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A preliminary study on orthopteran fauna in Chirang district, Assam, India

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Abstract
Insects under the order Orthptera including grasshoppers are economically important for maintaining balance in ecosystem. A preliminary survey was carried out to record orthopterans fauna in some selected sites in Chirang district, Assam. The work was performed from the month of December 2024 to May 2025. A total of 17 species under 4 families and 14 genera was recorded. Among them, the family Acrididae was dominant in the study area with 64.7% species composition and Gryllotalpa were very rare having 5.9% in visual abundance respectively. Similarly, other families Gryllidae contributed 17.6% and Tettigonidae having species composition of 11.8%. The grassland areas exhibited densely populated with insects (44%) as compared to forest regions (36%) and wetland sites (20%). The present work may be useful for the future scientific research on Orthopterans fauna including further their DNA barcoding and provides informations for conservation plans of these regions with rare species.

Keywords: Orthoptera, ecosystem, conservation, chirang, assam

Introduction

Insects are unique in their habitat, food preferences and ecological roles in the environment. The orthopterans fauna including terrestrial insects such as grasshoppers, locust and crickets supports food web, nutrient cycling and critical for ecosystem balance. Orthoptera is one of the largest order in the phylum Arthropoda with more than 28,000 species (Cigliano *et al.,* 2020) [7]. It belongs to the class Insecta and suborders are namely Ensifera and Caelifera. They are mostly terrestrial and herbivorous in nature. Globally, 10 species of grasshoppers are recognized based on their classification system and the family Acrididae exhibits highest diversity (Shishodia, 2010) [18]. These insects are famous for producing sound by rubbing their body parts that used in mating and communication.

Currently, approx 1,093 species under 404 genera and 21 families of the order Orthoptera were recorded in India (Chandra *et al.,* 2021; Chandra *et al.,* 2020; Chandra *et al.,* 2019; Chandra *et al.,* 2018) [6, 5, 4, 3]. Previously several studies from India (Sanjayan *et al.,* 1995; Kandibane *et al.,* 2004; Bhaskar *et al.,* 2018) [16, 10, 2] also added significant information on Orthoptera including grasshopper fauna. However, there were various study have been reported from different parts of Assam and Northeast India. All total 164 species belonging to 96 genera of 7 families recorded from Arunachal Pradesh, Northeast India (Gupta & Chandra, 2018) [8]. Similarly, study on Orthropteroids found in different habitats of the Kaziranga National Park, Assam, recorded 36 species under 30 genera and 4 families (Senthilkumar N, 2010) [17]. Recently, molecular DNA barcode analysis in combination with molecular characterization of selected species under Orthoptera from the state Assam, revealed that 20 species exhibited cryptic diversity (Narjari *et al.,* 2023) [11]. They are important source of food and often regarded as good bioindicator due to sensitivity to climate change, habitat destruction etc.

Despite their high population, widespread usage of chemical pesticides is threats to them and equally affecting their physiology and reproductive health. Orthopteran faun declines can affect the food webs in the ecosystem. All these making it very necessary to protect, study their distribution, food preferences along with their ecological role in the environment.

The current study was carried out to study the insects belong to the order Orthoptera and their preferred habitat. In this study, the Orthopteran fauna was reported from Chirang district of the state Assam, Northeast India. However, only a few works on orthopterans have been reported from Assam. This is the preliminary study and so far first time reported from this particular district. The findings might be beneficial for the future study on these insects under the order Orthoptera and equally helpful in providing the information for their conservation.

Methodology

The survey was done from the month of December 2024 to May 2025 in some selected parts of Chirang district, Assam. This study site is about 1,923 km² area and mostly covered by vegetation, small water bodies and forest, which making it highly rich in biodiversity. The Chirang district lies on the Northern plains of the Brahmaputra River. It is located nearly 90º21' east to 90 º 56' East longitudes and 26º33' north to 26º54' North latitude in Assam (Swargiary *et al.,* 2019) [19]. Specimens were collected with the help of net, bare hands and with some jars from wetlands, grasses near the water bodies, vegetation ground. Samples were first collected then photographed followed by identification were done by using standard book references (Tandon *et al.,* 1998; Prabakar *et al.,* 2005; Shishodia *et al.,* 2010) [20, 15, 18] then after the identification of insects they are released in the environment.

Results

Table 1: List of orthoptera species encountered during the survey along with their preferred habitat

Sl. No.	Family	Genera	Scientific Name	Grasslands	Forest	Wetlands
1	Acrididae	Choreodocus	*Choreodocus robustus*	+	-	-
2		Phlaeoba	*Phlaeoba tenebrosa*	-	-	+
3		Acrida	*Acrida exaltata*	+	-	+
4		Phlaeoba	*Phlaeoba infumata*	-	-	+
5		Oxya	*Oxya hyla*	+	-	+
6		Aeolopus	*Aeolopus fanulus*	+	-	-
7		Orthacris	*Orthacris maindroni*	+	-	-
8		Oxya	*Oxya fuscovittata*	+	-	+
9		Oxya	*Oxya japonica*	+	-	-
10		Xenocatantopus	*Xenocatantopus humilis*	+	+	+
11		Tagasta	*Tagasta indica*	-	+	-
12	Gryllidae	Trilophidia	*Trilophidia annulata*	+	+	-
13		Acheta	*Acheta domestica*	+	-	+
14		Brachytrupes	*Brachytrupes portentosus*	-	+	-
15	Gryllotalpa	Gryllotalpa	*Gryllotalpa africana*	-	+	-
16	Tettigonidae	Conocephalus	*Conocephalus longipennis*	-	-	+
17		Conocephalus	*Conocephalus maculatus*	+	-	+

A total of 17 species were recorded under 14 genera and 4 families of the order Orthoptera (Table.1). These species were recorded from agricultural fields, grasslands near the water bodies and some parts of wild environment in Chirang district, Assam. The 4 families includes- Acrididae (11 species), Gryllidae (3 species), Tettigonidae (2 species) and Gryllotalpa (1 species) (Fig. 1). Among all the species, specimens belong to the family Acrididae were dominant with the species composition of 64.7%, followed by Gryllidae family having 17.6% then family Tettigonidae with 11.8% and most rare species were belongs to the family Gryllotalpa consisting 5.9% (Fig. 2). Most commonly appeared insects under Acrididae family during the survey were- *Acrida exaltata*, Oxya spp. and Phlaeoba spp.

