



SINDH UNIVERSITY RESEARCH JOURNAL (SCIENCE SERIES)

Fauna of Acrididae (Orthoptera: Acridoidea) from Nara Desert District Khairpur

F. SOOMRO⁺⁺, R. SULTANA*, M. S. WAGAN, A. R. ABBASI**

Department of Zoology, Shah Abdul Latif University, Khairpur

Received 16th April 2015 and Revised 3rd October 2015

Abstract: The list of Acrididae species at the Nara desert was compiled. At Least 749 specimens belonging to 06 subfamilies i-e *Spathosternum prasiniferum* (Krauss, 1877), *Heteracris littrolis* (Rambur, 1839), *Aiolopus thalassinus thalassinus* (Fabricius, 1781), *Hilethera aeolopoides* (Uvarov, 1923), *Trilophidia annulata* (Thunberg, 1815), *Acrotylus humbertinus* (Saussure, 1884), *Sphingonotus rubescens rubescens* (Walker, 1870), *S. savignyi* (Saussure, 1884), *S. theodori theodori* (Uvarov 1924), *Aulacobothrus luteipis* (Walker, 1871), *Ochridia geniculata* (Bolivar, 1913), *O. gracilis gracilis* (Krauss, 1902), *Acrida exaltata* (Walker, 1859), *Acrida gigantea* (Herbt, 1786), *Truxalis examia examia* (Eichwald, 1830) and *Truxalis fitzgeraldi* (Dirish 1951) were captured and sorted out into 16 species belonging to 11 genera. Every month visit has been carried out into field during the year 2014. This paper contain an inventory of Acrididae of Nara but present study may led to the discovery of some new species and new record of grasshoppers in near future.

Keywords: Acrididae, Species, Nara, Inventory, Discovery.

1. INTRODUCTION

Administratively arid zone of Sindh is divided into two regions i-e. Kohistan (the western side of Indus valley) and Thar (Eastern side of Sindh province). Thar subdivided into Nara region in north and Thar region in south (Bhatti *et.al.*, 2001). Nara region comprises of desert portion of Sukkur, Khairpur and Sanghar (Anandani, 2004). In the present study author restricted to Nara desert areas situated on right bank of Nara canal emerge from Sukkur barrage in Nara taluka of Khairpur district (Bhatti *et.al.*, 2001). Nara desert comprises of wetlands, desert (lose sand and sandy dunes), adjoining rocky areas and cultivated land areas. Nara desert with its intermingling habitat persevere peculiar acridids grasshoppers fauna well adopted to survive in extreme conditions. Most of the member of family Acrididae are notable native herbivores agitate crop growth, nutritive composition, physiology and production. Being a primary consumer in ecosystem devastating plantation in arid zone from July to September (Parihar, 1987). Grasshoppers are indeed interest to entomologist because they are often in direct contest for food with man. Lose cause by acridid grasshoppers in scattered wild vegetation and cultivated field areas in dry desert zone are as high as in cultivated fields in plain areas, because wild vegetation harbor pest population when main host plant in cultivated filed area are unavailable. It is critical to manage damaging effects of pest in dry desert zone with limited cultivated field area. To get appropriate results it is necessary to identify pest species habitat with respect to host plants and their distribution within the particular ecosystem before developing an economical and effective programs of insect pest management (Parihar, 1987). The prime object of this study was to investigate the abundance of Acrididae

fauna in Nara desert, availability of host plants and wild vegetation and distribution of species in different months of year.

2. MATERIAL AND METHODS

Investigation side:

Present study was carried out in Nara (desert) included in the district Khairpur. Every month Surveys were conducted in 05 localities i-e Choondiko, Khehwari, Sikandarabad, Tajal and Kot-Jubo having sandy, loamy, untilld, rocky and few patches of medium fertile soil with cultivated field area. Annual rain fall of Khairpur district including Nara during the year 2014 recorded 5.47 inches (139mm)² with temperature 22c° -49c° (USAID report, 2014) .

Sampling:

Collection made once in a month during the year 2014. By using ordinary ariel insect net, forceps and by hand picking. Material was collected from scattered vegetation of herbs and grasses, open grounds, main field areas and their peripheries.

