

CORRESPONDENCE

Contribution to the knowledge of Chinese Phasmatodea IX: First report of Xeroderinae (Phasmatodea: Phasmatidae) from China

Wai-Chun George Ho

Hong Kong Entomological Society, P.O. Box No.73749, Kowloon Central Post Office, Hong Kong, China; E-mail: georgehwc@hotmail.com

Abstract This paper reports the subfamily Xeroderinae Günther, 1953 and the genus *Xenophasmina* Uvarov, 1940 for the first time from China; describes a new genus and a new species, *Sinoxenophasmina abbreviatum* **gen. & sp. nov.**, from Yunnan, China; suggests a new combination and a new synonym, *X. bedoti* (Redtenbacher, 1908) **comb. nov.** (= *X. similis* Redtenbacher, 1908 **syn. nov.**); and reports two new record species, *X. bedoti* (Redtenbacher, 1908) **comb. nov.** and *X. fimbriatum* (Redtenbacher, 1908), from China.

Key words Stick insects, new genus, new species, new combination, new synonym, China.

The subfamily Xeroderinae Günther, 1953 comprises nine genera and 20 species and is principally distributed from tropical Asia to Australasia (Otte & Brock, 2005; Hennemann & Conle, 2008; Brock *et al.*, 2020). *Xenophasmina* Uvarov, 1940 is the only genus found in continental Southeast Asia while other genera occur in the Australian Region and neighbouring islands. Until now, no taxa of Xeroderinae have been recorded in China. This paper reports the first occurrence of Xeroderinae and *Xenophasmina* from China, with the descriptions of two new taxa, the suggestions of two new nomenclatures and the reports of two new species for China.

The examined materials were pinned and dried. The systematic treatment is according to Otte & Brock (2005), Hennemann & Conle (2008), Simon *et al.* (2019) and Brock *et al.* (2020). The sequence of genera and species is in alphabetical order. Morphological terms follow Bragg (2001), Zompro (2004) and Bradler (2009). Taxonomic descriptions refer to Clark (1976, 1988, 1998), Clark-Sellick (1997) and Zompro (2004). All measurements are given in millimetres (mm). The types are deposited in Hong Kong Entomological Society, Hong Kong, China (HKES).

Xeroderinae Günther, 1953

Xeroderinae Günther, 1953: 547. Type genus: *Xeroderus* Gray, 1835.

Distribution. Tropical Asia to Australasia.

Remarks. Xeroderinae currently consists of 10 genera (Brock *et al.*, 2020). Hennemann & Conle (2008: 52) provided a taxonomic note for this subfamily. This is the first time this subfamily reported in China. A total of two genera and three species are recognised.

Sinoxenophasmina **gen. nov.**

Type species: *Sinoxenophasmina abbreviatum* **sp. nov.**, by present designation.

urn:lsid:zoobank.org:pub:266A52A4-95FC-4797-A2C1-98C960C4D19C

Received 19 September 2020, accepted 10 March 2021

Executive editor: Fuqiang Chen

Diagnosis. *Sinoxenophasmina* **gen nov.** is closely related to *Xenophasmina* Uvarov, 1940, but can be distinguished by the smaller size, the less robust body, the gently convex occiput of head, the absence of foliaceous lateral lobes on the terminal abdominal tergites and the subcylindrical cerci in the both sexes and the oval egg capsule.

Description. Small size. Apterous. Body slender, subcylindrical, with sparse granulations. Head rounded. Occiput gently convex. Pronotum trapezoidal. Mesonotum parallel-sided. Metanotum as long as median segment in female, longer than median segment in male. Female seventh sternum lacking praeopercular organ. Male anal segment non-spilt, with weakly emarginated posterior margin, female with rounded posterior margin. Supra-anal plate indistinct. Male poculum small, cup-shaped. Female subgenital plate scoop-shaped. Cerci subcylindrical, nearly flattened, lanceolate. Legs slender and lacking noticeable armature. Femora and tibiae triangular in cross-section, waved with elevations.

