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On finding of two unearthed species of Tettigoniidae (Orthoptera: Tettigonioidea) from Pakistan

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Abstract

The family Tettigoniidae (Orthoptera, Ensifera, Tettigonioidea) of Pakistan has been studied. Two new species are described: *Calopterus mansehraensis* sp. nov and *Gampsocleis akbari* sp. nov pertaining two tribes i-e: Drymadusini and Gampsocleidini. In addition to this, line drawing and photograph has been documented.

Keywords: Genera, tribes, taxonomy, new species, Pakistan

1. Introduction

Pakistan is the land of diversified relief. It has different ecological zones from Alpine and sub-Alpine, sub-tropical desert, saline and down to occasions ^[1]. The country as a whole is rich for long-horned grasshopper Tettigonioidea. The grasshopper insect fauna generally are grouped as short-horned grasshopper (Caelifera) and long-horned grasshopper (Ensifera) ^[1]. The geographical conditions of Pakistan are of great importance with its intermingling of oriental, Palaearctic and Afro-tropical elements and present an ideal situation for the study of Tettigonioidea fauna ^[1]. Unfortunately, information available about the species of Tettigonioidea and their distribution are quite inadequate. Study on the taxonomy of Tettigonioidae (Ensifera) of Pakistan is difficult due to the lack of modern taxonomic literature and correct diagnosis. Even for large insects as Katydids (Tettigonioidae) our knowledge about their taxonomic work is poor. The intension of present study is to contribute a brick to the knowledge of taxonomic status of Tettigonioidae in Pakistan ^[1]. Tettigoniids are previously poorly known due to their strictly nocturnal habitat while during daytime they hide in refuges as hollow plants, rolled leaves and in cracks. Thus they are not easily collected, in fact they can be found incidentally during daytime ^[1].

Tettigoniidae is commonly known as katydids. This family represented by 6500 species within 19 existing sub-families and further break into 74 tribes alongwith 1193 genera occurring all over the world ^[2]. Considerable taxonomic work has been done on Caelifera and Ensifera of Pakistan by various authors ^[3-20]. But, no attention has been paid to long-horned grasshoppers (Ensifera) particularly of genus *Gampsocleis* and *Calopterus* of Pakistan. At the present *Gampsocleis akbari* sp. nov is added to the genus *Gampsocleis* and *Calopterus mansehraensis* sp. nov. to the genus *Calopterus* is described from Pakistan. The present investigation provides addition of two new species to the Tettigonioidea fauna from this region.

2. Material and methods

The material studied was mainly collected for or by the first author and his research team from different areas of contrasting habitat of Pakistan (Map-1). The material was examined and snapshot were taken by Canon IXY430F digital camera. Measurements of all body parts were made using vernier caliper and ocular graph filled in microscope. Line drawings were made under ocular graph fitted in Steroscopic Binocular Microscope. The material was identified by adopting methods ^[2]. This work forms part of the Ph.D. studies of the first author and was conducted during the year 2011-2014. The material is deposited in Sindh Entomological Museum (SEM), Department of Zoology, and University of Sindh Jamshoro.

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3. Result and Discussion

3.1 Tribe Drymadusini

3.2 Genus *Calopterus* Uvarov, 1943

Calopterus Uvarov. 1942[1941]. Trans. Amer. Entomol. Soc. 67:305

Calopterus Sergeev & Pokivajlov. 1992. Zoologicheskii Zhurnal 71(3):138

Calopterus Otte, D. 1997. Orthoptera Species File 7:298

3.3 *Calopterus mansehraensis* sp. nov.

(Plate.1 a-e)

3.3.1 Diagnosis. This new species is closely related to *Calopterus balucha* but differs in coloration and body size and in having a unique brownish coloration (Plate.1 a,c). It is also 1mm larger in size than *balucha*. The last tergite of male without a pair of acute lobes, circus broad, truncate without short thick curved tooth at inner apical angle (Plate.1 e).

3.3.2 Description of holotype. Body long 2.6mm as that of the pronotal length, with brown coloration. Fastigium of vertex straight, rough, curved and somewhat wide than the first antennal segment, frontal ridge constricted between the antennae (Plate.1 b). Tegmina short extending up to the 6th abdominal segment brown; pronotum brownish wide from anterior portion (Plate.1 c), lateral lobes upper half with brown band, which becomes fine at its posterior, lower half paler. Lateral lobes with brown just lower the eye. The last tergite of male without a pair of acute lobes, circus broad, truncate without short thick curved tooth at inner apical angle.

