

Pylaemenes gulinqingensis sp. nov., a new species of subfamily Dataminae (Phasmida, Heteropterygidae) from Yunnan Province, China

HAO-RAN GAO¹, CHONG-XIN XIE²

¹ College of Plant Protection, Yunnan Agricultural University, Kunming 650201, China.

² Key Laboratory for Forest Resources Conservation and Utilization in the Southwest Mountains of China, Ministry of Education, Southwest Forestry University, Kunming, Yunnan 650224, China.

Corresponding author: Chong-Xin Xie (chongxinxie@163.com)

Academic editor: Ming Kai Tan | Received 25 December 2021 | Accepted 28 January 2022 | Published 22 July 2022

<http://zoobank.org/5F0CD556-056E-472F-AD5A-30DB20C608A9>

Citation: Gao H-R, Xie C-X (2022) *Pylaemenes gulinqingensis* sp. nov., a new species of subfamily Dataminae (Phasmida, Heteropterygidae) from Yunnan province, China. Journal of Orthoptera Research 31(2): 125–129. <https://doi.org/10.3897/jor.31.79783>

Abstract

Pylaemenes gulinqingensis sp. nov., from Gulinqing Nature Reserve, Maguan County, Yunnan, China, is described for the first time from two females and six eggs. The types of the new species are deposited in Southwest Forestry University (SWFU), China, as well as in the first author's collection.

Keywords

Dataminae, Datamini, new taxa, stick insects

Introduction

The genus *Pylaemenes* Stål, 1875 belongs to the tribe Datamini in the subfamily Dataminae of the family Heteropterygidae (Bank et al. 2021, Brock et al. 2022). *Pylaemenes* consists of 20 valid taxa and is distributed in the following areas: Vietnam (3 spp.), Indonesia (7 spp.), Malaysia and Singapore (both Peninsular Malaysia and Borneo) (8 spp.), Thailand (1 sp.), and China (1 sp.) (Ho 2013, 2016, 2018, Seow-Chone 2017a, b, 2018, 2020, 2021, Bresseel and Jiaranaisakul 2021, Hennemann 2021, Brock et al. 2022). This genus can be separated from the most related *Orestes* Redtenbacher, 1906 by a combination of the following characteristics: meso- and metanotum flattened or slightly tectiform and with distinctly raised median carina and lateral carinae (the thickened lateral edges of meso- and metanotum) and the conically elevated back of the head (Bresseel and Constant 2018, Bresseel and Jiaranaisakul 2021).

Recent phylogenetic studies have shown the genus *Pylaemenes* to be paraphyletic (Bank et al. 2021). Due to the lack of materials from important areas, the generic attribution of species in this genus remains difficult and needs revision (Bresseel and Jiaranaisakul 2021, Hennemann 2021). In this paper, we describe the second species of *Pylaemenes* from China: *P. gulinqingensis* sp. nov.

Materials and methods

The systematic treatment followed that of Brock et al. (2022) and Bank et al. (2021). The nomenclature of the cephalic armature follows Bresseel and Constant (2020). Egg descriptions follow

Clark-Sellick (1997). The specimens were collected directly during night surveys with the help of head torches. Photographs of specimens were taken using a Sony a6300 with LAOWA 60 mm F2.8 Marco. Photos were improved using Adobe Photoshop 2020 and Adobe Lightroom classic. The types of the new species are deposited in Southwest Forestry University (SWFU), China, and the first author's private collection (GHR).

Results

Taxonomy

Pylaemenes Stål, 1875

Type species.—*Phasma coronatum* de Haan, 1842 (= *Pylaemenes coronatus*), by subsequent designation; authority: Kirby (1904).

Distribution.—China (Yunnan); Indonesia; Malaysia; Singapore; Thailand; Vietnam.

Species included from China.—*Pylaemenes pui* Ho, 2013 [China: Pu'er and Xishuangbanna] (Fig. 3D); *Pylaemenes gulinqingensis* sp. nov. [China: Wenshan].

Suggested common name (Chinese).—瘤螞属

Pylaemenes gulinqingensis sp. nov.

