







شبكة المعلومــات الجامعية التوثيق الالكتروني والميكروفيلم



جامعة عين شمس

التوثيق الالكتروني والميكروفيلم



نقسم بللله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأفلام قد اعدت دون آية تغيرات



يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

40-20 في درجة حرارة من 15-20 منوية ورطوبة نسبية من

To be kept away from dust in dry cool place of 15 – 25c and relative humidity 20-40 %









BOENY

CHEMICAL AND TECHNOLOGICAL STUDIES ON THE PRODUCTION OF MUSHROOM AND THE POSIBILITY OF PROCESSING SOME PRODUCTS

By

KADRY HAMED MOHAMED EL-WASEIF

A thesis submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

In

Agriculture Science

Food Science Department Faculty of Agriculture, Moshtohor Zagazig University, Benha Branch





CHEMICAL AND TECHNOLOGICAL STUDIES ON THE PRODUCTION OF MUSHROOM AND THE POSIBILITY OF PROCESSING SOME PRODUCTS

By KADRY HAMED MOHAMED EL-WASEIF

B.Sc., Agriculture (Food Technology), Alexandria University, 1986M.Sc., Agriculture (Food Technology), Cairo University, 1997

Under the Supervision of:

Prof. Dr. R.M.A. El-Saadany

Prof. Of Food Technology, Faculty of Agriculture, Moshtohor, Zagazig

University (Benha Branch).

Ass. Prof. Dr. K.H. Tolba

Ass. Prof. Of Food Science and Technology, Food Technology Research Institute, Agriculture Research Center.

Karani



Approval Sheet

CHEMICAL AND TECHNOLOGICAL STUDIES ON THE PRODUCTION OF MUSHROOM AND THE POSIBILITY OF PROCESSING SOME PRODUCTS

By KADRY HAMED MOHAMED EL-WASEIF

B.Sc., Agriculture (Food Technology), Alexandria University, 1986M.Sc., Agriculture (Food Technology), Cairo University, 1997

This thesis for the Ph.D. degree has been Approved by:

Prof. Dr. A.A. El-Refai

Prof. Of Food Technology, Faculty of Agriculture, and Dean of Faculty of Specific Education, Menyat El-Nasr, Mansoura University.

Prof. Dr. H.H.A. Khalaf

Prof. Of Food Technology, Faculty of Agriculture, Moshtohor, Zagazig University (Benha Branch).

Prof. Dr. R.M.A. El-Saadany

Prof. Of Food Technology, Faculty of Agriculture, Moshtohor, Zagazig University (Benha Branch).

XM 1750 Sac

Ass. Prof. Dr. K.H. Tolba

Ass. Prof. Of Food Science and Technology, Food Technology Research Institute, Agricultural Research Center.

Date of Examination: / /2002.

