Research Article

# SURVEY OF ETHNOMEDICINAL MACROFUNGI OF NAGARJUN AND PHULCHOWKI AREAS OF KATHMANDU VALLEY, NEPAL

**Sanjay Kumar Jha*, Narendra Kumar and N.N. Tripathi**
Bacteriology and Natural Pesticide Laboratory, Department of Botany, DDU Gorakhpur University, Gorakhpur, India.
***Corresponding author's E-mail:** mailto.sanjayjha@rediffmail.com

**Accepted on:** 16-08-2011; **Finalized on:** 30-10-2011.

**ABSTRACT**

Macrofungal species play vital role in several disease ailments of human being. The present paper provides medicinal uses of some macrofungal species by inhabitant people of the Nagarjun and Phulchowki areas of Kathmandu valley, Nepal. A survey of Nagarjun and Phulchowki areas was conducted for collection of medicinal macrofungal species during June 2010 – March 2011. In all 11 macrofungal species viz., *Coprinus comatus*, *Daldinia concentrica*, *Fistulina hepatica, Ganoderma appalantum, G. lucidum, G. tsugae, Grifola frondosa, Lepiota cristata, Lycoperdon pyriforme* and *Pycnoporus cinnabarinus*, *Trametes versicolor* belonging to seven families were collected. The ethanomedicinal information on collected species from local people revealed that the species were used by them in curing various human disease (cancer, antitumor, pneumonia, wounds, stops bleeding, constipation, itchiness, blood pressure and diabetes) ailments.

**Keywords:** Kathmandu valley, Macrofungi, disease ailments.

## INTRODUCTION

Word wide medicinal and traditional uses of macrofungal species are quite prevalent. The nutritional and medicinal properties of many macrofungi are well known and documented in Europe, China, Japan, India and Malaysia[1-4]. However, such information is very scanty and poorly documented in Nepal especially from Kathmandu Valley. About 90% of the people residing in rural areas in Nepal have associated with the natural resources of their surroundings and possess knowledge about the various uses of resources that they need. The inhabitants of study sites have rich heritage particularly related to their natural sources and literature survey showed that the region was almost untapped from this point of view. Nagarjun hill is situated in west part and Phulchowki area in south part of the Kathmandu valley. Their location is in between the latitude of 27°34' - 27°46' North and longitude of 85°10' – 85°52' East. The tribal people such as Newar, Gurung, Magar, Tamang, Lama and Sherpa community live in adjoining areas of Phulchowki and Nagarjun forests. In present study we have collected information on altitude, local name and utilization of macrofungal species by tribes of adjoining areas of Nagarjun and Phulchowki forests in various disease ailments.

## MATERIALS AND METHODS

Surveys of different sites of Nagarjun and Phulchowki forests of Kathmandu valley were made during June 2010 – March 2011. Field study viz., altitude, longitude, habit/ habitat and climate of surveyed places were noted along with date, number and place of collection. Medicinal value of individual macrofungal species was recorded on spots with the help of tribal community. Information on traditional uses of macrofungi to cure various diseases was gathered through discussions and documented on well structured questionnaires. Questionnaires include questions on local name, parts used, mode of administration and method of preparation of medicines. Among interviewed people, 20 men and 20 women (among them 50% people were more than 50 years old) were selected who had traditional knowledge on macrofungi. Minimum of two and maximum of five patients who had taken treatment in recent times from study sites for various illnesses were interviewed. The collected species were brought to the laboratory in polyethylene bags and identified with the help of literatures[5-6] and electronic media source. Finally, each macrofungal species was preserved (dry and liquid preservation) separately at laboratory condition.

## RESULTS AND DISCUSSION

During present study 11 macrofungal species belonging to 7 families were collected. The mode of application of each species along with local name, habitat, altitude, date and place of collection and morphological detail is summarized below:

***Coprinus comatus*** (Mull.: Fr.) S F Gray

Family – Coprinaceae

Local name – Gobre chyau, Altitude – 1460m, Habitat – On soil

Description: Tall agaric with white, conical cap, in scattered trooping groups on soil short grass. cap 4 -12 cm tall × variable dia., stem 8 – 26 cm tall × 1·5 - 2·0 cm dia. Gills white at first and finally black, free, Spore brown, smooth, almond-shaped, Cystidia not distinctive.

