The Bioscan 7(4): 669-671, 2012
AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES
www.thebioscan.in

SURVEY OF MACROSCOPIC FUNGI FROM A FEW DISTRICTS OF TAMILNADU

S. SOOSAIRAJ*, P. RAJA, A. KALA AND P. KALAINGER RAJ
Department of Botany, St, Joseph's College (Autonomous),
Tiruchirappalli - 620 002, Tamilnadu
e-mail: pspsoosai@yahoo.co.in

KEY WORDS
Agaricaceae
Mushroom
Nutritive value
Polyporus

Received on :
09.07.2012

Accepted on :
15.10.2012

***Corresponding author**

ABSTRACT
Macroscopic fungi were collected from a few localities in Tamilnadu to document their distribution and diversity. Gilled mushroom are short lived, abundant soon after the monsoon where as the *Polyporus* species could be collected for a prolonged periods. The present survey includes 26 species from different habitats. Maximum number of species were belong to the family *Agaricaceae* followed by *Polyporaceae*. The most common genera are *Polyporus*. *Agaricus nivescens, Calocybe gambosa, Ganoderma lucidum, Geastrum fimbriatum, Lentinus tigrinus, Pleurotus ostreatus, Polyporus badius, Polyporus umbellatus, Schizophyllum commune* and *Panaeolus papilionaceus* are edible. This is the preliminary survey of collection and identification of macroscopic fungi as this has not been done in this part of India. This study also envisages further study on the usefulness of these fungi in terms of their nutritive and medicinal values.

INTRODUCTION

Fungi have been occupying a prominent position in biological world because of their variety, economic and environmental importance. Fungi are a huge group of fifty thousand species. They include mushrooms, toadstools, mould, mildew and yeast. Fungi are not plants, because they have no chlorophyll to make their food. So scientists put them in a group of kingdom of their own. The study of fungal biodiversity has been carried out world over (Crous, 2006) and 1.5 million species has been reported so for (Hawksworth, 2004). About 50% of them have been characterized (Manoharachary *et al.,* 2005). The total numbers of fungal species in India is 27,000 (Cowan, 2001; Chang and Miles, 2004).

Macro fungi are unique from fungal diversity point of view. Macro fungi grow prolifically and are found in many parts of the world (Smith, 1963). Macroscopic fungi (large, visible fungi) have been found to be good indicators of environmental change. Some types of fungi can be indicative of certain environmental factors and may be indicators of unique or sensitive habitats (Kosztarb, 1983).

Despite our relative ignorance of their affairs, fungi are extraordinarily widespread, diverse, abundant and ecologically important. Roughly 70,000 species of fungi have been identified out of the one to two million fungal species. Indeed, diversity studies of fungi are rare in the entire globe (Nishida, 1992; Ammirati *et al.,* 1994).

Wild edible mushrooms consumption has been increased during recent years due to their delicate flavors and textures as well as their high content of trace minerals (Kalac and Svoboda, 2000). Mushrooms are valuable health foods, low in calories and high in vegetable proteins, vitamins, iron, zinc, selenium, sodium, chitin, fibers and minerals (Racz *et al.,* 1996; Mendil *et al.,* 2004; Ouzouni, 2004). In other hand mushrooms have been reported as therapeutic foods, useful in preventing diseases such as hypertension, hypercholesterolemia and cancer (Bobek *et al.*, 1995; Bobek and Galbavy, 1999).

Medicinal properties lead to growing interest of using mushrooms in various nutraceutic products (Yaltirak, 2009). There are various edible mushroom species, which are sources of physiological agents for medicinal applications antiviral, possessing antitumor, cardiovascular and antibacterial (Halpern and Miller, 2002; Wasser, 2002).

The studies of literature inevitable portray the environmental, economical, nutritional and therapeutic value of macro fungi. However, studies on their distribution and taxonomy are relatively less in India. There are few articles referring the study of macro fungi in India (Kumar *et al.,* 1990; Upadhyay *et al.,* 2008). Hence the objective of present work deals with the survey of macroscopic fungi in Tamilnadu.

MATERIALS AND METHODS

Study area

Tamilnadu encompasses diverse hills and plains. These areas are rather treasure of diverse flora and fauna. Mushrooms have been collected from a few locations from various districts of Tamilnadu like Karur, Nagapattinam, Namakkal, Tiruchirappalli and Thiruvarur.

Survey collection and identification

Regular survey and collection of macro fungi were carried out in study area in the month of December, 2011 to February, 2012. While collecting information with regard to the host, their habitat, color of caps, associated features were also noted down carefully. The specimens were collected from different location early morning from cultivated lands, backyard of houses, floor and dead trees of forest and gardens. The collection of specimens was also done from different markets of the localities in order to gather information in regards to their place of occurrence. Collected samples were wrapped in cellophane paper and brought to the laboratory for their identification. In the lab they were washed carefully to remove the mud or any other unwanted material and a field number of allocated for each specimens. Macro fungi were preserved in 5% formaldehyde in jars and they were labeled with collection number and date. The specimens were stored in the lab for further study. Identification of the specimens was carried out by standard microscopic methods and also considering various morphological and anatomical features into account (Smith, 1963).