<http://zoobank.org/88341FFD-BE99-4BF3-AB26-44D8FAD72EF9>

Figs 1–3A, B

Material examined.—**Holotype:** CHINA • ♀; Yunnan Province, Wenshan Zhuang and Miao Autonomous Prefecture, Maguan County; Gulinqing Provincial Nature Reserve; 22.843324°N, 103.984206°E; 25 August 2020; Xiang-Jin Liu leg; SWFU. **Paratype:** CHINA • 1♀; Yunnan Province, Wenshan Zhuang and Miao Autonomous Prefecture, Maguan County; Gulinqing Provincial Nature Reserve; 29 August 2020; Xiang-Jin Liu leg; GHR • 6 eggs (naturally laid by holotype); same information as holotype; SWFU.

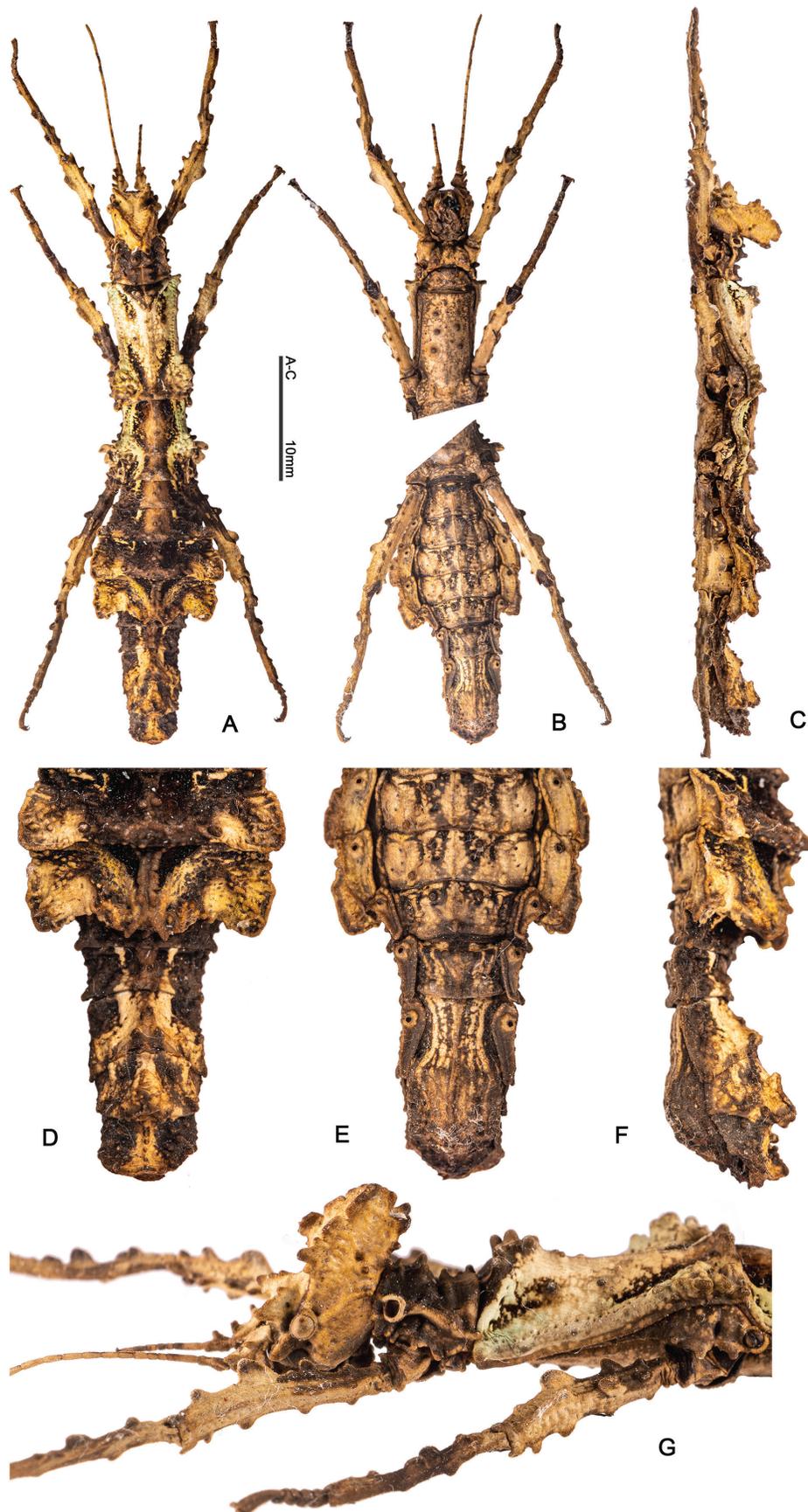


Fig. 1. Female (HT) of *Pylaemenes gulinqingensis* sp. nov. Habitus A. Dorsal; B. Lateral; C. Ventral, end of the abdomen; D. Dorsal; E. Lateral; F. Ventral, head and thorax G. Lateral.

