Journal on New Biological Reports
JNBR 5(1) 52 – 58 (2016)

ISSN 2319 – 1104 (Online)

Published by
www.researchtrend.net

Hyphomycetes diversity of Himachal Pradesh-I

I. B. Prasher and Rajnish Kumar Verma*

Mycology and Plant Pathology Laboratory, Department of Botany, Panjab University Chandigarh, 160014

***Corresponding author**: vermarajnish1985@@gmail.com

| **Received**: 29 February 2016 | **Accepted**: 12 April 2016 |

ABSTRACT

Dendryphiopsis atra (Corda) S. Hughes, *Melanographium citri* (Gonz. Frag. & Cif.) M.B. Ellis, *Moorella speciosa* P. Raghuveer Rao and Dev Rao, *Sporoschisma mirabile* Berk. & Broome and *Virgaria nigra* (Link) Gray, collected from the various localities of Himachal Pradesh are being described and illustrated.

Key Words: Anamorphic fungi, Diversity, Himalayas.

INTRODUCTION

This communication is in continuation with our earlier reports on hyphomycetes (Adamčik *et al.* 2015, Prasher *et al.* 2015, Prasher & Verma 2012a, b, 2014a, b, c, 2015a, b, c, d, e). During the survey of saprobic conidial fungi from forests of Himachal Pradesh, five interesting hyphomycetes were collected. *Dendryphiopsis atra* and *Sporoschisma mirabile* are first time reported from North–Western Himalayas, *Virgaria nigra* constitute a new record for Himachal Pradesh, *Melanographium citri* first time reported from Bilaspur and Solan district and *Moorella speciosa* first time reported from Hamirpur district.

MATERIALS AND METHODS

Decaying culms, leaves, twigs, cut stumps, bark and dead wood have been collected into separate Khakhi bags and brought to the laboratory. The specimens were mounted on glass slides either in 4% KOH or 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 have been taken with the help of Pro MED software. The specimens have been deposited in herbarium of Department of Botany, Panjab University (PAN).

RESULTS

Dendryphiopsis atra (Corda) S. Hughes, Can. J. Bot. 31: 655 (1953) **Fig. 1(A–F)**
= *Dendryphion atrum* Corda, Icon. fung. (Prague) 4: 33 (1840)

Colonies on natural substratum effuse black hairy. Mycelium mostly immersed. Stroma none. Setate and hyphopodia absent. Conidiophores macronematous, mononematous, branched at apex forming a stipe and head; stipe straight or flexuous, erect, mid to dark blackish brown, smooth up to 450 µm long and 6.64–8.36 µm wide, with smooth branches paler branches. Conidia solitary, acrogenous, simple, cylindrical rounded at the ends or obclavate, pale to mid dark brown or olivaceous brown, smooth, thick–walled, with 1–4 transverse septa 35.6–67.7×12.5–18.6 µm.

Collection examined: India Himachal Pradesh near Narkanda (Shimla), on dead and decaying stump of *Cedrus deodara*, 4 Oct. 2013, Rajnish Kumar Verma, PAN (32506).

Remarks: This species has already been reported from Narsinghpur (Madhya Pradesh) on dead stems of *Lawsonia alba*, Poona (Maharashtra) on dead

wood of *Alistonia* sp. and from kerala, but first time reported from Himachal Pradesh/ Himalayas (Bilgrami *et al.* 1991 and Jamaluddin *et al.* 2004).

Sporoschisma mirabile Berk. & Broome, Gard. Chron.: 540 (1847) **Fig. 2 (A–G).**

Colonies effuse, black on natural substratum. Mycelium immersed. Setae scattered or in groups mixed with conidiophores, black, upto 220 µm long 5–10 µm thick at the base, tapering to µm, apical vesicle is hyaline to subhyaline 5–8 µm in diameter. Conidiophores macronematous, mononematous, scattered or caespitose, unbranched, straight or flexuous, dark brown to black, smooth, each composed of swollen base, cylindrical stipe and a large, often legeniform often

in groups or mixed with setae, up to 250 µm long, 8–11 µm wide in widest part. Conidia catenate, formed endogenously in basipetal succession, simple, cylindrical, truncate or rounded at the ends with 3 transverse septa, dark brown, often somewhat darker at the septa,25– 37×8–12 µm.

