



<http://dx.doi.org/10.11646/zootaxa.3620.3.4>

<http://zoobank.org/urn:lsid:zoobank.org:pub:F7620AC2-4E3C-43FD-9C93-EB95F85ED57A>

**Contribution to the knowledge of Chinese Phasmatodea I:
A review of Neohiraseini (Phasmatodea: Phasmatidae: Lonchodinae)
from Hainan Province, China, with descriptions of one new genus,
five new species and three new subspecies, and redescriptions of
Pseudocentema Chen, He & Li and *Qiongphasma* Chen, He & Li**

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Abstract

This study deals with three genera, seven species and four subspecies of the tribe Neohiraseini Hennemann & Conle, 2008 from Hainan Province, China. The genera *Pseudocentema* Chen, He & Li, 2002 and *Qiongphasma* Chen, He & Li, 2002 are revised and redescribed, including descriptions of four new species, *P. liui* **spec. nov.**, *Q. bispinosus* **spec. nov.**, *Q. huishanensis* **spec. nov.** and *Q. wuzhishanense* **spec. nov.**, and three new subspecies, *Q. bispinosus bispinosus* **subspec. nov.**, *Q. b. minor* **subspec. nov.** and *Q. jianfengense obtusicristata* **subspec. nov.** First descriptions are given for the male and egg of *Pseudocentema bispinatum* Chen & He, 2002 and for the female of *Q. jianfengense jianfengense* Chen & He, 2002 **sen. str.** A new genus, *Neoqiongphasma* **gen. nov.**, is established for *N. diaoluoshanensis* **spec. nov.**, distinguished from *Pseudocentema* by its spinose thorax and from *Qiongphasma* by its unarmed head.

Key words: Neohiraseini, *Neoqiongphasma*, *Pseudocentema*, *Qiongphasma*, Hainan, China, review, new genus, new species, new subspecies, redescription, key

Introduction

Hainan Island is an administrative province and the largest tropical island in China. The island was part of Guangdong Province and was designated as a self-governing district in 1988. More than five-thousand species of insects inhabit in the island's rainforests (Huang 2002). No comprehensive phasmid study was conducted for the island until Chen *et al.* (2002) presented a key to the fauna which contained 18 genera and 30 species, including descriptions of three new genera and 16 new species, and two new distribution records. Later, Chen & He (2008) revised the Chinese fauna and added six new species to the island. The fauna of the island is comparatively high among the Chinese provinces, certain metropolitan areas, and administrative regions (Table 1). A total of 22 genera and 45 species are currently recognized from the island (Chen & He 2008; Chen & Zhang 2008; Hennemann *et al.* 2008; Chen & Pan 2009; Xu *et al.* 2009; Ho 2012a; Phasmida Species File Online by Brock). Unfortunately, most of the species are solely known from one male or one female and require further research.

TABLE 1. Comparison of three Chinese provinces / administrative regions with the highest number of genera and species.

Provinces / administrative regions	Genera	Species
Hainan	22	45
Yunnan	27	59
Guangxi	28	65

Neohiraseini Hennemann & Conle, 2008 is a recently established tribe and is principally restricted to the Indo-China area (Hennemann & Conle 2008: 78). In China, the tribe is composed of five genera, *Andropromachus* Carl,

1913 (= *Spiniphasma* Chen & He, 2000), *Cheniphasma* Ho, 2012, *Neohirasea* Rehn, 1904 (= *Paracentema* Redtenbacher, 1908), *Pseudocentema* Chen, He & Li, 2002 and *Qiongphasma* Chen, He & Li, 2002, the latter two genera are restricted to Hainan (Chen *et al.* 2002; Hennemann 2007; Chen & He 2008; Hennemann *et al.* 2008; Ho 2012b). Until recent collecting activities discovered the corresponding unknown sex, *Pseudocentema* and *Qiongphasma* were only known from one specimen. In order to contribute to the knowledge of the genera, a review including descriptions of four new species and three new subspecies are provided in this study.

A new genus, which includes the new species *Neoqiongphasma diaoluoshanensis* **gen. nov. spec. nov.**, is described from Diaoluoshan in the southeastern Hainan. It is readily distinguished from *Pseudocentema* and *Qiongphasma* by the spinose thorax and unarmed head respectively.

Key to the genera and species of the Neohiraseini from Hainan is provided.

Material and methods

This study is based on the examination of type-material and the collection of specimens in various localities. The type- and non-type material examined in this study are deposited or will be deposited in the following depositories: at the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS); Shanghai Entomological Museum, Chinese Academy of Sciences, Shanghai, China (SEM); Shanghai Normal University, Shanghai, China (SNU); the Museum of Biology, Sun Yat-Sen University, Guangzhou, Guangdong, China (SYSBM); Kadoorie Farm and Botanic Garden, Hong Kong, China (KFBG); and the private collection of George Ho Wai-Chun, Hong Kong, China (GH). Measurements are given in millimeters (mm.).

The specimens were collected directly by hand at night due to their nocturnal behavior. A hand torch was used to spot them on plants. Redescriptions of the genera are based on the types, original description and further material collected from the type-locality. Description of position of body armature is based on the acanthotaxy suggested by Rehn & Rehn (1939) and Bragg (2001). Morphological terms follow Bragg (1997, 2001) and Hennemann & Conle (2008). Ootaxonomic terminology refers to Clark (1976a, 1976b, 1979, 1988, 1998), Clark-Sellick (1997) and Zompro (2004). The sequence of species accounts is alphabetical. The taxonomic treatment provisionally follows Hennemann & Conle (2008).

For the distribution of each species in the checklist, the localities have been abbreviated as follows:

BWL	Bawangling National Nature Reserve (NNR), Changjiang Country.
DLS	Diaoluoshan NNR, Lingshui Country.
EXL	Exianling limestone forest, Dongfang Country.
HS	Huishan Nature Reserve (NR), Qionghai Country.
JFL	Jianfengling NNR, Ledong Country.
SX	Shangxi NR, Wanning Country.
YGL	Yinggeling NR, Baisha Country.
WZS	Wuzhishan NNR, Wuzhishan Country.

Taxonomy

Family Phasmatidae Gray, 1835: 12.

Subfamily Lonchodinae Brunner von Wattenwyl, 1893: 80.

Tribe Neohiraseini Hennemann & Conle, 2008: 78.

Type-genus. *Neohirasea* Rehn, 1904: 84.

Notes. Three genera, seven species and four subspecies of the tribe from Hainan are described in this study. A key to the genera and species of the tribe is given.

Distribution. China, Taiwan, Vietnam and India. In China, the tribe is restricted to the southern and eastern regions.

Key to the genera and species of Neohiraseini from Hainan, China:

1. Occiput lacking spines; abdomen with small tubercle or elevation medio-posteriorly in both sexes 2.
- Occiput spinose; abdomen with distinct crest-like structure medio-posteriorly in both sexes 4. *Qiongphasma* Chen, He & Li
2. Female large, body length > 90 mm.; mesonotum lacking spinose or lamellate hump, lateral margins of mesonotum with short spines, median segment with short posterior mesal spine and first paired posterior spines; and abdomen conically tuberculate medio-posteriorly; male unknown *Neoqiongphasma* Ho **gen. nov.**, *N. diaoluoshanensis* Ho **spec. nov.**
- Female medium-sized, body length < 80 mm.; mesonotum with a spinose or lamellate hump placed near the anterior margin; lateral margins of the mesonotum and median segment lacking spines; and abdomen dorsal-ventrally covered with flattened tubercles medio-posteriorly; most tergites of abdomen with scale-like elevation medio-posteriorly in male 3. *Pseudocentema* Chen, He & Li
3. Pronotum with anterior and posterior spines in both sexes; seventh sternum with indistinct praeopercular organ in female ...
- Pronotum with only a pair of medial spines in both sexes; seventh sternum with prominent praeopercular organ in female ...
- *P. bispinatum* Chen & He
- *P. liui* Ho **spec. nov.**
4. Metapleurum with one supra-coxal spine 5.
- Metapleurum with two supra-coxal spines 8.
5. Median segment with posterior mesal spine *Q. wuzhishanense* Ho **spec. nov.**
- Median segment lacking posterior mesal spine 6.
6. Occiput with one pair of long occipital medials; fourth and fifth abdominal tergites not distinctly elevated with a crest-like structure medio-posteriorly; postero-ventral carina of metafemora with three subapical spines, medio-ventral carina of mesofemora and metafemora with minute serrations; the first segment of metatarsi as long as the combined length of second and third segments together. *Q. huishanensis* Ho **spec. nov.**
- Vertex with at least two pairs of long occipital medials; fourth and fifth tergites strongly elevated with a crest-like structure medio-posteriorly; postero-ventral carina of metafemora with two subapical spines; medio-ventral carina of mesofemora and metafemora lacking serration; the first segment of metatarsi longer than the combined length of second and third segments together 7.
7. Fourth to seventh tergites with sharp and apically pointed crest-like structure or hump in both sexes medio-posteriorly; male with supra-orbitals, apices of cerci rounded *Q. jianfengense jianfengense* Chen & He **sen. str.**
- Fourth to seventh tergites with obtuse and apically rounded crest-like structure in both sexes medio-posteriorly; male lacking supra-orbital spines, apices of cerci slightly pointed *Q. jianfengense obtusicristata* Ho **subspec. nov.**
8. Metanotum with well-developed anterior spines in male; female large, > 70 mm.; ventral carinae of mesofemora and metafemora elevated with distinct serrations *Q. bispinosus bispinosus* Ho **spec. nov. subspec. nov.**
- Metanotum lacking anterior spines in male; female small to medium-sized, < 70 mm.; ventral carinae of mesofemora and metafemora with indistinct serrations *Q. bispinosus minor* Ho **spec. nov. subspec. nov.**

Genus *Neoqiongphasma* gen. nov.

(Figs. 1–3, 44)

Type-species. *Neoqiongphasma diaoluoshanensis* Ho **spec. nov.**, by present designation.

Diagnosis. This new genus is morphologically related to *Pseudocentema* Chen, He & Li, 2002, but differs in its large size, spinose thorax and its abdominal tergites conically tuberculate medio-posteriorly. Also related to *Spinohirasea* Zompro, 2002, *Neoqiongphasma* Ho **gen. nov.** is separated by slenderer mesofemora.

