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**REDESCRIPTION OF COCKROACH *PSEUDOGLOMERIS*  
(*GLOMEREXIS*) *TIBETANA* (BEY-BIENKO, 1938) (BLATTARIA:  
BLABERIDAE: PERISPHAERINAE) FROM CHINA**

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**Summary.** *Glomerexis* Bey-Bienko, 1938, **stat. resurr.** is resurrected from synonymy of *Pseudoglomeris* Brunner von Wattenwyl, 1893 and considered as a subgenus of the latter. The type species of *Glomerexis*, *P. (G.) tibetana* (Bey-Bienko, 1938) from eastern Xizang (Tibet), is redescribed and illustrated here. The subgenus *Glomerexis* consists of three alpine flightless species: the type one, *P. (G.) semisulcata* Hanitsch, 1924 and *P. (G.) angustifolia* (Wang et Che, 2011).

**Key words:** Dictyoptera, taxonomy, Hengduan Mountains, Xizang, Tibet.

**Ц.-Р. Ли. Переописание таракана *Pseudoglomeris (Glomerexis) tibetana* (Bey-Bienko, 1938) (Blattaria: Blaberidae: Perisphaerinae) из Китая // Дальневосточный энтомолог. 2021. N 442. С. 7-12.**

**Резюме.** *Glomerexis* Bey-Bienko, 1938 **stat. resurr.** восстанавливается из синонимов *Pseudoglomeris* Brunner von Wattenwyl, 1893 и рассматривается как подрод последнего. Приводится иллюстрированное переописание типового вида подрода – *P. (G.) tibetana* (Bey-Bienko, 1938) из Тибета. Подрод *Glomerexis* включает три альпийских вида: типовой, *P. (G.) semisulcata* Hanitsch, 1924 и *P. (G.) angustifolia* (Wang et Che, 2011).

