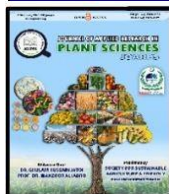


## Short Communication



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## First Photographic Record of the *Xenogryllus transversus* (Gryllidae: Orthoptera) from Pakistan

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### Abstract

Extensive surveys were conducted during this study to collect crickets from the subfamily Eneopterinae. The first photographic record of *Xenogryllus transversus* (Walker 1869) from Pakistan. For species confirmation, a description of the species is provided, as well as genitalia and a line drawing are given

**Keywords:** Photographic Record, genitalia, Eneopterinae, Orthoptera, species

### Introduction

The crickets of the subfamily Eneopterinae are diverse due to their communication signals and related structures (Saeed & Yousuf, 1990). Genus *Xenogryllus* was established by Bolivar (1980), included *Xenogryllus eneopteroides* an African species as type species, now genus is composed of 7 species or subspecies Worldwide (Cigaliano *et al.*, 2018). Chopard (1968) placed *Gryllus (phalangosis) marmoratus* to the genus as *Xenogryllus marmoratus* (Haan 1942), *Platydictylus transversus* as *Xenogryllus transversus* (Walker 1869) *Dionymus camichalias* as *X. camichaeli* (Chopard 1928) *Heterotrypus unipartitus* placed as subspecies of *X. marmoratus unipartitus* (Karny 1915), two species *X. ululiu* and *X. machaensis* recorded by Gorochov (1990, 1992) from Vietnam and included in this Genus. All species are distributed in Asia (China, Malaysia, Bengal, Vietnam) except *Xenogryllus eneopteroides* reported from Africa. The *Xenogryllus* crickets raised as pets by Chinese people due to their sweet singing sound and common distribution. *Xenogryllus* crickets are large sized, possess large legs, sing at night and found in shrubs and grasses (Jing *et al.*, 2018). In current study *Xenogryllus transversus* is described from Swat, Pakistan. Specimen of the species were captured from late dawn to midnight in dense dry grasses and *Oryza sativa* fields, producing loud sweet musical calling sounds. Except for Saeed & Yousuf (1990), no updated records of this species have been found in Pakistan. The current study is the first of its kind to provide photographic evidence and a detailed morphological description of this species from Pakistan. Hopefully, this research will add to our understanding of this Pakistani species.

### Materials and Methods

Specimens were collected mostly at night, dry-preserved. The insect pins were placed on the pronotum, just to the right of the median dorsal carina, and behind the transverse sulcus. Its left wings were positioned so that the body's long axis formed nearly a right angle with the pin, and its head was angled slightly downward. The back legs were tucked in tight under the body to decrease the chances of them breaking during transport and to make better use of available space. Several taxonomic features are located at the very tip, and these were not to be concealed by the rear legs until the specimens had dried completely. This is why the abdomen was positioned such that it dipped below the wings. Careful attention was devoted to the antennae, wings, and legs so that distinctive taxonomic features would be clearly visible once the specimen had dried. Cleaning dust and debris from the camel was done with a dry camel hair brush. After the specimens had dried completely, they were taken off the stretching boards and placed in standardized entomological boxes marked with the locality, date, and name of the collector. To keep insects like ants at away, naphthalene balls were placed inside of boxes (Panhwar, 2018; Panhwar & Ali 2018). Identification is mainly based on male. Kevan *et al.*, (1969) approach was modified for use in studying male genitalia. Instead of soaking the abdomen in hot water, as is commonly done, the insect was allowed to chill out over a small dessicator to which a few drops of 70% alcohol had been added to inhibit fungal growth. The length of time needed to relax varied from around 24 hours to several days, depending on the insect's size, age, and general state of preservation. In order to extract unsclerotized and non-chitinous tissues from the specimen, the supra-anal plate was lifted with a

needle cut laterally and the entire phallic complex was removed once the patient was relaxed. They were then rinsed extensively in running water before being studied in glycerol on a cavity slide (without a cover glass) in a stereoscope dissecting binocular microscope. There were two main reasons why glycerol was selected as the mounting agent instead of 70 percent ethyl alcohol. This medium served two purposes: first, it sufficiently cleaned the structures, and second, it did not evaporate noticeably when the slide was under a powerful microscope lamp or after the specimens were moved to microvials for storage. The rubber-capped microvials were affixed to the underside of the insects from which the phallic structure had been removed. Small strips of absorbent cotton fibre were used to prop up the specimens so they could stay in the right orientation. The line drawing of genitalia were made on Ocular graph fixed with microscope. The characters were noted down and were compared with data base available on ([www.orthoptera.speciesfile.org/](http://www.orthoptera.speciesfile.org/) ) Images were captured using Canon EOS 77D Digital SLR with EF-S 60mm f/2.8 USM macro photo lens. Measurement were carried out by Vernier caliper of dried pinned specimens. All measurements are in millimeter (mm). **Statistical analysis:** The data were collected from a single region and therefore presented as means and standard deviations (Mean± SD). The least significant difference (LSD) test was used in the context of the analysis of variance.