Diagnosis.—The females of the new species are very similar to *P. pui*. They share the same elevated structure on the back of the head and strongly widening abdominal terga II–IV, but they can be separated by the lack of x-shaped elevations on terga II–IV and different leg armature (Fig. 1A). In the new species, the lateral margin of the abdominal terga III–IV expansions lateral, like lamellae. The new species is variegated with yellow and green; it resembles a stick covered with moss, while other species of the genus almost all resemble a brown dry stick.

Distribution.—China, Gulinqing Provincial Nature Reserve. Only known from type locality.

Etymology.—The new species is named after the type locality Gulinqing Provincial Nature Reserve.

Description.—**Female.** Small size. Body robust and rough. General color yellow to brown with green variegation.

Head. Occiput strongly projecting posteriorly, cone-like, deep V-shaped in dorsal view, lateral surface punctulate with a shallow notch apically. Occipital spines are triangular humps, posterior supra-occipitals shorter and smaller than anterior supra-occipital spines. Supra-orbital spines strong, laterally compressed and lamellate, directed towards the central coronal spine. Central coronal spine present at the apex of the vertex. Posterior and lateral coronal spines present as conical tubercles (Fig. 1G). Compound eyes round and small with postocular carina behind them. Antennae setose, longer than profemora but shorter than the front legs, with 25 segments. Scapus triangular, with 2 short lobes. Pedicellus shorter than scapus.

Thorax. Pronotum short, trapezoidal, with conspicuous “+” sulcus, four pair tubercles along the longitudinal sulcus, two pairs before the transverse sulcus, two pairs behind; lateral margins with two short tubercles. One cup-like organ on the propleura near the anterior margin. Mesonotum with indistinct carina, the anterior apex of carina with six tubercles irregularly arranged, another two tubercles on the carina; lateral margins widening towards anterior, with several small tubercles elevated apically with the posterior margin elevated. Metanotum median carina distinct, sparsely covered with small granules, lateral margins elevated apically. Metapleura with two crescent-shaped lobes each, widening laterally and almost covering each metacoxa.

Abdomen. Median segment rugose with three granules near posterior margin medially. Terga II–IV gradually widening towards the posterior; terga V slightly narrower than terga IV but wider than terga VI–IX (Fig. 1D). Terga VI to anal segment almost equal in width to each other. Terga III–IV expansions lateral. Terga II–VIII armed with a pair of granules near the posterior margin medially. Terga IX hump. Anal segment shorter than tergum IX, with distinct median carina. Subgenital plate boat shaped, not surpassing the end of the anal segment, with distinct median and lateral carinae. Cerci exposed not obviously, apical round.

Legs. Profemora curved basally; antero-dorsal carina with three lobes and not equal in size; postero-dorsal carina with four lobes, the third one biggest. Protibiae armed with one to two lobes. Mesofemora with antero-dorsal carina with three lobes, increasing in size towards the apex; postero-dorsal carina armed with two lobes. Metafemora with the antero-dorsal carina with four lobes, the third being the biggest; postero-dorsal carina armed with three lobes, the last one ear shaped.

Male. Unknown.

