THE LIFE CYCLE OF THE WASP BEETLE, *CHLOROPHORUS VARIUS* MULL. (COLEOPTERA : CERAMBYCIDAE) ON PEACH IN EYGPT.

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Abstract

The wasp beetle , *Chlorophorus varius* Mull. (Coleoptera: cerambycidae) is a harmfull pest in peach orchards in Egypt. Larvae attack trunks and branches to live and feed inside the wood causing them to be broken and die. The behaviour and duration of each stage with the total life cycle and annual generations were studied. The egg , larval, pupal and adult stages with the total life cycle and annual generations were. The egg. , larval, pupal and adult stages lasted 5 - 8, 272 - 339 , 8-19 and 10 - 27 days , respectively. The pre-oviposition , oviposition and post oviposition periods were 6 - 9 , 4 - 11 and 0 - 3 days, respectively. The female laid 28 - 79 days. The total life cycle was completed in 298-359 days indicating that the insect might have one generation per year.

INTRODUCTION

The area under cultivation with peach trees (*Prunus persica* Sieb. Zucc.) in Egypt is almost about 80. 000 feddans of which 80% exists in Sinai. Peach trees are liable to attack by several borers. In spite of the fact that *C.varius* hardly affects peach trees, yet peach cultivators are not familiar with it. larvae which bore deep inside the trunks and branches cause them to weaken , easily broken and die.

C. varius is a polyphagous pest infesting peach, apricot, grapevine, apple, white mulbery, black mulbery, Egyptian acacia, false acacia, Egyptian willow,

weeping willow, white poplar, Jambolan plum, christmas berry tree, casuarina, royal poinciana, bamboo, sisso and caster oil. Moreover, the present author provided the first record of *C. varius* on fig plum and pear trees. Several other authors studied the pest on fruit trees. (El- Zoheiry 1950; Nour 1963; Alfieri 1976; Tadros 1982; Haggag 1982).

The aim of the present work is to add some knowledge on the biology of this pest on peach trees including behaviour and duration of the different stages, total life cycle and the annual generation.

MATERIALS AND METHODS

Branches and trunks of peach trees infested with *C. varius* were collected during winter months (December, 1987 and January, 1988) from Meet Ghamr , Dakahlia governorate. Specimens were kept in wire screen wooden cages (60x60x100cm) in the laboratory. Branches were dissected and mature larvae ,pre-pupae and pupae were individually introduced into 1x4 cm specimen tubes until the beetles emerged. Beetles were left untouched after emergence to allow enough body hardening before sexing.

Pairs of beetles (one female and one male) were placed into one pound glass jars containing corrugated filter paper and two slices of peach branches (3cm diameter and 1/2 cm thickness) held together with rubber band to act as oviposition sites. Jars were examined daily to renew corrugated paper and wooden slices, and for collecting the eggs which were laid between the inner surfaces of the wooden slices. for Soon after death, female beetles were dissected to count the well developed eggs in their ovaries. Deposited eggs were transferred into Petri dishes and kept in the laboratory until hatching . Hatched larvae were reared on wooden slices similar to those used for oviposition but more thicker (3-5 cm).

Larvae were individually forced into small holes artificially made with a fine needle at a rate of 10 larvae / slice. About a month later, the slices were dissected and the surviving larvae were individaully transferred to new peach cuttings (1-1.5 cm diameter and 10 cm length) kept in glass jars of suitable size. The larvae were tranferred to new cuttings periodically whenever necessary. Thicker branches were used as the larvae grew larger. The pre-pupae were place in petri dishes for daily

examination until they reached the pupal and adult stages.

RESULTS AND DISCUSSION

Egg Stage

Eggs of *C. varius* are usually deposited singly or in groups of 2 - 14 eggs each on peach trees in bark cracks especially at pruning and wounded sites and the old exit holes.

The incubation period of *C. varius* eggs under mean laboratory conditions of 30.4°C and 68% relative humidity ranged from 5 to 8 days , with an average of 6.10 ± 0.06 days (Table 1).

