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Population dynamics of mango mealy bug, *Drosicha mangiferae* Green from Jhansi, Uttar Pradesh

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ABSTRACT : Population dynamics of mango mealy bug nymphs, *Drosicha mangiferae* Green were observed on the basis of seasonal abundance. Canopy in selected area were pinmarked as Tree-A, Tree-B and Tree-C and the number of nymphs of insect present on the tree trunk, terminal twigs or on inflorescences was recorded at an interval of a week. Population of insect was seen to be decreasing thereafter from mid February till last May on three trees. From the visual observations, it reveals that nymphs of mealy bug seen on trunks in the beginning were identified as first instar till mid February.

Keywords : *Mangifera indica*, population dynamics, orchard, *Drosicha mangiferae*

INTRODUCTION

Mango, *Mangifera indica* L. (Anacardiaceae) is most popular and commercial fruit of India and cultivated in about 87 countries. India has third position in mango production in the world, next to Brazil and USA. Several insect-pests cause a considerable damage to mango crop every year. Tandon and Lal (1976) reported as many as 492 insect species infesting mango crop where 12 species are important insects particularly in the oriental region.

Tandon *et al*. (1978) recorded the host range of *D. mangiferae* and *D. stebbingi* feeding on 62 host plants under 51 genera and 28 families, which included fruit crops, forest trees, ornamental plants and weeds. Chandra *et al*. (1987) studied the biology of mango pest, *Drosicha mangiferae* and reported that the pest had 1 generation in a year and diapaused in the egg stage in soil for about 7 months. Mohan *et al*. (2004) described that mango mealy bug *D. mangiferae* is a serious pest in fruit orchards. Ashfaq *et al*. (2005) reported that mango is severely damaged by the giant mango mealy bug (*Drosicha stebbingi*). In the manuscript, population dynamics of *D. mangiferae* in mango orchard at Jhansi, Uttar Pradesh.

MATERIAL AND METHODS

The detailed description of the experiment, materials used and methods adopted for the present investigation are given below. The experiment was carried out during the year 2007-08 in the mango growing area of village Mau Ranipur, district Jhansi UP, India in an orchard. Twenty one mango trees of about same size and canopy were selected for the experiment purpose. Simple Randomized Block Design was taken up as the design of lay out for the experiment.

RESULTS AND DISCUSSION

The scientific name of the most common species of this pest is *Drosicha* (or *Monophlebus*) *mangiferae* (or *stebbingi*) belongs to the family Margarodidae and order Homoptera and reported from many places in India and China (Pradhan, 1961). There is a well-established sexual dimorphism in the adult stage which is generally found during the midsummer period, i.e. from April to June. Adult females are wingless and large-bodied. The male, on the other hand, is a winged creature with only one pair of wings and a very delicate reddish body which flies actively and fertilizes the females. The male adults have also much shorter longevity than the female adults which live for about a month. The adult gravid females after fertilization crawl down along the tree-trunk to the ground where they lay eggs at depths of about 2-6 inches and in clusters of 300 to 400 eggs each, whereas Nair (1975) reported upto 336 eggs hatched in January. The oviposition is generally confined to an area of a few feed in diameter round the base of the tree. These activities of migration from the tree downwards to the ground and oviposition in the soil are generally confined to the months from April to June when the males die soon after mating and the females soon after oviposition.

The eggs laid in the soil take quite a few months before they hatch and their hatching has been reported to be quite appreciably influenced by the temperature and moisture conditions of the soil. The result is that the hatching can occur as early as November of the same year or as late as March of the succeeding year. Late monsoons and winter rains have been reported to delay hatching.

