Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2017; 5(4): 186-188

Received: 23-05-2017
Accepted: 24-06-2017

Halimullah
Department of Zoology,
Hazara University Mansehra
Pakistan

Waheed Ali Panhwar
Department of Zoology,
Hazara University Mansehra
Pakistan

Riffat Sultana
Department of Zoology,
University of Sindh Jamshoro
Pakistan

Sardar Azhar Mehmood
Department of Zoology,
Hazara University Mansehra
Pakistan

Muhammad Saeed Wagan
Department of Zoology,
University of Sindh Jamshoro
Pakistan

Shabir Ahmed
Department of Zoology,
Hazara University Mansehra
Pakistan

Shoaib Ali
Department of Zoology,
Hazara University Mansehra
Pakistan

Mohammad Javid Khan
Department of Zoology,
University of Malakand KP
Pakistan

Correspondence
Halimullah
Department of Zoology,
Hazara University Mansehra
Pakistan

Gryllotalpa africana Palisot de Beauvois, 1805 (Orthoptera: Gryllotalpidae: Gryllotalpinae)

Halimullah, Waheed Ali Panhwar, Riffat Sultana, Sardar Azhar Mehmood, Muhammad Saeed Wagan, Shabir Ahmed, Shoaib Ali and Mohammad Javid Khan

Abstract
The present comparative study was conducted to determine the morphology of *G. africana* from this region from different localities of Bajour Agency during the year 2016-2017 from moist ground, preferably near water basis. *G. africana* is described from Pakistan. Additionally, morphological characters along with photograph and line drawing are documented. In addition to this, distributional data and habitat description is given. Hopefully, present study will contribute a brick to knowledge of *Gryllotalpa* species from this region.

Keywords: Pest, *Gryllotalpa Africana,* morphology, Pakistan

1. Introduction
The genus *Gryllotalpa* is recognized as an exclusively Old World genus [1], scattered all over temperate and tropical regions of Africa, Europe, Australia and Asia [2]. The genus *Gryllotalpa* was documented by Latreille in 1802 with type species *Gryllus gryllotalpa* and is considered by having the fore-tibiae with four dactyls [3, 4]. These creatures adapted to live underground, with compact ovipositor, fore-legs modified for digging and hind legs fully losing their jumping capability during the ontogenesis [5]. Nearly one hundred species have been known including a single extinct species [6]. Of which 26 species of *Gryllotalpa* are known from Oriental region. 05 species i.e: *Gryllotalpa orientalis, G. hirsuta, G. minuta*, *G. ornata* and *G. africana* have been reported from Indian subcontinent [7]. Numerous studies have been carried out on *Gryllotalpa* by [8-16]. Recently, *G. orientalis* Burmeister, 1838 have been documented from Pakistan [17].
The present paper presents preliminary results of a comparative study initiated to determine the morphology of *G. africana* from this region.

2. Materials and Methods
During field studies, adult *Gryllotalpa* were collected from different localities of Bajour Agency during the year 2016-2017 from moist ground, preferably near water basis. The easiest and effective way was the collection of specimens through mercury vapor light lamps. The collected specimens were killed and preserved in insect's cabinets. The morphological characteristics of specimens were noted under stereo microscope and photograph were capture with Nikon camera. Line drawings were made with Adobe Illustrator CS5 version. Identification was done by available literature. Examined specimens in this study are deposited in Insect Museum Department of Zoology, Hazara University Mansehra Pakistan.

3. Results
3.1 Taxonomy
Family Gryllotalpidae Leach, 1815
Subfamily Gryllotalpinae Leach, 1815
Tribe Gryllotalpini Leach, 1815

3.2 Genus *Gryllotalpa* Latreille, 1802
urn:lsid:Orthoptera.speciesfile.org:TaxonName:25037
Type species: *Gryllus gryllotalpa* Linnaeus

Genus Diagnosis

Generally large. Head spherical, with prognathous mouth parts. Antennae short, multi-segmented. Pronotum highly expanded. Four dactyls present at fore-tibiae. Tympanum shielded, initial in arrangement of slits. Spurs of base of fore-leg rising from the femur.

