



Descriptions of Chinese species of the subgenus *Diestrammena* (*Gymnaeta*) Adelung (Orthoptera: Rhaphidophoridae)

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Abstract

Diestrammena (*Gymnaeta*) was erected by Adelung in 1902 (Adelung 1902). The type species is *Gymnaeta berezowskii* Adelung, 1902. Presently, the subgenus *Gymnaeta* includes 9 species (Eades et al., 2007). In the present paper, one new species *D. (G.) caverna* sp. n., the male of *D.(G.) brevicauda* (Karny, 1933), and the male of *D.(G.) tianmushanensis* (Liu & Zhang, 2001), *D.(G.) borutzkyi* Gorochoy, 2004 are described. The specific name *Gymnaeta brevicauda* Karny, 1933 is resurrected. A key to the Chinese species of *Diestrammena* (*Gymnaeta*) is given. All the materials are deposited in the Shanghai Entomological Museum, Chinese Academy of Science.

Key words: Orthoptera, Aemodogryllinae, *Diestrammena*, *Gymnaeta*, new species, China

Key to the Chinese species of *Diestrammena* (*Gymnaeta*)

- 1(6) Hind tibiae above on each side with 59–83 spines2
2(5) Super internal spur of hind tibia as long as or longer than the metatarsus; hind tibia above on each side with 59–75 spines3
3(4) Tarsus of hind tibia with bristles beneath; fore femur about 1.6–1.7 times as long as pronotum; subgenital plate of female trapezoidal, apex with deeply excised length of body 12.0, pronotum 5.0–5.5, fore femora 8.5–9.0, hind femora 15.0–18.0, ovipositor 7.7–9.2 mm) ... *D.(G.) berezowskii* (Adelung, 1902)
4(3) Tarsus of hind tibia keeled beneath; fore femur about 1.4–1.5 times as long as pronotum; epiphallus of male as fig. 2; subgenital plate of female with pointed apex (length of body 11.5, pronotum 5.0–5.5, fore femora 7.5–8.0, hind femur 15.0–16.0, ovipositor 8.0mm)..... *D.(G.) brevicauda* (Karny, 1933)
5(2) Super internal spur of hind tibia shorter than the metatarsus; hind tibia above with 76–83 spines on each side; epiphallus of male as fig. 5; female subgenital plate triangular, apex with deeply excision length of body 15.0–17.0, pronotum 5.5–6.0, hind femora 19.0–20.0, ovipositor 9.0 mm).....
..... *D.(G.) tianmushanensis* (Liu & Zhang, 2001)
6(1) Hind tibia above on each side with 30–50 spines6
7(8) Fore tibia beneath with 2 internal and 2 external spurs; hind tibia above on each side with 50 spines; ovipositor longer than 15mm (length of body 13.5, pronotum 5.0, hind femora 17.0; ovipositor 16.0 mm)..... *D.(G.) longicauda* (Karny, 1933)
8(7) Fore tibia beneath with 1 internal and 2 external spurs; hind tibia above on each side with 30–45 spines; ovipositor short than 15 mm9

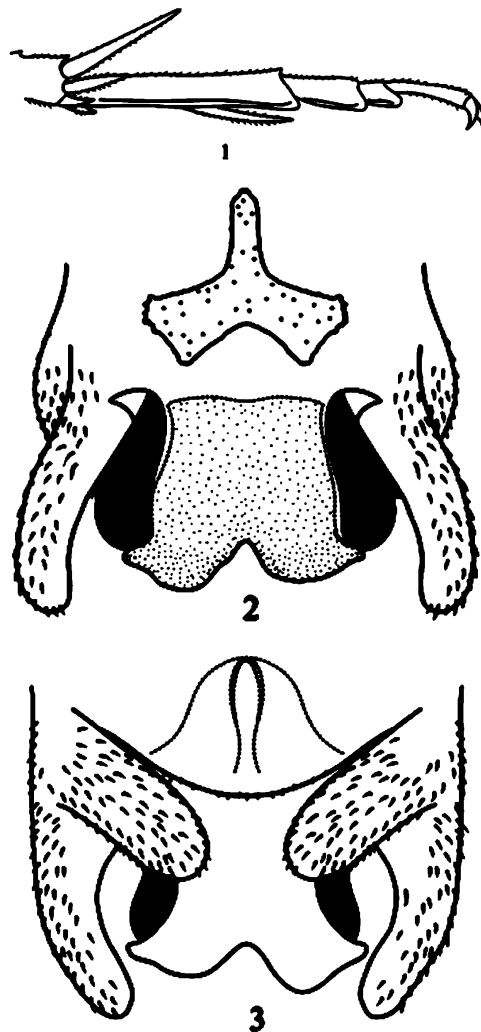
- 9(10) Fore femur about 2.4 times as long as the pronotum; epiphallus of male as fig. 8; subgenital plate of female trilobed (length of body 16.0–18.0, pronotum 5.0, hind femora 22.0–23.0, ovipositor 9.0–10.5mm)..... *D.(G.) borutzkyi* Gorochoy, 2004
10(9) Fore femur about 2.0 times as long as the pronotum.; epiphallus of male as fig. 11; subgenital plate of female as fig. 13..... *D.(G.) caverna* **sp. n.**

