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Biodiversity of mushrooms in Patharia forest of Sagar (M.P.)-III

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Patharia forest is situated on Vindhyan ranges at about 457.2-533.4 m above msl. It is mixed and dry deciduous type, dominated by *Acacia* species, *Butea monosperma*, *Tectona grandis* and ground flora consisting of *Biophytum sensitivum, Cassia tora, Cynodon dactylon, Euphorbia geniculata, Heteropogon contortus, Lantana camara, Parthenium hysterophorus*, etc. During the period of July 2011-July 2013, wild mushrooms were collected from the Patharia forest and 18 mushroom species belonging to 12 families were identified viz. *Vascellum pratense, Lycoperdon pyriform, Coniophora puteana, Clitocybe geotrapa, Ganoderma tsugae, Microglossum virde, Panaeolus sphinctrinus*, *Pleurotus cornucopiae, Fomes fomentarius,, Tyromyces lacteus, Lenzites Betulina, Hypholoma elongatum, Pholiota highlandensis, Serpula lacrymans, Tremella mesenterica, Lepista nuda, Collybia butyracea* and *Omphalina ericetorum.* Among them some are edible like *L. nuda and Clitopilus prunulus* which are used for culinary purposes; some are medicinal like *G. tsugae, T. mesentrica M. viride* which are used to prepare indigenous medicines using traditional techniques.

Key words: Biodiversity, mushrooms, medicinal mushrooms, poisonous mushrooms.

INTRODUCTION

A perusal of Indian literature indicates that little attention has been paid to mushroom ecology in India (Bakshi, 1974; Sharma and Lakhanpal, 1981; Saini and Atri, 1984; Natrajan, 1987; Kumar et al., 1990a, b). Most of the past researches on ecology of fungi from India were centered on mycorrhizic association with trees (Semwal et al., 2006).

Mushrooms are a wide group of fleshy fungi, which include bracket fungi, fairy clubs, toadstools, puffballs, stinkhorns, earthstars, bird's nest fungi and jelly fungi. Generally, they live as saprophytes, however some are severe agents of wood decay. All types of mushrooms are important in decomposition processes, because of their ability to degrade cellulose and other plant polymers. Besides, they serve as nature trash burners and soil replenishers, and thus help rejuvenate the ecosystem. Ample species of wild edible and medicinal mushrooms occur in all the biodiversity rich regions

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during the rainy season. They can be found on wood of living or dead trees, on the leaf litter, on the soil through the branching mycelial infiltration. Some mushrooms are found growing in association with trees of a particular family or genus (Arora, 2008; Karwa and Rai, 2010).

Biodiversity refers to the variety and variability among living organisms and ecological complexes in which they occur. It plays a significant role in nature by enriching soil, maintaining water and climate cycle, humidity, precipitation, conservation and recycling of waste materials into nutrients. It is believed that modern developmental activities are detrimental to biodiversity and it is felt that development is inversely proportional to biodiversity. Rich biodiversity is an indicator of healthy habitat and its potential to sustain life. India is top ten mega biodiversity centers and has ample species of wild mushrooms which occur during rainy season. There are about 2000 species of edible fungi known to man out of 10,000 species of macro-fungi. India is richer in flowering plants than any other country of its size; the fungal wealth of India is also expected to be equally diverse. Many studies have been done to document mushroom wealth from east, west, north and south India but the efforts made in central India including Chhatisgarh and Madhya Pradesh States received very limited attention (Thakur et al., 2006). Patharia forest of the Sagar region, M.P. is rich in plant biodiversity and the climatic conditions together made the natural habitat conducive for the occurrence of large number of mushrooms (Dehariya et al., 2010).

