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A potential nutraceutical mushroom *Pleurotus citrinopileatus* R. Heim from Puliebadze hill of Kohima (India) needs conservation: A report.

Botany

KEYWORDS: Gilled, Macrofungi, Nutraceutical, Puliebadze hill, Oyster.

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ABSTRACT

Pleurotus citrinopileatus also called as golden oyster mushroom is a gilled, edible, medicinal and easy to cultivate oyster mushroom found growing in cold and high elevated Puliebadze hill of Kohima (India). Its fruit bodies are typical oyster mushroom like with a brilliant yellow to golden brown colour and fragile cap. It is considered one of the best edible oyster mushroom and reported to possess many medicinal properties, thus making it one of the choice mushroom to cultivate as a potential nutraceutical source. The overexploitation for consumption, habitat destruction and climate change are threats to its very existence.

INTRODUCTION:

Nutraceuticals can be defined as a substance that may be considered a food or a part of food that provides medicinal or health benefits like the prevention and treatment of diseases. Mushroom have become important as a functional food and as a source for the development of drugs and nutraceuticals (Khatun *et al* 2012) also, they contain antioxidant, antitumor and antimicrobial properties (Ajith & Janardhanan 2007). Apart from their pharmacological properties mushrooms are becoming very important for our diet due to their high nutritional value as they contain high protein, minerals, fibers and low fats making it a good alternative food for many health conscious consumers and diabetic patients.

Mushroom is a general term used mainly for the fruiting body of macrofungi and represents only a short reproductive stage in their life. It is usual for a particular fungus to produce a visible fruiting body only under a precise combination of conditions, including geographical location, elevation, temperature, humidity, light and surrounding flora. Studies on macrofungi have been an area of importance because of their role in human welfare, especially in food industry, in medicine and biodegradation (Ozturk *et a*l 2003). However, the study of macrofungi, having edibility and medicinal properties are yet to be properly dealt with (Jonathan & Fasidi 2003). Mushroom represents an important biological resource of social, economic and ecological significance and since ancient time wild mushrooms are being consumed by man with delicacy probably for their taste and pleasing flavor but most of the mushroom which are used as food by local people have neither been documented nor studied properly. The indigenous mushrooms are used solely as product of the wild and prepared and eaten traditionally. This oyster mushroom *Pleurotus citrinopileatus* is important because it is available locally, easy to cultivate, they have good nutritional value and medicinal properties.

The work presented in this paper is a preliminary investigation of an indigenous oyster mushroom which appears to grow under a very narrow specific set of environmental condition and vulnerable to extinction because of over exploitation for consumption, habitat destruction and climate change.

MATERIAL AND METHODS :-

Study Site :- Nagaland is one of the North East Indian state with total geographical area of 16579 Sq.Km. Nagaland is bordered by Myanmar in the East, Assam in the West, Arunachal Pradesh and a part of Assam in the North and Manipur in the South. It lies between 93°.20′ to 95°.15’ East longitude and 25°.6′ and 26°.4′ North latitude. The recorded annual rainfall ranges from 2000 – 2500 mm. The temperature during the summer season remains between 16°C – 31° C and drops below 4°C and frost is common at high elevations.

Kohima the capital of Nagaland is situated at an elevation of 1444 m above the sea level with average temperature between 14.6°C to 22.2°C. The annual rainfall is around 1831.3mm. The Puliebadze hill in Kohima district has an altitude of about 1800 m and presents a typical Eastern Himalayan vegetation which provide rich habitats for macrofungal species to flourish.

Sample collection :- Mushroom samples were collected during rainy season between 2012 – 2014 based on the presence of sporophores of the species (Vogt et al 1992). The opportunistic sampling protocol was used, that the sample collection was done only in those sites where these fungi were most likely to occur.

During collection Sporocarps were removed from the substratum with great care to avoid damage. The habitat and the morphological characteristics of the mushroom were noted and colour photographs were taken. The specimens were wrapped in aluminum foil or paper and collected in plastic boxes for further identification in the laboratory.

