

Contribution to the knowledge of Chinese Phasmatodea XII: Four new species of *Interphasma* Chen & He, 2008 from Yunnan, China (Phasmatidae: Clitumninae: Medaurini)

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ABSTRACT

Four new species of *Interphasma* Chen & He, 2008 are described from Yunnan, China. They are namely, *Interphasma indistinctum* sp. nov., *Interphasma pusillum* sp. nov., *Interphasma robustum* sp. nov. and *Interphasma yunnanense* sp. nov. A checklist of the species and a key to the species of *Interphasma* in Yunnan are provided.

Key words: Stick insects, *Interphasma*, China, new species

中國螞蟥目之新知XII：中國雲南介螞蟥屬四新種（螞蟥科：克螞蟥亞科：莫螞蟥族）

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摘要：本文記述中國介螞蟥屬四新種：弱脊介螞蟥 *Interphasma indistinctum* sp. nov.、小介螞蟥 *Interphasma pusillum* sp. nov.、粗介螞蟥 *Interphasma robustum* sp. nov. 及雲南介螞蟥 *Interphasma yunnanense* sp. nov.；並編制了雲南介螞蟥屬名錄及分種檢索表。

關鍵字：竹節蟲，介螞蟥屬，中國，新種

INTRODUCTION

The genus *Interphasma* Chen & He, 2008 is the most speciose genus in the tribe Medaurini Hennemann & Conle, 2008 (Chen and He, 2008; Ho, 2017a). This genus is easily characterised by the small size and the unarmed body and legs from other genera in the tribe. Currently, 18 species and two subspecies are recognised in this genus (Chen and He, 2008; Chen and Zhang, 2008; Xu et al., 2010; Ho and Shi, 2013; Ho, 2017a, 2020a; Li et al., 2021; Brock et al., 2022).

This study is the twelfth of the series on the Contribution to the knowledge of Chinese Phasmatodea. The previous contributions I–XI contain descriptions of 97 new taxa (11 new genera, 73 new species and 13 new subspecies) and suggestions of 26 new nomenclatures (25 new combinations and one new synonym) from the subfamilies Clitumninae, Dataminae, Necrosiinae, Lonchodinae and Xeroderinae (Ho, 2013a, 2013b, 2016, 2017a, 2017b, 2020b, 2021a, 2021b, 2021c, 2021d, 2021e). This paper is a supplementary to Ho (2017a) and four new Chinese *Interphasma* species are described following collecting trips by the author. After these additions, 22 species and two subspecies are currently attributed to the genus *Interphasma*.

MATERIALS & METHODS

The morphological terms follow Bragg (2001), Zompro (2004) and Bradler (2009). Ootaxonomic descriptions refer to Clark (1976a, 1976b, 1979), Sellick (1988, 1997, 1998; = Clark, J.T.) and Zompro (2004). Measurements are given in millimetres (mm). The types are deposited in Hong Kong Entomological Society, Hong Kong, China (HKES) and Shanghai Entomological Museum, Chinese Academy of Sciences, Shanghai, China (SEM).

RESULTS

Phasmatidae Gray, 1835

Clitumninae Brunner von Wattenwyl, 1893

Medaurini Hennemann & Conle, 2008

Interphasma Chen & He, 2008

Type-species: *Interphasma lushanense* Chen & He, 2008: 329, by original designation.

Description: Small to medium-sized Medaurini. Apterous. Body unarmed in both sexes, slender in male and robust in female; rough, with sparse and small granulations which may be absent in the male of some species. Head oblong. Occiput flat. Antennae distinctly segmented, shorter than profemora. Thorax slender. Abdomen cylindrical. Seventh sternum with distinct praeopercular organ in most species in female. Anal segment tectiform in female, distinctly dilated into two semi-tergites in male. Supra-anal plate small or indistinct in female. Cerci short. Legs slender and unarmed. Profemora curved basally.

Description: China (Gansu, Guangxi, Guizhou, Jiangxi, Shaanxi, Sichuan, Xinjiang and Yunnan) and Vietnam.

Notes: A total of eight species and two subspecies are currently known in Yunnan. A checklist of the species and a key to the species of *Interphasma* in Yunnan are provided.

