Genus *Gelastorhinus* Brunner-Wattenwyl (Orthoptera: Acridoidea) in China with description of a new species

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A new species of the genus *Gelastorhinus* is described from Liaoning, China. The new species closely resembles *Gelastorhinus filatus* (Walker, 1870). In addition, an identification key for the Chinese species of *Gelastorhinus* is presented.

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1. Introduction

The genus *Gelastorhinus* was described by Brunner von Wattenwyl (1893). So far 22 species of *Gelastorhinus* have been described (Eades *et al.* 2012). They are mainly distributed in Southeast Asia, India, Myanmar, Sikkim and Africa. There are 6 species known in China, distributed in Sichuan, Fujian, Guangdong, Guangxi, Hong Kong and Taiwan. They respectively are: *Gelastorhinus chinensis* Willemse, 1932; *Gelastorhinus filatus* (Walker, 1870); *Gelastorhinus rotundatus* Shiraki, 1910; *Gelastorhinus tonkinensis* Willemse, 1951; *Gelastorhinus dubia* Willemse, 1932 *and Gelastorhinus sinensis* (Walker, 1871). In addition to these species, a new species is here described from China.

2. Material and methods

This study was carried out between 10.–27.IX.2007 in Liaoning, China. During the field work, specimens of *Gelastorhinus* were collected and then prepared as museum material by standard methods. The specimens were diagnosed by comparing with the species given by keys (Walker 1870, Shiraki 1910, Willemse 1932, 1951). Figures and measurements were obtained using a Motic-D400 plotter.

With a specimen under the objective, and a drawing paper under the drawing arm, the specimen was observed directly in the eyepiece, and the track tip of a pencil box was simultaneously moved so that the tip tracked along the contour of the sample.

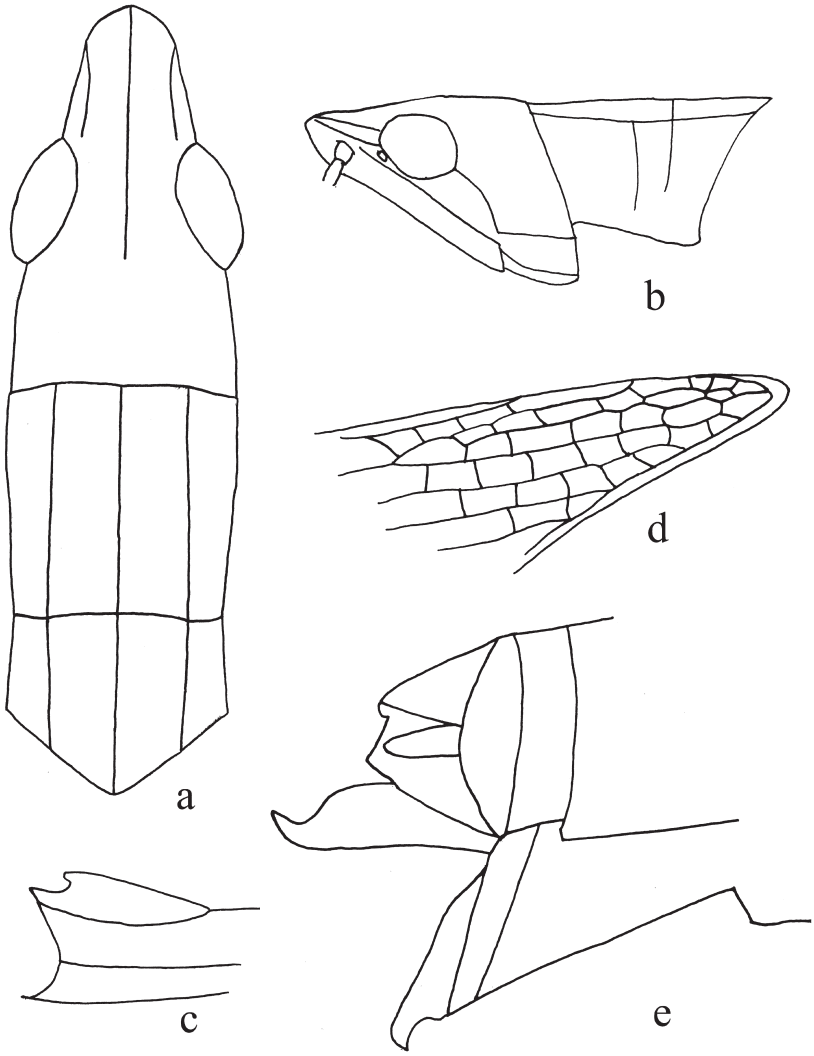

Fig.1. *Gelastorhinus liaoningensis* **sp. n.** female. – a. Head and pronotum, dorsal view. – b. Head and pronotum, lateral view. – c. Knee of hind femur, lateral view. – d. Tegmen. – e. Cerci.

The following measurements (all in mm) were taken in this study:

- Length of body (from tip of head to the end of abdomen)
- Longitudinal and horizontal diameter of compound eyes
- Distance between compound eyes
- Distance between antennae
- Length of subocular furrow
- Length of prozona
- Length of metazona
- Length of tegmina
- Length of hind femur

3. *Gelastorhinus* Brunner-Wattenwyl, 1893

Type-species: *Gelastorhinus albolineatus* Brunner-Wattenwyl, 1893.

Gelastorhinus Brunner-Wattenwyl, 1893: 137, 157.

Gelastorhinus Brunner-Wattenwyl, Kirby 1910: 409.

Gelastorhinus Brunner-Wattenwyl, Bei-Bienko & Mishchenko 1951: 405.

Gelastorhinus Brunner-Wattenwyl, Johnston 1956: 635.

Gelastorhinus Brunner-Wattenwyl, Xia 1958: 95.

