UTILIZATION OF ORGANIC WASTES FOR CULTIVATION AND PRODUCTION OF MUSHROOM

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Approval Sheet

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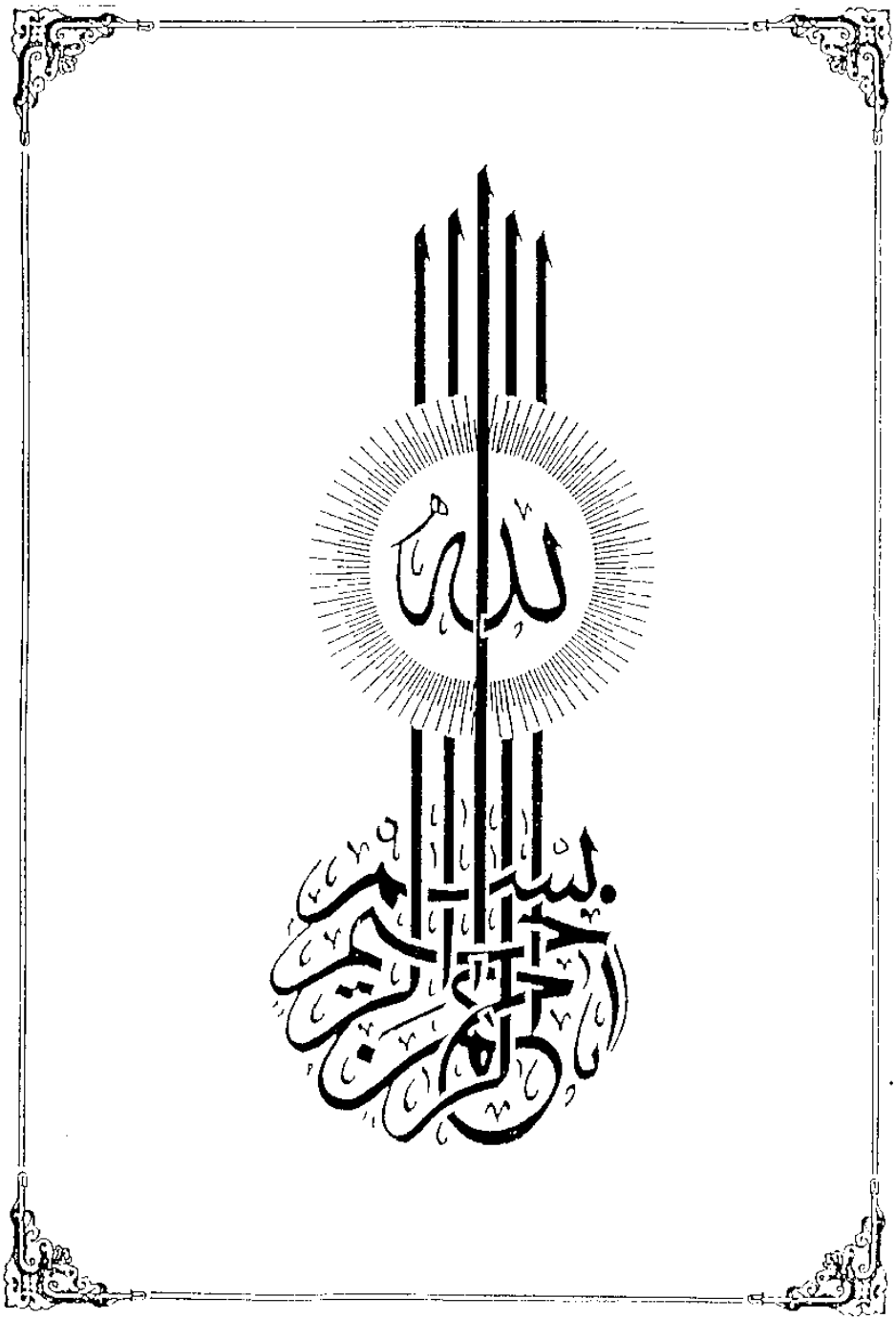

ABSTRACT

Thanaa Fouad Mohammady. (Utilization of organic wastes for cultivation and production of mushroom), Ph. D. Agricultural Science (Vegetable crops) Department of Horticulture, Faculty of Agriculture, Ain Shams University.

