



Four New Records of Agaricomycetous Fungi from Uttarakhand (Himalayas)

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ABSTRACT

Four species of Agaricomycetous fungi are being recorded for the first time from Uttarakhand (N.W. Himalayas). These belong to the families Fomitopsidaceae, Hymenochaetaceae and Polyporaceae. The species are: *Antrodia xantha* Fr., *Postia guttulata* (Peck ex Sacc.) Jülich, *Onnia tomentose* (Fr.) P. Karst., and *Trichaptum fusco-violaceum* (Ehrenb.:Fr.) Ryv.

Key Words: Agaricomycetes, Uttarakhand

INTRODUCTION

The Uttarakhand extends between 28° 43'N to 31° 27'N longitude and 77° 34'E to 81° 02' E latitude. Almost entire region of Uttarakhand is covered by mountains (approximately 93%) and about 64% of the mountains are covered with forests. The climate is stridently distinguished in its two diverse divisions: the major hilly terrain and the smaller plains. The climate however also varies within the mountains in accordance with the altitude of the place. The eastern edges of the Himalayan ranges are subject to heavy rainfall while the western division is relatively dry.

The vegetation of Uttarakhand varies from tropical forests to Alpine shrubs and meadows as per climatic changes due to elevational changes. Uttarakhand also has rich variety of medicinal plants. It also consists of several of rare and threatened species of plants and animals. The specimens were collected from the forests of Dehra Dun.

MATERIALS AND METHODS

Macroscopic Study: The live specimens have been studied for macroscopic characters in the field after Lodge *et.al* (2004). Macrochemical tests and the measurements of the specimen have been done in the field. Standard procedures were adopted to study the specimens after Prasher (1997;1999), Prasher and Chander (2006).

Methods of Taxonomic Study: The specimen has been taxonomically described using the following mountants/stains (Kirk *et.al.* 2008).

Amann's Lactophenol: for mounting of microscopic structures, 2% Glycerine: for mounting of microscopic structures, 5% Potassium hydroxide: for microchemical tests and softening of the materials, Melzer's Iodine: to check amyloidity of the sporulating structures, Distilled water: for observing the natural colour of the microscopic structures, Erythrosin B in ammonia: for observing septation in spores and mycelium, 1% Phloxine: used to stain and observe septation in spores and mycelium, Cotton blue: used to stain the cytoplasm of the fungal cells and also to observe cyanophilly of the microscopic structures. Congo red: Ascus wall, paraphyses, ascospores and excipular tissues were stained, Sulfobenzaldehyde used for staining gloeocystidia. The specimens have been revived in 2% KOH. All the measurements have been recorded in this reagent.

The drawings of various structures like hyphae, basidia, setae and basidiospores were made with the help of Camera Lucida manufactured by "Irma" from thin sections or crush mounts.

Taxonomy

Family-Fomitopsidaceae

Antrodia xantha (Fr.) Ryv. Norw. J. Bot.20:8, 1973.

Fructification annual, resupinate, soft, fragile when fresh, easily separable from wood, broadly effused, smooth when fresh, cracking freely; margin white, very small to absent. Pore surface pale yellow, when fresh fades to cream on drying; pores round to spilt; pore tubes yellow. Context white, homogenous, non-xanthochoric, non-amyloid.

