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Investigations on The Role of Pheromone Trapping in the Suppression of Red Palm Weevil *Rhynchophorus ferrugineus* Oliv. Population in Coconut Plantations

J. R. FALEIRO

ICAR Research Complex for Goa, Ela, Old Goa 403 402, India

India has 17.9 million hectares of land under coconut, *Cocos nucifera* L. with an annual production of 13,968 million nuts, making it the largest producer of coconuts in the world[4]. However, red palm weevil, *Rhynchophorus ferrugineus* Oliv., which is a fatal and dreaded pest of palms is fast emerging as the most important insect pest of coconut in India[6].

With the synthesis of the male aggregation pheromone "Ferrugineol" during 1993[3] and its availability in India since 1995, trapping adults of red palm weevil has taken a new dimension and forms a vital tool of the Integrated Pest Management (IPM) programme adopted to combat this pest[1,2]. At present, the commercially available palm weevil pheromone "Ferrolure" is imported and costs $ 5 to 10 a sachet. As the lure is expensive, many State Governments in India, including those of Kerala and Goa, have subsidised its cost.

The present investigation is an impact assessment study, which aims at assessing the role of pheromone trapping in suppressing the population build-up of red palm weevil in the field, by determining the age and fertility status of trap captured female weevils.

Pheromone trap captured red palm weevil adults infesting coconut plantations in Goa were collected from traps and reared in the laboratory on coconut petiole for a period of ten weeks between July and September, 1999. The trap captured adult weevils were divided into two sets viz (i) a single female was caged individually and confined to a celibate life (Set-I) and (ii) a female was caged together with a trap captured male partner (Set-II). Five replicates were maintained in each set. Observations on the number of eggs laid and their subsequent hatching were noted on daily basis. The total egg and hatch count for every female in both the sets was compiled at the end of the trail. Mortality of test insects, if any was also recorded.

From Fig. 1 it, can be seen that a single female of palm weevil in set-I (i. e. without a male partner) laid, on an average 208 eggs. While, females weevil in set-II which was reared with a male companion laid, on an average, 328 eggs. This showed that the female weevils attracted to the pheromone traps were young as a single female is reported to lay upto 500 eggs during its life span[7]. Further, it was found that all the test insects in both the sets lived

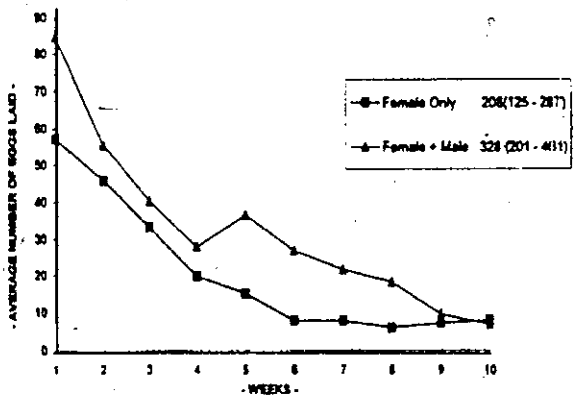

Fig. 1, Number of eggs laid by pheromone trap captured female red palm weevils

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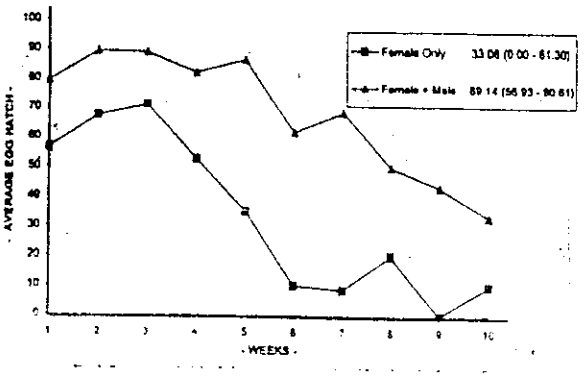

Fig. 2. Percent egg hatch of pheromone trap captured female red palm weevils

for more than 60 days. Female mortality was only observed in set-II after a period of two months.

It has been reported that the average adult life span of red palm weevil ranges between 2-3 months during which a female can lay up to 500 eggs[5,7]. Thus, observations on egg count and adult life span of test insects in this study have shown that young and gravid weevils were attracted to the traps.

In set-I the average hatch was 33.08 per cent, while in set-II, presence of male weevils enhanced the average egg hatch to 69.14 per cent (Fig. 2). Also in set-I eggs of only one weevil did not hatch, indicating that mostly fertile females were attracted to the trap.

This study has therefore, shown that the ferrugineol based pheromone traps besides attracting young weevils also capture a high percentage of gravid and fertile female weevils which would have otherwise remained free to cause infestations in the field. Thus the palm weevil pheromone lure, though costly, is beneficial as it plays a significant role in suppressing the population build up of this dreaded pest in coconut plantations.

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