These studies included four experiments:

The first experiment was to investigate the suitable organic wastes for growth and production of oyster mushroom in winter and spring seasons. Eleven organic wastes were used for cultivation of two species of oyster mushroom, i.e, *P.columbinus* and *P.sajor-caju*. Results indicated that three substrates, i.e, rice straw, corn stalks and wheat straw showed high productivity of oyster mushroom fruit bodies. Cultivation of oyster mushroom in winter season produced higher yield of fruit bodies than that in spring season.

The second experiment was to study the best supplements substrates which can be added for improving characteristics of the tested organic substrates for increasing fruit bodies production and quality. Four supplements substrates, i.e, 5% wheat bran, 5% brewery wastes, 2% ammonium nitrate and 2% urea were used. As for organic substrates, four materials, i.e, wheat straw, rice straw, corn stalks and sugar cane baggase were used. Results indicated that the highest yield was obtained due to adding wheat bran to all organic substrates. Adding 2% urea to all organic substrates led to sharp decrease in total yield.

The third experiment was to study the optimum conditions to increase period of storage ability for fresh fruit bodies. Fruit bodies were backed in different types of bags, i.e, polyethylene bags polypropylene bags, treated polyethylene bags, paper bags and paper bags covered with plastic sheets. Storage was carried out at 2, 4, 8 and 12°C for 12 days. The obtained results indicated that, fresh fruit bodies can be successfully stored at either 2 °C or 4 °C for12 days in case of using two bag types, i.e, polyethylene and treated polyethylene bags.

The fourth experiment was to study the effect of intercropping of oyster mushroom on the production and chemical properties of the cultivated soil. The intercropping was carried out between the rows of cauliflower in spring and overwintering eggplants in winter. The obtained results indicated that cultivation of oyster mushroom between vegetable plants in winter season can produce good yield as compared with greenhouses production. It also improved soil characteristics and inhibited the weeds growth.

Key words: Organic wastes-oyster mushroom-fruit bodies-storage-open field-supplements-intercropping.

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INTRODUCTION

The oyster mushroom, belongs to the genus *Pleurotus,* can grow on virtually any agricultural waste substrate and has a high saprophytic colonizing ability. The world production of the oyster mushroom was 900 000 tons (Zadrazil and Dube, 1992), China alone produces about 800 000 tons/year. In last year its production there was seven times more than the previous years. There is an annual increase in world production. The top producers are Japan, Taiwan, Italy and France.

Recently, cultivation and marketing or consumption of oyster mushroom is spreading rapidly in Egypt due to its ability to grow on wide range of unfermented agricultural wastes with low costs (Ahmed, 1995).

Edible mushrooms have been considered as the oldest microbial food (Kurtzman, 1974) and were possibly part of man's earliest diet (Chang, 1977). In recorded history, it appears that the Pharaohs prized mushrooms as a delicacy and the Greeks thought that warriers should eat mushrooms as a source of strength in battle. They were considered as the food of the Gods. The Chinese civilization also regarded mushrooms as a health food.

In recent years, much attention has been directed towards the development of protein sources used as food for human consumption. Microbial protein (single cell protein) approaches to be one of the alternative ways of increasing the world's protein supply, particularly in developing countries.

The concept of producing food and feed from agricultural wastes has received interest within the late few years as a result of increasingly frequent food shortages and price rises. Agricultural wastes could be converted into palatable food through manipulation of microorganisms, such as mushrooms.

Mushroom cultivation is now one of the some intensive and most technically demanding of all vegetable cultivations practised throughout the world. The fact that mushrooms convert wastes materials into a highly flavoured proteinaceous food is clearly relevant to the requirements of both the developing and developed countries. However, irrespective of public demand and food values, the future role of mushrooms will be governed by the economic of production.

Therefore, the object of this work was to study the suitable organic wastes for growth and production of oyster mushroom, the optimum conditions to increase storagability of fruit bodies and the possibility of intercropping oyster mushroom between vegetable crops.