

One new species of *Tetrix* Latreille (Orthoptera: Tetrigidae: Tetriginae) from China

Yao DENG¹, Mengqi WANG¹, Benyong MAO^{1,2①}

1. College of Agriculture and Biology Science, Dali University, Dali, Yunnan 671003, China

2. Collaborative Innovation Center for Biodiversity and Conservation in the Three Parallel Rivers Region of China, Dali, Yunnan 671003, China

Abstract: One new species, *Tetrix cangshanensis* sp. nov., is described and illustrated with photographs. *Tetrix cangshanensis* sp. nov. is similar to *T. parabipunctata* Zheng & Ou, 2004 and *T. bipunctata* (Linnaeus, 1758), but differs from the latter two by the straight facial carinae before superior ocelli in lateral view, by higher position of antennae insert, and by straight anterior margin of pronotum; from *T. parabipunctata* by short hind wing; and from *T. bipunctata* by narrow longitudinal furrow of facial carinae between antennae, by prozonal carinae constricted retrad, and by undulated lower margin of middle femur. Type specimens are deposited in the Biological Science Museum, Dali University (BMDU).

Key words: Caelifera; pygmy locust; taxonomy

中国蚱属一新种记述（直翅目：蚱科：蚱亚科）

邓瑶¹, 王梦琪¹, 毛本勇^{1,2①}

1. 大理大学农学与生物科学学院, 云南 大理 671003; 2. 中国三江并流区域生物多样性协同创新中心, 云南 大理 671003

摘要: 记述蚱属 1 新种: 苍山蚱 *Tetrix cangshanensis* sp. nov., 提供了新种的形态特征照片图。苍山蚱 *Tetrix cangshanensis* sp. nov. 与拟二斑蚱 *T. parabipunctata* Zheng & Ou, 2004 和二斑蚱 *T. bipunctata* (Linnaeus, 1758) 相似, 但以直的面面隆起, 较高的触角着生位置和直的前胸背板前缘区别于后者, 同时以较短的后翅区别于拟二斑蚱; 还以较狭的面面隆起纵沟, 向内收缩的沟前区侧隆线和波曲的中足股节下缘区别于二斑蚱。

关键词: 蝗亚目; 蚱; 分类

Introduction

The genus *Tetrix* Latreille, 1802 (Tetriginae: Tetrigidae) was erected with *Gryllus subulatus* Linnaeus, 1758 (= *Tetrix subulata* (Linnaeus, 1758)) from Northern Europe (Sweden) as its type (Latreille 1802), and currently includes 175 species and subspecies (Cigliano *et al.* 2021). They are mainly distributed in Asia, Europe, Africa, Australia and North America (Shishodia 1991; Yin *et al.* 1996; Jiang & Zheng 1998; Liang & Zheng 1998; Zheng 2005;

Accepted 15 July 2021. Published 25 September 2021. Published online 30 August 2021.

① Corresponding author, E-mail: 2401531429@qq.com

Deng *et al.* 2007; Storozhenko *et al.* 2015), of which 119 species are in China with 39 species in Yunnan.

While examining the specimens in the Biological Science Museum, Dali University (BMDU), a new species of *Tetrix* was found: *Tetrix cangshanensis* **sp. nov.** from Yunnan Province, China. Type specimens are deposited in the BMDU. Morphological terminology and measurement landmarks follow those of Zheng (2005), Deng *et al.* (2007), Tumbrinck (2014) and Muhammad *et al.* (2018). Measurements are given in millimeters (mm). Specimens were photographed using a stereomicroscope (Keyence VHX-S550E) equipped with a digital microscopic system. Plates were processed with Adobe Photoshop® 2020 software.

Taxonomy

Tetrix cangshanensis **sp. nov.** (Figs 1–14)

Female. Size small, surface covered with numerous small granules and less tubercula (Fig. 1).

