

A new species of *Macromotettixoides* (Orthoptera: Tetrigidae: Metrodorinae) from Yunnan, China

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Abstract: One new species of the genus *Macromotettixoides* Zheng, Wei & Jiang, 2005 is described and illustrated with photographs. *Macromotettixoides rugodorsalis* Li & Mao **sp. nov.** is similar to *M. jiuwanshanensis* Zheng, Wei & Jiang, 2005 and *M. wuyishana* Zheng, 2013, but differs from the latter two in: 1) anterior margin of vertex straight in dorsal view; 2) disc of pronotum densely covered with granules and tubercula, and hind process of pronotum with irregular wrinkled ridge; 3) lateral keels of prozona parallel, without humeral angle; and 4) lower margins of fore and middle femora with 2 large teeth each in base and middle.

Key words: Caelifera; pygmy locust; taxonomy

中国云南拟大磨蚱属一新种（直翅目：蚱科：短翼蚱亚科）

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摘要: 记述拟大磨蚱属 1 新种: 皱背拟大磨蚱 *Macromotettixoides rugodorsalis* Li & Mao **sp. nov.**, 提供了照片图。新种与九万山拟大磨蚱 *M. jiuwanshanensis* Zheng, Wei & Jiang, 2005 和武夷山拟大磨蚱 *M. wuyishana* Zheng, 2013 相似, 但以下面的特征区别于后两者: 背面观头顶前缘平直; 前胸背板背面密布颗粒和瘤突, 后突具不规则皱脊; 前胸背板沟前区侧隆线平行, 无肩角; 前足和中足下缘基部和中部各具 2 大齿突。

关键词: 蝗亚目; 蚱; 分类

Introduction

The original monotypic genus *Macromotettixoides* was erected by Zheng, Wei & Jiang in 2005 with *M. jiuwanshanensis* as type species. Afterwards, Zheng *et al.* (2006), Zheng & Shi (2009), Zheng, Wei & Li (2009), Deng (2011), Deng, Zheng & Yang (2012), Zheng (2013a), Deng *et al.* (2014), Zha *et al.* (2017) and Han, Li & Mao (2020) introduced a total of 10 new species. Meanwhile, Zheng *et al.* (2006), Deng (2016) and Zha *et al.* (2017) transferred another 6 species to this genus. As a result, so far 17 species of this genus are known in the

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world and all of them are distributed in China.

One new species, *Macromotettixoides rugodorsalis* Li & Mao **sp. nov.**, collected from Yunnan Province, China is described in this paper. An updated key to species of this genus is also provided.

Material and methods

Specimens were examined using a stereo microscope (Olympus SZX7) and photographed using a digital microscope (Keyence VHX-S550E). Morphological terminology and measurement landmarks follow Zheng (2005) and Tumbrinck (2014). Measurements are given in millimeters (mm). Type materials of this new species are deposited in the Biological Science Museum, Dali University (BMDU), Yunnan Province, China.

