



EVALUATION OF COLOURED FRUIT FLY TRAPS IN GUAVA

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ABSTRACT

A field experiment was carried out in guava orchards located at Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (U.P.) during December- May, 2017-18 and 2018-19. Four coloured traps i.e. green, yellow, transparent and Rakshak traps, placed at three locations for fruit fly *Bactrocera* spp., catches. Methyl eugenol was used as an attractant. The indigenously made green- and yellow-coloured vertical traps were the best as compared to transparent and Rakshak trap. Four fruit flies viz. *Bactrocera zonata* (Saunders), *B. dorsalis* (Hendel), *B. nigrotibialis* (Perkins) and *B. correcta* (Bezzi) were recorded, of which the *B. zonata* was found as dominant.

Key words: *Bactrocera* spp., *B. zonata*, *B. dorsalis*, *B. nigrotibialis*, *B. correcta*, guava, traps, green, yellow, transparent, vertical, Rakshak trap, methyl eugenol, trap catches

True fruit flies are serious pests of fruit crops (Verghese et al., 2004), and India is included in the list of those countries from where the import of fruits to many countries has been banned. Of the fruit flies, only adults are exposed to control measures while eggs and maggots remain protected in the host tissues, with most insecticidal treatments remaining ineffective (Sharma et al., 2011). Insecticides afflict many hazards warranting an integrated approach for fruit fly management (Verghese et al., 2012). Use of methyl eugenol traps and cue lure provide an ecofriendly alternative. Methyl eugenol, when used together with insecticide impregnated into a suitable substrate, forms the basis of male annihilation technique. Methyl eugenol specially attracts the males of *Bactrocera dorsalis* (Hendel), *B. correcta* (Bezzi) and *B. zonata* (Saunders) (Verghese et al., 2006), while cue lure attracts *B. cucurbitae* (Coquillett), *B. correcta*, *B. zonata* and *B. diversa* (Coquillett) etc. The sanitation combined with the use of lures and traps as well as baits proved to be one of the best alternatives for management of fruit flies. These traps have high efficiency, low cost and are environmentally quite safe (Sureshbabu and Virakthamath, 2003). Thus, keeping in view the economic importance of fruit flies on fruit crops, the present study evaluated with trap catches, the efficacy of locally made, low cost fruit fly traps in guava, in particular their colour.

MATERIALS AND METHODS

This experiment was conducted at the C S A University of Agriculture and Technology, Kanpur, during December 2017-18 and 2018-19. The traps used were made from waste plastic 2 l bottles painted with

green, yellow and transparent with three windows. To make the solution 150 ml of alcohol, 100 ml of methyl eugenol and 25 ml of malathion (50EC) was mixed in a beaker and kept in a bottle covered with a lid. For Rakshak traps, 4 ml of mixture was taken with a disposable syringe of 5 ml capacity and injected in the wick already hung in the trap. The charging of wick and wooden pieces was done after one month. Traps were hung at a height of 1.5 -2.0 m at each location. In guava, green, yellow, transparent and Rakshak traps were hung in four replications on the trees at a distance of 50 m. The fruit flies from all three places were collected separately at weekly intervals and identified to species using keys given by Ramani (1997), with studying under stereozoom microscope. The total number of fruit flies trapped in 3 places/ trap/ week was calculated, and subjected to ANOVA ($p=0.05$) and CD was computed.

RESULTS AND DISCUSSION

The major fruit fly species in the study areas in Kanpur region came out to be *B. zonata* which outnumbered all the other three species viz. *B. dorsalis*, *B. nigrotibialis* (Perkins) and *B. correcta*. It was observed that females tend to be more attracted to colour, with green coloured traps attracting more males as compared to yellow traps (Table 1). The present research elaborate the study conducted by Robacker (1992) who found that for Mexican fruit fly *Anastrepha ludens* (Loew), horizontal, rectangular traps were less attractive than spheres and vertical rectangles. Overall vertical rectangles were more attractive than spheres in spring but in autumn it was vice-versa. Rajita and Viraktamath (2005) reported that in mango orchard,

Table 1. Effect of colour of traps on fruit fly catches 2017- 2019

Treatments	Mean number of catches																							
	Insectary orchard						Horticulture orchard						Home science orchard											
	Dec 17	Jan 18	Feb 18	Mar 18	May 18	Mean	Dec 17	Jan 18	Feb 18	Mar 18	May 18	Mean	Dec 17	Jan 18	Feb 18	Mar 18	May 18	Mean	Dec 17	Jan 18	Feb 18	Mar 18	May 18	Mean
Green trap	42.87	51.75	43.25	47.25	58.75	42.50	47.50	51.75	53.75	71.87	62.25	46.25	45.25	46.25	51.87	50.62	71.87	50.12	45.25	46.25	51.87	50.62	71.87	50.12
Yellow trap	37.12	34.75	36.25	45.0	47.25	42.00	45.50	41.62	44.50	56.87	43.37	37.87	39.37	37.87	39.75	47.25	72.75	52.00	39.37	37.87	39.75	47.25	72.75	52.00
Transparent trap	36.37	41.00	34.87	39.37	51.37	47.25	45.25	41.12	40.12	54.6	47.12	37.00	38.25	37.00	41.87	42.50	61.00	41.62	38.25	37.00	41.87	42.50	61.00	41.62
Rakshak trap	34.25	37.37	31.25	33.37	42.37	31.50	35.75	32.75	33.75	53.25	41.12	32.12	35.37	32.12	40.87	40.00	54.62	41.37	35.37	32.12	40.87	40.00	54.62	41.37
SEm	2.06	2.29	2.01	2.18	4.88	1.71	1.94	1.48	2.20	5.62	4.30	3.34	2.62	3.34	1.84	1.99	5.83	4.15	2.62	3.34	1.84	1.99	5.83	4.15
CD	11.05	11.41	9.16	10.26	27.65	8.31	10.21	7.03	11.32	26.02	21.79	18.70	13.65	18.70	8.94	10.14	30.36	21.89	13.65	18.70	8.94	10.14	30.36	21.89
(p=0.05)																								

medium and big traps attracted significantly more flies. Contrary to present results, fruit flies showed greater response to spheres than to the bottles and cylinders. *Bactrocera dorsalis* was more attracted to green and big spheres while yellow and transparent traps attracted significantly more of *B. correcta* in guava and mango. Irrespective of species, yellow colour traps were attractive in guava while black colour traps in mango. According to Saputra and Marmaini (2016) only *B. dorsalis* was trapped in yellow colour baited traps with methyl eugenol, followed by the green coloured ones. Toorani and Abbasipour (2017) reported that fluorescent yellow traps at a height of 1.5 and 2 cm in south direction during October captured more of Mediterranean fruit fly, *Ceratitis capitata* (Wiedemann). Thus, the results of the present study will assist in knowing the low-cost preparation of traps. The indigenous coloured traps can help in formulating cheap and effective IPM technology.

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