



ENSIFERA (ORTHOPTERA) FAUNA FROM BAHAWALPUR DIVISION

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MY & MJS collected the data and performed the experiment. AW, MS & MR designed the study and wrote the paper.

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ABSTRACT

A preliminary survey was conducted in the Cholistan University Campus. About 908 samples of Ensifera were collected and sorted out in to Tettigoniodea. Majority of samples were collected from Noshera i-e 195 followed by 187 from Basti Yar Muhammad and 153 from Mari Shakh sujra while least percentage was reported from Jageer Bhatti Dahri i-e 54. Identification is now up to family and generic level.

1. INTRODUCTION

Orthoptera includes two suborders, Caelifera (short-horned grasshoppers and locusts) and Ensifera (crickets, katydids, and weta). The Ensifera, sometimes collectively known as "long-horned grasshoppers" are typified by antennae longer than the body, while the Caelifera have antennae shorter than the body. Grasshoppers are the largest and most diverse group of insects. Grasshoppers have several advantages for such studies, relating to its great body size easy catch ability and high dominance so, that it became a main invertebrate group for biological indication in its wider sense. They are often the main invertebrate consumer in grasslands and are to be important food source for many groups of predators e.g., birds, lizards etc. The grasshopper insect fauna generally are grouped as short-horned grasshopper (Caelifera) and long-horned grasshopper (Ensifera).

"Ensifera" means "sword bearer" in Latin and refers to the typically elongated and blade-like ovipositor of the females, although several taxa have a reduced or absent ovipositor. There are more than 11,000 described species in Ensifera.

Members of Ensifera are sometimes collectively known as "long-horned grasshoppers" although this designation often is limited to members of the family Tettigoniidae (the katydids, also called bush crickets in some countries) and not the crickets or weta. More commonly, the designation grasshopper itself refers to members of the orthopteran suborder Caelifera, also known as "short-horned grasshoppers. As members of the insect order Orthoptera, ensiferans are characterized by chewing/biting mouthparts, incomplete metamorphosis (hemimetabolism), saltatorial hind limbs (modified for leaping), and two pairs of wings that are held overlapping the abdomen at rest.

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The forewings are narrower than the hindwings and hardened at the base, while the hindwings are membranous and folded fan-like under the forewings when at rest. Ensifera include fine and threadlike antennae with well over 30 segments (except the fossorial Cooloolidae); a sword-like, sickle-shaped, or needle-like six-valved ovipositor (when present); and elongate mandibles with a prominent incisor. While the ovipositor of ensiferans tends to be well-developed, female caeliferans usually lack a long, external ovipositor. Ensiferans inhabit terrestrial habitats, such as meadows, savannas, and tropical forests, although many are found in marshes and other wetland environments, including various conehead katydids on reef beds. Riffat, & Wagan [9], [10] & [11].

Members of both Caelifera and Ensifera are primarily herbivorous, but range from herbivorous, to omnivorous, to exclusively predaceous species. Some ensiferans feed exclusively on pollen and nectar of flowers (among them, *Zaprochilus spp.*) and some specialize on seeds of grasses (for example, *Neoconocephalus spp.* and *Ruspolia spp.*) or pine trees and other conifers (for example, *Barbitistes constrictus*). Behaviorally, members of Ensifera tend to be largely nocturnal, versus the more diurnal Caelifera, which tend to feed and mate in the daytime and molt and egg lay at night. Male ensiferans produce sounds to attract mates, as well as for defense of territory and to spread an alarm if seized by a predator. Females of some katydid species also can make short calls to signal a response to a male, although their means of sound production is different. Reproduction involves the transfer of a sperm sac, or spermatophore. Hopefully, this work will be first of its kind and will be great help to agencies dealing with pest control in Cholistan desert of Bahawalpur Pakistan. Many workers i-e Ahmed [1], [2], Bei Bienko [3], Bei Bienko, & Mishchenko [4], Bolívar [5], Eichwald [6], Khalid et al., [7], Kumar & Usmani [8] carried some taxonomic work but this selected area it was untouched therefore present attempt has been made.