Taxonomy

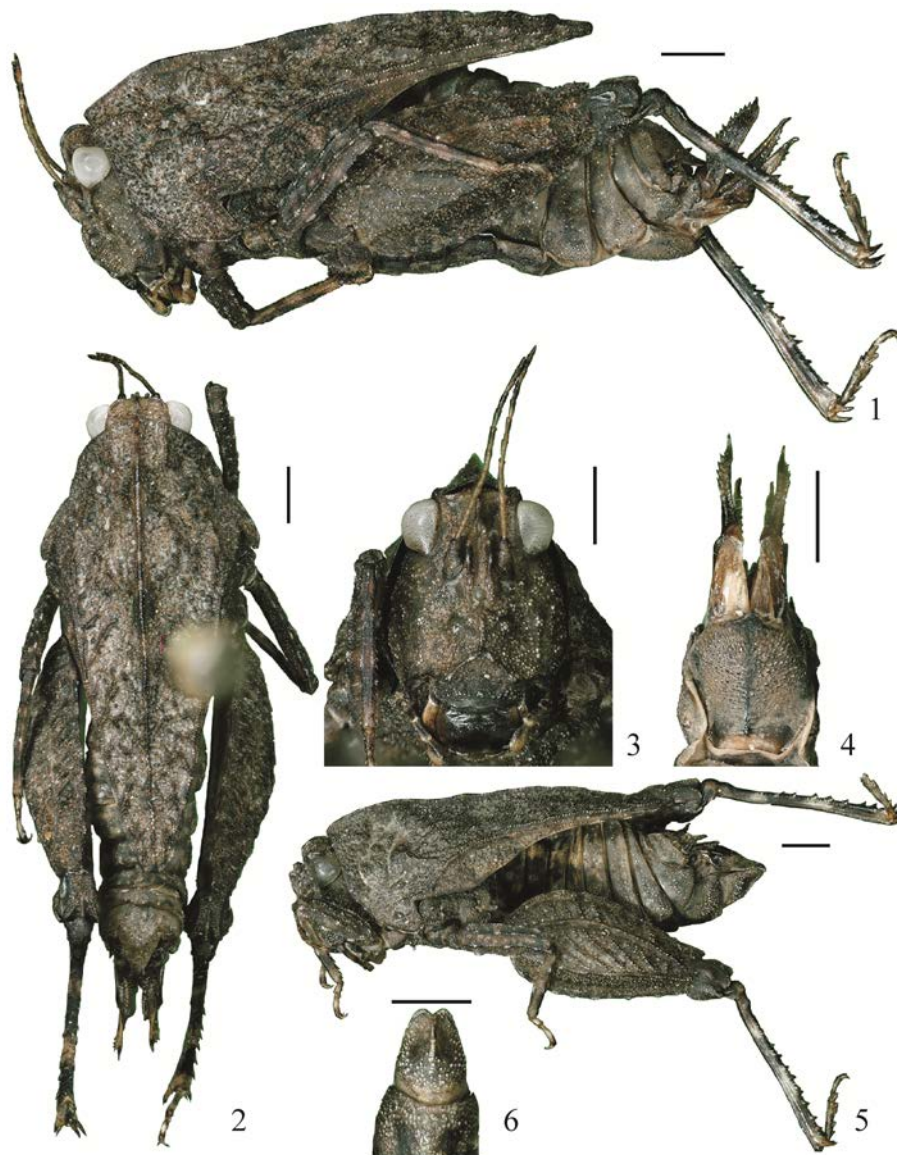
Key to the species of *Macromotettixoides* Zheng, Wei & Jiang

1. Antegenicular denticle absent; alae slightly elongate and nearly reaching middle of hind femur, visible.....
.....*M. aelytra** (Zheng, Li & Shi)
- . Antegenicular denticle present; alae very small and far from middle of hind femur, usually invisible 2
2. Pronotum flattened, nearly at the same level 3
- . Pronotum distinctly roof-like in lateral view..... 5
3. Anterior margin of pronotum broadly arcuate forward; humeral angles also broadly arcuate
.....*M. hainanensis* (Liang)
- . Anterior margin of pronotum truncated; humeral angles obtuse angled..... 4
4. Prozonal carinae contracted backward; hind process reaching middle of hind femur; vertex 1.4 times as wide as one eye.....
.....*M. taiwanensis* (Liang)
- . Prozonal carinae parallel; hind process reaching knee of hind femur; vertex 2.0 times as wide as one eye.....
.....*M. parvula* Zha & Wen
5. Anterior margin of pronotum obtusely angled forward 6
- . Anterior margin of pronotum truncated..... 10
6. Upper margin of pronotum wholly arcuate or nearly straight in lateral view 7
- . Upper margin of pronotum arcuate only before shoulders while straight or undulated behind shoulders in lateral view..... 9
7. Humeral angle obtusely angular; lower margins of fore and middle femora straight; anterior margin of vertex angled or arcuate 8
- . Humeral angle indistinct; lower margins of fore and middle femora with 2 large teeth; anterior margin of vertex straight.....
.....*M. rugodorsalis* Li & Mao **sp. nov.**
8. Vertex 3.0 times as wide as one eye, anterior margin obtusely angled; vertex together with frontal costa obtuse rounded; paired interhumeral carinae present.....
.....*M. wuyishana* Zheng
- . Vertex 2.1 times as wide as one eye, anterior margin arcuate; vertex together with frontal costa right angled; interhumeral carina absent
.....*M. jiuwanshanensis* Zheng, Wei & Jiang
9. Longitudinal furrow between antennae 1.6 times as wide as diameter of scapus; pronotal disc with many net-like wrinkles; humeral angles indistinct; fore and mid femora with lower margins a little undulate 8