Patharia hills are situated near the north of Tropics of Cancer on Vindhyan peaks. This area has a undulating topography with low rising hills of Sagar. The hills rise up to a height of 300 feet on the eastern side of Sagar Lake. The ridges facing the lake are denuded of forest, but the top and the east facing slopes have growth of varying density. The average annual rainfall of Sagar is 48 inches. The average monthly minimum and maximum temperatures are recorded as 11.1 and 25°C in January, 25.8 and 40.5°C in May and 23.3 and 28.6°C in July. The hills are built of Deccan Trap consisting of agate basalt, laid horizontally with localized entrapping ash, clay and impure lime. Thus, it would seem that the topography and the biotic factors together create a dynamic system of habitats, through time and space, for the struggling growth on the hills (Mishra and Joshi, 1952). The forest is a dry deciduous forest. It is dominated by *Tectona grandis, Butea monosprma, Accacia* sp. etc. and ground flora consist of *Lantana camara, Parthenium hysterophorus, Euphorbia geniculata, Heteropogon contortum, Cyanadon dactylon, Biophytum sensitivum, Cassia tora, Malvestrum* sp., etc.

Forest wealth and conducive environmental condition provide good amount of substrates for the occurrence of various mushrooms in the region. Considering the importance of mushroom diversity in the Patharia forest, we undertook the present study with the objectives of getting information on (1) Wild edible mushrooms in Sagar? (2) Research needed to be done in this area?

MATERIALS AND METHODS

During several visits from July 2011 to July 2013, we collected many species of mushrooms. For collection of the mushrooms various equipments such as hunting knife, plough, scissor, digging tools and wax paper pockets for wrapping the collected mushrooms were used. Collection sites other than Patharia forest are botanical garden, residential area in Sagar.

Collected specimens were then preserved in a liquid preservative (25:5:70 ml rectified alcohol + formalin + distilled water) (Hawksworth et al., 1995). Parts of the collected material were dried in a hot air oven. For identification of mushrooms various authentic keys (Arora, 1986; Singer, 1986; Hawksworth, 1974, 1995; Jorden 2000; Pegler and Spooner, 1997; Kuo, 2003; Upadhyay et al., 2008) were used. All the identified and un-identified specimens were deposited in the Museum, Department of Botany of Dr. H. S. Gour University, Sagar Madhya Pradesh. Length and width dimension of each mushroom collected were measured and photographs were taken.

RESULTS

During the investigation, mushrooms were collected and identified. At present, we were able to identified 18 genera belonging to 12 families. The identification of each organism was done on the basis of morphological features. The species identified were: *Vascellum pratense, Lycoperdon pyriform, Coniophora puteana, Clitocybe geotrapa, Ganoderma tsugae, Microglossum virde, Panaeolus sphinctrinus*, *Pleurotus cornucopiae, Fomes fomentarius, Tyromyces lacteus, Lenzites Betulina, Hypholoma elongatum, Pholiota highlandensis, Serpula lacrymans, Tremella mesenterica, Lepista nuda, Collybia butyracea* and *Omphalina ericetorum* (Figures 1 and 2). These species were recorded mostly during July to November. Among these species, some were edible, some poisonous but with medicinal value.

1. *Vascellum pratense*: Agaricaceae
Common name: It is commonly called Lawn puff ball.
Description: *Vascellum pratense* is a pear shaped body fruit with short stalk and a membrane separating the spore mass from the base. The fruit body is 2-4 cm in diameter, tapering below into a stalk like base, covered with small granules and spines which are easily rubbed off. The flesh is white and firm becoming olive brown and powdery. The spore deposit is olive brown. It is common in short grass habitat.
Scale: 20 × 15 cm.
Specimen examined: Botanical garden, Sagar University.
Date of collection: July 2, 2013.
Collected by: Deepak Vyas.
Edibility: Edible.

