



RESEARCH NOTE

Effect of sticky traps on non-target insect fauna in mango orchards

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ABSTRACT: Studies were conducted at ICAR-Indian Institute of Horticultural Research, Bengaluru to assess the number and proportion of non target insects and other arthropods getting killed through sticky traps in mango orchards. Five yellow sticky traps were erected in a mango orchard of about 2000 m² consisting of varieties ‘Alphonso’ and *Totapuri* during flowering period. Among the insects trapped during the peak flowering stage, majority belonged to the Order Hymenoptera (35.26% in each trap), distantly followed by Hemiptera (including leafhoppers) (26.88%) and Diptera (26.08%). Results clearly indicate that erecting a large number of sticky traps more than that required for pest monitoring, could affect pollinators and natural enemies. Hence in mango orchards, sticky traps should be used only for monitoring pest populations and mass trapping approach through sticky traps is not advisable.

Keywords: Mango, sticky traps, beneficial insects, pollinators

Pest monitoring is an important component of integrated pest management strategy. The management decisions based on the actual presence of the pest in the field not only minimize the cost of plant protection, but also facilitate effective pest suppression. This will also help to avoid calendar based blanket sprays. Sticky traps are the simple means of pest monitoring, especially for pests like thrips, aphids, leafhoppers, whiteflies and leaf miners. Traps of different colours like yellow, blue and white are used depending on the type of pest targeted. For example, blue traps are reported to be more effective against thrips while yellow traps are preferred for aphids and leafhoppers (Sridhar *et al.*, 2015). Besides monitoring pests, sticky traps are also used to document the relative abundance of different pollinators (Mondor, 1995). In mango orchards, yellow sticky traps are advocated and are being widely used to monitor and detect leafhopper populations (Verghese *et al.*, 2012). For monitoring purpose, traps are used sparingly in the field ranging from 4 to 5 per acre. However of late, the traps are being popularized by the makers of traps as a means of pest control. There were instances in Kolar and Chikballapur Districts of Karnataka, the major mango belts of the region, where farmers are advised to use a large number of sticky traps in mango orchards (as high as 30-40 traps/acre) with a scientifically non-verified assurance that they would completely bring down hopper incidence.

Systematic studies on the potential effect of using the sticky traps for mass trapping of harmful insects on non-targeted insects, such as pollinators and predators, are lacking and the information is rudimentary. The mass

trapping of insects by sticky traps would bring down pollinators and other beneficial insects, thus leading to an increase of the pest numbers (Mondor, 1995). Though sticky traps are used to minimize pest populations under special circumstances like polyhouses, their efficacy in orchards as pest control tools is verifiable, considering the migratory nature of many insect pests. In a study conducted at ICAR-Indian Institute of Horticultural Research, Bengaluru, five yellow sticky traps were erected in a mango orchard of about 2000 m² consisting of varieties ‘Alphonso’ and *Totapuri* during flowering period. Traps were replaced four times at weekly interval. The traps with insects were brought to laboratory and the number of insects per trap was recorded Order wise (Fig. 1). Among the insects trapped during the peak flowering stage, majority belonged to the Order Hymenoptera (35.26% in each trap), distantly followed by Hemiptera (including leafhoppers) (26.88%) and Diptera (26.08%) (Fig.2). This clearly indicates that during flowering time, mango flowers attract a large number of foragers which are also vulnerable to be trapped by sticky traps. The hymenopterans included *Apis florea*, *A. cerana*, *Tetragonula iridipennis* and many unidentified bees and wasps. Among the dipterans were Syrphids and Calliphorids, which are the most potential pollinators of mango and are found abundant during blossom period, which coincides with the trap erection in the field (Reddy *et al.*, 2012). Besides the insects of pollination value, general predators like praying mantis and spiders were found on the traps.

Though leafhoppers were trapped, the proportion of those stuck to traps to their total population in the field

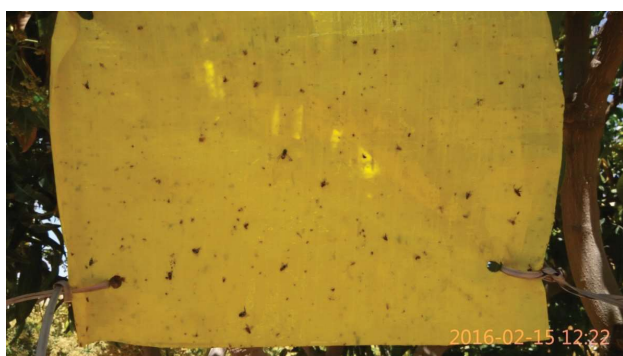


Fig 1. Bees and other non-target insects trapped on the yellow sticky trap

is too less and any number of traps could not completely bring down hopper population in the field. This is because damage is caused by both nymphs and adults where nymphs are not able to fly thus their chance of getting stuck to sticky traps is ruled out. On the other hand, the population of pollinators and other beneficial insects in the field is very low and their removal even in small numbers could potentially affect the natural balance and the ecosystem services they provide to the orchard. In a similar study conducted in an apple orchard in Turkey, Atakan and Pehlivan (2015) observed that using sticky traps for mass trapping of harmful insect species in fruit orchards might be risky and reduce the number of pollinators in the fruit orchards.

Based on these observations, it can be inferred that erecting a large number of sticky traps more than that required for pest monitoring, could certainly affect pollinators and natural enemies. Hence in mango orchards, sticky traps should be used only for monitoring pest populations and mass trapping approach through sticky traps may prove to be counterproductive, as a large number of non-target insects are also trapped. There is a need to spread the awareness among the growers on the detrimental effects of using sticky traps in large numbers.

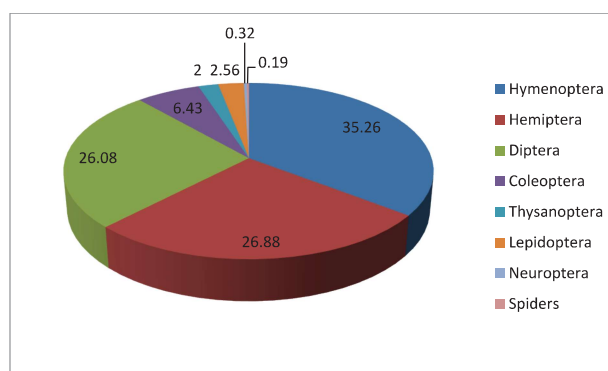


Fig. 2. Proportion of insects of different Orders trapped on yellow sticky traps in a mango orchard during blossom period

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