Material examined: India, Himachal Pradesh, near Kullu on fallen Bamboo culm, Rajnish Kumar Verma PAN (32717).

Remarks: The above described species matches well with the description of *Sporoschisma mirabile*. This species has previously been reported from Kerala. This constitutes a new record for Himachal

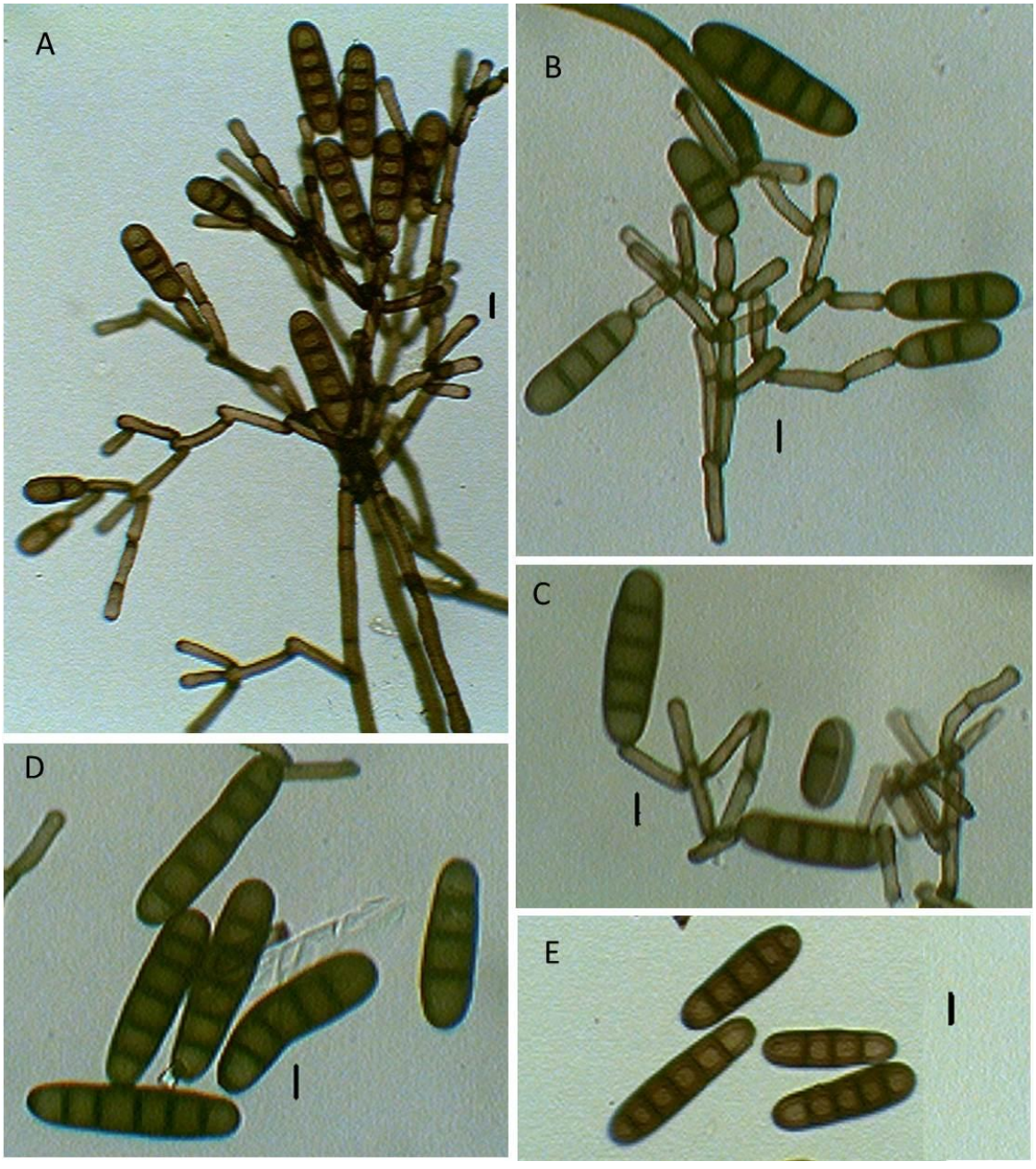

Fig.1. *Dendryphiopsis atra*. A–C Conidia attached to conidiophores D, E Conidia. Scale bars: A–E = 10 µm.