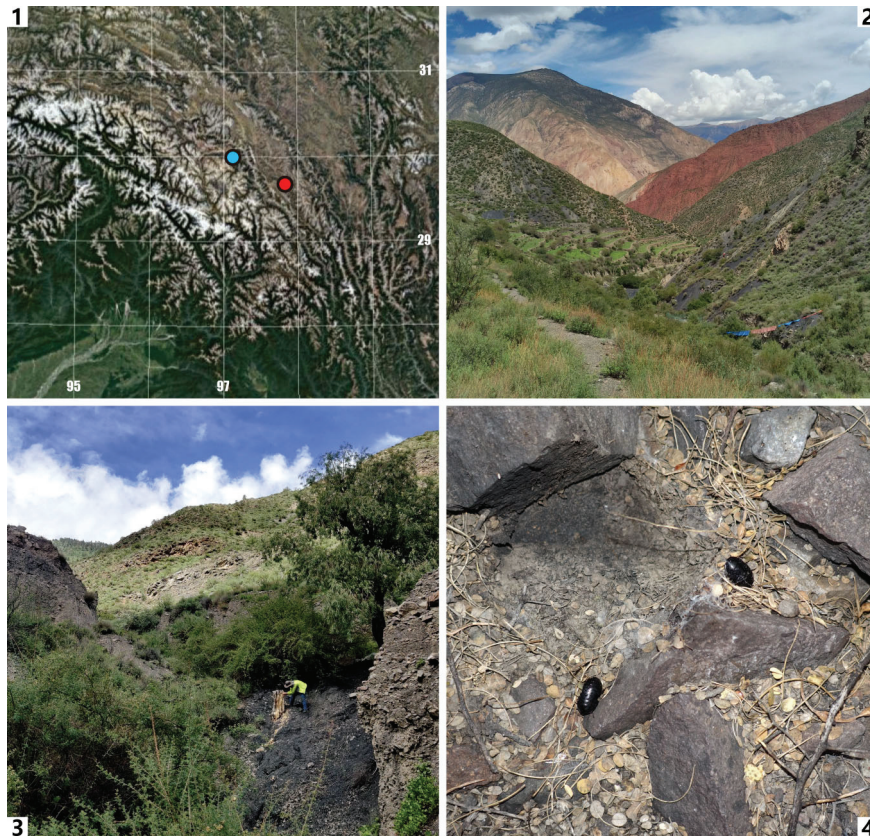
**INTRODUCTION**

The perisphaerine cockroaches from China were revised recently and *Glomerexis* Bey-Bienko, 1938 was synonymized under *Pseudoglomeris* Brunner von Wattenwyl, 1893 (Li *et al.*, 2018). Perisphaerinae exhibit strong sexual dimorphism: all females are apterous and resemble nymphs, while most males are dissimilar to nymphs and have wings. For many species, only one sex is known. In the genus *Pseudoglomeris* males of most species are macropterous, only two are brachypterous and only one is apterous. The apterous *P. tibetana* (Bey-Bienko, 1938), the genotype of *Glomerexis*, is known from both sexes (Bey-Bienko, 1938). However, the female paratype was not collected from the same locality as the male holotype, its identity is not firmly settled. Subsequent records of females are also uncertain (Bey-Bienko, 1954; Anisyutkin, 2003; Li *et al.*, 2018). During a geological expedition to eastern Xizang (Tibet) in 2019, this species was rediscovered with both sexes from around Baxiu (or Basu), the locality of the paratype, near the type locality, Zuogong (Figs 1–4). In

the present study, *P. tibetana* is redescribed, its relationship with other alpine flightless species (males of which are brachypterous) is discussed, and the taxonomy of *Glomerexis* is reconsidered.

#### MATERIAL AND METHODS

The specimens will be deposited at Institute of Entomology, Southwest University, Beibei, Chongqing, China. Genital segments were treated with a hot NaOH solution (10% m/m, ca. 90°C) for 30–60 min until soft tissue was digested completely, thus prepared for dissection. The dissected parts are preserved in glycerine. Photos were taken with a Zeiss AxioZoom V16 stereoscope. Shallow depth-of-field photos were stacked using CombineZP (by Alan Hadley) and Photoshop CC 2015; and optimized using Photoshop CC 2015. Morphological terminology largely follows Roth (2003); that for terminalia structures follows Klass (1998) and Li *et al.* (2018).



Figs 1–4. Geographical information and habitat of *Pseudoglomeris tibetana*. 1 – collecting locality (blue) and type locality (red); 2 – overview of the collecting locality; 3 – one collecting site, the author was opening a tree stump on a slope; 4 – the other collecting site, two females were escaping when the rock (top left) was removed. Image sources: 1, Landsat and Copernicus, retrieved from Google Earth; 2 and 4 by the author; 3 by Dr Yi-Tong Su.

## TAXONOMY

### Genus *Pseudoglomeris* Brunner von Wattenwyl, 1893

#### Subgenus *Glomerexis* Bey-Bienko, 1938, stat. resurr.

Type species: *Glomerexis tibetana* Bey-Bienko, 1938.

COMPOSITION. Three species from China: *P. (G.) tibetana* (Bey-Bienko, 1938), *P. (G.) semisulcata* Hanitsch, 1924 and *P. (G.) angustifolia* (Wang et Che, 2011).

REMARKS. *Pseudoglomeris tibetana* is closely related to two species from Yunnan Province, China, namely, *P. semisulcata* and *P. angustifolia*, especially the latter (see photos and description of type specimens in Wang & Che, 2011; Li *et al.*, 2018). They are the only known flightless *Pseudoglomeris* species, the males of which do not have fully developed wings, while the males of other species (if known) are macropterous. Remarkably, these three species do not have the virga sclerite, in contrast to all other *Pseudoglomeris* species and even all other Perisphaerinae (Roth, 1973; Li *et al.*, 2018). In terms of habitat, these species are all found in arid alpine areas, with altitude ca. 2000–3800 m. In comparison, other species of *Pseudoglomeris* are mainly found in tropical and subtropical areas with low altitude. *Pseudoglomeris tibetana*, *P. semisulcata* and *P. angustifolia* likely constitute a unique group adaptive to the environment of eastern Xizang and Hengduan Mountains; the absence of virga sclerite may suggest that this group is monophyletic, rather than results from ecological convergence. Anisyutkin (2003) and Li *et al.* (2018) speculated that *Glomerexis* may be a subgenus of *Pseudoglomeris*, but no conclusion was drawn because the male genitalia of the genotype *G. tibetana* were unknown. The male genitalia of *P. tibetana* are described and illustrated below and *Glomerexis* is regarded as a subgenus of *Pseudoglomeris*.

