



INCIDENCE AND DAMAGE SEVERITY OF PINK *HIBISCUS* MEALYBUG, *MACONELLICOCCUS HIRSUTUS* INFESTING ORNAMENTAL PLANTS

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ABSTRACT

Pink *hibiscus* mealybugs infest all plant parts; feeder roots, root crowns, stems, twigs, leaves, and flowers of ornamental plants. Ornamental plants enhance the beauty of homes, gardens, and commercial landscapes but this tiny pest can silently damage them. The study was conducted at Patuakhali Science and Technology University campus to assess the incidence of pink *hibiscus* mealybugs, *Maconellicoccus hirsutus* and their damage symptoms on different ornamental plant species grown in landscape and pots during period from February to September 2021. Results revealed that the highest incidence of mealybugs per plant in common coleus and china rose was recorded in the month of April and the lowest was in September. Among three hosts, the highest incidence was found on jatropha followed by Ixora and Mussaenda. In jatropha, the highest number of mealybugs per branch was observed in the month of April whereas the lowest number was in the month of September. In Ixora, the maximum number of mealybugs was recorded in the month of April and whereas the lowest number was in the month of September. Among ornamental plants, the highest percent leaf area covered by Mealybugs was found on garden croton (65%) and the lowest percent was on red China rose (10%). The maximum twig area covered by Mealybugs was recorded on yellow China rose (45%) while the minimum twig area covered was observed on croton (21%). The highest percent flower area covered by Mealybugs was found on Mussaenda (40%) and the lowest percent flower area covered was recorded on Ixora (12%). Findings on the incidence and damage severity by mealybugs on ornamental plants illustrated the serious threats to landscape and beautification of different institutions.

Keywords: Pink mealybugs, incidence, damage severity, ornamental plants, homes garden, landscape, pots

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INTRODUCTION

The Pink *Hibiscus* Mealybug, *Maconellicoccus hirsutus*, (Green) is a serious pest of many plants, trees, and shrubs in tropical and subtropical regions. It is native within the area encompassing Southeast Asia, Africa, and northern Australia. It is also known as the grape mealybug, the grapevine mealybug, the pink mealybug, the pink *Hibiscus* mealybug and the *Hibiscus* mealybug. *M. hirsutus* is highly invasive if introduced in the absence of its natural enemies, as demonstrated by its rapid spread through the Caribbean Islands and beyond in spite of plant quarantine throughout the region. Without natural controls it had a devastating impact on the agriculture, natural forests and tourism of Grenada (Peters and Watson 1999), damaging foreign exchange, trade in agricultural products, and the local ecology and water economy. Estimated economic losses due to its damage and control have been predicted to reach \$700 million in the United States (Moffitt 1999) and \$5 billion globally (Ranjan 2006). Mealybugs are considered pests of economic importance in several crops in the world (Morandi 2015, Garcia *et al.* 2016). They are worldwide pests of ornamental plants grown indoors and outdoors (Frank 2010). Mealybugs are soft, oval, wax-covered insects that feed on many plants in garden, landscape, and indoor settings. Cottony white wax is usually the first sign of their presence. Mealybugs may be found at rest or slowly crawling on the undersides of leaves, on stems in flowers or even on the pot. Usually found in colonies, they are piercing-sucking insects closely related to soft scales but lack the scale covers. Like soft scales, they can produce abundant honeydew and are often associated with black sooty mold. They are most active in warm, dry weather and thrive in areas without cold winters or on indoor plants. In warmer climates, mealybugs are serious pests on many citrus and ornamental plants. Pink *Hibiscus* mealybug is a polyphagous sap-sucking insect that feeds on a wide range of host plants in 76 plant families and over 200 genera (Mani 1989, Garland 1998, Pasiecznik *et al.* 2005). Its host range is very large, exceeding over 200 perennial and annual plant species, many of which are important in agriculture and ornamentals (Roltsch and Meyerdirk 2008). A polyphagous insect pest with a host range of more than 125 species of plants feeding on fruits, vegetables and fibre crops such as coffee, maize, sugarcane, soybean, okra and cotton. It is a primary consumer that also attacks ornamental plants such as the rose and *Hibiscus* (Reddy *et al.* 2009). Both greenhouse and field-grown ornamentals are commonly

