



# New records of hyphomycetous fungi from North Western Himalayas

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## ABSTRACT

*Stachybotrys chartarum* and *Xylohypha nigrescens* have been reported for the first time from North Western Himalayas and two species viz. *Helicosporium virescens* and *Stigmina obtecta* have been recorded for the first time from Himachal Pradesh.

**Key words:** Biodiversity, hyphomycetes, North Western Himalayas

## INTRODUCTION

This communication is in continuation with earlier reports on new records of fungi from North India/ North-Western Himalayas (Adamčík et al. 2015; Buyck et al. 2016; Gautam et al. 2015; Gautam and Avasthi 2016a, b; Prasher and Verma 2012 a, b; Prasher and Verma 2014a, b; Prasher and Verma 2015a, b, c, d, e; Prasher and Verma 2016; Prasher and Sushma 2014, 2016; Prasher et al. 2015a,b, 2016a, b & c). During the survey for anamorphic fungi from Himachal Pradesh four species belonging to different genera have been collected and described. Out of these four species two species viz. *Stachybotrys chartarum* and *Xylohypha nigrescens* are being reported for the first time from North Western Himalayas and two species i.e. *Helicosporium virescens*, *Stigmina obtecta* are being reported for the first time from Himachal Pradesh (Bilgarmi et al. 1991 and Jamaluddin et al. 2004).

## MATERIALS AND METHODS

Bark of different tree species 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). The specimens were studied microscopically under Matrix stereo trinocular microscope (VL-Z60) and transmission microscope (VRS-2f) for macroscopic and microscopic characters. All the measurements were taken with the help of Pro MED software. The specimens were deposited in the herbarium of Botany Department, Panjab University, Chandigarh, India (PAN).

## RESULTS

### Taxonomy

*Stachybotrys chartarum* (Ehrenb.) S. Hughes, Can. J. Bot. 36: 812, 1958. **Fig. 1**

Colonies on natural substratum effuse, usually black. Mycelium all immersed. Stroma none. Setae and hyphopodia absent. Conidiophores branched, hyaline to pale brown, smooth, up to 120  $\mu\text{m}$  long, from the point of branching, 2.5–4.8  $\mu\text{m}$  wide, bearing a crown of phialides at its apex. Phialides 8–10.6  $\mu\text{m}$  long, 3.3–4.4  $\mu\text{m}$  thick in the broadest part. Conidia broadly ellipsoidal, grey to dark blackish brown, verrucose, 7–9.7  $\times$  4.2–6.9  $\mu\text{m}$ .

**Collection examined:** India, Himachal Pradesh, Solan, on fallen twigs of unidentified tree, 5 April 2014, Rajnish Kumar Verma, PAN (32803).

**Remarks:** The above described species matches well with the description of *S. chartarum* in morphological details (Ellis 1971). This species has been first time reported from Himachal Pradesh/North–Western Himalayas (Bilgrami *et al.* 1991 and Jamaluddin *et al.* 2004).



**Fig. 1.** *Stachybotrys chartarum* A. Colony on natural substratum, B,C. Branched conidiophores, D, E. Conidiophores with phialides, E. Conidia. Scale bars: B = 20  $\mu\text{m}$ , C-F = 10  $\mu\text{m}$ .

