

A taxonomic study of the genus *Liaopodisma* Zheng, 1990 (Orthoptera, Acridoidea, Catantopidae, Podisminae) with descriptions of two new species from China

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Abstract: Three species of the genus *Liaopodisma* Zheng, 1990 are described and illustrated from China, including two new species, *i. e.*, *Liaopodisma taichungensis* sp. nov. and *Liaopodisma taiwanensis* sp. nov. The new species *L. taichungensis* sp. nov. is allied to *L. qianshanensis* Zheng, 1990, but differs from the latter by: black postocular band indistinct, median keel of pronotum almost invisible, length of tegmen 1.8 times width in male, interspace of mesosternum of male backward broadening gradually and hind tibia with 10 spines on outer side. The new species *L. taiwanensis* sp. nov. differs from two known species of the genus *Liaopodisma* Zheng by the hind femur red on lower side and tegmen not widened in the middle, anterior and posterior margin almost parallel. A key to species of the genus *Liaopodisma* is also given.

Key words: Orthoptera; Acridoidea; Catantopidae; Podisminae; *Liaopodisma*; new species; China

The genus *Liaopodisma* Zheng, 1990 is belonging to subfamily Podisminae, family Catantopidae, superfamily Acridoidea. Type species *Liaopodisma qianshanensis* Zheng, 1990 is distributed in Liaoning, China only. During the identification of grasshopper specimens collected from Taiwan, two new species of the genus, *i. e.*, *Liaopodisma taichungensis* sp. nov. and *Liaopodisma taiwanensis* sp. nov. are described below.

A key to species of the genus *Liaopodisma* Zheng, 1990 is given in this paper.

Genus *Liaopodisma* Zheng, 1990

Zheng, 1990. *Journal of Shaanxi Normal University (Natural Science Edition)*, 18(2): 59; Yin *et al.*, 1996. A Synonymic Catalogue of Grasshoppers and Their Allies of the World: (Orthoptera: Caelifera). 372; Zhong and Zheng, 2004. *Acta Zootaxonomica Sinica*, 29(1): 96; Li *et al.* 2006. *Fauna Sinica, Insecta*, 43: 339.

Type species *Liaopodisma qianshanensis* Zheng, 1990.

Head shorter than pronotum. Antennae filiform.

Eyes larger, vertical diameter 1.2–1.5 times longer than horizontal one, 1.5–2.2 times length of subocular furrow. Median carina of pronotum lower, visible in metazona only, lateral carinae absent, prozona 1.5 times metazona in length, hind margin of pronotum rounded arcus. Prosternal process

conical. Tegmina lobe-form, lateral, relatively straight on the anterior margin. Lateral lobes of metasternum contiguous at apical part in male, and separated in female. Hind femur symmetrical, upper median carina smooth, apex of lower genicular lobe rounded. Furcula of male present. Subgenital plate short conical in male, sharp at apex.

The genus is allied to *Sinopodisma* Chang (1940), but differs from the latter by prozona 1.5 times as long as metazona in length, posterior margin curved, without distinct shallow in the middle, lateral lobes of metasternum contiguous at apical part in male, and furcula of male present.

1. *Liaopodisma qianshanensis* Zheng, 1990.

Zheng, 1990. *Journal of Shaanxi Normal University (Natural Science Edition)*, 18(2): 59; Yin *et al.*, 1996. A Synonymic Catalogue of Grasshoppers and Their Allies of the World: (Orthoptera: Caelifera). 372; Zhong and Zheng, 2004. *Acta Zootaxonomica Sinica*, 29(1): 96; Li *et al.*, 2006. *Fauna Sinica, Insecta*, 43: 339.

Distribution: Qinshan (type locality), Liaoning, China.

Deposition of type specimens: Holotype ♂, allotype ♀, paratype 1 ♀, Shaanxi Normal University, Xi'an.

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2. *Liaopodisma taichungensis* sp. nov. (Figs. 1–6)

Holotype: ♂, paratypes 1 ♂, 1 ♀, Taiwan, Taichung, Kukuan, N 24°13', E 121°00'. 730 m, 1980-X-14–17, collected by K. S. Lin and C. H. Wang.

Type specimens are deposited in Taiwan Agricultural Research Institute, Taichung, China.

