

# A Surveillance Data of Natural Enemies of Mealybugs in Thrissur, Kerala

Juvin Jose

Neelankavil House, Kolangattukara, Choolissery. P.O. Pin-680541 Kerala

**Abstract:** Monitoring survey was carried out for natural enemies of mealybug species. It resulted in 15 species of natural enemies from 12 mealybug hosts and they belong to the order Coleoptera, Diptera, Hymenoptera and Lepidoptera. It includes beetles, fly, parasitoids and butterfly respectively. So these natural enemies combined action is resulted in natural regulations of mealybugs in the study locality.

**Keywords:** Survey, Mealybug colony, Parasitization, Natural enemies and Thrissur district

## 1. Introduction

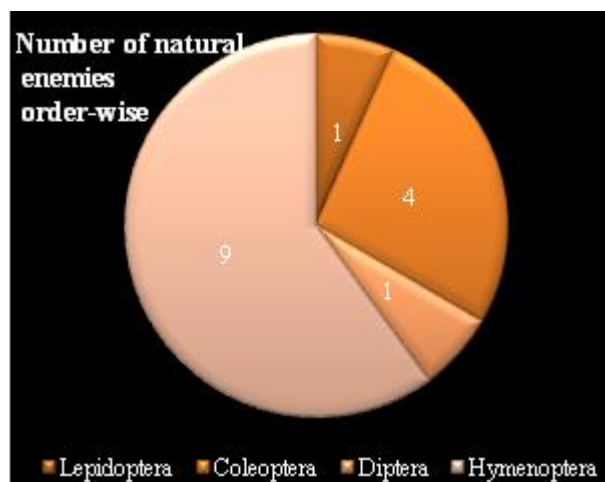
Mealybugs are sap feeding killers of plants. The pest group always hides in different plants parts. Frequent use of pesticides develops resistance in them. Natural enemies are fates of their natural control. So a proper listing is essential that is conferring in this surveillance study.

## 2. Materials and Method

Survey conducted in two summer seasons of 2015 and 2016. Collect mummified mealybug colonies and taken to lab. After the keen examination and identification of mealybug colony, it kept in wrapped transparent polythene bag with tag. The tag comprises location host and date of collection. The bag periodically checked for isolating emergence. The emergences collected were killed using with ethyl acetate and they preserved with voucher sample. For taxonomic identification NBAIR online database was used.

## 3. Results

Total twelve mealybug species were documented with parasitization. The each host colonies were incumbent of specific natural enemy. Maximum number of natural enemy species collected from order Hymenoptera. They were parasitoids. It was ten in number. Followed by this, the order Coleoptera reported five species of beetles. Order Lepidoptera and Diptera individually one butterfly and fly were documented.



## Host wise list of natural enemies reported

- 1) *Phenacoccus solenopsis* (Cotton mealybug) *Aenasius arizonensis*, *Spalgis epeus* and *Cryptolaemus montrouzieri*
- 2) *Ferrisia virgata* (Striped Mealybug) *Blepyrus insularis*, *Aenasius advena* and *spalgis epeus*
- 3) *Paracoccus marginatus* (Pappaya mealybug) *Pseudoleptomastix mexicana*, *Acerophagus papayae*, *Prochiloneurus pulchellus* and *spalgis epeus*
- 4) *Rastrococcus iceryoids* (Icerya mealybug) *Hyperaspis maindroni* and *Cacoxenus perspicax*
- 5) *Coccidohystrix insolita* (Eggplant mealybug) *Blepyrus insularis*, *Prochiloneurus pulchellus* and *Leptomastix nigrocincta*
- 6) *Planococcus citri* (Citrus mealybug) *Leptomastix dactylopii* and *Leptomastix nigrocincta*
- 7) *Pseudococcus longispinus* (Long tailed mealybug) *Spalgis epeus*
- 8) *Planococcus lilacinus* (Coffee mealybug) *Spalgis epeus*
- 9) *Icerya aegyptiaca* (Bead fruit mealybug) *Rodolia amabilis*
- 10) *Rastrococcus invadens* (Fruit tree mealybug) *Anagyrus mangicola*
- 11) *Dysmicoccus bevipipes* (Pineapple mealybug) *Cacoxenus perspicax*
- 12) *Nipaecoccus viridis* (Lebbeck mealybug) *Prochiloneurus pulchellus*, *Spalgis epeus* and *Scymnus nubilus*