Head. Head not exerted over the level of anterior margin of pronotum. In dorsal view, vertex as high as anterior margin of pronotum, but weakly higher than upper margin of eye; width between supraocular lobes 2.2 times as wide as an eye; anterior margin arched, clearly protruding anterior margin of eyes; lateral carinae upward turned and slightly surpassing upper margin of eye, retrad reaching supraocular lobes; medial carina clearly elevated and surpassing upper margin of eye in fore half, obsolete in back half of vertex, clearly visible before eyes; paired fossulae distinctly elongate, almost touching the anterior margin of vertex. In profile, frontal costa together with medial carina of vertex nearly circularly rectangular and obviously visible before eyes, bifurcated into facial carinae above paired ocelli; facial carinae straight, not concave before superior ocelli, between antennae anteriorly arcuate. In frontal view, facial carinae clearly narrow above paired ocelli, then gradually expanded; longitudinal furrow between antennae deep, 0.8 times as wide as the diameter of antennal scapus; lateral ocelli placed on the middle of anterior margins of eyes. Antennae filiform, short, inserted at lower 1/3 of internal margin of eyes, lower margin of antennal grooves at the level of lower margin of eyes, 14–15 segments, 7th–9th segments longest and 2.5–3.0 times long as wide. Eyes globose, distinctly lower than the top of vertex and anterior margin of pronotum.

Thorax. Pronotum slightly tectiform, nearly roof-like. In dorsal view, disc of pronotum with numerous small and less irregular tubercula; slightly rugged before and after shoulder, anterior margin straight; prozonal carinae distinct and long, extending to the anterior sulcus and clearly constricted inward; median carina conspicuous and complete, rarely interrupted; 1st and 2nd metamedial projections with base slightly swollen; humeral angle obtuse; interhumeral carinae present; hind process cone-shaped, not reaching apex of hind femur. In profile, upper margin of pronotum undulated or arched; hind process with internal lateral carina forward extending to humeral angle; humero-apical carina conspicuous; external lateral carina nearly ending at the basal 1/5 of hind femur, and slightly curved upward, nearly touching internal lateral carina; infrascapular area narrow. In lateral view, lateral lobe of pronotum with extralateral carina, posterior angle extending backwards and downwards, apex of angles round; tegminal and ventral sinuses presented. Tegmen with visible part long oval, apex rounded, 2.4–3.1 times as long as wide. Hind wing short, slightly surpassing the hind

margin of 2nd tergite in most individuals or 3rd tergite in a few, slightly surpassing basal 1/5 of hind femur. Fore and middle femora distinctly compressed, upper margins straight, slightly serrulate, lower margin undulated; middle femur, 3.5–4.7 times as long as wide, 1.1–1.3 times as wide as the visible part of tegmen. Hind femur stout, 2.7 times longer than wide, upper and lower margins thinly serrated, but basal part of margin smooth, antegenicular right-angle shaped, genicular denticles obtuse angle shaped; hind tibia with 8–10 spines on outer side, 7–8 spines on inner side; first tarsus longer than the third; three pulvilli larger in turn, the apices of first and third pulvilli obtuse, second nearly rectangular.

Abdomen. Ovipositor narrow and long, upper valve 3.9 times as long as wide, upper margin of upper valvula and lower margin of lower valvula armed with strong and sparse saw-like teeth. Subgenital plate 1.2 times as long as wide, hind margin with a strongly triangular protection in the middle, apex acute, deeply concave on both sides.

Coloration. Body gray-black or yellow-brown in dorsal view. Antenna yellow-brown, apical segments dark. Tegmen black or brown. Hind wing yellow-brown. Fore and mid legs brown with 4–5 big yellow spots. Hind tibia brown or yellow-brown.

Male. Similar to female, but body smaller. Vertex with width between supraocular lobes 2.0–2.3 times as wide as an eye. Pronotum with disc relatively smooth in dorsal view, only with numerous small granules, and upper margin slightly undulated or not undulated in profile. Middle femur slightly compressed and wide; outer side of hind tibia with 7–9 spines, inner side with 6–7 spines. Subgenital plate short and narrow, cone-shaped, apex truncated. Body yellow in dorsal view and brown-yellow in lateral view.