Distribution. China.

Remarks. This new genus only includes the type species *Sinoxenophasmina abbreviatum* **sp. nov.**

Etymology. The specific epithet of this new genus is derived from the Latin words 'Sino' (= China) and 'xenophasmina' referring to the close relationship with *Xenophasmina* Uvarov, 1940.

***Sinoxenophasmina abbreviatum* sp. nov.** (Figs 1–11)

Diagnosis. As in the generic diagnosis.

Description. Female. Small size. Apterous. Body distinctly larger and more robust than male. General colouration of body brown, legs brown with light brown markings. Head rounded, sparsely covered with small granules. Vertex and occiput gently convex. Median and lateral longitudinal furrows distinct. Compound eyes small and rounded, its length about two times of genae. Antennae sparsely covered with short bristles, apices reaching protarsi; scapus flattened basally, longer than pedicellus, as long as third segment. Pronotum trapezoidal, gently constricted posteriorly, shorter than head; anterior margin thickened, gently curved inwards, posterior margin truncate, transverse and longitudinal sulci crossing before middle point. Mesonotum parallel-sided, longer than combined length of metanotum and median segment, median longitudinal carina distinct, sparsely covered with a few small granules and a few oblong granules. Metanotum as long as median segment, gently expanded posteriorly, median longitudinal carina distinct, sparsely covered with a few small granules. Mesopleurae with a few small granules. Mesopleurae with short hairs on lower margin. Mesosternum and metasternum lacking granulation. Abdomen cylindrical, tapering posteriorly. Sparsely covered with a few small granules, median and lateral longitudinal carinae distinct. Median segment longer than wide. Seventh sternum lacking praeopercular organ. Eighth tergum longer than ninth tergum. Anal segment roughly as long as ninth tergum, medially constricted posteriorly, posterior margin rounded. Subgenital plate scoop-shaped, flattened, tapering posteriorly, apex pointed and reaching posterior margin of anal segment. Cerci short, subcylindrical and nearly flattened, apices pointed and surpassing posterior margin of anal segment. Legs slender and long, unarmed, covered with short hairs. Femora thicker than corresponding tibiae, triangular in cross-section. Profemora gently curved basally, posterodorsal carina indistinct, anterodorsal and posteroventral carinae waved with small elevations, anteroventral carina lacking elevation. Posterodorsal carina of mesofemora indistinct, anterodorsal carina waved with indistinct elevations, posteroventral carina waved with small elevations, anteroventral carina lacking elevation. Anterodorsal carina metafemora indistinct, posterodorsal and posteroventral carinae lacking elevation, anteroventral carina waved with small elevations. Tibiae roughly as long as corresponding femora. Posteroventral carina of protibiae and mesotibiae and anteroventral carina of metatibiae waved with small elevations, other carinae lacking elevation.

Male. Small size. Apterous. Body slender, similar to female, distinctly thinner and more slender than female. General colouration of body and legs greenish brown. Head sparsely covered with a few small granules. Rounded, vertex and occiput gently convex, median and lateral longitudinal furrows distinct. Compound eyes small and rounded, its length about two times of genae. Antennae long and filiform; scapus flattened basally, longer than pedicellus; and third segment longer than combined length of scapus and pedicellus. Thorax wrinkled. Pronotum trapezoidal, gently constricted posteriorly, as long as head; anterior margin thickened, gently curved inwards, posterior margin truncate, transverse and longitudinal sulci crossing before middle point. Mesonotum parallel-sided, longer than combined length of metanotum and median segment. Metanotum longer than median segment. Lower margin of mesopleurae with short hairs. Abdomen slender and cylindrical, surface gloss. Median segment rectangular, longer than wide. Second to sixth tergites parallel-sided. Eighth tergum expanded posteriorly, longer than ninth tergum. Anal segment roughly as long as ninth tergum, gently tapering posteriorly, posterior margin thickened, weakly emarginated. Poculum small, cup-shaped, posterior margin rounded and reaching anterior area of anal segment. Cerci subcylindrical, nearly flattened, short, weakly curved inwards, apices surpassing posterior margin of anal segment. Legs slender and long, covered with short hairs. Femora thicker than corresponding tibiae, more or less triangular in cross-section, medioventral carina with a few minute teeth subapically. Profemora curved basally, posterodorsal carina indistinct, anterodorsal carina with a minute tooth near middle area. Tibiae roughly as long as corresponding femora.

