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The Thar Crickets (Orthoptera: Gryllidae)

R. SULTANA[++] M. S. DAYO, M. S. WAGAN, M. LAL

Department of Zoology, University of Sindh, Jamshoro

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Abstract: Thar desert has totally about 14 species belonging to family Gryllidae consists of 03 subfamilies viz: Gryllinae, Gryllomorphinae, and Nemobiinae, pertaining to 4 tribes Gryllini, Eumodicogryllini, Pteronemobiini and Gryllomorphini under 9 genera. All the material was collected from Mithi, Nangarparkar, Chachro and Diplo. Beside this, distribution pattern of species important host plant attacked by gryllidae presented here. *Phonarellus (Phonarellus) humeralis* and *Gryllus (Gryllus) quadrimaculatus apicalis* species belonging to Gryllinae subfamily construct new records for Thar Sindh. Beside this, a single species of *Gryllomorpha* offering unique character might be proved new species when more material will be in hand.

Keywords: Gryllidae, subfamilies, distribution, genera, host plants, new records, Thar.

1. INTRODUCTION

Sindh has very diversified pattern, with various climatic zones in agriculture sector. It is rich for the Gryllidae fauna commonly known as true crickets. These are nocturnal and famous for their chirping, but only the male makes sounds. In sensitive climatic condition of Thar prevents collection of insect therefore, information available about the species of Gryllidae of Thar and their distribution are quite inadequate. It was basic aim to conduct this research to resolve pest problems. Gryllidae has good association with forest crops, they significantly damage the herbaceous plantation. These all facts suggest that these insect are very injurious to crops. The insects belonging to Gryllidae are generally phytophagous insects consume wide varieties of plants therefore, it could be recommend that large number of plants effect by this. Available data showed that, Gryllidae fauna of Thar is very insufficiently known in contrast to other families of Orthoptera (Chopard 1938), Huber *et al*., (1989), Jennion and Petrie (1997), Bentson *et al*., 2006 (Sultana *et al*., 2013) there is no correct data on the Gryllidae exist from this region. Reasonable data on the Acrididae of Sindh province is given by Ahmed (1980), Wagan (1990), Wagan and Naheed (1997), Yousuf (1996) and Sultana and Wagan (2007-2010) but no detail description on the taxonomic status of this group studied before this with exception of (Sultana and Wagan 2015). Although, it is major pest of our cash crops i-e, rice, wheat, maize, cotton and sugarcane. Therefore, present attempt is being carried out to identify their various species accurately, so that in light of this finding proper control planning should be taken out.

2. MATERIAL AND METHODS

2.1. Study Site

An extensive survey was carried out in Thar. Material was collected from trees, shrubs, herbs and grasses available in this region.

2.2 Killing and preservation of specimens

The method given by Vickery and Kevan (1983) was adapted for killing and preservation of insect samples. Capture samples brought to lab for detail analysis after this, all samples chloroformed in glass jars for 10 to 15 minutes but not longer because longer chloroform placement can de-colored the samples of green specimens. However, after this pinning of samples (for 24 hours) has been done by following standardized entomological method. All parts of insect body carefully stretched as desired for taxonomic study. Monitoring was also done by following method given by Sultana and Wagan(2012).

3. RESULTS

3.1. Key to subfamilies of Gryllidae occurring in Thar Desert

1. Larger in size, spines of the posterior tibia immoveable without hair…….……2

—Smaller in size, spines of the posterior tibia moveable pubescent ……...….... Nemobiinae.

2. Epiphallus quadrate, dorsally, broader deeply from anterior with broadly emerginate occupied two fifth of the length of epiphallus……...

……Gryllinae……..

[++]Corresponding Authors: Email: riffatumer@hotmail.com,

—Epiphallus in with the V-shaped medium proximal sclerite while ♂ has bifurcate hind part of anal plate…….. Gryllomorphinae.

As a result of this work, a total of 676 specimens were captured from 04 localities of Thar i-e, Mithi, Nangarparkar, Chachro and Diplo. Mostly the specimens were collected from agriculture land, which comprise on rocks, desert, semi desert, trees, herbs, wild vegetation etc. The collected material was sorted out into to 03 sub-families i-e, Gryllinae, Gryllomorphinae, and Nemobiinae. These 03 subfamilies pertaining to 4 tribes i-e, Gryllini, Eumodicogryllini, Pteronemobiini and Gryllomorphini and 9 genera i-e, *Acheta*, *Phonarellus*, *Teleogryllus*, *Loxoblemmus*, *Gryllus*, *Eumodicogryllus*, *Gryllodes*, *Pteronemobius* and *Gryllomorpha* which comprise on 14 species i-e, *Acheta domesticus*, Linnaeus, 1758, *Acheta chudeaui,* Chopard, 1927, *Acheta chudeaui chudeaui*, (Chopard,1927), *Acheta meridionalis*,Uvarov,1921, *Phonarellus (Phonarellus) humeralis* (Walker,1871), *Teleogryllus (Macroteleogryllus) mitratus* Burmeister, 1838, *Loxoblemmus formosanus* Shiraki, 1930, *Gryllus bimaculatus* De Geer, 1773, *Gryllus (Gryllus) quadrimaculatus apicalis* Bolívar, 1900, *Eumodicogryllus bordigalensis* (Latreille, 1804), *Gryllodes sigillatus* Walker, 1869, *Gryllodes supplicans* Walker, 1859, of subfamily Gryllinae. *Pteronemobius concolor*, Walker, 1871 belonging to subfamily Nemobiinae and *Gryllomorpha* sp. this specie of subfamily Gryllomorphinae is in process of identification. Beside this, identification keys were also presented here. Overall, species collection percentage showed that *Gryllodes sigillatus* was significantly highest with 25.44% followed by *Gryllodes supplicans* with 21.30%. Further, it was also noted that fair numbers of specimens have been captured from Mithi i-e, 36.83%, followed by Chachro 26.33%, Nangarparkar i-e, 20.11% and least population of Gryllidae has been reported from Diplo i-e, 15.97%.