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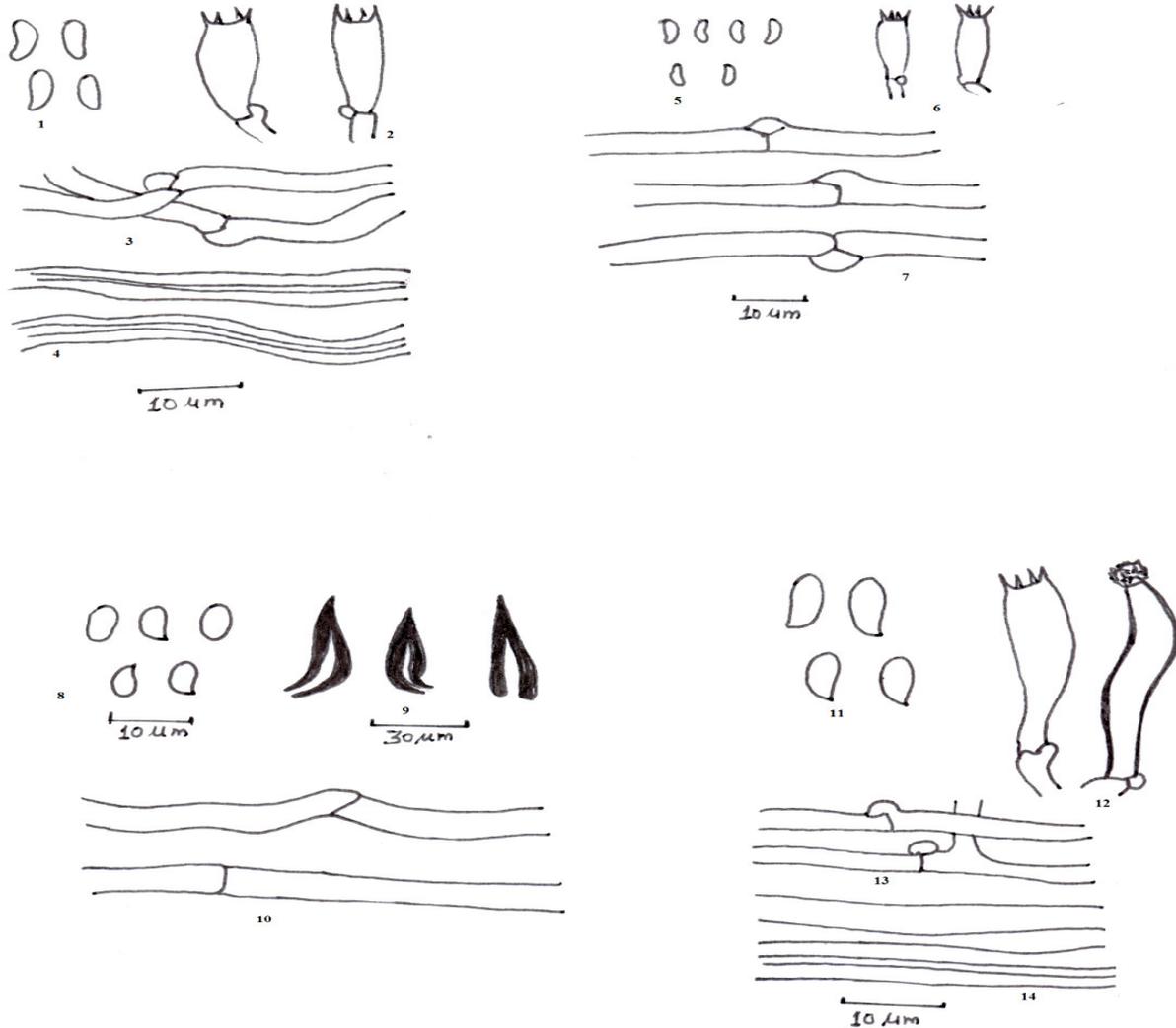


Figure 1. *Antrodia xantha* Fig's. (1-4), 1 Basidiospores, 2 Basidia, 3 Generative hyphae, 4 Skeletal hyphae; *Postia guttulata* (Peck ex Sacc.) Jülich, Fig's.(5-7): 5 Basidiospores, 6 Basidia, 7 Generative hyphae; *Onnia tomentosa* Fig's. (8-10): 8 Basidiospores, 9 Cystidia, 10 Generative hyphae; *Trichaptum fusco-violaceus* Fig's. (11-14): 11Basidiospores, 12 Basidia, 13 Generative hyphae, 14 skeletal hyphae

Hyphal system dimitic.; generative hyphae hyaline, thin-walled, branched, septate, clamped, cyanophilous, 1.8-4.2μm in diameter; skeletal hyphae hyaline to subhyaline, thick-walled, aseptate, unbranched, run parallel in dissepiments, weakly amyloid, gelatinized with conc. KOH and becomes irregular and swollen. Cystidia absent but Cystidioles present. Basidia clavate, 4-spored, cyanophilous up to 4.5μm broad. Basidiospores hyaline, thin-walled, allantoid to cylindrical, non-amyloid, 4-5.2×1-1.7 μm. (Plate-1, Fig.'s-1-4).

Collection examined: Lalita 22080 (PAN), on decaying rotten log in mixed forest. On way to Raipur forests, Dehra Dun, Oct. 10, 2011.