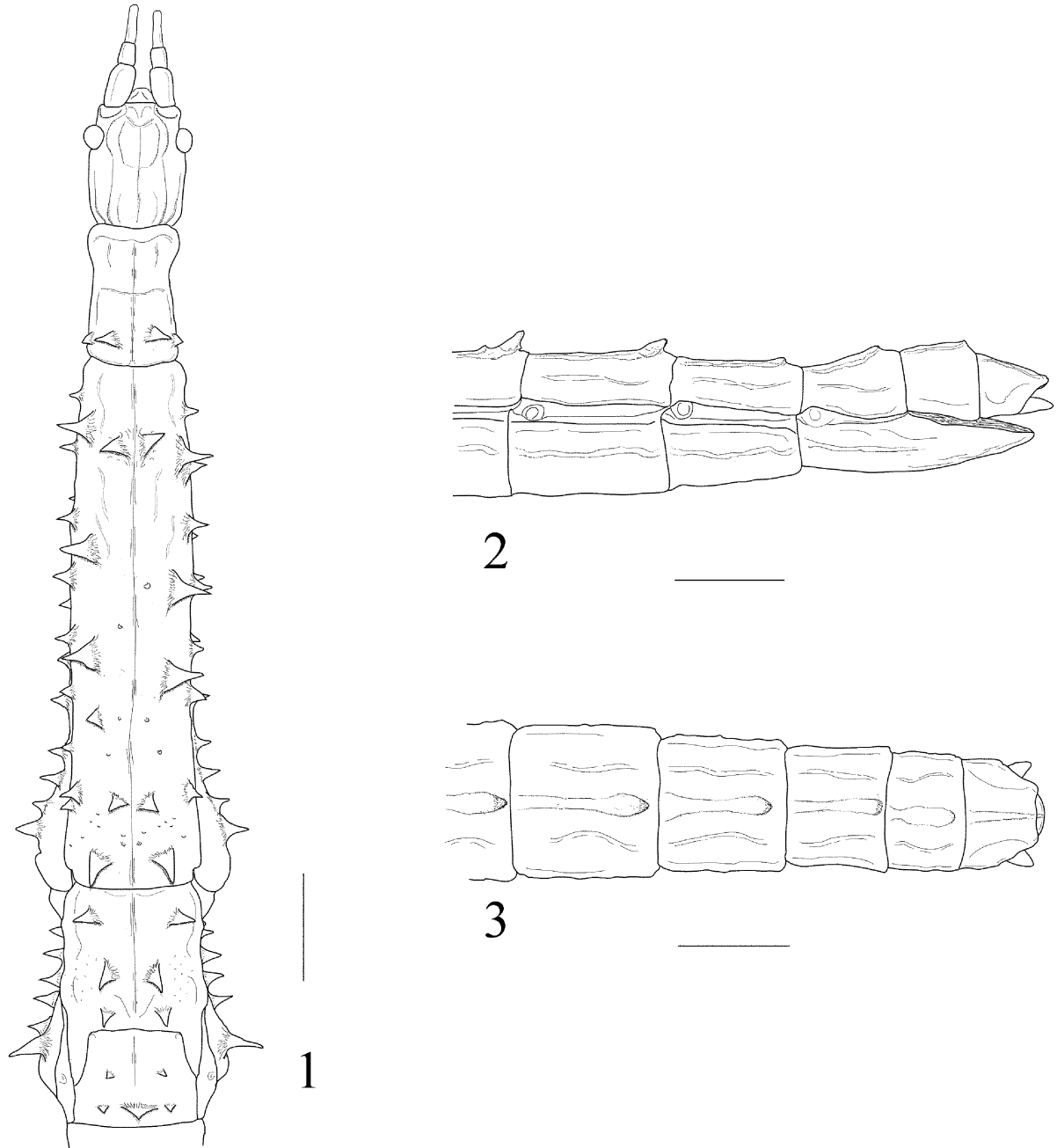
Description. Medium-sized. Body covered with spines and tubercles. Dull coloration, dark brown with light maculations. Head flat, oval, unarmed. Antennae filiform, longer than forelegs. Thorax with different sizes of granules, spines and tubercles. Pronotum with a pair of anterior pronotals and posterior pronotals; postero-lateral angle represented by a small tubercle. Mesonotum elongate, slightly parallel-sided, about 6 x length of pronotum; lateral margins with eight small spines, hind margin with a pair of spines. Mesopleurum lined with 12 to 13 spine-like tubercles. Mesosternum sparsely covered with granules. Metanotum slightly longer than wide, with a pair of long spines at the middle and a pair of small anterior and posterior spines. Metapleurum lined with five to six spines. Metasternum rough, granulations indistinct. Abdomen cylindrical, roughly parallel-sided, covered with small granules and spines. Median segment with three short spines at hind margin. Hind margin of second to sixth tergites with short posterior mesal spine. Anal segment lightly emarginate at hind margin. Supra-anal plate small,

with median carina. Subgenital plate flat, scoop-shaped, apex rounded. Cerci small, flattened, tapering posteriorly, apices pointed. Legs very slender. Antero-ventral and postero-ventral carinae of all femora with two short spines near the apices. Dorsal carinae of all femora and all tibiae unarmed.

Notes. This new genus consists of only one species and is endemic to Hainan. Male is unknown.

Distribution. Hainan, China.

Etymology. “Neo” means “new” and “qiong” means Hainan, referring to this new phasmid genus from Hainan.



FIGURES 1–3. *Neoqiongphasma diaoluoshanensis* Ho **gen. nov. spec. nov.** [scale bar 5 mm]. 1. HT female, head, pronotum, mesonotum, metanotum and median segment, dorsal view. 2. HT female, apex of abdomen, lateral view. 3. HT female, apex of abdomen, dorsal view.

***Neoqiongphasma diaoluoshanensis* spec. nov.**

(Figs. 1–3, 44)

Type. Holotype: ♀, Diaoluoshan National Nature Reserve, Lingshui Country, Hainan Province, China, 7.VII.2011, George Ho Wai-Chun (SYSBM).

Diagnosis. As in the description of the genus. Monotypic.

Description. Female (Figs. 1–3, 44). Medium-sized. Spiny and tuberculate. General color of body and legs dark brown with light brown markings which are distinctive on legs, but inconspicuous on the body. Mesosternum and metasternum light brown.

Head: Oblong, longer than wide, slightly parallel-sided. Surface sparsely covered with small granules. Vertex flat, with two elevations between the antennal bases. Hind part of occiput with two depressed elevations, divided by distinct median furrow. Eyes quite small and oval. Antennae filiform, reaching behind to the fourth abdominal tergum; the first segment 2 x longer than wide and 2 x longer than second segment.

Thorax: Covered with spines and tubercles of different sizes. Pronotum rectangular, 1.4 x longer than wide; with a pair of anterior and posterior spines; postero-lateral angle represented by a small tubercle; transverse sulcus placed just before the middle. Mesonotum elongate, about 6 x length of pronotum; lateral margins with eight small lateral spines; hind margin with a pair of spines, apices toward posterior; anterior and posterior area elevated with a pair of spines, laterad of the median line; pre-median and post-median spines distinct, apices toward lateral sides. Mesopleurum lined with 12–13 spine-like tubercles, gradually increasing in size posteriorly. Mesosternum sparsely covered with granules, denser on fore part. Metanotum slightly longer than wide, with a pair of long spines at the middle, and a pair of small anterior and posterior spines. Metapleurum lined with 5–6 spines, the posterior one longest. Metasternum rough, granulation indistinct.

Abdomen: Cylindrical, roughly parallel-sided. Covered with small granules and spines. Median segment with short posterior mesal spine and first paired posterior spines, the posterior mesal spine larger than the posterior spines. Second tergum with a pair of anterior spines and medial spines. Hind margin of second to sixth tergites with short posterior mesal spine and first paired posterior spines, the mesal spine larger than the posterior spines, both gradually reduced in size posteriorly. Second to eighth tergites with distinct median and two lateral carinae. Anal segment slightly longer than ninth tergum, median carina distinct, hind margin lightly emarginate. Supra-anal plate small, with median carina, not projecting behind anal segment. Subgenital plate flat, scoop-shaped, apex rounded, just projecting over the apex of anal segment. Cerci small, dark brown, flattened, tapering posteriorly, apices pointed, reaching posterior apex of the anal segment.

Legs: Slender and long. With light brown markings. Profemora curved basally, longer than mesonotum. Antero-ventral and postero-ventral carinae of all femora with two short spines near the apices. Medio-ventral carina of mesotibiae and metatibiae elevated at base. Dorsal carinae of all femora and all tibiae unarmed.

TABLE 2. Measurements of *Neoqiongphasma diaoluoshanensis* Ho gen. nov. spec. nov.

Length (mm)	Female
Body	97
Head	6.5
Antennae	63
Pronotum	6
Mesonotum	25
Metanotum	7
Median segment	4.5
Profemora	28
Mesofemora	22
Metafemora	30
Protibiae	33
Mesotibiae	21
Metatibiae	39

Male. Unknown.

Measurements in Table 2.

Distribution. Hainan (Diaoluoshan), China.

Etymology. This species is named after Diaoluoshan where the holotype was collected.

Genus *Pseudocentema* Chen, He & Li, 2002

(Figs. 4–13, 45–46)

Chen, He & Li, 2002: 106.

Hennemann, 2007: 25.

Hennemann, Conle & Zhang, 2008: 26.

Chen & He, 2008: 107.

Hennemann & Conle, 2008: 78.

Type-species. *Pseudocentema bispinatum*, Chen & He (in Chen, He & Li), 2002: 107, by original designation.

Diagnosis. Similar to *Qiongphasma* Chen, He & Li, 2002, *Pseudocentema* is characterized by brownish to blackish color, unarmed head, lack of crest-like abdominal structure medio-posteriorly in both sexes, and presence of distinct praeopercular organ on seventh sternum in female. Also morphologically related to *Neohirasea* Rehn, 1904, *Pseudocentema* is separated by a spinose or lamellate hump on anterior region of mesonotum, and elongate praeopercular organ on seventh sternum in female; and abdomen with a small hump postero-medially in male.

Description. Medium-sized. Apterous. Dull coloration. Female bulkier than male, male slender. Robust and rough body, covered with small granules, short spines and wrinkles. Head wide and flat. Occiput with granules, lacking spine. Antennae filiform, longer than profemora, reaching half of third abdominal tergum in female and sixth abdominal tergum in male. Pronotum with one to three pairs of short spines. Mesonotum with short tubercles or spines and with a bi-spinose or bi-lamellate hump placed near the anterior margin medially. Most tergites of abdomen with scale-like elevation medio-posteriorly. Median segment fused with metanotum. Broadly emarginate hind margin of anal segment in female, with slight notch in male. Female with distinct praeopercular organ on seventh sternum, granule or tubercle-like. Female operculum scoop-shaped, hind margin rounded. Male poculum cup-shaped. Cerci broad and flat. Profemora curved basally, antero-ventral and postero-ventral carinae of mesofemora and metafemora with two teeth near the apices. Egg capsule (Figs. 10–13) oval-shaped, buff brown to grayish brown, surface smooth or inconspicuously granulated. Operculum flattened, with capitulum, or convex and lacking capitulum. Micropylar plate oblong, both ends rounded. Internal micropylar plate closed. Median line absent.

Notes. Two species are recognized from this genus, which is confined to mountainous areas in primary forest ranging from 400 to 1800 meters above sea level. The egg is described and illustrated for the first time.

Distribution. Endemic to Hainan, China.

Species included:

- | | |
|--|--|
| 1. <i>Pseudocentema bispinatum</i> Chen & He
(in Chen, He & Li), 2002: 107, figs. 8: a–b. | [Hainan (JFL)] |
| 2. <i>Pseudocentema liui</i> Ho spec. nov. | Hainan (BWL, DLS, EXL, HS, SX, WZS & YGL)] |

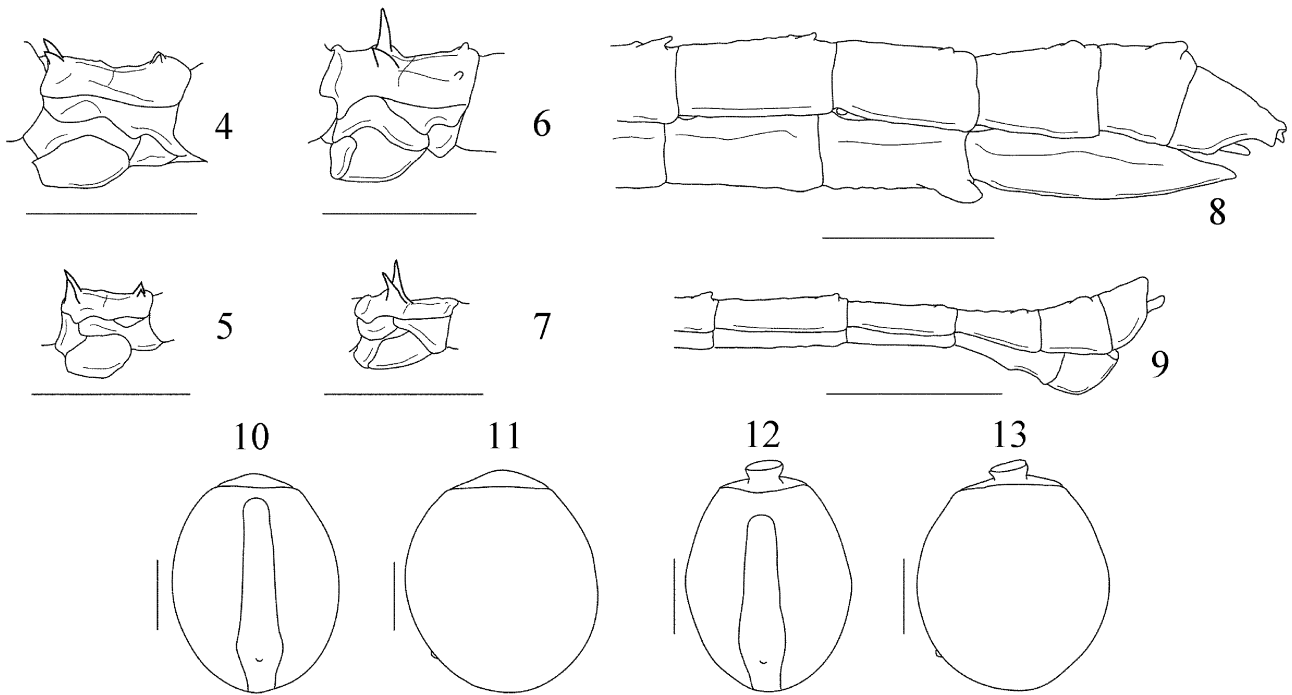
Pseudocentema bispinatum Chen & He, 2002

(Figs. 4–5, 10–11, 45)

Pseudocentema bispinatum, Chen & He (in Chen, He & Li), 2002: 107, figs. 8: a–b.