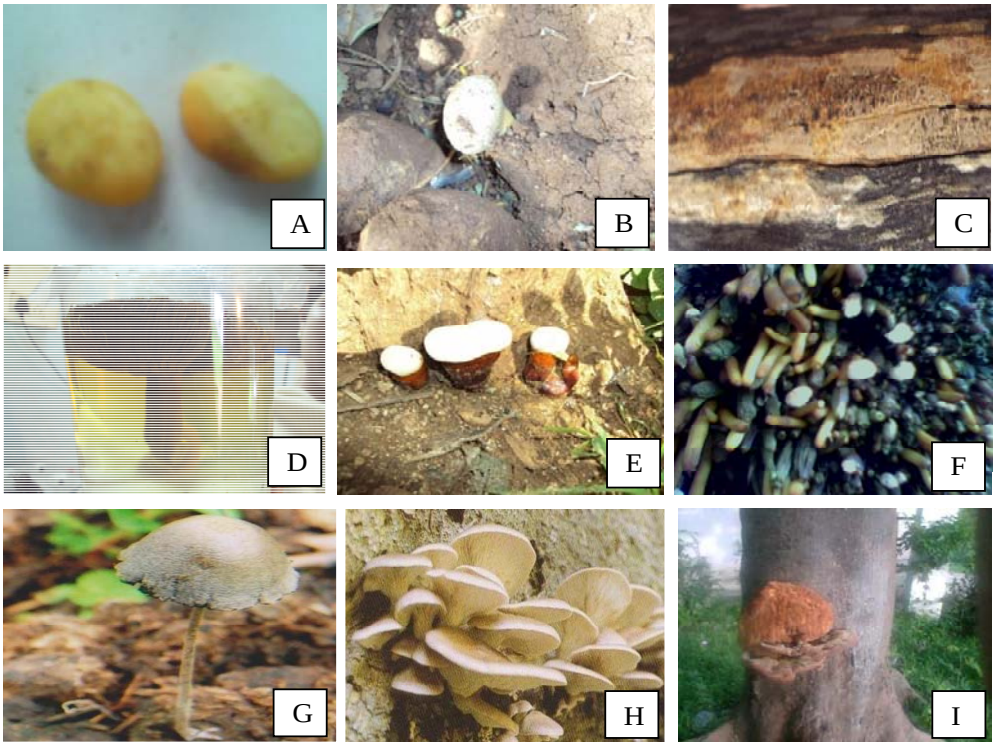

Figure 1. (A) *Vascellum pretense* (B) *Lycoperdon pyriform* (C) *Coniophora puteana* (D) *Clitopilus prunulus* (E) *Ganoderma tsugae* (F) *Microglossum virdae* (G) *Panaeolus sphinctrinus* (H) *Pleurotus cornucpoiae* (I) *Fomes fomentariu*

