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Some observation on genus *Himertula* (Phaneropterinae: Tettigoniidae: Orthoptera)

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Abstract
Species of *Himertula* Uvarov, 1940 are very little known from Pakistan. During the recent survey only 02 species viz: *Himertula kinneari* (Uvarov, 1923) and *Himertula marmorata* (Brunner, 1891) respectively were described. All morphological differences were highlighted by appropriate illustration and digital photograph. Furthermore, A collection of these two species from Pakistan constructed new records. In addition to this, checklist and a simplified taxonomic key for the separation of species has also been provided.

Keywords: Systematic, morphology, illustration, new records, keys

1. Introduction
Phaneropterinae are important pests of agriculture crops while many species are ecologically associated with forest biocenoses, damaging trees and shrubs. In addition to herbaceous plants, these facts extend the range of injurious plants to forest, fruit orchards, berry shrubs and grasses. Brunner [1] established this genus as *Himerta* with type species *Himerta marginata*. Latter on Uvarov In 1940 [2] gave its exact status as *Himertula.* At present this genus consists 08 species worldwide including Indian sub-continent [3].
Previous many workers [4-20] have carried significant work on the taxonomic status of Phaneropterinae from many parts of world including Pakistan and there is no availability of quantitative data about the taxonomic and ecological status of *Himertula* from Pakistan. In addition to this, simplified taxonomic keys based on the easily recognizable morphological characters and supported by appropriate illustrations are provided for the identification of species of this genus. Furthermore, a brief description of each supra-generic category along with photographs is also presented. Hopefully, this work will be helpful for the people dealing with pest control in Pakistan.

2. Material and Methods
In the result of recent survey 02 species of *Himertula* were collected from Pakistan during the year 2013-2014. The material was killed and preserved by Adopting the conventional method described by Panhwar [3]. The material is deposited At the Sindh Entomological Museum (SEM) at Department of Zoology, University of Sindh Jamshoro Pakistan. 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. The diagrams were drawn with the help of "Ocular Square Reticule" graph fitted in the Binocular dissecting microscope. The images were taken by Canon IXY430F digital camera. All measurement is given in millimeter (mm).

3. Results and Discussion
3.1 Checklist of *Himertula* species
1. *Himertula kinneari* (Uvarov, 1923) **New record**
2. *Himertula marginata* (Brunner von Wattenwyl, 1878)
3. *Himertula marmorata* (Brunner von Wattenwyl, 1891) New record
4. *Himertula odonturaeformis* (Brunner von Wattenwyl, 1891)
5. *Himertula pallida* (Brunner von Wattenwyl, 1891)
6. *Himertula pallisignata* Ingrisch & Shishodia, 1998

7. *Himertula vidhyavathiae* Ingrisch & Muralirangan, 2004
8. *Himertula viridis* (Uvarov, 1927)

3.2 Key to species of *Himertula* occurring in Pakistan

1. Pronotum not long, narrow, compressed at posterior & Subgenital plate strongly curved dorsally in an almost 90º angle; apices of apical lobes curved laterally (Fig. 1, c,f) ……..…… *Hkinneari* (Uvarov)

--.Pronotum long, narrow, flattened at posterior & Subgenital plate with apico lateral

Angles produced into distinct lobes (Fig. 2, a, e) ……..…….…… *H. marmorata* (Brunner)

3.3 Description of species

3.3.1 *Himertula kinneari* (Uvarov, 1923)

Himertula kinneari Otte, D. 1997

Himertula kinneari Warchalowska-Sliwa. 1998

(Fig. 1, a-e)

Diagnostic features

Body small with brownish coloration running from apex of fastigium to the anterior portion of tegmina (Fig.1, a, c). Fastigium of vertex conical, narrow than scapus, furrowed dorsally separated by step like incision from fastigium. Pronotum not long, narrow, disc round in anterior part and compressed at posterior (Fig.1, b, d). Abdomen yellowish or paler. Tegmina and wings well developed, often known as longed winged Phaneropterinae with open tympana. Male cerci strongly modified; Subgenital plate from lateral view strongly curved dorsally in an almost 90º angle; apices of apical lobes curved laterally (Fig.1, e, f).

