

Health Impact and Medicinal Properties of Nutritionally Edible Milky Mushroom (*Calocybe Indica*)

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Abstract—Dietary mushrooms are considered as valuable health foods since they are known for rich proteinaceous food, it consists of about 75 per cent proteins and are low in calories, fat, fatty acids, vitamins and minerals. Mushrooms as functional foods are used as nutrient supplements to enhance immunity in the form of tablets. *Calocybe indica* is an indigenous popular edible mushroom, having a variety of secondary metabolites such as phenolic compounds, terpenes and steroids possibly involved in their medicinal effects and nutritive value. Result of the present supplementation study revealed that milky mushroom is highly suitable and beneficial for promoting and maintaining health. Blood profile of the subjects showed a significant decrease in blood sugar, blood cholesterol and blood pressure levels in the subjects

Keywords—*Calocybe indica*, medicine, food, properties.

I. INTRODUCTION

Mushrooms now increasingly recognized because they correct diet, controls and modulates many functions of human body and consequently participates in the maintenance of state of good health, necessary to reduce the risk of many diseases. Modern pharmacological research confirms large parts of traditional knowledge regarding the medicinal effects of mushrooms due to their antifungal, antibacterial, antioxidant and antiviral properties, besides used as functional foods. *Calocybe indica*, popularly known as milky mushroom or summer mushroom, is a relatively new introduction from India to the world of mushroom growers.

Calocybe indica P&C is one of the promising mushrooms cultivated in summer introduced by Purkayastha and Chandra in 1974. The name is derived from the ancient Greek terms kalos means “pretty” and cubos “head”. In Orissa it is known as *dudha chhatu* and in some places they are called *kuduk*. Around nine species of *Calocybe* are found in

neotropical regions. Being low in fat and devoid of cholesterol, mushrooms make an ideal diet for the heart patients. Mushrooms are low in calorie: high in protein, with no starch and sugars, and are called the diabetics delight.

Mushrooms are low calorie food with very little fat which is free of cholesterol and rich in linoleic acid. Pushpa and Purushothama (2010) reported that *C.indica* is rich in protein and fiber with low fat content, which make the mushroom as a low energy, healthy food stuff. They were also of the opinion that milky mushroom can also be used as protein supplementary diet. Digestibility of milky mushroom protein is 72-83 per cent.

II. MATERIALS AND METHODS

Selection of subjects and experimental design

Medicinal value of *calocybe indica* was investigated by conducting supplementation study conducted on human volunteers as case study. A list of hyperglycemic, hyperlipidemic and hypertensive subjects were identified through the preliminary screening among the subjects with the above three disease conditions residing in Trivandrum by the interviewer. From among the above list, person under medication and subjects with co-morbidities were deleted. For each disease condition two subjects with similar clinical parameters were selected.

After selection, preliminary information's regarding their medical history, socio economic background, dietary and life style pattern were collected through a suitably structured pre tested questionnaire. The socio economic profile of the subjects such as socioeconomic status, religion and family background in general has a very distinct part to play in determining attitude and food consumption, health and behavioral pattern of the individual.

Details on the medical history of the subjects, food consumption pattern, use of medicines, other personal habits, blood profile and blood pressure of the respondents were estimated.

Anthropometric measurements relevant to the study include height, weight, waist and hip circumference. The waist hip ratio is a simple method for distinguishing between fatness in the lower trunk and upper trunk. Waist hip ratio (WHR) of >1.0 for men and >0.85 for women is often referred to as gynoid obesity, on assessing the anthropometric measurements, all the subjects does not follow ideal body weight and were at risk and prone to develop lifestyle diseases.

Preparation of mushroom sample

Milky mushroom (*Calocybe indica*) cultivated on paddy straw will be selected for the study. Milky mushroom was sun dried, powdered in a grinder and sieved using a fine mesh of about 10x size. Dried mushroom powder was packed in five gram sachet for supplementation to the respondents selected for the case study. Impact of the mushroom supplement on the subjects was monitored initially and after supplementation.

Monitoring indicators

Blood pressure, blood sugar, lipid profile, general health and morbidity of the subjects.

Diet and feeding

Various recipes were standardized in the laboratory incorporating mushroom supplement, in order to ensure the prompt inclusion of the supplement in the diet of the respondents. Recipes standardized with mushroom powder were commonly consumed popular breakfast dishes like dosa, idly, chapathy etc. Apart from the above other dishes like chutney powder, mixing the powder with rice, curd and black tea were also tested. It was observed that mushroom powder incorporation neither alter the texture nor the acceptability of the preparation.

Mushroom supplement was distributed to the subjects for consumption for a period up to three months. Subjects were given five g sachet of mushroom supplement distributed on a weekly basis. Investigator made a good rapport among the respondents and ensured the incorporation of supplement daily in their diet. Investigator has made interaction with the respondents personally and through telephone to know whether the subjects were consuming the supplement regularly. The supplementation study continued for three months. Two of the subjects discontinued the trial. Feeding trial over a given period of time is considered as the most reliable method to determine the impact of the food. The feeding experiment was conducted for a period of three months to assess the efficacy of

mushroom powder on hyperglycemia, hyperlipidemic and hypertension. Blood profile of the subjects recorded before the introduction of the supplement and after 45th and 90th day of supplementation.

