



On the incidences of oedipodinae (Orthoptera: Acrididae) from Nara Desert Khairpur, Sindh, Pakistan

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Abstract

A detailed survey for the collection of short horned grasshoppers were carried out during the year 2012-2013 from different localities of Nara desert i.e. Choondiko, Khehwari, Tajal, Sikandarabad and Jubo. A total of 322 specimens were collected and sorted into 6 genera and 8 species viz., *Sphingonotus rubescens rubescens* (Walker, 1870), *S. savignyi* (Saussure, 1884), *S. theodori theodori* (Uvarov, 1924), *Aiolopus thalassinus thalassinus* (Fabricius, 1781), *Hilethera aeolopoides* (Uvarov, 1923), *Acrotylus humbertinus* (Saussure, 1884), *A. longipes subfasciatus* (Bei-Bienko, 1948), *Trilophidia annulata* (Thunberg, 1815), *Locusta migratoria* (Linnaeus, 1758), of wing band grasshoppers (Oedipodinae). Furthermore, the status of some species were also conformed from this area. Present study might be proved guide line for future research.

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Introduction

Oedipodinae usually known as “wing band grasshopper” are the phytophagous and voracious feeders of many crops such as maize, wheat and fodder crops. Nevertheless, when they are in maximum numbers can play havoc with almost every type of vegetation and grasses accessible in its vicinity. Beside this, they are also important component of the food chain for many birds and mammals (Ela *et al.*, 2012). Generally they are known as geophilous (living in open grounds) and phytophilous (found at vegetation, grasses, herbs and shrubs) Bughio, (2012). Most of its members are cosmopolitan in nature. Distribution and incidences of grasshoppers have been studied by (Bei-Bienko and Mischenko (1952), Moeed (1966), Jago (1977), Ahmed (1980), Perwin *et al.*, (1983), Wagan and Solangi (1985), Riffat and Wagan (2010, 2012 & 2013) from many districts of Sindh, but Nara desert is still untouched by these entomologists. Although, Nara desert has a large numbers of Insect fauna.

Geographically, this desert falls within the jurisdiction of Khairpur district situated between 26°-28° N and 68°-69° E of Sindh (Bhatti *et al.*, 2001). Nara desert on South joins the Thar Desert, towards North enters into Cholistan desert of Punjab and towards west extended to Rajasthan Indian desert. Study area is recognized as desert due to the presence of large numbers of sand (Bhatti) dunes (Qureshi, 2008). Soil consist of lack of water, dry, barren, tree less region usually sandy (A region of semiarid to arid nature), sandy dunes, stony ridges, and gravel plain. Topographic composition, variable climate, change of temperature, humidity, and high rate of evop-transpiration has significant effect on diversity of insect fauna. Annual rain fall range from 88-135 mm and temperature 40°- 56° C in summer (Qureshi *et al.*, 2006). Grasshopper fauna adopted to survive in hostile conditions of desert are peculiar in nature. However, no work on the diversity of grasshopper from this region has been done to date. Keeping in view this fact an attempt has been made to study the diversity, incidences and distribution of grasshoppers

in area with a view to replace the pest incidence and distribution.

Material and methods

Study area

The survey of Oedipodinae assemblage was conducted in five sampling sites (Choondiko- 27.0982 N & 69.3182 E; Sikandarabad- 27.1715 N & 69.1589 E ; Tajal- 27.4400 N & 69.0463 E ; Khehwari- 26.9955 N & 68.9804 E; Kot-Jubo- 26.9832 N & 69.3649E) are union councils within Nara (desert) is actually taluka of district Khairpur, Sindh. Nara (desert) taluka comprises about 2/3 of whole area (15910 Km²) of district Khairpur. The altitude is between 50-61 meters above sea level. Nara desert on South joins the great Thar desert , towards North enters into Cholistan desert of Punjab and towards eastern side boundaries have been marked by Rajasthan great Indian desert (Jodhpur & Jaisalmer). The area comprises various habitat types i.e rain feds, Hillocks , gravel plains, lose sand and sandy dunes consist of Scattered Grasses, perennial herbs capable of drought resistance, thorny or prickly Shrubs, few number of trees and agricultural fields.