Pradesh / North–Western Himalayas (Bilgrami *et al.* 1991 and Jamaluddin *et al.* 2004).

Virgaria nigra (Link) Gray, Nat. Arr. Brit. Pl. (London) 1: 553 (1817) [1816–17] **Fig. 3 (A–F)**

= *Botrytis nigra* Link, Mag. Gesell. naturf. Freunde, Berlin 3(1–2): 14 (1809)
= *Sporotrichum fuliginosum* Pers., Mycol. eur. (Erlanga) 1: 77 (1822)

Colonies on natural substratum effuse, dark brown or almost black. Mycelium partly superficial, partly immersed. Stroma none. Setae and hyphopodia absent. Conidiophores macronematous, mononematous, erect or ascending, branched extensively, straight or flexuous, pale to mid brown, smooth up to 210 µm long and 1.5–3.2 µm wide. Conidia solitary, dry, acropleurogenous, simple reniform, often obliquely attenuated at the base, pale to mid brown, smooth, aseptate 3.4–4.8 × 1.9–3.3µm

Collection examined: India Himachal Pradesh Shogi (Shimla), on bark of unidentified tree, 10 Nov. 2011, Rajnish Kumar Verma, PAN (32772).

Remarks: This species have already been reported from Kambakkam Hills Tamilnadu, Belarpur Madhya Pradesh, Dehradun Uttarakhand and Bilaspur Himachal Pradesh, but first time reported from Shimla district of Himachal Pradesh (Bilgrami *et al.* 1991 and Jamaluddin *et al.* 2004).