#### *Pseudoglomeris (Glomerexis) tibetana* (Bey-Bienko, 1938)

Figs 5–15

*Glomerexis tibetana* Bey-Bienko, 1938: 123 [type locality: China, Xizang (Tibet), Zuogong (“Dzogang”)]; Anisyutkin, 2003: 75.

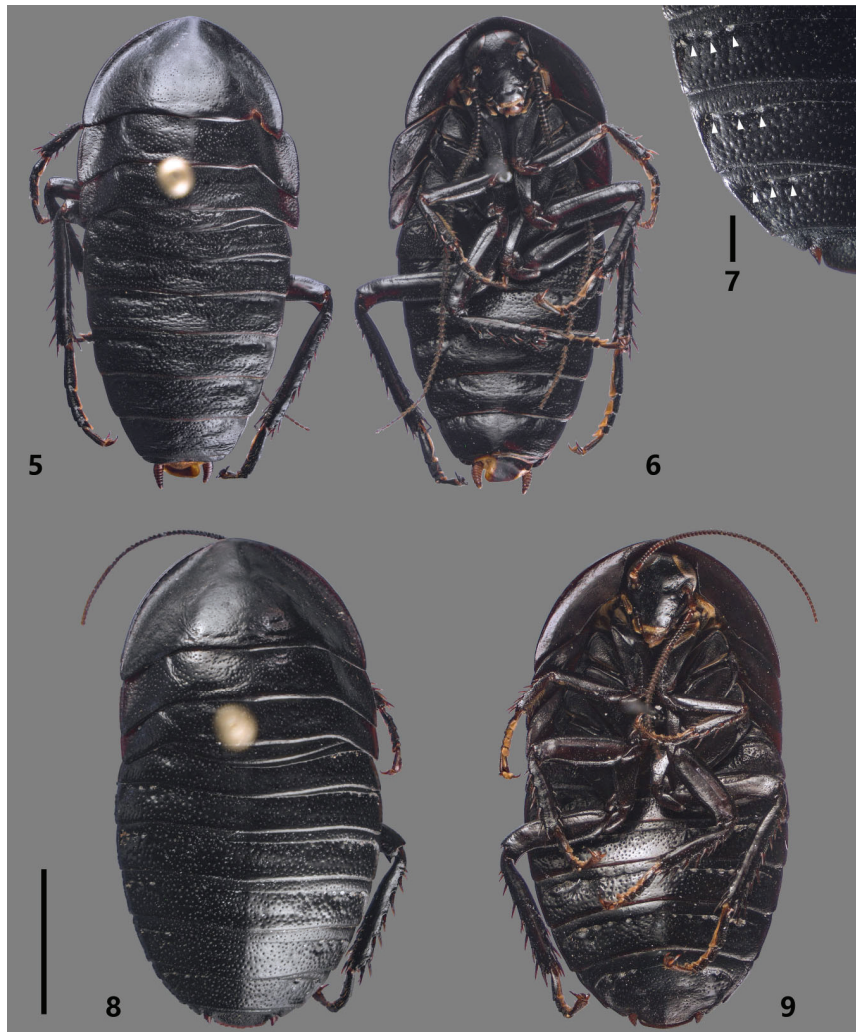
*Pseudoglomeris tibetana* (Bey-Bienko, 1938): Li *et al.*, 2018: 278.

MATERIAL EXAMINED. **China:** Xizang Autonomous Region, Changdu, east to Baxiu (or Basu), road from Wada to Longpu, Wada coal mine. 30°0'13.9–22.2"N, 97°6'35.3–37.5"E, 3260–3314 m, 31. VII 2019, 3 ♂, 4 ♀, leg. Xin-Ran Li.

DIAGNOSIS. Sexual dimorphism weakly expressed. Male apterous, first tergum not specialized or modification subtle (Figs 5–6); subgenital plate of normal length in the genus, stylus absent; virga sclerite absent. Female pit formula [3] (Fig. 7).