Apical part of vomer symmetrical, gradually constricted apically, apex pointed.

Measurements. Body length, ♀ 61.0 mm, ♂ 51.0–55.0 mm; antennae, ♀ 24.0 mm, ♂ 33.0–34.0 mm; head, ♀ 4.5 mm, ♂ 3.0 mm; pronotum, ♀ 4.0 mm, ♂ 3.0 mm; mesonotum, ♀ 14.0 mm, ♂ 13.0 mm; metanotum, ♀ 4.0 mm, ♂ 3.5–4.0 mm; median segment, ♀ 4.0 mm, ♂ 2.5–3.0 mm; profemora, ♀ 12.0 mm, ♂ 13.0 mm; mesofemora, ♀ 9.0 mm, ♂ 9.0 mm; metafemora, ♀ 13.0 mm, ♂ 13.0 mm; protibiae, ♀ 11.0 mm, ♂ 12.0 mm; mesotibiae, ♀ 7.0 mm, ♂ 8.0 mm; metatibiae, ♀ 12.0 mm, ♂ 12.0 mm.

Egg. Capsule greenish brown, wrinkled; oval, moderately tapering posteriorly in dorsal view, posterior pole weakly notched in lateral view. Micropylar plate oval, anteriorly tapering and pointed, posteriorly rounded. Micropylar cup placed at posterior area of micropylar plate. Median line indistinct. Operculum centrally with a stalked, mushroom-like capitulum.

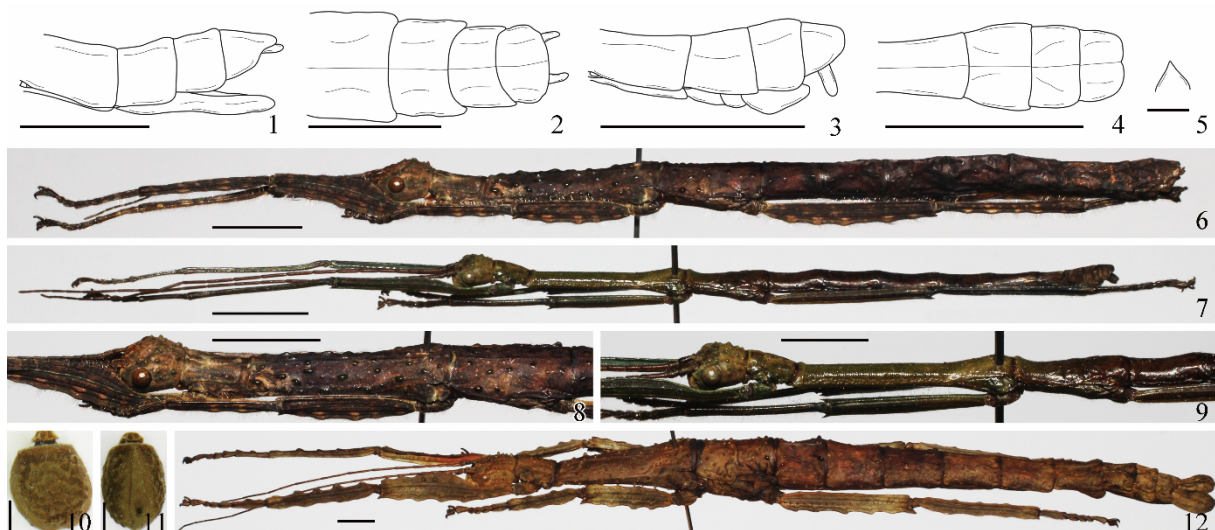
Measurements. Capsule length, 3.0 mm; capsule width, 2.5 mm; capsule height, 3.0 mm.

