular and narrowed towards the hilum, hilum protruding, thickened.

Collection examined: Rajnish Kumar Verma, 30017 (PAN), on decaying sticks, Bilaspur (H.P.), 670 m, March 12, 2011.

The description of the above specimen resembles the type description. It has already been recorded from Meerut Uttar Pradesh, but first time reported from N. W. Himalayas (Bilgrami *et al.* 1991 and Jamaluddin *et al.* 2004).

Khuskia oryzae H.J. Huds., *Trans. Br. mycol. Soc.* **46**(3): 358 (1963) **Fig. 1 F-H**

Mycelium inter and intracellular up to 2.8 µm present in all the tissues below the cuticle, hyaline, septate, septa at short intervals, branched, intercellular mycelium, possesses well developed branched haustoria with swollen tips, haustoria and intracellular mycelium are present in parenchyma cells. Conidiophores 5.0-10.5 × 4.0-7.5 µm wide, hyaline, non-septate, thin-walled, vesiculose emerge through the spaces in between the epidermal cells, scattered and gregarious, singly as well as in clusters, bear a single conidia at the tip, amphigenous. Conidia 12-14 × 10-17 µm wide, globose to subglobose, thick-walled, black, smooth, borne singly and apically at each conidiophore.

Collection examined: Rajnish Kumar Verma, 30070 (PAN), on decaying leaves, Swarghat (H.P.), 1220 m. March 12, 2012. It has already been reported from many places of the country, but first time reported from Himachal Pradesh (Bilgrami *et al.* 1991 and Jamaluddin *et al.* 2004).

Alternaria citri Ellis & N. Pierce, in Pierce, *Bot. Gaz.* **33**: 234 (1902) **Fig. 1 I, J**

Colonies effuse, superficial on the substratum. Mycelium immersed in the substratum, composed of septate, brown, smooth walled, thick hyphae. Conidiophore 30-90 × 3.6-6.0 µm, brown to dark brown, short or elongate, cylindric, straight or slightly curved, septate with a swollen basal cell, pigmented opaque, thick-walled, bear conidiogenous cells. The conidiogenous cell is raduliform, pale brown to colorless, straight or flexuous, geniculated, geniculations thickened, poroid. Conidia dictyo, ceteri, phaeo, porosporous, 11.2-56.0 × 8.0-24.0 µm, brown, thick-walled, elliptical to sub-globose or cylindrical, straight or slightly curved, dry, muriform, with both transverse and longitudinal septa, smooth, constricted at the septum, septa thick walled, distinct, apical cell more or less round, basal cell more or less triangular and narrow towards the hilum, hilum protruding, thickened.

Collection examined: Pooja, 30019 (PAN), on dead decaying leaves, of *Bambusa* sp. Swarghat (H.P.), 1220 m. July 20, 2012.

The species in its morphological range agrees well within the range of *A. citri* but differs from it in having wide conidiophores and slightly smaller conidia (11-56 µm as compared to 8-60 µm

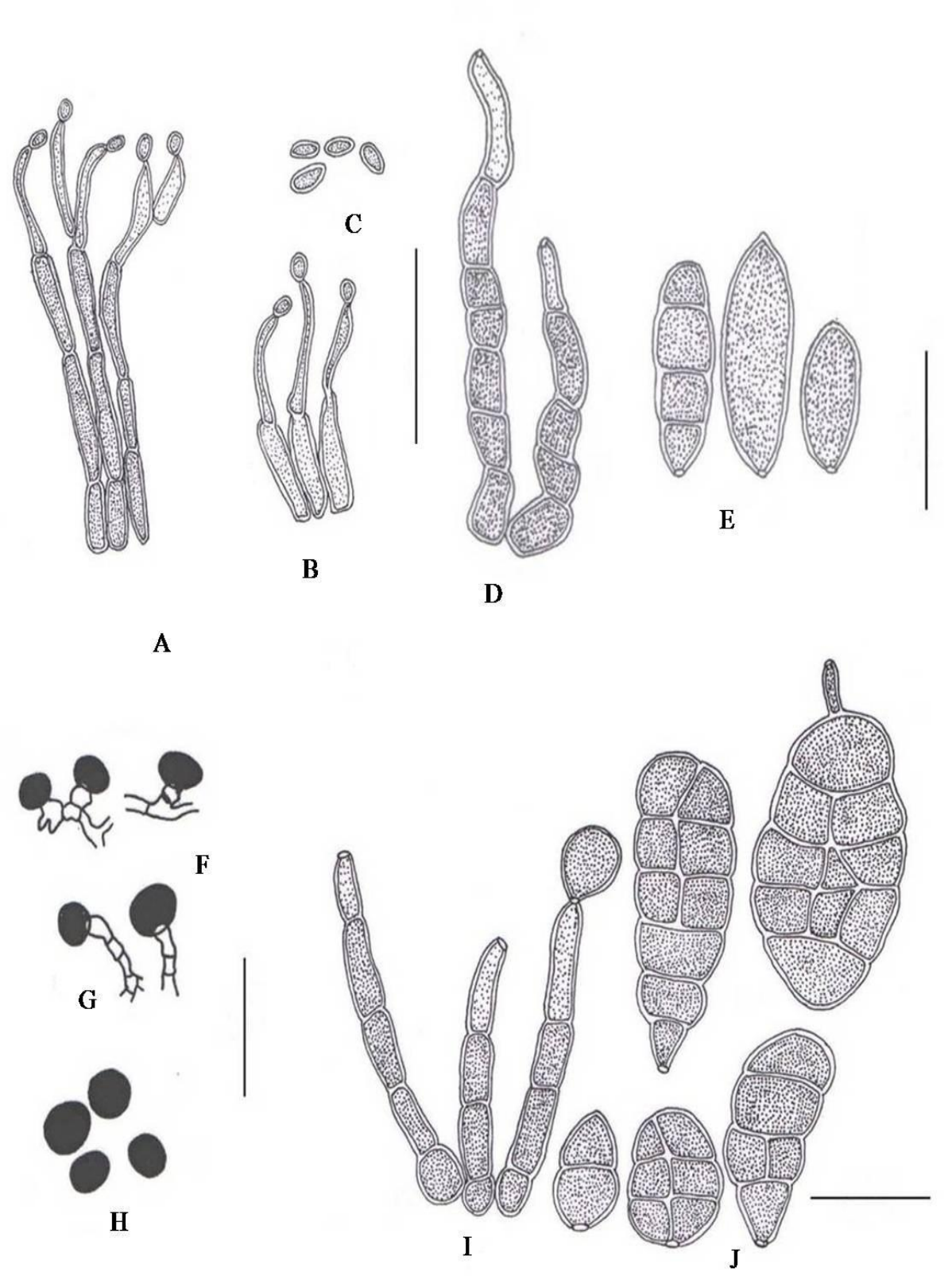

Figure 1 A-C ***Myrothecium roridum*** A, B Conidiophore with attached Conidia C Conidia**. D, E** ***Drechslera dematioidea*** **D.** Conidiophore **E.** Conidia. **F-H** ***Khuskia oryzae*** F,G Conidiophore conidiogenous cell with attached conidia H Conidia. **I, J** ***Alternaria citri*** E Conidiophores F Variously shaped conidia. **Scale bar** = 20 µm

in type specimen). This constitutes a new record for Himachal Pradesh though the species have been already recorded from Uttarakhand (North-Western Himalayas) (Bilgrami *et al.* 1991 and Jamaluddin *et al.* 2004).

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