Remarks: The species is characterised by annual, resupinate, widely effused, soft fructification having hyaline, allantoid to cylindrical basidiospores. This species is being recorded for the first time from Uttarakhand and is new record for Himalayas.

Family- Fomitopsidaceae

Postia guttulata (Peck ex Sacc.) Jülich, Persoonia 11(4): 423 (1982)=*Tyromyces guttulatus* (Peck.) Murr., N. Am. Fl. 9: 31, 1907.

Fructification annual, sessile, attached by short lateral base, soft when fresh, hard and brittle on drying; upper surface pale brown, azonate, glabrous; margin acute to blunt, entire or wavy. Pore surface creamish-brown, dull. Context white to creamish, homogenous, azonate, non-xanthochroic. Hyphal system monomitic; generative hyphae hyaline, thin-to thick-walled, septate, clamps present, 4-10µm in diameter. Cystidia absent. Basidia hyaline, 4-spored, clavate, up to 14×5.6 µm. Basidiospores hyaline, smooth, non-amyloid, thin-walled, oblong-ellipsoid, 3.5-4.5×1.7-2.1 µm (Plate-1, Fig.'s: 5-7).

Collection examined: Lalita 22081(PAN), on decaying bamboo and palm. Raipur Forests, Dehra Dun, Oct. 11, 2011.

Remarks: The species is characterised by its presence always on bamboo and palm, bluish grey surface, presence of dendrohyphidia, ellipsoid basidiospores. This species is being recorded for the first time recorded from Uttarakhand.

Family-Hymenochateaceae

Onnia tomentose (Fr.) P. Karst., Krit. Finl. Basidv., p. 326, 1889.

Fructification annual, substipitate, soft when fresh, brittle on drying. Pileus spatulate to flabelliform; margin acute, concolorous with upper surface, entire wavy. Pore surface rusty brown to dark brown, dull. Context yellowish brown, azonate, xanthochroic. Hyphal system monomitic; generative hyphae hyaline, thin to slightly thick-walled, branched, septate, clamps absent, non-amyloid, 4-7 µm in diameter. Setae dark brown, thick-walled, subulate, immersed in the hymenium. Basidia hyaline, clavate, 4-spored up to 4.5 µm in diameter. Basidiospores hyaline to pale brown, thin-walled, smooth, ellipsoid, minutely apiculate, non-amyloid, 5-7×3-4.2µm. (Plate-1, Fig.'s:8-10).

Collection examined: Lalita 22082 (PAN), on decaying coniferous stump. On the way to Raipur forests, Dehra Dun, Uttarakhand, Oct. 11, 2011.

Remarks: The species is being recorded for the first time from Uttarakhand.

Family-Polyporaceae

Trichaptum fuscoviolaceum (Ehrenb.:Fr.) Ryv. Norw. J. Bot. 19: 237, 1972.

Fructification annual, resupinate to effused-reflexed, solitary to compactly imbricate, thin to coriaceous, loosely attached with substratum; upper surface white to grey, faintly zonate to azonate; margin acute, concolorous with upper surface, incurved on drying. Context white to light creamish, non-xanthochroic.

Hyphal system dimitic; generative hyphae hyaline, thin-walled, septate, branched, clamps present, non-amyloid, acyanophilous, 2.5-4.5 µm in diameter; skeletal hyphae subhyaline, thick-walled, aseptate, unbranched, non-amyloid, acyanophilous, 3-5 µm in diameter. Cystidia present, thick-walled, cylindrical-clavate, incrustated with crystals, 20-35×5-8 µm. Basidia hyaline, clavate, 4-spored, up to 6 µm in diameter. Basidiospores hyaline, thin-walled, smooth, cylindrical-ellipsoid, non-amyloid, acyanophilous, 5.2-7.4×2.5-3 µm. (Plate-1: Fig.'s 11-14).

Collection examined: Lalita 22083 (PAN), on decaying *Pinus* log. Raipur forests, Dehra Dun, Uttarakhand, Oct.11, 2011.

Remarks: The species is marked by annual, effused-reflexed to sessile, dimitic hyphal system, incrustated cystidia and cylindrical-ellipsoid basidiospores. The species is being recorded for the first time from Uttarakhand.

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