J. Appl. Environ. Biol. Sci., 7(7)26-30, 2017

ISSN: 2090-4274
Journal of Applied Environmental and Biological Sciences
www.textroad.com

Grasshoppers of Taxa (Insecta, Orthroptra, Acrididae) at Ahmad Abad District Karak Khyber Pakhtunkhwa, Pakistan

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Received: February 11, 2017
Accepted: May 3, 2017

ABSTRACT

The grasshopper fauna from District Karak has been sampled during one survey of the area in January, 2016 to December 2016. In this paper five sub-families Oedipodinae, Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae, nine Genera and nine species of Acrididae were recorded during the survey are described. Family Oedipodinae was found the largest one comprising five species. There was noprevious records/data on the grasshoppers of the survey area (Karak). The maximum collection of acridids described here was collected at the grassland areas. Karakis one of the most heavily modified natural regions of Khyber Pakhtunkhwa. Since grasshoppers are a useful group for bioindication, it is important to acquire knowledge on their diversity in such environmental conditions.
KEY WORDS: Karak,Grasshoppers, fauna, Family, identification.

1. INTRODUCTION

Grasshoppers are largely phytophagous insects, they have been extensively studied on food selection in grasshoppers and these have been adequately reviewed by [1,2]. An overall majority of phytophagous insects restricts host plant use of a closely related group of plant species, sometimes even a single species [3]. Phylogenetic differences exist among grasshoppers in relation to host plant preferences [4,5]. For example, members of the acridid subfamily Gomphocerinae tend to have a preference from grasses, Cyrtacanthacridinae prefer forbs, and Oedipodinae eat both grasses and forbs [6,7,8]. The Acridinae are typically considered to be grass-feeders [9,10]. Very rarely a species in this subfamily will display herbivorous [11]. Orthoptera exists in terrestrial habitats throughout the world often associated with fields and meadows, though some species prefer caves, deserts, bogs and seashores. Members of both suborders (Ensifera and Caelifera) are generally phytophagous but many species are omnivores. Grasshoppers are included in the list of destructive crop pests with the family Acrididae alone having more than 100 species that are pests of agricultural crops and pastures. Among the described species, some are consistently rare, while others are common and widespread; still others show huge population variability, often becoming local and temporary keystone species, while entire communities of these insects may be essential to ecosystem functioning over a long period of time. Grasshopper species feed both on monocots and dicots [12]. Grasshopper assemblages (Acridoidea, Tetrigioidea and Tettigonioidea) in south-eastern Ethiopia consisted of 29 taxa, 26 of which were identified to species. Over 70 per cent of the species belonged to Acrididae and most of them were either pests or potential pests of cereal crops. Species richness, diversity and dominance within and between sites and seasons did not differ much during the 2- year period [13]. Acridids inhabited a wide range of ecosystems from 58 selected study sites in Tamil Nadu comprising a total of 37 species belonging to 2 families and 11 subfamilies during the period of the survey. The maximum species richness was recorded in forest ecosystem followed by wasteland, grassland and cropland. The diversity decreased with increase in altitude reaching a peak at 1100 MSL [14].

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2. MATERIALS AND METHOD

Study Area:

Ahmad Abad is one of the beautiful land area of Karak Khyber Pakhtunkhwa, Pakistan. This area is very popular, especially education point of view. The literacy ration of Ahmad Abad is on the top throughout the whole Karak District. This area is also important about economic point of view. Over here a big Maila is arranged on the day of Friday. This zone is a very important agricultural point of view. Over here, the majority ofthe area is under cultivation. Ahmad Abad is a moderate temperature zone. There is a verity of unknown invertebrates and vertebrate fauna. This area is very suitable for wildlife fauna.

Collection and Preservation

The insects were collected by "Sweep Sampling Method", as per Gadagkar*et al.* [15]. The net sweeps were carried to collect the insects. The net used in systematic sweeping were made of thick cotton cloth with a diameter of 30 cm at the mouth and a beg length of 60 cm. Sampling was done at random and at an interval of 15 days. The collected Orthopteran insects were transferred into jars containing Ethyl Acetate (CH2COOC2H5) soaked cotton. These jars were brought to the laboratory and the insects were stretched and pinned. The entomological pin number 1 to 20 was used according to the size of the specimen. These were oven dried at 60 ^{o}C for 72 hours to preserve them and then set into wooden boxes and labeled according to their systematic position. After the collection and preservation the specimens were identified up to species level by available literature, already existing specimens in the museum and keys.