-*M. lativertex* Deng *et al.*
- . Longitudinal furrow between antennae as wide as diameter of scapus; pronotal disc smooth; humeral angles arcuate; fore and mid femora with lower margins straight..... *M. brachynota* Zheng & Shi
10. Pronotum with shoulders inclined, humeral angle indistinct..... 11
- . Pronotum with shoulders relatively flat, humeral angle distinct..... 14
11. Antennal sockets situated below the level of ventral margins of eyes, or the upper margins of antennal base segments level with the ventral margins of eyes at most..... 12
- . Antennal sockets distinctly situated between the level of ventral margins of eyes..... 13
12. Prozonal carinae running parallel; hind process with netted keels, apex narrow and concave
..... *M. undulatifemura* Deng, Zheng & Yang
- . Distance between prozonal carinae gradually narrowed backward; hind process with tubercula and paired thick keels, apex relatively broad and rounded..... *M. tuberculata* Mao, Li & Han
13. Hind process shorter, reaching 2/3 of hind femora, apex concave; vertex broader, 2.0 times as wide as one eye in female.....*M. curvimarginus* (Zheng & Xu)
- . Hind process longer, approaching knee of hind femora, apex truncated; vertex narrower, 1.6–1.8 times as wide as one eye in female..... *M. truncata* Mao, Li & Han
14. Upper margin of pronotum, in lateral view, arcuate only before humeral angles while straight or undulated behind humeral angles..... 15
- . Upper margin of pronotum wholly straight in lateral view..... 16
15. Antennal sockets situated between the level of ventral margins of eyes; hind process reaching middle of hind femur; lower margin of mid femur undulate *M. cliva* Zheng *et al.*
- . Antennal sockets situated below the level of ventral margins of eyes; hind process reaching knee of hind femur; lower margin of mid femur straight *M. wufengensis* Zheng, Wei & Li
16. Vertex 2.14 times as wide as one eye; humeral angle broadly arcuate.....
..... *M. badagongshanensis* (Zheng)
- . Vertex 1.3–1.6 times as wide as one eye; humeral angle broadly obtuse..... 17
17. Vertex 1.3 times as wide as one eye; hind process distally narrow, apex truncated; first segment of hind tarsus with three pulvilli equal in length *M. zhengi* Deng
- . Vertex 1.6 times as wide as one eye; hind process distally broad, apex narrowly rounded; first segment of hind tarsus with three pulvilli gradually increasing in length *M. longling* Deng
- * We agree with Zha *et al.* (2017) who regarded the type specimen (a single female) of *M. aelytra* (Zheng, Li & Shi, 2002) to be a nymph whose antegenicular denticle and genicular denticle have not been separated. So it is necessary to collect more specimens in the future in order to confirm the validity of *M. aelytra*.

***Macromotettixoides rugodorsalis* Li & Mao sp. nov.** (Figs. 1–6)

Female. Body size small, covered with numerous granules and tubercula on surface. Head not exerted above the pronotal surface (Fig. 1). Vertex broad, contracted forward, 2.5–2.6 times as wide as one eye, with paired fossulae, anterior margin straight and slightly protruding before eyes, anterior part of lateral carina distinctly folded upward; median carina conspicuous and erected in anterior half; in lateral view, fastigium of vertex together with frontal costa rounded (Figs. 1, 2); frontal costa concave between lateral ocelli, and protruding as arch between antennae, width of longitudinal furrow of frontal ridge between antennae 1.3–1.4 times width of first segment of antennae. Antennae filiform, 16-segmented, inserted slightly below lower margin of eyes, middle segments of antennae about 3.2 times as long as wide (Fig. 3). Eyes globose. Lateral ocelli placed below middle of inner margins of eyes.