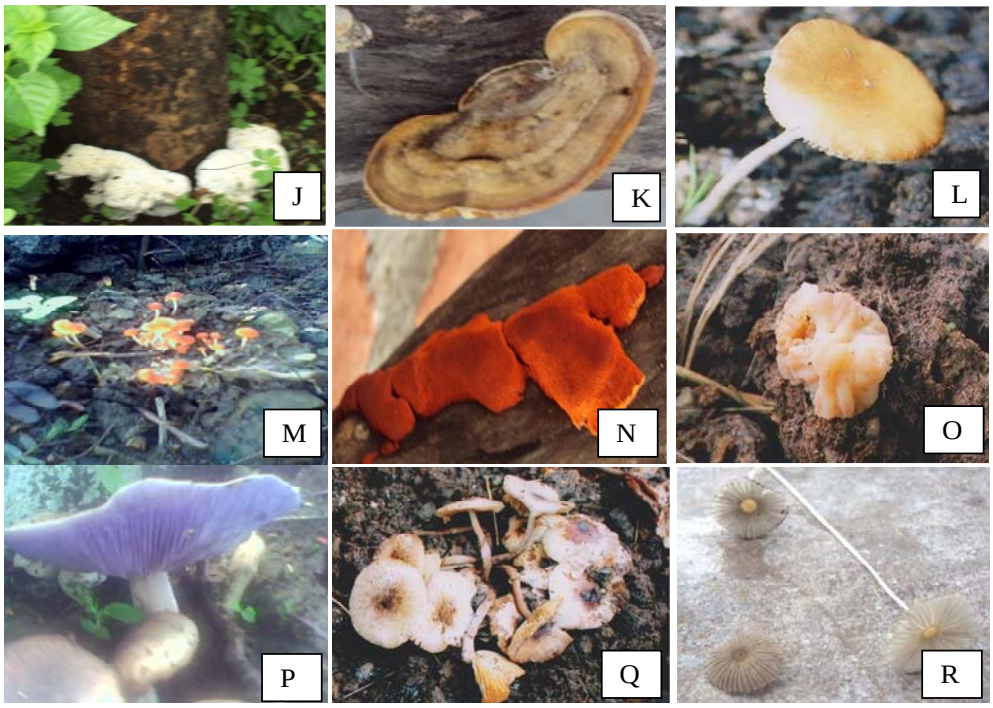

Figure 2. (J) *Tyromyces lacteus* (K) *Lenzites betulina* (L) *Hypholoma elongatum* (M) *Pholiota highlandensis* (N) *Serpulala Lacrymans* (O) *Tremella mesentrica* (P) *Lepista nuda* (Q) *Collybia butyracea* (R) *Omphalina ericetorum.*

2. *Lycoperdon pyriform (Schaeff)*: Agaricaceae.
Common name: It is commonly called stump puff ball or pear shaped puff ball.
Description: *Lycoperdon pyriform* grows on wood. Its fruit body is pear shaped, whitish at first and later becoming pale brown, with white branching cord like mycelium at the base. Its surface is scurfy at first, comprising tiny warts and granules which are soon lost, leaving a smooth inner wall. The inner wall is thin, papery with opening by a small irregular pore at the top.
Scale: 20×15 cm.
Specimen examined: Girls hostel, Sagar University.
Date of collection: August 30, 2012.
Collected by: Anjuli Chaubey.
Edibility: Edible.
Medicinal value: Spores of *Lycoperdon pyriform* are used to arrest the flow of blood from wounds and in treatment of piles (Sharma, 2003).

3. *Coniophora puteana*: Coniophoraceae.
Common name: It is commonly called cellar fungus or wet rot fungus.
Description: *Coniophora puteana* fruit body is closely related to the dead woody substrate. It is 18-35 cm in diameter with round patches of about 0.1 cm thick. Its surface is smooth-warty dark brown. Spore deposit olive brown.
Scale: 7×5 cm.
Specimen examined: Botany Department Dr. H. S. Gour University in Sagar M.P., India, 24° 27' N, 79° 21'E and 620.26 m.
Date of collection: July 31, 2013.
Collected by: Anjuli Chaubey and Deepak Vyas.
Edibility: Inedible.

4. *Clitopilus prunulus:* Entololomataceae.
Common name: It is commonly called sweet bread or the miller.
Description: *Clitopilus prunulus* is whitish in color and large size gills of decurrent type. Its cap is 12 cm in diameter with a wavy margin and 6 cm length stipe. Its flesh is thick, white and firm. It has strong smell with spore of white deposit.
Scale: 18×23 cm.
Specimen examined: Botanical garden, Sagar University.
Date of collection: August 14, 2012.
Collected by: Deepak Vyas.
Edibility: Edible.

5. *Ganoderma tsugae* (Murr.): Ganodermataceae.
Common name: It is commonly called wood decaying fungus.
Description: *Ganoderma tsugae* (Murr.) is of shiny varnished surface. Its cap is 2-12 by 5-30 cm in diameter, kidney shaped or fan shaped, reddish brown with some concentric zones and often with a white margin. Its spore deposit cinnamon-brown.
Scale: 1.5×1.5 cm.
Specimen examined: Stem of *Delonix regia* in Patharia forest of Sagar M.P., India, 24° 27' N, 79° 21'E and 620.26 m.
Date of collection: November 3, 2011.
Collected by: Anjuli Chaubey and Poonam Dehariya.
Edibility: Inedible.
Medicinal value: This mushroom possesses many different medicinal properties that dependent on the stage and environment of its growth (Jong and Brimingham, 1992, Liu, 1999). Traditionally, it has been widely used in treatment of hepatopathy, chronic hepatitis, nephritis, hypertension, arthritis, insomnia, bronchitis, asthma, gastric ulcers. Scientific studies have confirmed that substances extracted from the mushroom can reduce blood pressure, blood cholesterol and blood sugar levels (Hobbs, 1995).