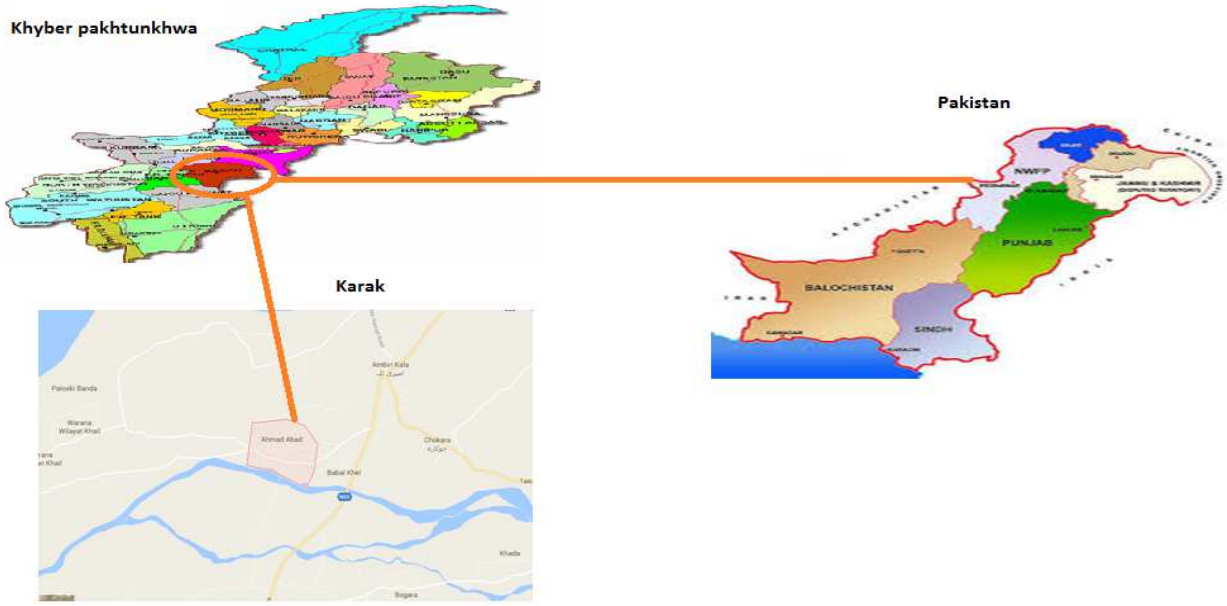

Figure. Map of Ahmad Abad Karak Khyber Pakhtunkhwa, Pakistan

3. RESULTS

A total of five subfamilies of Grasshoppers (Insecta: Orthoptera; Acridadae) belonging to 9 species were collected from Ahmad Abad DistrickKarak Khyber Pakhtunkhwa, Pakistan. Duration of the study period was one complete year, i.e.January, 2016 to December 2016. On the basis of number of species, Oedipodinaewas the most dominant family with 5 species: *Scintharistanotabilis, Sphingonotusrubescens, Aiolopusthalassinus, Acrotylushumbertianus* and *Oedaleussenegalensis* followed by, Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae which comprising only one species each like Acridaexaltata, Ochrilidiagracilis, Schistocercagregaria and Heteracrisillustrisrespectively. The number of individuals of different species and their percentage contribution to total Grasshoppers has been presented in Table 1. Oedaleus senegalensis was the most dominant specie of the family Acridadae in terms of number of individuals and constituted 17.83% of the total individuals followed by Sphingonotusrubescens 15.72%, Aiolopusthalassinus 13.65%, Acrotylushumbertianus 11.86%, Acridaexaltata 8.56%, Schistocercagregaria 7.81%, Heteracrisillustris 6.87%and Ochrilidiagracilisgracilis 6.77% respectively.

Table 1. Grasshoppers fauna of Ahmad Abad Karak Khyber Pakhtunkhwa, Pakistan.