Hennemann *et al.*, 2008: 26.

Chen & He, 2008: 108, fig. 73: A–C.



FIGURES 4–13. *Pseudocentema* spp. **4.** *P. bispinatum* Chen & He, 2002 [scale bar 5 mm], female, prothorax, lateral view. **5.** *P. bispinatum* Chen & He, 2002 [scale bar 5 mm], male, prothorax, lateral view. **6.** *P. liui* Ho **spec. nov.** [scale bar 5 mm], HT female, prothorax, lateral view. **7.** *P. liui* Ho **spec. nov.** [scale bar 5 mm], PT male, prothorax, lateral view. **8.** *P. liui* Ho **spec. nov.** [scale bar 5 mm], HT female, apex of abdomen, lateral view. **9.** *P. liui* Ho **spec. nov.** [scale bar 5 mm], PT male, apex of abdomen, lateral view. **10.** *P. bispinatum* Chen & He, 2002 [scale bar 1 mm], egg capsule, dorsal view. **11.** *P. bispinatum* Chen & He, 2002 [scale bar 1 mm], egg capsule, lateral view. **12.** *P. liui* Ho **spec. nov.** [scale bar 1 mm], egg capsule, dorsal view. **13.** *P. liui* Ho **spec. nov.** [scale bar 1 mm], egg capsule, lateral view.

Type. Holotype: ♀, Jianfengling, Ledong, Hainan Province, China, 29.VII.1983, Hua Lizhong (SYSBM).

Other material examined. 2♂♂, 2♀♀, Jianfengling National Nature Reserve, Ledong Country, Hainan Province, China, 22.I.2010, George Ho Wai-Chun (GH); ♂, Jianfengling National Nature Reserve, Ledong Country, Hainan Province, China, 16.IV.2011, George Ho Wai-Chun (GH); 2♀♀, Jianfengling National Nature Reserve, Ledong Country, Hainan Province, China, 11–13.VII.2011, George Ho Wai-Chun (GH).

Diagnosis. This species is readily distinguished from *P. liui* Ho **spec. nov.** by having anterior and posterior spines of pronotum in both sexes, and an indistinct praeopercular organ on the seventh sternum in the female.

Description. Female (Figs. 4, 45). Dull coloration, greenish brown or light brown. Medium-sized, robust. Thicker and bigger than male. Body rough, covered with different kinds of armature including wrinkles, granules and tubercles of irregular size.

Head: Oblong, dorso-ventrally flattened, obviously longer than wide. Occiput slightly convex, sparsely covered with small granules. Hind margin with six small and rounded swellings. Median furrow distinct. Eyes oval, light brown. Antennae filiform, longer than profemora; the first segment parallel-sided, 2 x length of second segment.

Thorax: Covered with small granules, tubercles and wrinkles. Pronotum with longitudinal and transverse sulci crossing at the middle, with a pair of small anterior spines, apices towards front; with a pair of small and blunt posterior spines; and a pair of small tubercles placed at the middle. Mesonotum longer than the combined length of metanotum and median segment, moderately expanded posteriorly, with several small granules along lateral margins; posterior margin 1.5 x length of anterior margin; median carina distinct, distinctly elevated with a bispinose hump near the anterior region medially. Mesosternum sparsely covered with small granules. Metanotum 6.5 x length of median segment, parallel-sided. Metapleurum with a small tubercle-like supra-coxal spine, indistinct in some individuals.

Abdomen: Sparsely covered with granules and wrinkles. Median segment very narrow, being almost fused with metanotum, border indistinct. From second to seventh tergites with a scale-like elevation medio-posteriorly

and a pair of small granules placed in front of the elevation. Seventh sternum with indistinct praeopercular organ at the posterior margin, granule-like. Eighth tergum longer than ninth tergum and longer than anal segment. Anal segment with wide emargination at hind margin. Subgenital plate scoop-shaped, hind margin rounded, reaching the end of anal segment, with distinct median carina. Cerci very short, flattened and exposed, apices slightly pointed, projecting behind the anal segment.

Legs: Same coloration as body, with darker markings. Mesofemora and metafemora broad and thick. Antero-ventral and postero-ventral carinae of mesofemora and metafemora with two small spines near the apices.

Male (Fig. 5). Brown to dark brown. Slender and smaller than female. Densely covered with minute granules throughout the body. Thorax covered with few spines and tubercles.

Head: Oblong, longer than wide. Vertex with two convex elevations between eyes. Occiput flattened, median furrow distinct, hind margin with two granule-like swellings. Eyes oval and protruding. Genae with a black postocular stripe behind eyes. Antennae filiform, longer than forelegs and projecting behind the sixth abdominal tergum; the first segment flattened at base, longer than second segment; third segment cylindrical, longer than the first segment.

Thorax: Generally dark brown except pronotum, mesosternum and metasternum. Covered with minute granules. Pronotum light brown, rectangular, anterior and posterior margin with a pair of spines, the anterior pair 2 x length of the posterior pair. Mesonotum slender, longer than mesofemora, median carina indistinct; two to three short spines placed near the anterior margin; also with a pair of pre-median spines and a pair of post-median spines; and a pair of long spines along the median carina at posterior end; lateral margins with a row of seven to nine small granules. Mesosternum orange brown, densely covered with minute granules. Mesopleurum with a short posterior spine. Metanotum longer than median segment and with a pair of spines placed near the middle. Metasternum orange brown, with minute granules. Metapleurum with one short supra-coxal spine and three small granules.

Abdomen: Brown to dark brown as most parts of the thorax, with minute granules. Parallel-sided and slender, longer than the combined length of head and thorax together. Median segment square. From second to seventh tergites with a short posterior tubercle, gradually reduced in size posteriorly. From seventh tergum to anal segment, with short lateral wrinkles. Eighth tergum longer than ninth tergum and longer than anal segment. Anal segment with emargination at hind margin, lateral angles rounded. Poculum cup-shaped, apex rounded, reaching hind margin of ninth tergum. Cerci densely covered with brown setae, short, flattened at base, apices rounded and thick, not exceeding the anal segment.

Legs: Long and slender. Hindlegs longer than forelegs. Antero-ventral and postero-ventral carinae of mesofemora and metafemora with two short subapical spines. Profemora curved basally. All tibiae unarmed.

Measurements in Table 3.

TABLE 3. Measurements of *Pseudocentema bispinatum* Chen & He, 2002.

Length (mm)	Female (HT)	Female	Male
Body	52	60–65	50–51
Head	3.5	5–5.5	3.5
Antennae	18	33–37	40
Pronotum	4	4–4.5	3
Mesonotum	12	12–15	12–13
Metanotum	4	3.5–4	3.5
Median segment	3	3–3.5	2
Profemora	12	14–17	15–16
Mesofemora	10	12–13	11–13
Metafemora	13	16–18	16–17
Protibiae	12	15–19	16–18.5
Mesotibiae	9	12–14	12–14
Metatibiae	12	19–22	19–22

Eggs (Figs. 10–11). The capsule is from buff brown to grayish brown, with dark mottling, oval shape, with smooth surface. Operculum oval, purple with whitish spots at the middle, flat without elevation. Micropylar plate oblong, buff to white, with few dark markings, both ends rounded. Internal micropylar plate closed, median line absent. Micropylar cup placed near the middle of micropylar plate.

Measurements (mm). Length 2.5, width 2.4, height 2.

Notes. Redescription is given including the undescribed male and egg.

Distribution. Hainan (Jianfengling), China.

Pseudocentema liui spec. nov.

(Figs. 6–9, 12–13, 46)

Types. Holotype: ♀, Yinggeling Nature Reserve, Baisha Country, Hainan Province, China, 27–29.IX.2010, George Ho Wai-Chun (IZCAS); Paratypes: 2♂♂, 3♀♀, Yinggeling Nature Reserve, Baisha Country, Hainan Province, China, 27–29.IX.2010, George Ho Wai-Chun (1♂ in IZCAS, 1♂, 1♀ in KFBG & 2♀♀ in GH); 2♂♂, 3♀♀, 1 nymph ♀, Bawangling National Nature Reserve, Changjiang Country, Hainan Province, China, 8–10.V.2011, George Ho Wai-Chun (GH); 2♂♂, 4♀♀, Exianling Limestone Forest, Dongfang Country, Hainan Province, China, 9–13.VI.2011, George Ho Wai-Chun (1♂, 2♀♀ in KFBG & 1♂, 2♀♀ in GH); 2♂♂, 2♀♀, Yinggeling Nature Reserve, Baisha Country, Hainan Province, China, 17–20.VI.2011, George Ho Wai-Chun (GH); 4♂♂, 4♀♀, Huishan Nature Reserve, Qionghai Country, Hainan Province, China, 2–3.VII.2011, George Ho Wai-Chun (GH); 5♂♂, 1♀, Shangxi Nature Reserve, Wanning Country, Hainan Province, China, 4.VII.2011, George Ho Wai-Chun (GH); 2♂♂, 2♀♀, Diaoluoshan National Nature Reserve, Lingshui Country, Hainan Province, China, 6.VII.2011, George Ho Wai-Chun (GH); 5♂♂, 5♀♀, Wuzhishan National Nature Reserve, Wuzhishan Country, Hainan Province, China, 8–10.VII.2011, George Ho Wai-Chun (GH).

Diagnosis. This new species is generally similar to *P. bispinatum* Chen & He, 2002 but differs from the latter by lacking spines on anterior margin and posterior margin of pronotum in both sexes; female with prominent praeopercular organ on seventh sternum.

Description. Female (Figs. 6, 8). Light brown to dark brown. Medium-sized and robust, thicker than male. Body rough, covered with granules, spines and wrinkles.

Head: With small granules. Longer than wide. Vertex with two flat elevations between eyes. Occiput flattened, with distinct median furrow. Hind margin with six small rounded swellings. Eyes oval. Antennae filiform and reaching posterior half of second abdominal tergum; the first segment dorso-ventrally compressed and parallel-sided; second segment slightly longer than wide.

Thorax: Covered with small granules and short tubercles. Pronotum expanded posteriorly, roughly as long as head; with a pair of short spine-like tubercles (may be reduced to two small granules in some individuals) placed just before transverse sulcus, apices of the tubercles towards the lateral sides; posterior margin of the pronotum with two small granules. Mesonotum covered with short wrinkles, gradually expanded posteriorly; median line distinct, with a spinose or lamellate hump near the anterior end. Mesopleurum with a row of six to eight small granules. Metanotum with a granule placed at the middle.

Abdomen: Rough surface covering with granules and wrinkles. Median segment almost fused with metanotum, border indefinite. From second to seventh tergites with a scale-like elevation medio-posteriorly and a pair of small granules placed in front of the elevation. Seventh sternum with distinct praeopercular organ formed by one pointed tubercle at posterior margin, elongate posteriorly. Anal segment roughly as long as eighth tergum, with wide emargination at hind margin, carina distinct. Operculum scoop-shaped, apex rounded, not projecting over the anal segment. Cerci very short, flattened, tapering posteriorly, apices pointed, exposed beyond the anal segment.

Legs: Same coloration as body with darker markings. Profemora curved basally. Antero-dorsal and antero-ventral carinae of profemora, and antero-dorsal and postero-dorsal carinae of mesofemora and metafemora sparsely armed with minute tooth-like elevations. Antero-ventral and postero-ventral carinae of mesofemora and metafemora with two to three subapical spines.