## *Spalgis epeus* Westwood (Fig. 1, 2 and 3)

It is widely known as apefly. The common name etymolyzed from it pupal shape or face like monkey face. *Spalgis epeus* was most potential natural enemy ever found in this survey. The Lepidopteran fly larva is voracious feeder of mealybug colonies. It preyed upon 5 species of mealybug. It found associated with *P. solenopsis*, *F. virgata*, *P. marginatus*, *P. longispinus* and *P. lilacinus*. Until attain pupation the apefly larva domicile of these host mealybug colonies. They feed on egg, instars and adults of mealybug colony. Maximum number of caterpillar collected from *P. marginatus* and *P. solenopsis* colony i.e 5 to 7.

## *Cacoxenus perspicax* Knab (Fig.4)

It is isolated from *D. bevipipes* and *R. iceryoids*. Maximum three emergences were reported from one colony of host. No combinative predatory allies reported with this Dipteran fly.

It laid their egg in mealybug colony. Subsequently its maggots arise and feed on these colonies. They mainly prefer feed on mealybug eggs.

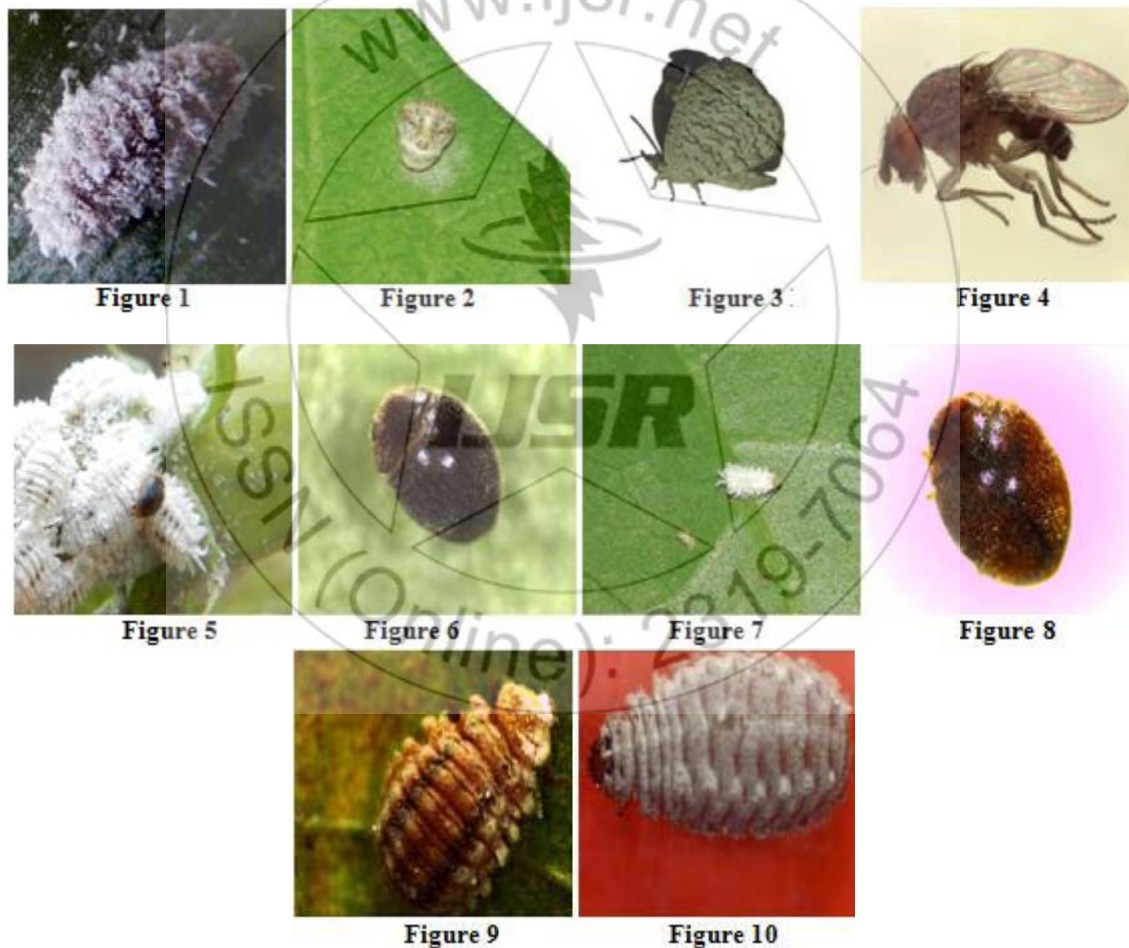
***Cryptolaemus montrouzieri* Mulsant** (Fig.5, 6 and 7)