Killing and Preservation:

Adult specimens were killed and preserved by following the method of (Riffat and Wagan, 2012) after this , specimens properly tagged, pinned and kept into insect boxes for longer preservation.

Identification:

All the samples were identified by using illustration and keys given by (Wagan, 1990) (Riffat *et al* , 2013).

3. RESULTS AND DISCUSSION

Sixteen known species from six sub-families i-e *Spathosternum prasiniferum* (Krauss, 1877), *Heteracris littrolis* (Rambur, 1839), *Aiolopus thalassinus thalassinus* (Fabricius, 1781), *Hilethera aeolopoides*

⁺⁺Corresponding authors: E-mail: riffatumer@hotmail.com fakhraasoomro110@hotmail.com

*Department of Zoology, University of Sindh, Jamshoro.

**Department of Fresh Water Biology and Fisheries, Pakistan University of Sindh Jamshoro, Pakistan

(Uvarov, 1923), *Trilophidia annulata* (Thunberg, 1815), *Acrotylus humbertinus* (Saussure, 1884), *Sphingonotus rubescens rubescens* (Walker, 1870), *S. savignyi* (Saussure, 1884), *S. theodori theodori* (Uvarov 1924), *Aulacobothrus luteipus* (Walker, 1871), *Ochrilidia geniculata* (Bolivar, 1913), *O. gracilis gracilis* (Krauss, 1902), *Acrida exaltata* (Walker, 1859), *Acrida gigantea* (Herbt, 1786), *Truxalis examia examia* (Eichwald, 1830) and *Truxalis fitzgralidi* (Dirish, 1951) from Nara desert were examined. More species of sub-family Oedipodinae were captured (**Table-I**) majority were associated with Short grasses and shrubs (Table-III). However, three species of Gomphocerinae i-e *Aulacobothrus luteipus*, *Ochrilidia geniculata* and *O. gracilis gracilis* were also came in collection. While the fauna of Hemiacridinae and Eyprepocnemidinae comprise on *Spathosternum prasiniferum* and *Heteracris littrolis* respectively. Beside this 02 species i-e *Acrida exaltata* and *A. gigantea* of Acridinae and *Truxalis examia examia* and *T. fitzgralidi* of Truxalinae were also recorded from *Saccharum bengalense*, *Cynodon dactylon*, *Triticum*, *Eleusine flagillifera*, *Sorghum bicolor* and *Aristida* and with surrounding vegetation (**Table-5**). It was also observed that more dominant species was *Acrotylus humbertinus* (Table-I) of Oedipodinae as compare to other species of Acrididae. However *Acrida gigantea* only restricted in Sikandarabad followed by *Truxalis examia examia* that was only captured from Choondiko (**Table-1**). Sixteen species has been enlisted in (**Table-2**) along with their monthly distribution which showed that majority of species were occur in hottest months viz. July to September in these three months not only temperature range was extended but there was also availability of water in field. It is very surprise to know that *Aiolopus thalassinus thalassinus* occur throughout the year.

The fauna of Nara comprise on mixture of vegetation that was consist on poor vegetation, Short, tall grasses along with herbs and shrubs (Table-III). Most of the host plants species belongs to family Poaceae with 10 species followed by Gramineae with 06 host plant species (Table-V). These 02 families of plants harbor majority of Acridid species and provide ideal breeding ground to grasshoppers to increase in density. Present survey provide clear picture of Acridid fauna their prevalence in different months of the year with respect to their habitat and host plants record.

It was noticed that *Acrotylus humbertinus* was found dominant pest in Nara desert these results are correlate with (Parihar, 1987) described highest composition of *Ochrilidia affinis* with 54% of total collection followed by *Acrotylus humbertinus* from Rajistan desert India located in the west of Nara desert. Furthermore, not a single specimen of *Ochrilidia affinis* were came in collection from Nara desert and *Acrotylus humbertinus* was found as dominant species followed by *A. thalassinus thalassinus*. (Parihar, 1987) never report *A. thalassinus thalassinus* from Rajisthan desert. This disparity might be due to unavailability of host plants. While few specimens of genus *Ochrilidia* i-e *O. gracilis gracilis* & *O. geniculata* with 0.93 & 0.26 % were also collected. It might be reason that *Ochrilidia* prefer to live in specific host plants i-e *Cymbopogon sachaenal* and *Eleusine compressa* suggested by (Parihar, 1987) but these plants were not occurred in Nara.

