BETA GLUCAN SYNTHESIS AND MYCOCHEMICALS SCREENING OF LYCOPERDON PERLATUM COLLECTED FROM SAYALGUDI, SOUTHERN TAMILNADU, INDIA

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***Abstract:** This work targets on β-glucan synthesis and analysis of mycochemicals present in the mushroom, Lycoperdon perlatum. The samples were collected from coastal region of southern Tamilnadu. The sample, that the surface sterilized fruit body was dried and stored in powder form. The mycochemicals were examined from the mushroom fruit body dried powder. The mushroom mycelium was grown on PDA plate by the spore inoculation. The production of extracellular enzymes from mushroom mycelium was detected. Beta-glucan was isolated from mycelium using submerged fermentation technique and purified. It was acid hydrolyzed using tri-fluoro acetic acid (TFA) and analyzed by thin-layer chromatography. Total protein content present in the mushroom was measured by Lowry's method. As like total carbohydrate content was measured by phenol and sulfuric acid method that contain 56% crude β-glucan. The result obtained from this study has shown the potential of Lycoperdon perlatum mushroom extract as a potent therapeutic agent and a food supplement.*

***Index Terms** – Lycoperdon perlatum, Beta-glucan, Mycochemicals, Extra cellular enzymes*

1. INTRODUCTION

Mushroom is the fruiting body of macro fungi (*Basidiomycota*) and produces only a short reproductive stage in their lifecycle (Hankin and Anagnostakis ,1975). Mushroom can be epigeous, large enough to be seen with the naked eyes and can be picked by hand (Chang and Miles, 1989). Mostly *Basidiomycetes* and *Ascomycetes* are the fruiting body producing fungi. Total mushrooms on the earth are estimated to be 140,000 species in which 10% (14,000 approximately) are known. From the thousands of known species, 2000 species are safe for human consumption and about 650 species of these having medicinal importance (Persoon, 1796). *Lycoperdon perlatum*, commonly known as puffball mushroom, is a species of puffball fungus in the family *Agaricaceae*. Mushrooms are the effective functional food as well as sources for the production of drugs having antioxidant, antitumor and antimicrobial activities (Kanad Das, 2010). Some mushrooms are consumed as potential nutriceuticals (compounds that having medicinal and nutritional characteristics and are consumed as medicines in the form of tablets or capsules) (Rai et al, 2005). The secondary metabolites of mushrooms are chemically diverse and possess a wide spectrum of biological activities, which are explored in traditional medicines and in new targets of molecular biology (Persoon, 1796. In twentieth century, mushrooms are well known to people all over the Asian countries as an important bio-source of novel secondary metabolites.

The puffball mushrooms are the good sources of protein, carbohydrates, fats and several micronutrients (Miura, 2003). The predominant fatty acids in the puffball are linoleic acid (37% of the total fatty acids), oleic acid (24%), palmitic acid (14.5%) and stearic acid (6.4%) (Perdeck, 1950). One of the anti-oxidant is β-glucan. β- Glucan is a polysaccharide (glucose polymers) that is found in many foods such as oats, barley, mushrooms and yeasts. Also, it is lesser extent in rye and wheat. It is extremely difficult to extract and purify. However, Oat bran contains about 7 percent beta glucan and is inexpensive. It is not enough to use as a supplement food. Non-cellulosic β-glucans are now recognized as potential immunological inducers and some are used medically in some countries (Rohrmann and Molitoris, 1992).

These β-glucans consist of a backbone of glucose residues linked by β-(1→3)-glycosidic bonds **(**Lakhanpal and Rana, 2005) often with attached side-chain glucose residues joined by β-(1→6) linkages. Instead of other carbohydrates, the use of β-glucans reduces the cholesterol and triglycerides (Cisneros et al, 1996). The effects on your face are dramatic and it gives a good result in your skin care by the routine massage (Robeiro, 2007) (Satitmanwiwat, 2012). The regular usage of β-glucans used to control blood sugar level in diabetic patients. β-glucan gives protection from ionizing radio activity. The literature suggests β-glucans are effective in treating diseases like cancer **(**Cheung, 2002) a range of microbial infections and hyper cholesterolaemia **(**Chen and Seviour, 2007). *Lycoperdon perlatum* was first studied by mycologist Christian Hendrik Persoon in 1796 (Almendros et al, 1987). The main reason to take beta glucan from the other contents is to induce our immune system. β-glucans have several different structures and different affinities towards receptors. This nature produces different host immune responses.

This study focuses on the synthesis of β-glucan and characterization of mycochemicals present in the mushroom, *Lycoperdon perlatum* was analyzed. This mushroom was collected from coastal regions of southern Tamilnadu, India. It was surface sterilized and the dried fruit body was stored in a powder form. The mushroom mycelium was isolated in PDA plate using spores. Mycochemical analysis was done and various fungal metabolites were examined.