Male (Figs. 7, 9, 46). Dark brown to brown. Slenderer than female. Body covered with minute granules. Thorax with sparse armature, mainly of short and small spines.

Head: Longer than wide. Vertex with two flat elevations between eyes. Occiput flattened, covered with few small granules, median furrow distinct. Hind margin with two small granule-like swellings. Eyes oval. Genae with a short carina behind eyes.

Thorax: Generally brown to dark brown, except for orange brown mesosternum and metasternum. With a few granules. Pronotum narrower than metanotum, parallel-sided, slightly shorter than head, anterior margin curved inward and with very few granules on the margins; with a pair of small spines pointing laterally and placed before transverse sulcus; posterior margin with small granules medially. Mesonotum slender, as long as mesofemora, with short wrinkles and few tubercles and a pair of spines placed near the posterior region; median carina indistinct; lateral margins with two longitudinal carinae. Mesosternum with small number of granules and a distinct median carina. Metanotum with three carinae, a pair of short spines placed at the middle and a small tubercle placed at the hind margin medially. Metasternum with sparse granules.

Abdomen: Brown as thorax. Parallel-sided and slender. Covered with minute granules and short wrinkles. Median segment almost fused with metanotum. From second to sixth tergites with a short tubercle medio-posteriorly, the tubercle gradually reduced in size posteriorly. Eighth tergum longer than ninth tergum. Anal segment shorter than ninth tergum, with emargination at posterior margin, postero-lateral angles rounded. Poculum cup-shaped, apex rounded, surpassing hind margin of the ninth tergum. Cerci densely covered with setae, slightly curved inward, flat and short, apices rounded and thick, extending beyond the anal segment.

Legs: Long and slender. With darker markings. Profemora curved basally. Antero-ventral and postero-ventral carinae of mesofemora and metafemora each with two subapical spines.

Measurements in Table 4.

TABLE 4. Measurements of *Pseudocentema liui* Ho spec. nov.

Length (mm)	Female (HT)	Female (PT)	Male (PT)
Body	67	67–70	52–57
Head	5.5	5–5.5	3.5–4
Antennae	34	33–40	42–48
Pronotum	4.5	4–4.5	3
Mesonotum	15	16.5–18	12–15
Metanotum	4.5	5	3.5–5
Median segment	2.5	3	2–2.5
Profemora	17	20	17–20
Mesofemora	12	13–15	12–15
Metafemora	17	19–21	17–20
Protibiae	18	20	17–23
Mesotibiae	13	14–15	12.5–16
Metatibiae	20	23–24	19–26

Eggs (Figs. 12–13). The capsule is from buff brown to grayish brown, with dark markings, oval shape, surface with inconspicuous granulations. Operculum flat, with a capitulum-like disc appendage, rounded with shallow depression. Micropylar plate oblong, buff to white, with sparse dark markings, both ends rounded. Outer margin of the plate grayish. Internal micropylar plate closed. Median line indistinct. Micropylar cup small, placed near the middle.

Measurements (mm). Length 2.5, width 2.2, height 2.5.

Notes. It feeds mainly on Wild Coffee *Psychotria asiatica* L. [Rubiaceae] and fern species in wild.

Distribution. From central to southeastern mountainous area of Hainan (Yinggeling, Bawangling, Exianling, Huishan, Shangxi, Diaoluoshan and Wuzhishan), China.

Etymology. This new species is named in honour of Prof. Liu Shengli (Hainan, China) for his contribution to the taxonomic study of Chinese Phasmatodea.

Genus *Qiongphasma* Chen, He & Li, 2002

(Figs. 14–43, 47–49)

Chen, He & Li, 2002: 106.

Hennemann, 2007: 25.

Hennemann, Conle & Zhang, 2008: 26.

Chen & He, 2008: 203.

Hennemann & Conle, 2008: 79.

Type-species. *Qiongphasma jianfengense* Chen & He (in Chen, He & Li), 2002: 106, by original designation.

Diagnosis. Similar to *Pseudocentema* Chen, He & Li, 2002, but *Qiongphasma* differs by its spinose occiput and triangularly expanded postero-lateral angles of abdominal tergites in both sexes. Also closely related to *Andropromachus* Carl, 1913, *Qiongphasma* is separated by the absence of supra-antennal spines in both sexes.

Description. Medium-sized. Apterous, with scale-like wing rudiments. Robust body in female, male thinner. Very spiny. Body spinose and tuberculate, covered with irregular sizes of spines and small granules, but less distinct in male. Head oval. Vertex flat, with two shallow depressions. Occiput conically elevated, spinose, with supra-orbitals and two to three pairs of medial spines (Fig. 24–25). Eyes small, near-globose to oval. Ocelli reduced, very small. Antennae filiform, longer than forelegs. Thorax and abdomen covered with short spines and small granules. Female mesonotum expanded moderately posteriorly or constricted at the anterior, slightly or moderately swollen pre-medially and slightly narrowing in posterior half, but elongate and nearly parallel-sided in male; with three pairs of long spines along median line, with five to six lateral spines and with two short posterior spines in female; with anterior mesal spines and pre-median, and post-median spines in male. Metanotum with anterior spines, posterior spines and a pair of long spines placed at the posterior end of median line in female; male with two pairs of spines along median line in metanotum. Metapleurum with one supra-coxal spine or two supra-coxal spines in both sexes (Figs. 26–27). Abdomen with medial spines from second to third tergites medio-posteriorly. Median segment with posterior spines in both sexes. Seventh tergum to anal segment with spinose crest-like structure medio-posteriorly in female; male with spines and the same crest-like structure as female, but smaller in size. Female seventh sternum lacking praeopercular organ or with a very small granule-like organ. Hind margin of anal segment emarginate or truncate in male and with two distinct emarginations in female. Cerci short and flattened, apices rounded, slightly curved inward in male, but straight in female. Tegmina absent, alae scale-like. Legs slender and long. Coxae with spine. Profemora basally curved. Antero-ventral and postero-ventral carinae of mesofemora and metafemora with two to three subapical spines. All carinae of femora with small serrations in female, but smooth in most species of male.

Notes. *Qiongphasma* is widely distributed in most remaining primary forests areas in Hainan. This species favors cool and humid areas and therefore can only be found at higher altitudes, between 600 and 1700 meters above sea level. It feeds mainly on fern species in the wild.

Distribution. Endemic to Hainan, China.

Species included:

1. *Qiongphasma bispinosus bispinosus* Ho **spec. nov. subspec. nov.** [Hainan (DLS)]
2. *Qiongphasma bispinosus minor* Ho **spec. nov. subspec. nov.** [Hainan (BWL & YGL)]
3. *Qiongphasma huishanensis* Ho **spec. nov.** [Hainan (HS)]
4. *Qiongphasma jianfengense jianfengense* Chen & He, 2002: 106, figs. 7: a–b. **sen. str.** [Hainan (JFL)]
5. *Qiongphasma jianfengense obtusicristata* Ho **subspec. nov.** [Hainan (WZS)]
6. *Qiongphasma wuzhishanense* Ho **spec. nov.** [Hainan (WZS)]

***Qionghasma bispinosus bispinosus* Ho spec. nov. subspec. nov.**

(Figs. 14–15, 24, 26, 28–29, 38–39)

Types. Holotype: ♂, Diaoluoshan National Nature Reserve, Lingshui Country, Hainan Province, China, 6.VII.2011, George Ho Wai-Chun (SYSBM); Paratypes: ♂♀, Diaoluoshan National Nature Reserve, Lingshui Country, Hainan Province, China, 6.VII.2011, George Ho Wai-Chun (1♀ in SYSBM & 1♂ in GH).

Diagnosis. This nominate race is different from *Q. bispinosus minor* Ho **spec. nov. subspec. nov.** in the well-developed anterior spines of metanotum in male; and large size and distinctly serrated ventral carinae of mesofemora, and metafemora in female.

Description. Male (Figs. 14–15, 38). Medium-sized. Very slender body. General coloration of body dull olive green.

Head: Oblong, longer than wide. Vertex flat, with two slightly flattened elevations between eyes, lateral margins of the elevations carinate. Occiput convex, with three pairs of medial spines along median furrow, posterior pair 2 x longer than anterior pair; and with a pair of long supra-orbital spines laterad of the middle occipital medial spines. Hind margin with six small swellings, median pair slightly larger than others. Eyes small, oval, with a small granule placed behind. Ocelli tiny, reduced, placed above the eyes. Antennae long, surpassing the end of abdomen; the first segment constricted at base, slightly carinate medially, almost 2 x length of second segment, roughly as long as third segment.

Thorax: Inconspicuously covered with sparse and minute granules. Pronotum slightly shorter than head, apparently longer than wide, anterior margin broadly emarginate, with anterior spines and posterior spines, the anterior pair longer. Mesonotum 5 x length of pronotum, parallel-sided from anterior to post-median region, slightly expanded posteriorly after the post-median region; lateral margins slightly pitted, with two to three small granules and one short spine-like tubercle medially; with two pairs of spines placed nearly at the anterior and posterior ends of median line; hind margin with a pair of posterior spines; also with pre-median and post-median spines, posterior pair as long as the anterior pair, apices pointing laterally. Mesopleurum with two small granules and a supra-coxal spine. Metanotum 1.5 x length of median segment, with a pair of short antero-lateral spines; also with two pairs of spines after along the half of median line, anterior pair 2 x length of the posterior pair. Metapleurum with one long medio-lateral spine and two supra-coxal spines.

Abdomen: Slender, with minute granulations. Median segment longer than pronotum, with medial spines and a pair of posterior spines at hind margin. Second to seventh tergites with a long medial posteriorly, largest at fifth tergum and smallest at seventh tergum, others equal in size; and with paired posterior spines laterad of the medial spine, reduced in size posteriorly. Eighth and ninth tergites expanded posteriorly, with triangularly expanded postero-lateral angles and with a small crest-like structure medio-posteriorly. Anal segment slightly longer than ninth tergum, hind margin slightly notched, with faint median and lateral carinae. Poculum cup-shaped, hind margin rounded. Cerci cylindrical, flattened, apices rounded and curved.

Legs: Generally same as the coloration of body, all apices of tibiae darker. Very long and slender. Procoxae and metacoxae with only one long and curved spine, metacoxae lacking spine. Profemora basally curved, longer than the combined length of pronotum, mesonotum and metanotum together. Antero-ventral and postero-ventral carinae of mesofemora and metafemora with two short spines near the apices, and with three to six weak serrations along the postero-ventral carina. Dorsal carinae of all femora unarmed.

Female (Figs. 24, 26, 28–29, 39). Large size. Body robust, larger and spinier than male. General coloration of body and legs green, with purplish brown markings. Spinose and granulated.

Head: Oblong, longer than wide. Vertex flat, with two flattened elevations between eyes, the elevations laterally carinate. Genae with a few small granules behind eyes. Occiput strongly convex, hind margin with six swellings, median pair largest. Median furrow distinct, laterad of three pairs of occipital medial spines, the anterior pair smallest, the posterior pair longest; also with a pair of long supra-orbital spines laterad of the median pair of occipital spines, longer than all the occipital spines. Eyes coffee brown, prominent and rounded. Antennae green with darker apices, filiform, longer than forelegs; the first segment cylindrical, flattened and constricted at base, 2 x length of second segment, slightly longer than third segment.

Thorax: Covered with spines and granules. Pronotum rectangular, shorter than head, anterior margin curved; with a pair of long medial spines and posterior spines, the anterior pair roughly as long as the posterior pair. Mesonotum moderately expanded posteriorly, slightly swollen medially, about 3.2 x length of pronotum, with three

pairs of long spines along median line evenly, median pair shortest; also with a pair of short posterior spines; lateral margins with four to five spines, median one longest; and with pre-median spines and post-median spines, both equal in length and size. Mesopleurum with three to four small spines and a long supra-coxal spine. Mesosternum with three small spines along margins. Metanotum as long as median segment, with a pair of antero-lateral spines and post-median spines, hind margin with a small mesal spine and inter-posterior spines. Metapleurum with three small spines, a long medio-lateral spine and two supra-coxal spines.