## Results and Discussion

### Systematic account

Order Orthoptera Olivier, 1789

**Table 1:** Morphometry of various body parts of *Xenogryllus transversus*

Body parameter	Male			Female		
	Mean± SD	LSD	Range	Mean± SD	LSD	Range
Body length	26.67±0.84	A	25.7-28.3	26±1.18	A	25-27.8
Head length	3.75±0.45	B	3.0-4.1	3.12±0.18	B	3.0-3.4
Head width	4.0±0.13	C	3.9-4.2	3.7±0.21	C	3.4-3.9
Pronotum length	3.36±0.27	D	3.1-3.9	3.2±0.14	D	3.1-3.4
Pronotum width	5.5±0.31	E	5.1-5.9	5.5±0.18	F	5.4-5.8
Tegmen length	21.33±0.9	F	19.8-22.1	21.7±0.77	G	21.05-22.7
Femur length	18.83±0.46	G	18-19.5	18.4±0.35	H	18.1-18.9
Femur width	3.26±0.14	H	3.0-3.4	3.1±0.06	I	3.05-3.2
Tibia length	19.33±0.90	I	18.7-20.3	19.2±0.33	J	19-19.7
Ovipositor length				25.7±0.81	K	25-26.5

Note: \*The Alphabets shows a significant difference (P<0.05) according to LSD test

Family Gryllidae Laicharting, 1781

Sub family Eneoptrinae Saussure, 1874

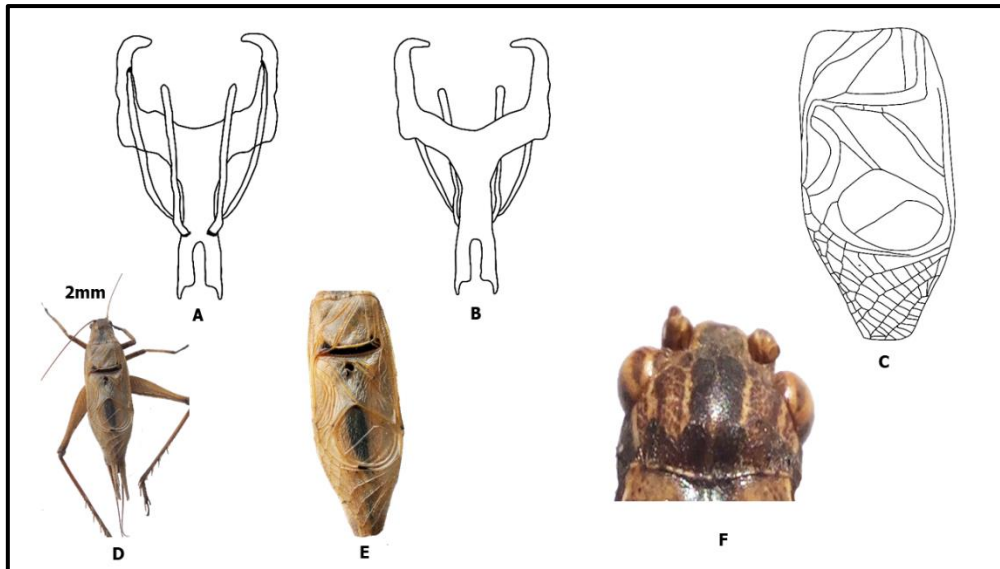
Tribe Xenogryllini Robillard 2004

***Xenogryllus transversus* (Walkar, 1869)**

(<http://orthoptera.speciesfile.org/Common/basic/Taxa.aspx?TaxonNameID=1127836>)

**Specimens Examined.** 9♂1♀ District Swat; (Mingora) 30. VIII.2018–5. IX. 2018 leg. Sami Ullah & Adnan Ali; 3♂5♀ Charbagh, 4.VI.2019 leg. Sami Ullah & Shoaib; 1♂3♀ Barikot, 17.VIII.2019 leg. Sami Ullah

**Description:** The body size is large (27.5mm), and the color is golden brown. The head is tapered, pointed toward the lower side, and adorned with a dark longitudinal band that extends from the occiput to the frontal rostrum; the latter is wider than the first antennal segment; the vertex fastigium is conspicuous, with prominent eyes that project laterally; and very long antennae. Pronotum brown, narrowing toward the front, with a blackish longitudinal marking on the midline, lateral lobes with round anterior margins. Tegmina mostly transparent, extending to the abdominal extremity; two long parallel oblique veins; mirror roundish, broader than its length, divided by curved vein about in the middle; black spot, one each at the inferior and posterior angles of the mirror, and one in the second chord concavity. Apical field with four distinct veins, rectangular and square cells. Legs pubescent; hind legs larger than the front and middle legs, anterior tibiae with oval external tympanum, posterior femora slender, particularly distally, posterior tibiae with 4 to 5 spines on each margin, profuse serrated among spine, long cerci, covered with minute hair (Table 1 & Figure 1).



**Figure. 1** (A-E) Shows the Genitalia and Habitus images of the *Xenogryllus transversus*

**Life History:** Lives in dense bushes and shrubs, where the male produces a very loud call that can be heard clearly up to 30- 40 m away. Males were seen calling from bushes and cannabis plantations in various locations. Few were also observed near bushes in rice plantations. Calling activity begins around 20:00 hrs. Their mature species is discovered after August.

**Remarks:** This species recorded for the first time from Swat, Pakistan. Previously, Saeed & Yousuf (1990) worked on a new record of the Eneopteridae family from Pakistan, but they were unable to provide photographic documentation or genitalia of this species. The presence of this species in Pakistan has been confirmed by this study.

### Conclusion

The present concludes the finding of *Xenogryllus transversus* (Walker, 1869) and establishes the first photographic record from Pakistan.

### Acknowledgments

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### Conflict of interest

The authors declare no conflict of interest for this study.

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