Table 1. Duration of the diferent stages and the total life cycle of *C.varius* under laboratory conditions.

Stage	Duration (days)		Lab. conditions	
	Range	Average	Temp.° C	R. H. %
Egg	5 - 8	6.10 ± 0.06	30.4	68
Larva	272 - 339	296.04 ± 2.22	21.9	72
Pupa	8 - 19	13.24 ± 0.38	30.2	61
Pre-oviposition	6 - 9	7.05 ± 0.15	30.7	58
Oviposition	4 - 11	7.20 ± 0.41	30.7	58
Post - ovipostion	0 - 23	1.60 ± 0.23	30.7	58
Longevity	10 - 27	15.85 ± 0.62	30.7	58
	11 - 27	17.50 ± 0.89	30.7	58
Total life cycle	298 - 359	322.62 ± 1.95	24.1	63

Upon hatching , the larva bore directly into the wood of the host at the contact site immediately facing the point where the shell was stuck and presses the resultant sawdust into the egg shell.

The percentage of egg hatchability of *C. varius* ranged between 90 and 100% with a mean of 96%

Larval Stage

Field and laboratory observations showed that larvae of *C. varius* spend the whole duration inside the tunnels boring deep into the wood of peach trees . In such case , detection of new infestation is quite hard. Young larvae excavate minute irregular tunnels under the bark. As the larvae grew older and larger, they bore deep into the heartwood and feed on the internal lignified tissues resulting in numerous cylindrically twisted elongate tunnels parallel to the axes of the stem or the branch. The larval tunnels reach more or less 50 cm in length and are filled with compcat powdery material formed of sawdust mixed with faeces all pushed behind the larvae and hardly pressed into the tunnels . This behaviour gives the larvae the ability to move forward. In spite of such extensive boring of the larvae, no external symptoms of infestation appear on the trees. In case of severe infestations, the bark cracks and split and , consequently, the tunnels begin to appear. At this stage, recognition of damage becomes possible.

In all cases, a single larva was seen in a separate tunnel under mean laboratory condition of 21.9 ^{o}C and 72 % R.H. The larval duration ranged 272-339 days , with and average of 296.04 ± 2.22 days (Table 1).

By the end of the larval stage , the mature larva passed a pre - pupal period that lasted from 5-9 days, with and average of 6.72 ± 0.13 days.

Pupal Stage

When the larva reaches maturity, it starts to excavate a vertical or semi - vertical pupation tunnel . Pupation tunnel is lined with fine sawdust at the blind and terminal ends. The terminal is adjusted to the underside of the bark and prepared for emergence by a thin semi-ciruclar bark through which emergence takes place. In the laboratory, pupation takes place outside the pupal tunnel .

Under mean laboratory conditions of 30.2 ^{o}C and 61% R.H., the pupal duration ranged 5-9 days (average 6.72 + 0.13) (Table 1).

The Adult Stage

Beetle emergence always occurs inside the pupation tunnel. After emergence, beetles remain inside the tunnels for 3-5 days (average of 3.46 + 0.08 days) to allow the cuticle to be hard enough before they took their way outside the tunnel .

Under mean laboratory conditions of 30.2 ^{o}C and 61% R. H., the percentages of beetle emergence ranged between 80-100 % with a mean of 92% .

Out of 447 beetles emerged during the period of study, 238 were females and 209 were males, indicating a sex ratio of 1 female : 0.88 male.

Mating and oviposition

C.varius beetles are active for mating and oviposition during day time . Mating usually took place 4 - 6 days after emergence (i.e.one day after the beetles emerge from the tunnels). Copulation lasted 20 - 105 minutes with an average of 53.50 $\pm$ 5.73 minutes , and the two sexes were capable of repeated coitus during their life span. The number of copulation ranged 7-23 times with a mean of 11.40. The more copulation occurs, the more eggs are laid.

