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Three lignicolous macrofungi from District Doda of Jammu Province (J&K), India

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Abstract

Three lignicolous macrofungal species, namely, *Fomes fomentarius* (L.ex Fr.) Fr., *Fomitopsis pinicola* (Fr.) Kar and *Fomes igniarius* (L.) Fr. belonging to aphyllophorales, collected from Kishtwar and Bhadarwah regions of district Doda of Jammu province (J&K), India, have been described in the present communication. Their taxonomic details, macro and micro-morphological characters have also been included. Critical microscopic observations and perusal of literature revealed that *Fomes igniarius* is new addition to the macrofungal flora of Jammu and Kashmir while as *Fomes fomentarius* and *Fomitopsis pinicola* are the first authentic records for the Jammu province.

Keywords:- *Aphyllophorales, Taxonomy, Fomes fomentarius, F. igniarius, Fomitopsis pinicola*

Introduction

Doda, the largest district in Jammu Province of Jammu and Kashmir state of India, lies in the Pir Panjal range of North-West Himalaya (Kashmir Himalaya) between 74º 30' - 76º 30' E longitude and 32º 30'- 34º 15' N latitude covering an area of 11,691 sq km of which 5,555 sq km comes under forest cover (DOS, 2002). The region is mainly mountainous and vegetation is dominated by coniferous and mixed forests with sub- tropical to temperate climate with average annual rainfall of 107-150 cm. The predominant plant species are *Cedrus deodara* (Roxb.) G. Don, *Pinus wallichiana* A.B. Jackson, *Picea smithiana* (Wallich.) Boiss., *Abies pindrow* Royle, *Quercus* spp. L., *Juglans regia* L., *Alnus nepalensis* D. Don, *Ulmus wallichiana* Planch. etc. Though the study area is endowed with vast phytodiversity including macrofungal resources wealth, hardly any report on the occurrence and distribution of lignicolous macrofungi from this region exists in the literature. Therefore, the present study was carried out with an objective to find out the lignicolous macrofungal species in the study area and thus provide more data on the lignicolous macrofungal flora of the region.

Materials and Method

The collected specimens have been described and illustrated based on the field study of the fresh specimens. For the collection of these fungi, standard methods of collection, preservation, macro and microscopic studies were followed (Atri *et al*., 2003; Kumar *et al*., 1990; Major, 1974; Smith *et al*., 1981) the shape, size, and colour of fresh specimens were recorded before preservation. All the measurements were taken and illustrations were made with the aid of Camera Lucida (Erma, Japan). Reagents used during microscopic analysis were 3% KOH, lactophenol, cotton blue, 1% phloxine and Melzer's Reagent. Crystals

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of 1,4-dichlorobenzene were used against insect infestation. The examined specimens have been deposited in the herbarium of Botany Department, University of Jammu, Jammu with accession numbers. For three-dimensional photography, the stereo Nikon camera (SMZ 800, Japan) was used.

Results and Discussion

1. *Fomes fomentarius* (L.ex Fr.) Fr.
Synonymy:
***Agaricus fomentarius* (L.) Lam.,** (1783)
***Boletus fomentarius* L.,** Sp. *Plantarum* : 1176 (1753)
***Polyporus fomentarius* (L.) Fr.,** *Syst.mycol*. (Lundae) 1: 374 91821)
***Ungulina fomentaria* (L.)** Pat., *Essai Tax. Hymenomyc.* : 102(1900)
Collection examined: Jammu and Kashmir, Kandail forest area, Paddar, Kishtwar, lignicolous, growing on wood of *Cedrus deodara* (Roxb.) G. Don, scattered to gregarious, coniferous forest, Sanjeev Kumar and Y.P. Sharma, JUH 9637, July 18, 2006.
Carpophore 14-20 cm, bracket shaped or hoof shaped, dimidiate to ungulate, sessile, upper surface smooth, greyish to grey brown with faint semi-circular markings, margins cream coloured, hazel or light brown, perennial; Context antique brown to cinnamon brown; hyphal system trimitic, generative hyphae 1.6-3.2 µ, branched, clamped, rarely septate, skeletal hyphae 3.2-8.0 µ, thick walled, hyaline, branched, binding hyphae 4.8-6.4 µ, thick walled, branched, pores 150-240 x 120-255 µ, small, round, light brown, flesh brown, thick, suberose, soft, a hard thick crust, shiny below, blackish gray in cross section, basidiospores 4.8-12.8 x 3.2-8.0 µ, ellipsoidal, smooth, hyaline (Fig.1-7).