Abdomen: Sparsely covered with small yellowish granules. Median segment fused with metanotum, border indistinct, with a pair of medial spines medially, a posterior mesal spine and first paired posterior spines, all equal in size and length; also with a pair of small medial spines placed in front of the posterior mesal spine. Hind margin of second to ninth tergites with spinose crest-like structure medio-posteriorly, apex acute, with one to three short spines on the crest. Second to seventh tergites with posterior spines, laterad of the medio-posterior crest, gradually reduced in size posteriorly; lateral margins with one to two small triangular spines. Second tergum with a pair of mesal spine in front of the crest. Third to eighth tergites with triangularly expanded postero-lateral angles, hind margin of the angles truncate. Anal segment roughly as long as eighth tergum, longer than ninth tergum, medially and laterally carinate, with two emargination at hind margin. Cerci flattened, apices rounded, reaching hind margin of the anal segment.

Legs: Green with purplish brown markings. Procoxae and mesocoxae with a spine. Profemora basally curved, antero-ventral carina with a small spine subapically, postero-ventral carina with two small spines subapically. Antero-ventral and postero-ventral carinae of mesofemora and metafemora with two small subapical spines. Antero-dorsal, postero-dorsal, antero-ventral and postero-ventral carinae of all femora evenly with six to ten small yellowish serrations. Medio-ventral carina of all femora with minute serrations. All tibiae lacking unarmed.

Measurements in Table 5.

TABLE 5. Measurements of *Qiongphasma bispinosus bispinosus* Ho **spec. nov. subspec. nov.**

Length (mm)	Male (HT)	Male (PT)	Female (PT)
Body	60	62	74
Head	4	4.5	6
Antennae	64	61	67
Pronotum	3	3.5	5
Mesonotum	13.5	15.5	16
Metanotum	4.5	4.5	4.5
Median segment	3.5	3.5	4.5
Profemora	23	23	23
Mesofemora	16	18	17
Metafemora	22	25	24
Protibiae	26	27	26
Mesotibiae	17	18.5	19
Metatibiae	26	29	24

Notes. This new species contains the nominate race and *Q. bispinosus minor* Ho **spec. nov. subspec. nov.**, described in this study.

Distribution. Hainan (Diaoluoshan), China.

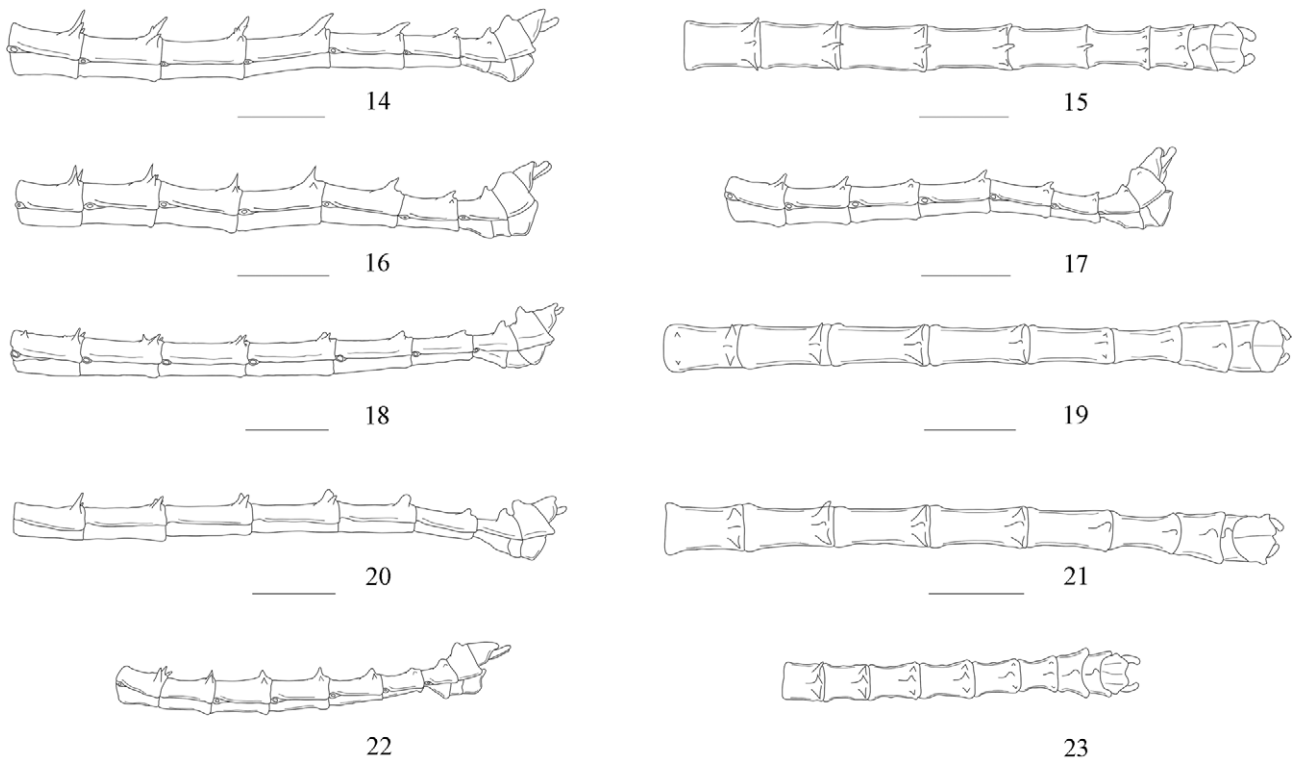
Etymology. Named after the feature of two supra-coxal spines of the metapleurum.

***Qiongphasma bispinosus minor* spec. nov. subspec. nov.**

(Figs. 16–17, 30–31, 40, 47)

Types. Holotype: ♂, 850 m., Bawangling National Nature Reserve, Changjiang Country, Hainan Province, China, 9.V.2011, George Ho Wai-Chun (SYSBM); Paratypes: 1♂, 1♀, 1 nymph ♀, 850 m., Bawangling National Nature

Reserve, Changjiang Country, Hainan Province, China, 9.V.2011, George Ho Wai-Chun (1♀ in SYSBM & 1♂, 1 nymph ♀ in GH); 2♂♂, 2♀♀, 1 gynandromorphic adult, 1500 m., Yinggeling Nature Reserve, Baisha Country, Hainan Province, China, 28.IX.2010, George Ho Wai-Chun (GH).



FIGURES 14–23. *Qionghasma* spp. [scale bar 5 mm]. **14.** *Q. bispinosus bispinosus* Ho **spec. nov. subspec. nov.**, HT male, abdomen, lateral view. **15.** *Q. bispinosus bispinosus* Ho **spec. nov. subspec. nov.**, HT male, abdomen, dorsal view. **16.** *Q. bispinosus minor* Ho **spec. nov. subspec. nov.**, HT male (BWL), abdomen, lateral view. **17.** *Q. bispinosus minor* Ho **spec. nov. subspec. nov.**, PT male (YGL), abdomen, lateral view. **18.** *Q. jianfengense jianfengense* Chen & He, 2002 **sen. str.**, male, abdomen, lateral view. **19.** *Q. jianfengense jianfengense* Chen & He, 2002 **sen. str.**, male, abdomen, dorsal view. **20.** *Q. jianfengense obtusicristata* Ho **subspec. nov.**, PT male, abdomen, lateral view. **21.** *Q. jianfengense obtusicristata* Ho **subspec. nov.**, PT male, abdomen, dorsal view. **22.** *Q. wuzhishanense* Ho **spec. nov.**, HT male, abdomen, lateral view. **23.** *Q. wuzhishanense* Ho **spec. nov.**, HT male, abdomen, dorsal view.

Diagnosis. This new subspecies is distinguished from *Q. bispinosus bispinosus* Ho **spec. nov. subspec. nov.** by its smaller size in both sexes; metapleurum with medio-lateral spine and metanotum lacking anterior spines in male; distinctly and moderately swollen pre-medially mesonotum, and ventral carinae of mesofemora and metafemora with indistinct serrations in female.

Description. Male (Figs. 16–17). Medium-sized, generally similar to the nominate race, but smaller and slimmer, with duller coloration.

Head: As in the nominate race, but head more rounded, occiput more gently convex, with only one to two pairs of occipital medial spines along median furrow, the posterior pair as long as the pair of long supra-orbital spines.

Thorax: As in the nominate race, pronotum with anterior and posterior spines, the anterior pair 2 x length of the posterior pair. Mesonotum parallel-sided, lateral margins with two to three small granules and heavily pitted. Metanotum lacking anterior spines, only with two pairs of spines along median line after the half. Metapleurum with one medio-lateral spine and two supra-coxal spines.

Abdomen: As in the nominate race, but second to seventh tergites with a long medial spine at posterior margin, almost as long as the paired posterior spines. Eighth and ninth tergites with a smaller crest medio-posteriorly. Anal segment as long as ninth tergum, hind margin notched distinctly. Poculum and cerci as in the nominate race.

Legs: As in the nominate race, all coxae lacking spine in YGL individuals. Lacking serration along the postero-ventral carina.

Female (Figs. 30–31, 47). Similar to the nominate race, but generally smaller.

Head: As in the nominate race, but vertex lacking supra-orbital. Occiput conically raised, with similar number

and positions of occipital spines as in the nominate race, but the supra-orbital spines bifurcated in some individuals and more granulated.

Thorax: Pronotum as in the nominate race, but the long medial spines 2 x length of posterior spines. Mesonotum as in the nominate race, but more distinctly constricted at the anterior, distinctly and moderately swollen pre-medially and parallel-sided in posterior half; two medio-lateral spines, the posterior one longer than anterior one. Mesopleurum, metanotum and metapleurum as in the nominate race.

Abdomen: As in the nominate race, but seventh tergum of some individuals with indistinct granule-like praeopercular organ. From second to seventh tergites with smaller medio-posterior crest; and shorter posterior spines laterad of the crest. Cerci much longer, extending the end of abdomen.

Legs: Generally as in the nominate race, but the dorsal and ventral carinae of all femora with indistinct serrations, much smaller.

Measurements in Table 6.

TABLE 6. Measurements of *Qionghasma bispinosus minor* Ho **spec. nov. subspec. nov.**

Length (mm)	Male (HT/BWL)	Male (PT/BWL)	Female (PT/BWL)	Male (PT/YGL)	Female (PT/YGL)
Body	57	58	68	49–51	53–57
Head	3.5	3.5	6	3	4.5–5
Antennae	42	55	55	45–48	41–43
Pronotum	3	3	4.5	2.5	3
Mesonotum	14	14.5	15	11.5–12	12
Metanotum	4.5	4.5	5	4	3–3.5
Median segment	2.5	2.5	4	2	3–3.5
Profemora	21	21	22	17–18	15–16
Mesofemora	15.5	15	16	12–13	11
Metafemora	21	20.5	24	17–18	15–15.5
Protibiae	25	23	26	19–20	16–18
Mesotibiae	17	17	20	14	12
Metatibiae	26	26.5	31	20	18–21

Notes. A gynandromorphic adult (Fig. 40), which was collected at Yinggeling Nature Reserve, had morphological characteristics of both sexes. The distinctly serrated left midlegs and left hindlegs, triangularly expanded angle from third to ninth abdominal tergites postero-laterally on left side, and enlarged crest-like structure on the abdominal tergites matched with the features of the female. Generally other parts of the body were matched with the male. This is the first report of gynandromorphy in Chinese Phasmatodea.

Distribution. Hainan (Bawangling and Yinggeling), China.

Etymology. This new subspecies is named after the small size of the body while compared with the nominate race.

***Qionghasma huishanensis* spec. nov.**

(Figs. 32–33)

Type. Holotype: ♀, Huishan Nature Reserve, Qionghai Country, Hainan Province, China, 3.VII.2011, George Ho Wai-Chun (SYSBM).

Diagnosis. This new species is distinctive from all other species in its less granulated body, occiput with two pairs of long occipital medial spines, hind margin of fourth and fifth abdominal tergites with indistinct crest-like structure, posterior carina of metafemora with three subapical spines, medio-ventral carina of mesofemora and metafemora with minute serrations, and first segment of metatarsi as long as second and third segments combined.