Species included in Yunnan, China:

1.1. *Interphasma elongatum elongatum* Ho, 2017 長臀介螞蟥 長臀亞種

1.2. *Interphasma elongatum parvum* Ho, 2017 長臀介螞蟥 短小亞種

2. *Interphasma huanglianshanense* Ho, 2017 黃連山介螞蟥

3. *Interphasma indistinctum* sp. nov. 弱脊介蝽
 4. *Interphasma marginatum* Chen & Zhang, 2008 黑緣介蝽
 5. *Interphasma nigrolineatum* Chen & He, 2008 黑條介蝽
 6. *Interphasma pusillum* sp. nov. 小介蝽
 7. *Interphasma robustum* sp. nov. 粗介蝽
 8. *Interphasma yunnanense* sp. nov. 雲南介蝽

Key to the species of *Interphasma* from Yunnan, China:

- Male:**
1. Anal abdominal segment with pointed apices in lateral view. **2**
 - Anal abdominal segment with obtuse apices in lateral view. **6**
 2. Poculum with a strongly elevated median hump. *I. nigrolineatum*
 - Poculum with a weakly elevated median hump. **3**
 3. Body slender and long. *I. indistinctum* sp. nov.
 - Body robust and short. **4**
 4. Apices of cerci surpassing middle area of anal abdominal segment. *I. huanglianshanense*
 - Apices of cerci not surpassing middle area of anal abdominal segment. **5**
 5. Body slender, body length longer than 50 mm. *I. elongatum elongatum*
 - Body robust, body length shorter than 50 mm. *I. elongatum parvum*
 6. Large size, body length longer than 40 mm. *I. marginatum*
 - Small size, body length shorter than 40 mm. **7**
 7. Upper margin of semi anal abdominal segments moderately curved downwards in lateral view. *I. yunnanense* sp. nov.
 - Upper margin of semi anal abdominal segments strongly curved downwards in lateral view. **8**
 8. Body length shorter than 32 mm, body comparatively slender. *I. pusillum* sp. nov.
 - Body length longer than 32 mm, body comparatively robust. *I. robustum* sp. nov.
3. Posteromedian area of seventh abdominal sternum with cylindrical praeopercular organ. **4**
 - Posteromedian area of seventh abdominal sternum with dorsoventrally flattened praeopercular organ. **5**
4. Seventh abdominal sternum with short praeopercular organ, posterior apex not reaching anterior area of eighth tergum. *I. marginatum*
 - Seventh abdominal sternum with long praeopercular organ, posterior apex reaching anterior area of eighth tergum. *I. indistinctum* sp. nov.
5. Body length shorter than 40 mm. *I. pusillum* sp. nov.
 - Body length longer than 40 mm. **6**
6. Posteromedian area of seventh abdominal sternum with apically rounded praeopercular organ. *I. robustum* sp. nov.
 - Posteromedian area of seventh abdominal sternum with apically pointed praeopercular organ. *I. huanglianshanense*

***Interphasma indistinctum* sp. nov.** (Figs. 1-4, 25-28, 41)

Types: Holotype, ♂, 2000m, Kunming, Yunnan, China, 30 May 2018, George Ho Wai-Chun (HKES); Paratypes: 2♂, 1♀, same data as holotype ♂ (HKES); 1♂, 2000m, Kunming, Yunnan, China, 5 June 2018, George Ho Wai-Chun (HKES); 3♂, 1 immature ♀, 2000m, Kunming, Yunnan, China, 23 June 2019, George Ho Wai-Chun (HKES).

Differentiation: *Interphasma indistinctum* sp. nov. is closely related to *I. lizipingense* Ho & Shi, 2013, but differs in the numbers of antennal segments (male with 21 segments and female with 16 segments) and indistinct longitudinal carinae on the abdomen in both sexes, the sparsely granulated thorax and the distinctly curved upper margin of semi anal abdominal segments in the male and the minutely notched posterior margin of anal abdominal segment and thick-built and horn-like praeopercular organ on the posteromedian area of seventh abdominal sternum in the female.

Description of male (Figs. 1-2, 25, 27): Small size. Body slender and slim. General colour of body brown and legs brown with small blackish markings.

