



## Destructive Mealy Bugs of Agricultural and Medical Crops From Kolhapur District, India

### KEYWORDS

Agriculture & Medical Crops, Mealy bugs, control, biocontrol agents, Kolhapur.

**Prof. Dr. T. V. Sathe**

Department of Zoology, Shivaji University, Kolhapur  
416 004, India.

**Dr. Nishad Sathe**

Sangivani Clinic Sangwade, Kolhapur.

**Dr. Aruna N. Sathe**

Sangivani Clinic Sangwade, Kolhapur

**A. G. Khamkar**

Dept. of Zoology, Shivaji University, Kolhapur - 416 004,  
India

### ABSTRACT

Mealy bugs (*Hemiptera*) are very potential insect pests of agricultural, medical, horticultural, floricultural and forest crops. They suck the cell sap from crop plants and affect the growth and yield. Therefore, destructive mealy bugs have been studied from above ecosystems. In all, 15 species have been reported from Kolhapur district. The important genera refer to *Maconellicoccus*, *Planococcus*, *Ferrisia*, *Ripersia*, *Drosicha*, *Drosichiella*, *Pseudococcus*, *Saccharicoccus* and *Nilaecoccus*. The dominant and most commonly found species were *M. hirsutus* and *D. mangiferae* and polyphagus too. The mealy bugs have been controlled by treating the crops 0.03% methyl parathion. The potential natural enemies of the mealy bugs in the region were lady bird beetles *Menochilus sexmaculatus*, *Cryptolaemus montrouzieri* and lacewings. Mealy bugs be controlled by safety chemicals and biocontrol agents as ecofriendly integrated pest management.

### INTRODUCTION

Mealy bugs (Order : Hemiptera) are potential cell sap sucking insect pests of crops in various agroecosystems including medical plants. They penetrate long proboscis quite deep in plant tissue for sucking cell sap hence, became safty from pesticides and difficult to control. Secondly, pesticides lead several serious problems like pest resistance, secondary pest out break, pest resurgence, pollutions, health hazards and killing of beneficial organisms. Therefore, for adopting alternative control measures, information on diversity, occurrence, damage, host plants and life cycle patterns is essential. Thirdly, health care through medicinal plants is safety. Review of literature indicates that in past, mealy bugs have been studied by Bartlett (1957), BenDay *et al.* (1997), Jalil and Kabir (1972), Mani and Krishnamoorthy (1989, 1990), Sathe (2009, 2013) Varshany (1992, 2002), Williams (1978) on various crops but, little is known about mealy bugs from Kolhapur region. Keeping in view all above facts, present work was carried out.

### MATERIALS & METHODS

Mealy bugs have been collected from various ecosystems including agricultural and medicinal plants of Kolhapur, India. The collected samples were examined and identified by consulting appropriate literature cited in the text. Occurrence and life cycle and host plants of species were studied by visiting ecosystems at 15 days interval and by spot observations by one man one hour search method. Morphological features of species have been recorded with the help of compound microscope and measurements were taken by oculometer. 0.03% methyl parathion was used for control of mealy bugs on various crops.

### RESULTS

Results are recorded in table-1. The results indicate that 15 species of mealy bugs belonging to genera *Maconellicoccus*, *Planococcus*, *Ferrisia*, *Ripersia*, *Drosicha*, *Drosichiella*, *Pseudococcus*, *Saccharicoccus* and *Nilaecoccus* were prevalent in Kolhapur district on economical important crop plants. *M. hirsutus* and *D. mangiferae* were dominant over other species and were polyphagus in the region. All mealy bug species were responsible for sucking the cell sap and causing curling and yellowing of leaves, disfiguring fruits and dropping of flowering and fruiting bodies. Mealy bugs secreted

sticky substance over leaf surface of crops and caused sooty mould which in turn affected the photosynthesis, growth and yield of the crop plants. *P. filamentosus*, *S. sacchari*, *R. oryzae* were found infesting crops throughout the year. However, *M. hirsutus* was found on pomegrate from July to May and *D. tamarindus*, *D. stebbingi* and *N. viridis* were common on the crops from December to March. Treating the crop with 0.03% methyl parathion provided good control of mealy bugs. The natural enemies such as lady bird beetles, *Menochilus sexmaculatus*, *Cryptolaemus montrouzieri* and lace wings were always associated with mealy bugs and suppressed the mealy bug population by feeding upon them.

### DISCUSSION

Mani and Krishnamoorthy (1991) reported *M. hirsutus* as an important pest of pomegranate *P. granatum* causing serious threat to pomegranate industry in South India. *M. hirsutus* was found infesting stem, flowers and fruits of pomegranate. The fruits of pomegranate are very useful for increasing immunity in humans. They reported over lapping mealy bug generations on this crop. In Kolhapur, it is very bad pest of ornamental plant *Hibiscus* spp. and found throughout the year (Sathe, 2013). On mulberry ecosystem of Kolhapur this species was responsible for causing 'Tukra Disease' wherein the top leaves became dark green, hard and thick curly which affected the quality of mulberry leaves, the essential food component of silk worms in sericulture industry. According to Ray (1989) Black mulberry *M. nigra* is useful against AIDS in human. An alkaloid deoxyjirimycin (DNJ) has been extracted from the root bark of *M. nigra* is effective component against AIDS. In mulberry ecosystems of Kolhapur *M. hirsutus* occurred in summer months (Sathe, 1996).