RESULTS AND DISCUSSION

Fungi are a distinct group of organisms which include species with large and visible fruiting bodies (macroscopic fungi). The best known examples of the macro fungi are the mushrooms. They have a cap and stalk and frequently seen in fields and forests. Most of them are inedible but there are a few notable examples that are consumed by humans. The number of poisonous species is relatively small while those that are fatal belong to a tiny minority.

Macro fungi have many different shapes and appearances. *Boletes* have pores rather than gills on the underside of the cap; truffles grow underground and do not have a stalk and a cap. *Huitlacoche* is a Mexican food produced when maize cobs are infected by a fungus. Wild edible fungus is used to distinguish their origin and the fact that they include a variety of forms that include infected maize cobs, stomach fungi, *Boletes,* bracket fungi and of course mushrooms (Hall *et al*., 1998).

The practice of collection and consumption of wild mushrooms are wide spread to many countries across the globe. The history of use of wild edible fungi is well recorded in China, although much information is still in Chinese. China is an example of a Mycophilic country while Britain is usually classified as Mycophobic (Dyke and Newton, 1999). Other notable countries include South Africa (Morris, 1994; Piearce, 1985), United Republic of Tanzania (Harkonen, 2002), Finland (Harkonen, 1998). Consumption of wild mushroom is an age old practice in India also especially among tribal in Manipur and Arunachal Pradesh of North East India (Sing and Sing, 1993; Sing *et al*., 2002) and Assam (Roberto *et al*., 2005).

The literature on macroscopic fungi is largely restricted to edible mushrooms and very little information is available on the other group of fungi. The study of fungi as taxonomic survey is literally unknown.

The present survey includes 26 species have been identified to specific level. Maximum number of species were belong to the family *Agaricaceae* (6) followed by *Polyporaceae* (5). The genera *Polyporus* contribute with three species. The wild macroscopic fungi found to inhabit variety of habits such as dead woods, leaves, forestry floor, and agricultural waste such as paddy straw and animal excreta (manure). Among the various habits, the fallen dead woods are found to be an ideal habit of fourteen species of fungi (Table 1) followed by soil associated with animal excreta.

Table 1: List of macroscopic fungi and edible status

S.No.	Species	Family	Habitat	Edible status
1	*Anthurus cruciatus*	*Phallaceae*	Paddy wastes	Not Edible
2	*Calocera cornea*	*Dacromycetaceae*	Wood	Not Edible
3	*Calocybe gambosa*	*Lyophyllaceae*	Wood	Edible
4	*Chlorophyllum molybdites*	*Agaricaceae*	Soil	Not Edible
5	*Coprinus lagopus*	*Agaricaceae*	Soil	Not Edible
6	*Coprinus plicatilis*	Agaricaceae	Soil	Not edible
7	*Coriolus versicolor*	*Polyporaceae*	Wood	Not Edible
8	*Cortinarius semisanguineus*	*Cortinariaceae*	Soil	Not Edible
9	*Dictyophora duplicata*	*Agaricaceae*	Wood	Not edible
10	*Ganoderma applanatum*	*Ganodermataceae*	Wood	Medicinal
11	*Ganoderma lucidum*	*Ganodermataceae*	Soil	Edible, Medicinal
12	*Geastrum fimbriatum*	*Geastraceae*	Wood	Edible
13	*Lactarius violascens*	Russulaceae	Wood	Not Edible
14	*Lentinus tigrinus*	*Lentinaceae*	Soil	Edible
15	*Lepiota puellaris*	*Agaricaceae*	Manure soil	Not Edible
16	*Microporus xanthopus*	*Polyporaceae*	Wood	Medicinal
17	*Panaeolus papilionaceus*	*Bolbitiaceae*	Dung	Edible
18	*Phaeolus schweinitzii*	*Fomitopsidaceae*	Soil	Not Edible, Medicinal
19	*Pleurotus ostreatus*	*Pleurotaceae*	Wood	Edible
20	*Polyporus badius*	*Polyporaceae*	Soil	Edible
21	*Polyporus brumalis*	*Polyporaceae*	Wood	Not Edible
22	*Polyporus umbellatus*	*Polyporaceae*	Wood	Edible, Medicinal
23	*Agaricus nivescens*	*Agaricaseae*	Wood	Edible
24	*Schizophyllum commune*	*Schizophyllaceae*	Wood	Edible, Medicinal
25	*Scleroderma aurantium*	*Sclerodermataceae*	Manure soil	Not Edible
26	*Xylaria polymorpha*	*Xylariaceae*	Wood	Medicinal

REFERENCES

Ammirati, J., Ammirati, S., Norvell, L., O'Dell, T., Puccio, M., Seidl, M. and Walker, G. 1994. The Puget Sound Mycological Society, S. Readhead, J. Grins, H. Burdsall, T. Volk, and K. Nakosone, Preliminary Report on the Fungi of Barlow Pass, Washington. *McIlvania*. **11(2):** 10-33.

Bobek, P. and Galbavy, S. 1999. Collection of chemical properties of popular wild edible mushrooms. *J. Horticulture and Forestry*. **43(5):** 339-346.

