Neuronal Health – Can Culinary and Medicinal Mushrooms Help?

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ABSTRACT

Hericium Erinaceus is a culinary and medicinal mushroom that is well established for its applications in brain and nerve health. Ganoderma Lucidum, Grifola frondosa and Sarcodon Scabrosus have been reported to have neurite outgrowth and neuronal health benefits. The number of mushrooms, however, studied for neurodegenerative activity are few when compared to the more than 2,000 species of edible and/or medicinal mushrooms identified. In the on-going search for other potent culinary and/or medicinal mushrooms, indigenous mushrooms used in traditional medicines such as Lignosus rhinocerotis and Ganoderma neo-japonicum are being investigated. Further, the edible mushroom, Pleurotus giganteus can be a potential candidate, too. Can these edible and medicinal mushrooms be tapped to tackle the health concerns of the aging brain which is projected to be more than 80-90 million of people age 65 and above in 2050 who may be affected by age-related neurodegenerative disorders. Scientific validation is needed if these mushrooms are to be considered and this can be achieved by understanding the molecular and biochemical mechanisms involved in the stimulation of neurite outgrowth. Though it is difficult to extrapolate the in vitro studies to what may happen in the human brain, studies have shown that there can be improvement in cognitive abilities of the aged if the mushroom is incorporated in their daily diets.

Key words: Neuronal health, Mushrooms, Hericium Erinaceus, Pleurotus giganteus, Lignosus rhinocerotis, Ganoderma neo-japonicum, Neurite outgrowth, Nerve regeneration

INTRODUCTION

The macrofungi - the mushrooms are eukaryotic, non-photosynthetic, and aerobic organisms that form characteristic fruiting bodies. Belonging to the Fifth Kingdom, all mushrooms are heterotrophic, and they assimilate nutritive substances by absorption of simple molecules as nutrients after complex organic polymers such as celluloses are degraded by extracellular enzymes secreted by them. The mushrooms are taxonomically classified in two different groups: Basidiomycetes, which comprise many of the known genera and Ascomycetes. Edible and medicinal mushrooms, which can be commercially produced, are cultivated on lignocellulosic agricultural residues such as straw, wood chips, and sawdust.14

Mushrooms have been used by humans since thousands of years as food and/or as medicine. More than 14,000 species of mushrooms are recognized, and among them, approximately 2000 are identified as edible.15 Of the 2000 edible mushrooms in 30 genera, 270 species are now considered as potential therapeutic or preventative agents that may ensure wellness of humans.14 Today, the increasing consumption of mushrooms can be attributed not only to the pleasant flavor and aroma of culinary mushrooms but...