

## THE COCCINELLIDS (COLEOPTERA:COCCINELLIDAE) FAUNA IN MANDUWALA REGION, DEHRADUN, INDIA

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(Accepted 17 October 2017)

**ABSTRACT :** The latitude of Manduwala in Dehradun, Uttarakhand, India is 30.321915, and the longitude is 78.026619. Dehradun, Uttarakhand, India is located at India Country. These beetles are useful because of their predaceous Nature. The specimens of this research were collected by hand picking. These are of small size and easy to capture by hand. Killing Jar is a device used by entomologists to kill captured insects quickly and with minimum damage. The Jar, typically glass, must be hermetically sealable and one design has a thin layer of hardened plaster of paris on the bottom to absorb the killing agent. The killing agent will then slowly evaporate, allowing the jar to be used many times before needing to refresh the jar. A second method utilizes a wad of cotton placed in the bottom of jar. Liquid killing agent is then added until the absorbent material is nearly saturated. The most common killing agent is Chloroform and ethyl acetate. The species belong the family Coccinellidae; Sub family-Coccinellinae, the total of 9 species, *Coccinella quinquepunctata*, *Coccinella hieroglyphica*, *Coccinella transversalis*, *Harmonia dimidiata*, *Coccinella leonine*, *Harmonia conformis*, *Coccinella septempunctata*, *Hippodamia veriegata*, *Halmus chalybeus* was identified. Coccinellids are the most important and powerful predators of hemipteran pests including, aphids, mealybugs, scale insects and whiteflies. The present study is helpful in future research on the Bio-control of hemipteran pests due to genetics, physiology and behavior of coccinellids. This study combined with studies of their flight aerodynamics and interactions with agricultural ecosystems will undoubtedly lead to improvements in coccinellid-based hemipteran pests control programs.

**Key words :** Coccinella, Manduwala, Dehradun, India.

### INTRODUCTION

The predaceous insects of family Coccinellidae are commonly known variously as ladybirds (English English, Australian English, and South African English), ladybugs (North American English), lady beetles or coccinellid beetles (preferred by scientists). The family name comes from its type genus, *Coccinella* (White, 1983). 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 (Moreton, 1969). These beetles are of extremely diverse habits. The majority of beetles are useful because of their predaceous nature; but some are harmful, being polyphagous. The other coccinellids are predators of a variety of pests' viz., aphids, leaf-hoppers, scale insects, mealy bugs, mites and other soft bodied insects (Omkar and Bind, 1993, 1996; Omkar and Pervez, 1999, 2000, 2002). In present study, the Coccinellidae family nine species was reported from Manduwala region, Dehradun as *Coccinella quinquepunctata*, *Coccinella hieroglyphica*, *Coccinella transversalis*, *Harmonia dimidiata*, *Coccinella leonine*, *Harmonia conformis*, *Coccinella septempunctata*, *Hippodamia veriegata* and *Halmus chalybeus*. Coccinellids are the most important

and powerful predators of hemipteran pests including, aphids, mealybugs, scale insects and whiteflies. Their migratory abilities pose challenges and opportunities for the development of effective biological control programs against aphids and other hemipteran pests. The present study is helpful in future research on the biocontrol of hemipteran pests due to genetics, physiology and behavior of coccinellids. This study combined with studies of their flight aerodynamics and interactions with agricultural ecosystems will undoubtedly lead to improvements in coccinellid-based hemipteran pests control programs.

### MATERIALS AND METHODS

#### Collection of specimens

Insect nets have been used for collection of live specimens, it is however very much possible to collect Lady Bird Beetles by hand carefully (Harit, 2015). Species were collected killing and preserved dry as per entomological procedures used elsewhere and were identified with the help of standard literature available and with the help of expert scientists at Zoological Survey of India. Killing Jar is a device used by entomologists to kill captured insects quickly and with minimum damage. The Jar, typically glass, must be hermetically sealable and one design has a thin layer of hardened plaster of