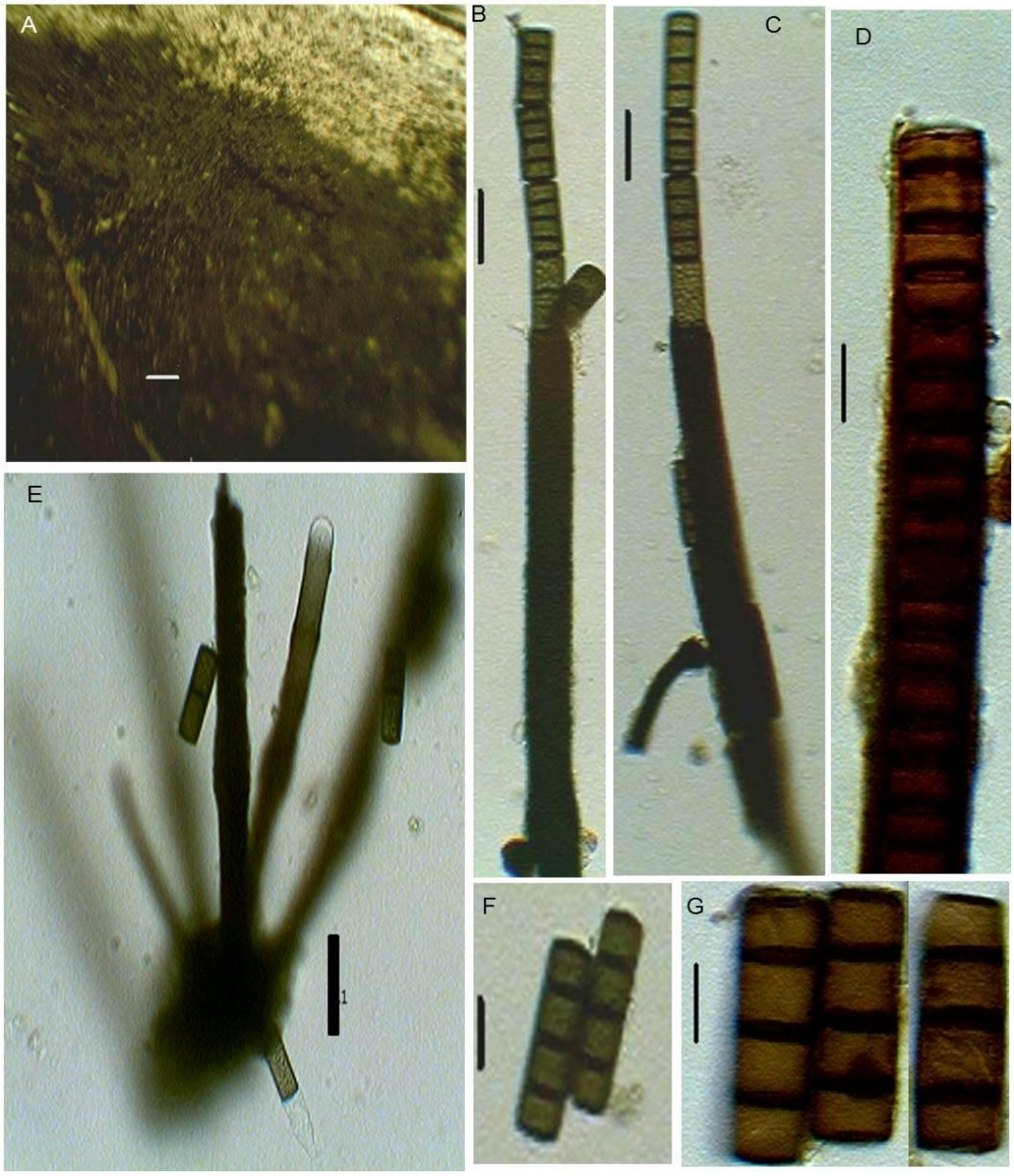

Fig. 2. *Sporoschisma mirable*. A. Colonies on natural substratum B–D. Conidiogenous cell attached to conidiophore E. Conidia. Scale bars: A= 1 mm; B–D = 10 µm F–G= 5 um.

