

**Title: Antioxidant Properties of Cultivated Edible Mushroom****Author: Muna, Grace Adoyo**

Mushrooms have been widely used as food or food ingredients in many food products for a long time. Button mushrooms (*Agaricus bisporus*) grow widely in temperate and subtropical areas. Prevalence of oxidative cellular damage caused by reactive free radicals has raised interests from the global scientific and clinical community. Compelling epidemiological evidence exists for the link between consumption of antioxidant-rich diet and a reduced risk of free radical-induced diseases. However, in the recent years, the restriction in the use of synthetic antioxidants, due to their toxicity and carcinogenicity, has caused an increased interest towards natural antioxidant sources. The general assumption is that edible cultivated mushrooms in Kenya are rich in natural source of antioxidants. One such mushroom is the *Agaricus bisporus* that has been selected in this study. The main objective of the study was to evaluate the antioxidant activity and levels of ethanolic and hot water extracts from *Agaricus bisporus* mycelium and fruiting body. The phytochemicals present in *Agaricus bisporus* were tested using standard procedures described by Krishnaiah et al (2009) and revealed that phenols, tannins, polyphenol, saponin, flavanoids, cardiac glycosides, terpenoids, reducing sugars; and alkaloids are present in all extracts. Phylobatanin, sterols and anthoquinone were absent in MHWE. The total antioxidant activity was analysed using 1,1-diphenyl-2-picrylhydrazyl, hydroxyl, superoxide radical scavenging and reducing power assays, along with total phenolic,  $\alpha$ -carotene, lycopene, flavanoid and ascorbic acid concentrations in mycelium and fruiting body hot water and ethanolic extracts. Total phenolic,  $\alpha$ -carotene, lycopene, flavanoid and ascorbic acid composition of *Agaricus bisporus* extracts was analysed by colorimetric assays described by Barros et al (2008) with some modification and found to contain (40.26 - 04.61 mg/ml), (48.99 - 2.86 mg/g), (67.82 - 11.87 mg/g), (93.8 - 17.2 mg/g), and (11.62 - 10.22 mg/g), respectively. The mineral elemental analysis done using EDXRF (energy dispersive x-ray fluorescence analytical method) revealed that the samples contain zinc (42.9 mg/l), iron (33-48.5 mg/l), copper (18-24 mg/l) and manganese (7.5-9 mg/l). The extracts showed more scavenging activity on hot water Hydroxyl radical and reducing power of ethanol extract. Generally the mycelium extracts were more effective free radical scavengers than the fruiting bodies. Due to the above characteristics, *Agaricus bisporus* mushroom could be considered a food complement with antioxidative activity in the diet for the health benefits they present.