attacked. Most species of ornamental plants can be infested with mealybugs. *M. hirsutus* destroys crops and ornamental plants (Hoy *et al.* 2003). Mealybugs damage plants by inserting their threadlike mouthparts into any part of the plant and sucking sap (Frank 2011). It is a pest of many plants, and a new problem on ornamental plants in Bangladesh. Recently it causes serious damage to ornamental plants in landscape and plants grown in pots. For proper management of any insect pest, it is important to know the incidence and damage extent of the particular insect pest. The sufficient information regarding incidence and damage extent of mealy bugs on ornamental plants is limited in Bangladesh. Considering above facts, the study was conducted to know the incidence of mealybugs on different ornamental plant species and to determine their damage severity.

MATERIALS AND METHODS

Incidence of mealybug populations and their damage symptoms were observed on different ornamental plant species grown in landscape and pots at Patuakhali Science and Technology University campus during February to September 2021. Five plants of each ornamental plant species were selected for data collection. Data were recorded on the number of mealybugs per leaf, per twig, per branch, per flower of each plant species as required. The number of mealybugs per plant was calculated by summing the number of mealybugs from each plant parts of 5 plants. The percentage of damage was determined from leaf, twig and flower area covered by mealybug which was measured by eye estimation.

Microscopic study of mealybug species identification: The mealybugs of different ornamental plants were collected separately in a plastic bag containing cotton balls soaked in ethyl acetate. Each individual was dipped in 99% ethyl alcohol for 2-3 seconds to wet the specimen and then placed in distilled water for 3-5 minutes. Finally mealybugs were observed in glycerine jelly using a stereoscopic microscope (Zoom Stereo Microscope, BTB-3A). Photographs of the specimen were made using digital camera (Plate 1).

