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Khalid Usman
Department of Zoology, Hazara University Mansehra, Khyber Pakhtunkhwa, Pakistan

Hameed Ur Rehman
Department of Chemistry, Kohat University of Science &Technology, KUST, Kohat, KP, Pakistan

Sehrish Khudadad
Department of Zoology, Hazara University Mansehra, Khyber Pakhtunkhwa, Pakistan

Khalid Pervaiz
Fisheries Research & Training Institute, Government of the Punjab, Lahore Pakistan

Sahibzada Muhammad Jawad
Department of Zoology, Islamia College University Peshawar, KPK, Pakistan

Abdur Rab
Department of Zoology, Kohat University of Science & Technology, KUST, Kohat, KP, Pakistan

Muhammad Idrees Khan
Department of Wildlife and Ecology, University of Veternary and Animal Sciences, Lahore, Pakistan.

Correspondence
Hameed Ur Rehman
Department of Chemistry, Kohat University of Science &Technology, KUST, Kohat, KP, Pakistan

Checklist of Grasshoppers fauna at Bogara District Karak Khyber Pakhtunkhwa, Pakistan

Khalid Usman, Hameed Ur Rehman, Sehrish Khudadad, Khalid Pervaiz, Sahibzada Muhammad Jawad, Abdur Rab, Muhammad Idrees Khan

Abstract
The present study was conducted at Bogara District Karak to find out checklist of Grasshoppers fauna. Sampling of Grasshoppers fauna was done continuously in various periods of time. After collection, all the specimens of the Grasshoppers were identified up to the species level. During the current study, a total of 4 families of the Actidids were recorded which collectively comprising 5 species. The identified Grasshoppers species were *Scintharistanotabilis, Sphingonotus rubescens, Ochrilidia gracilis, Schistocercagregaria* and *Heteracris illustris* respectively. The 5 sub families of Acridids were Oedipodinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae respectively. Since grasshoppers are a valuable group for bio indication, it is significant to get information on their multiplicity in such ecological circumstances.

Keywords: Bogara, checklist, species, collection, order, recorded, Karak

1. Introduction
The grasshoppers did not existing without preferential foodstuff verities, accomplished that important factor was taxonomic composition, though alteration in the fauna of grasshopper large quantity did not related to the plenty of principal foodstuff vegetation in the environment [1]. The function of other inhabitant 'sad apt able factor such as and disease, predators and parasites is an approximate one. This is extremely principally because deficient in inquiry into the inhabitant's dynamic of the grasshopper fauna populations of the type permit examination of the death ratio. Populations are generally resolute statically, to relay these to injure inflict in the plants, and to find out they require for organize procedures [2, 3]. Egg survey is also carried out as an aid to forecasting inhabitant's outbreak[4]. A lot of population of the grasshoppers fauna abundance might be arises from the direct or indirect effects of a desirable rising period on the situation of the plants. Where such a reaction take place, less numbers once more follow in arid season [5-6]. In this situation, limitations of foodstuff and protection operate on postembryonic period, to control the inhabitants [6].The aim of the present research work was to find out the Checklist of Grasshoppers fauna at Bogara District Karak Khyber Pakhtunkhwa, Pakistan.

2. Materials and Methods
2.1 Study Area
Sport point of view Bogara is very popular especially game of Volley Ball. Wali Khan is one of the most charming and fibular Volley Ball player resident of Bogara. This area is also divided into few tribes like Rangeen Khel and Maryam Khel. Literacy ratio of Bogarais also high. Doctor Musharaf is one of the great Botanist of this region. There is a main road in the center of Bogara which link this region with Indus Highway road and main Tehsil (Takhti Nusrati). The land of Bogara is almost sandy and inhabited by valuable flora. Over here, majority of area are under cultivation. Summer season of this area is moderate. Furthermore, this zone comprising verity of unknown invertebrates and vertebrate's fauna.

2.2 Collection and Preservation
Collection of Grasshoppers fauna was carried out by "Sweep Sampling Method", as per Gadagkar *et al.*[7]. For sampling net sweep were carried. The net was made by a thick cotton cloth with a diameter of 30 cm at mouth and a beg length of 60 cm and was applied in a proper systematic way.