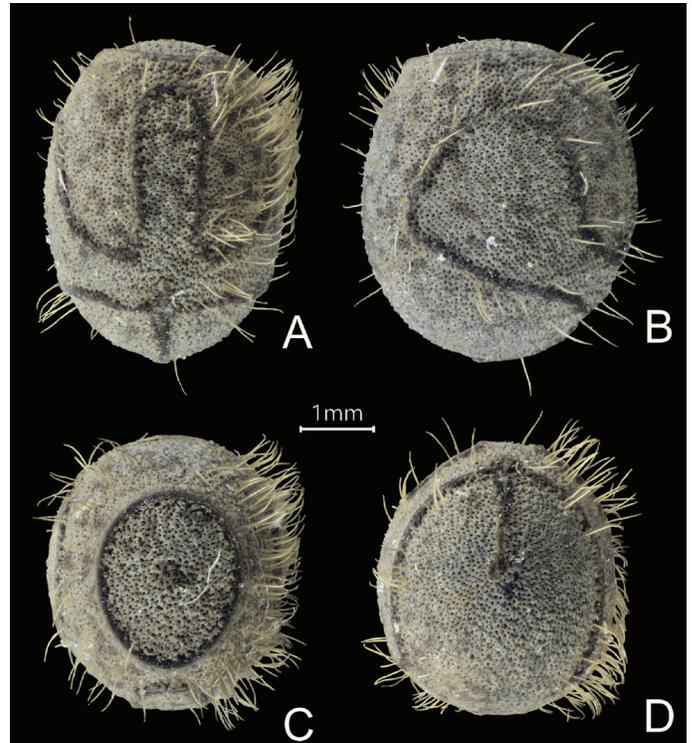


Fig. 2. Egg of *Pylaemenes gulinqingensis* sp. nov. A. Dorsal; B. Lateral; C. Operculum; D. Pole.

Egg. Measurements [mm]: Length: 3.6; width: 3.3; height: 4.2. Capsule dark brown with dark spots, oval, posterior pole rounded; surface densely punctulate and sparsely covered with pale setae with a distal black structure. Operculum sub-circular, slightly convex. Micropylar plate tri-lobate with one anterior expansion and two posterior expansions like an inverse Y (Fig. 2A). The margin of micropylar plate darker and indistinctly raised. Median line dark and indistinctly raised.

Measurements (in mm).—♀. Body 39.2–48.5, head 4.5, antennae 15.0, pronotum 3.3–3.8, mesonotum 7.7–10.3, profemora 8.4–9.7, mesofemora 8.2–8.4, metafemora 10.2–10.5, protibiae 8.0–8.8, mesotibiae 6.3–7.0, metatibiae 8.3–9.5.

Discussion

How to differentiate the genera *Pylaemenes* and *Orestes* accurately and deal with the problem of synonymy is the focus of current research on the subfamily Dataminae (Bresseel and Jiaranaisakul 2021, Hennemann 2021). For the species present in China, Ho (2013) described the genus *Hainanphasma* Ho, 2013, with two species—*H. cristatum* Ho, 2013 (Fig. 3C) and *H. diaoluoshanensis* Ho, 2013—both endemic to Hainan, with weak generic distinction. Bresseel and Constant (2018) had already discussed this genus and pointed out examples and problems. Obviously, the genus *Hainanphasma* is doubtful, and a revision of the subfamily Dataminae is needed.

The new species presented here is particular in that it appears variegated like moss. We suggest that this coloration is due to the fact that the new species is from a high-altitude moss forest; unfortunately, no altitude data was recorded in the field collection. Gulinqing Nature Reserve has forests ranging from about 1000 m to over 2000 m. Our type specimens were collected



Fig. 3. Living photos. A, B. *Pylaemenes gulinqingensis* sp. nov. (Gulinqing, Yunnan, China); C. *Hainanphasma cristata* Ho, 2013 (Mt. Jianfengling, Hainan Island, China); D. *P. pui* Ho, 2013 (Mengla, Yunnan, China). Photo credit A–C. Pei-Lin Liao; D. Chao Wu.

in the middle area, and the number of specimens is small. If our hypothesis is true, high-altitude and low-altitude species may show different diversity (both morphologically and molecularly). The Chinese fauna of the subfamily Dataminae currently includes 10 species, with the description of the new species. However, the species diversity of this subfamily in China is probably higher. Most of the species of this subfamily come from relatively low altitude in southern China. Therefore, in the relatively high-altitude mountains of southern China, there may be interesting species waiting to be discovered. Bank et al. (2021) analyzed the geographical locations of the subfamily Dataminae, including the Wallacea, Borneo, and mainland Asia. Therefore, in places such as Laos, Cambodia, Myanmar, and other places where species are still poorly known, we believe that more species will be discovered.

Acknowledgements

The authors wish to thank Pei-Lin Liao and Chao Wu from Beijing for providing the living photos, Le Liang (Beijing) and Zhi-Yu Xie (Zhangzhou) for providing information. Our deepest gratitude to editor Dr. Ming Kai Tan and reviewer Dr. Francis Seow-Choen for their work. We would also like to thank our teachers: Yu-Han Qian (SWFU), Hong-Rui Zhang (Yunnan Agricultura University), Shu-Qi He (Yunnan Agricultura University), Xue-Yan Li (Kunming), and Zhi-Wei Dong (Kunming) for their support of this research. We also thank Jun Cai (SWFU), Zi-Xu Yin (Qingdao), and Shang-Qian Fu (Nanning) for providing help with this manuscript.

