

LABORATORY REARING OF RED PALM WEEVIL, *RHYNCHOPHORUS FERRUGINEUS*. OLV. (COLEOPTERA: CURCULIONIDAE) ON ARTIFICIAL DIET

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Abstract

Laboratory trails were conducted in order to set up rearing program for red palm weevil *Rhynchophorus ferrugineus*. OLV. for use in different experimental researches .An artificial diet specified for red palm weevil was created. One kilogram of the artificial diet made from local materials could rear 6 larvae for about 3 months with approximated cost 3 L.E.

INTRODUCTION

The red palm weevil *Rhynchophorus ferrugineus* OLV. is considered the most destructive pest to palm trees in many countries. Biological and toxicological researches need a mass of insects for handling . Accordingly, mass rearing is very essential part of such studies . Throughout the plan work of Middle East Red Palm Weevil Program , Egyptian team created a successful artificial diet.

Mass rearing of *P. palmarum* on artificial diet was reported by Ranavavare, *et al.* (1975), Rahalkar,*et al.* (1978) and Giblin *et al.* (1989). Also, Weissling *et al.* (1995), studied rearing *P. ferrugineus* on artificial diet.

MATERIALS AND METHODS

Through the red palm weevil program, the Egyptian side team researchers carried out some trails to create an artificial diet to produce mass number of insects to serve biological and toxicological experiments.

Several local materials characterized by its cheaper cost, available and suitability for rearing weevils in mass production were tested .

Contents : One kilogram of potatoes or sweet potatoes , 250 gm carrot , 20 gm glucose, 4 gm casein, 15 gm agar, 250 gm cereals, vitamins B, 1mg and D, 0.2 mg and

0.5 liter water. All contents except vitamins were stirred in a blinder, boiled, cocked, cooled, then vitamins were added and autoclaved.

Cooled diet was poured in plastic cups and kept in a refrigerator for ready use.

Newly laid eggs (50 replicates) from adult culture were inserted into plastic cups (250 ml/capacity) containing 5 gm of artificial diet, covered with muslin cloth and kept at controlled laboratory conditions (27 °C and 85% RH). Daily inspection was carried out till eggs hatched and larval instars and pupal stages were completed and the artificial diet were weighed for each stage (rate of consumption). After emergence, adult weevils were transferred into wire screen cages. Each stage was replicated 5 times, data of larval instars and food consumption and weight of larvae were recorded.

RESULTS AND DISCUSSIONS

Obtained results from breeding insect on the artificial diet were shown in Table 1. Data, indicated that 3 gms of the artificial diet were enough for the first larval instar to complete its stage within 3-4 days with an average of 0.001 gm of weighed larvae. Five grams were consumed by the second larval instar, 6, 8, 11, 14, 15, 18, 18, 22 and 24 grams for the other 9 instars .

Table 1. Diet consumption / instar and period of each one in days

Consumption (in grams)	Instars	Period (in days)	Weight of larva (in grams)
3	1 st	3-4	0.001
5	2 nd	3-4	0.064
6	3 rd	5-6	0.149
8	4 th	5-6	0.24
11	5 th	6-7	0.54
14	6 th	6-8	1.53
15	7 th	7-9	2.66
18	8 th	7-9	3.64
18	9 th	11-14	4.57
22	10 th	11-15	5.64
24	11 th	14-16	7.33
Total			
144 gm	11 instars	78-98	26.36

Periods of larval instars ranged from 3-4 , 5-6, 6-7 ,6-8 ,7-9 ,11-14 ,11-15, and 14-16 days for the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th and 11th instars, re-

spectively . The weight of larvae were 0.001,0.064,0.149, 0.24, 0.54, 1.53, 2.7, 3.6, 4.6, 5.6, and 7.3 grams for the respective 11 larval instars. Total larval duration consumed about 144 gm of diet and spent 78-98 days.

Economics: Almost, 150gms of artificial diet gave complete duration to the larval stage. Thus, 1 Kg artificial diet reared approximately. 6 larvae from hatching to prepupae and cost about 3 Egyptian pounds.

It was noticed that under the conditions of artificial diet, breeding larval duration can be continued up to 5 months and gave more than 16 instars unless diet provided with palm fibrous to stimulate the last larval instar to pupate (making cocoon).

The present diet is used in rearing the weevil for different scientific program or as commercial production when larvae used as a source of food for human as in New Guinea (Mercer et al 1997).

Literature cited

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تربية معملية لسوسة النخيل الحمراء

على بيئة غذائية مصنعة

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من خلال المشروع الإقليمي لسوسة النخيل الحمراء ، نجح الفريق البحثى فى إبتكار بيئة غذائية مصنعة لتربية سوسة النخيل الحمراء لتوفير أعداد مناسبة للدراسات المعملية البيولوجية ودراسات السمية التى تحتاج لأعداد كبيرة من الحشرات. نجحت بيئة وزنها كيلو جرام فى إنتاج ٦ حشرات من البيض الى الحشرة الكاملة خلال ٢ شهور بتكلفة إقتصادية حوالى ثلاثة جنيهات مصرية .