The collected sporocarps were described for their morphological characters like color, size, shape odour and texture and identified by standard microscopic method (Roy & De 1996).

RESULT AND DISCUSSION:

Taxonomic Position :- *Pleurotus citrinopileatus* belongs to Kingdom – Fungi, Division – Basidiomycota, Order – Agaricales and Family – Pleurotaceae.

Description :- The fruiting bodies of *Pleurotus citrinopileatus* grows in clusters of bright yellow to golden brown cap.

Cap: Diameter 2 - 8.2cm, the flesh is thin white with a pleasant smell, thicker in the middle, margin entire when young which become slightly incurved and wavy, slightly sticky when young and become velvety dry surface texture, depressed and yellow to golden colour.

Stipe: Its attachment to pileus is off-center, up to 1.5cm width and 5cm length, white solid, cylindrical, often curved.

Gills: White, closely spaced and runs down the stipe. Annulas & Volva: Absent.

Spore : Smooth, elliptical shaped. Spore Print: Pinkish to purplish.

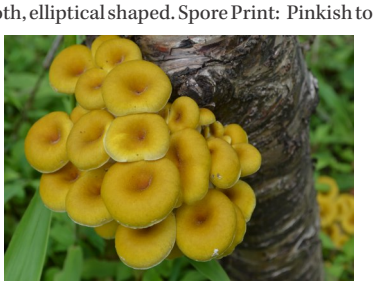

Fig: Pleurotus citrinopileatus

Discussion :- The Golden Oyster Mushroom is an edible, gilled fungi native to Japan, Russia and Northern China. It is a wood rotting fungi, found mostly in dead logs of hardwood such as Cherry, Elm and Fig etc. It grows in big clusters of bright yellow to golden brown cap.

Stamets (2000) had reported this mushroom as a saprophyte of Asian wood hardwood especially Oaks, Elm, Beech and Poplars.

During the survey the sporocarp of *Pleurotus citrinopileatus* could be collected only sporadically during the month of May to June which is before the onset of monsoon. During this time the average temperature and rainfall remains moderate i.e. 24.5°C and 246.4mm respectively. Thus indicating that *Pleurotus citrinopileatus* requires a very narrow range of environmental condition for fruiting.

It has been reported that this mushroom have high nutritive value, containing all the essential amino acids and minerals, a source of antioxidants, it is anti-hyperglycemic, source of lipid lowering and cholesterol lowering drug (Lovastatin), anti-tumor and anti-HIV compound.

Like any other edible mushroom, collection and consumption of the Golden Oyster Mushroom by the local people is practiced since ancient time and with the increased awareness of the health benefits and nutritional value of the wild mushroom it has been found that, hunting for wild mushroom during the rainy seasons have increased greatly. As this fungal species requires specific host and a particular set of conditions for fruiting, over exploitation for consumption, habitat destruction such as deforestation and climatic change will definitely threaten their very survival. As this immensely diverse and beautiful group of organism is gradually diminishing due to several natural and man made factors, it is necessary to adopt both in-situ and ex-situ conservation measures (Manoharacharya *et al* 2005, Das 2010) so as to make them more sustainable.

CONCLUSION: The use of wild edible mushroom plays a vital role in enrichment of the socio-economic life of the tribal people. The demand for mushroom has been increasing in the recent time due to population growth, market expansion and changing of consumer behavior due to increased knowledge of their many benefits. As *Pleurotus citrinopileatus* is cultivated commercially elsewhere in the world such as in Japan, China, Taiwan and India etc. this locally available wild species too need to be domesticated in order to meet the demand of the local market and also achieve sustainability. Its host specificity, human intervention such as overexploitation, habitat destruction and global phenomenon such as climate change are some of the causes of great concern for their availability later. Conservation of its genetic resource needs urgent attention so as to prevent its extinction and to promote commercial importance of this rare and endangered mushroom which is also of great relevance in socio-economic structure of the local people.

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