Male: Body small. Head shorter than pronotum. Vertex short and broad, oblique forward, width 3.0 times length at anterior margin of eyes. Frontal ridge with longitudinal sulcus, lateral ridge constructed slightly under median ocellus. Eyes oval, vertical diameter 1.3 times horizontal diameter, 2.0 times subocular furrows. Antennae filiform, long, reaching base of hind femur, length of a segment in middle of antennae is about 3 times width. Pronotum cylindrical, anterior margin almost straight, posterior margin curved, without weak shallow in middle; median keel of pronotum almost invisible, lateral carinae absent, three transverse sulci distinct; prozona 1.5 times metazona in length, length of lateral lobe of pronotum larger than high, anterior lower angle circular widely, posterior lower angle obtuse. Prosternal process conical. Width of lateral lobes of mesosternum larger than length, interspace of mesosternum backward broadening gradually. Lateral lobes of metasternum contiguous at apical part. Tegmina scaly, laterally, separated on the back, apex rounded, length 1.8 times width, extending over hind margin of first abdominal segment, covering tympanum, widened in the middle distinctly. Hind femur symmetrical, upper median carina smooth, lower lateral genicular lobe straight at lower margin. Hind tibia with 10 spines on inner and outer side, outer apical spine absent. Tympanum developed, tympanic cavity circle nearly. Furcula very small. Epiproct triangle, apex rounded, with longitudinal groove in middle. Cercus compressed, curved inward slightly, broadening strongly at base. Subgenital plate short conical, apex acute.

Female: Body median in size. Width of vertex 3 times length at anterior margin of eyes, twice width of frontal ridge between antennae, width between eyes 1.3 times as long as width between antennae. Frontal ridge with light longitudinal groove. Eyes oval, vertical diameter 1.4 times longer than horizontal diameter, 1.5 times subocular furrows. Antennae filiform, length of a segment in middle of antennae about twice width. Prozona 1.4 times metazona in length. Interspace of mesosternum nearly square, its length longer than minimum width. Lateral lobes of metasternum separated.

Tegmina scaly, laterally, length twice width. Epiproct triangle. Cercus short conical. Valves of ovipositor shorter, apex hooked. Hind margin of subgenital plate prominent in middle, apex triangle.

Coloration: Body yellowish-green. Antennae yellowish-brown. Black postocular band indistinct. Pronotum greenish-brown, lateral lobes of pronotum yellowish-green. Hind femur yellowish-green, upper lateral genicular lobes black, lower lateral genicular lobes black, other part yellowish-green. Hind tibiae green.

Measurement (in mm): Length of body: ♂ 21.5–22.4, ♀ 28.6. Length of pronotum: ♂ 4.9–5.8, ♀ 6.2. Length of tegmina: ♂ 3.5–3.9, ♀ 5.1. Length of hind femur: ♂ 12.8–13.0, ♀ 14.9.

Diagnosis: The new species is allied to *Liaopodisma qianshanensis* Zheng, 1990, but differs from the latter by: black postocular band indistinct; median keel of pronotum almost invisible; length of tegmen 1.8 times width in male; interspace of mesosternum in male backward broadening gradually, and hind tibia with 10 spines on outer side.