Date of collection – March 5, 2011, Place of collection – Mudhkhu (Nagarjun)

Mode of administration – Fresh extract powder of fruitng bodies is generally used in skin diseases like lesions and infected skin or for wound healing. To be more specific the cap is opened and the spore bearing gills are applied to the affected area directly, which is then bandaged. It can be said that the sores are given the prime importance. The spore is applied till the healing is considerable.

***Daldinia concentrica*** (Bolt.: Fr.) Ces &de Not

Family – Xylariaceae

Local name – Dally, Altitude – 1390m, Habitat – On dead wood

Description: Hard brown or black ball like, encrusting dead wood. Stroma 1·7 - 6·0 cm dia.,Stroma reddish-brown, quickly becoming black, sub-spherical, fully embedded in stromatal tissue in a single layer just below the surface. Asci cylindrical.Spores 8 in number, black, smooth, non-septate.

Date of collection – Sep 28, 2010. Place of collection – Phulbari (Nagarjun)

Mode of administration – It is useful for curing diseases like pneumonia, wounds, stops bleeding constipation, and itchiness. Its powder mixed with oil, around 5 to 6 entire fruitng bodies are triturated fresh with water for several times to form a uniform paste. The paste is consumed orally for pneumonia or constipation but is applied for eczema. Generally for pneumonia 1 tablespoon is administered for 3–5 times on different days. For severe constipation same dose is given after dinner for 2 to 3 days. (It is used in two methods Tamang used with oil & Magar used with water)

***Fistulina hepatica*** Schaeff.Fr.

Family – Fistulinaceae

Local name – Jibre, Altitude – 1450m, Habitat – On tree trunk

Description: Large tongue like, and it is rough-surfaced with a reddish-brown colour. 8·0-20 cm dia. × 1·5 - 5·0 cm thick. The spores are released from minute pores on the creamy-white underside of the fruit body. A younger *Fistulina hepatica* is a pinkish-red colour, and it darkens with age. It bleeds a dull red juice when cut, and the cut flesh further resembles meat. The underside of the fruiting body, from which the spores are ejected, is a mass of tubules. The genus name is a diminutive of the Latin word fistula and means "small tube", whilst the species name *hepatica* means "liver-like", referring to the consistency of the flesh.

Date of collection – Aug. 25, 2010, Place of collection – Mudhkhu (Nagarjun)

Mode of administration – It is used in viral fiver. First we wash later we used, daily two or three times cooked or raw mushrooms are consumed orally. This is repeated till recovery is evident.

***Ganoderma applanatum*** (Pers.:Wallr.) pat.

Family - Ganodermataceae

Local name – Kathey chyau, Altitude – 1500m. Habitat – On trunk of broad leaf tree

Description: Very large grey – brown bracket with knobby appearance, underside pore – bearing whitish, tough, perennial: in overlapping tiers, parasitic on trunks of broad – leaf trees. 6 – 10 cm dia × 2 – 6 cm thick. Fruiting body grayish – brown, often discolored redish – brown from deposited spores, more or less flattened, radially wavy or wrinkled and concentrically grooved and zoned, broadly attached; sessile. Flesh cinnamon – brown, thinner than the tube region, very tough and fibrous. Pores white, circular, 4 – 5 per mm. Tubes brown, in

annual layers. Spores brown, broadly ellipsoid, flattened at one end with hyaline germ pore, non – amyloidal. Basidia 4 – spored. Cystidia absent.

Date of collection – Sep. 25, 2010, Place of collection – Phulchowki.

Mode of administration – It is used in hypertension, blood pressure and diabetes. It is consumed as granular powered 10-20gram twice a day up to till recover.