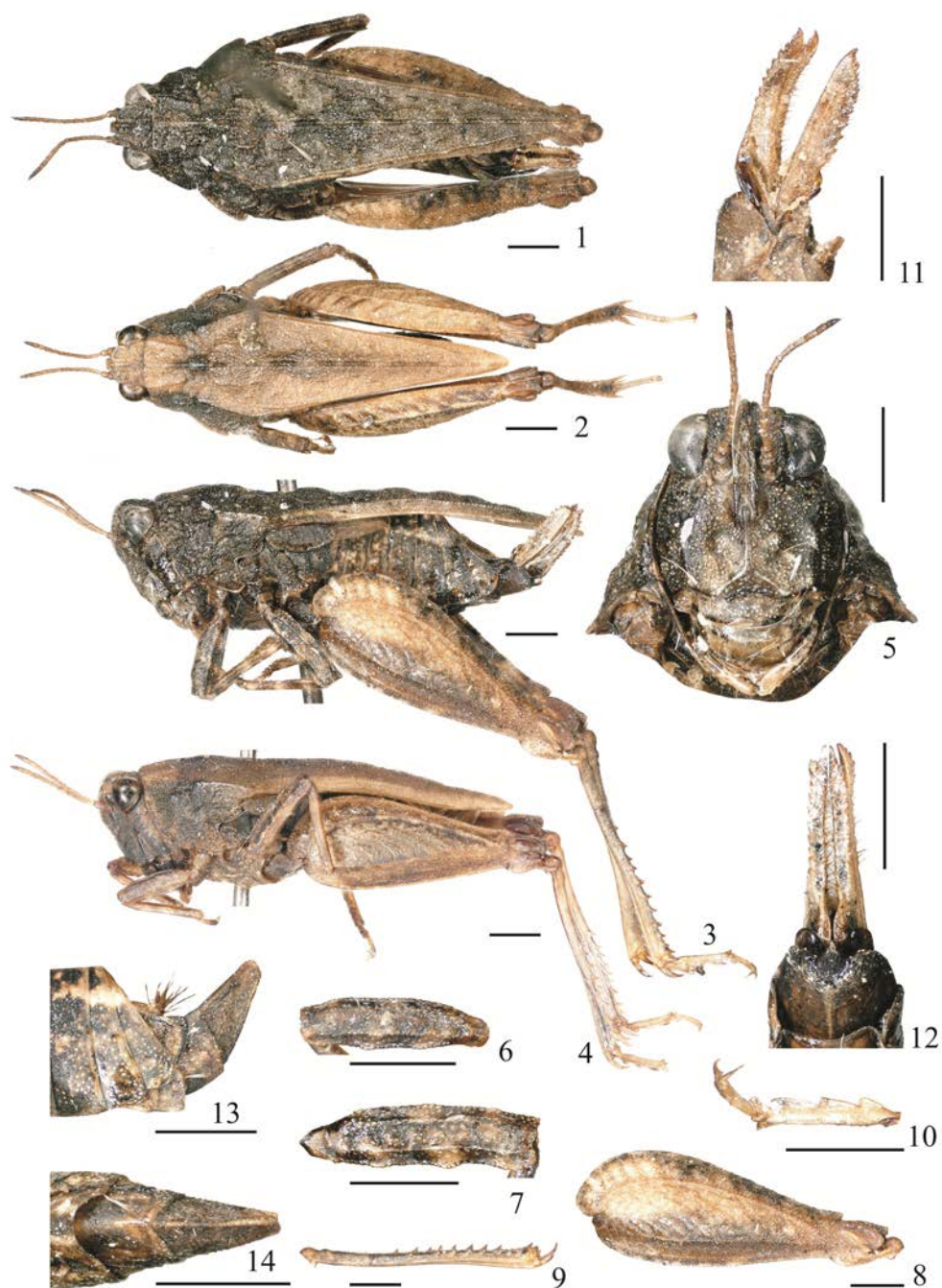
Measurements (mm). Length of body ♀ 8.1–8.8, ♂ 6.3–6.9; length of pronotum ♀ 6.6–8.0, ♂ 6.5–6.7; width of pronotum ♀ 3.0–3.3, ♂ 2.7–2.9; length of hind femur ♀ 4.8–5.4, ♂ 4.5–4.9.

Holotype. ♀, **China**, Yunnan, Dali, Cangshan Mountain, 25°45'N, 100°06'E, alt. 2096 m, 20-VIII-2002, leg. Jishan XU, BMDU. **Paratypes.** 12♀6♂, the same data as holotype; 16♀5♂, Yunnan, Dali, Yangbi, 25°41'N, 99°59'E, alt. 2028 m, 06-VI-2004, leg. Jishan XU & Yiwei DING; 5♀10♂, Yunnan, Dali, Xiaguan, 25°36'N, 100°14'E, alt. 2000–2800 m, 22-V-2007, leg. Jishan XU & Yanwen LI. Type specimens are deposited in BMDU.

Distribution. China (Yunnan).

Etymology. The specific epithet indicates the type locality in Cangshan Mountain, Yunnan Province.