Class	Order	Sub Families	Genus	Species	No of individuals	Percentage
Insecta	Orthroptra	Oedipodinae	*Scintharista*	*notabilis*	*122*	11.48%
			Sphingonotus	*rubescens*	*167*	15.72%
			Aiolopus	*thalassinus*	*145*	13.65%
			Acrotylus	*humbertianus*	*126*	11.86%
			Oedaleus	*senegalensis*	*183*	17.23%
		Acridinae	*Acrida*	*exaltata*	*91*	8.56%
		Gomphocerinae	*Ochrilidia*	*gracilis*	*72*	6.77%
		Cyrtacanthacridinae	*Schistocerca*	*gregaria*	*83*	*7.81%*
		Eyprepocnemidinae	*Heteracris*	*illustris*	*73*	*6.87%*
Class 01	**Orders 01**	**Sub Families 05**	**Genus 09**	**Species 09**	**Total 1062**	**100%**

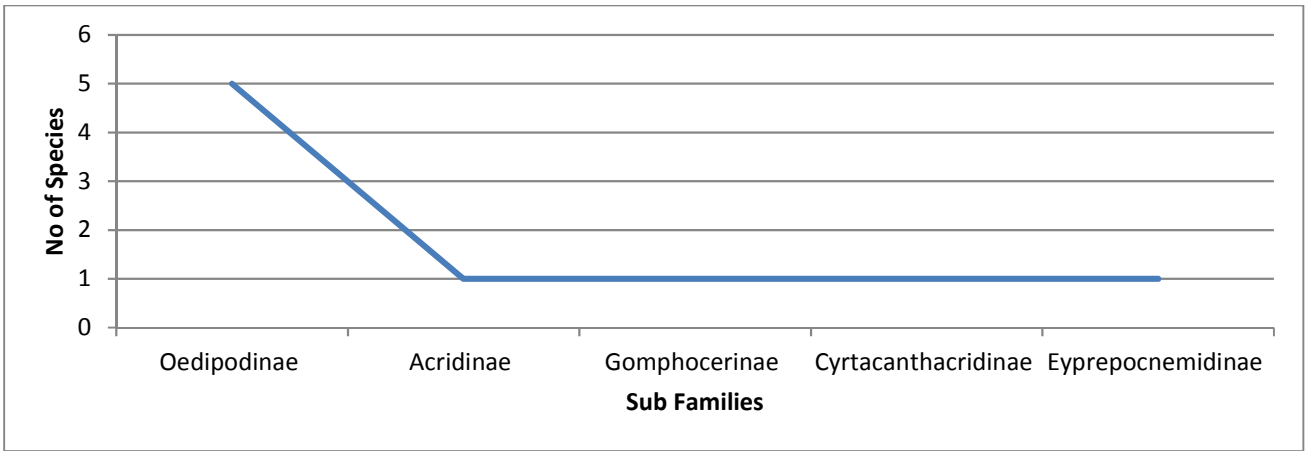

Figure 2. Sub Families wise distribution of Grasshoppers fauna in Ahmad Abad Karak.