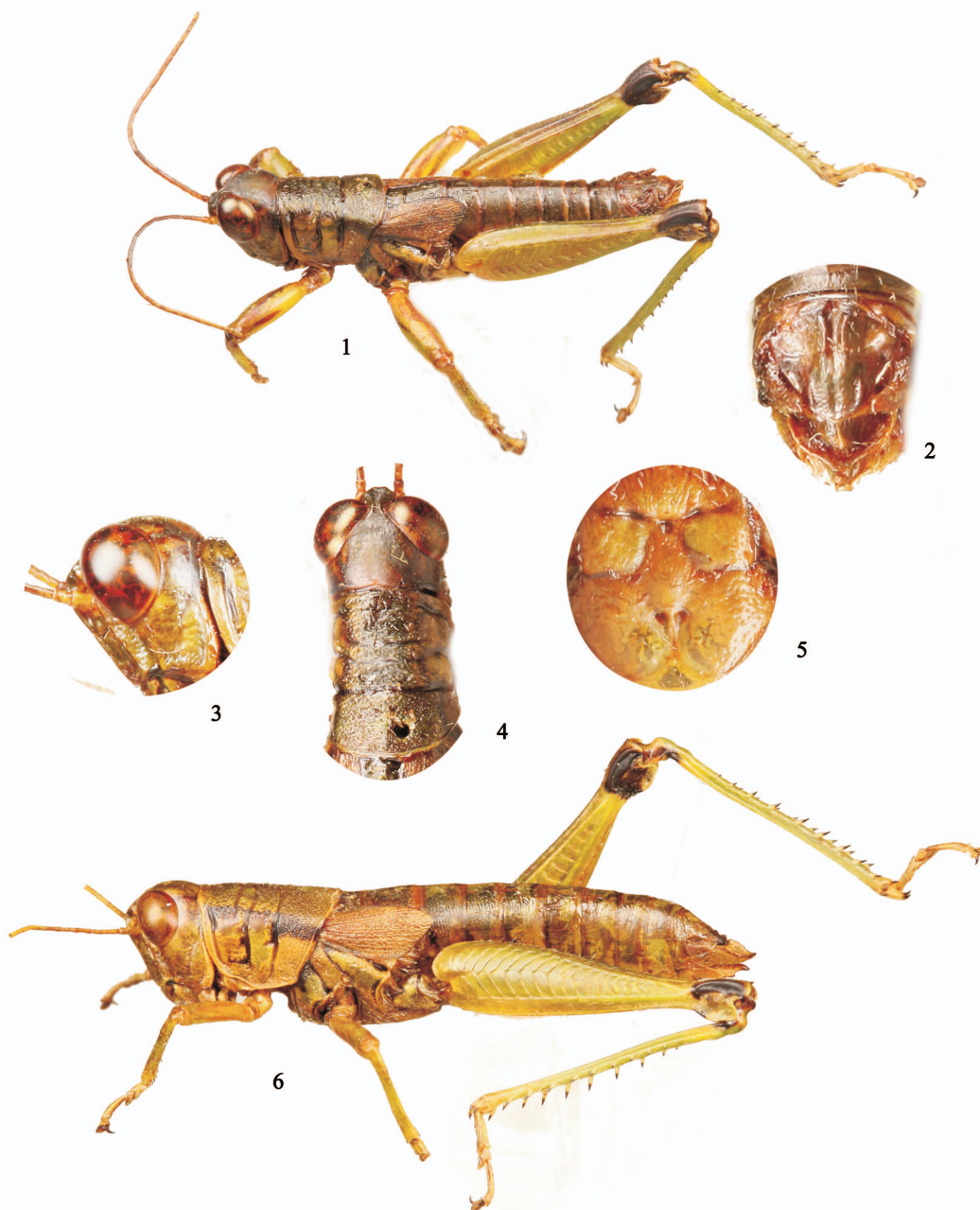
Etymology: The specific epithet is named for Taichung, the type locality.

3. *Liaopodisma taiwanensis* sp. nov. (Figs. 7–12)

Holotype: ♂, Taiwan Nanhunpo, 1924-IX-07, collected by T. Shiraki and J. Sonan.

Type specimen is deposited in the Department of Entomology, University of Taiwan, Taipei, China.

Male: Body median in size. Head shorter than pronotum. Vertex short and broad, oblique forward, width 4.0 times length at anterior margin of eyes. Frontal ridge with longitudinal sulcus, downward extended. Eyes oval, vertical diameter 1.2 times longer than horizontal diameter, and 1.6 times longer than subocular furrows. Pronotum cylindrical, anterior margin concave in middle, posterior margin curved, without weak shallow in middle; median keel of pronotum visible, lateral carinae absent, three transverse sulci distinct; prozona 1.5 times metazona in length, length of lateral lobe of pronotum longer than high, anterior lower angle circular widely, posterior lower angle obtuse. Prosternal process conical, apex pointed. Width of lateral lobes of mesosternum almost equal to length. Lateral lobes of metasternum contiguous at apical part. Tegmina scaly, laterally, separated on the back, apex rounded, length 3.0 times width, almost reaching hind margin of first abdominal segment,



Figs. 1–6 *Liaopodisma taichungensis* sp. nov.

