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## SUMMARY

Bostrichid wood-boring insects are considered as important economic pests attacking ornamental, shade, horticulture, wood and wild trees. The present work was conducted in Division of wood boring insects, Ministry of Agriculture as well as in Plant Protection Department, Faculty of Agriculture Al-Azhar University on some bostrichid boring species. The work extending from 1997 to 1999 year.

This work was carried out to study several of ecological and biological aspects of such insect pests at some Egyptian Governorates. These Governorates are: Ismailia, Qalubia, Giza and El-Wady-El-Gaded. The main of this present subject are summarized as follows:

I-survey of bostrichid wood-boring insects.

This survey comprised 15 districts covered previously mentioned Governorates. The studied localities were chosen where the presence of infested trees.

### **a-Association of Bostrichid Borers With Their Host Plants:**

During this work, nine species of wood-borers belonging to Family Bostrichidae (order: Coleoptera) were recorded associated with twenty three host plants. These species were classified into six genera. The highest number of borer species (8 species) was recoded at both Qalubia and Giza Governorates, while the lowest number (6 species) was found at El-Wady-El-Gaded Governorate. The highest number of borer species

(6 species) was recorded on palm trees, followed by mango trees (5 species), recorded on sesban bushes, Okra stalks and willow trees while the lowest one (one species).

### **b-Activity Period of Bostrichid Borers:**

There were differences of activity periods of tested borers not only from Governorate to another but also from one district to the others. The activity periods of these borers observed during the period extending from 1<sup>st</sup> week of April to 3<sup>rd</sup> week of November.

### **2-Biological Studies on Some Borers:**

*Dinoderus minutus* and *Bostrychoplites zickeli* were chosen to studying their biology.

#### **a-Biological Studies of *D. minutus*:**

##### **1-The egg stage:**

The general description and oviposition site, the incubation period of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generation were studied. The incubation period for these generations were  $6.2 \pm 0.44$ ,  $4.7 \pm 0.45$  and  $7.4 \pm 0.75$  days, respectively. Rate of hatchability ranged between 56.25 % to 95.7 %.

##### **2-The Larval Stage:**

The general description of the newly-hatched and full-grown larvae were done. The duration of the larval stage ranged between 47 to 167 during three annual generations. The duration of pre-pupa varied from 0 to 3 days. The maximum average of pre-pupal duration ( $1.9 \pm 0.18$  days) was recorded in 3<sup>rd</sup>

generation at climatic factors averaged 21 °C and 61 % R.H., while the minimum average ( $0.8 \pm 0.13$  days) was recorded at 36 °C with 57 % R.H.

### **3-The Pupal Stage:**

The general description of pupa was studied, the pupation occurred inside pupal cell in the sap wood region. The duration of pupal stage ranged between 4 to 11 days. The maximum average of pupal duration ( $9.1 \pm 0.46$  days) was recorded in 3<sup>rd</sup> generation at 20.9 °C and 59 % R.H. The minimum average ( $5.2 \pm 0.36$  days) was obtained in 2<sup>nd</sup> generation at 36.4 °C with 58 % R.H.

### **4-The Adult Stage:**

The general description was studied, the adult remained in the pupal chamber until its body become hard. This period extended from 1 to 3 days in the 1<sup>st</sup> generation with an average of  $1.8 \pm 0.2$  days at 29 °C and 55 % R.H. In the 2<sup>nd</sup> generation, this period ranged between 0 to 2 days with an average of  $0.9 \pm 0.18$  days at 35.2 °C and 56 % R.H. and between 1 to 3 days in the 3<sup>rd</sup> generation it recorded 1-3 days with an average of  $2.4 \pm 0.22$  days at 20.9 °C and 51 % R.H. The pre-oviposition period ranged between 0-4 days in different annual generations. In 1<sup>st</sup> generation, it was 1-3 days with an average  $2.1 \pm 0.23$  days at 20.9 °C and 51 % R.H., In 2<sup>nd</sup> generation it was 0-3 days with an average  $1 \pm 0.2$  days at 33.7 °C and 57.4 % R.H. In 3<sup>rd</sup> generation, it ranged from 1 to 4 days with an average of  $1.9 \pm 0.27$  days at 33.3 °C and 57.9 % R.H.

