



DIVERSITY OF FIELD CRICKETS (GRYLLIDAE: ORTHOPTERA) FROM MIRPURKHAS, SINDH

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ARTICLE INFORMATION

Article History:

Received: 24th March, 2020

Accepted: 20th August 2020

Published online: 25th November 2020

Key words:

Gryllidae, Gryllinae, Nemobiinae, Orthoptera, *Gryllus*, New records, Mirpurkhas.

ABSTRACT

During the present survey, 12 species were collected from district Mirpurkhas that includes 11 species and 01 subspecies belonging to family Gryllidae consists of 02 sub-families i-e: Gryllinae and Nemobiinae. These 02 subfamilies pertaining to 03 tribe's i-e Gryllini, Medicogryllini and Pteronemobiini under 05 genera. As a result of this work, a total of 626 specimens were captured from 07 localities of District Mirpurkhas. Out of these species, 01 species and 01 subspecies such as *Gryllus multipulsator* and *Gryllus (gryllus) assimilis assimilis* subspecies were recorded as first time from the region.

1. INTRODUCTION

Mirpurkhas is the 4th largest city in Sindh province and 33rd largest city of Pakistan. Mirpurkhas is known for its mango cultivation, with hundreds of varieties of mangoes produced each year, it is also called city of mangoes. Family Gryllidae included in order Orthoptera and suborder Ensifera which are also known as long horned grasshoppers because they have long antennae. The representative of family Gryllidae are commonly known as true crickets. They are nocturnal in habitat and famous for chirping, but only the male makes sound. The Gryllidae occurring in wide variety of habitats i.e trees, shrubs, herbs, vegetations, soil moisture and grasses. Like cockroaches, crickets have chewing mouthparts and can feed practically on anything. They are often attracted to lights around a building at night. Crickets have a cosmopolitan distribution, being found in all parts of the world. Mostly have close resemblance with long horned grasshoppers, and Katydid of family Tettigoniidae. These insect having very important morphological characters such as flat appearance with elongated filiform antennae.

They having nocturnal nature feed all type of material and their most important features are 3 segmented tarsi along with good jumping legs. Gryllidae insects play an important role in maintaining the balance of ecosystem. They break down plant material and renewing soil minerals. So, they are of great importance in agriculture. They are generally phytophagous and consume wide varieties of plant. The negative impact that crickets have on ecosystem include injuring seedling, large number of crickets can be very destructive. Crops and gardens are grossly affected by black field crickets and of course, the chirping can be quite loud and irritating.

In Pakistan, cricket fauna was identified by Ghouri and Ahmed (1959); Chopard (1969); Yunus *et al.*, (1980); Ramzan (1984); Qayoom *et al.*, (1987); Abdullah (1995); Saeed *et al.*, (2000); Malik (2015) and Riffat *et al.*, (2016). Most of workers collected material from Punjab and as far as concerned to Sindh only references to particular areas like Karachi, Sukkur, Badin Hyderabad and Thar Desert can be found in literature. Therefore, present study was designed to survey and identified the cricket species from District Mirpurkhas-Sindh.

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2. MATERIALS AND METHODS

Study Site

The study on finding of crickets was carried out in District Mirpurkhas-Sindh during 2019. Seven localities of district Mirpurkhas were visited i.e: Digri, Mirpurkhas Sindhri, Shujabad (Mirwah), Jhuddo, Hussain Bux Mari and Kot Ghulam Muhammad during the research work. Specimens were collected from trees, shrubs, herbs grasses, bakeries, holes in the houses, on lights at night, leaf litter, soil cracks, crops, vegetable fields and around human habitats.

Killing and Preservation of Specimens

The method given by Vickery and Kevan (1983) was adopted for killing and preservation of specimens. All specimens were collected by insect net and hand picking method. Captured samples brought to lab for further analysis. All specimens were killed by chloroform in glass jar after that pinning of samples has been done by standard entomological method. The identification of collected material was carried out from morphology and their concealed genitalia. For the proper identification of cricket species, the Standard Entomological procedure and tools were followed. The taxonomic work was properly mounted, labeled and sorted.

3. RESULTS

The studies on cricket species was carried out from district Mirpurkhas-Sindh revealed that 05 genera and 11 species with 01 subspecies belonging to 02 subfamilies of main family Gryllidae were identified during the present study.