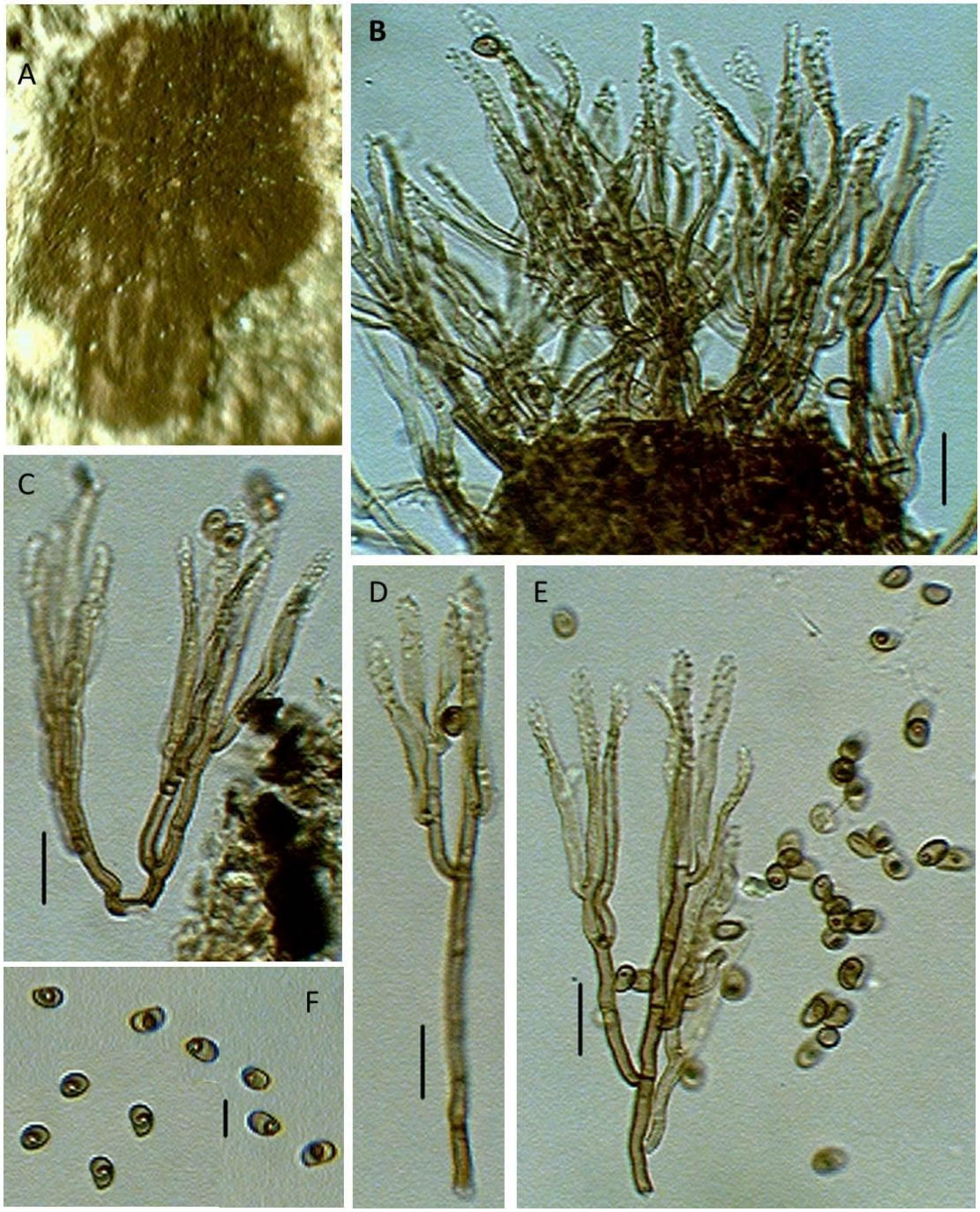

Fig. 3. *Virgaria nigra*. A. Colonies on natural substratum. B–E. Conidiophores and Conidia. F. Conidia. Scale bars: B–E =10 µm, F = 5 µm.

Melanographium citri (Gonz. Frag. & Cif.) M.B. Ellis, Mycol. Pap. 93: 21 (1963) **Fig 4 (A–F).**

= *Pseudocamptoum citri* Gonz. Frag. & Cif., Boln Real Soc. Españ. Hist. Nat., Biologica 25: 454 (1925)

Colonies on natural substratum effuse, velvety, dark blackish brown. Stroma mostly immersed. Conidiophores macronematous, mononematous, caespitose, unbranched straight or flexuous brown smooth up to 900 µm long and 3.8–6.4 µm wide. Conidia solitary, dry, acropleurogenous, simple, frequently reniform but may be ellipsoidal, limoniform, obovoid or pyriform, brown, smooth or verrucose, 0– septate, often with a hyaline germ slit mid dark brown, smooth 14.76×17.97–10.55×13.52 µm.

Collection examined: India Himachal Pradesh, Around Renuka Lake (Sirmaur) on Rachis of *Phoenix* sp. 15 September 2011, PAN (32743), Near railway fatak (Solan) on *Phoenix* species, 5 April 2014, PAN (32773) and Near Swarghat (Bilaspur) on fallen branches of *Phoenix* species,

15 November 2015 Rajnish Kumar Verma, PAN (32774).

Remark: This species has already been reported from Mandi (Himachal Pradesh), Ratnagiri (Maharashtra), Tinsukia (Assam) and Goa (Bilgrami *et al.* 1991 & Jamaluddin *et al.* 2004, Bhat 2010). This constitutes a new record for Bilaspur and solan district of Himachal Pradesh.

Moorella speciosa P. Raghuveer Rao and Dev Rao, 1964, *Mycopath*. *Mycol*. *appl*. **22:** 50–52. **Fig. 5 (A–F)**

Colonies on natural substratum effuse, blackish brown, velvety. Mycelium partly superficial partly immersed. Setae and hyphopodia absent. Conidiophores macronematous, erect, straight or slightly flexuous, septate, dark brown, smooth, with numerous short, brown branches formed in verticils at intervals along the stipe, 220–278 µm in length, 7.8–10 µm wide at base, 5.0–6.5 µm wide at apex. Conidiogenous cells polyblastic, integrated and terminal on the stipe and branches or rarely discrete, superficial or ellipsoidal, denticulate. Conidia solitary, dry, developing several at a time or successively from a pale brown, thin–walled protrusion at the apex of the condiogenous cell, simple, helicoid, septate, hyaline or subhyaline, smooth, 1–1.5 times coiled, 4–6 septate, 8–10 µm diameter, with filament 4–4.5 µm thick.