6. *Microglossum viride* (Persoon : Fries) gillet: Geoglossaceae.
Common name: It is commonly called green earth tongue.
Description: *Microglossum viride* (Persoon : Fries) gillet is an erect club shaped species with greenish fruit bodies characterized by the scurfy-scaly stem. Its fruit body is 3-6 cm high, narrowly clavate green or olive green in color with smooth upper fertile part. It is sharply delimited from the stem. Its stipe is 0.2-0.5 cm thick, often slightly compressed, cylindrical or curved. The surface is scurfy or scaly. Its flesh is pale greenish. It is clustered or gregarious.
Scale: 14×6 cm.
Specimen examined: Botanical garden, Sagar University.
Date of collection: August 20, 2012.
Collected by: Deepak Vyas.
Edibility: Inedible.
Medicinal value: It has antiviral activity through stimulation of interferon production. It inhibit HIV-1 (Ng.T.B., 1998).

7. *Panaeolus sphinctrinus* (Fr. Quel): Psathyrellaceae.
Common name: It is commonly called grey mottle gills.
Description: *Panaeolus sphinctrinus* (Fr. Quel) is bell shaped, of cap size 2-3 cm in diameter, dark grey in color, smooth with a fringe of tiny white scales of the veil attached to the margin.
Scale: 4×6 cm.
Specimen examined: Botany Department Dr. H.S. Gour University in Sagar M.P., India, 24° 27' N, 79° 21'E and 620.26 m.
Date of collection: September 12, 2008
Collected by: Deepak Vyas and Anjuli Chaubey.
Edibility: Inedible.

8. *Pleurotus cornucopiae:* Pleurotaceae.
Common name: It is commonly called oyster cap mushroom.
Description: *Pleurotus cornucopiae* is usually found growing on tree of sandal wood. The cap size is 5-12 cm in across and convex. It is whitish in color of almost a magnolia shade, it turns fairy dark brown with age. The stipe size is 5-8 cm. The gills are quite deep, the flesh is white spore deposit.
Scale: 13×5 cm.
Specimen examined: Botanical garden, Sagar University.
Date of collection: August 14, 2012.
Collected by: Deepak Vyas.
Edibility: Edible.

9. ***Fomes fomentarius* (L.:Fr.) J. Kicks:** Polyporaceae.
Common name: It is commonly called tinder fungus.
Description: This is one of the largest bracket fungi. It cap is 4-20 by 10-50 cm in diameter. Its fruit body is like a horse hoof shaped with layer yellowish brown and brick coloured. Its tubes form annual layers. Its flesh is pale brown, very tough and leathery. Its spore deposit white.
Scale: 15×5 cm.
Specimen examined: From stem of *Delonix regia* of University campus. Sagar, M.P. examined India, 24° 27' N, 78° 4'E and 620.26 m.
Date of collection: October 21, 2011.
Collected by: Deepak Vyas, Anjuli Chaubey, Poonam Dehariya.
Edibility: Inedible.

Medicinal value: It is also known as “Agarics of sergeons” because of its use for stopping light hemorrhages. Its flesh was beaten with a mallet to make it supple and applied as non caustic haemostatic. It was also traditionally used by barbers to stop the bleeding of razor cuts. This mass was applied on wounds to stop bleeding. They were also using it to make warm compress for extremities and joints (Giovannini, 2006). In China it is used by indigestion and to reduce stasis of digestive vitality, for esophageal cancer and gastric and uterine carcinomas (Ying et al., 1987).

