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Research Paper

A preliminary investigation of the Insect fauna of family Carabidae (Coleoptera: Insecta) of Kota University campus

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Abstract: Kota region, popularly known as Hadoti, is rich in biodiversity and natural resources. This region is blessed by rich vegetation and wetlands. The present paper reports commonly observed species of Family Carabidae (Coleoptera: Insecta, Arthropoda). The field survey was conducted from January, 2015 to October, 2015. Surveys and collection was done in morning (06.00AM-10.00 AM) and evening (04.00-08.00 pm) at one month interval. Ground dwelling beetles were collected with the help of pit fall trap method. As per need sweep net method was also utilized. In few instances, beetles were handpicked. Both, aquatic and terrestrial, habitats were explored and 11 species from 8 genera (*Anthia, Carabus, Calosoma, Chlaenius, Dineutus, Cicindela, Poecilus, Pterostichus*) of Family Carabidae (Coleoptera: Insecta) were found. The collection is under study and many more species of this and other families will be identified.

Keywords: Carabidae, Coleoptera, Insecta, Arthropoda, Ground beetle, Kota, Rajasthan.

INTRODUCTION

Insects are fascinating organisms for research as these affect every aspect of our life. Carabids occupy most land habitats on nearly all continents. These beetles are abundant in the field and attract attention with their peculiar shape and coloration. They are mostly active at night and prey on a wide range of small animals such as other insects and spiders; some species are active during the day and feed on plant tissue. Most ground-beetles live at the surface of the ground, while some species dwell in the soil, in caves, or on the vegetation. Most Indian species cannot fly which reduces their dispersal capacity and affects the flow of genes defining their body shape.

The family Carabidae (ground-beetles) is composed of over 34,000 species. 1,927 genera are distributed worldwide and approximately 15,088 species were recorded from India (Kazmi, and Ramamurthy, 2004). Ground beetles play important roles in an ecosystem owing to their wide range of feeding mechanisms and being very numerous. They feed on wide range of organic materials including plant debris and animal dung's, thus playing a key role of nutrient recycling within an ecosystem.

Moreover, due to their higher sensitivity to environmental changes (physical, climatic, chemical changes) ground beetles can be used as indicators for changes in environmental conditions (Larsen et al., 2003; Villa-costillo and Wagner, 2002). With reference to order Coleoptera, excellent faunal treatises have been prepared by Horn (1981) describing fifteen new species from Kerala and by Gahan (1906) describing fifteen species. Jacoby (1908) and Maulik (1919) described thirty one and sixteen species of Chrysomelidae beetles, respectively. Beeson (1961) made an excellent treatment of economically important Coleoptera of the Indian sub continent.

Indian carabid fauna can be studied with the help of The Fauna of British India including Ceylon and Burma; Coleoptera: Carabidae (Andrewes 1929) and Catalogue of Indian Insects: Carabidae (Andrewes, 1930). Zoological Survey of India (1986) had undertaken four faunistic explorations in Silent Valley National Park wherein one hundred twenty eight species of Coleoptera have been recorded including ten new species. Pearson and Ghorpade (1989) made emphasis on geographical distribution and ecological history of tiger beetles of the Indian subcontinent.

Our knowledge regarding carabid diversity in SE Rajasthan (Hadoti region) is very little. Therefore, present study was undertaken.

MATERIALS AND MEHODS

The survey area is about 150 hectares of bare and un-constructed land in the university campus situated at MBS Marg, near Kabir circle, Kota (Rajasthan). The field survey was conducted from January 2015 to October, 2015. Surveys and collection was done in morning (08.00-10.00 am) and evening (04.30-07.00 pm) weekly initially and later at one month interval. Ground dwelling beetles were collected with the help of pit fall trap method. Pitfall traps are one of the most common methods used for sampling ground beetle communities (Lovei and Sunderland, 1996). As per need sweep net method was also utilized. In few instances beetles were handpicked. Photographs were captured through a Nikon stereomicroscope and Canon 500 digital camera.

RESULTS AND DISCUSSION

In India, ground-beetles are generally recognized by the following body features: length, 1.0–39.0 mm; colour dark (usually black or brown); elytra (wing covers) rarely spotted; dorsal surface without hair cover; head narrower than pronotum (dorsal part between head and wings); mandibles well developed, with sharp tips; eyes moderate in size; antennae thread-like or beaded like a necklace, composed of 11 segments; pronotum narrower than elytra, with a pronounced mobility; legs long and slender, fit for running; tarsi (last part of legs) composed of 5 segments; elytra fused, with striae (deepened lines) present; membranous wings very short, almost absent. Most carabids are recognizable alive by a peculiar way of running on the ground.

During the present surveys and collection in all 11 species distributed over 8 genera belonging to the family Carabidae of beetles were recorded. The names of Genera and species are listed in Table 1.

Table 1: Diversity of family Carabidae (Ground Beetles) from university campus of Kota University, Kota, Rajasthan

S. No.	Name of Genus	Name of Species
1	*Anthia*	*hexasticta*
2	*Anthia*	*sexmaculata*
3	*Carabus*	*glabratus*
4	*Carabus*	*orientalis*
5	*Carabus*	*rutilans*

6	*Calosoma*	*maderae*
7	*Chlaenius*	*tricolor*
8	*Dineutus*	*indicus*
9	*Cicindela*	*abdominalis*
10	*Poecilus*	*chalcites*
11	*Pterostichus*	*Melanarius*

Beetles are fascinating organisms for research as these affect every aspect of our life. These occupy most land habitats on nearly all continents. These beetles are abundant in the field and attract attention with their peculiar shape and coloration. These were being studied by many researchers in various parts of Indian subcontinent. For instance, Kazmi and Ramamurthy (2004) who encountered 99 species belonging to 60 genera under 13 families of Coleoptera from Thar Desert of Rajasthan. Chandra (2000) enlisted 94 species of scarabaeid beetles from Madhya Pradesh. In the present studied species of Carabids were enlisted in table 1. In present investigation 11 species of beetles were identified. The results of the present study are in agreement with earlier studies conducted in Rajasthan and Madhya Pradesh.

Preliminary study conducted on Biodiversity pattern of cavernicolous ground beetles and their conservation status in the Azores (Borges *et. al.*, 2007) in which total 10 species were studied while in present study 11 species of ground beetles recorded from study area.

Diversity of beetles (Insecta: Coleoptera) from the vicinity of Semadoh - Makhala Road, Sipna Range Melghat Tiger Reserve (M.S.) India were studied (Thakare and Zade, 2012) in which 3 species were studied of ground beetles.

Beetles of Jalgaon District of Maharashtra, India were studied (Pawara *et. al*., 2014) 4 species and 4 genera were studied of ground beetles, only 1 species (*A. sexgutatta*) was studied of genus *Anthia* which is also recorded in present study. In present study 3 species were recorded of *Anthia* genus viz. *A sexgutatta, A hexasticta* and *A sexmaculata*. 3 species recorded of genus *Carabus* while preliminary investigation only 1 species (*C. auroaitens*) of genus *Carabus* was recorded. Blatchley (1910) described the genus Pseudacystaand provided keys to the Tingidae of the eastern United States. While studying dispersal of beetles, Anderson and Levey (2014) found that adult mortality up to 41 % parasitism by nematodes and ectoparasitic fungi was there.

Conclusion: The data revealed will be addition to our knowledge of diversity of ground beetle found in outer area of Kota city, Rajasthan. It also provides baseline data for further research. The study is going on.

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