3.3 *Gryllotalpa africana* Palisot de Beauvois, 1805
urn:lsid:Orthoptera.speciesfile.org:TaxonName:464314
3.3.1 Synonym.
Gryllotalpa confusa Chopard, 1939
Gryllotalpa formosana Chopard, 1931
Gryllotalpa fossor Scudder, 1869
Gryllotalpa oryctes Scudder, 1869

3.3.2 Material examined. FATA. Bajour Agency: Village Sharif Khana, Sadiqabad Pattk, Shago Khar, Nawgai. 5.ix.2016 15♂10♀ leg. Halimullah & Waheed.A.P same but 19.iii.2017 18♂23♀ leg. Halimullah & Waheed A.P.

3.3.3 Description of species.
Body medium to large (23-35♂ and ♀ 22-33mm) cylindrical in shape with yellowish-brown coloration. Veins of tegmina fulvous. Ocelli large little bit globose; separately distant from the next to eye. The anterior portion of the lower edge of the fore femora with a hardly noticeable excision. Fore-trochanter cultrate, the upper edge straight until close to the tip, where it was very slightly upturned the lower edge strongly convex and regularly furnished with frequent long and slender spines along the whole edge. Tibial dactyls curved centrifugally, the upper was fixed and the movable once was down. The movable was long somewhat slender; the fixed ones almost triangular at base, produced at margins. 1st lateral dactyl of tibiae large, 2nd lancet shaped, from one third to half the length of the 1st. Acicular claws short equal to the length, breadth of the 2nd lateral dactyl. Hind edge of the terminal half of the hind tibiae with four large spines, internal edge of apex with more length, external edge of apex with four short spines. Claws of hind tarsi approximately two third the length of the terminal tarsal joint, the inner somewhat elongated. Tegmina covering more than half of tip of the abdomen, and slight beyond the tip of the hind femora. Wings reaching to the tip of the anal cerci. Ninth abdominal part equipped above with longitudinal lateral rows of minute hairs, extended nearly to join from opposite margins. Cerci greater in length of pronotum.

3.3.4 Measurement (in mm). Total Body length: ♂23.5-35, ♀ 22-33, Pronotum length: ♂, ♀7-9, Tegmen length: ♂ 9.5-12, ♀ 9-11, Femur, ♂8.5-10, ♀ 7.5-10.

3.3.5 Habitat. *Gryllotalpa africana* omnivorous found underground, constructing burrows and feeding on plant roots, larvae and other insects, prefers moist, loose soil, so harm frequently happens in crop fields nearby moist places.

3.3.6 Distribution. This species is widely distributed in Pakistan, India, Libya, Algeria, Portugal, China and Africa.

3.3.7 Comparative note. Data base collection showed that male neotype of this species was deposited in Museum of Academy of Natural Sciences of Drexel University, Philadelphia. The *G. africana* is widely distributed species in Africa as well as in oriental region [23]. [1] while revising the genus synonymize *G. fosser* as *G. africana*.