Sampling protocol

Entomological sweep net (8.89 cms in diameter and 50.8 cms in length) was used for sampling of adult grasshoppers of Oedipodinae (Acrididae) from various habitat to cover a sampling period extending from November to December for the year 2012-2013. Sampling was achieved in the interval of a week in a month.

Killing and preservation of samples

Collected specimens were immediately brought in the laboratory for the killing and preservation, Vickery & Kevan (1983) method has been adopted. Collected material brought in to the laboratory was killed by means of potassium cyanide in standard entomological killing bottles. Specimens were not left too long (30 minutes) in cyanide because color of grasshoppers particularly green likely to change if kept for longer time. Mounting was done after few

hours of killing for safety purpose not to damage soft body parts following the standard entomological procedure i.e. pinning, wings starching and body adjustment finally fully dried specimens were stored in standard entomological boxes with labels showing locality, date of collection and collector name. Naphthalene balls were placed in boxes to prevent the attack of ants and other insect.

Identification of samples

Identification of specimens was carried out under the stereoscopic dissecting binocular microscope and sorted out in to respective taxa (genera & species) with the help of keys and description available in literature and on the web site (<http://www.orthoptera.org>) Orthoptera Species File Online and by adopting the keys given by Wagan (1985) and Bughio (2012).

Meteorological variable

The weather of Nara desert Khairpur, Sindh is sub-tropical , dry & barren. The temperature range of District Khairpur including Nara desert was minimum 13° C in the month of December and

maximum temperature was 47° C in the month of June 2013. The average humidity was 43.73%. Average temperature and humidity data for year 2013 was obtained from monthly editions of e-talk newsletter center of biodiversity & conservation, Shah Abdul Latif University, Khairpur (<http://www.cbc-salu.org> & www.accuweather.com)& district metrology office and compared with data collected during survey from study sites for further confirmation.

Results and discussion

Collected acridid grasshoppers were belonging to sub-family oedipodinae pertaining to 6 genera and 9 species (Table 1) viz., *Sphingonotus rubescens rubescens* (Walker, 1870), *S. savignyi* (Saussure, 1884), *S. theodori theodori* (Uvarov, 1924), *Aiolopus thalassinus thalassinus* (Fabricius, 1781), *Hilethera aeolopoides* (Uvarov, 1923), *Acrotylus humbertinus* (Saussure, 1884), *A.longipes subfasciatus* (Bei-Bienko, 1948), *Trilophidia annulata* (Thunberg, 1815), *Locusta migratoria* (Linnaeus, 1758), of wing band grasshoppers (Oedipodinae) (Table-1).

Table 1. Distribution and percentage of species of Oedipodinae in different localities of Nara desert during 2012-13.

Name of Tribe, Genra and Species	Choondiko		Khehwari		Tajal		Sikand-arabad		Kot – Jubo		Total	%
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀		
Epacromini												
<i>Helethera aeolopoides</i> (Uvarov, 1923)	10	12	8	10	4	5	2	3	-	-	54	16.77
<i>Aiolopus thalassinus thalassinus</i> (Fabricius, 1781)	8	10	8	15	-	2	3	3	1	2	52	16.14
Trilophidini												
<i>Trilophidia annulata</i> (Thunberg, 1815)	1	3	-	5	-	5	1	2	-	1	18	5.59
Locustini												
<i>Locusta migratoria</i> (Linnaeus, 1758)	4	5	4	2	-	-	-	1	-	2	14	4.34
Acrotylini												
<i>Acrotylushumbertinus</i> (Saussure, 1884)	10	15	10	14	9	10	-	13	1	2	84	26.08
<i>A.longipessubasciatus</i> (Bei-Bienko, 1948)	05	10	4	8	5	5	-	-	-	1	38	11.80
Sphingonotini												
<i>Sphingonotus rubescensrubescens</i> (Walker, 1870)	6	8	7	8	-	2	1	3	2	1	38	11.80
<i>S. savignyi</i> (Saussure 1884)	3	5	5	4	1	-	1	-	-	-	19	5.90
<i>S. theodoritheodori</i> (Uvarov 1924)	2	-	3	-	-	-	-	-	-	-	-	1.55

