سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

سامية محمد مصطفى

شبكة المعلومات الجامعية

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التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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سامية محمد مصطفى

بالرسالة صفحات لم ترد بالأصل

USING MICROBIAL CULTURES FOR PRODUCING ANIMAL FEEDS FROM AGRICULTURAL WASTES

By

Mahmoud Wafik Ahmed Mohamed Sadik

B. Sc. (Agric. Science) Biochemistry, Faculty of Agriculture, Cairo University, 1993

M. Sc. Agric. Sci. (Environmental Sanitation) Faculty of Agriculture, Gent Univ., Belgium (1998)

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Under supervision of

Prof. Dr. Moawad K. Zahra

Professor of Agric. Microbiology, Dept. of Agric Microbiology.

Faculty of Agriculture, Cairo University.

Prof. Dr. Ahmed F. El-Shahaby

Professor of Agric. Microbiology, Dept. of Agric Microbiology

Faculty of Agriculture, Cairo University.

Dr. Ensaf E. Dawood.

Associate Professor of Agric. Microbiology, Dept. of Agric Microbiology

Faculty of Agriculture, Cairo University.

Cairo University

Faculty of Agriculture

Dept. of Agric. Microbiology

Approval sheet

Name : Mahmoud Wafik Ahmed Mohamed Sadik

Title : Using microbial cultures for producing animal feeds from agricultural wastes

Degree: Ph.D. in Agric. Sciences, (Agric. Microbiology)

Approved by

Prof. Dr. Wagdy A. Mashhour
Prof. of Agric. Microbiology,
and Vice-Dean for Graduate Studies and Research
Fac. Agric., Ain Shams Univ.

Prof. Dr. Ismail Hosny
Prof. of Agric. Microbiology,
Fac. Agric., Cairo Univ.

Prof. Dr. Moawad K. Zahra
Prof. of Agric. Microbiology,
Fac. Agric., Cairo Univ.

Prof. Dr. Ahmed Fadel El-Shahaby
Prof. of Agric. Microbiology,
Fac. Agric., Cairo Univ.

Date: / / 2003

Name of Candidate	: *Mahmoud Wafik Ahmed Mohamed Sadik*
Degree	: Doctor of Philosophy of Agriculture Microbiology.
Title of Thesis	: Using microbial cultures for producing animal feeds from agriculture wastes
Supervisors	: Prof. Dr. *Moawad Kamel S. Zahra*, Prof. Dr. *Ahmed Fadel El-Shahaby* and Dr. *Ensaf E. Dawood.*
Department	: Agriculture Microbiology
Branch	: ---------- **Approval :** / / 2003

ABESTRACT

Large amounts of agricultural wastes reaching hundreds of millions of tons are produced annually in cultivated land. Most of these organic materials are of no or very low economic value, farmers usually get rid of them by burning which results in serious environmental pollution. The objective of the present work is to study possible use of some agricultural wastes namely, sugar-cane bagasse, corn stalks and cotton stalks as carbonaceous materials for obtaining valuable products. Bioconversion of these materials under laboratory and field conditions using selected strains of microorganisms (solid state fermentation technique) together with some chemical treatments was carried out in a sequence of experiments. Evaluation of the final products was made.

Solid state fermentation (SSF) of sugar-cane bagasse by mixed culture (*Trichoderma viride* EMCC 107, *Saccharomyces cerevisiae* EMCC 56 and *Cellulomonas cellulans* ATCC 21681), succeeded to increase the crude protein content of the fermented sugar-cane bagasse up to 7.07 % at moisture content 80 %. Also, the biological treatment succeeded to decrease the organic carbon content from 37.20 (raw material) to 27.20 % after 23 days of solid state fermentation at 80 % moisture content.

Solid state fermentation of corn stalks by mixed culture increased markedly crude protein up to 12.25 % after 1 week.

Moreover solid state fermentation of cotton stalks (ground to 100 mm and 50 mm particle size followed by heat treatment either by autoclaving or steaming) recorded that grinding to 100 mm particle size resulted in less crude protein production (9.28 % and 9.80 % in autoclaving and steaming, respectively) than in case of cotton stalks ground to 50 mm particle size (10.20 and 11.53 % crude protein production in both autoclaving and steaming, respectively).

Combination of chemical (urea 5 %) and biological treatment (solid state fermentation) of cotton stalks was applied in both laboratory scale and in situ field.

It could be stated that, treatment with urea applied in situ field revealed crude protein increase up to 8.33 % followed by increasing

to 16 % after 18 days of solid state fermentation with the mixed culture. Fermentation process, also succeeded to decrease organic carbon, crude fiber, cellulose and lignin to 18.30 %, 34 %, 30.17 % and 20.20 %, respectively.

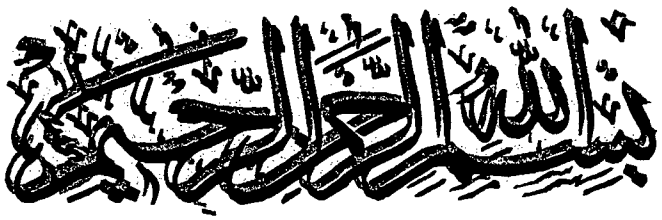
Also, it was succeeded to improve its protein quality through increasing of amino acids contents such as proline, tyrosine, valine, isoleucine and lysine (11.50, 14.53, 7.40, 17 and 12.20 g / 100 g protein, respectively in the fermented cotton stalks).

Biological evaluation of fermented cotton stalks on farm animals (sheep) was carried out. Different parameters were determined such as rumenal parameters (pH, N-NH_3 and TVFAs), rumenal microbiology (total viable counts, proteolytic, saccharolytic and cellulolytic bacteria and protozoal counts), blood parameters (SGOT, SGPT, serum urea, total protein and createnin) and effect on animal growth and digestibility. It could be revealed that animal fed on fermented cotton stalks (12.5 %) recorded the highest daily gain (179.31 g / day) compared to those fed on traditional ration (25 % hay + 75 % concentrated roughages).

Supervisor

M.K. Zahra

Prof. Dr. *Moawad K. Zahra*



"إن الذين قالوا ربنا الله ثم استقاموا تتنزل
عليهم الملائكة ألا تخافوا و لا تحزنوا و
أبشروا بالجنة التي كنتم توعدون"

صدق الله العظيم

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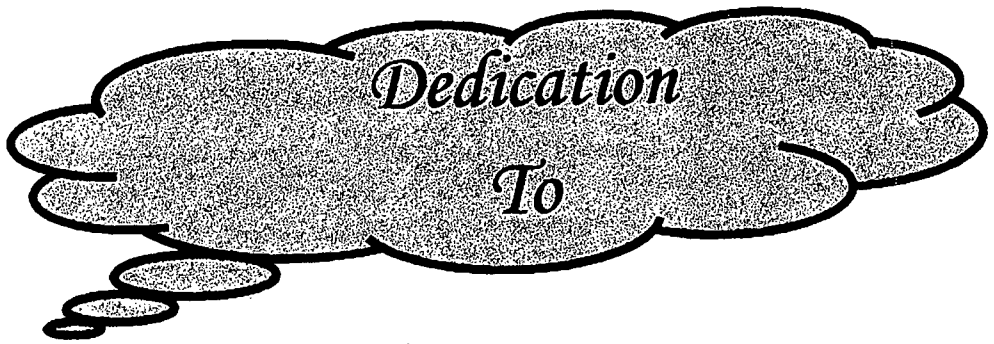

I would like to dedicate this thesis to my father and mother.

This is in memory of both noble, endless love and continuous giving over the years

Mahmoud Wafik Ahmed

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