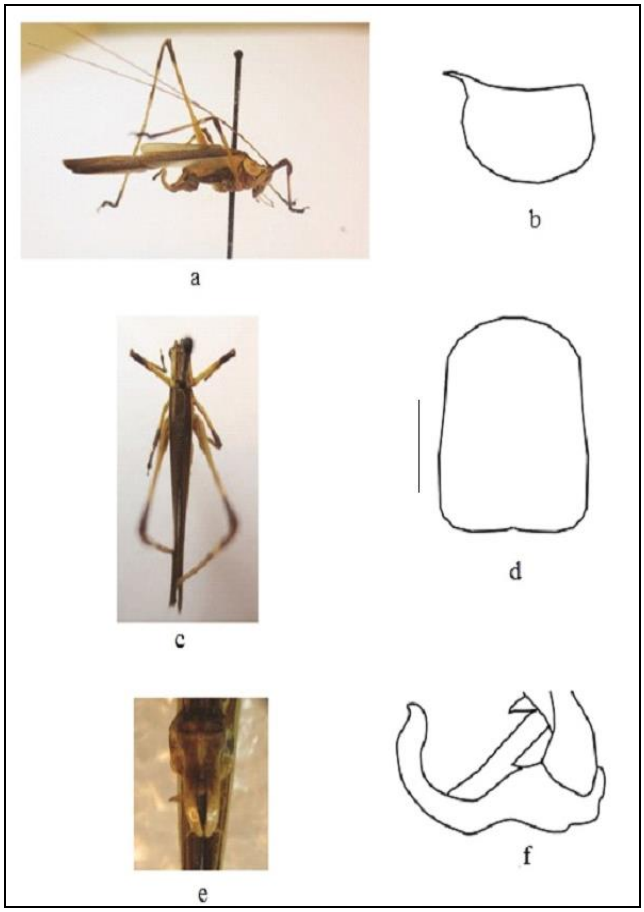

Fig 1: Himertula kinneari a-f Male:a, Adult lv, c, same But Dv b, Pronotum Lv d, same but dv, e Subgenital Plate, F Subgenital Plate LV. (Bar Line = 4mm)

3.3.2 Length measurements: 17♂: pronotum, 3.5-4mm; tegmina, 11.5-12mm; femur, 15.5-16mm; tibia, 18.18.5mm; total body length, 10.5-11mm.

3.3.3 Material Examined: Khyber Pakhtunkhwa: Abbottabad 24.viii.2014 17♂ (Waheed A.P. & Riffat S)

3.3.4 Remarks

Ingrisch & Shishodia [8] reported single male and female of this species from Uttar Pardesh, India. Beside this, they stated that these species are widely distributed in Nepal, Bhutan including Indian subcontinent. At the present, we have reported 17♂♂from Abbottabad, Pakistan. More recent Ingrisch & Muralirangan [9] provided detailed description of this species from Tamil Nadu, India. Present study agreed on the description given by Ingrisch & Muralirangan [9].

3.3.5 Ecological account

Abbottabad district is situated in Khyber Pukhtunkhwa. The topography of the area is both rocky and scenic, and its site at the base of the Himalayas lends it a moderate climate throughout the year. It is situated between (33° 50' 34° 23° N, 73° 35' 73° 31°E). This district is a distinctive and rich in bigeographic region, having diverse floral and faunal wealth *Acacia modesta, Achyranthes aspera, Chenopodium ambrosoides, Geranium wallichianum Grewia optiva, Medicago sativa, Portulaca oleracea* and *Tagetes erecta.* At present, 17♂♂ have been captured from the *Medicago sativa*, this host plant also reported for the first time.

3.3.6 *Himertula marmorata* (Brunner von Wattenwyl, 1891)

Himerta marmorata Kirby, W.F. 1906.

