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Beetles (Insecta: Coleoptera) fauna of Chirang district, Assam, Northeast India: A preliminary study

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Abstract
Beetles represent the largest order with the most diverse insect groups on Earth. The insects under order Coleoptera, beetles was documented from Chirang district of the state Assam. Present survey was carried out from the month of April 2023 to November 2023. A total of 24 species belonging to 10 families and 24 genera were recorded from different ecological habitat namely agricultural fields, regions covered with water, grasslands and others. Beetles under the family Scarabaeidae revealed dominance throughout the period of the study with 5 species, followed by Coccinellidae with 4 species, then 2 species each from Carabidae, Tenebrionidae, followed by each family of Cerambycidae, Chrysomelidae and Staphylinidae with 2 species, and 1 species each from Curculionidae, Elateridae and Hydrophilidae recorded. They contributed a major part of biodiversity in that region. This study revealed that the agricultural lands and croplands were most preferred habitats of beetles. This present documentation provides a significant baseline data on the order Coleoptera of Chirang district and it may give insights of insect conservation based on specific habitat preferences and helpful for further comparative analysis.

Keywords: Coleoptera, habitat, biodiversity, chirang, assam

Introduction

Insects are the largest class including beetles under the phylum Arthropoda. Coleopterans are widely distributed and abundant insects having unique ecological role in the ecosystem. Beetles are found commonly in every natural habitat namely terrestrial, freshwater and marine environment (Bouchard *et al.,* 2017) [8]. However, presence of Coleoptera fauna is rare in the polar region. Beetles are responsible for pollination, soil aeration, maintaining food web, nutrient cycling, bio-indicators and nutrient rich food source. A total of 103 families under Coleoptera were recorded from India, among them 15,000 species belonging to 2,000 genera are reported from India (Biswas, 1995) [7]. Worldwide many researchers have contributed in providing studies about species composition and abundance of beetles (Martikainen *et al.,* 2000; Stork *et al.,* 2001; Magagula and Samways, 2001 and Magagula, 2009) [13, 17, 11, 12]. Due to favourable climate and greenery habitats of Lower Assam region, it has significant contribution in maintaining the biodiversity of Northeast India. Similarly, attempts were made by various workers to investigate on Coleopterans from different parts including Northeast India (Singh *et al.,* 2010; Arya and Joshi, 2011; Chandra *et al.,* 2012 and Arya *et al.,* 2013) [16, 2, 9, 3]. Although all the beetles are yet not identified and discovered. Therefore, an attempt was carried out to report on beetles (Coleoptera) from Chirang district, Assam, Northeast India. The present study may be helpful for the future research.

Materials and Methods

The present survey was carried out in some regions of Chirang district of the state Assam from April 2023 to November 2023. The Chirang district is located Latitude 26° 31′ 31″ North and Longitude 90° 29′ 26″ East. This region covered an area of 1,923 km^2 and surrounded by agricultural fields, vegetation and forest (Swargiary *et al.,* 2019) [18]. Chirang district shares boundary of Bhutan in the North, Bongaigaon district along with some portion of Kokrajhar in the South, Baksa district in the East side and Kokrajhar district in the West. Specimens were collected with the help of nets, handpicked and other methods with proper care. The selected sampling sites for this study were- agricultural fields, crops, grasslands and some regions. Collected specimens were identified by using the standard taxonomic keys followed by published literature and books. After the identification, beetles were released in the natural environment. Specimen identification was done from family, genus then to species level with their preferred habitat respectively.

Results

Table 1: Checklist of coleopterans from different habitats of Chirang district, Assam

Sl. No.	family	Genus	Species	Habitat
1	Carabidae	*Harpalus*	*Harpalus sp.*	Grassland
2		*Pheropsophus*	*Pheropsophus sp.*	Soil surface
3		*Calosoma*	*Calosoma sp.*	Grasslands
4	Cerambycidae	*Batocera*	*Batocera rufomaculata*	Trees
5		*Brachinus*	*Brachinus sp.*	Soil surface
6	Chrysomelidae	*Cassida*	*Cassida sp.*	Vegetation
7		*Aulacophora*	*Aulacophora foveicolis*	Cucurbits crop
8	Coccinellidae	*Cheilomenes*	*Cheilomenes sexmaculata*	Agricultural fields
9		*Hippodamia*	*Hippodamia variegata*	Croplands
10		*Coccinella*	*Coccinella septempunctata*	Croplands

11		*Brumoides*	*Brumoides suturalis*	Crop vegetation
12	Curculionidae	*Sitophilus*	*Sitophilus oryzae*	Stored grains
13	Elateridae	*Melanotus*	*Melanotus sp.*	Agricultural land
14	Hydrophilidae	*Hydrophilus*	*Hydrophilus sp.*	Water bodies
15	Scarabaeidae	*Onthophagus*	*Onthophagus gazella*	Dung covered areas
16		*Maladera*	*Maladera insanabilis*	Crop fields
17		*Phyllognathus*	*Phyllognathus dionysius*	Grasslands
18		*Apogonia*	*Apogonia sp.*	Agricultural land
19		*Holotrichia*	*Holotrichia serrata*	Agricultural fields
20	Staphylinidae	*Philonthus*	*Philonthus sp.*	Soil litter
21		*Paederus*	*Paederus fuscipes*	Moist fields
22	Tenebrionidae	*Tribolium*	*Tribolium castaneum*	Stored grains
23		*Gonocephalum*	*Gonocephalum sp.*	Dry soil
24		*Blaps*	*Blaps sp.*	Dry habitat