Fig.1


Fig.2

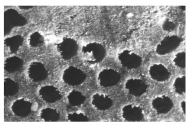
Fig.3

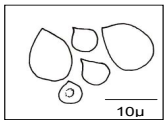

Fig.4

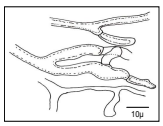

Fig.5

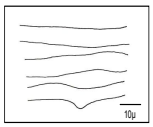

Fig.6

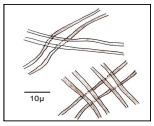

Fig.7

Habitat and Distribution: *Fomes fomentarius* is inedible, worldwide in distribution and has been reported from Africa, Asia, Europe and North America (Sinclair *et al.* 1987). In India, it was recorded growing on twig of *Aesculus indica* Coleb. ex Cambess and *Juglans regia* from Dehradun (Bakshi *et al*., 1971); on *Cedrus deodara* and *Pyrus* sp. L. from Himachal Pradesh (Thind and Rattan, 1971); and on *Betula* sp. Tourn. from Kashmir, Jammu and Kashmir (Abraham, 1991; Llyod, 1898-1925); This fungus is very well used by local population for fire production, decorative items etc. On comparing the taxonomic details of the present specimen with Teng (1988) and Schwarze (1994), it was close to their description except spore length.

2. *Fomes igniarius* (L.) Fr.
Synonymy:
***Phellinus igniarius* (L.) Quel.** (1886)
Collection examined: Jammu and Kashmir, Bhadarwah, Ramtund forest area, lignicolous, growing on wood of *Cedrus deodara*, scattered, Sanjeev Kumar and Y.P.Sharma, JUH 9641, January 10, 2006.
Carpophore 15x16.5 cm, applanate, woody, hard, cinnamon brown, sessile, bracket like, perennial, pores 135-225 x 210-300 µ, oval to elongated; margins obtuse, sterile, ochraceous tawny to sudan brown; context argus brown, hard woody; hyphal system dimitic, generative hyphae 2.4- 8.0 µ, wide, thin to thick walled, septate, clamped, hyaline, skeletal hyphae 1.6-6.4 µ, wide, thick walled, aseptate, branched, basidiospores 4.8-6.4 x 1.6-3.2 µ, ellipsoidal to subglobose with thick walls (Fig.8-12).

