

**THE ROLE OF EFFECTIVE INSECT POLLINATORS
IN IMPROVING FRUIT CHARACTERISTICS OF
SOME HORTICULTURAL CROPS**

By

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THESIS

**Submitted in Partial Fulfillment of the
Requirements for the Degree of**

DOCTOR OF PHILOSOPHY

In

**Agricultural Sciences
(Economic Entomology)**

**Department of Economic Entomology and pesticides
Faculty of Agriculture
Cairo University
EGYPT**

2016

APPROVAL SHEET

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Title of Thesis: The role of effective insect pollinators in improving fruit characteristics of some horticultural crops
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ABSTRACT

The present study was carried out on three plum cultivars; Golden Japanese, Hollywood and Santarosa at Elkalubia Governorate during 2012 & 2013 to study the behavior of bee foragers and the response of sequential increase of honeybee visits/ flower on plum cultivars on fruit set and fruit characteristics on the studied cultivars. Several sequential treatments were applied from 1 bee visit/ flower up to ten bee visits/ flower besides zero visit (control) and open pollination treatments. Investigations on *Annona* species (*Annona atemoya*, *Annona cherimoya* and *Annona squamosa*) was conducted at El-Mansouria district, during 2014 & 2015 to identify insects visitors and also study the effect of insect pollination treatment on fruit set and fruit characteristics in comparison with hand pollination (control).

In general, Hollywood plum cv. was significantly more attractant to bee foragers than Santarosa and Golden Japanese cvs. with highest activity at 2 p.m. The activity of honey bee foragers in collecting of pollen, nectar or both from flowers was investigated. Highest percentage of pollen gatherers was recorded on flowers of Hollywood cv. followed by Golden Japanese then Santarosa flowers and reached to its peak at 11 a.m. In the other hand, Golden Japanese flowers were significantly attracted the nectar foragers than Santarosa and Hollywood flowers with peak at 2 p.m. The collection of both nectar and pollen in the same trip by one forager was also observed on the three studied plum cvs. Santarosa flowers attained the first rank encouraging honeybee workers for gathering the both types of food. This activity pattern concentrated at early morning or late afternoon with no significant difference between them.

On the present study, bee foragers showed significant benefit to plum cvs. and significant improving as a result of increasing bee visits/ flower when compared with self-pollination (control) on final fruit set as well as on fruit characteristics; fruit weight, volume and T.S.S. Increasing honey bee visits/ flower improved fruit quality through decreasing fruit firmness.

Thus, it can be recommended from the obtained results to maintain sufficient honey bee colonies in Golden Japanese, Hollywood and Santarosa plum orchards that offer at least ten bee visits/ flower to increase fruit set and to achieve satisfactory improvement in yield and fruit characteristics.

In *Annona*, *Carpophilus hemipterus* was the most abundant insect visitor to *Annona* species under investigation.

Insect pollination treatment was carried on *Annona* species by *Carpophilus hemipterus* beetles results in high improvement in fruit set and fruit characteristics compared with hand pollination treatment (control).

Key words: Plum, *Annona*, Cross-Pollination, Honeybee, beetle pollination, Fruit Set, Fruit Characteristics.

DEDICATION

I dedicate this work to whom my heart feel towards them with love; to my father Hassan El-Dereny, mother Alya El-Dereny, my sister Soha and my brother Mouafak and their children Marwan, Moustafa, Sherien, Mohamed, Malak, Farouk and Hassan and I thank all my family for bearing with me and for their patience, assistance and encouragement to me throughout my study period. Special dedication with love to my little sister Hagar El-Dereny for all the support and encourage she lovely offered along the period of my post graduation.

ACKNOWLEDGEMENT

First of all, thanks to Allah for helping me to conduct this work. It is a great pleasure to express my deep gratitude and indebtedness to my supervisor Prof. Dr. MOHAMMAD ABDAL-WAHAB ABD AL-FATTAH, Professor of Economic Entomology, Fac. of Agric., Cairo University for suggesting the problem of study, for his precious guidance, encouragement, moral support have enabled me to come this far and for being a wonderful mentor and for his devotion to my research and to me as a student

I am particularly grateful to Prof. Dr. IBRAHIM ELSHENAWY, Assistant Professor of Pomology, Fac. Agric., Cairo University and Prof. Dr. EMAD EZZ EL-DIN THARWAT, Head Researcher of Apiculture, Plant Protection Research Institute, Agriculture Research Centre, Ministry of Agriculture for their continuous encouragement and valuable discussions and giving invaluable comments on the work which have been inspirational throughout the work.

I wish to express my sincere thanks and Grateful appreciation to all staff members of apiary, Fac. of Agric., Cairo University and Apiculture department, Plant protection Institute, Agriculture Research centre, Ministry of Agriculture.

This work could have been a distant dream if I did not get the moral encouragement, help and continual support from my family and friends

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