Table 2: List of species, genera and families recorded in the survey

Family Name	Number of Genera	Number of Species
Scarabaeidae	5	5
Coccinellidae	4	4
Carabidae, Tenebrionidae	3	3
Cerambycidae, Chrysomelidae, Staphylinidae	2	2
Curculionidae, Elateridae, Hydrophilidae	1	1

In this study, a total of 24 species belonging to 10 families and 24 genera were recorded and shown in Table 1 and Table 2. The 10 families are namely- Scarabaeidae, Coccinellidae, Carabidae, Tenebrionidae, Cerambycidae, Chrysomelidae, Staphylinidae, Curculionidae, Elateridae, Hydrophilidae. Number of species from the family Scarabaeidae(5) were commonly abundant and coleopterans under the family- Curculionidae(1), Elateridae(1), Hydrophilidae(1) were rare in the sampling site (Fig. 1). Among them, Scarabaeidae family exhibited dominant group of insect with species composition 21%, followed by Coccinellidae 17%, followed by 13% each Carabidae and Tenebrionidae, then each Cerambycidae, Chrysomelidae and Staphylinidae family revealed 8% and followed by each Curculionidae, Elateridae and Hydrophilidae family has 4% species composition in percentage (Fig. 2). Mostly preferred habitats by the beetles were agricultural land, cropland and vegetation.

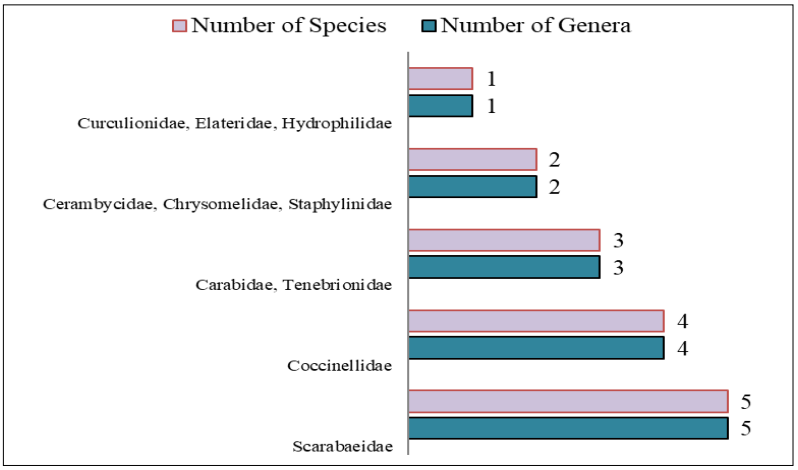

Fig 1: Graphical representation of recorded families with number of genera and species

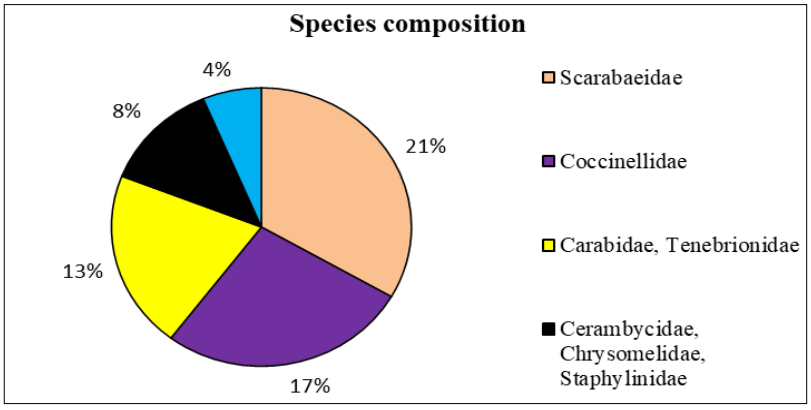

Fig 2: Species composition of each family

Discussion

In this preliminary study, an attempt was conducted to study the Coleopterans fauna including their preferred habitat in Chirang district of the state Assam, Northeast India. This investigation includes survey, collection and identification of the insects under the order Coleoptera. The data collection also revealed the habitat preferences by specific beetles. All total 24 species under 10 families and 24 genera are reported in this work. Among the 10 families, insects belong to the family Scarabaeidae were more abundant and dominant as compared to others. These findings were similar with the work recorded by Banerjee (2014) [4] from Durgapur, West Bengal, India and Aland *et al.,* (2012) [1] from Amba Reserve Forest, Western Ghat. 9 families of Coleptera were reported from work done by Banerjee (2014) [4] and 152 species belonging to 25 families of beetles recorded by Aland *et al.,* (2012) [1]. Previously various similar works has been done on beetles from different parts of India by Bhawane *et al.,* (2012) [6], Thakare *et al.,* (2012) [19] and Chandra and Gupta (2013) [10]. Beetles under the family Scarabaeidae was dominant and family namely Curculionidae, Elateridae and Hydrophilidae were less common throughout the survey period. Present findings are accordance with the study done by Murthy (2020) [14] in South Indian states that recorded subfamily Scarabaeinae with 17.64% and Dynastinae 5.88% of scarab beetles. Recently, Prajapat *et al.,* (2022) [15] worked on beetles of the Aravali Range, Jaipur, India. However, beetles such as *Apogonia sp.* and *Holotrichia serrata* were abundant in the agricultural habitat which indicated that they are mostly herbivorous. Many were also collected from different habitats as well. Often some of the beetle species revealed rare in visual appearance based on their preferred particular habitat and few are moving to new regions where previously not been reported (Bhattacharyya *et al.,* 2017) [5]. The current preliminary work will provide a baseline data for future research on these insects based on the seasonal changes and helpful for the diversity studies.

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