

## **INCIDENCE AND DAMAGE OF MEALY BUGS *DROSICHA MANGIFERAE* GREEN (HEMIPTERA: COCCIDAE) ON MANGO *MANGIFERA INDICA* L. FROM KOLHAPUR DISTRICT, INDIA**

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**Abstract:** Mango *Mangifera indica* L, the king of all fruits is cultivated in about 7, 50,000 hectares in Indian subcontinent. The varieties like hapus, grafted and hybrids are more susceptible to insect pests including Mealy bugs, *Drosicha mangiferae* Green (Hemiptera: Coccidae). Therefore, incidence and damage caused by *D. mangiferae* on mango varieties hapus, grafted and hybrids have been studied from Kolhapur district during the years 2011-2013. The pest occurred on the crop in December and caused extensive damage to crop by sucking cell sap from tender leaves, stem, flowering and fruiting bodies which resulted in extensive fall of flowering and fruiting bodies. The Mealy bug population was associated with crop up to ripening of fruits which disfigured and made the fruits insipid in the Kolhapur region. Hapus, grafted and other hybrid varieties of Mango were equally susceptible to Mealy bug attack in the region. Preventive control measures are suggested in the paper.

**Keywords:** Incidence, Damage, *Drosicha mangiferae*, Mango varieties, Kolhapur.

### **Introduction**

Mango *Mangifera indica* L., the king of all fruits is cultivated in about 7,50,000 hectares of land in Indian subcontinent. Kolhapur district is mango growing tract of India. Both, deshi and hybrid varieties are largely grown in this region. However, Hapus, grafted and other hybrid varieties are regularly attacked by Mealy bug *Drosicha mangiferae* Green (Hemiptera: Coccidae). Therefore, hoping as base line for designing suitable and ecofriendly control, incidence and damage aspects of *D. mangiferae* on mango varieties Hapus, grafted and other hybrids have been studied from Kolhapur district, India. Review of literature indicates that Atwal (1963), Atwal et al (1969), Ayyar (1941), Butani(1974), Rehman and Latif (1944), Sen and Prasad (1956) etc worked on Mealy bugs.

### **Materials and Methods**

Incidence and damage caused by *D. mangiferae* on mango varieties namely Hapus, grafted and other hybrids have been observed on the crops by visiting the fields weekly at morning

hours 7.30 to 8.30 am. Spot observations were made on the occurrence, settlement on different crop parts and life cycle stages of mealy bugs and symptoms expressed by the crop due to Mealy bug damage. Destructive sampling, based on random selection of 80 leaves, 20 twigs of 10 cm length and 5 fruits was carried out from 5 centres (Tahasils) of study area (Kolhapur district), namely Gaganbawada, Ajara, Karveer, Hatkanangale and Jaysingpur. The selection of spot was based on geography and climat conditions.

## Results

Results are recorded in Table-1. The results indicate that highest number of Mealy bugs was recorded on all selected parts of mango for studies viz, leaves (80), twigs (20) and fruits (5) in Jaysingpur and Hatakangale it was moderate on the crop in Karaveer and lowest in Gaganbawada. The lowest number of mealy bugs in Gaganbawada and Ajara might be due to heavy rain and probably other natural enemies like ladybird beetle, lacewings and Syrphid flies which acts as predators of Mealy bugs in the region. High temperature always favors the population of *D. mangiferae* on mango crop. Approaching hot months mealy bug population was found increased. The pest occurred on the crop in December and caused extensive damage to crop by sucking cell sap from tender leaves, stem, flowering and fruiting bodies which resulted in extensive fall of flowering and fruiting bodies. The Mealy bug population was associated with crop up to ripening of fruits which disfigured and made the fruits insipid in the Kolhapur region. Hapus, grafted and other hybrid varieties of Mango were equally susceptible to Mealy bug attack in the region. Rather than mango *D. mangiferae* damaged mulberry, guava, papaya, jamun, citrus, tamarind, cotton, okra, brinjal and hibiscus by sucking the cell sap and causing the leaves curly, yellow and dry; also affected growth and yield of the crop by causing sooty moulds on leaves of crops. Stages of eggs and nymphs seen from December to April. On an average female laid 45.00 eggs and completed its development within one month.

It has been recorded that the mealy bug deposit eggs in soil in April- May at the depth of 15-20 cm in silken purses. The eggs hatched in December last week or January first week. Overlapping hatching and generations were noticed. 80% of the newly hatched nymphs immediately ascended on the mango tree and settled on suitable/tender portion of the crop. First instar nymphs were noted during December to February second instars during February to mid March and third instars from March to April and then became adults. The adults (male and females) mated immediately and laid eggs in soil immediately.