Head: Oval, longer than pronotum, with a few small granules. Vertex with two indistinct elevations between compound eyes. Occiput flat, median longitudinal furrow distinct, lateral furrows indistinct. Genae with a blackish postocular band. Compound eyes small and rounded, its length about four times that of genae. Antennae short, reaching subapical area of profemora, with 21 segments; scapus flattened and constricted at base, median longitudinal carina indistinct, shorter than combined length of pedicellus and third segment, longer than third segment; pedicellus shorter than third segment.

Thorax: Sparsely covered with a few small granules. Pronotum rectangular, longer than wide, anterior margin gently curved inwards, posterior margin nearly truncate, transverse and longitudinal sulci crossing at middle point. Mesonotum broadly emarginated medially, with small pits along lateral margins. Metanotum longer than median segment, with small pits along lateral margins.

Abdomen: With small and sparse granules, also with

indistinct median and lateral longitudinal carinae. Median segment trapezoidal, gently expanded posteriorly. Parallel-sided from second to seventh tergites. Eighth tergum gently expanded posteriorly. Second to seventh tergites with a few small pits along lateral margins. Eighth tergum longer than ninth tergum. Anal segment elongated posteriorly, longer than eighth tergum, dilated into two semi-tergites, moderately tapering posteriorly, apices pointed in lateral view. Inner margins of semi-

