BIOLOGY OF THE CITRUS BUTTERFLY, PAPILIO DEMOLEUS DEMOLEUS L. (LEPIDOPTERA, PAPILIONIDAE) IN DJAHROM

A. FARAHBAKHSH and A. KASHKOOLI (1)

Plant pests and Diseases Research Laboratory of Shiraz

Introduction:

The citrus butterfly, *Papilio demoleus demoleus* L., sometimes called the lemon butterfly (Ebling, 1959), is one of the pests of citrus orchards especially citrus nurseries and seedlings in southern Iran. The Insect is ditributed in Persian Gulf and Oman coastal area, Khuzestan, Fars and Baloochestan (Farahbakhsh Gh., 1961). The larva which is called citrus caterpillar or orange dog feeds on tender leaves and eats them from the edge right into mid-rib. In case of severe infestations, the young nursery plants become deprived of leaves.

This research was conducted to study place of oviposition, number of eggs laid by the female, hatching period of eggs, larval and pupal periods, the lenght of adult life and the lenght of life cycle in Djahrom area which has more than 3000 hectars under citrus cultivation.

Materials and Methods

Cages of a cubic wooden framework with dimensions of $80 \times 40 \times 50$ cm covered with metalic mosquito nets were used for orchard experiments. Plastic cages with dimensions of $22 \times 15 \times 8$ & $18 \times 8 \times 5$ cm were used for laboratory experiments. The cages were placed in the Citrus Research Office yard in Djahrom which is located near cirus orchards and there were 8 citrus trees (sour orange, sweet orange, sour lime and mandarin). One pot of blossoming petunia was put in each cage as nectar source for newly emerged adults. Two pots of prevviously examined related citrus plants were also placed in each cage as food sources. Only one male and one female butterfly of the same age were kept in each cage. Behavior of different stages were carefully observed from 7 AM. to 6 PM.

(1). P.O. Box 369, Shiraz, Iran

Results

The eggs are laid singly on the underside of the tender leaves. A single female deposits 12-77 eggs, 38.17 on the average. The average time required for inc...oation, larval and pupal stages were 3.61, 16.68 and 8.54 days respectively, from the end of April until the end of September. In October the incubation and larval stages averaged 8.91 and 30.85 days. The lenght of adult life had an average time of 6.21 days. The pupal stage averaged 89.91 days in winter. The life cycle had an average of 34.51 days. The pest had 4 to 5 generations under Djahrom conditions (table 1).

stage	April to June	July & August	September & October	November	Remarks
Egg	3.76	2.47	4.61	8.91	
Larva	16.28	15.94	17.82	30.85	osO Lora I.
Pupa	8.35	7.44	9.85	and vers them he points are worth was col	in winter 89.91
Adult	5.81	4.91	6.30	aridan di Ala A thatistan di A	
Average	34.20	30.76	38.58	dina antiva	retan i nater

Table 1 – Length of egg incubation, larval," Pupal and adult stages of citrus butterfly on citrus (average time)

REFERENCES

DAVATCHI, A. 1949. The Important pests of growing plants and their control. Ministry of Agriculture, Tehran, Iran. (in persian)

- EBLING, W. 1959. Subtropical Fruit Pests. University of California, Division of Agricultural Sciences, U.S.A.
- FARAHBAKHSH, Gh. 1975. Citrus Trees Pests. Ministry of Agriculture, Extension Organization, Tehran, Iran. (in persian)
- FARAHBAKHSH, Gh. 1961. Economically important insects and other enemies of plants and agricultural products in Iran. Ministry of Agriculture, *Pub. No.* 1 Tehran, Iran.

POURKHATAI, S. and M. Eshraghi, 1976. The Report of Citrus Research Program of Khuzestan. Ministry of Agriculture, Plant Pests and Diseases Research Laboratory of Khuzestan, Ahwaz, Iran. (in persian)

- SAEED, A. 1964. Citrus Fruits. The Punjab Fruit Journal, No. 90 99 West Pakistan.
- SHARIFEE, S. and N. Zarea, 1970. Annals of the Entomological Society of America, vol. 63: 1211 – 1212.

Daring Coroser Leffel in Lans W. P. 15 (1997), 5 Ket per ha and Dield far W. P. 2007, 6.1 (p. 2016), ware applied at the local war and 200 m2 with 1 10 L. sprayer and mained Serverman fully solved the served was form

Set a triple and the there are not the fact of and "no top-back the set was taken in the set of the

The converse of the insection more sole than sole the relief is fauture, with 10 pero lighters and 10 pper D'sitivity were between \$1-20°, and \$1-104°, reserved to 37 range? These analysed.

The rate of designing of the case (producedes of the first deades is shown in the providence.

In most of the meet it was found that they sull its of both instaliside was greater to the teo 1 Som depth than in the site site in Low digits.

Dama the 2 year study period the limited conduct detroated from 5 periods 0.001 pp.a and Dobline detroated from 0.5 to 0.01 m and the the nodeed that the rate of 6 5 k parts repid in the first mine and the shert flor following member and 15 periods the to microbial action

The Addit Mill XOB D.7 . ICOORHIE Track March 111