4. Discussion

The present comparative study was carried out from Bajour Agency during the year 2016-2017. The specimens were captured from moist ground, preferably near water basis places. The material was sorted out into family Gryllotalpidae Leach, 1815, genus
Gryllotalpa Latreille, 1802 with single species i-e: *Gryllotalpa africana* Palisot de Beauvois, 1805. In addition to this, distribution, morphological characters, synonymy along with photograph and line drawings are documented.
Approximately 100 species have been recognized together with a single nonexistent species [6]. About twenty-six species of *Gryllotalpa* are recognized from Oriental region. Five species i.e: *Gryllotalpa orientalis, G. hirsuta, G. minuta*, *G. ornata* and *G. africana* have been described from Indian sub-continent [7]. *G. africana*, as a minor pest, cause significant injury to rice crop in West Bengal and India [18]. The nymphs and adults of *G. africana* cause harm to rice in the Andaman and Nicobar Islands, India [19]. In Mauritius, *G. africana* causes confined harm but is considered capable of reaching prevalent extents [20]. In Korea, few ginseng fields were uninhibited due to substantial damage caused by *G. africana* instantly after uprooting seedlings. In the island territories of Papua New Guinea, *G. africana* is a minor pest of rice [21]. The mole crickets destroy up to 30% of tobacco seedlings in nurseries in Moldavia [22]. Tan and *Gryllotalpa* from Malaysia resulted in finding of *Gryllotalpa permai* as new species to Science. Further, they studied and analysed morphological and sound production in *Gryllotalpa permai*. In addition to this, they have provided detail description of *Gryllotalpa fulvipes* [24]. The phylogeny of mole crickets. He reported 26 in-group taxa, representative of already described genera of Gryllotalpidae in a phylogenetic analysis, depend on eighty-nine, morphological features. The diverse studies of the subsequent data matrix sustained the monophyly of Scapteriscinae and Gryllotalpinae and its internal group. Subfamilies, tribes and genera of Gryllotalpidae are fully identified, demonstrated and taxonomic keys for identification was given. 04 tribes were recognized (Indioscaptorini n. trib. (Scapteriscinae), Triamescaptorini n. trib., Gryllotalpellini n. trib. and Neocurtillini n. trib. (Gryllotalpinae)) and 2 other were completely restricted (Scapteriscini stat. rev. and Gryllotalpini stat. rev.). 2 new genera were pronounced (*Neoscap-teriscus* n. gen. and *Leptocurtilla* n. gen.) and in addition to this 07-new species: *Gryllotalpella rehni* n. sp., *G. tindalei* n. sp., *G. lawrencei* n. sp., *Neocurtilla ingrischi* n. sp., *N. townsendi* n. sp., *Leptocurtilla juanmanueli* n. sp. and *L. chopardi* n. sp were described. Moreover, he made changes in classification like previously described species placed in *Scapteriscus* was transmitted to the new genus N*eoscapteriscus*, apart from *Scapteriscus oxydactilus* and *S. headsi* that were kept in *Scapteriscus, Gryl-lotalpa chilensis reinst*. stat. and *Leptocurtilla maranona*, n. comb. Additionally, he gave previous information about the phylogenetic analysis of mole crickets in his studies [25]. Confidently, present study will contribute a brick to knowledge in the Biodiversity of *Gryllotalpa* fauna of this region.

5. Conclusion

From the recent study, it is concluded that *Gryllotalpa* species are severe pests of agriculture crop particularly rice. Additionally, these species having variation from morphological point of view. Distributional data provided in this study will generate a guide line for future researchers.

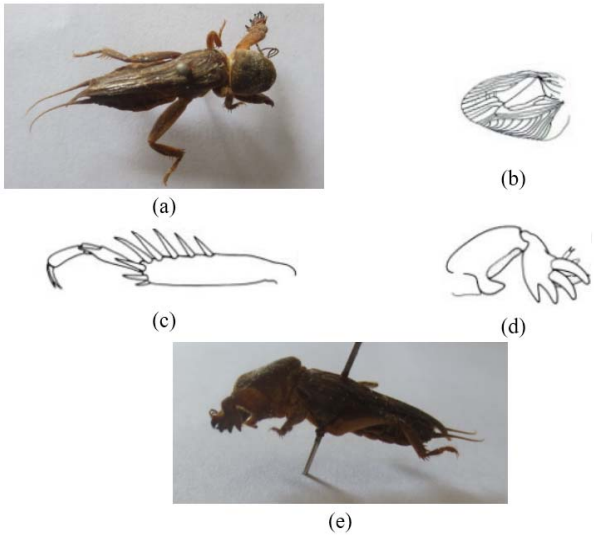

Fig 1: *Gryllotalpa africana* Palisot de Beauvois, 1805 (a) Habitus Dorsal View, (b) Tegmina, (c) Femur, (d) Fore-Leg, (e) Habitus Lateral View.

6. Acknowledgement
The authors are highly thankful to their research team. The first author is highly thankful to his elder brother Muhammad Ibrahim in financial help in his studies.