Description. Female (Figs. 32–33). Large species. Robust body. Dull green with brownish markings. Inconspicuously granulated throughout the body.

Head: Oblong, longer than wide. Vertex flat, with very few granules. Occiput slightly convex, with a pair of small granule-like supra-orbital spines placed posterior to the eyes. Median furrow distinct, laterad of two pairs of occipital medial spines, the anterior pair minute and the posterior pair as long as the first antennal segment; and with a pair of supra-orbital spines laterad of the minute anterior occipital spines. Hind margin of the head with eight small swellings. Genae with three small granules behind eyes. Eyes dark brown, oval. Antennae filiform, longer than forelegs; the first segment flattened at base, 2.5 x length of second segment.

Thorax: Pronotum slightly longer than head, antero-lateral angles rounded, with a pair of long medial spines and posterior spines. Mesonotum with few granules, expanded posteriorly, slightly swollen pre-medially, with three pairs of long spines along the median line and a pair of short posterior spines; lateral margins with six small spines, 3 x shorter than the pre-median spines and post-median spines. Mesopleurum with five to six lateral spines and a long supra-coxal spine. Metanotum longer than median segment, with a pair of short antero-lateral spines, a pair of post-median spines, a pair of inter-posterior spines and a small lateral spine medio-laterally. Metapleurum with three to four small lateral spines of which the posterior is longest; a long medio-lateral spine placed above the lateral spines and with a long supra-coxal spine.

Abdomen: Covered with inconspicuous granules. Median segment almost fused with metanotum, border indistinct, with a pair of medial spines and posterior spines. Lateral margins of second to ninth tergites with one to three short spines. From second to seventh tergites with anterior spines which are gradually reduced in size posteriorly; also with a pair of medial spines near the posterior end of median line. Eighth tergum lacking anterior spine. Second to fourth tergites with medial spine. Hind margin of fifth to ninth tergites with a small crest-like structure which is gradually increasing in size posteriorly, apex obtuse. Second to ninth tergites with posterior spines, laterad of the crest-like abdominal structure or medial spine, gradually reduced in size posteriorly. Third to seventh tergites with expanded postero-lateral angles, hind margin of the angles curved. Anal segment 1.5 x length of ninth tergum, median carina distinct, with two emarginations at hind margin. Cerci flattened, apices rounded, slightly exposed behind anal segment.

Legs: All coxae with only one short spine. Posterior carina of metafemora with three subapical spines. Medio-ventral carina of mesofemora and metafemora with indistinct serrations. First segment of metatarsi as long as the combined length of second segment and third segment together. All tibiae unarmed.

Male. Unknown.

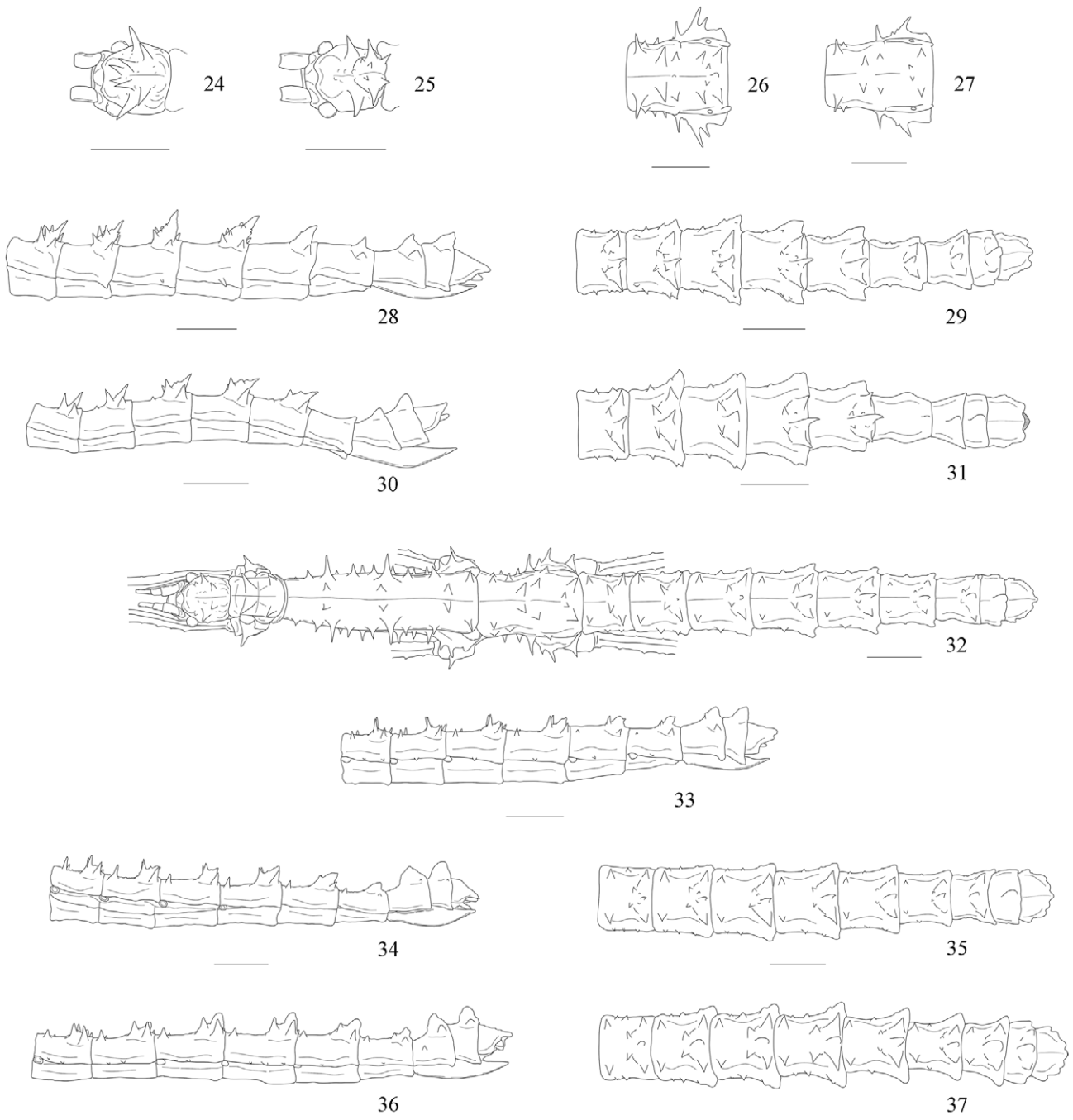
Measurements in Table 7.

TABLE 7. Measurements of *Qiongphasma huishanensis* Ho **spec. nov.**

Length (mm)	Female
Body	84
Head	6
Antennae	76
Pronotum	5
Mesonotum	19
Metanotum	6
Median segment	4
Profemora	25
Mesofemora	18
Metafemora	25
Protibiae	28
Mesotibiae	20
Metatibiae	30

Distribution. Hainan (Huishan), China.

Etymology. This species is named after the type-locality, Huishan Nature Reserve.



FIGURES 24–37. *Qionghasma* spp. [scale bar 5 mm]. **24.** *Q. bispinosus bispinosus* Ho **spec. nov. subspec. nov.**, PT female, head, dorsal view. **25.** *Q. jianfengense obtusicristata* Ho **subspec. nov.**, PT female, head, dorsal view. **26.** *Q. bispinosus bispinosus* Ho **spec. nov. subspec. nov.**, PT female, pronotum, dorsal view. **27.** *Q. jianfengense jianfengense* Chen & He, 2002 **sen. str.**, female, pronotum, dorsal view. **28.** *Q. bispinosus bispinosus* Ho **spec. nov. subspec. nov.**, PT female, abdomen, lateral view. **29.** *Q. bispinosus bispinosus* Ho **spec. nov. subspec. nov.**, PT female, abdomen, dorsal view. **30.** *Q. bispinosus minor* Ho **spec. nov. subspec. nov.**, PT female (BWL), abdomen, lateral view. **31.** *Q. bispinosus minor* Ho **spec. nov. subspec. nov.**, PT female (BWL), abdomen, lateral view. **32.** *Q. huishanensis* Ho **spec. nov.**, HT female, body, dorsal view. **33.** *Q. huishanensis* Ho **spec. nov.**, HT female, abdomen, lateral view. **34.** *Q. jianfengense jianfengense* Chen & He, 2002 **sen. str.**, female, abdomen, lateral view. **35.** *Q. jianfengense jianfengense* Chen & He, 2002 **sen. str.**, female, abdomen, dorsal view. **36.** *Q. jianfengense obtusicristata* Ho **subspec. nov.**, HT female, abdomen, lateral view. **37.** *Q. jianfengense obtusicristata* Ho **subspec. nov.**, HT female, abdomen, dorsal view.



FIGURES 38–43. Habitus of *Qiongphasma* spp. [not to scale] **38.** *Q. bispinosus bispinosus* Ho **spec. nov. subspec. nov.**, HT male, Diaoluoshan National Nature Reserve, Lingshui Country, Hainan Province, China. **39.** *Q. bispinosus bispinosus* Ho **spec. nov. subspec. nov.**, PT female, Diaoluoshan National Nature Reserve, Baoting, Hainan Province, China. **40.** *Q. bispinosus minor* Ho **spec. nov. subspec. nov.**, PT gynandromorphic adult, Yinggeling Nature Reserve, Baisha Country, Hainan Province, China. **41.** *Q. jianfengense jianfengense* Chen & He, 2002 **sen. str.**, male, Jianfengling National Nature Reserve, Ledong Country, Hainan Province, China. **42.** *Q. jianfengense jianfengense* Chen & He, 2002 **sen. str.**, female, Jianfengling National Nature Reserve, Ledong Country, Hainan Province, China. **43.** *Q. wuzhishanense* Ho **spec. nov.**, HT male, Wuzhishan National Nature Reserve, Wuzhishan National, Hainan Province, China.

***Qiongphasma jianfengense jianfengense* Chen & He, 2002 sen. str.**

(Figs. 18–19, 27, 34–35, 41–42)

Qiongphasma jianfengense, Chen & He (in Chen, He & Li), 2002: 106, figs. 7: a–b.

Hennemann, Conle & Zhang, 2008: 26.

Chen & He, 2008: 203, figs. 169: A–C.

Type. Holotype: ♂, Jianfengling, Ledong Country, Hainan Province, China, 19.V.1983, Chen Huanqiang (SYSBM).

Other material examined. 2♂♂, 1♀, Jianfengling National Nature Reserve, Ledong Country, Hainan Province, China, 6–7.VI.2008, George Ho Wai-Chun (GH); ♂, Jianfengling National Nature Reserve, Ledong Country, Hainan Province, China, 14–16.IV.2010, Zhu Jianqing (SNU); 3♂♂, Jianfengling National Nature Reserve, Ledong Country, Hainan Province, China, 15–16.IV.2011, George Ho Wai-Chun (GH); 4♂♂, 3♀♀, Jianfengling National Nature Reserve, Ledong Country, Hainan Province, China, 11.VII.2011, George Ho Wai-Chun (GH).

Diagnosis. Differs from *Qiongphasma jianfengense obtusicristata* Ho **subspec. nov.** by hind margin of fourth to seventh tergites having sharp apically crest-like structure or hump in both sexes; and male with supra-orbital spines and rounded apices of cerci.

Description. Male (Figs. 18–19, 41). Medium-sized, slender and quite elongate. Not as spiny as female. Body covered with a few short spines. Dull coloration, dorsal surface uniformly greenish brown, ventral surface of thorax and abdomen brown.

Head: Oval, nearly rectangular, hind margin with six small swellings. Vertex flat, with two slight elevations between eyes, but not strongly convex. Occiput slightly convex, with one to two pairs of medial spines along median furrow, the posterior pair longer than the anterior pair; also with a pair of supra-orbital spines laterad of the anterior medial spines, absent in some individuals. Eyes small, nearly rounded. Antennae light brown, filiform, longer than forelegs; the first antennal segment rectangular, apices thick, medially faintly carinate, shorter than third segment; second segment cylindrical, shorter than the first segment and shorter than third segment.