1: Body, lateral view, ♂; 2: End of abdomen dorsal view, ♂; 3: Head, lateral view, ♂; 4: Head and pronotum, dorsal view, ♂; 5: Mesosternum and metasternum, ♂; 6: Body, lateral view, ♀.

covering tympanum, not widened in the middle, anterior and posterior margin almost parallel. Hind femur symmetrical, upper median carina smooth, lower lateral genicular lobes straight at lower margin. Hind tibia with 9 spines on inner and outer side, outer apical spine absent. Tympanum developed, tympanic cavity nearly circle. Furcula very small. Epiproct triangle, apex rounded, with longitudinal groove at base in middle. Cercus compressed, curved inward slightly, broadening slightly at base. Subgenital plate short conical, apex acute.

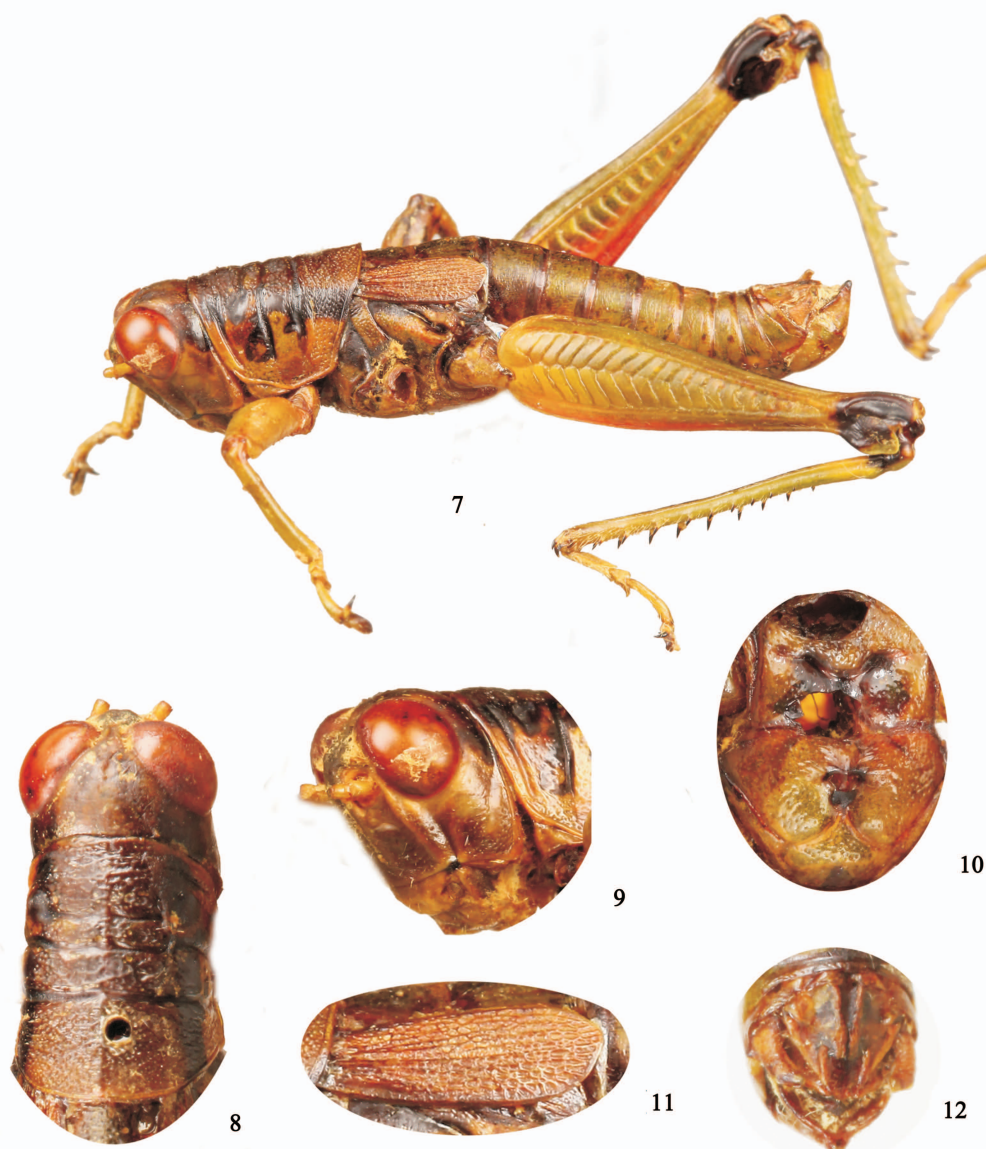
Coloration: Body yellowish-green. Black postocular band distinct. Pronotum greenish-brown, lateral lobes