The female beetle usually deposits its eggs in bark cracks of peach trees. Eggs are stuck properly in position with the aid of a gummy secretion.

At mean laboratory conditions of 30.7^{o}C and 58% R.H., mated females started to lay eggs 6-9 days after emergence with an average pre- oviposition period of 7.05 $\pm$ 0.15 days .

The oviposition period of the mated females ranged 4 - 11 days with an average of 7.20 $\pm$ 0.41 days . The female beetles laid 28-79 eggs , with a mean of 57.75 eggs / female. About 72 % of the total eggs were laid during the 7 th to 11 th days of the females life span, and 28% of the eggs were deposited during the rest of their life.

The number of eggs which remained in the ovaries of the ovipositing mated females after death was 1-42 eggs , with a mean of 21.45 eggs / female , thus rising the total fecundity of the mated female beetles to 66 - 93 eggs , with a mean of 79.20 eggs / female .

The post - oviposition period of the mated female beetles ranged 0-3 days with an average of 1.60 $\pm$ 0.23 (Table 1) .

Adult longevity

At mean temperature of 30.7°C and 58% R. H., the adult longevities of the female and male beetles were 15.85 ± 0.62 (range 10 -23) and 17.50 ± 0.89 (range 11 - 27) days , respectively (Table 1).

The Total life Cycle and Annual Generation

Under the prevailing mean laboratory conditions of 24.1°C and 63% R. H., the total life cycle of *C.varius* was completed in 298- 359 days with an average of 322.62 ± 1.95 days (Table1) .

These results indicate that *C. varius* most probably has one generation per year.

REFERENCES

1. Alfieri , M.A., 1976. The Coleoptera of Egypt . Bull. Soc. ent. Egypt. 5:223.
2. El - Zoheiry, M. S., 1950 . The wasp beetle , *Chlorophorus varius* Mull. (Col. : Cerambycidae) a new pest of grapevine in Egypt. Proc. of the 8th International Cong. of Entomology, Stockholm, pp. 727 - 731.
3. Haggag, S. M., 1982. Studies on *Chlorophorus varius* Mull. (Col. Cerambycidae) . M. Sc. Thesis , Fac. of Agric., Al - Azhar Univ.
4. Nour, H., 1963. Classification of wood boring beetles as known to exist in Egypt, U.A. R. (Coleoptera). Tech. Bull., 35 pp.
5. Tadros , A. W., 1982. Biological , ecological and control studies on *Paropta paradoxa* H. - Schaeff. (Lep. : Cossidae) and *Chlorophorus varius* Mull. (Col. : Cerambycidae) on grapevine trees in Egypt. Ph. D. Thesis, Fac. of Agric., Cairo Univ. Egypt.

دورة حياة حفار ساق الخوخ ذو القرون الطويلة *Chlorophorus varius* علي أشجار الخوخ في مصر

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يسبب حفار ساق الخوخ ذو القرون الطويلة أضراراً بالغة في حدائق الخوخ في مصر . تهاجم اليرقات السوق والأفرع لتعيش وتتغذي داخل الخشب مسببة تكسر وموت الأجزاء المصابة. درس سلوك وفترة حياة الأطوار المختلفة بالاضافة إلي إجمالي دورة الحياة والأجيال خلال العام. استغرقت أطوار البيضة ، واليرقة والعذراء ، والحشرة الكاملة ٥ – ٨ ، ٢٧٢ – ٣٣٩ ، ٨ – ١٩ ، ١٠ – ٢٧ يوماً علي التوالي . بلغت فترات ما قبل وضع البيض ، ووضع البيض، وما بعد وضع البيض ٦ – ٩ ، ٤ – ١١ ، صفر – ٣ يوما علي الترتيب ، كما وضعت الأنثي الملقحة ٢٨ – ٧٩ بيضة وأكملت الحشرة دورة حياتها في ٢٩٨ – ٣٥٩ يوما، ودلت الدراسة علي أن للحشرة جيلاً واحداً تقريباً خلال العام.