Western Maharashtra is sugarcane belt but mealy bugs are limiting factor of sugar recovery in Kolhapur region. The mealy bug *S. sacchari* was found throughout the year on sugarcane in Kolhapur. Mealy bugs are also potential pests of floriculture (Sathe, 2013) and horticulture crops of the region. They have serious impact on grape production in Western Maharashtra (Sathe, *et al.*, 2010).

According to Mani (1990) the mealy bugs *P. citri* and *F. ver-gata* were serious pests on guava in India. They made ob-

servations on incidence of *F. virgata* and *P. citri* in 1987 in two localities around Bangalore. They selected one orchard at Honnenahalli for survey of mealy bugs. At Honnenahalli farm, *P. citri* appeared in July on guava trees and became serious by August presumably due to the frequent applications of insecticides namely quinolphos 0.05%, methyl parathion 0.05% and monocrotophos 0.05%. The mealy bug population ranged from 984 to 3401 per tree with a mean of 1420. They also recorded *F. virgata* as serious pest of guava from this region. In the present study mealy bugs have been reported from various ecosystems such as agricultural, medicinal, horticultural, floricultural and forest ecosystems by visiting 15 days interval to the spot studies and methyl parathion 0.05% suppressed the mealy bugs in the region. Natural enemies like *M. sexmaculata*, *C. montruizieri* and lace wings have also good impact on mealy bug population suppression in the region.

In general, mealy bugs are serious threat to several agricultural and medicinal crops in Kolhapur district, India. Hence, their survey, occurrence, life cycles, host plants and control both by using safety chemicals and biocontrol agents are essential part of integrated and ecofriendly pest management. The present work will add great relevance in controlling the diversity of mealy bugs.

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**Table 1: Destructive mealy bugs on crops of economic importance from Kolhapur district**

Sr. No.	Mealy bug species	Host plants	Features	occurrence
1.	Planococcus citri (Risso)	Guava Psidium guajava L., Citrus spp.	Oval, flat bodied, suck cell sap	July - Nov.
2.	Planococcus lilacinus (Cockerell)	Custard apple, citrus, guava, Tamarind Tamarindus indica L.	Suck cell sap from leaves & roots	July - Nov.
3.	Ferrisia virgata (Ckll.)	Guava, custard apple	White tailed, two long waxy processes at posterior end. Complete its development within one month	Through out the year
4.	Maconellicoccus (Phenacoccus) hirsutus Green.	Pomegranate Punica granatum (L.) (Polyphagous - more than 125 host Rents) Mulberry Moras alba L. Hibiscus sp.	Pink coloured Infest stem, flowers and fruits Infest flowers and fruits Infest flowers and fruits	July - May March - June Through out the year
5.	Rice mealy bug Rippersia oryzae Green (Coccidae)	Rice Oryza sativa L.	Reddish white, plumpy, powdery. Complete its life cycle in 20 days. Stunting plant growth, curling and yellow leaves	Through out the year

6.	The citrus mealy bug Pseudococcus filamentosus Cockerell (Pseudococcidae)	Citrus spp. Begonia and garden plants	Flat bodied with waxy filaments on margins. Life cycle completed in 7 weeks. Secretes honey dew, affect photosynthesis	Through out the year
7.	Pseudococcus spp.	Grape vine Vitus vinifera L.	Oval, orange red, cottony covering.	Aug - April
8.	Mango mealy bug Drosicha mangiferae Green (Coccidae)	Mango Mangifera indica L. Citrus spp., Syzygium spp., Psidium guajava L. Ficus bengalensis Carica papaya L.	Flat bodied with waxy components on back	Dec - May
9.	Drosicho stebbingi Gr.	Fig, Mango, Shorea	Flat bodied with powdery covering	Dec. - March
10.	Drosicha contrahens (Walker)	Mango	Flat bodied with powdery covering	Dec. - March
11.	Drosichiella tamarindus Green	Ber, Zyzyphus spp. Jamun, Tamarind, Fig	Flat bodied with powdery covering	Dec. - March
12.	Nilaecoccus viridis (Newstead) (Pseudococcidae)	Tamarind, Citrus spp.	Flat bodied with powdery covering Males winged, females wingless	Dec. - March

13.	Sugarcane mealy bug Saccharicoccus sacchari (Cockerell) (Coccidae)	Sugarcane Saccharum spp.	Females inert pink, 5 mm long with mealy power. Males winged, life cycle completed within one month, several generations are possible in a year	Through out the year
14.	Pseudococcus coccotis Mask.	Coconut	Flat bodied females wingless, many generations are completed in a year	Through out the year
15.	P. longispinus T.	Coconut	Flat bodied females wingless, many generations are completed in a year	Through out the year

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