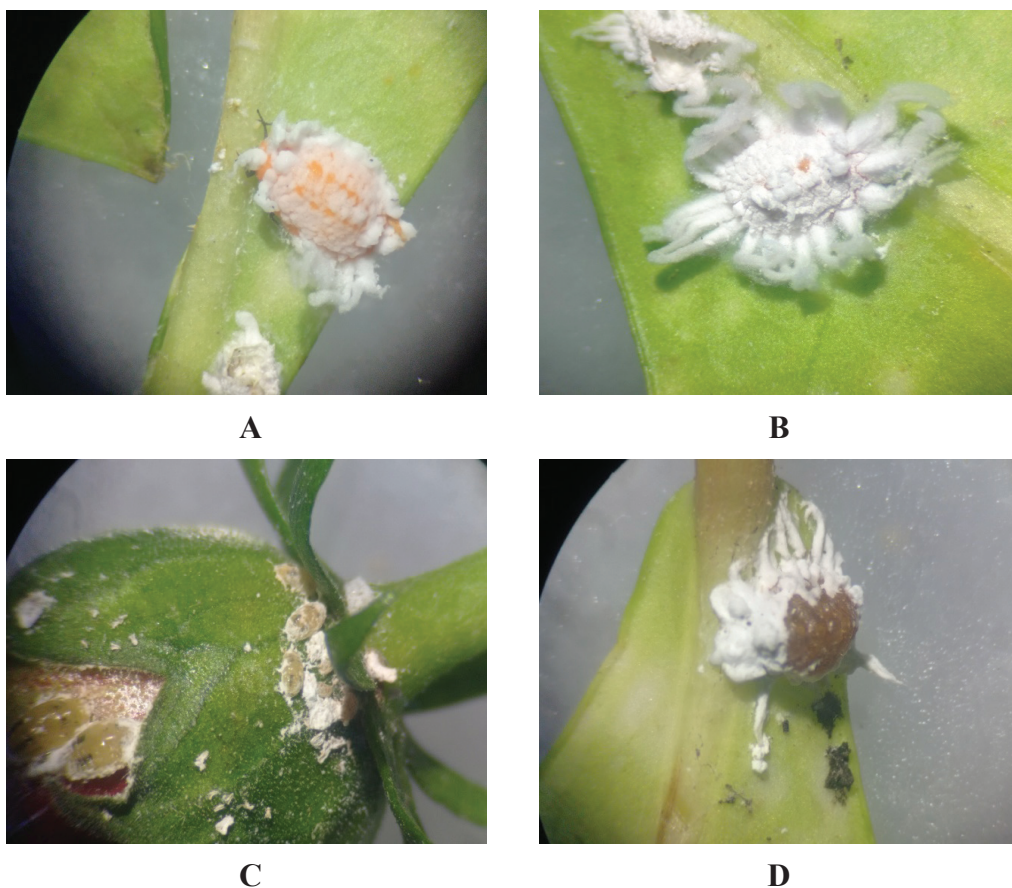


Plate 1. Microscopic views of the pink *Hibiscus* mealybugs (A-D)

Statistical analysis: Collected data were tabulated and graphical presentation was performed by using MS Excell program.

RESULTS AND DISCUSSION

Monthly incidence of Mealybugs per plant on maity and elite coleus: In elite coleus, the highest incidence of Mealybugs per plant was recorded in the month of April followed by May, June and March while the lowest incidence was in the month of September followed by August, July and February. In case of maity coleus,

similar trend was also observed indicating the highest incidence in the month of April followed by May and the lowest in the month of September followed by August (Fig. 1).

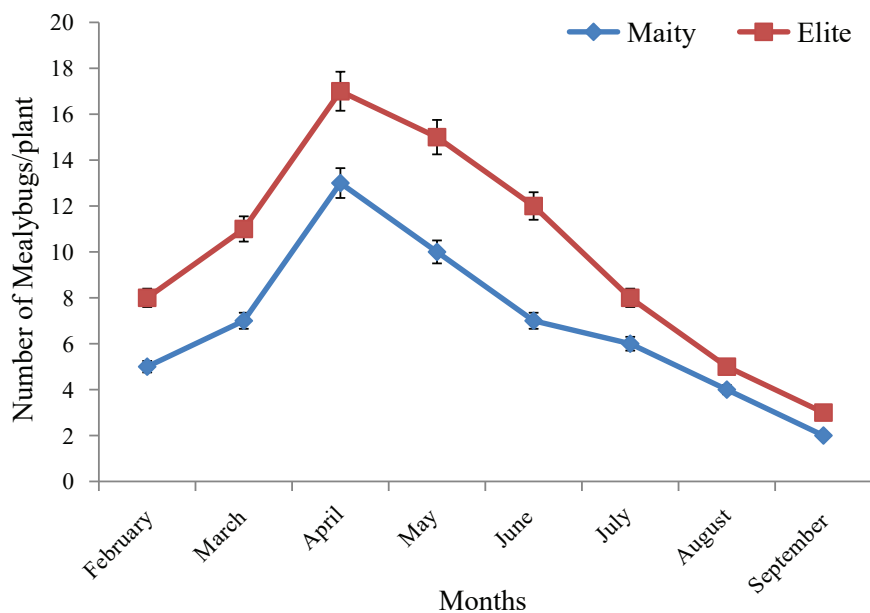


Fig. 1. Monthly incidence of Mealybugs per plant on maity and elite coleus plants at PSTU campus during February to September 2021

Monthly incidence of Mealybugs per plant on red and yellow China rose:

Figure 2 revealed that the highest number of Mealybugs per plant was recorded in the month of April followed by May, June and March while the lowest was in the month of September followed by August, July and February on yellow China rose. In case of red China rose, similar trend was also observed indicating the highest number in the month of April followed by May and the lowest in the month of September followed by August.