## Discussion

According to Atwal (1963) the *D. mangiferae* was active from December to May and spent rests of the year in the egg stage. *D. mangiferae* was widely distributed in indogangetic plains from Punjab to Assam (Butani, 1974; Sen and Prasad, 1956) and found attacking about 62 host plants including jackfruit *Artocarpus heterophyllus* Lam., banyan *Ficus bengalensis*, guava *Psidium guajava* L., Papaya *Carica papaya* L., Citrus *Citrus spp.* and Jamun *Syzigium spp.* In Kolhapur region also it was found on various crops such as mulberry *Morus alba*, *D. guajava*, *C. papaya*, *Syzigium sp.*, *Citrus sp.* and *Tamarandus indica* Lim., cotton, okra, hibiscus and brinjal (Sathe, 1998). In mulberry ecosystems of Kolhapur region, *D. mangiferae* occurred mostly in summer months and damaged mulberry crop by causing 'Tukra disease' wherein darkening of green colour, hardening and curling of leaves at top region of the crop taken place (Sathe, 1998). Sathe (1998) also suggested *Cryptolaemus montruizieri* as good biocontrol agent of mealy bug on mulberry.

In the present study it has been recorded that the mealy bug deposited eggs in soil in April-May at the depth of 15-20 cm in silken purses. The eggs hatched in December last week or January first week. Overlapping hatching and generations were noticed. 80 % of the newly hatched nymphs immediately climb on the mango tree and settled on suitable/tender portion of the crop. First instar nymphs were noted during December to February, second instars during February to mid March and third instars from March to April and then became adults. The adults (male and females) mated and laid eggs in soil immediately.

According to Rao et al. (2006) mealy bugs posed a serious threat for cultivation of many fruit crops. *Planococcus citri* Risso occasionally attained epidemic forms on citrus. A total of nine mealy bug species have been reported on citrus and *D. mangiferae* was one of them reported from Nagpur region of Maharashtra.

From Kenya and Tanzania, Tanga, (2013) studied effects of climatic factors on the occurrence and seasonal variations in population of a mango mealy bug *Rastricoccus inceryoides* (Pseudococcidae). The study revealed that populations of *R. inceryoides* followed as annual cycle which was synchronized with the mango fruiting season, with a peak incidence occurred during the Northeast monsoon (December- February) at a temperature range of 23-33<sup>0</sup>C and relative humidity of 54-86% and total rainfall from 0-63mm. The population trend of *R. inceryoides* was climate dependent and declined sharply following the onset of the heavy rains from March- May and continued through the coldest and driest period of year from June- October (Southern monsoon). In the present study population of

mealy bugs was increased by increase in temperature and suddenly declined due to harvest of crop fruits.

### References

- [1] Atwal, A.S 1963. Insect pests of mango and their control. Punjab hort. J. 3, 235-258.
- [2] Ayyar, T V.R. 1941. Notes on some south Indian mealy bugs. Indian J. Ent, 3, 107-113.
- [3] Butani D.K. 1974. Insect pests of fruit crops and their control. 7. Mango. Pesticides, 8(3), 37-41.
- [4] Rahman, K.A and Latif, M.A. 1944. Description, bionomics and control of the giant mealy bug *Drosicha stebbingi* Gr. Bull. Ent. Res, 35, 197-209.
- [5] Rao C.N., V.J. Shivankar and Shyam Singh 2006 Citrus mealy bug (*Planococcus citri* Risso) management- a review. Agric Review, 27(2), 142-146.
- [6] Sen A.C. and D. Prasad 1956. Biology and control of mango mealy bug *Drosicha mangiferae* Green. Indian J. Ent, 18, 127-140.
- [7] Sathe T.V. 1998 Sericultural crop protection. Asawari publi. Osmanabad.pp.1 to 120.
- [8] Tanga Mbi, Chrysantus 2013. Bioecology of Mango mealy bug green (Hemiptera: Pseudococcidae) and its associated natural enemies in Kenya and Tanzania. PhD thesis, University of Pretoria. Pp. 156-183.

**Table-1:** Average incidence of *D. mangiferae* on mango varieties in Kolhapur district (2011-2013).

Sr. No	Study Centre	No. of species on leaves (80)	No. of species on twigs (20)	No. of species on fruits (5)	Susceptibility of mango varieties to Mealy bugs		
					Hapus	Grafted	Other hybrids
1.	Karveer (Rain fall-above 1000mm)	160	142	16	++	++	++
2.	Gaganbawada (Rain fall-above 5000mm)	87	114	13	+	+	+
3.	Ajara (Rain fall-above 2000mm)	147	130	14	+	+	+
4.	Hatkanangale (Rain fall-above 875mm)	178	158	18	+++	+++	+++
5.	Jaysingpur (Rain fall-less than 750mm)	187	162	20	+++	+++	+++

+++ High  
 ++ Moderate  
 + Low