Diagnosis. *Tetrix cangshanensis* **sp. nov.** is similar to *Tetrix parabipunctata* Zheng & Ou, 2004 and *T. bipunctata* (Linnaeus, 1758), but differs from the latter two by the straight facial carinae before superior ocelli in lateral view (slightly concave in the latter two), antennae inserted at lower 1/3 of internal margin of eyes (inserted between lower margin of eyes in the latter two), anterior margin of pronotum straight (obtuse angle protruding in the latter two); from *T. parabipunctata* by short hind wing which slightly surpasses the hind margin of 2nd or 3rd tergite (reaching base of supra-anal plate in *T. parabipunctata*); from *T. bipunctata* by facial carinae with longitudinal furrow between antennae narrower than the diameter of antennal scapus (wider, in *T. bipunctata*), prozonal carinae retrad constricted (parallel in *T. bipunctata*), lower margin of middle femur undulated (straight in *T. bipunctata*).



Figures 1–14. *Tetrix cangshanensis* **sp. nov.** 1, 2. Female and male bodies, dorsal view; 3, 4. Female and male bodies, lateral view; 5. Female head, frontal view; 6–8. Left fore, middle and hind femora, lateral view; 9. Left hind tibia, lateral view; 10. Left hind tarsi, lateral view; 11. Ovipositor of female, lateral view; 12. Female subgenital plate, ventral view; 13. Male subgenital plate, lateral view; 14. Male subgenital plate, ventral view. Scale bars = 1 mm.

Acknowledgements

This project was supported by the National Natural Science Foundation of China (31760628, 31960110), the Yunnan Provincial Education Department's Science Research Foundation Projects (2020Y0485), and the project of the Integrated Scientific Expedition of the Cangshan Erhai National Nature Reserve.

References

- Cigliano MM, Braun H, Eades DC & Otte D. Orthoptera species file. Version 5.0/5.0. Available from: <http://Orthoptera.SpeciesFile.org> (Accessed 20 April 2021).
- Deng WA, Zheng ZM & Wei SZ. 2007. *Fauna of the Tetrigoidea from Yunnan and Guangxi*. Guangxi Science & Technology Press, Nanning, 458 pp.
- Jiang GF & Zheng ZM. 1998. *Grasshoppers and Locusts from Guangxi*. Guangxi Normal University Press, Guilin, 390 pp.
- Linnaeus. 1758. *Systema Naturae per Regna tria naturae, secundum classes ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Editio decem, Holmiae (Stockholm), 824 pp.
- Latreille PA. 1802. *Histoire naturelle générale et particulière des crustacés et des insectes: ouvrage faisant suite aux Oeuvres de Leclerc de Buffon, et partie du Cours complet d'histoire naturelle rédigé par CS Sonnini (Vol. 73)*. Dufart, Paris, 432 pp.
- Liang GQ & Zheng ZM. 1998. *Fauna Sinica, Insecta, Vol. 12, Orthoptera, Tetrigoidea*. Science Press, Beijing, 278 pp.
- Muhammad AA, Tan MK, Abdullah NA, Azirun MS, Bhaskar D & Skejo J. 2018. An annotated catalogue of the pygmy grasshoppers of the tribe Scelimenini Bolívar, 1887 (Orthoptera: Tetrigidae) with two new *Scelimena* species from the Malay Peninsula and Sumatra. *Zootaxa*, 4485(1): 1–70.
- Storozhenko SY, Kim TW & Jeon MJ. 2015. *Monograph of Korean Orthoptera*. National Institute of Biological Resources, Incheon, 377 pp.
- Shishodia MS. 1991. *Taxonomy and Zoogeography of the Tetrigoidea (Orthoptera: Tetrigoidea) of North Eastern India*. Jnanodaya Press, Calcutta, 204 pp.
- Tumbrinck J. 2014. Taxonomic revision of the Cladonotinae (Orthoptera: Tetrigidae) from the islands of South-East Asia and from Australia, with general remarks to the classification and morphology of the Tetrigidae and descriptions of new genera and species from New Guinea and New Caledonia. *Biodiversity, Biogeography and Nature Conservation in Wallacea and New Guinea*, 434: 345–396.
- Yin XC, Shi JP & Yin Z. 1996. *Synonymic Catalogue of Grasshoppers and their Allies of the World (Orthoptera: Caelifera)*. China Forestry Publishing House, Beijing, 1266 pp.
- Zheng ZM. 2005. *Fauna of the Tetrigoidea from Western China*. Science Press, Beijing, 501 pp.