***Diestrammena (Gymnaeta) brevicauda* (Karny, 1933)**

(Figs. 1–3) new status

Tachycines (Gymnaeta) brevicauda Karny, 1933. Ark. Zool., 26A(2): 6; Karny, 1937. Genera Insectorum, 206: 248.

The original description of the female (Karny, 1933). Additional description of male as follows:



FIGURES 1–3. *Diestrammena (Gymnaeta) brevicauda* (Karny, 1933). 1. Tarsus of hind leg, lateral view; 2. Male genitalia, dorsal view; 3. Male genitalia, ventral view.

Diagnosis. Male. Head with fastigium of vertex divided into two conical tubercles. Legs long and slender; Fore femur about 1.4–1.5 times as long as the pronotum, unarmed beneath, the internal genicular lobe with 1 short spine and external lobe with 1 long movable spur; fore tibia beneath with 1 internal and 2 external spurs, a small median spine between the paired apical spurs. Mid femur unarmed beneath, the internal and external genicular lobe with 1 long movable spur ; mid tibia beneath with 1 internal and 1 external spur, a short spine

between the paired apical spurs. Hind femur unarmed beneath; hind tibia above on each side with 59–69 spines, grouped in series, super internal spur of hind tibia equal to the metatarsus (fig. 1). Male genitalia as figs. 2–3.

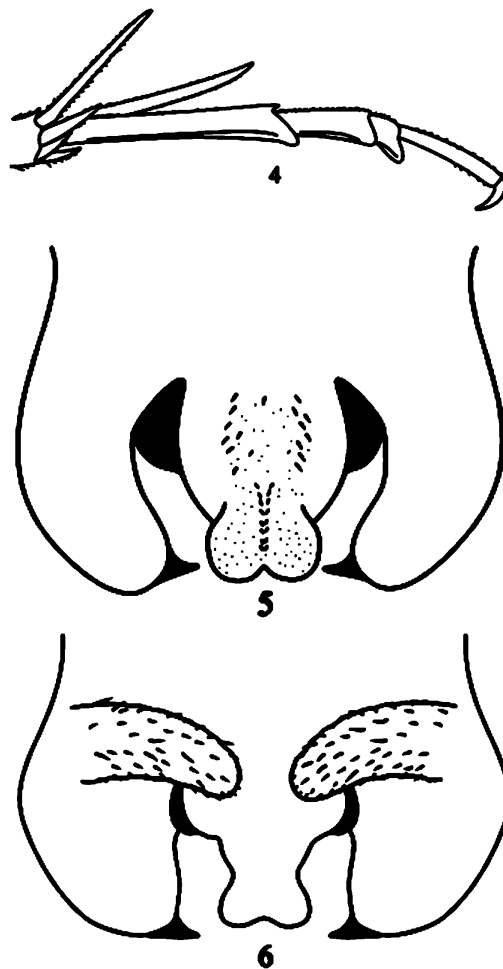
Coloration. Body blackish brown, mottled with pale blotches.

Measurements (in mm): length of body 11.5, pronotum 5.5, fore femora 8.0, hind femora 16.0.

Specimens examined: 1♂, Shannxi, (Qingling Tiantaishan), 2–3. IX.1999, leg. Liu Xian-Wei & Yin, Hai-Sheng.

Discussion. This species was synonymized by Storozhenko (1990) with *D.(G.) coomani* Chopard, but we consider that is a distinct species. Differs in that the fore femora are shorter, about 1.4–1.5 times as long as pronotum, and the structure of male genitalia.

Distribution. China (Gansu, Shannxi).



FIGURES 4–6. *Diestrammena (Gymnaeta) tianmushanensis* Liu & Zhang, 2001. 4. Tarsus of hind leg, lateral view; 5. Male genitalia, dorsal view; 6. Male genitalia, ventral view.

***Diestrammena (Gymnaeta) tianmushanensis* (Liu & Zhang, 2001)**

(figs. 4–6)

Tachycines (Gymnaeta) tianmushanensis Liu & Zhang, 2001. In Wu & Pan, 2001. Insects of Tianmushan National nature Reserve, p. 98–99.