As a result of this work, a total of 626 specimens were captured from 07 localities of District Mirpurkhas i.e Digri, Jhuddo, Mirpurkhas, Mirwah (Shujaabad), Sindhri, Kot Ghulam Muhammad and Hussain Bux Mari. Mostly the specimens were collected from agricultural land, trees, herbs, wild vegetation and from holes in the houses etc. The collected material was sorted out into to 02 sub-families i-e: Gryllinae and Nemobiinae. These 02 subfamilies pertaining to 03 tribes i-e Gryllini, Medicogryllini and Pteronemobiini and 05 genera, which comprise on 11 species and 01 subspecies i.e: *Acheta domesticus*, Linnaeus, 1758, *Acheta chudeaui*, Chopard 1927, *Acheta meridionalis*, Uvarov, 1921, *Acheta thoracica saeed et al.* 2000, *Teleogryllus (macroteogryllus) mitratus* Burmiester, 1838, *Gryllus bimaculatas*, De Geer, 1773, *Gryllus (gryllus) quadrimaculatus apicalis* Bolivar, 1900, *Gryllus (Gryllus) assimilis assimilis*, Fabricius, 1775,

subspecies, *Gryllus multipulsator*, Weissman, 2009, *Gryllodes sigillatus* Walker, 1869, *Gryllodes supplicans* Walker, 1859, of subfamily Gryllinae. *Pteronemobius concolor*, Walker, 1871 belonging to family Nemobiinae. Overall species collection showed that *Acheta domestica* was significantly highest with 30.51% followed by *Gryllodes sigillatus* with 23.32%. Further, it was noted that fair number of specimens have been captured from Digri (32.42%) followed by Mirwah (14.85%) and least population of Gryllidae has been reported from Hussain Bux Mari (10.06%) and Sindhri (10.06%).

4. DISCUSSION

The present study was carried out to explore cricket fauna of district Mirpurkhas. Family Gryllidae included in order Orthoptera and suborder Ensifera which are also known as long horned grasshoppers because they have long antennae. The Gryllidae have mainly cylindrical bodies, round heads, and long antennae. Behind the head is a smooth, robust pronotum. The abdomen ends in a pair of long cerci, females have a long, cylindrical ovipositor. The hind legs have enlarged femora, providing power for jumping. The front wings are adapted as tough, leathery elytra, and some crickets chirp by rubbing parts of these together.

The taxonomic work on the distribution of Gryllidae fauna have been carried out by the several researcher. Chopard (1969) described species belong to 12 families of Gryllioidea from Pakistan and adjoining countries. The detailed survey of Gryllidae fauna was carried out by Saeed *et al.* (2000), they visited the different localities of Pakistan and identified fauna up to family, sub families and generic level but most of workers collected material from Punjab and as for as concerned to Sindh only references to particular areas like Karachi, Sukkur, Badin, Hyderabad and Thar Desert can be found in literature.

5. CONCLUSION

It could be concluded that overall big diversity of crickets were available in field in different season all the developmental stages of was seen and significant numbers were found in this area.

CONFLICT OF INTEREST

Author has declared that there is no conflict of interest regarding publication of this article.

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KEY TO SUBFAMILIES OF GRYLLIDAE OCCURRING IN DISTRICT MIRPURKHAS

1	Posterior tibia with short spines, Head without dorsal bristles, Cerci long with minute hairs and pointed at apex, Ovipositor with smooth margins.....	Gryllinae
----	Posterior tibia with long spines, Head with dorsal bristles, Cerci long and slender, Ovipositor with denticulate margin.....	Nemobiinae

Table 1: Distribution of species in various localities of District Mirpurkhas

SPECIES	LOCALITIES								Percentage %
	Digri (n=203)	Mirpurkhas (n=66)	Mirwah (n=93)	Kot Ghulam Muhammad (n=70)	Sindhri (n=63)	Hussain Bux Mari (n=63)	Jhuddo (n=68)	Total (n=626)	
<i>Acheta domesticus</i>	63	16	21	20	21	28	22	191	30.51%
<i>Acheta chudeaui</i>	15	2	6	5	7	4	2	41	6.54%
<i>Acheta meridionalis</i>	13	3	7	4	5	3	4	39	6.23%
<i>Acheta thoracica saeed et al.</i>	5	--	--	--	--	--	--	05	0.79%
<i>Grylloides sigillatus</i>	41	18	29	21	9	11	17	146	23.32%
<i>Grylloides supplicans</i>	26	21	16	13	17	13	18	123	19.64%
<i>Gryllus bimaculatus</i>	20	4	6	7	3	4	4	48	7.66%
<i>Gryllus (Gryllus) assimilis assimilis subspecies</i>	1	--	--	--	--	--	--	01	0.15%
<i>Gryllus quadrimaculatus apicalis</i>	5	--	--	--	--	--	--	05	0.79%
<i>Gryllus multipulsator</i>	8	--	--	--	--	--	--	08	1.27%
<i>Telogyllus mitratus</i>	--	--	5	--	--	--	--	05	0.79%
<i>Pteronemobius concolor</i>	6	2	3	1	1	--	1	14	2.23%

Note: Total number of specimens were collected **626**.