***Ganoderma lucidum*** (Curt.: Fr.) Karst.

Family – Ganodermataceae

Local name – Dhishymu, Altitude – 1700m, Habitat – On stumps of tree

Date of collection – Aug. 25, 2010, Place of collection – Mudhkhu (Nagarjun)

Description: Large brown kidney – shaped bracket with lacquered appearance, underside spore – bearing, whitish, arising, from latral stem, annual; solitary or in small groups, on stumps of broad leaf, favouring oak. 5 – 25 cm dia × 2 – 4 cm thick. Fruiting body reddish brown, shiny, margin pallid when young, more or less flattened, radially wavy and concentrically groved and zoned, attached by stout lateral stem. Flesh cinnamon – brown, tough and fibrous. Pores white, bruising brown, becoming brown with age, circular 3 – 4 per mm. Tubes concolorous with pore, 5 – 20 mm deep. Spores pallid brown, watery, broadly elliposoid, truncated at one end with hyaline germ pore, non – amyloid. Basidia 4 – spored. Cystidia absent.

Modes of administration – It is used to strengthen body, increase in body healing ability, and associated with longevity. It is taken with hot water.

***Ganoderma tsugae*** Murr. orson and miller

Family – Ganodermataceae

Local name – Kathey chyau, Altitude – 1550m, Habitat – On stumps of tree

Description: Medium to large, basidiocarps perennial, ungulate, often irregular when growing from cracks etc., normally dimidiate and semicircular in outline, variable in size, 5-30 cm long, 4-16 cm wide and up to 10 cm thick in single basidiocarps, woody hard when dry, pileus dull, cocoa-brown to deep umber to black in old specimens, dying or weathered specimens more grayish, surface often covered with a cinnamon to pale cocoa powder of deposited spores, smooth, somewhat cracking with age and drying, black cuticle present, increasing in thickness towards the base, margin light-coloured in actively growing specimens, whitish to yellowish, pore surface white to cream in actively growing specimens, pale to umber-brown, pores round, entire, quite thick-walled, weakly stratified, up 6 cm thick, context evenly dark bay brown, rarely with some white spots, but these bands are apparently absent in some specimens. Hyphal system dimitic, generative hyphae with clamps, thin-walled and hyaline, wide, skeletal hyphae dominating in the basidiocarp, variable brown to yellow, thick-walled to solid, branching variable, in lower part unbranched and then arboriform in the top, often irregular, Basidia barrel shaped. Basidiospores truncate, golden-brown, echinulate.

Date of collection: Nov 7, 2010. Place of collection - Phulchowki

Mode of administration – Decoction of immature fruiting bodies in hot water is given 3 – 5 days in cases of cough and cold. It is also orally consumed for good health.

***Grifola frondosa*** (Dick.&fr.) S.F.Gray

Family – Polyporaceae

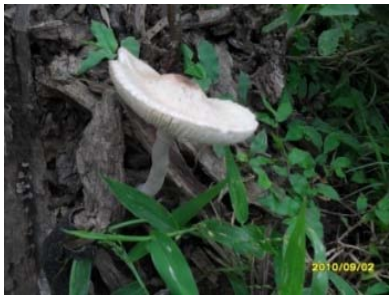
Local name- Chipley chyau, Altitude – 1400m, Habitat – On wood broad leaf tree (Base of the tree trunk)

Description: Tongue-like, brownish fruiting bodies, arising in clumps, annual, parasitic on wood of tree, usually arising from the base of the trunk. Individual caps 4 – 12 cm dia.× 0·4 - 1·2 cm thick, collectively 20-40 cm dia. Fruiting body upper surface tan, several ligulate caps arising from a central branched stem, each cap thick and leathery, stem pallid cream or greyiesh, laterally compressed. Spores hyaline, smooth, broadly ellipsoid, non-amyloid with droplets. Basidia 4-spored. Cystidia absent.

Date of collection – Sep 28, 2010. Place of collection – Phulbari (Nagarjun)

Mode of administration - Boiled fruits bodies is used to relive for muscle pains and to maintain, protect or restore immune health & anti diabetic. One or two fruit bodies are applied over the painful area as a past. It is used in two ways – Serpa used as past but newer takes with hot water two times daily or till total recovery is confirmed.

***Lepiota cristata*** (Fr.) Kummer




Family – Agaricaceae

Local name –Chate chyau, Altitude –1380m, Habitat – Among leaf litter

Description: small, agaric with whitish scaly cap, tan at the centre black like, whit gills, free, crowded and stem with ring, more or less smooth, equal, solitary or scattered on soil in wood. Cap1·5 - 5·0cm dia., stem 3·0 - 4·0cm tall × 0·2 - 0·4cm dia. Spores hyaline, smooth, bullet-shaped. Cystida not distinctive.