10. *Tyromyces lacteus* (Fr.) Murril: Polyporaceae.
Common name: It is commonly called milk white polypore.
Description: This is a soft white bracket fungi commonly found on deciduous trees. Its cap is 2-6 cm in diameter, semicircular, with a broad lateral attachment. Its tubes are 1-1.5 cm long. Its flesh is up to 0.3 cm thick with soft white fibrous. It has white spore deposit.
Scale: 18×28 cm.
Specimen examined: Trees of Patharia forest Sagar M.P., India, 24° 27' N, 79° 21'E and 620.26 m.
Date of collection: August 2, 2012.
Collected by: Anjuli Chaubey.
Edibility: Inedible.

11. *Lenzites Betulina* (L) Fr. Limaceum: Polyporaceae.
Common name: It is commonly called Birch Lenzitis.
Description: It is a thin bracket fungus, found growing on dead wood. Its cap size is 2-9 cm in diameter, bracket to shelf shaped with a broad or narrow, lateral attachment, finely hairy, with narrow concentric zoning. Its pore surface is with thick radiating gills. Its flesh is 0.2-0.3 cm thick, white and tough. It has white spore deposit.
Scale: 6×9 cm.
Specimen examined: Botanical garden, Sagar University.
Date of collection: August 30, 2012.
Collected by: Anjuli Chaubey.
Edibility: Inedible.

12. *Hypholoma elongatum* (Pers. ex) Ricken: Strophoriaceae.
Common name: It is commonly called swamp sulphur cap.
Description: *Hypholoma elongatum* (Pers. ex) Ricken is generally found in large groups. Its cap and stipe are yellow in color and is 1-3 cm in diameter of bell shape. Its stipe is 5-10 x 0.3-0.4 cm tall, slender and hollow. Its flesh is thin, white and brittle. Its spore deposit sooty brown.
Scale: 13×5 cm.
Specimen examined: Twigs, leaves and other debris of Patharia forest Sagar M.P., India, 24° 27' N, 79° 21'E and 620.26 m.
Date of collection: July 30, 2012.
Collected by: Anjuli Chaubey and Poonam Dehariya.
Edibility: Inedible.

13. *Pholiota highlandensis* (Peck) A.H. S M & Hessler: Strophoriaceae.
Common name: It is commonly called charcoal pholiota.
Description: It is commonly found on burnt ground or burnt stumps, distinguished by the slimy cap and reddish brown gills. Its cap size is 3-5 cm in diameter, convex becoming flattened with a wavy margin, stipe length is 2-5 cm in diameter, brownish red, paler at the apex. Its flesh is thin. Its spore deposit is cinnamon brown.
Scale: 5×4 cm.
Specimen examined: Botanical garden, Sagar University.
Date of collection: August 30, 2012.
Collected by: Deepak Vyas.
Edibility: Inedible.

14. *Serpula lacrymans*: Serpulaceae.
Common name: It is commonly called dry rot fungus.
Description: It was found growing on dead wood. It is destructive fungus of domestic wood, characterized by

fruit bodies with a rusty brown in color. It has fruit body spreading over the substrate and forming large pancake like patches with the age. Spore has yellowish brown deposit.
Scale: 3×5 cm.
Specimen examined: Botanical garden, Sagar University.
Date of collection: August 30, 2011.
Collected by: Anjuli Chaubey.
Edibility: Inedible.

15. ***Tremella mesenterica (*Retz: Fr):** Tremellaceae.
Common name: It is commonly called yellow brain fungus or witches' buffer.
Description: This fungus is bright orange yellow in color and irregular, brain like in shape, folded and lobed, gelatinous. Spore has white deposit.
Scale: 1.5×1.5 cm.
Specimen examined: From litter fall and cow dung in Pathariya forest of Sagar M.P., India, 24° 27' N, 79° 21'E and 620.26 m.
Date of collection: September 22, 2011.
Collected by: Anjuli Chaubey and Deepak Vyas.
Edibility: Inedible.
Medicinal value: It has a long historical use in traditional Chinese medicine as an immune tonic and also for treating debility and exhaustion together with many other ailments including skin-care. It contains acidic polysaccharides, especially glucuronoxylomannan, readily extracted with hot water giving a smooth and stable solution used in oriental cosine. The polysaccharide of this fungus show anticancer activity. Clinical trials have shown it to be effective in treating radio and chemo therapy- induced Leukopenia, boosting immunological functions and stimulating leukocyte activity (Hobbs, 1995).