2. MATERIALS AND METHODS

Collection of grasshoppers

The adults of Tettigoniodea were collected from the agriculture fields of rice, forests, fruit orchards, berry shrubs, semi desert & desert areas, trees, shrubs, herbs and grasses with the help of traditional insect

hand-net (8.89 cms in diameter and 50.8 cms in length) as well as by hand catching. The collection was made during the year 2021 in the months of March to June from various area of Bahawalpur desert (Map. I).

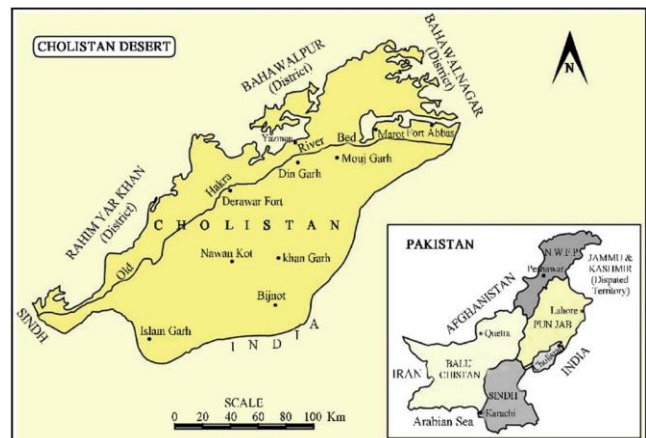


Figure 1. Map of Cholistan Desert

Killing and preservation of grasshoppers

The following method has been adapted from killing and preservation of grasshoppers. Collected material brought into the laboratory was killed by means of potassium cyanide in standard entomological killing bottles. The specimens were not left too long (½ hours) in cyanide because the color changed particularly that of green specimens all collected specimens were thoroughly examined under the stereoscopic dissecting binocular microscope and sorted out according to sub-families and species wise. Pinning of the specimens was made within few hours. As the specimens were flexible there was a little danger of losing any part through the necessary manipulation, further the parts could be stretched as desired. Mounting was done according to the following standard procedure. The insect pins were inserted on the pronotum posterior to transverse sulcus slightly to the right of median dorsal carina. The left wings were set with the long axis of the body nearly at right angle to the pin and the head was directed slightly downwards. The posterior legs were bent beneath the body to minimize the possibility of breaking and to occupy the least amount of storage space. The abdomen was so set that it dropped below the wings and not obscured by the hind legs as several taxonomic characters are found on the terminal end and these were not to be hidden till the

specimens were dried thoroughly. The body parts had to be supported with extra pins so that it can dry in the desired position and special attention was paid to the antennae, wings and legs in order to display important taxonomic characters. Dust and other extraneous matter were removed with the help of a dry camel hairbrush. The fully dried specimens were removed from stretching boards and were stored in standard entomological boxes with labels showing locality, date of collection and collector name. Napthalene balls were placed in boxes to prevent the attack of ants and other insect.

Identification of the specimens

Identification of specimen was carried out under the Stereoscopic Dissecting Binocular Microscope with the help of keys and description available in literature and on the “web site (<http://www.orthoptera.org>) Orthoptera Species File Online”.

3. RESULTS AND DISCUSSION

Table 1. March to May 2021 form Bahawalpur Division Family Tettigoniinae

S. No.	Locality	Specimens
01.	Noshera	195
02.	Janu Wala	102
03.	Mubarkpur	75
04.	Hatheji	45
05.	Basti Yar Muhammad	187
06.	Basti Chachran	153
07.	Mari Shakh sujra	97
08.	Jageer Bhatti Dahri	54
Total		908

It has been seen from Table 1 that significant numbers were reported from Noshera i-e 195 folowed by 187 from Basti Yar Muhammad and least numbers were captured from Mubarkpur i-e 75 followed by Hatheji i-e 45 these dissimilarities amongst the insect numbers just because of availability of host plants occur in that region. Earlier, Riffat & Wagan ^[9] also reported the species diversity difference in various region. Overall, it was noted that availability of host plant effect the diversity of any insect. If there is good environmental condition insect gave preference to that region.



Figure 2. Field Survey



Figure 3. Male



Figure 4. Female

4. CONFLICT OF INTEREST

The authors declares that there is no conflict of interests regarding the publication of this article.

5. ACKNOWLEDGMENT

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