

Research Article

Survey and surveillance of natural enemies in mango ecosystem

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ABSTRACT: Abundance of natural enemies in mango ecosystem was studied through survey and surveillance. In order to record the natural enemies associated with mango ecosystem surveys were conducted in mango orchards in and around Malihabad block of Lucknow for two years. During the study period ten species of coccinellids and two species of chrysopid predators were recorded. The activity of lady bird beetles was noticed in mango orchard during first week of March to last week of March (10 to 13th Standard Meteorological Week (SMW) of 2016). Lady bird beetles, *Coccinella septempunctata*, *C. transversalis*, and *Menochilus sexmaculata*, were found in abundance and their population counts were taken. Peak populations of coccinellids were observed during 12th SMW with 3.3 adult beetles/panicle. Six species of parasitoids were collected from the mango ecosystem, among them; the most abundant parasitoid was *Brachymeria lasus*, parasitizing mango leaf webber. It was evident that wherever indiscriminate use of insecticides was undertaken, natural enemy population was very low. In unprotected orchards abundant natural enemies were recorded. In order to achieve natural control of the pest it is advised that the orchardists adopt minimal spray may be taken up.

KEY WORDS: Coccinellids, mango, natural enemies

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INTRODUCTION

Mango is grown throughout subtropics and tropics. Among the mango producing countries, India holds first rank with 45 per cent share (NHB, 2016). Key challenges for mango production in India are insect pests and diseases. The major insect pests of mango include hoppers, thrips, mealy bugs, midge, leaf webber, scale insects, stem borer and fruit fly (Reddy *et al.*, 2018). Insect pest management is very important for the profitable cultivation of mango. Among the insect pest management methods, biological control play crucial role in checking the insect pests under detrimental levels by predators and parasitoids. Exploration of natural enemies in local or in the native region of the pest, or introduction of natural enemies from foreign countries and augmenting them for the pest management can be used as an effective strategy in biological control program (Barratt *et al.*, 2018). The value of biological control often becomes evident when predators and parasitoids are disturbed by spraying of insecticides or weather aberrations (Messing and Brodeur, 2018). Biological control plays an increasing role in the management of fruit pests. There are many ways to improve the biological control of pests of fruit. Decisions for pest

spraying should be carefully weighed against the possible effects on predators and parasitoids. These decisions require a better understanding of the complex of natural enemies and the relative abundance of natural enemies.

MATERIALS AND METHODS

Twelve mango orchards of cv. Dashehari between 20 and 35 years of age were chosen to monitor natural enemies. Data on natural enemies were recorded weekly from five randomly selected trees in each orchard in four directions of the tree during the vegetative and reproductive phases. Abundance of predators and parasitoids were recorded in the orchards and major natural enemies were collected and brought to lab for the further processing. Parasitoids were identified by Dr. Balaji Rajkumar (trained taxonomist) and many are common natural enemies identified based on the literature and the experience of the authors.

RESULTS AND DISCUSSION

Abundance of natural enemies in mango ecosystem

During the survey and surveillance of the natural enemies in the mango ecosystem, 10 species of coccinellids and two