Thorax: Pronotum longer than wide, transverse and longitudinal sulci crossing at the middle; with anterior and posterior spines, the posterior pair distinctly shorter than the anterior pair. Prosternum with distinct 'x'-shaped sulcus. Mesonotum 2 x length of the total length of metanotum and median segment combined together, parallel-sided, lateral margins sparsely covered with 7 to 10 small granules; with a pair of spines placed near posterior end of faint median line; hind margin with a pair of posterior spines; two short pre-median and post-median spines very distinct, posterior pair longer than anterior pair, apices directing lateral sides. Mesopleurum with three lateral granules and a long supra-coxal spine. Mesosternum with small granules. Metanotum 1.5 x length of median segment, with two pairs of spines along median line after the middle. Metapleurum with medio-lateral spine, two lateral granules, one postero-lateral spine and one supra-coxal spine. Metasternum with small granules.

Abdomen: Cylindrical and slender. Parallel-sided from second to seventh tergites. Median segment with distinct median carina and a pair of posterior spines at hind margin. From hind margin of second to sixth tergites with a pair of posterior spines, reduced in size posteriorly. Third and fourth tergites with a small posterior medial spine, which is absent on second tergum. Fifth to ninth tergites with a distinct hump medio-posteriorly, apex pointed. Eighth and ninth tergites expanded posteriorly, with triangular postero-lateral angles, with two small granules laterad of the hump. Hind margin of anal segment truncate or slightly emarginate, with three distinct carinae. Poculum rounded at hind margin, with a short carina. Cerci flattened, apices rounded, curved inward, surpassing end of the anal segment.

Legs: Brownish green, very long and slender. Profemora basally curved, longer than mesonotum. Procoxae and mesocoxae with only one short spine, metacoxae lacking spine. Forelegs as long as hindlegs. Antero-ventral and postero-ventral carinae of mesofemora and metafemora with two short spines near the apices. Medio-ventral carina of mesofemora and metafemora lacking serration. First segment of metatarsi longer than the combined length of second and third segments together.

Female (Figs. 27, 34–35, 42). Very spiny species, robust and large size. Body covered with irregular-sized spines. Different from male in its striking coloration and larger size. General color of body and legs bright green. Body covered with small yellowish granules. Thorax and abdomen bright green with irregular-sized purplish mottling. Abdomen with purplish armature.

Head: Oblong, longer than wide, sparsely covered with small granules. Vertex flat, with small oval depression between bases of antennae, anterior margin carinate; with a pair of minute granule-like supra-orbital spines placed posterior to the eyes. Occiput elevated with a spinose hump, raised with two to three pairs of medial spines laterad of median furrow, the median pair usually 2 x to 3 x length of other pairs; also with a pair of long supra-orbital spines placed antero-laterally to the spinose hump. Hind margin with six to eight swellings, median pair larger than others. Eyes oval, small and yellowish. Antennae green as head, with purple ring, filiform, longer than forelegs; the first segment 2.5 x length of second segment and slightly longer than third segment.

Thorax: Covered with small granules. Pronotum as long as head, hind margin rounded, with a pair of long medial spines and short posterior spines, antero-lateral angles protruding and near truncate, transverse and longitudinal sulci crossing at the middle. Mesonotum moderately expanded behind, median line indistinct, covered with different sizes of spines; three pairs of long spines along the median line with the posterior pair longest; two long pre-median and post-median spines laterad of the median line; with five to six short lateral spines along margins; and with two short posterior spines. Mesopleurum with six to seven small lateral spines and a long supra-coxal spine. Mesosternum sparsely covered with granules and with three short spines near lateral margins. Metanotum square, parallel-sided, distinctly longer than median segment, with scale-like wing rudiments postero-laterally; with a pair of short antero-lateral spines and inter-posterior spines; and two long spines placed near the posterior end of median line. Metapleurum with one small metapleural, three to four small lateral spines with the posterior longest, a long medio-lateral spine placed above the lateral spines, and a long posteriorly-curved supra-coxal spine.

Abdomen: Green, as thorax, with a greenish reversed 'V'-shaped marking. Ventral surface of thorax and abdomen brown. Covered with small granules dorsally and ventrally and spines of different size. Median segment

rectangular, with a pair of medial spines and posterior spines. From second to eighth tergites with a pair of anterior spines, gradually reduced in size posteriorly. From fourth to ninth tergites with a spinose crest-like structure medio-posteriorly, apex pointed, with a short posterior on each side of the crest. Second tergum almost parallel-sided. Third to ninth tergites with triangularly-expanded postero-lateral angles, hind margin of the angles truncate. Seventh sternum lacking praeopercular organ. Anal segment as long as or slightly shorter than ninth tergum, with three distinct carinae, hind margin with two emarginations. Subgenital plate scoop-shaped, reaching hind margin of the anal segment, with distinct median carina. Cerci short and flattened, apices rounded and just exceeding behind the anal segment.

Legs: Bright green with purplish markings. Procoxae and mesocoxae with only one spine, indistinct or absent on metacoxae. Antero-ventral and postero-ventral carinae of all femora with two short spines near apices. Dorsal and ventral carinae of all femora with seven to eight small serrations. Profemora basally curved, as long as metafemora and longer than mesofemora. Metatibiae longest among all tibiae. First segment of metatarsi longer than the combined length of second and third segments together.

Measurements in Table 8.

TABLE 8. Measurements of *Qiongphasma jianfengense jianfengense* Chen & He, 2002 **sen. str.**

Length (mm)	Male (HT)	Male	Female
Body	65	60–66	74–80
Head	3	3–4	6
Antennae	55	58–63	56–58
Pronotum	3.5	3–3.5	4.5–5
Mesonotum	15.5	14–16.5	16.5–17.5
Metanotum	4	4–5	5–5.5
Median segment	3	3–4	4
Profemora	23	21–26	21–24
Mesofemora	17	15–18	15–17
Metafemora	23	21–24	21–25
Protibiae	20	23–28	23–26
Mesotibiae	19	17–20	16–20
Metatibiae	24	24–30	26–31

Notes. Chen, He and Li (2002: 106) described *Qiongphasma* based on a single male. Female is described here for the first time.

Distribution. Hainan (Jianfengling), China.

***Qiongphasma jianfengense obtusicristata* Ho subsp. nov.**

(Figs. 20–21, 25, 36–37, 48–49)

Types. Holotype: ♀, 700 m., Wuzhishan National Nature Reserve, Wuzhishan Country, Hainan Province, China, 8.VII.2011, George Ho Wai-Chun (KFBG); Paratype: ♀, 800 m., Wuzhishan, Wuzhishan Country, Hainan Province, China, 16–24.IV.2011, Hua Wexuan (SEM); 3♂♂, 2♀♀, 700 m., Wuzhishan National Nature Reserve, Wuzhishan Country, Hainan Province, China, 8.VII.2011, George Ho Wai-Chun (1♂ in KFBG & 2♂♂, 2♀♀ in GH).

Diagnosis. Differs from *Q. j. jianfengense* Chen & He, 2002 **sen. str.** by obtuse apical crest-like structure from fourth to seventh abdominal tergites in both sexes; lacking supra-orbital spines and slightly pointed apices of cerci in male.

Description. Female (Figs. 25, 36–37, 49). Large. Greenish body. Covered with similar armature as in the nominate race.

Head: As in the nominate race. Vertex with a pair of indistinct minute granule-like supra-orbital spines placed at the posterior of eyes and following with shorter supra-orbital spine on each side. Occiput convex, but much flattened, with two to three pairs of medial spines lateral to median furrow.

Thorax: Structure and armature as in the nominate form.

Abdomen: Generally as in the nominate form, but fourth to ninth tergites with more obtuse and rounded apical crest-like structure, gradually larger in size posteriorly. Third to ninth tergites with triangularly expanded posterolateral angles, hind margin of the angles more truncate. Seventh sternum lacking praeopercular organ. Anal segment as long as ninth tergum, hind margin with two emarginations. Operculum scoop-shaped, not reaching hind margin of the anal segment. Cerci short and flattened, apices rounded and just exceeding the anal segment.

Legs: As in the nominate form, procoxae with a spine, absent or with a spine on mesocoxae, completely absent on metacoxae.

Male (Figs. 20–21, 48). Dull coloration, olive green. Slenderer and thinner than female. Generally similar to the nominate race.

Head: As in the nominate form, but occiput more flattened, with only a pair of occipital spines placed near the end of median furrow and lacking supra-orbital spines. Genae with a very thin and pale green postocular stripe.

Thorax: With similar position of armature as in the nominate race. Pronotum with anterior and posterior spines, the anterior pair slightly longer than the posterior pair. Mesonotum as in the nominate form, but with minute spines along the margins.

Abdomen: As in the nominate form, but fifth to ninth tergites with a distinct hump medio-posteriorly, more rounded and obtuse apically. Anal segment slightly emarginate at hind margin. Poculum rounded at hind margin, with a short median carina. Cerci flat, apices slightly pointed, curved inward.

Legs: As in the nominate form, very slender, procoxae with a short spine, mesocoxae and metacoxae lacking spine. Antero-ventral and postero-ventral carinae of mesofemora and metafemora with two to three short spines near the apices.

Measurements in Table 9.

TABLE 9. Measurements of *Qiongphasma jianfengense obtusicristata* Ho **subspec. nov.**

Length (mm)	Female (HT)	Female (PT)	Male (PT)
Body	74	77–79	62–64
Head	5	5.5–6	3.5
Antennae	70	55–69	57–68
Pronotum	5	5	3.5
Mesonotum	18	18–19	16–16.5
Metanotum	5.5	5–5.5	4.5–5
Median segment	3.5	4	3
Profemora	24	25	22–24
Mesofemora	17	17.5–18	16–17
Metafemora	25	24–25	22–24
Protibiae	26.5	25–27	26–28
Mesotibiae	19	18–19	17–19
Metatibiae	29	28–29	27–30

Notes. This race has temporarily only been found between 700 and 800 meters above sea level at Wuzhishan.

Distribution. Hainan (Wuzhishan), China.

Etymology. Combining “obtusi” [=obtuse] and “crista” [=crest], the name refers to the obtuse apical crest-like structure of the abdominal tergites.



FIGURES 44–49. 44. *Neoqionghasma diaoluoshanensis* Ho **gen. nov. spec. nov.**, HT female, Diaoluoshan National Nature Reserve, Lingshui Country, Hainan Province, China. 45. *Pseudocentema bispinatum* Chen & He, 2002, female, Jianfengling National Nature Reserve, Ledong Country, Hainan Province, China. 46. *Pseudocentema liui* Ho **spec. nov.**, male, Yinggeling Nature Reserve, Baisha Country, Hainan Province, China. 47. *Qionghasma bispinosus minor* Ho **spec. nov. subspec. nov.**, PT nymph female, Bawangling National Nature Reserve, Changjiang Country, Hainan Province, China. 48. *Qionghasma jianfengense obtusicristata* Ho **subspec. nov.**, male, 700 m., Wuzhishan National Nature Reserve, Wuzhishan Country, Hainan Province, China. 49. *Qionghasma jianfengense obtusicristata* Ho **subspec. nov.**, female, 700 m., Wuzhishan National Nature Reserve, Wuzhishan Country, Hainan Province, China.

Qionghasma wuzhishanense* Ho **spec. nov.*
(Figs. 22–23, 43)

Type. Holotype: ♂, 1800 m., Wuzhishan National Nature Reserve, Hainan Province, China, 9.VII.2011, George Ho Wai-Chun (SYSBM).

Diagnosis. This new species is similar to *Q. bispinosus* Ho **spec. nov.**, but can be separated by its smaller size, medial bi-spined hump of metanotum, and serrated antero-dorsal, and postero-dorsal carinae of all femora.

Description. Male (Figs. 22–23, 43). Smallest *Qiongphasma*. Slender body. General color of body dull green with brownish markings.

Head: Oblong, slightly rounded. Vertex flat, with two convex elevations between eyes, anteriorly and laterally carinate. Occiput convex, with three pairs of medial spines along median furrow, posterior pair as long as median pair; and with a pair of long supra-orbital spines laterad of the middle occipital spines, longer than all occipital spines. Hind margin with six small swellings, median pair slightly larger than others. Eyes grayish brown, small and oval. Antennae dull green, with darker apices, long, as long as the total length of abdomen; the first segment constricted at base, faintly carinate medially, almost 2 x length of second segment, shorter than third segment.