Material examined. Holotype ♀, China, Yunnan, Dehong, Yingjiang, 1000 m, 3 July 2019, George Ho Wai-Chun. Paratypes. 2 eggs, same data as holotype; 1♂, 1 immature ♀, China, Yunnan, Yuxi, Xiping, 2000 m, 23 June 2019, George Ho Wai-Chun; 1♂, China, Yunnan, Honghe, Jinping, 2000 m, 26 August 2019, George Ho Wai-Chun; 1♂, China, Yunnan, Honghe, Jinping, Fenshuiling, 1300–1400 m, 4 September 2016, George Ho Wai-Chun.

Distribution. China.

Remarks. The measurements only included the adults.

Etymology. The specific epithet of this new species is derived from the short body length while compared with the taxa in *Xenophasmina*.



Figures 1–11. *Sinxenophasmina abbreviatum* gen. & sp. nov. 12. *Xenophasmina fimbriatum* (Redtenbacher, 1908). 1. Female apex of abdomen, lateral view. 2. Female apex of abdomen, dorsal view. 3. Male apex of abdomen, lateral view. 4. Male apex of abdomen, dorsal view. 5. Male vomer, ventral view. 6. Female habitus. 7. Male habitus. 8. Female head and thorax, dorsolateral view. 9. Male head and thorax, dorsolateral view. 10. Egg, lateral view. 11. Egg, dorsal view. 12. Female habitus. Scale bars: 1–4, 6–9, 12 = 5 mm; 5, 10–11 = 1 mm.

Xenophasmina Uvarov, 1940

Xenophasmina Uvarov, 1940: 379. Type species: *Xenophasma fimbriatum* Redtenbacher, 1908, inherited from replaced name, by Uvarov, 1940: 379.

Distribution. China, Laos, Myanmar, Thailand and Vietnam.

Remarks. This genus consists of two species and is restricted to Indochinese area. It is a new record for China.

Xenophasmina bedoti (Redtenbacher, 1908) comb. nov.

Rhaphiderus bedoti Redtenbacher, 1908: 388.

Xenophasma simile Redtenbacher, 1908: 442. **syn. nov.**

Material examined. 1♂1♀, Vietnam, Lao Cai, Sa Pa, 1400–1450 m, May 2010, Abramov, A.V.; 1♂, China, Yunnan, Xishuangbannan, June 2019 (assessed by a photo).

Distribution. China, Laos, Thailand and Vietnam.

Remarks. The species is recorded in China for the first time. *Xenophasmina bedoti* (Redtenbacher, 1908) **comb. nov.** was misplaced in *Rhaphiderus* Serville, 1838 (Tropidoderinae Brunner von Wattenwyl, 1893, Monandropoterini Brunner von Wattenwyl, 1893) and here transferred. *Xenophasmina similis* (Redtenbacher, 1908) is the corresponding sex of this species and here synonymised. This species is widely distributed over Indochinese Region and has been expected to occur in southwestern parts of China.

***Xenophasmina fimbriatum* (Redtenbacher, 1908)** (Fig. 12)

Xenophasma fimbriatum Redtenbacher, 1908: 442.

Material examined. 1♀, China, Yunnan, Dali, 2300m, 10 July 2017, Bi Wenxuan.

Distribution. China, Myanmar and Thailand.

Remarks. The species is recorded in China for the first time.

Acknowledgements I wish to thank Mr. Wenxuan Bi (Shanghai, China) for providing collecting information of the phasmids from Yunnan, China; Dr. Dmitri Logunov (Manchester Museum, The University of Manchester, U.K.) for arranging loan of specimens; Mr. Zhiyong Yu (Yunnan, China) for his kind assistance; Manchester Museum, The University of Manchester, U.K. for the loan of specimens; and the anonymous reviewers for providing valuable comments to improve the manuscript.