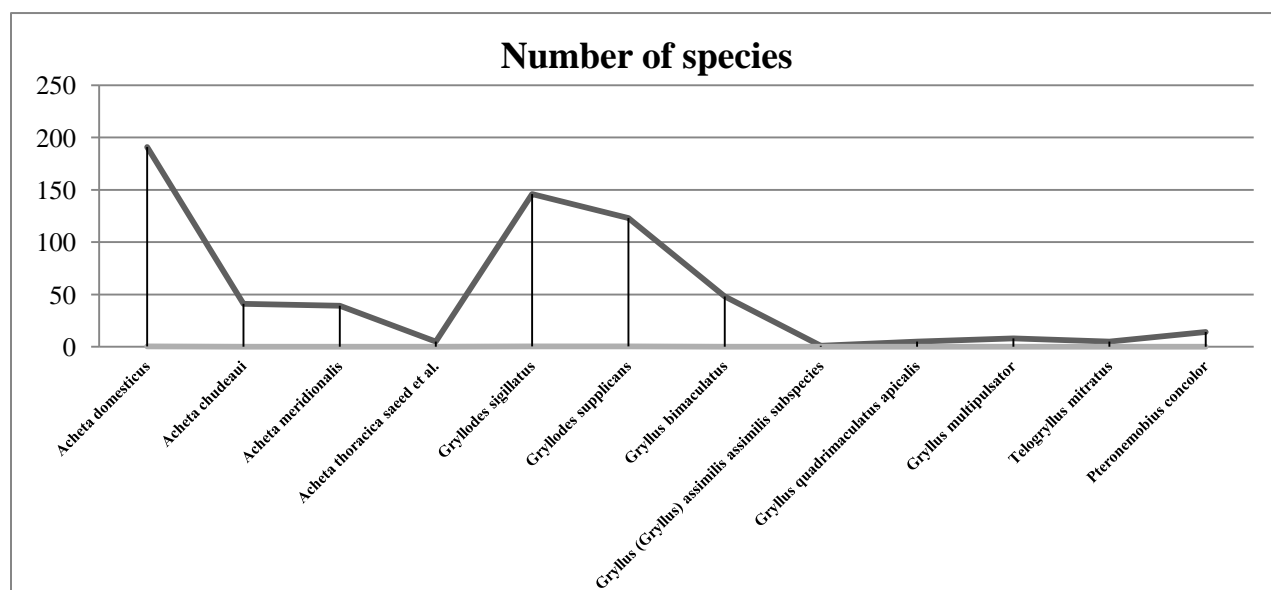
**Figure 1: Distribution of species in various localities of District Mirpurkhas.**

Table 2: Showing number of specimens collected from District Mirpurkhas.

Species	Male	Female	Total (n=626)	Percentage %
<i>Acheta domesticus</i>	83	108	191	30.51%
<i>Acheta chudeaui</i>	19	22	41	6.54%
<i>Acheta meridionalis</i>	12	27	39	6.23%
<i>Acheta thoracica saeed et al.</i>	03	02	05	0.79%
<i>Grylloides sigillatus</i>	48	98	146	23.32%
<i>Grylloides supplicans</i>	55	68	123	19.64%
<i>Gryllus bimaculatus</i>	15	33	48	7.66%
<i>Gryllus (Gryllus) assimilis assimilis subspecies</i>	01	----	01	0.15%
<i>Gryllus quadrimaculatus apicalis</i>	05	----	05	0.79%
<i>Gryllus multipulsator</i>	05	03	08	1.27%
<i>Telogyllus mitratus</i>	05	----	05	0.79%
<i>Pteronemobius concolor</i>	04	10	14	2.23%

Note: Total number of specimens were collected **626**.