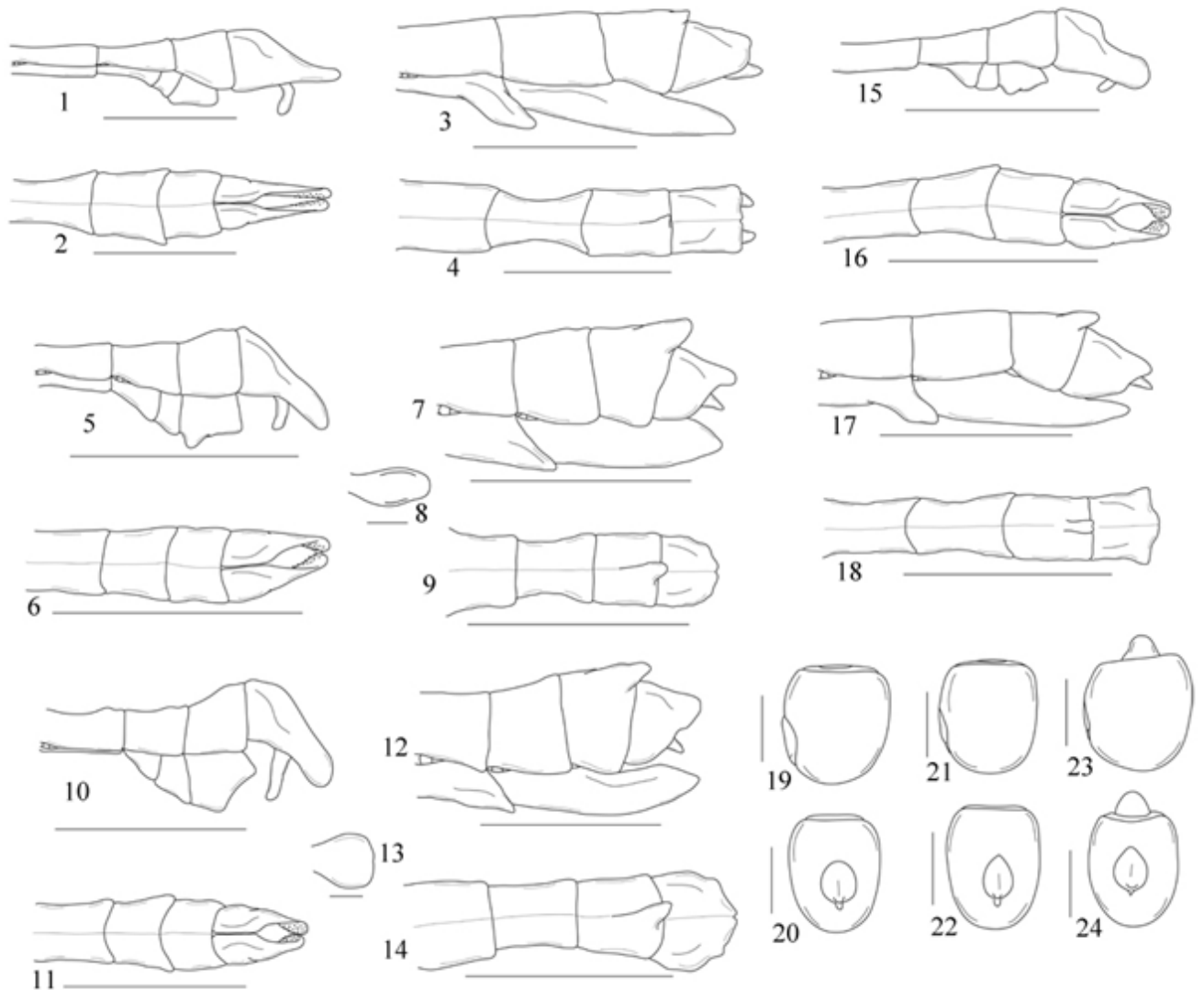


Figure 1-24. *Interphasma* spp. 1. *Interphasma indistinctum* sp. nov., male, apex of abdomen, lateral view. 2. *Interphasma indistinctum* sp. nov., male, apex of abdomen, dorsal view. 3. *Interphasma indistinctum* sp. nov., female, apex of abdomen, lateral view. 4. *Interphasma indistinctum* sp. nov., female, apex of abdomen, dorsal view. 5. *Interphasma pusillum* sp. nov., male, apex of abdomen, lateral view. 6. *Interphasma pusillum* sp. nov., male, apex of abdomen, dorsal view. 7. *Interphasma pusillum* sp. nov., female, apex of abdomen, lateral view. 8. *Interphasma pusillum* sp. nov., female, praeopercular organ, ventral view. 9. *Interphasma pusillum* sp. nov., female, apex of abdomen, dorsal view. 10. *Interphasma robustum* sp. nov., male, apex of abdomen, lateral view. 11. *Interphasma robustum* sp. nov., male, apex of abdomen, dorsal view. 12. *Interphasma robustum* sp. nov., female, apex of abdomen, lateral view. 13. *Interphasma robustum* sp. nov., female, praeopercular organ, ventral view. 14. *Interphasma robustum* sp. nov., female, apex of abdomen, dorsal view. 15. *Interphasma yunnanense* sp. nov., male, apex of abdomen, lateral view. 16. *Interphasma yunnanense* sp. nov., male, apex of abdomen, dorsal view. 17. *Interphasma yunnanense* sp. nov., female, apex of abdomen, lateral view. 18. *Interphasma yunnanense* sp. nov., female, apex of abdomen, dorsal view. 19. *Interphasma pusillum* sp. nov., egg, lateral view. 20. *Interphasma pusillum* sp. nov., egg, dorsal view. 21. *Interphasma robustum* sp. nov., egg, lateral view. 22. *Interphasma robustum* sp. nov., egg, dorsal view. 23. *Interphasma yunnanense* sp. nov., egg, lateral view. 24. *Interphasma yunnanense* sp. nov., egg, dorsal view. Scale bars: apex of abdomen = 5 mm; egg = 1 mm. Drawings by author.

tergites weakly curved inwards in dorsal view, with minute teeth; upper margin gently curved downwards in lateral view, lower margin weakly curved upwards in lateral view. Poculum cup-shaped, with a small elevation medially, posterior margin rounded and reaching anterior area of anal segment. Cerci short, flattened, curved inwards, apices swollen and rounded.

Legs: Very slender and long. Unarmed. All femora thicker than corresponding tibiae. Profemora curved basally.

Description of female (Figs. 3-4, 26, 28): Small size. Body slender, distinctly larger and more robust than male. General colour of body brown and legs brown with small blackish markings.

Head: Oval, longer than pronotum. Sparsely covered with small granules and interspersed with a few enlarged granules. Occiput moderately convex, with distinct median longitudinal furrow, lateral furrows and posterior swellings indistinct. Genae with an inconspicuous blackish postocular band. Compound eyes oval, its length about four times that of genae. Antennae with short bristles, reaching middle area of profemora, with 16 segments; scapus dorsoventrally flattened, basally constricted, distinctly carinate mediolongitudinally, longer than third segment; pedicellus shorter than third segment.

Thorax: Rough, wrinkled, covered with small granules and interspersed with a few enlarged granules. Pronotum trapezoidal, gently expanded posteriorly, anterior margin curved inwards, posterior margin truncate, transverse and longitudinal sulci just crossing after middle point. Mesonotum gently expanded posteriorly, median longitudinal line distinct. Metanotum longer than median segment.