The young nymphs soon after hatching, crawl about in search of some suitable food-plant on which, if found, they spend some time. Thereafter, they begin their ascent along the tree-trunks and this upward migration lasts for several weeks. On reaching the fresh growths, the nymphs congregate there and begin to suck the plant-sap. They moult thrice during their nymphal period which lasts about three months or more, depending on the environmental temperature. Thereafter, the male-forming nymphs undergo

some sort of pupation and transform themselves into winged adult males which are alive from 22 to 27 days and the female-producing nymphs do not undergo any appreciable change except in size and they live from 76 to 135 days

As per studies done by researchers, study of seasonal abundance of nymphal population of mealy bug is also felt to be taken up herein. For such study, 3 mango trees of about same age and canopy in selected area were pinmarked as Tree-A, Tree-B and Tree-C and the number of nymphs of insect present on the tree trunk, terminal twigs or on inflorescences was recorded at an interval of a week from 15 November 2007 to 29 May 2008 to know the seasonal abundance of insect's population which is shown in the Graphs 1, 2 and 3 below:

(I) Population on trunk. Data from the Graph 1, 2 and 3 show the population of mealy bug nymphs started crawling on tree trunk at an average of 0.4 in 10 cm^2 area on 6th December 2007 in tree-B, while average population of nymphs was counted as 1.0 on tree-A and 0.4 on tree-C on 13th December 2007. This population of mealy bug then went on increasing at weekly interval till first week of January and the population was found to be constant for a month about up to first week of February. Population of insect was seen to be decreasing thereafter from mid February for last May on three trees. From the visual observations, it reveals that nymphs of mealy bug seen on trunks in the beginning were identified as first instar till mid February. and now population of second instar nymphs started whereas emergence or crawling of first instar is still continued next fortnight. The second instar nymphs also started moulting from mid March, which again moulted to fourth instar nymphs in mid April and further they are identified as full grown up mealy bug with ovisac in last week of April and onwards. The population of mealy bug seen coming down the tree to the ground with its ovisac in last week of April, which continued later till the date.

As the previous studies shows that male adults of mealy bug are short flier insects and here they have been seen flying over the canopy of tree in search of female of mealy bug for mating. Thus, full grown mealy bugs seen coming down through the branches and then trunk to the ground level in the last week of April were found to be gravid and they were ready to oviposition in the ground.

(II) Population on shoots. Data from the Graphs 1, 2 and 3 show the population of mealy bug nymphs started congregating on tender parts of tree such as the buds at an average of 0.4 and 0.6 per bud on 20th December 2007 in tree-A and B, respectively while an average population of nymphs was counted as 1.0 on tree-C 27th December 2007. This population of mealy bug then went on increasing at weekly interval till the middle of March 2008 in tree-C and A while till first week of April in tree-B. Population of insect was seen to be decreasing thereafter from mid February till last May on all three trees. From the visual observations, it reveals that nymphs of mealy bug seen on panicles in the beginning were identified as first instar till middle of February and now population of second instar nymphs started moulting whereas emergence or crawling of first instar is still continued during next fortnight. The second instar nymphs also started moulting from mid March, which again moulted to fourth instar nymphs in mid April and further they are identified as full grown up mealy bug with developed ovisac in last week of April and onwards. The population of mealy bug seen coming down the tree to the ground with its ovisac in last week o April which continued later till the date.

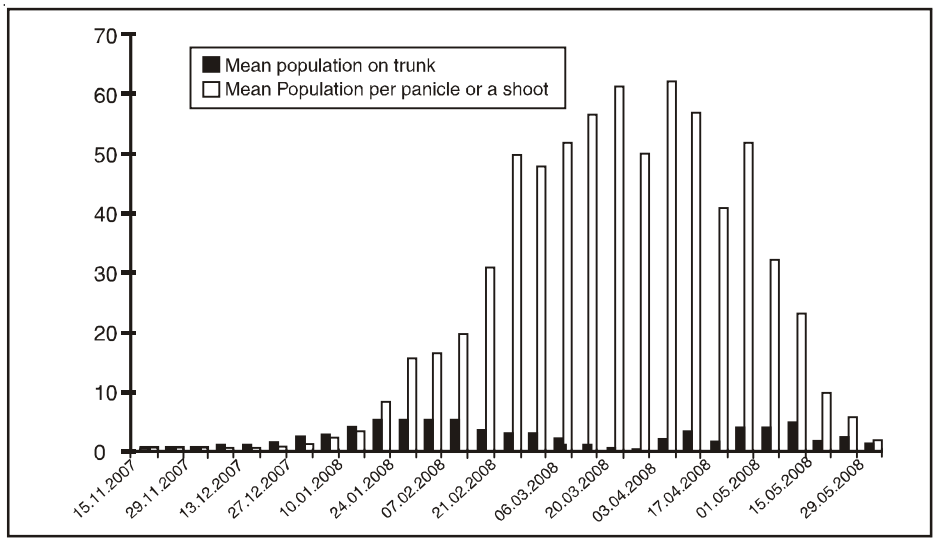

Fig.1. Tree-A: Observations of nymphal population of mango mealy bug, *D. mangiferae* in the research locality selected for studies.