3.3.3 Length measurements. 1♂ pronotum, 10mm; tegmina 5mm, femur, 25mm; tibia, 24 mm; total body length, 26mm.

3.3.4 Material examined: Khyber Pakhtunkhwa. Mansehra near (Wapda House) 16.x.2012 1♂ (Wagan, Waheed A.P & Riffat S)

3.3.5 Depository. The type material has been deposited in the Sindh Entomological Museum (SEM), Department of Zoology University of Sindh, Jamshoro.

3.3.6 Derivato nominis: This species seems to be collected only in the hilly and mountainous regions of the Mansehra district of Khyber Pakhtunkhwa. The name of the new species refers to the latter.

3.3.7 Remark. Uvarov^[21] erected a new genus i.e. *Calopterus* and designated *Paradrymadusa werneri* as a type species for this genus. This new species is closely related to *Calopterus balucha* but differs in body size and in having a distinctive brownish coloration. It is also 1mm larger in size than *C.balucha*. The presences of exposed tegmina give authentic variation among these species.

3.3.8 Ecological account. *Calopterus manseheriansis* has been collected from the Mansehra district from *Malus domestica* and apparently has been found in the agricultural field habitats that were surrounded by different vegetation, lush and long grasses.

3.4 Tribe Gampsocleidini

3.5 Genus *Gampsocleis* Fieber, 1852

Gampsocleis Fieber. 1852. Orthoptera.speciesfile.org: Taxon Name:1502

Gampsocleis Fieber. 1853. Lotos 3:147

Gampsocleis Fischer. 1853. Orthoptera Europaea 254

Gampsocleis Herman. 1874. Verh. der Zoologisch-Botanischen Gesellsch. Wien 24:197, 201

Gampsocleis Bolívar, I. 1877. An. Soc. Espan. Hist. Nat. 6:340

3.6 *Gampsocleis akbari* sp.nov.

(Plate.2 a-e)

3.6.1 Diagnosis. This species is very closely related to *Gampsocleis sinensis* (Walker) but 5 mm larger. In this new species the pronotum is provided with median band, tegmina with brown spots and ovipositor are slightly more slanting (Plate.2 e). In *G. sinensis* the pronotum is without median band (Plate.2 a,b). Tegmina without spot and ovipositor are slightly slanting.

3.6.2 Description of holotype. Head broadly rounded, fastigium of vertex produced up to antennal base, prosternum with two long slender spines between fore legs. Pronotum with anterior margin slightly sinuate posteriorly broadly rounded just above the posterior sulcus there is V-shaped marking, in the median (Plate.2 c,d), there is dark black colored band and the same incomplete band present at lateral carinae. Tegmina & Wings well developed wings equal or slightly longer than tegmina. Fastigium of vertex with brown patches bands, face with dark patches; sternum whitish.

3.6.3 Coloration. Brown pronotum with dark brown band to black band in the middle and two short lateral bands at the slits of lateral carinae. Tegmina brown with dark patches hind femur brown.

3.6.4 Length measurements. 1♀: pronotum, 6.3 mm; tegmina, 56 mm; femur, 22.4 mm; tibia, 23.8; ovipositor, 22mm; total body length, 21mm.

3.6.5 Material examined. Balochistan: Quetta. Dali 1 female holotype 7.v.2012 (Riffat S. & Wagan, M.S.)

3.6.6 Depository. The type material has been deposited in the Sindh Entomological Museum (SEM), Department of Zoology University of Sindh, Jamshoro.

3.6.7 Derivato nominis. This species has been named in the honour of Prof. Dr. S.S. Akbar the Ex-Chairman Department of Zoology, University of Sindh, Jamshoro for his countless contribution in the field of Taxonomy.

3.6.8 Remarks. This species is very closely related to *Gampsocleis sinensis* (Walker) but 5 mm larger. In this new species the pronotum is provided with median band, tegmina with brown spots and ovipositor is slightly more slanting.