Figures 1–6. *Macromotettixoides rugodorsalis* Li & Mao **sp. nov.** 1–4. ♀; 5, 6. ♂. 1, 5. Body, lateral views; 2. Body, dorsal view; 3. Head, frontal view; 4, 6. Subgenital plate, ventral views. Scale bars = 1 mm.

Pronotum tectiform in dorsal view, anterior margin of pronotum obtusely angled forward, upper margin of pronotum arched in lateral view (Figs. 1, 2); disc of pronotum very coarse and uneven, densely covered with granules and tubercula; median carina of pronotum entire and distinct, lateral keels of prozona parallel, humeral angle indistinct, interhumeral carinae between shoulders absent; hind process of pronotum short cone-shaped, with irregular wrinkled ridges, apex nearly rounded, approaching or slightly surpassing the knee of hind femora; external lateral carina and lower margin of pronotum coming together behind the

middle of the pronotum; lateral lobe of pronotum with posterior angle turning downwards, apex truncated, posterior margins of lateral lobes of pronotum with one concavity (Figs. 1, 2, 5). Tegmina and alae absent. Lower margins of fore and middle femora with 2 large teeth each in base and middle (lower margins of fore femora with 3 teeth in an individual); hind femora stout, 2.3–2.4 times as long as wide, upper outside with 2–3 large strumae, upper and lower margins finely serrate, antegenicular and genicular denticles nearly right angled, outer and inner sides of hind tibiae with 6 and 5–6 spines respectively, first tarsal segment 1.5 times as long as the third one, three pulvilli larger in turn, apices of the first and the second pulvilli sharp, and apex of the third pulvillus rectangular (Figs. 1, 5). Ovipositor narrow and long, upper valve 3.5 times as long as wide, upper and lower valve with slender saw-like teeth. Posterior margin of subgenital plate nearly rounded, with an acute triangular projection in middle (Fig. 4), and slightly folded upward.

Body brown or dark brown. Hind tibia black, with two light rings in the base and middle.

Male. Slightly smaller than female. Vertex 2.3 times as wide as one eye. Longitudinal furrow of frontal ridge between antennae 1.3 times as wide as first segment of antennae. Antenna with middle segments 3.5 times as long as wide. Hind femur 2.2 times as long as wide. Subgenital plate short cone-shaped, apex bifurcate (Fig. 6). Other characters same as female.

Measurements. Length of body ♀ 9.5–10.5 mm, ♂ 9.0 mm; length of pronotum ♀ 7.4–7.9 mm, ♂ 6.9 mm; length of hind femur ♀ 5.1–5.3 mm, ♂ 4.9 mm.

Holotype. ♀, **China**, Yunnan, Yongping, 25°11'N, 99°31'E, alt. 2374 m, 28-VII-2019, leg. Benyong MAO. **Paratypes.** 3♀1♂, leg. Miao LI, Benyong MAO & Fengxu YIN, other data same as holotype. Type specimens are deposited in the BMDU.

Distribution. China (Yunnan).

Diagnosis. This species is similar to *M. jiuwanshanensis* Zheng, Wei & Jiang and *M. wuyishana* Zheng, but differs in: anterior margin of vertex straight in dorsal view; disc of pronotum densely covered with granules and tubercula, and hind process of pronotum with irregular wrinkled ridge; lateral keels of prozona parallel, humeral angle indistinct; lower margins of fore and middle femora with 2 large teeth each in base and middle.

Etymology. The specific epithet *rugodorsalis* refers to hind process of pronotum covered with irregular wrinkled ridges.

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