



DAMAGE AND OVIPOSITION OF TEA MOSQUITO BUG *HELOPELTIS ANTONII* SIGNORET ON GUAVA, NEEM AND MORINGA

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ABSTRACT

A study on symptoms of damage and ovipositional preference of tea mosquito bug (TMB), *Helopeltis antonii* Signoret was done on guava, moringa and neem. A survey was conducted in villages of Dindigul and Theni districts of Tamil Nadu, India for observing symptoms of damage. In guava, the bug feeds both on new flush and fruits, causing irregular necrotic spots on young leaves and corky out growths on fruits. In moringa, the leaves and flowers dry-up and give wilted appearance. In neem, the nymphs and adults feed on young flush that lead to dieback. All the three hosts, irrespective of TMB feeding bloom during next favourable season. For ovipositional preference, the descending order of preference is guava, moringa and neem.

Key words: *Helopeltis antonii*, guava, neem, moringa, symptoms of damage, necrotic spots, corky out growth, wilting, drying, ovipositional preference

The tea mosquito bug, *Helopeltis antonii* Signoret has been emerging as a major problematic pest of guava, moringa and neem. The genus *Helopeltis*, commonly known as Tea Mosquito Bugs (TMB), is a group of Heteropterans in the family Miridae (capsid bugs). The first record of TMB was in Java during 1847 on tea crop (Rao, 1970) and in India it was in Cachar District in Assam during 1968 on tea crop (Watt and Mann, 1903). It is a major pest of tea, and also a major threat to cashew, *Acacia*, cocoa, camphor, pepper and cardamom. Recently it is trying to emerge on guava, moringa and neem in many areas, besides having few alternate weed hosts to complete their life cycle during off-season of crops. Life cycle of TMB is about 30-35 days with several generations in a year. In extreme winter the adults undergo hibernation. A female is capable of laying about 35-40 eggs. Hatching occurs within 5-7 days. The nymphal periods last for 15-20 days and adult period is for 5-8 days with five moults in its life period (Selvamuthukumar, 2001). Biology of TMB mainly depends on suitable climatic conditions, hosts and varieties (Aravinthraju et al., 2022a) on which it feeds. They determine the growth, development, fecundity, longevity and life cycle of TMB. Since, the host range and damage of TMB have been increasing in recent past, the need of managing this pest became the important task and hence the current study is focused

on the damage symptoms and ovipositional preference of TMB in guava, moringa and neem.

MATERIALS AND METHODS

A survey was conducted in Dindigul and Theni districts of Tamil Nadu during 2019-2020 for the tea mosquito bug incidence on guava, neem and moringa. Mulaiyur and panniyamalai village, Natham block of Dindigul district and Thimmarasanaikanur and Maravapatti village, Andipatti block of Theni district in Tamil Nadu, India were selected for the survey. In all the locations, the symptoms of damage and population of TMB in each host were observed and documented. The observations were made randomly at five twigs from four directions and one at centre twig. This was followed by mass rearing as described by Sundararaju and John (1992). Adult bugs and nymphs, collected from the guava fields were released in separate cages with one month old guava seedlings. The rearing cage having size of 74 x 74 x 74 cm made up of aluminium is used. Three sides and top of the cage were closed with wired net and glass respectively and one side was provided with movable glass lid. The seedlings were replaced three days once based on feeding punctures and drying of leaves and seedling in adult cage was observed for presence of egg. This mass rearing setup was maintained in normal atmospheric condition

under shade at Insectary, Department of Agricultural Entomology, Agricultural College and Research Institute, Madurai. The ovipositional preference of TMB among the hosts such as guava, moringa and neem based on choice tests were conducted. The guava, moringa and neem seedlings were placed together in a cage with dimension of 74 x 74 x 74 cm. Five pairs of adults from mass culture were released inside the cage. Oviposition injuries were observed in twigs as well as midrib of young leaves. Observations on number of eggs laid after release were made individually on each host during 3-5 days using hand lens (10x). The experiment was replicated 5 times and the data were analyzed for standard error/ deviation.