3.6.9 Ecological account. Quetta (30°12'0"N, 67° 0'0" E) is famous as the fruit garden of Pakistan because of fruit orchards and variety of dry fruit production. It is surrounded by the pastures and mountains with variety of plantations. At present, the specimen was collected from a rice field.

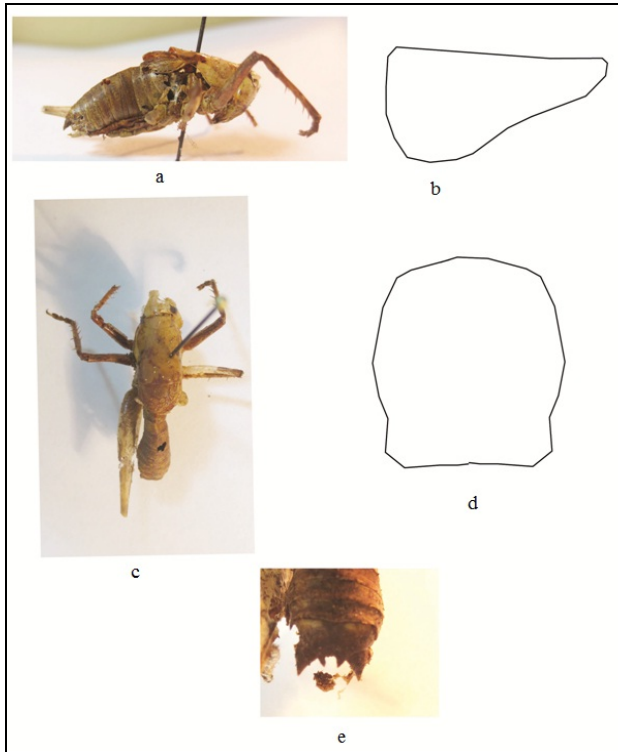


Plate 1: *Calotropusa mansehraensis* sp.nov.a-e male: a, Adult LV, c, same but DV, b Pronotum LV d, same but DV, e Subgenital plate. (Bar line = 4mm)

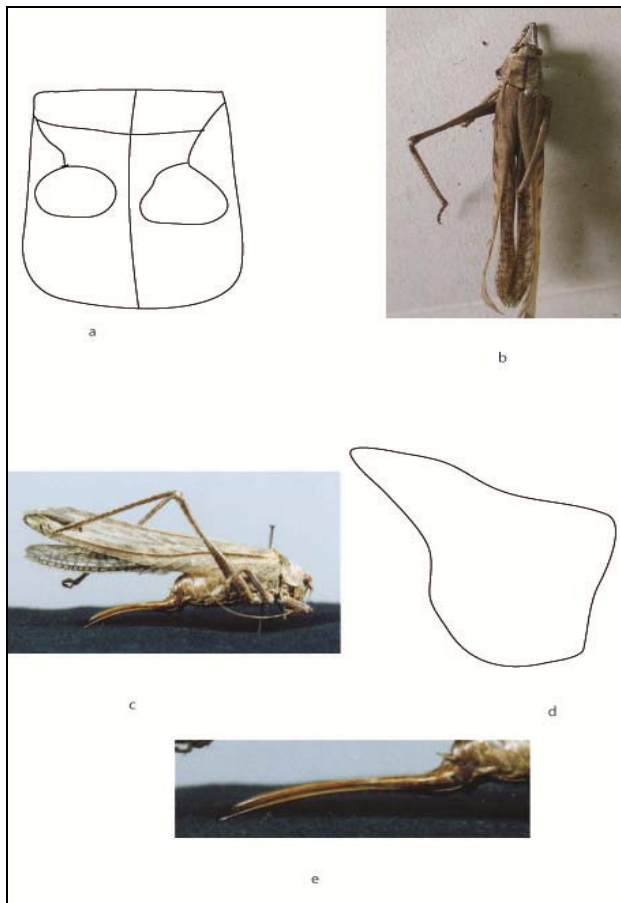


Plate 2: *Gampsocleis akbari* sp.nov a-e Female: a Pronotum DV, b, adult DV, c, adult LV, d Pronotum LV, e Ovipositor LV. (Bar line = 4mm)



Map 1: Showing the various provinces of Pakistan

4. Conclusion

From the above facts it is concluded that if more surveys of Pakistan may be carried out so it will lead to the discovery of new species and new records.

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