The averages of oviposition periods in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generations were  $4.8 \pm 0.36$ ,  $3.3 \pm 0.33$  and  $4.1 \pm 0.37$  days respectively.

The post-oviposition period ranged between 4 to 34 days in three generations.

Longevity of adult (female ranged between 11 to 46 days, while the male longevity ranged 10-32 days. The longest longevity of male and female recorded in 3<sup>rd</sup> generation, while the shortest longevity of male and female recorded in 2<sup>nd</sup> generation. The borer *Dinoderus minutus* has three generations in year on the bamboo-wood. The generation period 12, 9 and 27 weeks in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generation, respectively in year 1997, while, in year 1998 this period recorded 12, 10 and 27 weeks in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generation, respectively.

## **Biological Studies of *B. zickeli* Mars:**

### **1-Egg Stage**

The laboratory observation showed that female deposited its eggs through the vassels of vascular bundles of wood. the incubation period ranged between 4 to 9 days with an average of  $5.4 \pm 0.52$  days.

### **2-Larval Stage**

- a- The general description of the full-grown larva was done.
- b- The larval duration between 56 to 76 days with an average of  $61.7 \pm 1.9$  days. The pre-pupal duration ranged of  $1.8 \pm 0.29$  days.

### 3-Pupal Stage:

The general description was done. The pupal duration of this borer ranged between 8 to 11 days with an average of  $9.2 \pm 0.29$  days at  $26.8^{\circ}\text{C}$  and 63 % R.H.

### 4- Adult Stage

a-The general description of adults (male and female) was made.

b-The adult longevity of this insect borer ranged between 7 to 20 days.

c-The total life cycle ranged between 77 to 97 days with an average of  $84.5 \pm 1.9$  days.

### Ecological Studies of *D. minutus*:

#### A-Seasonal abundance and population fluctuations of *Dinoderus minutus*.

The beetle of *D. minutus* were abundant throughout the period from 1<sup>st</sup> half of February until 2<sup>nd</sup> half of November, recording three occurrence periods. The emergence periods of beetles were 10, 10 and 16 weeks in year 1997 and 14, 10 and 14 weeks in year 1998. The population peaks of these periods detected during the 1<sup>st</sup> half of April, 2<sup>nd</sup> half of June and 1<sup>st</sup> half September in year 1997 and 2<sup>nd</sup> half of April, 1<sup>st</sup> half of July and 1<sup>st</sup> half of September in year 1998.

#### B-Effect of Moisture Content of Bamboo-Wood on Infestation by *Dinoderus minutus*

The highest infestations were recorded at a moisture content of 28.57 % and the least ones were recorded at moisture content of 37.68 %.

### **C-Effect of Specific Density and Thickness of Bamboo-Wood on The infestation of *Dinoderus minutus*.**

The highest infestation recorded of the variety *Bambusa arundinacea* when specific density was  $0.99 \text{ G./Cm}^3$  and thickness of pieces was 9.4mm., while the lowest infestation was recorded on the variety *D. strictus*, whereas the variety *Bamboo vulgaris* was resistant to infestation (specific density =  $0.4 \text{ G./Cm}^3$  and thickness = 2.8 mm.).

### **Ecological Studies of *Bostrychoplites zickeli***

#### **A-Effect of date palm varieties on some biological activities of *B. zickeli*.**

##### **1- On adult longevity**

The highest longevities of males and females were recorded on the Seidi variety, while the lowest longevities were recorded on the Zeghloul variety.

##### **2-On The Number Produced Per female:**

The highest number produced from female rearing on males variety ( $14.4 \pm 1.72$  beetles) and lowest number recorded on Zaghloul variety ( $8.6 \pm 0.81$  beetles).

##### **3-On The Period of Emergence:**

The longest period was recorded on Males variety ( $39.4 \pm 3.5$  days) and the lowest period was recorded on Eglani variety ( $27.8 \pm 1.39$  days).

#### **4-On The Duration of Generation:**

The longest period of generation observed on Males variety ( $92.4 \pm 2.5$  days) and the shortest period was recorded on Eglani variety ( $86.6 \pm 4.49$  days).

#### **B-The Relative Susceptibility of Date Palm Varieties to Infestation With *B. zickeli*:**

The highest initial infestation was recorded on Haiani variety ( $9.8 \pm 2.26$  beetles) while the least infestation was on Seedi variety ( $0.6 \pm 0.4$  beetles).