



كلية العلوم
قسم علم الحشرات

دراسات بيولوجية وبيئية ووراثية على الطفيل من جنس "براكون"
براكونيدي: رتبة غشائية الأجنحة

رسالة علمية مقدمة من

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للحصول علي درجة دكتوراه الفلسفة في
(علم الحشرات)

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Department of Entomology
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**Biological, ecological and genetical studies on the
parasitoid, *Bracon* spp.
(Hymenoptera: Braconidae)**

A thesis
Presented to the Faculty of Science,
Ain Shams University, For the
Award of the Ph.D.
Degree
(Entomology)

BY

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LIST OF ABBREVIATIONS

ha	hectare
Rs	Indian Rupee
RAPD	Random Amplified Polymorphic DNA
DHC	differential hemocytes counting
d	Days
s	Second
μl	Micro liter
μm	Micro molecules
dNTP	Deoxyribonucleoside triphosphates
UPGMA	Unweighted Pair Group Method with Arithmetic Mean
MEGA4	Molecular Evolutionary Genetics Analysis software version 4
NCBI	National Center for Biotechnology Information
BLAST	Basic Local Alignment Search Tool

ABSTRACT

The present work was carried out to study some biological aspect of *B. brevicornis* under laboratory condition as a biological control agent and determine the best lepidopteran host for its rearing.

During our survey in three governorates (Giza, Qaliubeia and Assiut) during (March 2011- March 2013), the data indicate that *Bracon* spp. was found associated with *Tuta absoluta* in fields of tomatoes. Our finding refer to the parasitoid was recorded with high population in August, September and October than that recorded in March and April.

Morphological characters of the parasitoids were showed that, the colour of adult parasitoids was variable among both species, body nearly orange brown to largely dark brown. The mean number of antennal segments were (15.2 ± 0.42453 and 13 ± 0.00 segments) for female *B. hebetor* and *B. brevicornis* respectively, and the mean number of antennal segments of male *B. hebetor* and *B. brevicornis* were (18.57 ± 0.18 and 20.87 ± 0.19 segments) respectively. While low levels of similarity (78.21% in the partial 16S rRNA genes and 86% in RAPD-PCR) appeared between the insects *B. hebetor Egypt* and *B. brevicornis Egypt*. Moreover, a phylogenetic tree constructed from 16S rDNA sequences showed that *B. hebetor Egypt* clustered with the *B. hebetor* with a degree of similarity 92%, but *B. brevicornis Egypt* clustered in a separated group.

When the parasitoid was reared in the laboratory on different hosts (*Ephestia kuehniella*, *Galleria mellonella*, *Corcyra cephalonica*, *Spodoptera littoralis*, *Sesamia cretica* and

Pectinophora gossypiella) the result revealed that, the type of host had great impact on the durations of the immature stages and longevity of the parasitoid, in addition the laboratory host, *G. mellonella*, was more suitable host for *B. brevicornis* than other tested hosts, Where *G. mellonella* was considered the most preferable site for oviposition (268.88 ± 19.65 eggs).

When the parasitoid was reared on natural host (*G. mellonella*) we found that the total number of eggs per day increased as parasitoid density increased with a constant number hosts. On the other hand the deposited eggs per day decreased as host density increases with a constant parasitoid density.

The function response of *B. brevicornis* to different densities of *G. mellonella* was exhibit type II. Rate of attack (a) and handling time (T_h) were 1.03 and 0.6672 hours, respectively. The expected maximum number attacked host T / T_h is 35.97 hosts per day.

The effect of entomopathogenic fungi, *Metarhizium anisopliae* and *Beauveria bassiana* on adult parasitoid was low or negligible when compared with control.

The parasitoid failed to complete their life on the diets. Female could not deposit eggs in absence of the larval host.

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