REDESCRIPTION. Based on the materials in the present study. Both sexes apterous, uniformly deep dark brown (Figs 5–9). Pronotum nearly semicircular, covering entire head, which is small. Forefemoral spination type C0 or C1 (the terminal spine may be genicular spine). Middle and hind femora with a very short genicular spine, and a spinous process at the terminal anteroventral margin. Plantulae present at four proximal tarsomeres, along almost the entire segment. Arolium in moderate size, claws symmetrical, not specialized. **Female:** body length 17–17.5 mm, width 9.2 mm. external morphology indistinguishable with nymph; fine punctations throughout the body, but those on the supra-anal plate inconspicuous. Head length 3.3 mm, width 2.5 mm. Genitalia normal as in the genus (Fig. 10). **Male:** body length 16–19 mm, width 7.8–8.0 mm. Fine punctations throughout the body, abdomen with wrinkles which sometimes merge punctations. Head length 3.0 mm, width 2.3

mm. Abdomen narrower than female. Terminalia essentially typical of the genus but the virga sclerite absent, very similar to *P. angustifolia*. Supra-anal plate transverse, hind margin slightly arcuate, sclerotization of the left paraproct smaller than the right; cercus with seven segments as normal (Fig. 11). Subgenital plate with the left side entire, membranous area small; the right side concave, the membranous area large; stylus absent (Fig. 12). Cleft phallomere and rod sclerite normal (Figs 13–14). Hook-base sclerite developed, hook-apex sclerite with sharp tip, without apical incision or cracks (Fig. 15); the dorsal part and the ventral part of these sclerite are symmetrical.



Figs 5–9. Habitus of *Pseudoglomeris tibetana*, male (5, 6), female (8, 9) and partial female abdomen in dorsal view with white arrowheads indicating pits (7). Scale bars = 1 mm for fig. 7; 5 mm for other figs.

DISTRIBUTION. China: Xizang (Tibet), the easternmost region.

REMARKS. These cockroaches, as well as their exuviae, were found under the bark of a dead standing wood (Fig. 3), at rock-soil interface (Fig. 4), and under artificial fabrics. They utilize suchlike crevices as shelters. The males and females were collected together, therefore they are matched to one species with confidence.

The specimens are determined to *P. tibetana* because the males are almost identical to the holotype, particularly in the habitus that is wingless, and the subgenital plate that lacks styli (see Li *et al.*, 2018). Besides, their locality Baxiu is close to the type locality Zuogong (ca.



Figs 10–15. Terminalia of *Pseudoglomeris tibetana*. 10 – valvulae and surrounding elements of female, dorsal view; 11–15 – male: 11 – supra-anal plate, ventral view, note that the left cercus (at the right side of this view) is deformed; 12 – subgenital plate, dorsal view; 13 – cleft phallomere, dorsal view; 14 – rod sclerite of middle phallomere, dorsal view; 15 – hook-like phallomere, dorsal view. Abbreviations: cc – cercus; ha – hook-apex sclerite; hb – hook-base sclerite; pl – lateral part of posterior lobe of 2nd valvifer ring; pp – paraproct; sap – supra-anal plate. Scale bars = 500  $\mu$ m.

80 km), with similar climate. Baxiu is also the locality of the paratype, written as “Poshō” in Bey-Bienko (1938). The description of the paratype accords with the females herein, particularly the pit formula (Anisyutkin, 2003). Bey-Bienko (1954) also reported three females from Adunzi (“A-tun-tse”), Deqin, northern Yunnan, but the identities of these females remain debatable (Anisyutkin, 2003). The pit formula of the specimens from Adunzi is not identical to [3] (Anisyutkin, 2003). Besides, Deqin is a little far from Zuogong (ca. 170 km), and the complicated topography between these localities may constitute critical barriers that cause long-term speciation. Li *et al.* (2018) described two females possibly belonging to this species from Baxiu, but according to the present study, those females might not be *P. tibetana*. The pit formula of the females herein is [3], but that in Li *et al.* (2018) is [2]. In the genitalia of the females herein, the lateral part of posterior lobe of 2nd valvifer ring is longer (Fig. 10). However, the females herein and therein closely resemble each other, and the intraspecific variation is unclear, therefore it is appropriate to retain the original determination as “*Pseudoglomeris cf. tibetana*”.

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