It widely known as ladybird beetle. It documented from *Phenacoccus solenopsis* colony. Both adult and larva are greedyguts of mealybug colony. Larva feed on eggs. Adult feed on eggs, instars and adults of mealybug. It feed opportunistically on other plant sap feeding insects also. It is massly reared in biological laboratories and used for biological control nowadays. It is a coccinellid species. Apart from this there are several Coccinellids also world famous as mealybug destroyer. The other Coccinellid species reported were *Scymnus nubilus*, *Hyperaspis maindroni* and *Rodolia amabilis* (fig.8, 9 and 10 respectively).

**Parasitoids** Ten parasitoid species were recorded. Among the species *Aenasius arizonensis* is voracious feeder of *P. solenopsis*. It was highly selective in host also. All the

mummified *P. solenopsis* were reported with *arizonensis* parasitization. Likewise *Aenasius advena* reported from *F. virgata* only. Another parasitoid reported from *F. virgata* was *Bleyprus insularis*. It was found in *C. insolita* also. *Acerophagus papaya* is exotic natural enemy of *P. marginatus*. It introduced in 2010 in India [1]. Associate parasitization reported from two parasitoid species *Leptomastix dactylopii* and *Leptomastix nigrocineta* from *P.citri*. Both the species shows high affinity to incumbent upon *P. citri* colony. But *L. nigrocineta* reported in *C. insolita* mummies also. *Anagyrus mangicola* was another natural enemy selective in their nature host. It was reported from *R. invadens*. Aside from these facts *Prochiloneurus pulchellus* documented from three mealybug hosts. It is one of the hyperparasitoid reported in survey. *P. marginatus*, *N. viridis* and *C. insolita* were main host colonies of *P. pulchellus*. So it is one of the potential bio-control agent among the parasitoid species recorded.

**Natural enemies collected**



Parasitoids



*Prochiloneurus pulchellus*



*Leptomastix nigrocincta*



*Aenasius arizonensis*



*Blepyrus insularis*



*Anagyrus mangicola*



*Ptomastix mexicana*



*Leptomastix dactylopii*



*Pseudleptomastix mexicana*



*Acerphagus papayae*

References

- [1] N. Sakthivel. Effectiveness of three introduced encyrtid parasitic wasps (*Acerophagus papayae*, *Anagyrus loecki* and *Pseudleptomastix mexicana*) against papaya mealybug, *Paracoccus marginatus*, infesting mulberry in Tamil Nadu.. *Journal of Biopesticides*, 2013. Volume. 6 (1): 71-76.