Thorax: Covered with very few sparse and minute granules. Pronotum shorter than head, slightly longer than wide, anterior margin curved, with anterior and posterior spines, the anterior pair 2 x length of the posterior pair. Mesonotum about 4.8 x length of pronotum, parallel-sided from anterior to post-median region, slightly expanded posteriorly after the post-median region; lateral margins slightly pitted, with two to three small granules and one short spine-like tubercle medially; with two pairs of spines placed nearly at the anterior and posterior ends of median line, the posterior pair longer than the anterior pair; hind margin with a pair of posterior spines; also with pre-median and post-median spines, posterior pair roughly as long as the anterior pair, apices pointing front. Mesopleurum with a short supra-coxal spine. Metanotum longer than pronotum, about 1.8 x length of median segment, with a pair of well-developed antero-lateral spines and hind margin with a pair of spines; middle region elevated with a spinose hump, with two pairs of spines, anterior pair about 3 x length of the posterior pair. Metapleurum with one short medio-lateral spine and one supra-coxal spine.

Abdomen: Lacking distinctive granulation. Slender. Median segment as long as wide, with medial spines and a pair of posterior spines at hind margin. Second to seventh tergites with a medial spine posteriorly, gradually reduced in size posteriorly; and with paired posterior spines laterad of the medial spine, reduced in size posteriorly. Eighth and ninth tergites expanded posteriorly, medially and laterally carinate, with triangularly expanded postero-lateral angles and with a small crest-like structure medio-posteriorly. Anal segment longer than ninth tergum, with median and lateral carinae, hind margin with broad v-shaped emargination and minute denticles. Poculum cup-shaped, small, hind margin rounded, with a basal hump. Cerci cylindrical and long, apices obtuse and distinctly curved inward.

Legs: Green with darker markings. Very long and slender. All coxae lacking spine. Profemora basally curved, antero-ventral and postero-ventral carinae with one short spine near apices. Antero-dorsal and postero-dorsal carinae of all femora wavy, with minute serrations. Antero-ventral and postero-ventral carinae of mesofemora and metafemora each with two small spines near apices and wavy. All tibiae lacking armature.

Female. Unknown.

Measurements in Table 10.

TABLE 10. Measurements of *Qiongphasma wuzhishanense* Ho **spec. nov.**

Length (mm)	Male
Body	40
Head	3
Antennae	40
Pronotum	2
Mesonotum	9.5
Metanotum	3.5
Median segment	2
Profemora	13.5
Mesofemora	11
Metafemora	14
Protibiae	16
Mesotibiae	13
Metatibiae	18

Distribution. Hainan (Wuzhishan), China.

Etymology. This species is named after the type-locality, Wuzhishan National Nature Reserve.

Discussion

Hennemann and Conle (2008: 78) placed *Pseudocentema* Chen, He & Li, 2002 and *Qiongphasma* Chen, He & Li, 2002 in the tribe Neohiraseini Hennemann & Conle, 2008 [Phasmatidae: Lonchodinae] based on their similar morphology to *Neohirasea* Rehn, 1904. Morphologically, *Pseudocentema* and *Qiongphasma* are probably most closely related to *Neohirasea* and *Andropromachus* Carl, 1913 respectively. The new genus, *Neoqiongphasma* Ho **gen. nov.**, is closely related to *Pseudocentema* and *Spinohirasea* Zompro, 2002. To advance our knowledge, a key to all genera of the tribe is given:

1. Occiput lacking spines 2.
- Occiput spinose 6.
2. Mesonotum and median segment with spines 3.
- Mesonotum and median segment lacking spines 4.
3. Mesofemora slender, slightly as long as mesonotum *Neoqiongphasma* Ho **gen. nov.**
- Mesofemora robust and thick-built, distinctly shorter than mesonotum *Spinohirasea* Zompro
4. Antero-dorsal and postero-dorsal carinae of mesofemora and metafemora with distinct fin-like serrations in female; antero-ventral and postero-ventral carinae of mesofemora and metafemora unarmed in male *Cheniphasma* Ho
- Antero-dorsal and postero-dorsal carinae of mesofemora and metafemora smooth or with flattened expansions; ventro-anterior and ventro-posterior carinae of mesofemora and metafemora with two subapical spines in male 5.
5. Female mesonotum with a spinose or lamellate hump placed near the anterior margin and elongate praeopercular organ on seventh sternum; most tergites of abdomen with small hump medio-posteriorly in male *Pseudocentema* Chen, He & Li
- Female mesonotum lacking spinose or lamellate hump on anterior region of mesonotum and with indistinct praeopercular organ on seventh sternum; tergites of abdomen lacking small hump medio-posteriorly in male *Neohirasea* Rehn
6. Head lacking supra-antennal spines *Qiongphasma* Chen, He & Li
- Head with supra-antennal spines *Andropromachus* Carl

A recent molecular study (Komoto *et al.* 2011) suggested that *Neohirasea* is close to *Sipylloidea* Brunner von Wattenwyl, 1893 [Diapheromeridae: Necrosiinae]. In fact, *Pseudocentema* and *Qiongphasma* were originally placed in Necrosiinae (Chen *et al.* 2002) and Chen and He (2008) later retained this taxonomic placement in their monograph. The oval-shaped and oblong micropylar plate in the egg structure of *Pseudocentema* (Fig. 10–13) reveals the close relationship with Necrosiinae. Therefore, further studies and material to investigate the systematic position of the genera are necessary.

Acknowledgments

I wish to deeply thank Dr John Fellowes (Kadoorie Farm and Botanic Garden) for giving valuable comments, and thoughtful proofreading to greatly improve the manuscript. I also wish to thank the Institute of Zoology, Chinese Academy of Sciences (IZCAS), Shanghai Entomological Museum, Chinese Academy of Sciences (SEM), Shanghai Normal University (SNU) and the Museum of Biology, Sun Yat-Sen University (SYSBM) for access to the corresponding collections and loan of specimens. Very special thanks go out to Dr Chan Pui-Lok, Mr Lo Yik-Fui, Mr Wan Pak-Ho and Miss Carrie Wong (Kadoorie Conservation China, Kadoorie Farm and Botanic Garden, Hong Kong) for their kind assistance. I am also grateful to the staff of Bawangling National Nature Reserve, Diaoluoshan National Nature Reserve, Exianling Limestone Forest, Huishan Nature Reserve, Jianfengling National Nature Reserve, Shangxi Nature Reserve and Yinggeling Nature Reserve, Hainan for their field assistance. I must also acknowledge the authority of the Wildlife Conservation Division of Hainan Forestry Department, China for permission to collect insects in the nature reserves; and Kadoorie Farm and Botanic Garden for financial and logistic support for travelling in Hainan Island. I also thank the anonymous reviewers for providing valuable comments to improve the manuscript.

References

- Brock, P.D. Phasmida Species File Online. Version 2.1/4.1. Available from <http://Phasmida.SpeciesFile.org> (accessed 5 January 2013).
- Bragg, P.E. (1997) A glossary of terms used to describe phasmids. *Phasmid Studies*, 6, 24.
- Bragg, P.E. (2001) *Phasmids of Borneo*. Natural History Publications, Kota Kinabalu, Sabah, 772 pp.
- 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.
- Carl, J. (1913) Phasmides nouveaux ou peu connus du Muséum de Genève. *Revue Suisse de Zoologie*, 21, 1–56.
- Chen, S.C. & He, Y.H. (2000) Three new genera and two new species of Heteronemiidae (Phasmatodea) from south China. In: Zhang, Y.L. (Ed.), *Systematic and Faunistic Research on Chinese Insects - Proceedings of the 5th National Congress of Insect Taxonomy*. China Agricultural Science Press, Beijing, pp. 31–35.
- Chen, S.C. & He, Y.H. (2008) *Phasmatodea of China*. China Forestry Publishing House, Beijing, 476 pp.
- Chen, S.C., He, Y.H. & Li, Y. (2002) Phasmatodea. In: Huang, F.S. (Ed.), *Forest insects of Hainan*. Science Press, China, pp. 100–116.
- Chen, S.C. & Pan, Y.Z. (2009) A new species of the genus *Cnipsomorpha* (Phasmatodea: Heteronemiidae) from Yunnan Province. *Entomotaxonomia*, 31(2), 85–87.
- Chen, S.C. & Zhang, P.Y. (2008) Five new species of stick insect from Yunnan Province and description of male *Cnipsomorpha colorantis* (Chen & He) (Phasmatodea: Heteronemiidae, Phasmatidae). *Entomotaxonomia*, 30(4), 245–254.
- Clark, J.T. (1976a) The capitulum of phasmid eggs (Insecta: Phasmida). *Zoological Journal of the Linnean Society, London*, 59, 365–375.
- Clark, J.T. (1976b) The eggs of stick insects (Phasmida) - a review with descriptions of the eggs of eleven species. *Systematic Entomology*, 1, 95–105. <http://dx.doi.org/10.1111/j.1365-3113.1976.tb00342.x>
- Clark, J.T. (1979) A key to the eggs of stick and leaf insects (Phasmida). *Systematic Entomology*, 4, 325–331. <http://dx.doi.org/10.1111/j.1365-3113.1979.tb00617.x>
- 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, London*, 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. <http://dx.doi.org/10.1046/j.1365-3113.1998.00056.x>
- Clark-Sellick, J.T.C. (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. <http://dx.doi.org/10.1080/11250009709356178>
- Gray, G.R. (1835) *Synopsis of the species of insects belonging to the family of Phasmidae*. Longman, London, 48 pp.
- Hennemann, F.H. (2007) Notes on the genera *Andropromachus* Carl, 1913 and *Spinohirasea* Zompro, 2001. *Phasmid Studies*, 15, 15–26.
- 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.
- Hennemann, F.H., Conle, O.V. & Zhang, W.W. (2008) Catalogue of the stick and leaf-insects (Phasmatodea) of China, with a faunistic analysis, review of recent ecological and biological studies and bibliography (Insecta: Orthoptera: Phasmatodea). *Zootaxa*, 1735, 1–76.
- Ho, G.W.C. (2012a) Notes on the genera *Sinophasma* Günther, 1940 and *Pachyscia* Redtenbacher, 1908 (Phasmatodea: Diapheromeridae: Necrosiinae), with the description of four new species from China. *Zootaxa*, 3495, 57–72.
- Ho, G.W.C. (2012b) Taxonomic study of the tribe Neohiraseini Hennemann & Conle, 2008 (Phasmida: Phasmatidae: Lonchodinae) in continental China. *Entomologica Fennica*, 23, 215–226.
- Huang, F.S. (2002) *Forest insects of Hainan*. Science Press, China, 1064 pp.
- Komoto, N., Yukuhiro, K., Ueda, K. & Yomita, S. (2011) Exploring the molecular phylogeny of phasmids with whole mitochondrial genome sequences. *Molecular Phylogenetics and Evolution*, 58, 43–52. <http://dx.doi.org/10.1016/j.ympev.2010.10.013>
- Redtenbacher, J. (1908) *Die Insektenfamilie der Phasmiden. III. Phasmidae Anareolatae (Phibalosomini, Acrophyllini, Necrosiini)*. Wilhelm Engelmann, Leipzig, 250 pp.
- Rehn, J.A.G. (1904) Studies in the orthopterous family Phasmidae. *Proceedings of the Academy of Natural Science of Philadelphia*, 56, 38–107.
- Rehn, J.A.G. & Rehn, J.W.H. (1939[1938]) The Orthoptera of the Philippine Islands, Part I. - Phasmatidae; Obriminae. *Proceedings of the Academy of Natural Science of Philadelphia*, 90, 389–487.
- Xu, F.L., Yang, M.F. & Guo, G.H. (2010) A new species of the genus *Interphasma* from China (Phasmatodea, Phasmatidae). *Acta Zootaxonomica Sinica*, 35(2), 395–397.
- Zompro, O. (2002) *Spinohirasea crassithorax*, n. gen. n. sp., eine neue Stabschrecke aus Vietnam (Phasmatodea: Phasmatidae: Lonchodinae: Menexenini). *Bonner Zoologische Beiträge*, 50, 67–72.
- 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.