Out of these the highest percentage was recorded 26.08% followed by 16.77% and 16.14% of *Acrotylus humbertinus*, *Helethera aeolopoides* and *Aiolopus thalassinus thalassinus* while lowest percentage was recorded 1.55% followed by 4.34% and 5.59% of *Sphingonotus theodori theodori*, *Locusta migratoria* and *Trilophidia annulata* respectively (Fig-1). It was interesting to notice that very few specimens were came in collection from Kot-Jubo with 4.03 % while majority of specimens were collected from Choondiko with 36.33% followed by Khehwari with 35.71 % (Fig-2) However all of recorded species were recorded from Nara desert district Khairpur except two species of genus *Sphingonotus* i.e. *S. savignyi* and *S. theodori theodori* were not recorded from the localities of Sikandarabad and Kot-Jubo.

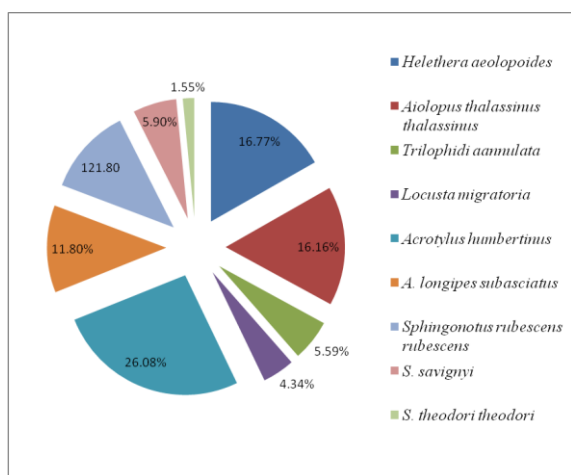


Fig. 1. Showing the percentage of species of Oedipodinae from Nara desert during 2012-13.

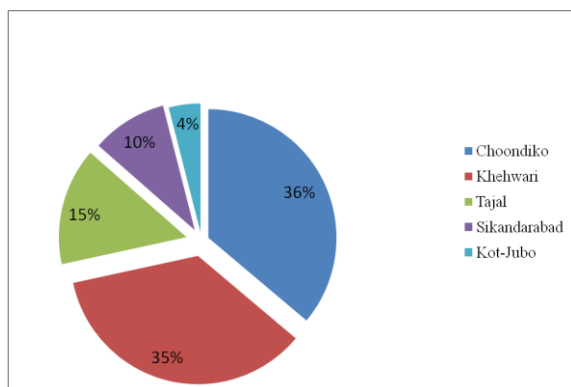


Fig. 2. Graph showing percentage of specimens collected from different localities of Nara desert during 2012-13.

Furthermore out of five localities of Nara desert no specimen of *S. theodori theodori* was collected from Tajal, Sikandarabad and Kot-Jubo. Surprisingly no female were came in collection and only five male were collected from Choondiko and Khehwari localities (Table-I).

From the recorded results of acridid assemblage of bend wing grasshoppers could be observed that the assemblage of bend wing grasshoppers belonging to sub-family oedipodinae were dominantly species rich in some localities and poor in others. The highest richness was recorded from Choondiko and Khehwari areas. While, the relatively poor assemblage was detected from Kot-Jubo, Sikandarabad and Tajal areas. In general species of oedipodinae are exclusively reported from grassland, cultivated fields and plains of Sindh province i.e. Bei-Bienko & Mischenko (1952), Jago (1977), Ahmed (1980), Perwin *et.al.*, (1983) and Wagan & Solangi (1985) while few species of oedipodinae were also reported by Riffat *et.al.*, (2013) from Thar, these result are in accordance with earlier finding of Riffat *et.al.*, (2013) and occurrence of many species has been confirmed

Acrotylus humbertinus was found significantly rich in distribution in all the localities that confirmed the dominant status in Nara desert followed by *Aiolopus thalassinus thalassinus*. Earlier Ahmed (1980), Perwin (1983) & Wagan & Solangi (1985) has reported this species from cultivated plain areas from Sindh.

A single male of *Sphingonotus theodori theodori*, was reported from calcareous rocky area of Dadu district by Wagan (1985) at present we have reported 05 males from Choondiko & Khehwari from thorny habitat. Surprisingly no female came in collection but our later study and extensive survey might be resolved this mystery. At the present it was also notice that richness of species depend on relative temperature, humidity and availability of host plants exist in surveyed area.

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