Original description of the female (Liu & Zhang, 2001). Additional description of male as follows:

Diagnosis. Male. Head with fastigium of vertex divided into two conical tubercles. Legs long and slender; Fore femur about 1.8 times as long as the pronotum, unarmed beneath, the internal genicular lobe with 1 short spine and external lobe with 1 long movable spur; fore tibia beneath with 0 internal and 1 external spur, a small median spine between the paired apical spurs. Mid femur unarmed beneath, the internal and external genicular lobe with 1 long movable spur; mid tibia with 1 internal and 1 external spur beneath, a short spine between the paired apical spurs. Hind femur unarmed beneath, hind tibiae above on each side with 74–76 spines, grouped in series, super internal spur of hind tibia shorter than the metatarsus (fig. 4). Male genitalia as fig. 5–6.

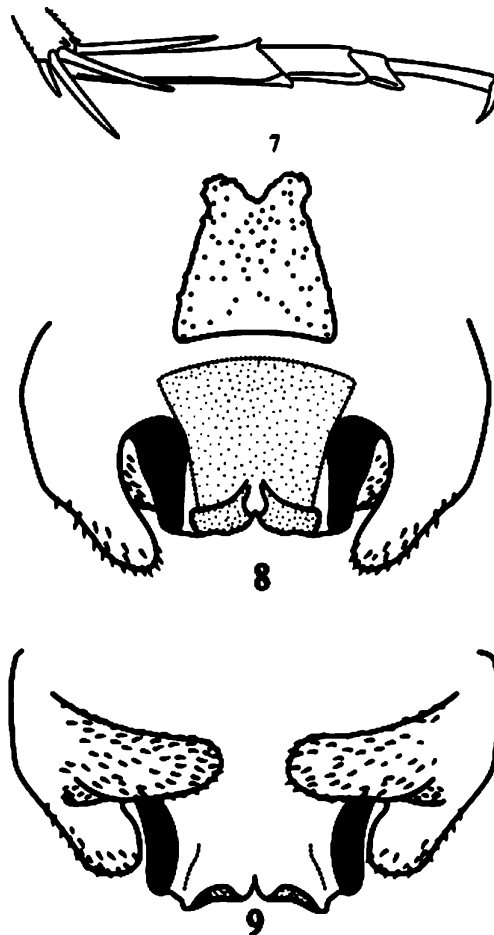
Coloration. Body yellowish brown, mottled with darkish blotches.

Measurements (in mm): length of body 15.0, pronotum 5.0, fore femora 9.0, hind femora 17.0.

Specimens examined: 1♂, Anhui, (Wenquan Huangshan), 23. X.1985, leg. Liu Xian-Wei.

Discussion. This species resembles *D.(G.) berezowskii* Adelung, 1902. But differs in the number of spines of hind tibiae and upper internal spur distinctly shorter than the metatarsus. The shape of male genitalia and shape of female subgenital plate are distinctive.

Distribution. China (Zhejiang, Anhui).



FIGURES 7–9. *Diestrammena (Gymnaeta) borutzkyi* Gorochoy, 1994. 7. Tarsus of hind leg, lateral view; 8. Male genitalia, dorsal view; 9. Male genitalia, ventral view.

***Diestrammena (Gymnaeta) borutzkyi* Gorochov, 1994**

(Figs. 7–9)

Diestrammena (Gymnaeta) borutzkyi Gorochov, 1994 (Gorochov 1994). Proc. Zool. Inst. St-Petersburg, 257: 49.

The original description of the female (Gorochov, 1994). Additional description of male as follows:

Diagnosis. Male. Head with fastigium of vertex divided into two conical tubercles. Legs long and slender; Fore femur about 2.4 times as long as the pronotum, unarmed beneath, the internal genicular lobe with 1 short spine, external lobe with 1 long movable spine; fore tibia beneath with 2 external and 1 internal spines, a small median spine between the paired apical spurs. Mid femora unarmed beneath, the internal and external genicular lobe with 1 long movable spine; mid tibiae beneath with 1 external and 1 internal spine, a short spine between the paired apical spurs. Hind femur unarmed beneath; hind tibia armed on each dorsal margin with 32–44 spines, which grouped in series, super internal spur of hind tibiae shorter than the metatarsus (fig. 7); tarsus keeled beneath. Male genitalia as figs. 8–9.

Coloration. Body yellowish brown, mottled with dark brown blotches.

Measurements (in mm): length of body 16.0–19.0, pronotum 5.0–6.0, fore femora 12.0–13.5, hind femora 22.0–25.0, ovipositor 9.0–12.0.

Specimens examined: 1 ♂, 2 ♀♀, Guizhou (Chishui National Reserve in Spinulose Tree Fern), 20.X.2006, leg. Liu, Xian-Wei et al.; 1 ♀, Hunan (Zhangjiajie), 10–12.IX.1988, leg. Liu Xian-Wei; 1 ♀, Sichuan (Emeishan), 2–4.VIII.2007, leg. Liu Xian-Wei.