Collection examined: India, Himachal Pradesh, Bhoranj (Hamirpur), on the Culm of *Bamboo* species 22 July 2012, Rajnish Kumar Verma PAN (30108).

Remarks: It has previously been reported from, Jabalpur, Madhya Pradesh (Sharma, 1979); Dehra Dun (Prasher and Kaur 2014) and solan (Himachal Pradesh) Prasher and Singh (2015). This species is first time reported from Hamirpur district of Himachal Pradesh.

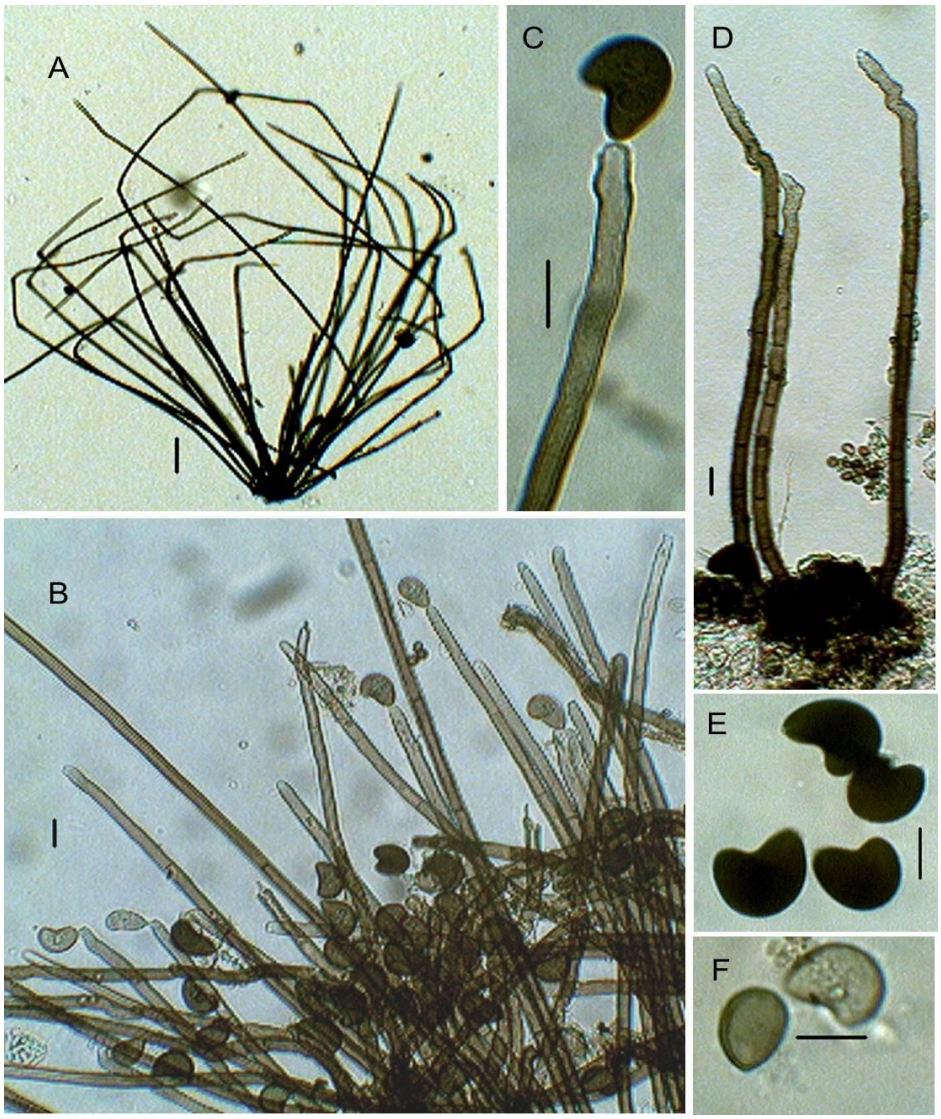

Fig. 4. ***Melanographium citri*****.** A, D. Conidiophores in loose fascicles B,C Conidiophore(s) with attached conidia E Mature conidia F Immature conidia. Scale bars: A= 50µm, B–F= 10µm.