ACKNOWLEDGEMENT

We extend our gratitude to Prof. Dr. M.Tahir Rajput for confirmation of some botanical names and provide of plant literature.

Table. I. Showing distribution and percentage of Acridid fauna in various localities of Nara desert.

Sub-families and species	Choondiko	Kheh wari	Tajal	Sikanda r--abad	Kot-Jubo	Total specimens (749)	Percentage %
Hemiacridinae:							
<i>Spathosternum prasiniferum</i> (Krauss, 1877)	15	16	05	03	07	46	6.14%
Eyprepocnemidinae:							
<i>Heteracris littrolis</i> (Rambur, 1839)	23	17	09	11	09	69	9.21%
Oedipodinae:							
<i>Aiolopus thalassinus thalassinus</i> (Fabricius, 1781)	16	30	16	20	07	89	11.88 %
<i>Hilethera aeolopoides</i> (Uvarov, 1923)	23	12	08	11	03	57	7.61%
<i>Trilophidia annulata</i> (Thunberg, 1815)	06	05	05	03	02	21	2.80%
<i>Acrotylus humbertinus</i> (Saussure, 1884)	71	36	30	16	08	161	21.49%
<i>Sphingonotus rubescens rubescens</i> (Walker, 1870)	28	22	09	11	07	76	10.14%
<i>S. savignyi</i> (Saussure 1884)	23	19	12	10	09	73	9.74%
<i>S. theodori theodori</i> (Uvarov 1924)	05	04	03	01	00	13	1.73%
Gomphocerinae:							
<i>Aulacobothrus luteipus</i> (Walker, 1871)	18	10	14	03	08	53	7.07 %
<i>Ochrilidia geniculata</i> (Bolivar, 1913)	16	03	12	08	06	45	6.00 %
<i>O. gracilis gracilis</i> (Krauss, 1902)	10	07	05	05	02	29	3.96 %
Acridinae:							
<i>Acrida exaltata</i> (Walker, 1859)	04	00	00	03	00	07	0.93%
<i>A. gigantea</i> (Herbt, 1786)	00	00	00	02	00	02	0.26%
Truxalinae:							
<i>Truxalis examia examia</i> (Eichwald, 1830)	03	02	00	00	00	05	0.66%
<i>T. fitzgralidi</i> (Dirsh, 1951)	03	00	00	00	00	03	0.40%

Table 2. Month wise collection of acridids fauna from Nara desert during year 2014.

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Spathosternum prasiniferum</i>	-	-	-	+	+	++	+++	+++	++	+	+	-
<i>Heteracris littrolis</i>	-	-	+	++	+	++	++	+++	+++	+	+	+
<i>Aiolopus thalassinus thalassinus</i>	+	+	++	++	++	+++	+++	++	+	++	+	+
<i>Hilethera aeolopoides</i>	-	-	+	+	+	++	+++	+++	+	+	-	-
<i>Trilophidia annulata</i>	-	-	+	+++	++	+	-	-	-	-	-	-
<i>Acrotylus humbertinus</i>	-	+	+	++	++	+++	+++	+++	+++	++	+	+
<i>Sphingonotus rubescens rubescens</i>	-	-	+	++	+	+	+	++	++	+++	+++	+
<i>S. savignyi</i>	-	+	+	+++	++	+	+	+	++	+++	+++	+
<i>S. theodori theodori</i>	-	-	-	-	-	+	++	++	+	-	-	-
<i>Aulacothrus luteipas</i>	-	+	+	+	-	+	++	+++	++	+	+	-
<i>Ochrilidia geniculata</i>	-	-	+	+	+	++	+++	++	+	-	-	-
<i>O. gracilis gracilis</i>	-	+	+	+	-	+	++	+	-	-	-	-
<i>Acrida exaltata</i>	-	-	-	-	-	-	+	++	+	-	-	-
<i>A. gigantea</i>	-	-	-	-	-	-	-	-	-	+	-	-
<i>Truxalis examia examia</i>	-	-	+	+	-	-	-	-	-	-	-	-
<i>T. fitzgraldi</i>	-	-	-	+	-	-	-	-	-	-	-	-

Note: +++ = More dominant Jan= January, Feb= February, Mar= March, Apr= April, Jun = June, Jul=July,
 ++ = Moderate dominant Aug= August, Sep= September, Oct= October, Nov = November, Dec = December
 + = Less dominant Temp = Temperature, Hum = Humidity
 - = Absent

Table 3. Showing distribution of Acridid fauna relative to their habitats.