Monthly Incidence of Mealybugs per branch on Jatropha, Ixora and Mussaenda: Among three hosts, the highest incidence was found on jatropha followed by Ixora and Mussaenda. In jatropha, the highest number of mealybugs per branch was observed in the month of April followed by May and June whereas the

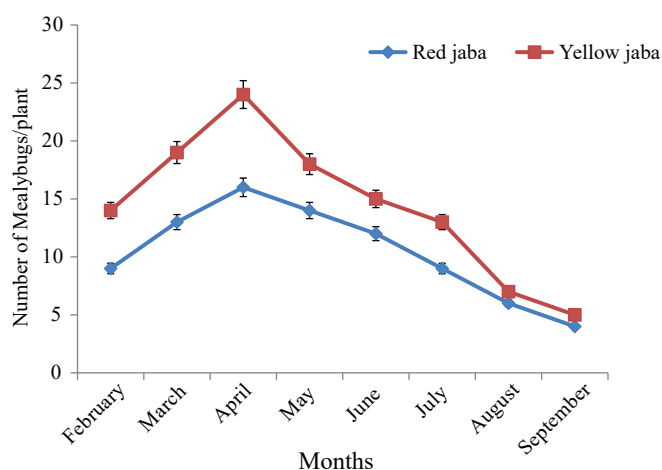


Fig. 2. Monthly incidence of Mealybugs per plant on red and yellow China rose plants at PSTU campus during February to September 2021

lowest number was in the month of September followed by August, February, July and March. In *Ixora*, the maximum number of mealybugs was recorded in the month of April followed by May and June while the lowest was in the month of September followed by August, February, July and March. Similar trend of monthly incidence was also observed in case of *Mussaenda* (Fig. 3).

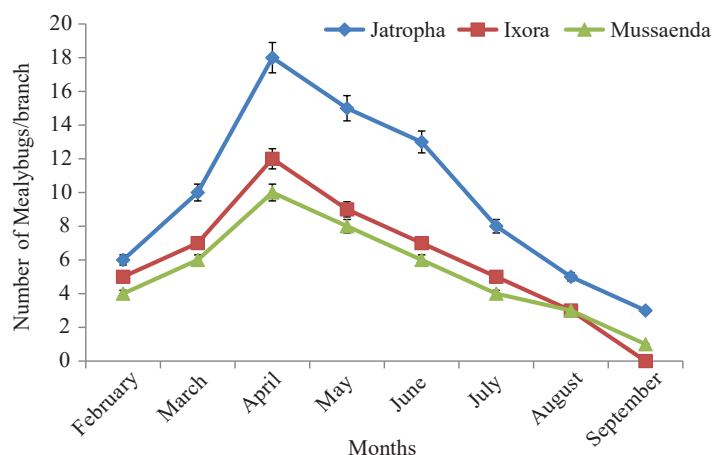


Fig. 3. Monthly Incidence of Mealybugs per branch on *Jatropa*, *Ixora* and *Mussaenda* plants at PSTU campus during February to September 2021

Damage potential of Pink hibiscus mealybugs: Leaf area (%) covered by Mealybugs: Among ornamental plants, the highest percent leaf area covered by Mealybugs was found on maity coleus (65%) followed by *Acalypha hispida* (35%), elite coleus (25%), croton (20%) and yellow China rose (18%). However, the lowest percent was on red China rose (10%) followed by *A. wilkesiana* (15%) and agnishar (16%) (Fig. 4).