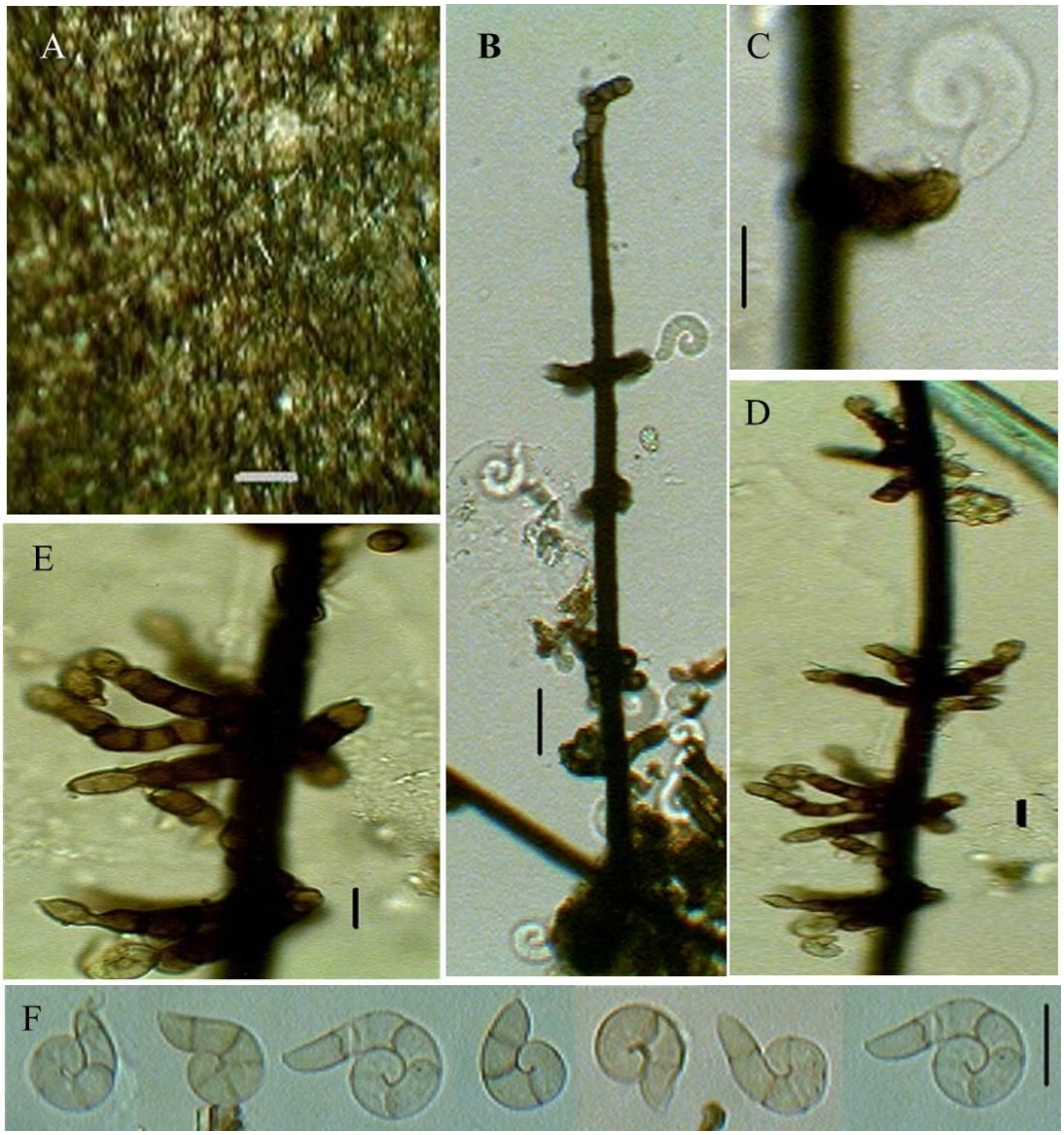

Fig. 5. ***Morrella speciosa.*** A Colonies on substrate B, C. Conidia attached to Conidiophore D, E. Conidia Scale bars A = 0.5 mm ; B–C= 10 µm d = 5um, E–F= 10 um

ACKNOWLEDGEMENTS

The authors are thankful to Ministry of Environment and Forests, Government of India for the financial assistance (vide letter no. 14/26/2008–ERS/RE dt. 06.06.2010), UGC (SAP, DRS III) and Chairperson Department of Botany Panjab University Chandigarh for providing infrastructural and laboratory facilities.