Bobek, P., Ozdyn, L. and Kuniak, L. 1995. Identification of wild edible mushrooms. *J. Horticulture and Forestry*. **39:** 96-98.

Chang, Y. S. and Miles, G. P. 2004. Collection of edible wild mushroom in India. *An International Quarterly J. Life Sciences* CRC press, USA., p. 436.

Cowan, P. W. 2001. Fungi- Life supports for ecosystem. *Essential ARB*. **4:** 1-5.

Crous, P. W. 2006. The study of fungal biodiversity. *An International Quarterly J. Life Sciences*. **55:** 13-15.

Dyke, A. J. and Newton, A. C. 1999. Commercial harvesting of wild mushrooms in Scottish forest: is it sustainable? *Scottish forestry*. **53:** 77-85.

Hall, I. R., Buchanan, B. K., Wang, Y. and Cole, A. L. J. 1998. Edible and poisonous mushrooms: an introduction. Christchurch, Newzeland institute for crop and food research limited, p.248.

Halpern, G. M. and Miller, A. H. 2002. Collection of several varieties of wild mushroom. *International Journal of Agriculture and Biology*. **13:** 415-418.

Hawksworth, D. L. 2004. Million species reported. *An International Quarterly J. Life Sciences*. **50:** 19.

Harkonen, M. 1998. Use of mushrooms by Finns and Karclians. *International J. Circumpolar Health*. **40:** 40-55.

Harkonen, M. 2002. Mushroom collecting in Tanzania and Hunan (south China): Inherited wisdom and folklore of two different cultures. *Tropical Mycology*. **1:** 149-165.

Kalac, P. and Svoboda, L. 2000. Identification of wild mushrooms. *J. Horticulture and Forestry*. **69:** 273-281.

Kosztarb, M. 1983. Editorial, A Biological Survey of the United States, *Science*.

Kumar, A. Bhatt, R. P. and Lakanpal, T. N. 1990. Collection of rich varieties of wild edible mushroom from north Himalaya, India. *International Journal of Agriculture and Biology*. p. 160.

Manoharachary, C., Sridhar, K., Singh, R., Adholeya, Suryanarayanan, T. S., Rawat, S. and Johri, B. N. 2005. Fungal Biodiversity: Distribution, Conservation and Prospecting of Fungi from India. *Current Science*. **89(1):** 58-71.

Mendil, D., Uluozlu, O. D., Hasdemir, E. and Cagler, A. 2004. Determination of trace elements on some wild edible mushrooms samples from Kastamonou, Turkey. *Food Chem*. **88:** 281-285.

Morris, B. 1994. Bowa: Ethnomycological notes on the macrofungi of Malawi. In J. H Seyani &A.C. Chikuni, eds. Proceedings of the X111th plenary meeting of AETFAT, **1:** 635-647.

Nishida, F. H., Sundberg, W. J., Menge, J. A., States, J. S., Tulloss, R. E. and Cifuentes Blanco, J. 1992. Studies in mycoflora of the Chiricahua Mountains, Cochise County, Arizona, U. S. A, Preliminary report on species distribution, ecology, and biogeographical Affinites, *Chiricahua Mountains Research Symposium, Proceedings*, A. M. Barton and S. A. Sloane, p.126.

Ouzouni, P. 2004. Identification of antioxidant activity of wild mushrooms. *J. Horticulture and Forestry*. **27:** 66-67.

Piearce, G. D. 1985. Living stone and fungi in tropical Africa. *Bulletin of the Brittish Mycological Society*. **19(1):** 39-50.

Racz, L., Papp, L., Prokai, B. and Kovacz, Z. S. 1996. Identification of nutrition in wild mushrooms. *J. Horticulture and Forestry*. **198:** 367-386.

Roberto Garibay-Orijel1, J., Cifuentes, Estrada-Torres, A. and Caballero, J. 2005. Fungal Biodiversity, People using macro-fungal diversity in Oaxaca, Mexico.

Sing, N. I. and Sing, S. M. 1993. Edible Fleshy Fungal Flora of Manipur-Bioveel. **4(2):** 153-158.

Sing, Sing, N. I., Sing, S. M. and Th, C. 2002. Fleshy Fungi of Manipur in Plant Genetic Diversity: Exploaration, Evaluation, Conservation (Eds.) S.P. Vij; K, Kondo; M.L.Sharma; Ashish Gupta. Affiliated East West Press Pvt. Ltd. New Delhi. pp. 9-13.

Smith, A. H. 1963. The Mushroom hunter's field guide. University of Michigan Press, Annarbor. p. 67.

Upadhyay, R. C., Kaur, A., Kumari, D., Scmwal, K. C. and Gulati, A. 2008. Collection of rich varieties of wild edible mushroom from north Himalaya India. *International J. Agriculture and Biology*. **38:** 24-39.

Wasser, J. R. 2002. Medicinal mushrooms. *International J. Agriculture and Biology*. **60:** 258-274.

Yaltirak, R. 2009. Presence of antioxidants and compounds in mushroom. *International J. Agriculture and Biology*. **13:** 2052-2056.