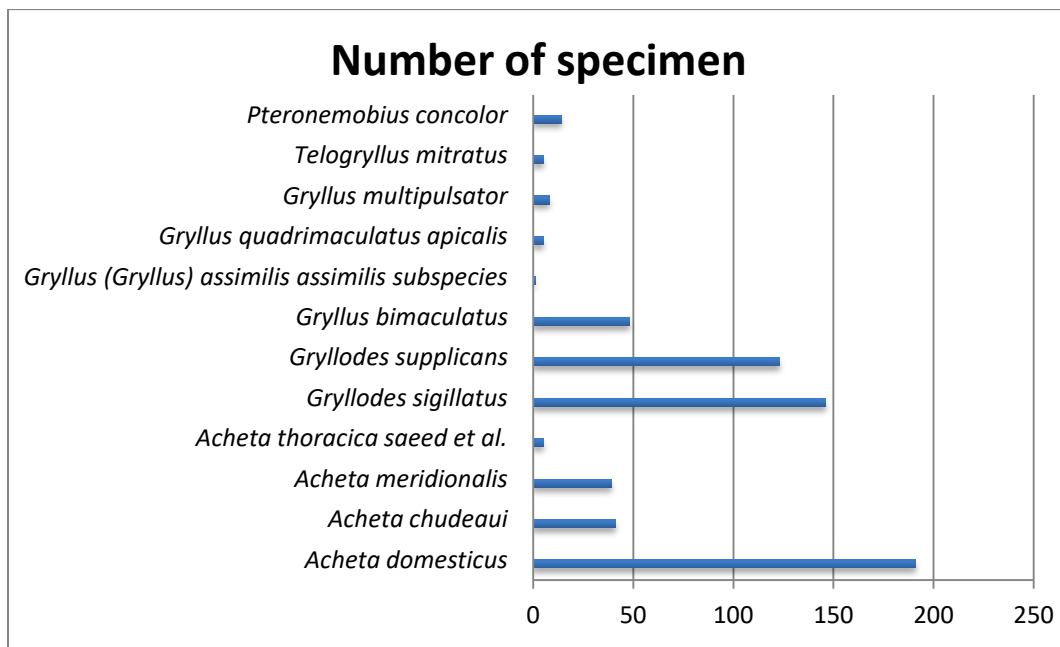


Figure 2: Showing number of specimens in various localities of District Mirpurkhas.

Table 3: Showing number and percentage of specimens collected from various localities of District Mirpurkhas.

S.No.	Localities	Number of specimens	Percentage
1	Digri	203	32.42%
2	Mirpurkhas	66	10.54%
3	Mirwah (Shujabad)	93	14.85%
4	Kot Ghulam Muhammad	70	11.18%
5	Sindhri	63	10.06%
6	Hussain Bux Mari	63	10.06%
7	Jhuddo	68	10.86%

Note: Total number of specimens were collected **626**.

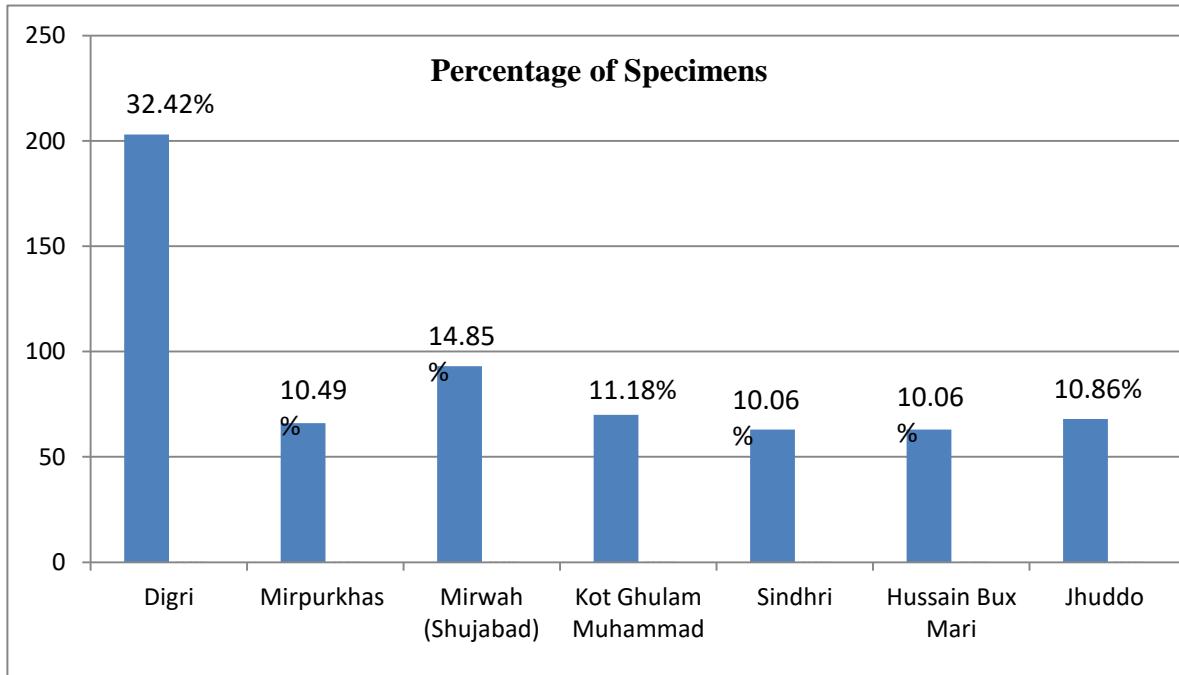


Figure 3: Showing percentage of specimens collected from various localities of District Mirpurkhas.