Table 1. Comparison between female of *Gelastorhinus filatus* (Walker) and *G. liaoningensis* **sp. n.**

Character	*G. filatus*	*G. liaoningensis* **sp. n.**
Vertical diameter of eye/ minimum width of vertex between eyes	1.5–1.9	1.25
Length of the upper valvula	Longer than lower valvula	Same length or shorter
Antennae	From basal first segments 10 to 11 flat, others rounded	Basal segments 2 to 11 wide and flat
Mesostethium lobes	Separate narrowly	The latter part almost connected and separated only by a thin groove
Color of hind femur	Yellow-green, green	Knee is green except upper kneelobes, the rest part red

Gelastorhinus Brunner-Wattenwyl, Dirsh 1965: 409.
Gelastorhinus Brunner-Wattenwyl, Haskell 1982: 386.
Gelastorhinus Brunner-Wattenwyl, Zheng 1985: 387.
Gelastorhinus Brunner-Wattenwyl, Liu 1990: 174, 183–184.
Gelastorhinus Brunner-Wattenwyl, Zheng 1993: 375, 404–406.
Gelastorhinus Brunner-Wattenwyl, Liu *et al.* 1995: 114.
Gelastorhinus Brunner-Wattenwyl, Yin *et al.* 1996: 300.

3.1. Key to the species of *Gelastorhinus* in China

1. Posterior margin of pronotum nearly straight *G. sinensis* (Walker)
– Posterior margin of pronotum arcuate 2
2. Tegmen long and narrow, its apex acute 3
– Tegmen short and wide, its apex round 5
3. Long spine on upper kneelobes of inner side of hind femur. Its length about 2 times that of the upper kneelobes of outer side *G. chinensis* Willemse
– Short spine on upper kneelobes of inner side of hind femur. Its length equal to or much shorter than that of the upper kneelobes of outer side 4
4. Lower valvula much shorter than upper valvula *G. filatus* (Walker)
– Lower valvula not shorter than upper valvula *G. liaoningensis* **sp. n.**
5. Hind knee dark brown 6
– Hind knee black *G. dubia* Willemse
6. Tegmina short, nearly surpassing hind femur, apex rounded. Apex of cerci slightly expanded and rounded *G. rotundatus* Shiraki
– Tegmina long, surpassing beyond hind femur, apex acute. Apex of cerci not expanded, slender *G. tonkinensis* Willemse

3.2. Description of *Gelastorhinus liaoningensis* sp. n. female (Fig. 1)

Type material. Holotype, 1♀: Collected from Suizhong county, Huludao city, Liaoning province (N40°19'36", E120°20'25") by Liming Wang and Ying Lu, 21.IX. 2007. Paratype, 1♀: Same data as the holotype. The type specimens are deposited in Department of Biology, School of Life Sciences, Northeast Normal University, China.

Diagnosis. The new species is similar to *G. filatus*, but differs from the latter as shown in Table 1.

Description. Head. Slightly shorter than pronotum from the dorsal view (Fig. 1a). Vertex promnient, flat and slightly concave with a median carina. Vertical diameter of eyes/minimum width of vertex 1.25, apex arc-shaped. Frons backwards oblique, with deep longitudinal sulcus along whole length, widening gradually from the bottom of median ocellus to clypeus.

Eyes oval, located near middle of posterior

part of head, vertical diameter of eyes 1.65 times of horizontal diameter and 1.15 times subocular furrow.

Antennae sword-shaped, their basal part (segments 2–11) wide and flat, the rest columnar, surpassing the posterior margin of pronotum.

Thorax. Anterior margin of pronotum straight, posterior margin curve. Median carina tectiform, lateral carinae nearly parallel (Fig. 1a). Anterior transverse sulcus not tectiform. Median transverse sulcus nearly incise lateral carina, but not median carina. Posterior transverse sulcus tectiform, and incise the median carina and lateral carinae. Prozona 1.3 times of metazona (Fig. 1b).

The latter parts of mesostethium lateral lobes are almost connected and separated only by a thin groove. The latter parts of metasternum lateral lobes connected.

Tegmina developed, apex acute (Fig. 1d) and exceeding tip of abdomen. Procostal, costal and medial area of tegmina with intercalary veins. Hind wings developed and shorter than tegmina.

Hind femur short, not reaching end of abdomen. Upper carina of hind femur smooth. Upper kneelobes nearly rectangular-shaped (Fig. 1c), inner and outer lobes equal. Lower kneelobes acutely angle-shaped, lower margin flat. Inner side of hind tibia with 15 spines and the outer one with 13 spines, without outer apical spine.

Abdomen. Cerci cylindrical (Fig. 1e), almost reaching the top of the supra-anal plate. Valvula short, end hook-shaped. Lower valvula not shorter than upper one.

Coloration. Back of body red-brown, with a dark red-brown postocular band. Postocular band reaches the posterior margin of pronotum, and extends to the basal part of costal area. Procostal area and costal area of tegmina green, otherwise red-brown. Hind legs yellow-green. Knee green except upper kneelobes, the rest part red. Segmengtal venter of protarsus and mesotarsus lawngreen. Tarsus of hind legs lawngreen.

Measurements (mm). Holotype, 1♀, Paratype 1♀: Body length: 41.86, 41.72; Pronotum length: 7.20, 7.11; Tegmina length: 41.76, 41.61; Hind femur length: 17.40, 17.12.

Etymology. The species name is derived from the place of origin.

4. Discussion

According to available data, species of *Gelastorhinus* are mainly distributed in tropical and subtropical climate zones. However, in our investigation we discovered *Gelastorhinus* in the temperate climate zone in Liaoning province. This discovery changed the former knowledge and has significance for studies of the distribution and migration habits of *Gelastorhinus*.

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