4. DISCUSSION

The Grylloidea is an important member of Ensifera. The ensifera includes 04 subfamilies, i-e, Gryllacridoidea, Prophalangopsidea, Tettigoniodea and Grylloidea (Chopard 1969). The Grylloidea bears somewhat similarities with Tettigonioidea but it has 04 segmented tarsal in female, while ovipositor is needle like of in cylindrical shaped, in appearance straight of curved it comprised on 02 pairs of valves. Their cerci elongated, flexible while few species are greenish in color. They are nocturnal they hide themselves during extreme weather and live in humid environment during day period.Crickets are omnivorous scavengers who mostly feed on organic materials, including decaying plant material, fungi, and some seedling plants. Crickets eat their own dead when there are no other sources of food available, and exhibit predatorial behavior upon weakened, crippled crickets.

This group is most classical type of cricket, characterized by the big, globular composition. Gryllidae has great importance, because it is major and minor pest of varieties of vegetation (Weissman *et al.,* 1980) Previously many systematists just used the morphological characters to recognize the Gryllidae inseated of song production organ, but when they understand that this aspect is very useful for classification they start working on this and introduce this organ as basic tool in identification of this group, and recommended that this organ offer very reliable character for species isolation. Earlier, co-workers i-e, (Alexander, 1962, Huber *et al.,* 1989, Otte 1992) stated that Orthoptera is first unique group that evolve acoustic behavior for utilization in sound communication in environment. They further stated that, bioacoustics data has come from different behavioral and neuro physiological studies that were carried on crickets in past by Walker (1975) Forrest (1982) Romer and Baily (1986) Huber *et al*., (1989) from various regions of world.

Beside this, it was also found that many species of crickets are dimorphic in metathoracic wings length the insects having long winged can fly faster while the insects with short-winged not move fast. Present study recommends that genetic and environmental factors are responsible for this length dimorphism. This fact was earlier reported by Alexander (1962).

Table-1 Distribution of species in various localities of Thar Desert.

Species	Localities					
	Mithi (n=249)	Chachro (n=178)	Nangarparkar (n=136)	Diplo (n=108)	Total (n=676)	Percentage %
Acheta domesticus	35	25	12	8	80	11.83
Acheta chudeaui	05	03	07	06	21	3.10
Acheta chudeaui chudeaui	04	02	05	03	14	2.07
Acheta meridionalis	02	04	03	02	11	1.62
Phonarellus (Phonarellus) humeralis	03	05	04	02	14	2.07
Teleogryllus mitratus	08	04	04	06	22	3.25
Loxoblemmus formosanus	04	06	05	09	24	3.55
Gryllus bimaculatus	20	33	13	28	94	13.90
G. (Gryllus) quadrimaculatus apicalis	05	03	04	02	14	2.07
Eumodicogryllus bordigalensis	10	4	2	3	19	2.81
Gryllodes sigillatus	70	40	37	25	172	25.44
G.supplicans	61	35	34	9	144	21.30
Gryllomorpha sp.	00	01	00	00	01	0.14
Pteronemobius concolor	22	13	06	05	46	6.80

Note: Total No: of specimens were captured 676.

Table-2 Showing the number of specimens collected from Thar Desert.

Species	Male	Female	Total	Percentage %
Acheta domesticus	29	51	80	11.83
A. chudeaui	9	12	21	3.10
A. chudeaui chudeaui	14	---	14	2.07
A. meridionalis	---	11	11	1.62
Phonarellus (Phonarellus)humeralis	14	---	14	2.07
Teleogryllus mitratus	22	---	22	3.25
Loxoblemmus formosanus	24	---	24	3.55
Gryllus bimaculatus	23	71	94	13.90
G. (Gryllus) quadrimaculatus apicalis	---	14	14	2.07
Eumodicogryllus bordigalensis	---	19	19	2.81
Gryllodes sigillatus	68	104	172	25.44
G.supplicans	51	93	144	21.30
Gryllomorpha sp.	---	01	01	0.14
Pteronemobius concolor	---	46	46	6.80

Note: Total No: of specimens were collected 676.

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