

Study of Coleoptera fauna at Tal Chhapar wildlife sanctuary, Churu, Rajasthan

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Abstract

The present research study was carried out at Tal Chhapar Wildlife Sanctuary, Churu, Rajasthan. Rajasthan state is very diverse due to its topography. Tal Chhapar Wildlife Sanctuary is situated in the Thar desert region of Rajasthan. The diversity of any area is affected by the flora and fauna of that area. Insect fauna plays an essential role in the diversity of any region as its most diversified group of animals. In Insect fauna most diversified class is Coleoptera which was collected and studied during the research period from January 2022 to October 2023. The study was carried out for the Season of winter, summer, monsoon, and post-monsoon by Quadrat sampling method. Based on the total number of species Scarabaeidae was the supreme family (6 species) followed by Cerambycidae (3 species), Carabidae, (2 species), Tenebrionidae, Coccinellidae, Elateridae, and Meloidae with one species respectively. Scarabaeidae Family was found Dominant family, as it recorded 40% species followed by Cerambycidae with 20%, Carabidae with 13.4%, and remaining with 6.6% species each.

Keywords: Insect, species, diversity, family, sanctuary, beetle

Introduction

On Earth, insects are the most abundant and varied animals. They are members of the class Insecta, phylum Arthropoda, that are genuinely common and typically quite noticeable in any area (Kumar Arya *et al.*, 2016) [3]. Insects play an important role in the biodiversity of any habitat. It is the largest class within the Kingdom of Animalia. Coleoptera is the most diverse order from the class Insecta (Jangir P *et al.*, 2022) [5]. The largest animal order Coleoptera also known as beetles. Insect collectors recognize their diverse habitats, beautiful coloration, and economic value (Arya and Joshi 2014) [2]. In numerous freshwater and terrestrial habitats across the globe, the Order Coleoptera is incredibly diverse in terms of species. Beetles have 3,50,000 described species, with around 15,088 species recorded from India. almost all biologists are aware that they are the most varied animal group (Aland *et al.*, 2012) [1]. One-third of all animals and approximately 40% of all insects are beetles. Beetles have evolved unique adaptations and behaviors to adapt to their diverse environments. Development of the elytra from the forewing, which covers the hindwings and allows adult coleopterans to reside in hidden habitats and encoded spaces. elytra are the key component in the diversification and survival of these insects. The hindwings of Coleoptera are membranous and functional. Basic features like the size, shape, and colour of beetles can range from tiny to very large, but they are typically compact, strongly sclerotized, and nearly flattened (Thakare and Zade 2012) [11]. Scarabaeidae is the largest family in the order Coleoptera, with a global distribution. The Scarabaeidae family includes approximately 2,500 species from the Indian subcontinent (Jakhar *et al.*, 2021) [4].

Study area

Rajasthan, with its vast topography and 3,42,239 square kilometers, is the largest state in India (Parvez and Srivastava 2010) [9]. Churu is located in northeastern Rajasthan, where arid conditions are predominant. This district is located in the "Thar" desert tract. The Tal Chhapar

sanctuary is situated at the intersection of 27° 42' North latitude and 74° 20' East longitude in the Sujangarh tehsil of the district Churu. The sanctuary is situated at a height of approximately 286.6 meters above mean sea level. Its total area is 6.94 square kilometers (Ojha 2016) [8]. This region is classified as having a Northern Tropical Thorn Forest (6B) and a Desert Thorn Forest (6B/C) subtype of vegetation. With a large variance in the average annual rainfall, precipitation in this area is highly erratic. The climate in this region is dry and varies greatly in temperature, with highs of 50°C in May-June and lows of 10°C in December/January (Kaur *et al.*, 2020) [6].

Materials and Methods

1. **Study period-** Sampling of insects was carried out from January 2022 to October 2023.
2. **Sampling -** Sampling was done by the Quadrat sampling method.
3. **Collection –** The collection of insects was done by hand picking and sweep net.
4. **Preservation-** The beetles were collected and then transferred to the bottle which had chloroform-soaked cotton and then preserved. Insects were put to dry preservation by pinning.

Observations and results

15 species of 7 families were collected during study time from the study area Tal Chhapar Wildlife Sanctuary. The majority of species are from families Scarabaeidae and Cerambycidae.

Scarabaeidae

6 species were collected from the family Scarabaeidae. *Scarabaeus laticollis*, *Onthophagus*, *Onthophagus gazella*, *Catharsius*, *Maladera castanea*, and *Pelidnota punctata* species were found during collection. Members of this family commonly called dung beetle were majorly present and collected during the study. Figure 1-6.

Cerambycidae

3 species were collected from the family Cerambycidae. *Xylotrechus*, *Prosopocera virifulgens*, and *Derobrachus geminatus* species were collected during collection. The second majorly found species during collection. Members of this family have long antennae almost equal to their body size and sometimes longer than their body so these are known as longhorn beetles. Figure 7-9.

Carabidae

Calosoma sayi and *Pheropsophus jessoensis* species were collected during the study. Members of this family are commonly known as ground beetles. Figure 10-11.

Tenebrionidae

Pimelia Genus were found during collection. Member of family Tenebrionidae commonly known as darkling beetle. Figure 12.