Himerta marmorata Otte, D. 1997

(Fig. 2, a-e)

Diagnostic features

Body small with brownish coloration running from apex of fastigium to the anterior portion of tegmina (Fig. 2, a). Fastigium of vertex conical, narrow than scapus, furrowed dorsally separated by step like incision from fastigium (Fig. 2, c). Pronotum with lateral lobes brownish with only ventral margin lightly coloured (Fig. 2, b). Pronotum long, narrow, disc rounded in anterior part and flattened at posterior (Fig. 2, d). Abdomen yellowish or paler. Tegmina and wings well developed. Female subgenital plate with apico lateral angles produced into distinct lobes (Fig. 2, e).

3.3.7 Length measurements: 12♀: pronotum, 5-5.5mm; tegmina, 17.5-18mm; femur, 20.5-21mm; tibia, 27.5-28mm; ovipositor, 6-6.5mm; total body length, 15-15.5mm.

3.3.8 Material Examined: Khyber Pakhtunkhwa: Chitral 9.viii.2014 12♀ (Waheed A.P & Riffat S)

3.3.9 Remarks

Ingrisch & Muralirangan [9] reported this species from Tamil Nadu, India. At the present, we have reported 12 ♀♀ of this species for the first time from Chitral Pakistan. But the material at hand differs in brown or light black band at its lateral side of pronotum which were not reported in the previous studied species.

3.3.10 Ecological account

Chitral **(**35°50′46″N 71°47′09″E) is calculated amongst the highest regions of the world, far-reaching from 1,094 meter at Arandu to 7,726 meters at Tirichmir, and stuffing over 40 peaks more than 6,100 meter height. *Anthemis cotula, Aesculus indica, Allium barszczewskii, Bunium persicum, Ferula narthex Paeonia emodi* and *Delphinium nordhagenii* are widely oppressed by the confined people for their diverse ethnobotanical use. During present survey 2♀♀ of *H. marmorata* have been collected from the weeds, this region has been surveyed for the first time.

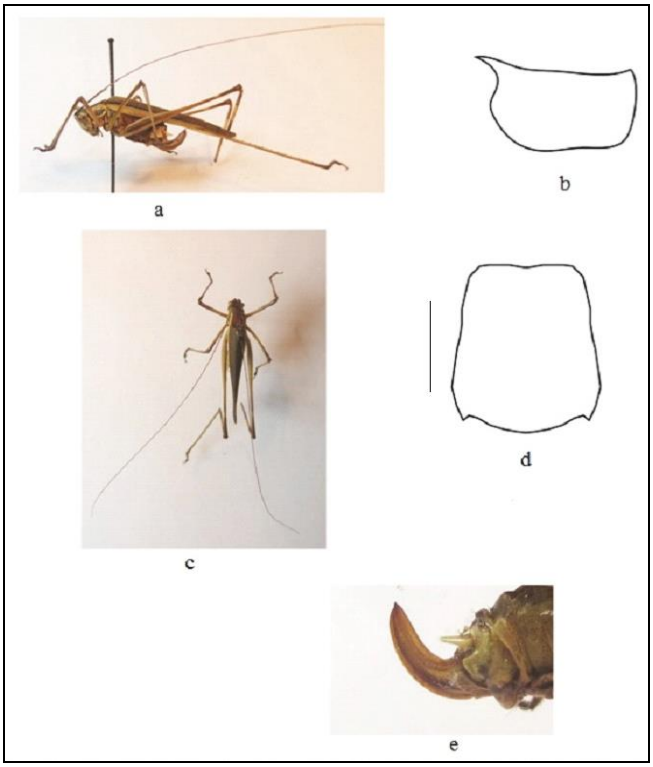

Fig 2: Himertula Mamorata a-e Female : a, Adult LV, C, Same But DV, B Pronotam Lvd, Same But Dv, e Ovipositor LV, (Bar Line = 4mm)

4. Conclusion

It was concluded from the present study that more surveys should be made in order to sample more biodiversity of *Himertula* from this region. Hopefully, this study will prove to be a firm basis for the future scientists dealing with the *Himertula* biodiversity of Pakistan.

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