RESULTS AND DISCUSSION

In guava the TMB feeds both on young flush and fruits, but more infestation was noticed on fruits. In young flush the growing meristem get dried with irregular necrotic spots on young leaves and the leaves eventually fall off. Egg laying of tea mosquito bug is on mid rib of young leaves and immediately after hatching the first instar nymphs congregate over the young leaves and meristem of particular flush for feeding. In later stages the nymphs spread away to other flushes and fruits for feeding. In fruits, there will be formation of corky out growths developed along the feeding puncture which is due to toxin injected into fruits along with saliva. As the fruit size increases the size of scab also increases and later on severe infestation formation of cracks over the fruits occur. At severe infestation entire leaves will fall off and dry twigs with dried fruits will remain. The infestation of TMB was observed more during flowering and fruiting stage of guava crop. This is in accordance with Bose et al. (2020), who reported the necrotic spots in leaves and scab formation over fruits as major symptoms due to TMB infestation in guava. Aravinthraju et al. (2021) informed *Helopeltis antonii* as emerging and severe pest of guava with high yield loss. In moringa TMB preferred to feed on young twigs, flowers and in some cases pods. Due to feeding, the twigs and flowers were dried and the tree showed wilted appearance with oozing out of honey like resins. Egg laying of TMB gravid females was on young twigs, which on hatching nymphs congregate over young twigs for feeding. The infestation of TMB on moringa was noticed irrespective of stage of crop, but comparatively it prefers aged trees than young trees. Suresh (2021) and Aravinthraju et al. (2022a) recorded similar damage symptoms of TMB on moringa and mentioned the severe infested moringa tree as snag,

sharp sticks without leaves. In neem infestation of TMB was on young twigs with honey like exclusion from twigs. Due to feeding, drying and wilting of trees were noticed. Egg laying of TMB gravid females was on young twigs, upon hatching nymphs congregated over young twigs for feeding. The infestation of TMB on neem initially was on vegetative stage and during flowering stage, population of TMB recorded very low.

All the three hosts, irrespective of TMB feeding were bloomed in the next favorable season. While considering moringa, due to infestation in twigs and flowers, quantitative yield loss will be more, but in guava both quantitative yield loss due to infestation on young twigs and qualitative yield loss due to infestation on guava fruits were recorded. Singh and Pillai (1984) reported the similar type of symptoms in other hosts. Feeding causes scorched appearance to the trees due to the drying up of new flushes, it also causes shrivelling and abortion of immature nuts in cashew. Later, as fruit size increased the size of scab also increased and at the most there will be formation of cracks on the fruits. At severe infestation all leaves and fruits fall off. According to Srikumar et al. (2016) TMB causes complete destruction of cashew crops. The young and succulent parts of cashew such as the shoots, young leaves, inflorescence and fruits were fed by nymph and adult of TMB. In cashew, infestation on leaves, shoots, panicles, immature fruits and nuts are caused by four mirid species of (Sundararaju and Sundarababu, 1999). The data obtained from ovipositional choice test conducted to find suitable hosts of tea mosquito bug exhibited that, among three hosts, neem has recorded a numerically higher number of eggs per female (5.76 ± 1.52 eggs/ female) followed by guava (4.52 ± 1.05 mean number of eggs per female) and moringa (3.64 ± 0.89 mean number of eggs/ female). The descending order of preference of tea mosquito bug for egg laying was neem, guava and moringa. The same kind of result was given by Selvamuthukumaran (2001) who observed high mean number of eggs (151.16 ± 1.78 eggs/ 10 pairs of adults) in neem followed by guava (98.60 ± 1.93 eggs/ 10 adult pairs).

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AUTHOR CONTRIBUTION STATEMENT

K A performed the idea of this article and wrote the manuscript. K S and S M provided the materials with guidance to conduct the experiment. Also helped in writing and correcting the article. Hence all authors equally contributed towards the experiments. The authors read and approved the final manuscript.

CONFLICT OF INTEREST

No conflict of interest.

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