



Survey of Predatory Coccinellids (Coleoptera: Coccinellidae) in the Dapoli area of Konkan region

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ABSTRACT

Aphids are important pests of various cultivated crops and their populations are kept in check under natural conditions by one of their predators, the coccinellids. The indiscriminate use of pesticides has resulted into several adverse effects. Hence, the situation demands the bio-intensive integrated pest management approach for managing the pests of agricultural importance. Chilomenes sexmaculata (Fab.) is an effective predator to be used as a bio-control agent but the major challenge is its mass rearing and augmentation. Hence, present studies were undertaken to survey the predatory coccinellids (Coleoptera: Coccinellidae) in the Dapoli area of Konkan region, during 2010-12 at College of Agriculture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. The survey of coccinellids conducted in Department of Agronomy and Horticulture, College of Agriculture, Dapoli during December, 2010 to November, 2011 and results revealed that the five species of aphidivorous coccinellids viz., Chilomenes sexmaculata (F.), Coccinella septempunctata (L.), Coccinella transversalis (F.), Chilocorus nigritus (F.) and Illeis cincta (F.).

Key words: *Chilomenes sexmaculata, Coccinella spp., aphidivorous coccinellids*

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INTRODUCTION

Coccinellids or lady beetles, members of the family Coccinellidae, are among the most familiar beetles and have common names around the world, such as lady cows, God's cows and virgin's insect [11]. These are small to medium size beetles with an oval, oblong or hemispherical body shape [10]. Most of them are of bright shining colors with a pattern of spots or patches against a contrasting background. Many appear to be distasteful to birds, and their conspicuous appearance is an example of warning coloration [11].

Lady beetles are mostly considered beneficial because of their predatory activity and help in regulating pest populations of soft bodied insects like aphids, jassids, etc. World over about 420 genera and 5500 species of coccinellids have been recorded while in India 401 species belonging to 79 genera have been recorded so far [12]. Family Coccinellidae is further classified into six subfamilies namely; Chilocorinae, Coccinellinae, Coccidulinae, Scymninae, Sticholotidinae and Epilachninae. Ladybird beetles are mostly considered beneficial because of their predatory activity and help in regulating pest populations of soft bodied insects like aphids, jassids, etc [7]. However, members of its subfamily Epilachninae are phytophagous and are pests of important agricultural crops belonging to the family Fabaceae and compositae [3, 8]. A ladybird may eat aphids equal to its body weight every day. *Hippodamia variegata* (Goeze) is a general predator specially feeding on soft- bodied nymphs of aphids, mealy bugs and also scale insects, whiteflies and mites. An adult can consume 3, 23, 29 eggs, larvae and adults of red spider mites, respectively [2]. A single adult consumes around 5,000 aphids in its lifespan, whereas an adult female consumes about 300 aphids before laying eggs [4]. Similar study demonstrated that adults over winter in sheltered locations such as tree holes and other natural hiding places. Many monovolantine coccinellids species migrate in response to unfavorable environmental conditions. Species of Coccinellidae hibernate separately in small groups under fallen leaves in the forest clearings and in other habitat. The most suitable places for hibernation are well warmed forest clearings. In the beginning of September the coccinellids beetles fight for the sites of hibernation. The most important features of the coccinellid beetle biology are their seasonal migration and mass aggregation. These aggregations at

particular places for the purpose of hibernation have been noted all over the world [6,9]. The objective of the current study was to find out the lady beetles fauna of in the Dapoli area of Konkan region of Maharashtra State.

MATERIAL AND METHODS

Survey was undertaken on the fields of Department of Agronomy and Horticulture, College of Agriculture, Dapoli to collect the species of coccinellids. Different crops like cereals, pulses and vegetables were selected and inspected at weekly interval. During survey plants affected by aphids were located and observed to collect predaceous coccinellids.

Different species of coccinellids collected during the survey from the fields. The area of 2 x 2 m was selected from different crops and observations were recorded during December, 2010 to November, 2011 at weekly interval on different crops.

RESULT AND DISCUSSION

The following species of aphidophagous coccinellid beetles were collected from the fields of Department of Agronomy and Horticulture, College of Agriculture, Dapoli during 2010-11.

1. *Chilomenes sexmaculata* (Linn.)
2. *Coccinella transversalis* F.
3. *Coccinella septempunctata* L.
4. *Chilocorus nigritus* F.
5. *Illeis cincta* (Fab.)

All the above species of coccinellids were found commonly occurring in the field. Most of them collected from Mustard, Wal, Cowpea, Lablab bean, Brinjal, Chilli, Bitter guard, Water melon and Snake guard. Among these, predominantly occurring species were *Chilomenes sexmaculata* L., *Coccinella transversalis* F. and *Coccinella septempunctata* (Linn.) All these species of lady beetles were either true aphidophagous or incidental predators of homopteran insects, like mealy bugs and scale.

Similar records of predaceous coccinellids have been made by Singh and Singh [15]; Agarwala and Ghosh [1] reported a prey-predator catalogue which included 36 species of true aphidophagous Coccinellidae in India and other incidental predators of aphids. Sakhalkar [13] reported 9 species of aphidivorous coccinellids in Konkan region.

In another study Hemchandra *et al.* [5] the coccinellids diversity between the agro-ecosystem and forest ecosystems was compared. It was found that out of the 2363 specimens comprising 36 species of coccinellids, 2290 specimens comprising 35 species are aphidiphagous in the agro-ecosystem. The population of *Cheilomenes sexmaculata* (Fab.) was highest. The dominant species are *Coccinella septempunctata* L., *Micraspis discolor* (Fab.), *Coelophora saucia* (Mulsant) and *Pseudoaspidimerous flaviceps* (Walker). They indicated that the dominant index as 0.08 i.e. 8% species are dominant.

Sharma and Joshi [14] carried out an extensive survey of predatory and mycophagous Coccinellid beetles (Coleoptera: Coccinellidae) was conducted in the Dehradun District, India, over a period of two years (July 2005 to June 2007). A total of 4382 specimens of Coccinellids were collected at four different sites representing four different ecosystems having altitudes from 310m to 640m within the Dehradun. Twenty five species were identified and 14 species were recorded for the first time from district Dehradun. These 14 newly recorded species belong to 11 genera of 4 tribes and 3 sub-families. The following 14 species belonged to sub-family Coccinellinae and tribe Coccinellini: *Aneleis cardoni* (Weise), *Cheilomenes sexmaculata* var *undulata* (Fabricius), *Harmonia dimidiata* (Fabricius), *Hippodamia variegata* (Goeze), *Hippodamia* sp., *Illeis cincta* (Fabricius), *Megalocaria dilatata* (Fabricius), *Micraspis discolor* (Fabricius), *Micraspis vincta* (Fabricius), *Micraspis* sp., and *Psyllobora bisoctonata* (Mulsant). Two species occurred from sub-family Chilocorinae and tribe Chilocirini: *Brumoides suturalis* (Fabricius) and *Chilocorus nigrita* (Fabricius). Only one species namely *Rodolia sexnotata* (Mulsant) represented tribe Noviini of the subfamily Coccidulinae.

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