

International Journal of Statistics and Applied Mathematics

ISSN: 2456-1452
Maths 2023; SP-8(6): 898-900
© 2023 Stats & Maths
<https://www.mathsjournal.com>
Received: 22-08-2023
Accepted: 26-09-2023

P Thilagam
Horticultural College and
Research Institute, Jeenuur,
Tamil Nadu Agricultural
University, Coimbatore,
Tamil Nadu, India

S Srividhya
Horticultural College and
Research Institute, Jeenuur,
Tamil Nadu Agricultural
University, Coimbatore,
Tamil Nadu, India

Corresponding Author:
P Thilagam
Horticultural College and
Research Institute, Jeenuur,
Tamil Nadu Agricultural
University, Coimbatore,
Tamil Nadu, India

Monitoring of fruit fly through parapheromone traps in farm orchard

P Thilagam and S Srividhya

Abstract

Monitoring of fruit fly in mango orchard using methyl eugenol and cue lure traps were studied at Regional Research Station, Paiyur for a period of one year from January – December 2017. The observations indicated in a year a single methyl eugenol traps attracted 36,790 fruit flies per year while cue lure trap caught 1,474 fruit flies per year. The methyl eugenol trap recorded its highest number of catches during the months of June - August 2017 with a peak in June recording 13,366 No.s per month, whereas the highest number of trap catches in cue lure was reported during the month of February 2017 recording 436 No.s per month.

Keywords: Parapheromone traps, mango, fruit flies

Introduction

Fruit flies (Family: Tephritidae; Order: Diptera) are one of the most serious pests of fruits and vegetables. They cause enormous economic losses in every part of the world. In Indian subcontinent, there are more than 200 known species of fruit flies, most of these species are polyphagous having higher rate of fecundity and ability to quickly spread over a wide area that makes them real devastating pest for fruit growers. The fruit fly, *Bactrocera dorsalis* Hendel is injurious to various types of fruits specially mango, guava, jamun, papaya and citrus. The fruitfly, *Bactrocera cucurbitae* Coquillet is an important pest of cucurbit fruits and vegetables. A number of methods to control these pests viz., chemical control (Dashad *et al.*, 1999) [2], cultural control (Makhmoor and Singh, 1999) [6], combination of plant products and insecticide (Saikia and Dutta, 1997) [8] and culture filtrates of fungi (Purnima *et al.*, 1999) [7] have also been tried. Sterile insect technique (Dominiak *et al.*, 1998) [3] and lure and kill method (Jacobson 1972) [5] are used to control fruit flies throughout the world. However, for obtaining the complete success the knowledge on population dynamics of fruit flies serves as an important prerequisite. Parapheromone traps provide an easy and efficient method to monitor the activities of adult male fruit fly populations (Alyokhin *et al.*, 2000) [1]. Hence, the present studies were carried out to monitor the fruit fly populations in mango orchards so that the peak activity of the adult populations could be identified for the adoption of effective management options.

Materials and Methods

A mango orchard at Regional Research Station was placed with two standard white cylindrical jar type fruit fly traps (developed and supplied by SABRC, Chennai) viz., methyl eugenol (ME) and cue lure (CL) traps (Sithanantham 2011) [9] and each was fixed with plywood block dispensers (4 x 1 x 1 cm) loaded with ME and CL as respective lures, which were replaced at weekly intervals. The count on the fruitfly in each trap was taken at weekly intervals and placed in butter paper cover for further studies.

Results and Discussion

During the one-year period of observation, it was found that a single methyl eugenol traps attracted 36,790 fruit flies per year with its highest number of catches during the month of

June 2017 recording 13,366 No.s per month and the lowest population of fruitflies (75 No.s / month) during the month of April 2017 followed by March 2017 (87 No.s / month). None of the observation period was left without the trap catch of fruit flies on methyl eugenol (Fig 1.). Besides ME trap, cue lure trap caught 1,474 fruit flies per year with the highest number of trap catches reported during the month of February 2017 recording 436 No.s per month, whereas the lowest number of trap catch was recorded during the month of September 2014 (10 No.s / month) (Fig 2.).

On an average, the ME trap caught 3341.5 No.s per week during the peak incidence *i.e* on June 2017 followed by 2735.25 No.s per week during the month of August 2017. The lowest average number of fruit flies per week was reported during the month of April 2017 (18.75 no.s/week). The CL

trap caught 87.2 No.s per week during the peak incidence *i.e* on February 2017 with its lowest average of 2.5 No.s per week during the month of September 2017. The fruitfly catches in ME as well as CL traps were different throughout the period. There also exist differences in catches between weeks in traps baited with ME and CL traps (Table 1).

The above results are also supported by Gillani *et al.*, 2002 ^[4] who found that *Dacus Zonatus* was present in the field throughout the year except during January and in great numbers in April to August. *Dacus dorsalis* was present in the field from April to November but in reasonable numbers only in August and September, whereas *Dacus cucurbitae* was present in the field for a short period from late August to November and in reasonable numbers only in October.

