BIOCHEMICAL STUDIES ON PESTICIDE RESIDUES BONDED WITH EGYPTIAN COTTON FIBERS AND SEEDS

By

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B.Sc. Agric. Sci. (Biochemistry), Fac. Agric., Cairo Univ., 2000
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THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

In

Agricultural Sciences (Agricultural Biochemistry)

Department of Biochemistry
Faculty of Agriculture
Cairo University
EGYPT

2016

APPROVAL SHEET

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Title of Thesis: Biochemical Studies on Pesticide Residues Bonded with Egyptian Cotton Fibers and Seeds

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ABSTRACT

Cotton still represents the most important crop and a main element in Egypt's national economy. Pests infesting cotton affect the crop's quality and yield. Pesticides are considered to be one of the major elements in protecting cotton production. The present work is to evaluate the effects of pesticides and their residues on the physical and chemical properties for fiber and seed on cotton varieties Giza 86 and Giza 90. The results indicated that pesticide residues in Giza 86 fiber and seed, were found also significant decrease in fiber length, fineness, brightness (Rd%), fiber strength, but significant increase in fiber elongation and yellowness (+b) with insignificant differences between Giza 86 and Giza 90 seasons 2012 and 2013. The present results showed significant increase in protein during the same season 2012 as well as insignificant variations between Giza 86 and Giza 90 varieties seasons of 2012 and 2013 in cottonseed constituents. The another results revealed that the quality of organically grown cotton was equal to or better than conventionally grown cotton. Fineness and maturity values for all the cultivars at 2012 and 2013 were satisfactory for the organic and conventional cotton and the oil content of cottonseed of Giza 86 and Giza 90 in seasons 2012 and 2013 was less than the organic samples and vice versa for protein content. These mean that the pesticides application produced pesticide residues and changes in the physical, chemical and mechanical properties.

Key words: pesticide residues, cottonseed, physical, mechanical, chemical properties

DEDICATION

I dedicate this work to whom my heartfelt thanks; above all, Allah, then to my family including mother, father ,wife and my kids for their patience , help &support along the period of my post-graduation

ACKNOWLEDGMENT

Sincere thanks to ***Dr. Emam Abd El-Mobdei Abd El-Rahim*** *and* ***Dr. Sherif Helmy Ahmed*** *professors of biochemistry, faculty of agriculture, Cairo university, for Sponsoring this thesis, continuous encouragement and guidance and valuable discussion during the scope of this work. My deep appreciation and Sincere thanks to* ***Dr. Yassmin Emam Abd El-Mobdei Abd El-Rahim*** *department of entomology and pesticide, faculty of agriculture, Cairo University, for continued help. I would like to express my grateful gratitude to* ***Dr. Salah Mansour Saleh*** *professor Researcher of Textile Chemistry, Cotton Research Institute (ARC), for his generous guidance and valuable discussion during the scope of this work.*

Finally my special thanks are to my colleagues and friends

In the Biochemistry Department, faculty of agriculture, Cairo university, chemistry Department, Cotton Research Institute, Agriculture Research Center and Lovely Egypt.

LIST OF ABBREVIATION

C.R.I: Cotton research institute

DP: Degree of polymerization

A.C.H: American Cotton Handbook

WHO: World Health Organization

NIOH: National Institute of Occupational Health

ChE: Cholinesterase

OCPs: Organochlorine pesticides

OP: Organophosphate pesticides

MRL: Maximum residual level

TPs: Transformation products

GOTS: Organic Textile Standard

OE: Organic Exchange

DDT: Dichloro-Diphenyl-Trichloroethane

DDE: Dichloro-Diphenyl-Dichloroethylene

DDD: Dichloro-Diphenyl-Dichloroethane

HCH: β-hexachlorocyclohexane

BHC: Benzene Hexachloride

PCBs: Polychlorinated Biphenyls

OC: Organochlorine

HCB: Hexachlorobenzene

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INTRODUCTION

Cotton termed as “The King of Fibers and a crop of prosperity”, having a great impact on men and matter, is an industrial commodity of worldwide importance. It is a variety of plants of the genus *Gossypium*, belonging to the *Malvacae* family. The areas under cotton production in the world are estimated at around 30-31 million hectares. In Egypt, cotton is a very important crop that is cultivated mainly for fibers in industry and seeds for oil which is of great value (Mohamed *et al.*, 2013). Egypt is known as an exporter of high quality cotton, which has an international reputation in special features that attract niche market consumers. Cotton plays a dominant role in the country’s economy by meeting the domestic and export demands, contributing significantly to agriculture, industry, employment and export earnings. The 2006 statistics1 shows that Egyptian cotton provided a cash income to roughly one million small farmers. In addition, the cotton industry labour for totals to about 1 million (Abu Hatab, 2009). During the last years, cotton plants in Egypt have been attacked by numerous pests from planting till harvest, including sap sucking pests, cotton leaf worms and cotton bollworms, causing great damage to plants and crop yield. All the plant parts may be attacked, but the most serious pests primarily attack the fruiting portions, squares, flowers and green bolls, reducing both quantity and quality of the harvested lint and seeds, during the late season. Cotton plants greatly suffer from infestation with pink bollworm, *Pectinophora gossypiella* (Saunders) and spiny bollworm, *Earais insulana* (Boisd) (Mohamed *et al*., 2013). The main