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HITHERTO UNREPORTED MACROFUNGI FROM JAMMU & KASHMIR - II

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ABSTRACT

The Jammu & Kashmir State, lying on the Western Himalayas harbours rich biodiversity in macrofungi owing to peculiar physiography and wide variation in agro-climatic conditions. During the survey of mycorrhizae prevailing in conifer-dominated forests of Kashmir four hitherto un-reported macrofungi viz, *Bolbitius vitellinus* (Pers.: Fries) Fries, *Clitocybe nuda* (Bull.:Fr.) Bigelow & Smith, *Coprinopsis macrocephala* (Berk.) Berk.Stroh-Tintling and *Tricholoma scalpturatum* (Fr.) Quél. were collected. These are reported for the first time from the Jammu & Kashmir State, India.

Key words: *Bolbitius vitellinus, Clitocybe nuda, Coprinopsis macrocephala,* forests, India, Jammu & Kashmir, macrofungi, *Tricholoma scalpturatum*

INTRODUCTION

Jammu and Kashmir forests lying on Western Himalayas harbour rich diversity in macrofungi owing to the enormous agro-climatic variations and peculiar physiography. Hardly 270 macrofungal species have been reported from Jammu and Kashmir State, including the part under Pakistan (Walting and Abraham, 1992; Gardezi and Najma, 2005; Beig *et al*., 2008a,b; Kumar and Sharma, 20; Dar *et al*., 2009a,c; Dar *et al*., 2010b; Sharma *et al*., 2010). Further, there is urgent need to thoroughly explore these forests for macrofungi emanating in different seasons under varied environments and conserve the biodiversity prevailing in the State for future use (Walting and Gregori, 1980; Samant and Dhar, 1997; Dar *et al*., 2010a). The present communication, as a part of continuous investigation (Dar *et al*., 2009b), describes some newly reported macrofungi from Jammu and Kashmir State, India.

MATERIALS AND METHODS

Forest areas of Tangmarg, Gulmarg and Babareshi of Jehlum Valley Division and Pahalgam of Lidder Division were surveyed for mycorrhizae during March, 2009 to April, 2010. Standard methods were followed for the collection, preservation and macro- and micros-copic studies of macrofungi (Kumar *et al*., 1990; Atri *et al*., 2003). Identification was made on the basis of critical observations of the specimens and perusal of relevant literature (Pacioni, 1985) and Mycokey (*http://www.mycokey.com*). Photographs were taken using digital Nikon camera. The sporocarps and sporophores of macrofungi were maintained in 4% formaldehyde solution in the laboratory and preserved in the herbarium of Division of Plant Pathology, S.K. University of Agricultural Sciences and Technology of Kashmir, Srinagar, India.

RESULTS AND DISCUSSION

During mycorrhiza survey in Kashmir forests several macrofungi were collected from lower forest range to alpine zone. *Bolbitius vitellinus*, *Clitocybe nuda*, *Coprinopsis macrocephala* and *Tricholoma scalpturatum* were observed hitherto unreported from Jammu & Kashmir State (Plate 1) [Bilgrammi *et al*., 1981, 1991; Sarbhoy *et al*., 1996; Jamaluddin *et al*., 2004]. These macrofungi are described:

Bolbitius vitellinus (Pers.: Fries) Fries

This non-edible macrofungi was found gregariously on dead wood of broad leaved trees during summer to late autumn season in Pahalgam, Kashmir (altitude: 2,150 masl). The cap was 2-6 cm across, oval to bell-shaped, finally expanding to almost flat. The surface was smooth, viscid and yellow to bright yellow when fresh and tended to fade from edge to whitish or grayish with deeply striate-sulcate margins when mature. The stipe was 5-9 x 0.3-0.6 cm almost cylindrical, thick, and slightly enlarged at base, hollow, fragile, whitish-yellow in colour, with no partial veil. The flesh was thin, membranous above the gills and pale yellow. The gills were crowded, ochreous or pale yellow at first and later turned to yellowish-brown with age, quite distant, semi-free and edge frayed. The spores were smooth, elliptical, rust brown and measured 11-15 x 6-9 µm in size. The fungus does not producer any particular odour or flavour. Spores light yellow-ochre, oval, almond-shaped smooth, 12-14 x 7-8 µm.

Tricholoma scalpturatum (Fr.) Quél. (syn. *T. argyraceum*, *T. chrysites*)

This macrofungus was found in coniferous forests dominated by the fir (*Abies pindrow*) trees during early summer to late autumn in Gulmarg, Kashmir (altitude: 2,653 masl). The pileus of the fungi was 3.0-7.0 cm broad, convex, plano-convex to plano-depressed with slightly elevated disc. The margin of the cap was incurved, wavy with adhering pallid fibrils, eventually decurved to upturned with age. The surface of the cap was felty-tomentose and becomes squamulose with dark grey to blackish over a pallid background. The stipe was 1.5-5.0 cm tall, solid at first, then developing a thin, hollow core at maturity; white often faintly flushed with the cap colour. The flesh was white and grayish in stipe. The gills were abruptly adnexed to sinuate, close, moderately broad, initially white and then turned grey with age. The spores were elliptical, smooth and measured 5.0-6.0 x 3.0-4.0 µm in size.

Coprinopsis macrocephala (Berk.) Berk.Stroh-Tintling

The macrofungi was observed on dung-heaps and rotting straw during summer to late autumn season in the plain meadows of Gulmarg forests (altitude: 2,653 masl). The cap of the fungus was 1-3 cm across, cylindrical to conical at first then expanding to broadly bell-shaped and later then flat. The colour of the cap was initially white then turned grey often buff at centre with age. The cap was covered in coarse fibres which break up into buff-coloured scales. The stipe was 3.0-8.0 x 0.2-0.7 cm, translucent white. The gills were white and soon becoming black at later stage. The spores were ellipsoid and measured 11.0-14.0 x 7.5-8.5 µm in size.

Clitocybe nuda (Bull.:Fr.) H.E. Bigelow & A.H. Smith (syn. *Lepista nuda*)

The macrofungus was found under the canopy of hardwoods dominated by coniferous forests during late autumn in Pahalgam (altitude: 2,150 masl) forests of Kashmir. The pileus of the fungus was 4-9 cm broad, convex, becoming nearly plane in age. The margins were in-rolled, wavy and sometimes upturned at maturity. The surface of the cap was smooth, moist, violet to lilac in colour and then fading to tan. The flesh was soft and fragile. The gills were adnexed, notched to sub-decurrent, close, moderately broad and violet to lilac in colour, fading in age to tan or light-brown. The stipe was 3.0-6.5 cm long, 1.0-2.5 cm thick. The surface of the stipe was fibrillose to slightly scaly, colored like the cap and the veil is lacking. The spores were elliptical, smooth and measured 6-8 x 4-5 µm in size.

Tricholoma scalpturatum

Bolbitius vitellinus

Clitocybe nuda

Coprinopsis macrocephala

Plate 1: Unreported macrofungi from Jammu and Kashmir (The inset figures are the spores of respective macrofungi).

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