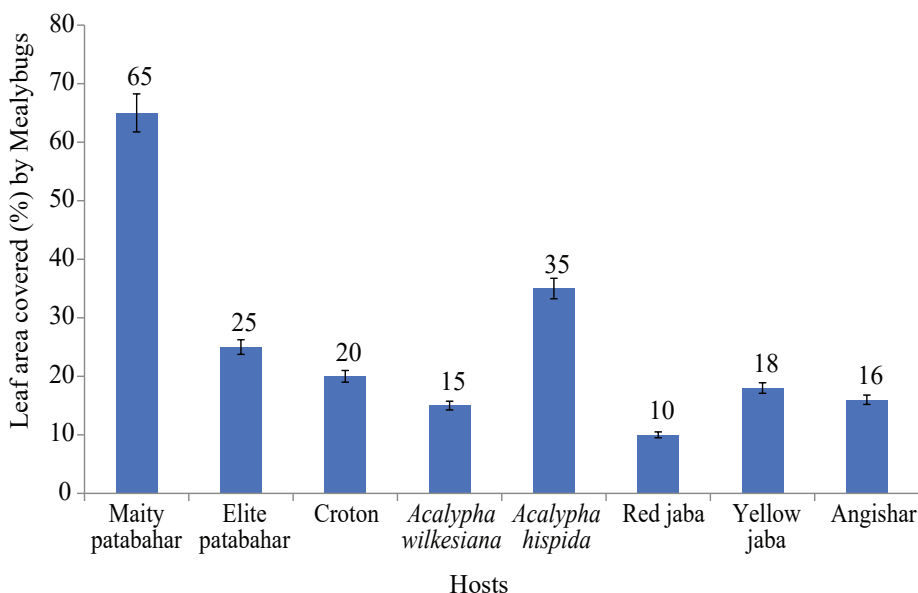


Fig. 4. Percentage of leaf area covered by Mealybugs on different ornamental plants

Percentage of twig area covered by Mealybugs: Figure 5 revealed that the maximum percent twig area covered by Mealybugs was recorded on yellow China rose (45%) which was followed by Mussaenda (40%), elite coleus (35%), jatropha (30%), red China rose (30%) and *A. wilkesiana* (28%) while the minimum twig area covered was observed on croton (21%) followed by rose (22%), maity coleus (23%), Ixora (24%) and *A. hispida* (25%).

Percentage of flower area covered by Mealybugs: Figure 6 illustrated that the highest percent flower area covered by Mealybugs was found on Mussaenda (40%) followed by jatropha (35%) and red China rose (28%) whereas the lowest percent flower area covered was recorded on Ixora (12%) followed by *A. hispida* (18%).

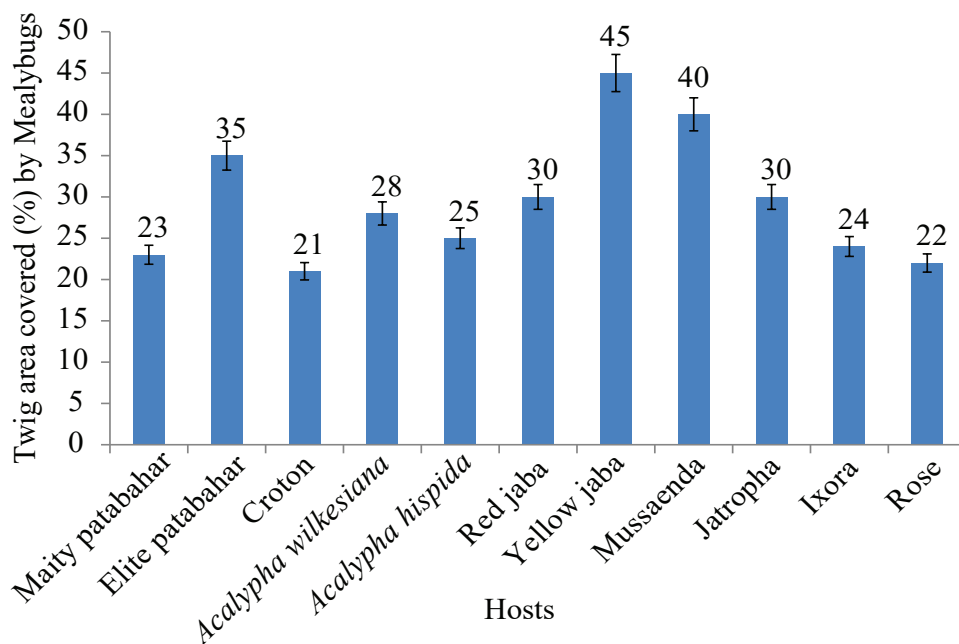


Fig. 5. Percentage of twig area covered by Mealybugs on different ornamental plants

