



Lure and Kill Technique Against Melon Fruit Fly, *Bactrocera cucurbitae* coq. Through Mass Trapping by Using Different Coloured Pheromone Traps and Poison Baits

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India is the second largest producer of vegetables in the world after China, accounting for about 10 per cent of the world's production¹. Among vegetables, cucurbitaceous vegetable covers a major share (area 159.16 thousand hectares and production 1748.16 thousand tonnes) of total vegetables in the state of West Bengal². Melon fruit fly, *B. cucurbitae* (Coq.) (Diptera: Tephritidae) is one of the main tropical fruit flies causing considerable damage in cucurbits. Extent of yield loss caused by the pest to cucurbitaceous vegetables ranging from 30-100% depending upon cucurbit species and the season in different parts of the world^{3,4,5,6,7}. It is very much difficult to manage the pest simply through the application of chemical pesticides due to their peculiar biological features. Unlike other insects, the adult females are directly involved in initiating and causing the damage in the growing vegetables. The discovery of a number of compounds strongly attractive to male fruit flies (Tephritidae) has suggested the possible significance of male attractants⁸. It has been estimated that each male fly removed from the wild fly population by an attractant would represent one unmated female⁹ and for decades, these olfactory attractants have been the basis of tephritid detection, monitoring and control¹⁰. The para-pheromone, cue-lure traps have been reported to attract *B. cucurbitae* males and this sex attractant is also more effective than food lure^{11,12,13}. Cue-lure appeared as more effective and resulted in higher male catches of fruit flies in Faisalabad and Sahiwal district during 2007 in bitter melon fields¹⁴.

Impact of Colour variation in traps for attracting melon fruit fly

Ravikumar and Viraktamath (2007)¹⁵ reported that yellow and transparent traps attracted significantly high number of *B. correcta* in guava (70.45 fruit flies/trap/week) and mango (5.13 fruit flies/trap/week), respectively. When total fruit flies irrespective of species were considered, yellow colour traps were attractive in guava (71.91 fruit flies/trap/week) orchard. Stark and Vargas (1992)¹⁶ reported that white and yellow traps caught the largest number of flies, whereas green, red and black caught the fewest.

Impact of different types of baits against melon fruit fly

The purpose of this objective was to evaluate the efficacy of the traps for attracting and killing effect against the fruit fly. Ramsamy *et al.* (1987)¹⁷; Zaman (1995)¹³ and Liu and Lin (1993)¹² observed that methyl eugenol and cue-lure traps have been reported to attract *B. cucurbitae* males from mid-July to mid-November. Melon fruit fly can also be controlled through use of black tulsii, *Ocimum sanctum* as the border crop sprayed with protein bait (protein derived from corn, wheat or other sources) containing spinosad as a toxicant¹⁸. Cue-lure traps have been used for monitoring and mass trapping of the melon fruit flies in bitter melon^{19,20,21}. 'GF-120 Fruit Fly Bait' containing spinosad as a toxicant have been found to be

effective in the area wide management of melon fruit fly in Hawaii^{22,23}. Although, the protein baits, para-pheromone lures, cue-lures and baited traps have been successful for the monitoring and control of melon fruit fly²⁴. Cue-lure is highly attractive kairomone lures to *B. cucurbitae* (Coquillett). Bucket traps baited with cue-lure (1 malathion) and weathered under Hawaiian climatic conditions were attractive to *B. cucurbitae* up to 8 week²⁵. Banana/jaggery (10% weight: volume) was equally effective as compared to Protein Hydrolysate (3% volume: volume) in attracting melon fly. Malathion 50 EC was suitable for bait solution for this purpose²⁶.

Conclusion

Melon fruit fly is widely distributed key insect pest throughout the World. Most of the major cucurbit vegetable crops are severely attacked by this single pest. As the cucurbit fruits are harvested at short intervals for marketing and self-consumption, it is difficult to rely only on insecticides as a means of controlling this pest due to its cryptic nature. In situations where chemical control of melon fruit fly becomes necessary, only integrated methods of control appear to be effective. Chemical control, although quite prevalent, is risky. The farmers show little concern for the residual effect of chemicals, being more concerned about profit. The vegetables are brought to the market long before the chemicals have broken down. Therefore, there is a basic need to explore an eco-friendly and environmentally safe innovative approach to curb this devastating menace and increase the yield of cucurbitaceous vegetables. Besides this, as cue-lure is a specific para-pheromone for attracting male cucurbit fruit fly, this also helps to create an imbalance on male: female ratio in the environment and causes comparatively low infestation due to the production of unfertilized eggs by female.

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