Coccinellidae

Coccinella septempunctata species were collected from the study site during the study. Ladybird beetles are commonly known beetles of this family. Figure 13.

Elateridae

Melanotus punctosus species were collected from the study site during the study. Elateridae commonly known as click beetles. Figure 14.

Meloidae

Epicauta pensylvanica species were collected during collection. Meloidae are commonly known as Blister beetles. Figure 15.

Table 1: Coleoptera Fauna collected from Tal Chhapar Wildlife Sanctuary

S.No.	Family	Species	Richness of family
1.	Scarabaeidae	<i>Scarabaeus laticollis</i> <i>Onthophagus</i> <i>Onthophagus gazella</i> <i>Catharsius</i> <i>Maladera castanea</i> <i>Pelidnota punctata</i>	40%
2.	Cerambycidae	<i>Xylotrechus</i> <i>Prosopocera virifulgens</i> <i>Derobrachus geminatus</i>	20%
3.	Carabidae	<i>Calosoma sayi</i> <i>Pheropsophus jessoensis</i>	13.4%
4.	Tenebrionidae	<i>Pimelia</i>	6.6%
5.	Coccinellidae	<i>Coccinella septempunctata</i>	6.6%
6.	Elateridae	<i>Melanotus punctosus</i>	6.6%
7.	Meloidae	<i>Epicauta pensylvanica</i>	6.6%



Fig 1



Fig 2



Fig 3



Fig 4



Fig 5



Fig 6



Fig 7



Fig 8



Fig 9



Fig 10



Fig 11



Fig 12



Fig 13



Fig 14

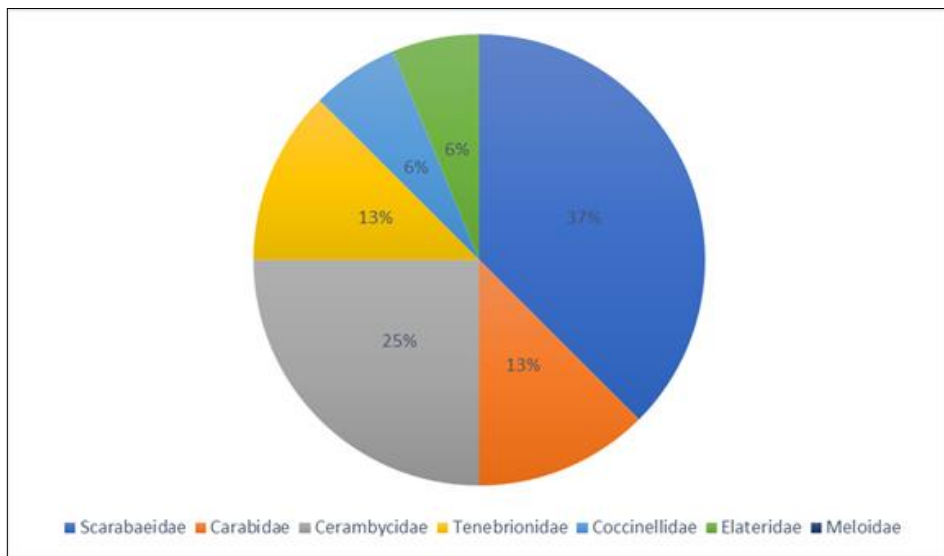


Fig 15

Fig. 1 *Scarabaeus laticollis*, Fig. 2 *Onthophagus*, Fig. 3 *Onthophagus gazella* Fig. 4 *Catharsius*, Fig. 5 *Maladera castanea*, Fig. 6 *Pelidnota punctata*, Fig. 7 *Xylotrechus*, Fig. 8 *Prosopocera virifulgens*, Fig. 9 *Derobrachus geminatus*, Fig. 10 *Calosoma sayi*, Fig. 11 *Pheropsophus jessoensis*,

Fig. 12 *Pimelia*, Fig.13 *Coccinella septempunctata*, Fig. 14 *Melanotus punctosus*, Fig. 15 *Epicauta pensylvanica*

Graphic representation of Coleoptera



Discussion

During the study period, 16 species of seven families were collected from the study area Tal Chhappar Wildlife Sanctuary, Churu, Rajasthan. The Scarabaeidae family was found to be dominant among these families as it was observed with 6 species. The second diverse family is Cerambycidae with 3 species. Carabidae and Tenebrionidae possess two species each. The remaining families are represented by one species each. The findings of the present study are confirmed by the earlier study of Kazmi and Ramamurthy 2004^[7] who studied Coleoptera (Insecta) fauna from the Indian Thar Desert, Rajasthan. Through their study, we confirm species of Scarabaeidae, Tenebrionidae, Carabidae, and Coccinellidae families. Sewak (2009)^[10] also reported species of the Scarabaeidae family at Tal Chhappar Wild Life Sanctuary during their study, which was conducted during the year 2004-2005 by the parties of Desert Regional Station, Zoological Survey of India, Jodhpur. The information will help us understand the biodiversity of insects at Tal Chhappar Wildlife Sanctuary and the Thar desert region. Additionally, it serves as a starting point for future research and opens up new possibilities for study.

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