i

, , ,

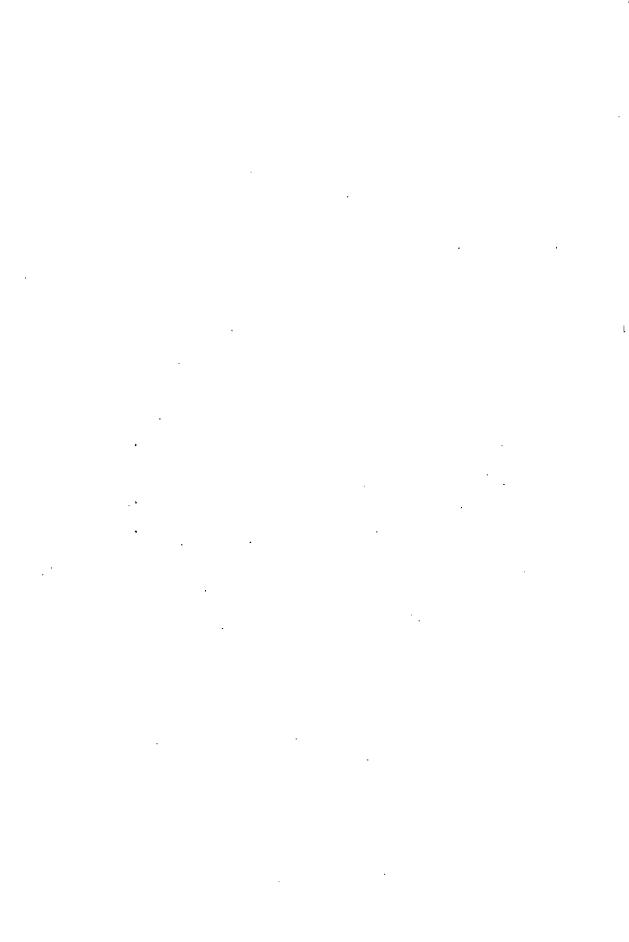
ACKNOWLEDGEMENT

The author would like, to thank **Prof. Dr. Raouf El-Saadany**, Professor of Food Technology, Faculty of Agriculture Moshtohor, Zagazig University, for his stimulating guidance, supervision sincere guidance and encouragement during this work.

My thanks is also extended to **Dr. Korani H. Tolba**, Ass. Prof. of Food Science and Technology, Food Technology Research Institute, Agricultural Research Center, for his encouragement, following up the work, helps and supervising during the preparation and finishing of this study.

Also, thanks should be extended to Director and Staff member of Food Tech. Res. Institute.

Many thanks to the Scientific Research Staff of Academic.



CONTENTS

| | Page |
|--|------|
| 1. INTRODUCTION | 1 |
| 2. REVIEW OF LITERATURE | 5 |
| 2.1. World production of some edible mushrooms | 5 |
| 2.2. Cultivation of button mushroom (<i>Agaricus bisporus</i>) | 10 |
| 2.2.1. Mycelial growth | 10 |
| 2.2.2. Spawn | 11 |
| 2.2.3. Compost preparation | 12 |
| 2.2.4. Growing systems | 14 |
| 2.2.5. Casing layer | 15 |
| 2.2.6. Cropping | 16 |
| 2.3. Cultivation of oyster mushroom (<i>Pleurotus</i> ostreatus) | 17 |
| 2.3.1. Preparation of spawn | 17 |
| 2.3.2. Mycelial growth | 18 |
| 2.3.3. Organic supstrates and cultivation methods | 19 |
| 2.3.4. Effect of fungi growth oyster mushroom on the chemical composition of the agricultural wastes | 21 |
| 2.4. Cultivation of shiitake mushroom (<i>Lentinus</i> | 23 |

| | Page |
|--|------|
| 2.5. Chemical composition of mushrooms | 26 |
| 2.5.1. Moisture content | 26 |
| 2.5.2. Protein content | 27 |
| 2.5.3. Lipids and fatty acids | 28 |
| 2.5.4. Ash and minerals content | 31 |
| 2.5.5. Crude fiber content | 32 |
| 2.5.6. Carbohydrates content | 33 |
| 2.5.7. Amino acids content | 34 |
| 2.5.8. Ascorbic acid content | 38 |
| 2.6. Preservation methods of mushrooms | 39 |
| 2.6.1. Canning of mushroom | 39 |
| 2.6.2. Drying of mushroom | 42 |
| 3. MATERIALS AND METHODS | 46 |
| 3.1. Materials | 46 |
| 3.1.1. Tested organisms and source | 46 |
| 3.1.2. Preparation of culture medium for pure strain | 46 |
| 3.1.3. Spawn production media | 46 |
| 3.1.4. Substrate media as for mushroom cultivation | 46 |
| 3.1.5. Growing bags system | 47 |
| 3.2. Methods | 47 |
| 3.2.1. Fungal propagation | 47 |
| 3.2.1.1. Preparation of media | 47 |