References

- Bradler, S. 2009. Die Phylogenie der Stab- und Gespenstschrecken (Insecta: Phasmatodea). *Species, Phylogeny and Evolution*, 2: 3–139.
- Bragg, P.E. 2001. *Phasmids of Borneo*. Natural History Publications, Kota Kinabalu. 772pp.
- Brock, P.D., Büscher, T., Baker, E. 2020. Phasmida Species File Online. Version 5.0/5.0. Available from <http://phasmida.speciesfile.org/HomePage/Phasmida/HomePage.aspx> (accessed 1 July 2020).
- Brunner von Wattenwyl, K. 1893. Révision du Système des Orthoptères et description des espèces rapportées par M. Leonardo Fea de Birmanie. *Annali del Museo Civico di storia naturale Giacomo Doria, Genova*, (2)13(33): 1–230.
- Clark, J.T. 1976. The capitulum of phasmid eggs (Insecta: Phasmida). *Zoological Journal of the Linnean Society*, 59: 365–375.
- Clark, J.T. 1988. The capitula of phasmid eggs: an update with a review of the current state of phasmid ootaxonomy. *Zoological Journal of the Linnean Society*, 93: 273–282.
- Clark, J.T. 1998. The micropylar plate of the eggs of Phasmida, with a survey of the range of plate form within the order. *Systematic Entomology*, 23: 203–228.
- Clark-Sellick, J.T. 1997. The range of egg capsule morphology within the Phasmatodea and its relevance to the taxonomy of the order. *Italian Journal of Zoology*, 64: 97–104.
- Gray, G.R. 1835. *Synopsis of the Species of Insects Belonging to the Family of Phasmidae*. Longman, London. 48 pp.
- Günther, K. 1953. Über die taxonomische gliederung und die geographische verbreitung der insektenordnung der Phasmatodea. *Beiträge zur Entomologie, Berlin*, 3(5): 541–563.
- Hennemann, F.H., Conle, O.V. 2008. Revision of Oriental Phasmatodea: The tribe Pharnaciini Günther, 1953, including the description of the world's longest insect, and a survey of the family Phasmatidae Gray, 1835 with keys to the subfamilies and tribes (Phasmatodea: "Anareolatae": Phasmatidae). *Zootaxa*, 1906: 1–316.
- Otte, D., Brock, P.D. 2005. *Phasmida Species File - Catalog of stick and leaf insects of the world*. The Insect Diversity Association and the Academy of Natural Sciences, Philadelphia. 414pp.
- Redtenbacher, J. 1908. *Die Insektenfamilie der Phasmiden. III. Phasmidae Anareolatae (Phibalosomini, Acrophyllini, Necrosiini)*. Wilhelm Engelmann, Leipzig. 250pp.
- Serville, J.G.A. 1838. *Histoire naturelle des Insectes. Orthoptères*. Librairie Encyclopédique de Roret, Paris. 776pp.
- Simon, S., Letsch, H., Bank, S., Buckley, T.R., Donath, A., Liu, S., Machida, R., Meusemann, K., Misof, B., Podsiadlowski, L., Zhou, X., Wipfler, B., Bradler, S. 2019. Old world and new world Phasmatodea: Phylogenomics resolve the evolutionary history of stick and leaf insects. *Frontiers in Ecology and Evolution*, 7(345): 1–14.
- Uvarov, B.P. 1940. Eleven new generic names in Orthoptera. *Annals and Magazine of Natural History, London*, 11(6): 377–380.
- Zompro, O. 2004. Revision of the genera of the Areolatae, including the status of *Timema* and *Agathemera* (Insecta, Phasmatodea). *Abhandlungen des Naturwissenschaftlichen Vereins Hamburg, (NF)37*: 1–327.