16. *Lepista nuda* (Bull.:Fr.) Cke.: Tricholomataceae.
Common name: It is commonly called wood blewit.
Description: *Lepista nuda* (Bull.:Fr.) Cke. cap is 7-13 cm in diameter, brownish violet and rounded in shape. Stipe is 4-8 cm thick and brownish. Gills violet in color, flesh thick with a faint fruity smell. Spore deposit pale pinkish.
Scale: 7×3.5 cm.
Specimen examined: Litter grass in Patharia forest of Sagar M.P., India, 24° 27' N, 79° 21'E and 620.26 m was examined.
Date of collection: July 24, 2012.
Collected by: Deepak Vyas.
Edibility: Edible.
Medicinal value: It is resistant to Gram+ and Gram- bacteria (Ying et al., 1987; Giovannini, 2006).

17. *Collybia butyracea* (Bull: Fr) Lennox: Tricholomataceae.
Common name: It is commonly called greasy tough shank.
Description: *Collybia butyracea* (Bull: Fr) Lennox cap is yellowish brown to dark brown in color but remaining dark at centre. Its stipe is 3-6 x 0.5-1 cm, flesh pale and fibrous, lacking a distinctive smell. Its spore has white deposit.
Scale: 12 × 5 cm.
Specimen examined: Cow dung/Litter fall, Patharia forest of Sagar M.P., India, 24° 27' N, 79° 21'E and 620.26 m.
Date of collection: August 22, 2011.
Collected by: Deepak Vyas and Poonam Dehariya.
Edibility: Inedible.

18. *Omphalina ericetorum* (Pers. Quel. Biglow): Tricholomataceae.
Common name: It is commonly called umbrella naval cap.
Description: *Omphalina ericetorum* (Pers. Quel. Biglow) is very small in size with white cap and yellowish to brown stipe. Its cap size is 1-3 cm in diameter and the stipe is 1-3 x 0.2-0.3 cm cylindrical. It has pale decurrent gills, with wavy margin. Its flesh is thin white. Its spore has white deposit.
Scale: 3×5 cm.
Specimen examined: Girls hostel in Sagar M.P., India, 24°27' N, 79°21' E and 620.26 m.
Date of collection: July 25, 2013.
Collected by: Anjuli Chaubey.
Edibility: Inedible.

DISCUSSION

Mushrooms are a nutritionally functional food and a source of physiologically beneficial and non-inventive medicines. In nature, mushrooms grow wild in almost all types of soils, on decaying organic matter, wooden stumps, etc. They appear in all seasons; however rains favor rapid growth when organic matter or its decomposition products are easily available. About 10,000 species within the overall fungal estimates of 1.5 million belong to this group. Mushrooms alone are represented by about 41,000 species, of which approximately 850 species are recorded from India (Manoharachary et al., 2005). Mushrooms are of ancient lineage, universal, remarkably beautiful and diverse in their form and in their interaction with other biota.

The occurrence of mushrooms on such familiar substrate as wood, litter and soil, implies a role for them in these microhabitats. Forest litter and forest soils are often literally permeated by fungal threads and tubes (collectively known as mycelium) often forming 'Rhizomorph', capable of free and extensive spread in litter and soil (Subramanian, 1995).