Composition of Habitat	Acridid Species
Very poor vegetation	<i>Acrotylus humbertinus</i> , <i>Sphingonotus rubescens rubescens</i> , <i>S. savignyi</i> , <i>S. theodori theodori</i> , <i>Trilophidia annulata</i>
Short grasses and herbs	<i>Acrotylus humbertinus</i> , <i>Sphingonotus rubescens rubescens</i> , <i>S. savignyi</i> , <i>S. theodori theodori</i> , <i>Trilophidia annulata</i> , <i>Aiolopus thalassinus thalassinus</i> , <i>Spathosternum prasiniferum</i> , <i>Acrida exaltata</i> , <i>A. gigantea</i> , <i>Truxalis examia examia</i> , <i>T. fitzgraldi</i>
Tall grasses and shrubs	<i>Sphingonotus rubescens rubescens</i> , <i>S. savignyi</i> , <i>Aulacothrus luteipas</i> , <i>Spathosternum prasiniferum</i> , <i>Aiolopus thalassinus thalassinus</i> , <i>Hilethera aeolopoides</i> , <i>Heteracris littrolis</i> , <i>Ochrilidia geniculata</i> , <i>O. gracilis gracilis</i>

Table 4 Showing the distribution of Acridid species on different host plants occurring in Nara (desert) localities.

Species	Host plants	
	Botanical Name	Common/Local Name
<i>Spathosternum prasiniferum</i>	<i>Sorghum bicolor</i> <i>Pennisetum typhoides</i>	Jowar Millet
<i>Heteracris littrolis</i>	<i>Lasiurus indicus</i> <i>Saccharum bengalense</i>	Booro Booro
<i>Aiolopus thalassinus thalassinus</i>	<i>Cynodon dactylon</i> <i>Penisetum typhoides</i>	Lawn grass- Chabar Gaah Millet
<i>Hilethera aeolopoides</i>	<i>Medicago sativa</i> <i>Euphorbia hirta</i>	Alfalfa-Losan Smart weed- Kheer wal
<i>Trilophidia annulata</i>	<i>Medicago sativa</i> <i>Lasiurus indicus</i>	Alfalfa-Losan Booro <i>Euphorbia hirta</i>
<i>Acrotylus humbertinus</i>	<i>Zea mays</i> <i>Sorghum bicolor</i> <i>Eleusine flagillifera</i>	Maize Jowar Finger millet grass
<i>Sphingonotus rubescens rubescens</i>	<i>Saccharum bengalense</i> <i>S. arundinacea</i>	Booro Kano- Sar-Reed plant
<i>S. savignyi</i>	<i>Saccharum bengalense</i> <i>S. arundinacea</i>	Booro Kano- Sar-Reed plant
<i>S. theodori theodori</i>	<i>Aristida funiculata</i> <i>Echinops echinatus</i>	Lumb gaah Kanderi bhattar

Species	Host plants	
	Botanical Name	Common/Local Name
<i>Ochrilidia geniculata</i>	<i>Triticum sp.</i> <i>Aeluropus logopoides</i>	Wheat Kalar gaah
<i>O. gracilis gracilis</i>	<i>Triticum sp.</i> <i>Aeluropus logopoides</i> <i>Saccharum</i>	Wheat Booro
<i>Acrida exaltata</i>	<i>Saccharum bengalense</i> <i>Cynodon dactylon</i> <i>Aeluropus</i>	Booro Lawn grass- ChabarGaah
<i>A. gigantea</i>	<i>Triticum sp.</i> <i>Saccharum bengalense</i> <i>Cynodon</i>	Wheat Booro
<i>Truxalis examia examia</i>	<i>Pennisetum typhoides</i> <i>Sorghum bicolor</i>	Millet Jowar
<i>T. fitzgralidi</i>	<i>Sorghum bicolor</i> <i>Triticum sp.</i>	Jowar Wheat