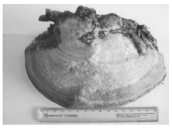
Fig.8

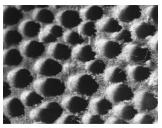
Fig.9

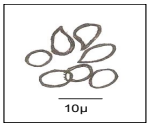

Fig.10

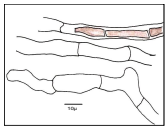
Fig.11

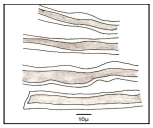
Fig.12

Habitat and Distribution: Recorded on dead trees of *Picea morinda* Link. and *Abies pindrow* from Darjeeling, West Bengal Berkeley (1856). The above examined specimen resembles with the taxonomic details given by Natrajan and Kolandavelu (1998) and differs only with respect to basidiospore length.
3. *Fomitopsis pinicola* (Fr.) Kar.
Synonymy:
Antrodia tuber (P.Karst.) P.Karst., *Finl. Basidsvamp*. (11) : (1898)
Boletus fulvus Schaeff., *Fung. Bavar. Palat*. 4: 89 (1774)
Boletus pinicola Sw., *Sevenska Vet.Acad.hand*., 1852 : 88 (1810)
Fomes pinicola (Sw.) Fr. *Summa veg. Scand.,* Section Post. (Stockholm) (1849)
Polyporus pinicola (Sw.) Fr., *Syst.mycol.* (Lundae) 1: 372(1821)
Ungulina marginata (Fr.) Pat., *Essi Tax. Hymenomyc*.: 103 (1900)
Collection examined: Jammu and Kashmir, Kishtwar, Chishoti village of Machail Padder, solitary, lignicolous, on wood of *Juglans regia* L. in mixed forest of *Juglans regia* L. and conifers, Sanjeev Kumar and Y.P. Sharma, JUH 9638, July19, 2006.
Carpophore 12 cm long and 11cm wide, hoof shaped, sessile, thick and flattened, yellowish turning slightly reddish brown and finally brownish black with semi-circular concentric markings, blackish crust shiny or pruinose, margins yellowed, perennial, pores 105 x 210 µ, irregular, cream or light brown sometimes reddish when rubbed, hyphal system dimitic, generative hyphae 4.0-20.0 µ wide, septate, thin walled to thick walled, branched with clamp connections, skeletal hyphae 1.6-6.4 µ wide, thick walled, branched, without clamps, slightly flexuous, binding hyphae 3.2-8.0 µ,
wide, hyaline, aseptate, unbranched, basidiospores 4.8-11.2 x 2.4-6.4 µ, pale yellow to white, smooth, elliptical, chlamydospores 4.8 -14.4 x 3.2-11.2 µ, thick walled (Fig.13-19).
This species resembles with the taxonomic details given by Natrajan and Kolandavelu (1998) and differs only with respect to basidiospore length.


Fig.13


Fig.14

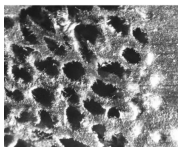
Fig.15

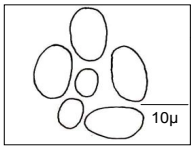

Fig.16

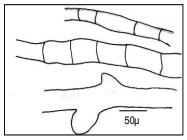

Fig.17

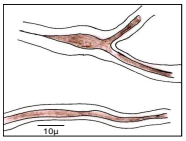

Fig.18

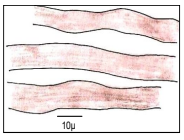

Fig.19

Habitat and Distribution: *Fomitopsis pinicola* is inedible and has been reported only from Kashmir in India by Abraham (1991). It is usually parasitic on broad–leaved and coniferous species but also grows as a saprophyte on dead tree trunks..

Survey of literature (Bilgrami *et al.* 1979, 1981, 1991; Jamaluddin *et al*., 2004) shows that out of these three species, *Fomes igniarius* is new from Jammu and Kashmir state, whereas, *Fomes fomentarius* and *Fomitopsis pinicola* constitute the first authentic reports from the Jammu Province.

Lagend

Fig.1- *Fomes fomentarius* on treetruk of *Cedrusdeodara*
Fig.2- Carpophore of *Fomesfomentarius*
Fig.3- Pores of *Fomes fomentarius*
Fig.4- Basidiospores of *Fomes fomentarius*
Fig.5- Generative hyphae of *Fomes fomentarius*
Fig.6- Skeletalhyphae of *Fomes fomentarius*
Fig.7- Bindinghyphae of *Fomes fomentarius*
Fig.8- Carpophore of *Fomes igniarius*
Fig.9- Pores of *Fomes igniarius*
Fig.10- Basidiospores of *Fomes igniarius*
Fig.11- Geerativehyphae of *Fomes igniarius*
Fig.12- Skeletalhyphae of *Fomes igniarius*
Fig.13- *Fomitopsis pinicola* on tree trunk of *Juglans regia*
Fig.14- Carpophore of *Fomitopsis pinicola*
Fig.15- Pores of *Fomiitopsis pinicola*
Fig.16- Basidiospores of *Fomitopsis pinicola*
Fig.17- Generative hyphae of *Fomitopsis pinicola*
Fig.18- Skeletalhyphae of *Fomitopsis pinicola*
Fig.19- Binding hyphae of *Fomitopsis pinicola*

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