During the isolation of the mushrooms, it was observed that the species were very much dependent upon the

habitat in which they occur. Species in this region were found to be associated with grasses, herbs, shrubs and trees. Their host specificity occurs due to complex pattern of interactions with the climate, the soil, plants and animals. Some species are specific only on dead woods or woody debris such as *L. betulina, S. lacrymans, L. pyriform, P. highlandensis, C. puteana, T. lacteus*. Some occur only on grassland and associated with grassroots such as *V. pratense*. Some species grow only on dung or enriched soil such as *H. elongatum, C. butyrace*a and *T. mesentrica*. Some species are only association with living trees such as *L. nuda*, *F. fomentarius, C. geotrapa.* In some cases, it was observed that the morphological characters viz stipe length, stipe breadth, cap size, color conk size and brightness also varied with different host or localities, for example, two isolates of *G. tsugae* collected from living tree of *D. sisoo* and other from dead stump of *D. regia* showed wide variation in their size and color. The species which was collected from living tree of *D. sisoo* had greater conk than that collected from dead stumps of *D. regia*.

Thus, despite their growth on lignocellulosic wastes, to produce the mushroom fruiting bodies of great diversity in color, structure, size, texture, flavor and nutritional composition of essential amino acids and vitamins, unequivocally, they reflect on the magnificent capacities of the mushrooms for “biosynthesis” through different from “photosynthesis” (Rajarathnam et al., 1997).

Occurrence of mushrooms in forest has been reported by many workers such as Singer (1989) who reported 1320 species belonging to 129 genera under Agaricales. Sharma and Doshi (1990) who reported some new hosts of *Pleurotus* species from Rajasthan. Pradeep et al. (1998) reported occurrence of mushrooms from Western Ghats. Doshi and Sharma (1997) were recorded as wild mushrooms of Rajasthan. Thakur et al. (2006) reported mushroom wealth from Chhattisgarh and Madhya Pradesh States. Karwa and Rai (2010) reported edible fungal diversity from central India. Recently, Thakur et al. (2011) reported biodiversity of mushrooms of Chhattisgarh region. Vishwakarma et al. (2011) reported some medicinal mushrooms of Uttarakhand. Dwivedi et al. (2012) reported biodiversity of mushrooms from Amarkantak biosphere reserve forest of central India. Pushpa and Purushothama (2012) reported mushrooms diversity of Karnataka. In recent years, we have (Dehariya et al., 2010; Dehariya and Vyas, 2013) found variety of mushrooms growing in the Patharia forest of Sagar, M.P. A recent study by Chandulal et al. (2013) provided information regarding diversity of mushrooms in Gujarat.

Occurrence of variety of mushrooms in the forest of India sub-continent suggests a close link between mushroom production and forest health. Though, no earlier data on the mushroom diversity corroborating forest diversity is available from this region, yet it is deduced that due to recent conservation strategies adopted by the forest department, number of plants are growing and have enriched the flora of Patharia forest. Thus, the rich diversity of the forest facilitate conducive environment for production of wild mushrooms.

The results of the present study show that some of the mushrooms act as mycorhizal fungi because of their close dependency on associated tree species. It is interesting to note that richness and abundance of the mushrooms was much higher in the thick forest whereas because destruction and thinning of the forest mushrooms were decreased. According to Kroper and Albee (1996) and Buee et al. (2005) fruit body production of some fungi adversely affected disturbed forest due to thinning of trees. However, according to Shaw et al. (2003) some mushrooms increase their fruit body production, when thinning is increased. According to Arnolds (1988), most healthy forest ecosystem housed more than 45% ecto mycorhhizal fungi. Thus, it is deduced that mushrooms are comparable to plants in requiring particular site, condition to thrive.

With this study, it could be concluded that Patharia forest housed number of wild mushroom which have immense importance in the maintenance of forest ecology and wealth, secondly some of the wild mushroom have been found to have great medicinal properties. These wild mushrooms are good source of income generation for the unemployed youth of the region and finally it gives us an impetus to search an indicator mushroom species for the forest management.

Conflict of Interests

The author(s) have not declared any conflict of interests.

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