Randomly sampling of grasshopper was carried out after each interval of 15 days. The collected Grasshoppers (Ortho pteran) were transferred into jars containing Ethyl Acetate soaked cotton. These jars were brought to the laboratory and the insects (Grasshoppers) 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 oC for 72 hours to preserve them and then set in to 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 [8].

Fig 1: Map of Bogara District Karak Khyber Pakhtunkhwa, Pakistan.

3. Results and Discussion

In the current research conducted at Bogara a total of 4 sub families of the Grasshoppers were recorded which consisting 5 species. The identified species of grasshoppers were *Scintharistanotabilis, Sphingonotus rubescens, Ochrilidia gracilis, Schistocerca gregaria* and *Heteracrisillustris* respectively as shown in the Table 1. Out of the 4 sub families, Oedipodinae was the dominant one. Overall results reviled the study area existing verity of grasshopper's fauna. Koli *et al.* (2010) considered on Orthoptera fauna in Chandoli National stop, and revealed 12 types of Tettigoniidae [9]. Chamorro *et al.* (2011) have recorded 77 types of Tettigoniidae from Colombia [10]. Srinivasan and Prabakar (2012) have revealed 10 types of since quite a while ago horned grasshopper from Arunachal Pradesh [11]. Chandra and Gupta (2012) have revealed 18 types of Tettigoniidae in Zoological Overview of India [12]. Kulkarni and Shishodia (2004), have reprted 8 types of since quite a while ago horned Grasshopper from Pench National Stop [13]. Senthikumar *et al.* (2006) considered on Ortho pteran fauna of Gibbon natural life haven in Assam and recorded 13 species Tettigonidae[14].The present investigation conducted at Bogara shows variation after comparing the results of the both studies areas. In the present study only 5 species of the grasshoppers fauna were recorded which were too much less as compared to the previous studies carried out in various times by various Entomologists. In the previous studies mention above in detailed revealed that there were more in numbers of grasshopper's species existing as compared to the present study. The variation in numbering of the grasshoppers fauna may be due to topography changing of the both study lands. The variation may be due to climatic factors because each species of grasshoppers possessing a proper habitat and climatic factor in which they live.Khalid *et al* conducted work on the diversity of Orthoptera (Acridids: grasshoppers) at Rehmat Abad District Karak Khyber Pakhtunkhwa, Pakistan. A total of 567 specimens of grasshoppers were collected in the current study. The recorded grasshoppers fauna belongs to One Class Insecta; One Order Orthoptera; Five sub Families Oedipodinae, Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae; Five Genera and Five Species respectively. The Sub Family Oedipodinae represented by two species *Scintharistanotabilis* and *Sphingonotusrubescens* while Sub families Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae comprising only one species each which were *Acridaexaltata, Ochrilidia gracilis, Schistocercagregaria, Heteracris*and *illustris* respectively. From the current study it can be revealed that Acridids almost prefer to hot environment and Grassy ground [8]. Khalid *et al* conducted study on grasshopper fauna was explored from May 2016 to May 2017 from Meta Khel District Karak Khyber Pakhtunkhwa, Pakistan. During the current study a total of 622 specimens of Grasshoppers were recorded and identified up to the species level. In this research a total of 7 species of Grasshoppers were recorded which were *Scintharistanotabilis, Sphingonotus rubescens, Aiolopus thalassinus, Acrotylushumbertianus, Acrida exaltata, Ochrilidia gracilis* and *Schistocerca gregaria.* The Sub family Oedipodinae was found the largest one over all the recorded Sub families [15]. Khalid *et al* conducted study on Grasshoper of Ahmad abad and recorded five subfamilies of Grasshoppers (Insecta: Orthoptera; Acridadae) belonging to 9 species were collected from Ahmad Abad District Karak 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, Oedipodinae was the most dominant family with 5 species: *Scintharistanotabilis, Sphingonotus rubescens, Aiolopus thalassinus, Acrotylushumbertianus* and *Oedaleus senegalensis* followed by, Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae which comprising only one species each like *Acrida exaltata, Ochrilidia gracilis, Schistocerca gregaria* and Heteracrisillustris respectively [16]. Khalid *et al* find out grasshopper fauna at Toordand from September 2016 to September 2017 District Karak KP, Pakistan. Five sub-families Oedipodinae, Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae, Seven (7) species of Grasshoppers belonging to five sub-families Oedipodinae, Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae, were identified during the current survey namely *Scintharistanotabilis, Sphingonotus rubescens, Aiolopus thalassinus, Acrotylushumbertianus, Acrida exaltata, Schistocerca gregaria* and *Heteracrisillustris* respectively. In this research Sub Family Oedipodinae was found the largest one over all the families which consisting four Species. Overall the recorded species of Grasshoppers were *Scintharistanotabilis, Sphingonotus rubescens, Aiolopus thalassinus, Acrotylushumbertianus, Acrida exaltata, Schistocerca gregaria* and *Heteracrisillustris* respectively [17].Khalid *et al,*conducted to explore grasshopper fauna Khada from District Karak Khyber Pakhtunkhwa, Pakistan from January to December 2016. In the current investigation 5sub-families of the Grasshoppers were identified up to the species level like Oedipodinae, Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae, 8 Genera and 8 species *Scintharistanotabilis, Sphingonotus rubescens, Aiolopus thalassinus, Acrotylushumbertianus, Acrida exaltata, Ochrilidia gracilis, Schistocerca gregaria* and *Heteracrisillustris* of Acrididae were recorded. Among the recorded 5 sub Families, Family Oedipodinae was found the richest one consisting 4 species of Grasshopper while other sub Families Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae comprising only one species each.

