Hexapoda (*Insecta indica*)

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Relative catches of fruit flies among three dispenser options for methyl-eugenal based trapping in guava crop ecosystem in srilanka

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ABSTRACT: Insect para-pheromones eliciting aggregation response in males of the Tephritid fruit flies are being deployed for trap- based monitoring and mass trapping in many tropical and temperate horticultural crops globally .The relative catches of *B. dorsalis* species complex were compared for three alternative ME dispensers in guava crop in two fields at FRDI, Kananvila, Srilanka during Sep-Oct.2019. The overall catches were significantly higher for large disc (4x4x1cm) dispenser, being nearly five-fold greater than small disc (4x1x1cm) dispenser, while the liquid (Vial-wick) dispenser was second in rank consistently. It has shown the scope for maximising the ME trap catches with large disc dispenser choice in guava crop ecosystem in Sri lanka. The potential for such improved dispenser in cost-effective enhancement of the impact of ME-based mass trapping as an eco-safe alternative to synthetic insecticide use in guava crop ecosystem is indicated. Future R&D towards more holistic enhancement of the trapping system components including trap design-lure dispenser combination choice is suggested.

Key words: *Fruitflies, Methyl eugenal, dispenser options, Bactorcera dorsalis, guava ecosystem*

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Introduction

Sri Lankan agri- horticulture cropping systems are keen to adopt market-focus and consumer-safe technologies as means of enhancing the profitability of farming through compliant practices. This focus also constitutes a major plank in adopting Integrated Pest Management (IPM) towards more sustainable farming. Tephritid fruit flies are an important constraint to the marketable yields in major tree fruit crops like mango, guava and citrus among others. Trapping systems with para-pheromone dispensers are an important management tool for trapping of fruit flies.

Methyl-eugenal is recommended for both monitoring and mass trapping of the *Bactrocera dorsalis* complex in tree fruit crops like mango ,guava and citrus. The relative role of trap design attributes in attracting and/or retaining the attracted males in these trapping systems has been well documented by Sithanantham (2011).The major alternative dispenser options for ME include plywood discs of different sizes, besides vial with cotton wick. Their relative efficacy of dispensers tends to be influenced also by the trap design in which they are deployed.

Materials & Methods

The present collaborative field study was undertaken in SriLanka during 2019 to compare three dispenser options for such trapping in guava crop ecosystem. The trial was undertaken in guava crop in two fields at FRDI, Kananvila, Srilanka. The trap used was the locally popular Steiner type trap design, which confers adequate attraction and retention.

The three dispenser options compared were as follows:

T^1. Plywood disc-large(4x4x1cm)

T^2. Plywood disc-small(4x1x1cm)

T^3. Vial with cotton wick

In all three dispensers, the recommended parapheromone- methyl eugenal blended with hexane@8:1 ratio was used, besides malathion being added at 10% to this attractant mix, so to ensure quick knockdown of the attracted flies and so help in accurate record of trapped flies. The traps representing these three treatments were compared in guava fields of minimum one acre area each. The treatments were kept at an inter-distance of 20m and their positions within the replication interchanged randomly after each count. concurrently with six consecutive weekly observations. The data from the two locations were pooled and analysed as per procedures suggested by Gomez and Gomez (1983).

Results

The weekly mean trap catches of the target fruitfly species complex led by *Bactrocera dorsalis* was found to be maximum in T1 (large plywood disc) in both locations, followed in rank byT2- (Vial with wick dispenser), the least being in T3 (small plywood disc). (Fig1.1,1.2 and 1.3).

The weekly catch of fruit flies in first location was maximum in T1 and least in T3 (Fig.1.1) while the same trend was also evident in the second location (Fig.1.2).The difference in overall catch between T1 and T3 was nearly five-folds between the least and best treatments (Fig.1.3).