7. References

1. Townsend BC. A revision of the Afrotropical mole-crickets (Orthoptera: Gryllotalpidae). Bulletin of the British Museum (Natural History), Entomology Series. 1983; 46(2):175-203.
2. Otte D, Alexander RD. The Australian crickets (Orthoptera: Gryllidae). The Academy of Natural Sciences of Philadelphia, PA, 1983.
3. Chopard L. Family Gryllidae: Subfamilies Mogoplistinae, Myrecophilinae, Scleropterinae, Cachoplistinae, Pteroplistinae, Pentacentrinae, Phalangopsinae, Trigonidiinae, Eneopterinae; Family Oecanthidae, Gryllotalpidae. In: Beier, M. (Ed.), Orthopterorum Catalogus. Uitgeverij Dr. W. Junk N.V.'s, Gravenhage. 1968; 12:215-500.
4. Ma L, Zhang Y. Redescriptions of two incompletely described species of mole cricket genus Gryllotalpa (Grylloidea; Gryllotalpidae; Gryllotalpinae) from China with description of two new species and a key to the known Chinese species. Zootaxa. 2011; 2733:41-48.
5. Gorochov AV. System and evolution of the suborder Ensifera (Orthoptera) II. Proceedings of the Zoological Institute, Russian Academy of Sciences 1995; 260:1-212. [In Russian]
6. Cigliano MM, Braun H, Eades DC, Otte D. Orthoptera Species File Online. Visited 15 September, 2016. Available from: http://Orthoptera.SpeciesFile.org (accessed 21 February 2017)
7. Chandra K, Gupta SK, Shishodia MS. A Checklist of Orthoptera (Insecta) of India.E-Publication, Zoological Survey of India, 2011, 42.
8. Chopard, LGryllides de Subma, Flores et Timor Verhandlungen der Naturforschenden Gesellshaft in Basel. 1954; 65(1):31-45.
9. Rongcai Y. Study on the Occurrence of the *Gryllotalpa Orientalis* in Jilin and Its Prevention and Control. Journal of Jilin Agricultural Sciences, 1993; 2:012.
10. Brandenburg RL, Xia Y, Schoeman AS. Tunnel architectures of three species of mole crickets (Orthoptera: Gryllotalpidae). Florida Entomologist. 2002; 85(2):383-385.
11. Kim I, Cha SY, Yoon MH, Hwang JS, Lee SM, Sohn HD, Jin BR. The complete nucleotide sequence and gene organization of the mitochondrial genome of the oriental mole cricket, Gryllotalpa orientalis (Orthoptera: Gryllotalpidae). *Gene*, 2005; 353(2):155-168.
12. Ingrisch S, Nikouei P, Hatami B. A new species of mole crickets Gryllotalpa Linnaeus, 1758 from Iran (Orthoptera: Gryllotalpidae). Entomologische Zeitschrift. 2006; 116(5):195-202.
13. Endo C. Seasonal wing dimorphism and life cycle of the mole cricket Gryllotalpa orientalis (Orthoptera: Gryllotalpidae). European Journal of Entomology. 2006; 103(4):743-750.
14. Endo C. The underground life of the oriental mole cricket: an analysis of burrow morphology. Journal of Zoology. 2007; 273(4):414-420.
15. Jin GHT. Body Surface Morphology and Wettability of the Oriental Mole Cricket (Gryllotalpa orientalis Burmeister) [J]. Transactions of the Chinese Society for Agricultural Machinery. 2008; 11:040.
16. Park YK, Lee YB. Studies on the Artificial Rearing of Mole Cricket, Gryllotalpa orientalis (Orthoptera: Gryllotalpidae). International Journal of Industrial Entomology. 2012; 25(2):175-179.
17. Ullah H, Panhwar WA, Mehmood SA, Xu S, Ikram Ilahi I, Ahmed S. Study on The Oriental Mole Cricket, *Gryllotalpa orientalis* (Orthoptera: Gryllotalpidae: Gryllotalpinae). International Journal of Advanced Research. 2017; 5(4):592-595
18. Chatterjee PB. Two harmful insects of rice in North Bengal. Indian Farming. 1973; 22(12):35.
19. Shah NK. New record of the mole cricket, Gryllotalpa africana Beauv. (Insecta) from Andamans. Journal of the Andaman Science Association. 1990; 6(1).
20. Ramlogun HG. The pests and diseases of Tea in Mauritius. Revue Agricole et Sucrière de l'Ile Maurice. 1971; 50(1):48-67.
21. Hale PR, Hale JT. Insect pests of rice in the New Guinea Islands. Rice Entomology Newsletter. 1975(3).
22. Tkach MT. Tobacco protection. Zashchita Rastenii. 1979; (8):34-6.
23. Chopard L. On Grylliae from the Malay peninsula. Bulletin of the Raffles Museum, 1931; 6:124-149.
24. Tan MK, Kamaruddin KN. A new species of Gryllotalpa mole cricket (Orthoptera: Gryllotalpidae: Gryllotalpinae) from Peninsular Malaysia. Zootaxa. 2016; 4066(5):552-60.
25. Cadena-Castaneda OJ. The phylogeny of mole crickets (Orthoptera: Gryllotalpoidea: Gryllotalpidae). Zootaxa. 2015; 3985(4):451-90.