of pronotum yellowish-green. Hind femur yellowish-green, red on lower side, upper lateral genicular lobes black, lower one black. Hind tibiae yellowish-green, black at base.

Measurement (in mm): Length of body: ♂ 25.7. Length of tegmina: ♂ 4.3. Length of pronotum: 6.1. Length of hind femur: ♂ 14.1.

Diagnosis: The new species differs from other two species of the genus *Liaopodisma* Zheng by the hind femur red on lower side and tegmen not widened in the middle, anterior and posterior margin almost parallel.

Etymology: The specific epithet is named for Taiwan, the type locality.



Figs. 7–12 *Liaopodisma taiwanensis* sp. nov. ♂
 7: Body, lateral view; 8: Head and pronotum, dorsal view; 9: Head, lateral view;
 10: Meso-metasternum, ventral view; 11: Tegmen; 12: End of abdomen.

Key to species of the genus *Liaopodisma* Zheng, 1990

- 1 Hind femur not red on lower side, tegmen widened in the middle distinctly 2
 Hind femur red on lower side, tegmen not widened in the middle, anterior and posterior margin almost parallel
 *Liaopodisma taiwanensis* sp. nov.
- 2 Black postocular band indistinct, median keel of pronotum almost invisible, length of tegmen 1.8 times width in male, interspace of mesosternum of male backward broadening gradually, and hind tibia with 10 spines on outer side *L. taichungensis* sp. nov.
 Black postocular band distinct, median keel of pronotum visible in metazona, length of tegmen 2.3 times width in male, interspace of mesosternum of male narrow in middle, and hind tibia with 8 spines on outer side *L. qianshanensis* Zheng, 1990

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中国辽秃蝗属的分类研究及二新种记述

(直翅目, 蝗总科, 斑腿蝗科, 秃蝗亚科)

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摘要: 记述了我国辽秃蝗属 *Liaopodisma* 3 个种, 包括 2 新种: 台中辽秃蝗 *Liaopodisma taichungensis* sp. nov. 和台湾辽秃蝗 *Liaopodisma taiwanensis* sp. nov.。台中辽秃蝗 *L. taichungensis* sp. nov. 同千山辽秃蝗 *L. qianshanensis* Zheng, 1990 近似, 不同之处为黑色眼后带不明显, 前胸背板中隆线几乎不见, 雄性前翅长为宽的 1.8 倍, 雄性中胸腹板中隔向后渐宽大, 雄性后足胫节外侧具 10 刺。台湾辽秃蝗 *L. taiwanensis* sp. nov. 的后足股节下侧红色, 前翅中部不加宽且前、后缘几乎平行, 可与本属其余 2 已知种区别。并附辽秃蝗属种检索表。

关键词: 直翅目; 蝗总科; 斑腿蝗科; 秃蝗亚科; 辽秃蝗属; 新种; 中国

中图分类号: Q969 **文献标志码:** A **文章编号:** 0454-6296(2013)10-1203-05

附录: 新种简记

1. 台中辽秃蝗, 新种 *Liaopodisma taichungensis* sp. nov. (图 1~6)

正模: ♂, 副模 1 ♂, 1 ♀, 台湾, 台中, 1980-X-14 - 17, 采集者: K. S. Lin 和 C. H. Wang。

词源: 新种种名源自模式标本产地地名“Taichung”。

模式标本保存于台湾农业试验所(台中)。

2. 台湾辽秃蝗, 新种 *Liaopodisma taiwanensis* sp. nov. (图 7~12)

正模: ♂, 台湾 Nanhunpo, 1924-IX-07, 采集者: T. Shiraki 和 J. Sonan。

词源: 新种种名源自模式标本产地地名“Taiwan”。

模式标本保存于台湾大学昆虫学系(台北)。

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