REFERENCES

Adamčik S, Cai L, Chakraborty D, Chen X–H, Cotter H Van T, Dai D–Q, Dai, Y–C, Das K, Deng C, Ghobad–Nejhad M, Hyde KD, Langerm E, Deepna Latha KP, Liu F, Liu S, Liu T, Lv W, Lv S–X, Machado AR, Pinho DB, Pereira OL, Prasher IB, Rosado AC, Qin J, Qin W–M, Verma RK, Wang Q, Yang Z–L, Yu X–D, Zhou L–W and Buyck B. (2015) Fungal Biodiversity Profiles 1–10. Cryptogamie, Mycologie. 36 (2): 121–166. http://dx.doi/10.7872/crym/v36.iss2.2015.1

Bhat DJ (2010) Fascinating Microfungi (Hyphomycetes) of Western Ghats—India. Broadway Book Centre Goa.

Bilgrami KS, Jamaluddin and Rizwi MA. 1991. Fungi of India List and References. Today and tomorrow's Printers & Publishers, New Delhi, India.

Ellis MB. 1971. Dematiaceous Hyphomycetes. Coomonwealth Mycological Instititute, Kew, UK

Ellis MB. 1976. More Dematiaceous Hyphomycetes. Coomonwealth Mycological Instititute, Kew, UK.

Gautam AK. 2014. *Fusicladium ahmadii* on *Pyrus pashia*: a new record for Indian mycobiota from Himachal Pradesh. Pl Pathol Quarantine. 4(2): 86–89, Doi 10.5943/ppq/4/2/1

Jamaluddin MG, Goswami and Ojha BM. 2004. Fungi of India 1989–2001. Scientific Publishers, Jodhpur, India.

Kirk PM, Cannon PF, Minter DW and Stalpers JA. 2008. Dictionary of the Fungi. 10th edn. CAB International, Wallingford, UK

Prasher IB and Singh G. 2015. New and interesting hyphomycetes from North–western Himalayas. Kavaka. 44: 83–86.

Prasher IB and Verma RK 2014b. Four interesting Hyphomycetes from Himachal Pradesh. J New Biol Rep 3(3): 159 – 166.

Prasher IB and Verma RK. 2012a. Two Hyphomycetes New to Himalayas. Pl Sc Feed. 2(8): 122–124.

Prasher IB and Verma RK. 2012b. *Periconia* species new to North Western Himalaya. J New Biol Rep 1(1): 01–02.

Prasher IB and Verma RK. 2014a. Hyphomycetes new to N.W. Himalayas and Siwaliks, in Ahluwalia AS and Gaur R. (Eds) *Science, Technology and Enviornment*, Panjab University, Chandigarh. 37–41.

Prasher IB and Verma RK. 2014c. *Taeniolina echinata*- A new species of hyphomycetes (anamorphic) fungus from North India. Kavaka 43:11-13

Prasher IB and Verma RK. 2015a. Hyphomycetes from Himachal Pradesh, India. J New Biol Rep 4(1): 70–75

Prasher IB and Verma RK. 2015b. Two new species of *Dictyosporium* from India. Phytotaxa 204 (3): 193–202. http://dx.doi.org/10.11646/phytotaxa.204.3.2

Prasher IB and Verma RK. 2015c. Some new and interesting Hyphomycetes from North Western Himalayas, India. Nova Hedwigia 100(1–2) 269–277. http://dx.doi.org/10.1127/nova_hedwigia/2014/2015

Prasher IB and Verma RK. 2015d. Two new species of *Acroconidiella* from India. J New Biol Rep 4(2): 111–114.

Prasher IB and Verma RK. 2015e. *Neosporidesmium appendiculatus* sp. nov. from North– Western India. Mycological Progress 14: 87. http://dx.doi.org/10.1007/s11557-015-1112-5

Prasher IB, Singh KJ and Verma RK. 2015. Some interesting hyphomycetes from Himachal Pradesh, India. J New Biol Rep 4(1): 89 – 92

Sharma ND. 1979. Some records of fungi from India. Indian Phytopathol 32: 518–522.