Maximum collection of the grasshopper was carried out during hot season i.e. June and July. The present study revealed that this area is suitable for sub Family Oedipodinaeas compared to other families. This survey will be very useful for the future Entomologists in the field of Entomology [18].

Table 1: Grasshoppers fauna at Bogara District Karak Khyber Pakhtunkhwa, Pakistan.

S. No.	Class	Order	Families	Genus	Species
1	Insecta	Orthoptera	Oedipodinae	*Scintharista*	*notabilis*
2	Insecta	Orthoptera	Oedipodinae	*Sphingonotus*	*rubescens*
3	Insecta	Orthoptera	Gomphocerinae	*Ochrilidia*	*gracilis*
4	Insecta	Orthoptera	Cyrtacanthacridinae	*Schistocerca*	*gregaria*
5	Insecta	Orthoptera	Eyprepocnemidinae	*Heteracris*	*illustris*
	Class 1	Orders 1	Families 4	Genus 5	Species 5

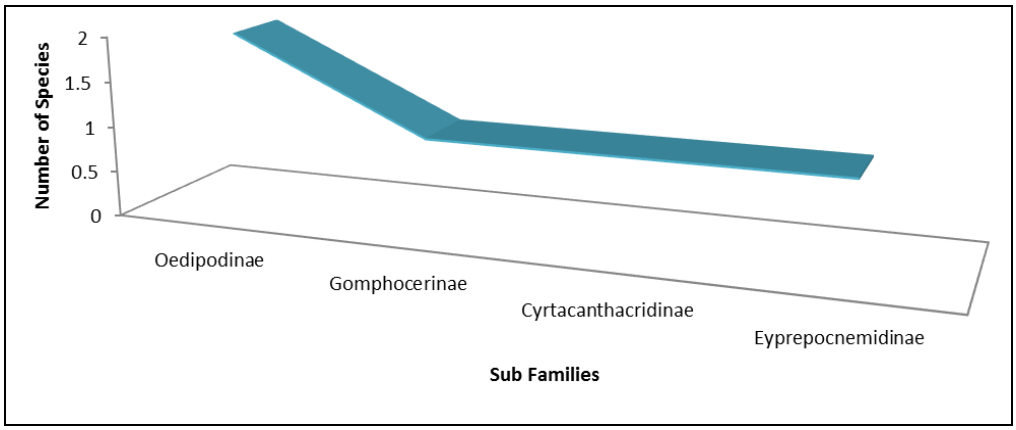

Fig 2: Families wise distribution of grasshoppers fauna at Bogara Karak KP, Pakistan.

4. Conclusion

During the current survey 5 sub families of grasshoppers were explored which were Oedipodinae, Acridinae, Gomphocerinae, Cyrtacanthacridinae and Eyprepocnemidinae respectively.

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