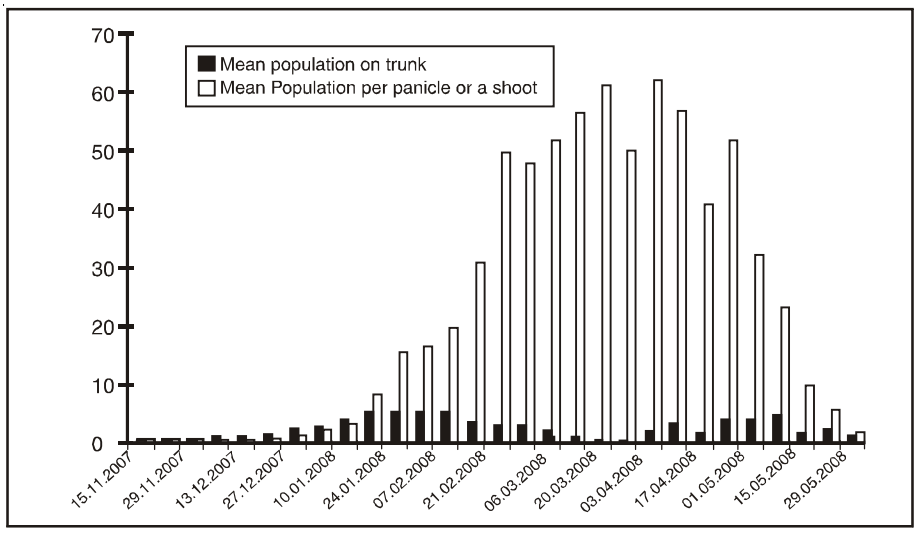

Fig.2. Tree-B: Observations of nymphal population of mango mealy bug, *D. mangiferae* in the research locality selected for studies.

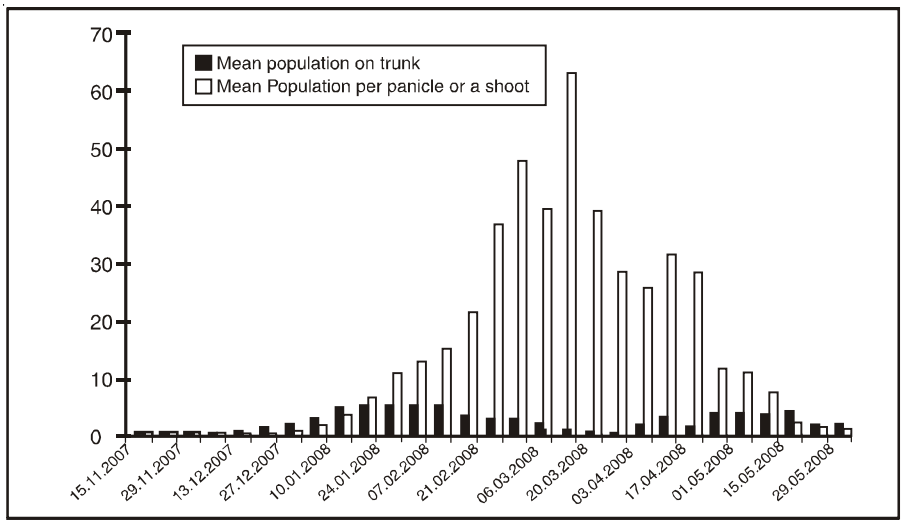

Fig.3. Tree-C: Observations of nymphal population of mango mealy bug, *D. mangiferae* in the research locality selected for studies.

As the previous studies show that the male adults of mealy bug are short flier insects and here they have been seen flying over the canopy of tree in search of female of mealy bug for mating while the maximum population of mealy bug went through the 3rd instar. Thus, full grown mealy bugs seen coming down through the branches and then trunk to the ground level in the last week of April were found to be gravid and they were ready to oviposition in the ground.

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