III. RESULTS AND DISCUSSION

Impact of the mushroom supplement on the blood sugar levels

Both the subjects were willingly participated in the mushroom supplementation study and were not taking any oral hypoglycemic agents for controlling the disease. The result revealed that initial value obtained for fasting blood glucose of subject A and B were 135 mg/dl and 165 mg/dl respectively. After supplementation 45 days for both the subjects the level has reduced to 128 mg/dl. At the end of the 90th day, fasting blood sugar level was 112 mg/dl and 98 mg/dl respectively. A steady decline was observed in the two subjects studied with regard to fasting blood sugar levels.

Impact of the mushroom supplement on the cholesterol levels

Both the hyper cholesterolemic subjects were interestingly participated in the feeding experiment and were not on medication. Direct monitoring was done by the investigator. The result showed that value obtained for fasting blood cholesterol level initially 231 mg/dl and 240 mg/dl for subject A and subject B respectively. In 45th day of supplementation there is no decrease in the cholesterol level in subject A while subject B showed reduced level to 225 mg/dl. At the end of 90th day of supplementation the cholesterol level reduced to 223 mg/dl and 178 mg/dl for subject A and B respectively. Result revealed remarkable decline in the cholesterol level of the subjects selected for the study.

Impact of mushroom supplement on the blood pressure levels

Subjects under study were not on any medication for controlling hypertension. The result showed that initially the value obtained for blood pressure level of subject A and B were found to be 170/100 mm Hg and 140/100 mm Hg respectively. After 45th days of supplementation subject A shows reduction in blood pressure level to 150/90 mm Hg but in subject B slight increase in the level was observed to 150/100 mm Hg. When monitored after 90 days of supplementation there was steady decline in the case of subject A to 80/100 mm Hg and 120/80 mm Hg in subject B

Table.1: Mean basal characteristics of subjects selected for the study

Basal characteristics	Diabetic		Hypercholesterolemic		Hypertensive	
	SubjecA	Subject B	SubjecA	SubjectB	SubjecA	Subject B
Height	154	160	155	155	175	155
Weight	79	76	65	65	78	60
Waist circumference	45	46	42	43	40	46
Hip circumference	47	49	45	47	41	48
BMI	25.64	23.87	20.96	20.96	22.28	25
Waist hip ratio	0.95	0.93	0.93	0.91	0.97	0.95

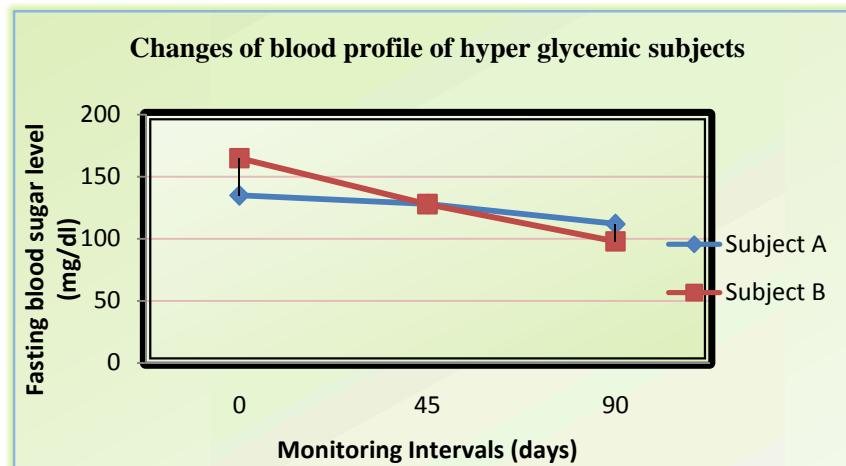


Fig.1

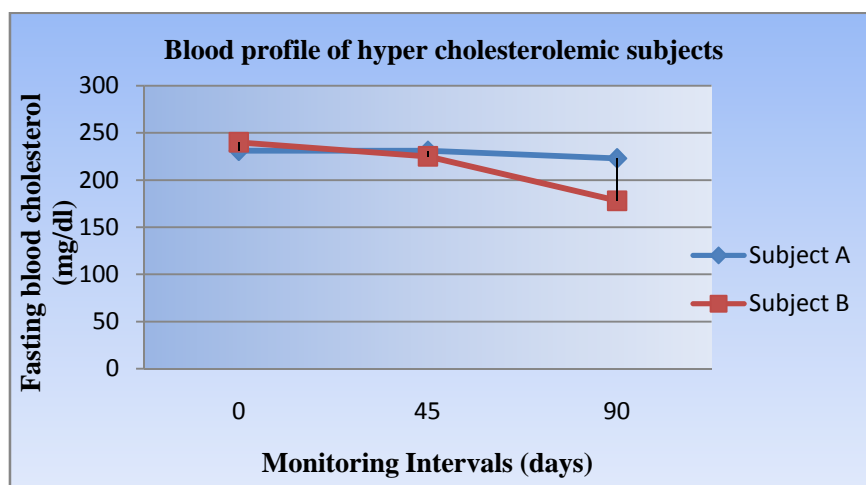


Fig.2

IV. CONCLUSIONS

Overall, the result revealed that incorporation of mushroom supplement was able to reduce blood sugar and blood cholesterol to a considerable level. Hypertension was also found to control to some extent. Further research is necessary so as to get more data for generating concrete assign.

REFERENCES

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