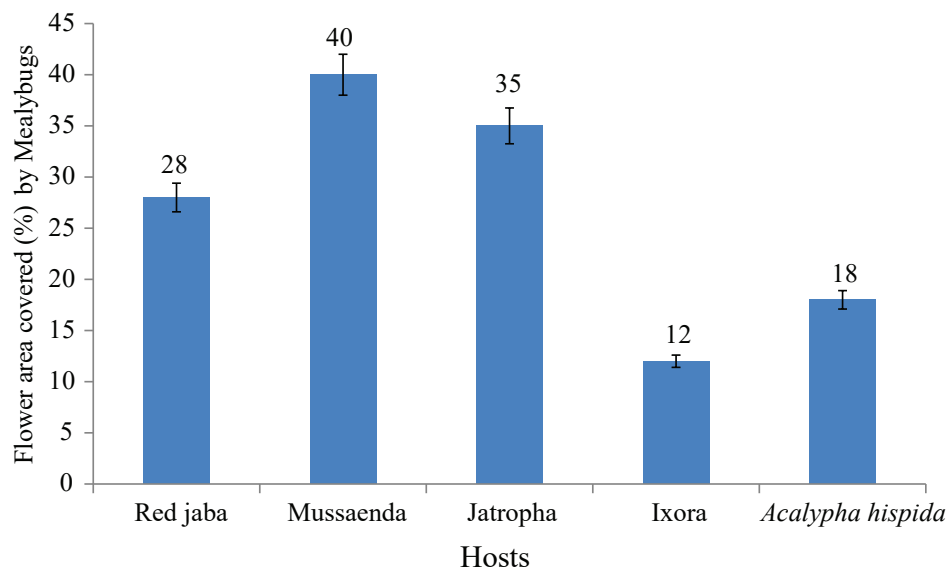


Fig. 6. Percentage of flower area covered by Mealybugs on different ornamental plants

The findings of the present study are supported by Raghuraman Angu *et al.* (2017) who stated that the population of mealybug on grapevine started increasing from third week of January 2015 and peak incidence was recorded from ninth week of February 2015 to thirteenth week of March 2015. Khan (2023) found that the highest incidence of mealybug per leaf was recorded on century plant and the lowest was on Mussaenda. The highest number of mealybugs per twig was found on Elite coleus followed by *Hibiscus* while the lowest number was found on Croton. He also stated that the highest percentage of infested twigs per plant was found on *Hibiscus* followed by *Jatropha* while the lowest percentage was on Maity coleus. Pink *Hibiscus* mealybug feeds on the soft tissues of many plant species and injects a toxic saliva that causes curling and contortion of leaves. The entire plant may be stunted and the shoot tips develop a bushy appearance. Buds may not flower and stems may twist. Fruit may also be deformed. The mealybug excretes honeydew which encourages the development of black sooty mold. Very high mealybug populations can kill plants (Williams 1996). The pink *Hibiscus* mealybug is expected to attack many Florida crops including citrus, avocado, carambola, fig, guava, mango, soursop, and sugarcane; vegetable crops including asparagus, beans, beets, cabbage, peanuts, pigeon pea, cucumber, lettuce, pepper, pumpkin, and tomato; forest trees, and many species of ornamental plants including *Allamanda*, *Angelica*, *Anthurium*, *Bougainvillea*, croton, ginger lily, *Heliconia*, *Ixora*, *Hibiscus*, palm, and oleander (Frank 2010). In the Caribbean, damage has been reported on *Annona* spp., *Spondias* spp., okra (*Abelmoschus esculentus*), mango, sorrel (*Hibiscus sabdariffa*), *Albizia saman* and other ornamentals important to the tourist industry, and forest trees such as blue mahoe (*Hibiscus elatus*) and teak (*Tectona grandis*) (Pollard 1995). *M. hirsutus* destroys crops and ornamental plants (Hoy *et al.* 2003). As it feeds, the *Hibiscus* mealybug injects into the plant a toxic saliva that results in malformed leaf and shoot growth, stunting, and occasional death. Leaves show a characteristic curling, similar to damage caused by viruses. Heavily infested plants have shortened internodes leading to resetting or a “bunchy top” appearance. A heavy, black, sooty mold may develop on an infested plant’s leaves and stems as a result of the mealybug’s heavy honey-dew secretions. When fruits are infested, they can be entirely covered with the white waxy coating of the mealybug.