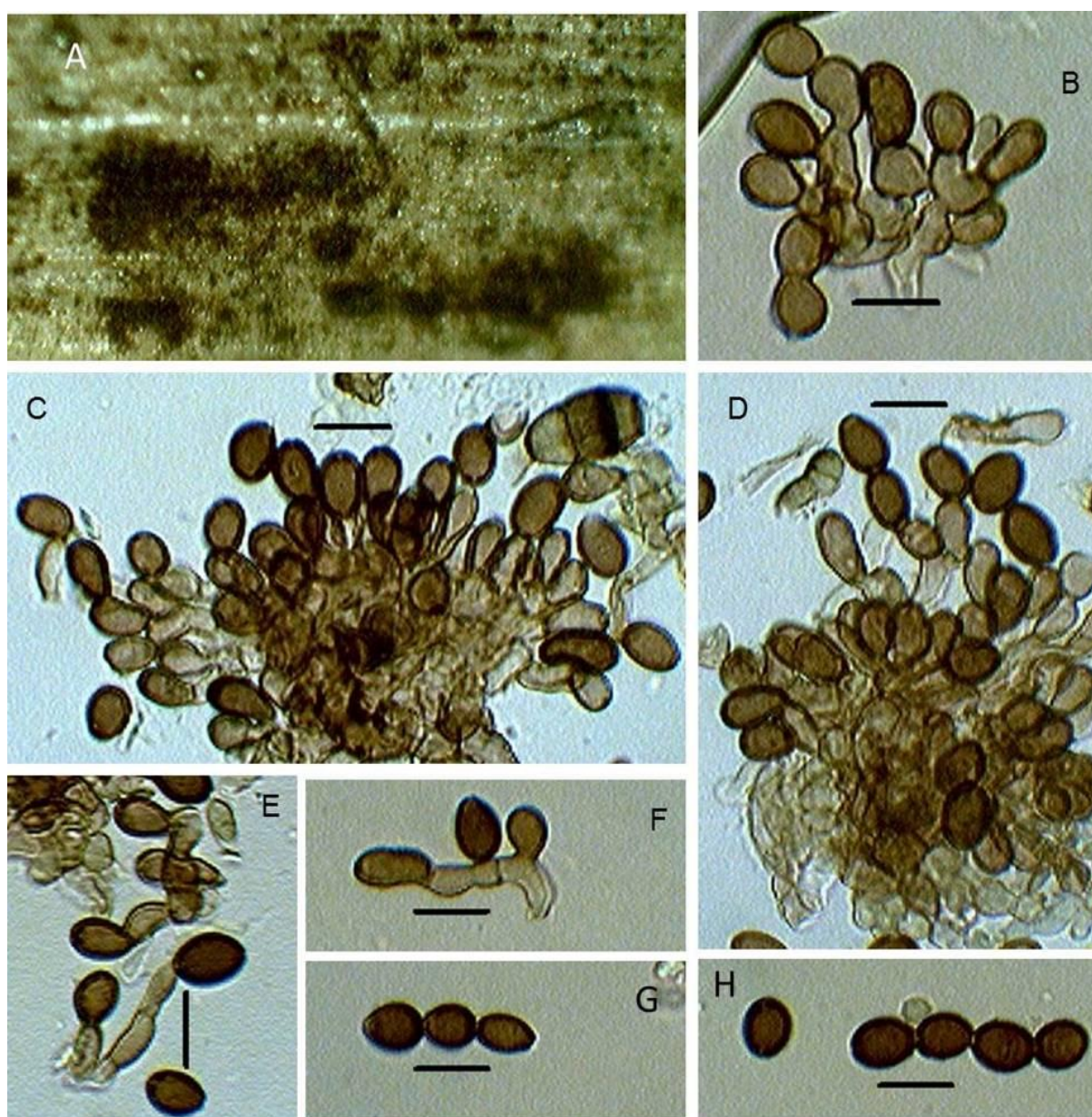


*Xylohypha nigrescens* (Pers.) E.W. Mason, in Deighton, Mycol. Pap. 78: 43 (1960). **Fig. 2**

Colonies on natural substratum effuse, powdery, dark blackish brown to black. Mycelium immersed. Stroma none. Setae and hyphopodia absent. Conidiophores macronematous, mononematous, unbranched, straight or flexuous, brown, smooth,  $15\text{--}32 \times 2.3\text{--}4.2 \mu\text{m}$ . Conidia dry, catenate, in long unbranched or occasionally branched acropetal chains which break up very readily, simple, ellipsoidal, pale to mid brown, smooth,  $6.5\text{--}10 \times 4.2\text{--}6 \mu\text{m}$ .

**Collection examined:** India, Himachal Pradesh, Solan, on fallen leaves of unidentified tree, 5 April 2014, Rajnish Kumar Verma, PAN (32785).