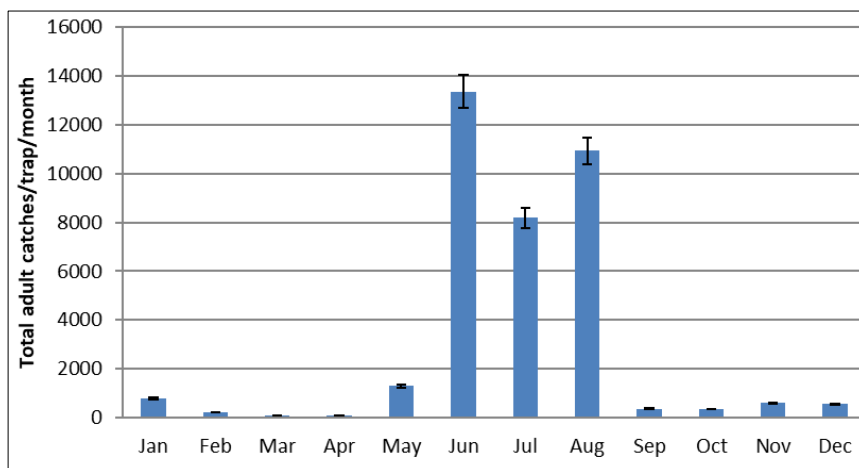


Fig 1: Trap catches in Methyl Eugenol traps in Mango Orchard

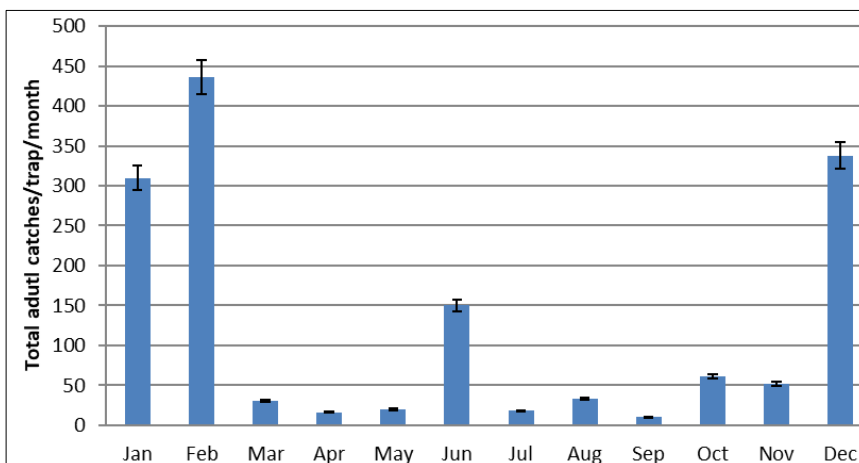


Fig 2: Trap catches in Cue lure traps in Mango Orchard

Table 1: Mean Weekly catches of fruitflies in ME and CL traps in Mango orchard

Month	Methyl eugenol trap		Cue-lure traps	
	Total catch	Weekly Mean	Total catch	Weekly Mean
January 2017	776	155.2	310	62
February 2017	208	52.0	436	87.2
March 2017	87	21.75	30	6
April 2017	75	18.75	16	3.2
May 2017	1296	324.0	20	4
June 2017	13366	3341.5	150	30
July 2017	8190	2047.5	18	4.5
August 2017	10941	2735.25	33	6.6
September 2017	355	88.75	10	2.5
October 2017	351	70.2	61	12.2
November 2017	597	149.25	52	13
December 2017	548	109.6	338	67.6

Total Trap catches	36790	-	1474	-
Mean	3065.83		122.83	
SD	4823.08		151.17	

References

1. Alyokhin AV, Messing RH, Duan JJ. Visual and olfactory stimuli and fruit maturity affect trap captures of oriental fruit flies (Diptera: Tephritidae). J Econ. Entomol. 2000;93:644-649.
2. Dashad SS, Chaudhary OP, Rakesh K. Chemical control of ber fruitfly. Crop Res Hisar. 1999;17:333-335.
3. Dominiak BC, Cagnacci M, Rafferty T, Barchia I. Field cage release of sterile Queensland fruit fly (*Bactrocera tryoni*). Gen. App. Entomol. 1998;28:65-71.
4. Gillani WA, Bashir T, Ilyas M. Studies on population dynamics of fruit flies (Diptera; Tephritidae) in Guava and Nectrin orchards in Islamabad. J Biol. Sciences. 2002;5(4):452-454.
5. Jacobson M. Insect sex pheromones. New York: Academic Press; c1972. p. 382.
6. Makhmoor HD, Singh ST. Effective concentration of methyl eugenol for the control of guava fruit fly, *Dacus dorsalis* Hendel in Guava orchard. Ann. Pl. Prot. Sci. 1998;6:166-169.
7. Purnima S, Saxena SK, Sinha P. Effect of culture filtrates of three fungi in different combinations on the development of the fruitfly, *Dacus cucurbitae* Coq. Ann. Pl. Prot. Sci. 1999;7:96-99.
8. Saikia DK, Dutta SK. Efficacy of some insecticides and plant products against fruitfly, *Dacus tau* on ridge gourd, *Luffa acutangala*. J Agric Sci Soc North East India. 1997;10:132-135.
9. Sithanatham S. Recent progress in improving the impact of parapheromones in trap lures systems for fruitfly management. In: Proceedings of International Symposium on Insect Pest Management. St. Xavier's College, Palaymkottai, T.N; c2011. p. 56-57.