Fig: 1.1.Relative guava fruit fly catches for three lure dispensers-Location 1

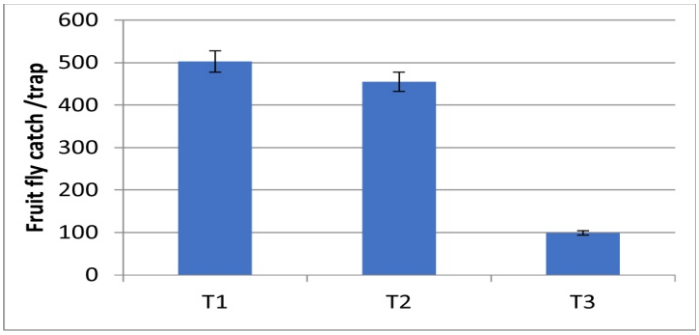


Fig: 1.2 .Relative guava fruit fly catches for three lure dispensers-Location 2

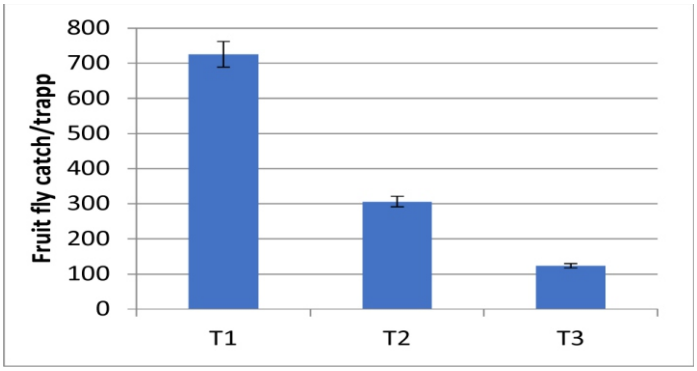
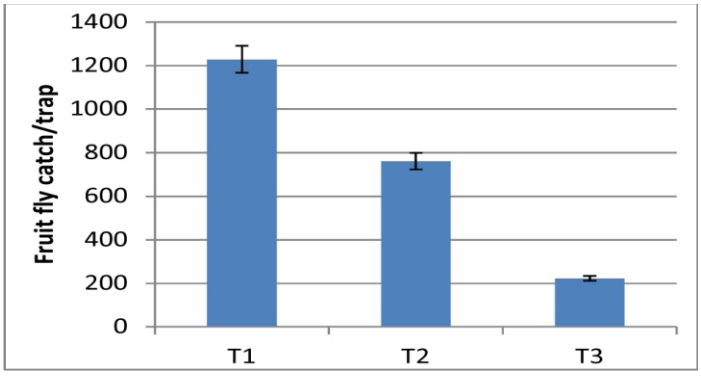


Fig: 1.3.Overall guava fruit fly catches for three lure dispensers



The overall trend in fruit fly catch among the six weeks of observation showed consistent pattern of higher catch in large plywood disc (T1) followed in rank by vial with wick (T2). This was confirming the reliability of the superiority of the two dispenser types over the small plywood disc which was least effective.

Discussion

The present results clarified that large size plywood disc dispenser was superior, while vial with wick was next in rank. This is apparently the first such information on relative efficiency of dispenser options for methyl eugenal based fruit fly trapping in guava ecosystem in SriLanka**.** While vial with wick was found to be more efficient than small or even large plywood discs for methyl eugenal dispensing in mango ecosystems in earlier studies in India with cylindrical vertical jar type traps (Sithanantham,2011), the present findings are specific to their relative performance as dispensers in the guava ecosystem with Steiner type trap design. Evidently, the crop ecology as well as trap design attributes may have manifest their relative influence on the relative trap catch performance. There is also scope for further R&D on comparing these dispenser options with longer duration of trap catch observations, while the present findings are adequate to reliably recommend the large plywood disc as superior to the other options when used in Steiner type trap in guava ecosystem in Sri Lanka

Conclusion

The present study has confirmed that for the Steiner type trap being commonly used in SriLanka, large plywood discs are superior, with an improvement in fruitfly catch by nearly five folds over the small- sized ply wood disc , besides by about 60 percent more than vial with wick dispenser option.

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