**Remarks:** The genus *Xylohypha* was established Mason in 1960 with *X. nigrescens* as type species. The species described above matches well with the description of *X. nigrescens* (Ellis 1971). This species is characterised by the presence of conidia which are simple, ellipsoidal, in long unbranched or occasionally branched acropetal chains which break up very readily. Presently, the genus is represented by ten species. Earlier it has been reported from New Delhi and (Poona) Maharashtra, so this constitutes a new record for North–Western Himalayas (Bilgrami *et al.* 1991 and Jamaluddin *et al.* 2004).



**Fig. 2.** *Xylohypha nigrescens*. A. Colonies on natural substratum, B–F. Conidia attached to conidiophores, G, H. Conidia. Scale bar: B–F= 10  $\mu\text{m}$ .



*Helicosporium virescens* (Pers.) Sivan., Bitunicate Ascomycetes and their Anamorphs (Vaduz): 591, 1984. **Fig. 3**

Colonies on natural substrate effuse. Mycelium mostly superficial and partly immersed, composed of smooth hyphae. Stroma none. Setae and hyphopodia absent. Conidiophores macronematous, usually unbranched, subulate, septate, lower part brown to dark brown, up to 350  $\mu\text{m}$  long, 1.87–2.95  $\mu\text{m}$  wide. Conidiogenous cells monoblastic or polyblastic, integrated, intercalary. Conidia pleurogenous, holoblastic, helical, tightly coiled 3–4 times in one plane, hyaline to yellowish green in mass, 12.66–14.23  $\mu\text{m}$  diam. Conidial filament 0.95–1.35  $\mu\text{m}$  thick, indistinctly septate.

**Collection examined:** India, Himachal Pradesh, Solan, on fallen leaves of unidentified tree, 5 April 2014, Rajnish Kumar Verma, PAN (32796).

**Remarks:** The genus *Helicosporium* was erected by Nees (1817) with *H. virescens* as type species.

The genus *Helicosporium* is characterized by the presence of long conidiophores and helicoid conidia that are relatively thin-walled and hygroscopic (Goos 1989). The species with in genus are mainly distinguished by the morphology of conidia (diameter, filament width and number of coils), conidiophores, conidiogenous cells and colony color (Goos 1989). Zhao *et al.* (2007) accepted 21 species in the genus. Two species viz. *H. vesiculiferum* A.C. Cruz & Gusmão and *H. melghatianum* Hande are described by Cruz *et al.* (2009) and Dharkar *et al.* (2010) from Bahia (Brazil) and Melghat (India) respectively. Presently the genus is represented by 23 species (Zhao *et al.* 2007; Cruz *et al.* 2009 and Dharkar *et al.* 2010). The genus *Helicosporium* in India is represented by 14 species (Mukherjee & Manoharachary 2010; Dharkar *et al.* 2010 and Soni *et al.* 2011). This species is first time reported from Himachal Pradesh/Himalayas (Bilgrami *et al.* 1991 and Jamaluddin *et al.* 2004).



**Fig. 3.** *Helicosporium virescens*. A–C. Conidia attached to conidiophores, D–I. Conidia. Scale bar: A–I = 10  $\mu\text{m}$ .



*Stigmina obtecta* (Petr. & Esfand.) M.B. Ellis,  
Mycol. Pap. 111: 42 (1967). **Fig. 4**

Colony effuse, black in colour on natural substrate. Conidiophores closely packed together, subhyaline to brown in colour, smooth, length is up to 40  $\mu\text{m}$  and width is 4.13-7.28  $\mu\text{m}$ . Conidia smooth, brown in colour, solitary, transversely septate also having vertical septa in some cells, 22.5-53.7  $\times$  11.2-25.6  $\mu\text{m}$ .

**Collection examined:** India, Himachal Pradesh, Kinnaur, Pooh, on bark of angiospermic tree, 11 July 2014, Sushma, PAN (31562).

**Remarks:** The above described species has been earlier reported from Jammu and Kashmir in India (Bilgrami *et al.* 1991 & Jamaluddin *et al.* 2004), but this is being reported for the first time from Himachal Pradesh.



**Fig. 4.** *Stigmina obtecta*. a. Colony on natural substratum, b-d. Conidia attached with conidiophores, e, f. Conidia. Scale bars b-f = 10  $\mu\text{m}$ .

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