In the present study, mainly specimens were reported from selected areas, such as- grasslands, forest and wetlands. The grassland habitat served as the most densely populated region with 11 species insects under orthoptera, followed by wetlands habitat composing about 9 species and 5 species of insects preferred habitat was the forest (Fig. 3). Moreover, the genera, oxya contributed more species in grassland habitat. Three Orthopteran species namely- *Conocephalus maculates,* Oxya spp. and Phlaeoba spp. are almost observed commonly in three habitat.

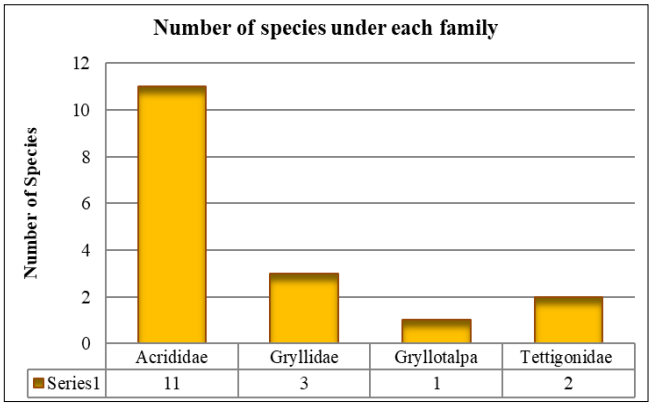

Fig 1: Survey species belonging to different family of the order Orthoptera

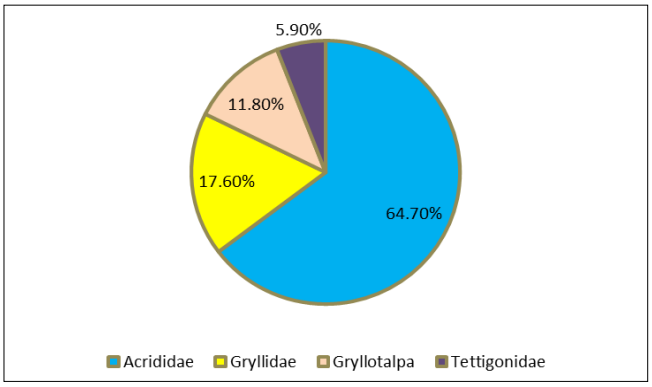

Fig 2: Percentage composition of each family from the survey

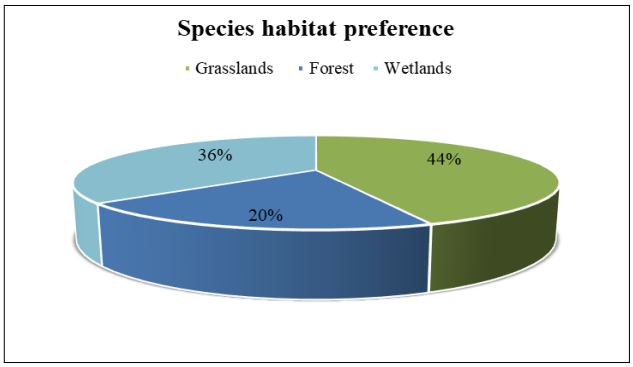

Fig 3: Percentage representation of habitat preferred by different orthopteran fauna in the study area

Discussion

Present preliminary study on the insects under Orthoptera was carried out from the different ecological habitat of Chirang district, Assam Northeast India. The survey was done from December 2024 to May 2025 and recorded collectively 17 species belonging to 14 genera and 5 families under the order Orthoptera. This finding is similar with the study carried out by Narjari and Narjari (2024) [12] in Udalguri district, Assam, it reported altogether 18 species identification belongs to 3 families and 12 families under the order Orthoptera. Moreover, insects belongs to the family Acrididae were dominant in the study site and it equally supports the observation recorded by Paulraj *et al.,*

(2009) [14], the study was carried out in Tamil Nadu and reported that Acrididae family was dominant with 21 species belonging to 15 genera. Similar studies also found that the insect belongs to Acrididae family show dominant and widely distributed family under Orthoptera (Thakkar *et al.,* 2015; Arya *et al.,* 2015) [1, 21]. Several previous studies have been performed on this insect order around many parts of India and revealed similar observation with the current work. Recently, a molecular based work was carried out by Narjari *et al.,* (2023) [11] in Assam that highlighted all the cryptic communities within the order Orthoptera.

In this study, Orthopterans were most commonly found in grassland region. It confirms that they are mostly herbivorous (Parker, 1952; Uvarov, 1966; Joern, 1979) [13, 22, 9]. The distribution of Orthopteran is greatly influenced by rainfall, temperature and soil condition. In addition to their diversity and importance in food web, they have beneficial role in maintaining soil ecosystem, stimulating nutrients and plant growth (Van Hook, 1971) [23]. Record of these insect from a particular geographical area may help in both monitoring as well as keeping the potential pest species under check that will benefits the crops of that region. The present work may help in future studies on insects under Orthopteran from this region. It will also provide insights for the conservation of rare species and their preferred habitat.

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