Date of collection – Sep. 29, 2010. Place of collection – Nagarjun

Mode of administration – Whole part is crushed in mortar with pistal and applied on skin infection twice days for 3 to 5 days.

***Lycoperdon pyriforme*** Schaeff.:pers.


Family – Lycoperdaceae

Local name – Naspati chyau, Altitude – 1450m, Habitat – On soil

Description: Smallish dull brown or grey – brown, pear shaped structure on a pedestal solitary or in troops on rotten wood or on soil Fruiting body 2·0 - 5·0cm dia ×2·0 - 4·5cm tall, Gleba ( spore mass) at first white and firm, becoming brown, spores olive-brown, smooth, spherical.

Date of collection – Aug 25, 2010. Place of collection – Phulchowki

Mode of administration – Fruit juice used in stomach pain and to cure wounds, hallucinogenic.

***Pycnoporus cinnabarinus*** (Jac.: Fr) Karst

Family – Polyporaceae

Local – Sindure, Altitude – 1450m, Habitat – On stem

Description: Saprobic on the dead wood of hardwoods (usually with bark still adnate) and rarely on the wood of conifers; causing a white rot; annual; spring through fall, or over winter in warm climates; Fruiting Body: Semicircular to kidney-shaped; planoconvex; 2-13 cm across; up to 2 cm thick; upper surface finely hairy to suedelike, becoming roughened or nearly smooth (often pocked in age), bright reddish orange to dull orangish with age; undersurface bright reddish orange, with 2-4 round to angular (or sometimes slot-like) pores per mm, occasionally extending onto the substrate below the cap; tubes to 5 mm deep; stem absent; flesh tough, reddish to pale orange.

Date of collection – Aug. 25, 2010. Place of collection – Phulchowki.

Mode of administration – First after washing with hot water, dried, and then mixed with mustard oil. After few hours the oil becomes red in colour. The red coloured oil filtered and used as ointment for the treatment of ear infections of child. It is also used in wounds.

***Trametes versicolor*** (L.: Fr.) Pill.

Family – Polyporaceae

Local name – Kathe chyau, Altitude – 1540m, Habitat – On tree trunk.

Description: Fan-shaped, grey to brown or even black, with many narrow zones.Cap 3 – 10 cm in dia. Spore deposit white.

Date of collection – Feb 27, 2011, Place of collection – Nagarjun hill (Fulbari)

Mode of administration – Powder of fruit bodies applied externally on affected in skin deaseas for 5 – 7 days. It is also used in cancer.

## CONCLUSION

During survey 11 ethnomedicinal macrofungal species belonging to 7 families of fungi were collected. The study revealed that surveyed area harbor a rich diversity of macrofungal species which are being used by local tribes in curing their various diseases like anticancer, ant-diabetes**,** pneumonia, wounds, stops bleeding constipation, Muscle pains and itchiness.

**Acknowledgement**: Authors are thankful to Head, Department of Botany, DDU Gorakhpur University, Gorakhpur and Prof. Kamal, for his valuable suggestions. One of the authors (S. K. Jha) thanks Tribhuvan University, Institute of Science & Technology for granting study leave.

## REFERENCES

1. Dickinson C, Lucas J. The Encyclopaedia of Mushrooms. New York, Crescent Books. 1983.
2. Huang N. *Edible Fungi Encyclopaedia*. Beijing, China Agricultural Press. 1997 reprint. (in Chinese) 1993.
3. Huang N. Colored Illustrations of Macrofungi (Mushrooms) of China. Beijing, China Agrcultural Press. (in Chinese) 1998.
4. Chang ST, Miles PG. Mushrooms cultivation, nutritional value, medicinal effect & environment impact, Second edition CRC Press 2OO4.
5. Jordon M. The Encyclopedia of fungi of Britain Europe (John Taylor Book Ventuse Ltd. Ed.) Devid and Charles, Brunel House, Newton Abbot, Devon 1995.
6. Atri NS, Kaur H. Wild mushrooms collection and identification. Mushroom Res. 14: 2003; 56 – 59.

**********