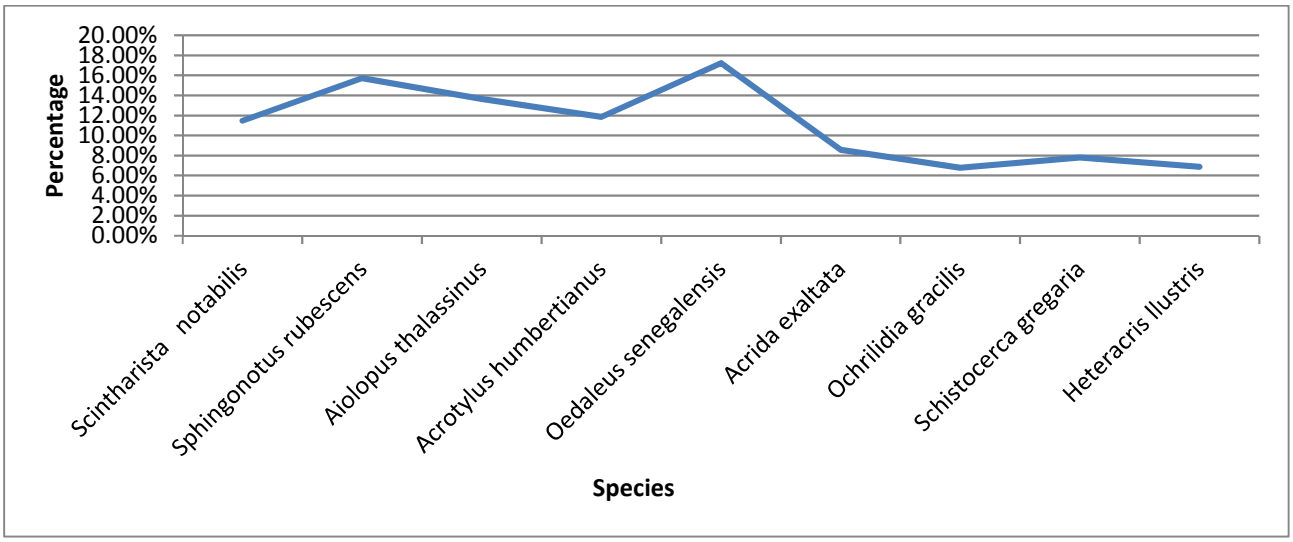

Figure 3. Species wise Percentage of Grasshoppers fauna in Ahmad Abad Karak.

4. DISCUSSION

In the current paper five sub-families Oedipodinae, Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae, nine Genera and nine species of Acrididae were recorded during the study as mention above about in detaile in (Table 1). The most dominant family was found Oedipodinae consisting five individuals. This study was the first time attempt in Ahmad Abad areas. Because till now there was no previous records/data on the grasshoppers of the survey area (Ahmad Abad). Majority of acridids were collected from Ahmad Abad those areas free of Pollution especially transport activities.Kulkarni &Shishodia (2004), have reprted 8 species of long horned Grasshopper from Pench National Park [16]. Senthikumar*et al*. (2006) studied on Orthopteran fauna of Gibbon wildlife sanctuary in Assam and recorded 13 species Tettigonidae [17]. In the current study conducted in Ahmad Abad only 9 species of Grasshoppers were recorded comprising five sub-families Oedipodinae, Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae respectively. Chandra and Shishodia (2007) reported 18 species of orthopteran insects from Madhya Pradesh and Chhattisgarh [18]. Koli*et al*. (2010) studied on Orthoptera fauna in Chandoli National park, and reported 12 species of Tettigoniidae [19]. In the present investigationminimum fauna of grasshoppers was explored when compared result of the both studies. Shishodia*et al.* (2010) published 160 species and subspecies of Tettigoniids from India, among these 18 species were recorded from Maharashtra [20]. Chamorro *et al.* (2011) have recorded 77 species of Tettigoniidae from Colombia. Srinivasan and Prabakar (2012) have reported 10 species of long horned grasshopper from Arunachal Pradesh [21]. Chandra and Gupta (2012) have reported 18 species of Tettigoniidae in Zoological Survey of India [22]. Results of the present survey revealed that there was a quite a difference in the both studies Orthroptra. The variation may be the change in land area of both the study area. Ambily and Aswathy (2013) have reported 2 species of long horned grasshopper from Mar Thoma college for women, Perumbavoor [23]. Thakkar et al (2015) studied on the diversity of Orthoptera fauna in south Gujarat, India in which 9 species of Tettigonidae were reported [24]. Arya et al (2015) have reported 6 Species from Western Himalayas, India [25]. From the present investigation, it can be concluded that the variation among the species numbering may be due to change in climate factors of the both research areas i.e. change in Temperature, Change in the humidity level, Intense radiation and pollution. Besides all these factors the agricultural activities (Pesticides spray) adversely affected on the population of grasshoppers. Because majority collection was carried out from the areas free from agricultural activities. Hence the current results conducted in Ahmad Abad apparently show that the area is very suitable for the grasshoppers population survival. Furthermore, if the agricultural activities are not stopped so in future the population of grasshopper's fauna will be declined from the study area (Ahmad Abad). For this purpose Government and should have a strong collaboration for the safety of these invertebrate fauna of grasshoppers.

5. Conclusion

From the current results it can be concluded that Ahmad Abad area is very suitable for grasshopper's fauna. Duration the study period, i.e. January, 2016 to December 2016 a total of 5 subfamilies of grasshoppers were recorded likeOedipodinae,Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinaerespectively.

6. Acknowledgement

I am immensely thankful to Hameed Ur Rehman (Department of Chemistry) and all the group members. I am also thankful to my brother Dr. Wahid Raza (Department of Management Sciences ICUP) who has supported me throughout in specimen collection.

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