Table. 5 Showing host plants species of Acridid fauna with their relative families from Nara desert

Plants Species	Families	Plants Species	Families
<i>Lasiurus indicus</i>	Poaceae	<i>Eleusine flagillifer</i>	Gramineae
<i>Saccharum bengalense</i>	Poaceae	<i>Triticum sp.</i>	Gramineae
<i>S. spontaneum</i>	Poaceae	<i>Solanum melongena</i>	Solanaceae
<i>S.arundinacea</i>	Poaceae	<i>Lycopersicum esculentum</i>	Solanaceae
<i>Cenchrus ciliaris</i>	Poaceae	<i>Euphorbia hirta</i>	Euphorbiaceae
<i>C.biforus</i>	Poaceae	<i>E. thymifolia</i>	Euphorbiaceae
<i>Aristida funiculate</i>	Poaceae	<i>Vigna sinensis</i>	Leguminosae
<i>A.adscensionis</i>	Poaceae	<i>Medicago sativa</i>	Leguminosae
<i>Aeluropus logopoides</i>	Poaceae	<i>Cyperus rotundus</i>	Cyperaceae
<i>Dactyloctenium</i>	Poaceae	<i>Aerva javanica</i>	Amaranthaceae
<i>Sorghum bicolor</i>	Gramineae	<i>Tephrosia fleiforms</i>	Fabaceae
<i>Pennisetum typhoides</i>	Gramineae	<i>Echinops echinatus</i>	Asteraceae
<i>Cynodon dactylon</i>	Gramineae	<i>Hibiscus esculentus</i>	Malvaceae
<i>Zea maya</i>	Gramineae	<i>Citrullus colocynthis</i>	Cucurbitaceae

REFERENCES:

- Anandani, R., (2004). Assessment Report On Drought Situation In Arid–Zone Of Sindh. Thardeep. Rur. Devl. Prog. Emg. Uni. Tharparkar. Sindh. Pakistan. (www.thardeep.org.pk), 1-29.
- Bhatti, G. R., R. Qureshi, And M. Shah, (2001). Ethinbotany Of Qadan Wari Of Nara Desert. *Pak. J. Bot* 33 (Special Issue), 801-812.
- Bidau, C. J., (2014). Patterns In Orthoptera Biodiversity. I. Adaptations In Ecological And Evolutionary Context. *J. Ins. Biodiv*, 2(20): 1-39.
- Parihar, D. R., (1987). Grasshopper Pests Of Grazing-Land Vegetation And Their Management In Indian Desert, Central. Ari. Zon. Res. Inst. Jodhpur. India. 130Pp.
- Paulraj, M. G., V. Anbalagan, And S. Ignacimuthu, (2009). Distribution Of Grasshoppers (Insecta: Orthoptera) Among Different Host Plants And Habitats In Two Districts Of Tamil Nadu, India. (Jott Communication) *J. Threat. Taxa.*, 1(4): 23-33.
- Rajput, M. T., S. S. Hassney, K. M. Khan, (2009). Plant Taxonomy. Publisher. N.B.D. Hyderabad. Sindh.
- Riffat, S., Y. S. Wagan, And M. S. Wagan, (2013). Orthopteran Biodiversity Of Thar Desert, Sindh, Pakistan. *Pak. J. Zool.*, 45 (2): 299-304.
- Soomro, F., M. S. Wagan, And S. Riffat, (2014). On The Incidences Of Oedipodinae (Orthoptera: Acrididae) From Nara Desert Khairpur, Sindh, Pakistan. *J. Bio. Env. Sci.*, 5(4): 970-977.
- Usaids Report., (2014). Pakistan Emergency Situational Analysis- A Profile of District Khairpur. (www.sindh.gov.pk), 1-63.
- Vickery, V.R., And B. Kevan, (1983). A Monograph of The Orthopteroid Insects Of The Canada And Adjacent Regions. *Lyman. Ent. Mus. Res. Lab. Mem.*, 13: 618-1462.
- Wagan, M.S., (1990). Grasshoppers (Acrididae) Of Sindh. Pakistan Science Foundation, Islamabad. Isbn No. 969-8040-06-4. 110.