REFERENCES

- FRANK, S. D. 2010. Ornamental and Turf mealybugs. <http://www.ces.ncsu.edu/depts/ent/notes/O&T/flowers/note19/note19> Access on: 15 December 2025.
- FRANK, S. D. 2011. Mealybugs. <http://mrec.ifas.ufl.edu/Iso/Mealybugs.htm> Access on: 15 December 2025
- GARCÍA, M. M., DENNO, B.D., MILLER, D.R., MILLER, G.L., BEN-DOV, Y. & HARDY, N.B. 2016. ScaleNet: a literature-based model of scale insect biology and systematics. Available at: <<http://scalenet.info/>>. Access on: 01 January 2026.
- GARLAND, J. A. 1998. Pest Risk Assessment of the pink mealybug, *Maconellicoccus hirsutus* (Green), with particular reference to Canadian greenhouses. PRA 96–21. Canadian Food Inspection Agency, Ottawa (CA).
- HOY, M. A., HAMON, A. & NGUYEN, R. 2003. *Pink Hibiscus Mealybug, Maconellicoccus hirsutus*. University of Florida, Institute of Food and Agricultural Sciences Extension. Publication #ENY029 (IN156).
- Khan, M. M. H. 2023. Host range, incidence and damage of pink hibiscus mealybug, *maconellicoccus hirsutus* infesting ornamental plants. *SAARC J. Agric.*, **21**(1): 203-215.
- MANI, M. 1989. A review of the pink mealybug-*Maconellicoccus hirsutus* (Green). *Insect Sci its Appl.* **10**: 157-167.
- MOFFITT, L. 1999. Economic Risk to United States Agriculture of Pink Hibiscus Mealybug Invasion. USDA; Washington, DC, USA.
- MORANDI, F. W. J. 2015. A survey of mealybugs infesting south-Brazilian wine vineyards. *Revista Brasileira de Entomologia.* **59**(3): 251-254.
- PASIECZNIK, N., SMITH, I., WATSON, G., BRUNT, A., RITCHIE, B. & CHARLES, L. 2005. CABI/EPPO distribution maps of plant pests and plant diseases and their important role in plant quarantine. *EPPO Bull.* **35**: 1-7.
- PETERS, T. & WATSON, G. W. 1999. The biological control of *Hibiscus* mealybug in Grenada. In: Bell K, ed. Paths to prosperity: science and technology in the Commonwealth 1999/2000. London, UK: Kensington Publications, 130-132.

- POLLARD, G. V. 1995. Pink or hibiscus mealybug in the Caribbean. *CARAPHIN News* **12**: 1-2.
- RAGHURAMAN ANGU, A., NARENDRA REDDY, C., ANITHA KUMARI, D. & RAMESH, S. 2017. Seasonal Incidence of Mealybug, *Maconellicoccus hirsutus* (Green) on Grape. *Int. J. Curr. Microbiol. App. Sci.* **6**(2): 1629-1635.
- RANJAN R. 2006. Economic impacts of pink hibiscus mealybug in Florida and the United States. *Stoch. Environ. Res. Risk Assess.* **20**: 353.
- REDDY, G. V. P., MUNIAPPAN, R., CRUZ, Z. T., NAZ, F., BAMBA, J. P. & TENORIO, J. 2009. Present Status of *Maconellicoccus hirsutus* (Hemiptera: Pseudococcidae) in the Mariana Islands and Its Control by Two Fortuitously Introduced Natural Enemies. *Entomol.* **102**: 1431-1439.
- ROLTSCH, W. J., D. E. MEYERDIRK, R. WARKENTIN, E. R. ANDRESS, & CARRERA, K. 2006. Classical biological control of the pink hibiscus mealybug, *Maconellicoccus hirsutus* (Green), in southern California. *Biol. Ctrl.* **37**(2): 155-166.
- WILLIAMS, D. J. 1996. A brief account of the *Hibiscus* mealybug *Maconellicoccus hirsutus* (Hemiptera: Pseudococcidae), a pest of agriculture and horticulture, with descriptions of two related species from southern Asia. *Bull. Entomol. Res.* **86**: 617-628.

