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Research article

DIVERSITY OF MYCOFLORA IN CONIFER FORESTS OF MUNSIARY AND ITS ADJOINING AREAS OF UTTARAKHAND, INDIA

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ABSTRACT: The present study was carried out in different forest areas of Uttarakhand especially at Munsiary and its adjoining areas between the period of September-October, 2012. Field trips were undertaken at various altitudes ranges from 1500 to 2500 meter. The specimens, especially fruiting bodies of macrofungi were collected and examined in the laboratory. Forty five specimens were identified and all of them were belonged to the subdivision Basidiomycotina. A good number of specimens were found to be associated with forest trees especially with the members of pinaceae for their mycorrhizal association.
Key Words: Basidiomycotina, Macrofungal diversity, Mycorrhizal association, Munsiary, Uttarakhand

INTRODUCTION

Munsiary is a hill resort situated in Pithoragarh district of Uttarakhand of North India. The average temperature during September and October ranges between 14 °C-18 °C. It lies at the base of the great Himalayan mountain range, at an elevation of about 2200m (7200ft.). The forest areas of Munsiary are ideal and represents the most fascinating and characteristic vegetation of Indian subcontinent. Earlier workers have done their research work on the diversity of mushrooms in many areas of Uttarakhand and North western Himalayas [1-6]. But the present workers paid their attention on the study of macrofungal diversity in different forest areas of Munsiary and the adjoining areas of Uttarakhand and provide important information on diversity of macrofungi of mycorrhizal association. Due to favorable environmental conditions and latitudinal and altitudinal factors this area treated as an ideal location for the growth of high diversity of forest flora, specially the members of Pinaceae under the coniferous plant group of gymnosperms.

The present investigation was conducted in different forest areas of Uttarakhand, India. Emphasis was given on Munsiary and adjoining areas (Mayabati, Kausani, Chokauri, Pithoragarh, Ranikhet, Nainital, & Haridwar) during the period of September & October, 2012. The above mentioned areas are considered as hot spot for diversity of macrofungi, especially of the group of Basidoimycotina [7-10]. These fungi are mainly found to occur in forest areas where environmental conditions are most favorable and ideal for their growth and development. The fleshy and wood rotting macrofungi which are collected, are mostly member of Agaricaceae, Amanitaceae, Coprinaceae, Ganodermataceae, Russulaceae. Among them Agaricaceae is the dominating family.

MATERIALS AND METHODS

During field survey, fruiting bodies of macrofungi were collected in polythene packets to avoid damage in any part of it. Before put up it in the packet, morphological study was carried out by noting their shape, size, color, odour, length, breadth, diameter of fruiting bodies. Nature of forests, vegetation, plant- fungus association, actual occurrence, location of fungi, climatic conditions, altitudes of sites were also noted. Photograph of fruiting bodies were taken for studying their natural habitats. Each or every fungus specimen was taken in separate polythene packet to avoid the mixing of spores. Microscopic study was undertaken within a short period just after bringing it in laboratory. Sectional view and spore characters were also observed after preparation of glass slide with the help of lactophenol and cotton blue. Identification were made on the basis of both field report, morphological study and microscopic observation after/in consulting the available literatures [7, 11-16].

RESULTS AND DISCUSSION

A total no. of 70 specimens were collected from different parts of Uttarakhand specially from the hill areas of Munsiary, of which 25 species were damped and unable to study vividly. Rest 45 specimens were studied in details and identified. A list of the identified specimens are given below.

List of fungi

1. *Agaricus campestris* L.ex Fr. , (Fam. Agaricaceae)
2. *Agaricus xanthodermus* Genev. , (Fam. Agaricaceae)
3. *Agaricus arvenssis Schaeff* ex Fr. , (Fam. Agaricaceae)
4. *Agaricus augustus* Fr., (Fam. Agaricaceae)
5. *Pleurotus* sp., (Fam. Agaricaceae)
6. *Lentinus* sp., (Fam. Agaricaceae)
7. *Armillaria malea (Vahl) P.Kumm*.,(Fam. Agaricaceae)
8. *Mycena* sp., (Fam. Mycenaceae)
9. *Tricholoma* sp., (Fam. Tricholomataceae)
10. *Amanita muscaria* (L) Pers, (Fam. Amanitaceae)
11. *Coprinus* sp., (Fam. Agaricaceae)
12. *Cantharellus* sp .(Fam. Cantharellaceae)
13. *Suillus granulatus* (L.) Roussel , (Fam. Suillaceae)
14. *Collybia sp.* ,(Fam. Tricholomataceae)
15. *Russula sp*., (Fam. Russulaceae)
16. *Suillus luteus* (L.: Fries) Gray , (Fam. Suillaceae)
17. *Calvatia sp.* , (Fam. Agaricaceae)
18. *Boletus subtomentosum* L.ex Fr., (Fam. Boletaceae)
19. *Boletus sp*., (Fam. Boletaceae)
20. *Marasmius sp.*, (Fam.Marasmiaceae)
21. *Lactarius porninsis* Rolland, (Fam.Russulaceae)
22. *Lactarius volemus* (Fr.) Fr., (Fam. Russulaceae)
23. *Lactarius lilacinus* (Lasch)Fr. ,(Fam. Russulaceae)
24. *Russula virescens* (Schaeff) Fr., (Fam. Russaulaceae)
25. *Lepiota cristata* (A&S) Fr., (Fam. Agaricaceae)
26. *Russula lepida* Fr., (Fam. Russulaceae)
27. *Boletus chrysenteron* Bull,(Fam. Boletaceae)

28. *Suillus* sp., (Fam. Suillaceae)
29. *Marasmius oreades* (Botton) Fr., (Fam. Marasmiaceae)
30. *Clitocybe squamulosa* (Pers)Fr.,(Fam. Tricholomataceae)
31. *Entoloma* sp., (Fam. Entolomataceae)
32. *Lactarius* sp., (Fam. Russulaceae)
33. *Lycoperdon* sp., (Fam. Agaricaceae)
34. *Polyporus* sp., (Fam. Polyporaceae)
35. *Amanita* sp. (Fam. Amanitaceae)
36. *Cantharellus sp*. (Fam. Cantharellaceae).
37. *Cortinarius* sp., (Fam. Cortinariaceae)
38. *Calvatia* sp., (Fam. Agaricaceae)
39. *Laccaria bicolor* (Maire)P.D.Orton,(Fam. Hydnangiaceae)
40. *Russula nobilis* Velen, (Fam. Russulaceae)
41. *Boletus edulis* Bull., (Fam. Boletaceae)
42. *Cantharellus* sp., (Fam. Cantharellaceae)
43. *Ganoderma applantum* (Pers.) Pat.,(Fam. Ganodermataceae)
44. *Laetiporus sulphureus* (Bull) Murnill, (Fam. Polyporaceae)
45. *Lenzites betulinus* (L.) Fr., (Fam. Polyporaceae)

Out of forty five fungal species studied and identified in the present investigation, twelve species belong to the family Agaricaceae followed by eight members of Russulaceae, four of Boletaceae, three each of Tricholomataceae, Cantharallaceae and Polyporaceae, two each of Amanitaceae and Marasmiaceae and finally one each of the family Mycenaceae, Entolomataceae, Cortinariaceae, Hydnangiaceae and Ganodermataceae. Though the present area of investigation was emphasized on the mycodiversity and mycorrhizal association with the forest trees, nevertheless three species of wood rotting fungi (members of Polyporaceae) were found on the bark of trees of *Pinus* and was not considered as the members of mycorrhizal association. Simply they were found in the area in investigation that is why they have been included in the list of fungi.

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