References

- Bank S, Buckley TR, Büscher TH, Bresseel J, Constant J, de Haan M, Dittmar D, Dräger H, Kahar RS, Kang A, Kneubühler B, Langton-Myers SS, Bradler S (2021) Reconstructing the nonadaptive radiation of an ancient lineage of ground-dwelling stick insects (Phasmatodea: Heteropterygidae). *Systematic Entomology* 46: 487–507. <https://doi.org/10.1111/syen.12472>
- Bresseel J, Constant J (2020) *Microrestes* gen. nov., a new genus in the Oriental stick insect tribe Datamini Rehn & Rehn, 1939 with a new species and a new combination (Phasmida: Heteropterygidae: Dataminae). *Belgian Journal of Entomology* 106: 1–19.
- Bresseel J, Jiranaaisakul K (2021) *Pylaemenes scrupeus* sp. nov., a new Datamini from Thailand (Phasmida: Heteropterygidae: Dataminae). *Belgian Journal of Entomology* 123: 1–15.
- Brock PD, Büscher T, Baker E (2022) Phasmida Species File Online. Version 5.0/5.0. [accessed 8 April 2022]
- Clark-Sellick JT (1997) Descriptive terminology of the phasmid egg capsule, with an extended key to the phasmid genera based on egg structure. *Systematic Entomology* 22: 97–122. <https://doi.org/10.1046/j.1365-3113.1997.d01-30.x>
- de Haan W (1842) Bijdragen to de Kennis der Orthoptera. In: Temminck (Eds) *Verhandlungen over de natuurlijke Geschiedenis der Nederlandsche overzeesche Bezittingen, Verhandelingen Zoologie*, Vol. 2. Luchtmans and van der Hoek, Leiden, 95–138.
- Hennemann FH (2021) Stick insects of Sulawesi, Peleng and the Sula Islands, Indonesia—a review including checklists of species and descriptions of new taxa (Insecta: Phasmatodea). *Zootaxa* 5073: 1–189. <https://doi.org/10.11646/zootaxa.5073.1.1>

- Ho GWC (2013) Contribution to the knowledge of Chinese Phasmatodea II: Review of the Dataminae Rehn & Rehn, 1939 (Phasmatodea: Heteropterygidae) of China, with descriptions of one new genus and four new species. *Zootaxa* 3669: 201–222. <https://doi.org/10.11646/zootaxa.3669.3.1>
- Ho GWC (2016) The genus *Pylaemenes* Stål, 1875 (Phasmatodea: Heteropterygidae: Dataminae) of East Asia with descriptions of two new species. *Tettigonia: Memoirs of the Orthopterological Society of Japan* 11: 1–14.
- Ho GWC (2018) Three new species of genus *Pylaemenes* Stål (Phasmatodea: Heteropterygidae: Dataminae) from Vietnam. *Zoological Systematics* 43(3): 276–282.
- Kirby WF (1904) A synonymic catalogue of Orthoptera 1. Orthoptera Euplexoptera, Cursoria et Gressoria. (Forficulidae, Hemimeridae, Blattidae, Mantidae, Phasmodae). British Museum, London, 501 pp.
- Redtenbacher J (1906) Die Insektenfamilie der Phasmoden. Vol. 1. Phasmodae Areolatae. Wilhelm Engelmann, Leipzig, 1–180.
- Seow-Choen F (2017a) A Taxonomic Guide to the Stick Insects of Singapore. Natural History Publications (Borneo), Kota Kinabalu, Sabah, 175 pp.
- Seow-Choen F (2017b) A Taxonomic Guide to the Stick Insects of Borneo Vol. 2. Natural History Publications (Borneo), Kota Kinabalu, Sabah, 416 pp.
- Seow-Choen F (2018) A taxonomic guide to the stick insects of Sumatra. Vol. I. Natural History Publications (Borneo), Kota Kinabalu, 703 pp.
- Seow-Choen F (2020) A taxonomic guide to the stick insects of Sumatra. Vol. II. Natural History Publications (Borneo), Kota Kinabalu, 416 pp.
- Seow-Choen F (2021) A taxonomic guide to the stick insects of Peninsular Malaysia. Vol. I. Natural History Publications (Borneo), Kota Kinabalu, 416 pp.
- Stål C (1875) Recensio orthopterorum 3. Revue critique des Orthoptères décrits par Linné, DeGeer et Thunberg. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* 32: 1–105.