CULTIVATION OF *PLEUROTUS* (Fr) Kummer MUSHROOM SPECIES USING SELECTED AGRICULTURAL AND INDUSTRIAL WASTES.

BY

PETER. M. WACHIRA

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Department of Botany

Faculty of Science.

College of Biological and Physical Sciences.

University of Nairobi.

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ABSTRACT

Consumption and cultivation of indigenous *Pleurotus* mushrooms from organic wastes could aid in improving the diet, increase income as well as cleaning the environment. It is both sustainable and durable method of food production without damaging the environment. This study was aimed at cultivation of wild *Pleurotus* mushrooms on organic wastes as an addition food source and as an addition to *Agaricus spp.*

A wild *Pleurotus* mushroom was collected at Chiromo Campus near Agriculture Laboratory and tissue cultured. The young mushroom mycelium was cultured on both Potato Dextrose Agar (PDA) and Malt Extract Agar (MEA). Pure cultures were then inoculated to maize grains to make the spawn. Collected, cleaned and treated substrates (sugar cane baggase, maize cobs, waste papers and sawdust) in polythene bags were inoculated with this spawn. The bags were then taken to the fruiting room for fructification whose moisture level was maintained above 75 %. Cultivation boxes were constructed and the colonized mounds arranged inside after initiating fructification. Contaminants were identified according to their colours, habit, smell (bacteria) and microscopic examinations. The mushroom caps and stalks were harvested from every substrate, weighed and recorded in grams. The data was used to test for difference in mushroom production through analysis of variance at 0.05 level of significance from all the substrates.

From the fieldwork, the diversity of mushrooms was found to be decreasing. Cultural studies showed that mushroom mycelium cultured on artificial media grew very fast. Mycelium grew faster in MEA than in PDA. The studies also revealed that, mycelium

also grew in Potato Carrot Agar, Oat Meal Agar and Potato Waste Dextrose Agar. Maize grains were the best spawn carriers after double autoclaving. Cultivation boxes were used to produce mushrooms. The boxes reduced the contamination and water evaporation thus maintaining high moisture levels since each box was opened at a time. Fungal contaminants were found in all levels of mushroom cultivation, occurring in different colours. Bacterial contamination was common but was reduced with the use of antibiotics in the media before inoculations.

Sugar cane baggase was found to be the best substrate for mushroom cultivation under the conditions of these experiments with a biological efficiency of 50.8%. Maize cobs and waste papers gave a biological efficiency of 35 % and 33.8 % respectively. The study demonstrated possibility of producing mushroom cultures from wild mushrooms that has more potential for commercial purposes in Kenya both for consumption and environmental remediation.

More studies can be done on this mushroom to develop it for cultivation and to make better hybrids with the strains already known to give high yields with the least input and acertain its edibility by determining its chemical constituents.