

An Observation on Predatory Mites as an Important Biocontrol Agent on Rose in West Bengal India

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Abstract: The phytophagous mites attack the ornamental plants and cause substantial economic loss by sucking the plant sap and cause chemical, physiological and mechanical injuries which ultimately lead to reducing yield and economic loss. The use of synthetic chemical pesticides to control the mite problem is long in use in agricultural practices. But these types of pesticides have very hazardous effect on environment. The predatory mites can be an alternative to synthetic chemical pesticides and useful in IPM as an important biocontrol agent. In the present study the correlation coefficient has been worked out between the Phytophagous and Predatory mite population occurring on Rose (*Rosa* spp.) for three consecutive years which are 2009-2010, 2010- 2011 and 2011 -2012 and the correlation coefficient were -0.079, -0.066, and -0.032. And hence the the predatory mites have been suggested as an alternative to synthetic chemical pesticides as an biocontrol agent.

Keywords: phytophagous, predatory, IPM, biocontrol agent.

I. INTRODUCTION

Govt. of India has identified floriculture and horticulture as sunrise industries and accorded 100% export oriented status earning substantial foreign exchange. Floriculture and horticulture have become important commercial trades in agriculture as commercial floriculture is becoming high volume industry due to liberalization of industrial and trade policies. The important floricultural crops in India having high potentiality are rose, carnation, chrysanthemum, gerbera, gladiolus, orchids, anthuria, tulip, lilies, marigold, aster, tuberose, etc. and the leading states in India producing floricultural crops are Maharashtra, Haryana, Karnataka, Tamil Nadu, Rajasthan, West Bengal, etc.

The phytophagous mites which attack the floricultural and horticultural crops are known to inflict damage causing loss to the extent of 5-70% and in some cases, the loss may be far reaching leading to total crop failure. Some of the reported losses are 5-60% in jasmine due to *Aceria jasmini*, 53% on roses by *Tetranychus urticae*, etc. (Gupta, 2012).

Though, some works have been done on fruit trees and ornamental plants from West Bengal, (Karmakar *et.al.* 2010, Chatterjee & Gupta 1995) but so far no comprehensive study has been made to find out the natural solution to this mite problem. The objective of the present study was to find out the natural controlling measures of the phytophagous mites which can be used as the alternatives or substitution of chemical pesticides and can be an useful component of Integrated Pest Management .

II. MATERIALS AND METHODS

- **Study Area:** Ornamental Plant Garden Ramakrishna Mission Ashrama, Narendrapur in South 24 Pargana district of West Bengal (22°26'21" N, 88°23'45" E).
- **Study Period:** May 2009 - April 2012.
- **Host Plant:** Rose (*Rosa* spp.) was selected for statistical analysis in this study.
- **Data Collection:**

To study the interrelationship between phytophagous and predatory mites, 6 Rose plants in the Ornamental Plant Garden Ramakrishna Mission Ashrama, Narendrapur, were selected and tagged. Therefore, for altogether 6 plants, from each plant, 10 leaves were plucked at random from all around the plant and a total of 60 leaves were examined in each month. Population from each leaf was counted from 6.25 cm² area by placing a card board sheet having a hole of that size on the plucked leaf and counting the population of mites from that area only. Wherever necessary, to determine the correct identity of mites, slides were prepared and examined under microscope.

III. RESULT

The **phytophagous** group included mites belonging to the families -**Tetranychidae**, **Tenuipalpidae**, **Tarsonemidae** and **Eriophyidae** and **Predatory** group was represented by the mites belonging to the family **Phytoseiidae**.

TABLE: CORRELATION CO-EFFICIENT OF PHYTOPHAGOUS AND PREDATORY MITES ON ROSE

Study period	Phytophagous X Predatory
2009-2010	-0.079
2010-2011	-0.032
2011-2012	-0.066

IV. CONCLUSION

The use of predatory mites is an essential part of biocontrol programs used by both vegetable and ornamental growers around the world (van Lenteren 2003, Schneider 2009). One of the first commercially produced biocontrol agents, back in the late 1960s, was *Phytoseiulus persimilis*, a predatory mite to control two spotted spider mite (TSSM). Since then several other species of predatory mites have been introduced to control a range of different pests: *Amblyseius cucumeris*, *Amblyseius swirskii*, *Ambyseius californicus* and many others. But unfortunately, no such kind of practices are available in our country so far. As throughout the study period, the phytophagous mite population was negatively correlated with predatory mite population on both the hosts, it can be assumed that:

- The predatory mites acted as the factors that reduced the phytophagous mite population
- Further, these mites can be used as important biocontrol agents in agricultural practices and can be a very important component of Integrated Pest Management (Karmakar *et al.*, 2016, Chakraborty 2010).

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