

Population Index of Male Fruit Fly Population

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Abstract: In this research, population index in terms of flies per trap per day (FTD) and seasonal fluctuation of fruit fly species were evaluated for giving technical information to make decisions regarding operational modes of small scale fruit fly control program at mango plantation area, Pa lake village, Mandalay Division, Myanmar. According to the calculated FTD values, the mango plantation area was an infested area of oriental fruit flies during January to May 2017. As a result of this, species present in this infested area was determined. Only one species, *Bactroceradorsalis* was observed according to FTD values, it can be concluded that the trial area was an infested area.

Keywords: Population index (FTD), Mango plantation, Oriental fruit fly, *Bactroceradorsalis*

1. Introduction

Generally, damage caused by fruit flies can be divided into two categories: plant injury – fruit fly adults most often lay their eggs in the fresh flesh of fruits and vegetables. The eggs hatch into larvae (maggots), which most often feed on the inside of the fruit, resulting in a soft, mushy mess and economic injury – fruit flies can often be present at low levels without causing significant economic problems, so control may not be necessary. If high fruit fly populations are causing more severe damage, management practices may need to be implemented. Strategies for the control of fruit flies include physical control, cultural control, biological control, behavioural control, genetic control, chemical control and combinations of some of these into an integrated Pest Management (IPM) approach. The most commonly used techniques in fruit fly control programmes are bait application technique (BAT) and male annihilation technique (MAT).

The latter involves the use of a high density of trapping stations consisting of a male lure combined with an insecticide (usually technical malathion), to reduce the male population to such a low level that mating does not occur. MAT uses pheromones in lure blocks to mass-trap males, thereby reducing the mating success of females. It is hoped that MAT, which kills only males, as opposed to BAT which kills both sexes, will maintain the fly populations at these very low levels. There are several examples of the successful use of methyl eugenol in the technique. Oriental fruit fly was eradicated from the Island of Rota in the Marianas by Steiner and his colleagues [1].

The insecticide used during the eradication was naled. Outstanding successes have been recorded using this method for eradication of Oriental fruit fly from California and from the Amami Islands of Japan [2]. The effectiveness of using Cue-lure as the lure for the male annihilation of species attracted to it is not as great as that using methyl eugenol. Therefore, efforts to use Cue-lure to eradicate melon fly populations have been unsuccessful, though populations were reduced initially.

2. Materials and Methods

2.1 Study on Population of Fruit Fly

The trial was carried from January 2017 to July 2017 in mango plantations at Pa lake village, Mandalay Division, Myanmar. Adult fruit flies were collected by using commercially available methyl eugenol fruit fly attractant provided from Department of Biotechnology under Technological University (Kyaukse). The studied area of 8.094 hectares was pertained and three methyl eugenol traps were set up in three different trial places and thus traps density/ km² would be 1.0545. The results were recorded every day up to five days period of assessment. The index of fruit fly population collected in traps was calculated by using the formula:

$$\text{FTD (Flies/Trap/Day)} = F / (T \times D)$$

Where,

F = Total number of flies

T = Number of serviced traps

D = Average number of days were exposed

<i>Trapping Applications</i>			
<i>Infested area</i>	<i>Suppression</i>	<i>Eradication</i>	<i>Exclusion</i>
FTD > 1	FTD: 1 – 0.1	FTD: 0.1- 0	FTD: 0

3. Results and Discussion

Taxonomic Identification of Fruit Fly Species

In taxonomic identification, all the fruit flies caught in this trial were oriental fruit flies and they can be separated with other fruit flies by its identification trait, clear wings with black T shaped mark on the top of the abdomen.

Observational study on population variation of fruit fly

Total number of fruit flies caught in trial area and FTD values wereshown in Table. 1 and according to FTD values, it can be concluded that the trial area was an infested area.

Table. 1. TOTAL NUMBER OF FRUIT FLIES CAUGHT and FDT values

Trial Period (2017)							
Trap No.	Jan:	Feb:	March	April	May	June	July
No. of Flies							
1	41	51	61	41	27	26	9
2	39	49	51	31	29	25	4
3	31	59	51	33	20	26	8
Total	111	159	163	105	76	77	21
Mean±SD	34 ± 5.3	53 ± 5.3	54 ± 5.8	36 ± 5.3	23 ± 4.7	21 ± 5.8	7 ± 2.6
FDT Value	7.4	10.6	10.9	7.0	5.1	5.1	0.5

Conclusion

According to the current survey, it had been found that the FTD values resulted in every month during investigation were greater than one and therefore we could say surely that the studied area was infested by oriental fruit flies. As a result of this, only one species, *Bactrocera dorsalis* was found in this infested area. It might be assumed that no fruit fly control programmes were used in the area. However, the current experimental work is a preliminary study for fruit fly control program and thus further observational studies regarding the monitoring survey are still needed to verify the characteristics of a pest population including seasonal population fluctuation, relative abundance host sequence and others.

Acknowledgements

The authors appreciate and thanks to corresponding people who helped directly or indirectly for this paper

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Author Profile



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