Discussion. This species differs from all other species of the subgenus by the longer fore femora (about 2.4 times as long as pronotum) and the shape of male genitalia.

Distribution. China (Hunan, Guizhou, Chongqing, Sichuan).

***Diestrammena (Gymnaeta) caverna* sp. n.**

(Figs. 10–13)

Diagnosis. Male. Head with fastigium of vertex divided into two conical tubercles. Legs long and slender; Fore femora about 2.0 times as long as the pronotum, unarmed beneath, the internal genicular lobe with 1 short spine, external lobe with 1 long movable spur; fore tibia with 1 internal and 2 external spurs beneath, a small median spine between the paired apical spurs. Mid femur unarmed beneath, the internal and external genicular lobe with 1 long movable spur; mid tibia beneath with 1 external and 1 internal spur, a short spine between the paired apical spurs. Hind femur unarmed beneath; hind tibia above on each side with 28–48 spines, grouped in series, super internal spur of hind tibia shorter than the metatarsus (fig. 10); tarsus keeled beneath. Male genitalia as figs. 12–13.

Female. Subgenital plate with median lobe rounded triangular (Fig. 11), ovipositor short, about half of hind femora.

Measurements (in mm): length of body 11.0–12.0, pronotum 4.5, fore femora 9.0, hind femora 19.0, ovipositor 10.0.

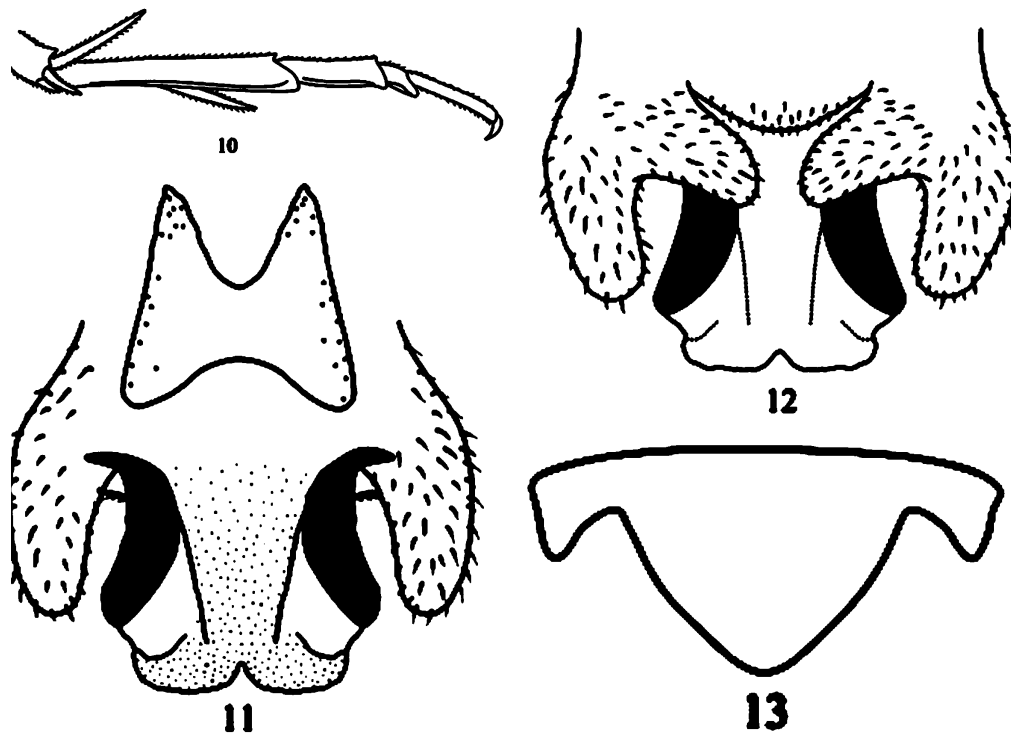
Coloration. Body yellowish brown, mottled with dark brown blotches.

Holotype ♂, Yinshui Cave, near Mount Jiugong, Tongshan County, southeast Hubei (Province), Central China. GPS co-ordinates: 114.3600"–114.3900"E, 29.3730"–29.4030" N; elevation, approximately 230 m, By Zhongjiu Jiao; Paratypes, 1 ♂, 2 ♀♀, same data as in holotype.

Discussion. This new species resembles *D.(G.) borutzkyi* Gorochov, 2004, but differs in its smaller size, and the structure of the male genitalia and the female subgenital plate.

Etymology. The name of the species refers to living in the cave.

Distribution. Known only from China (Hubei).



FIGURES 10–13. *Diestrammena (Gymnaeta) caverna* sp. n. 10. Tarsus of hind leg, lateral view; 11. Male genitalia, dorsal view; 12. Male genitalia, ventral view; 13. Female subgenital plate, ventral view.

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