Abdomen: Cylindrical, gradually tapering posteriorly. Covered with small granules and interspersed with a

few enlarged granules, also with indistinct median and lateral longitudinal carinae. Median segment wider than long. Seventh sternum with a horn-like praeopercular organ on posteromedian area, distinctly elongated posteriorly, tapering apically, apex pointed. Eighth tergum longer than ninth tergum. Ninth tergum with a small crest posteromedially. Anal segment shorter than ninth tergum, with a minute notch posteromedially. Supra-anal plate indistinct. Subgenital plate scoop-shaped, mediolongitudinally carinate, posterior margin pointed and reaching posterior area of anal segment. Cerci short, apices pointed and surpassing posterior margin of anal segment.

Legs: Slender and long. Unarmed. Femora thicker than corresponding tibiae. Profemora curved at base.

Measurements: See Table 1.

Distribution: China (Yunnan).

Notes: The measurements are only given to the adults.

Etymology: The specific epithet of this new species is derived from the indistinct longitudinal carinae on the abdomen in both sexes.

***Interphasma pusillum* sp. nov.** (Figs. 5-9, 19-20, 29-32, 41)

Types: Holotype, ♂, 2400m, Xinping, Yuxi, Yunnan, China, 24 June 2019, George Ho Wai-Chun (HKES); Paratypes, 9♂, 11♀, 47 eggs, same data as holotype ♂ (HKES).

Differentiation: *Interphasma pusillum* sp. nov. is the shortest and smallest *Interphasma*. It is closely related to *I. robustum* sp. nov., but can be separated by its small size in both sexes, the comparatively slender body, the shorter cerci and the comparatively moderate curved downwards upper and lower margins of semi

	Holotype Male	Paratype Males	Paratype Female
Body	45.0	42.0-44.0	47.0
Head	2.5	2.5	3.5
Antennae	13.0	11.0	8.0
Pronotum	2.0	2.0	2.5
Mesonotum	9.0	8.0-9.0	10.0
Metanotum	4.5	4.0-4.5	6.0
Median segment	1.5	1.5	2.0
Cerci	1.0	1.0	1.0
Profemora	21.0	20.0-21.0	19.0
Mesofemora	14.0	12.0-13.5	12.0
Metafemora	19.0	16.0-18.0	17.0
Protibiae	25.0	20.0-23.0	21.0
Mesotibiae	15.0	13.0-14.5	13.0
Metatibiae	23.0	19.0-21.0	20.0

Table 1. Measurements of *Interphasma indistinctum* sp. nov.

anal abdominal segments in the male and the apically constricted and pointed praeopercular organ on the posteromedian area of seventh abdominal sternum in the female.

Description of male (Figs. 5-6, 29, 31): Small size. Body slender. General colour of body brown and legs brown with small blackish markings.

Head: Oval, as long as pronotum, with sparse and small granules. Vertex with two obscure elevations between compound eyes. Occiput flat, median longitudinal furrow distinct, lateral furrows indistinct. Compound eyes small and oval, its length about two-and-one-half times that of genae. Genae with a blackish postocular band. Antennae short, reaching subapical area of profemora, with 17 to 18 segments; scapus flattened and constricted at base, median longitudinal carina distinct, as long as third segment; pedicellus shorter than third segment.

Thorax: Sparsely covered with a very few small granules. Pronotum rectangular, longer than wide, anterior margin distinctly curved inwards, posterior margin truncate, transverse and longitudinal sulci crossing at middle point. Mesonotum broadly emarginated medially, longer than combined length of metanotum and median

segment, with a few small pits along lateral margins. Metanotum longer than median segment, with a few small pits along lateral margins.

Abdomen: Sparsely covered with a very few granules. Median segment trapezoidal, expanded posteriorly. Second to seventh tergites parallel-sided, with a few small pits along lateral margins. Eighth tergum gently expanded posteriorly, as long as ninth tergum. Anal segment elongated posteriorly, longer than ninth tergum, dilated into two semi-tergites, tapering posteriorly, inner margins gently curved in dorsal view; apices obtuse in lateral view, with a few minute teeth. Semi-tergites with strongly curved downwards upper margin and lower margin in lateral view. Poculum cup-shaped, with a small elevation basally, posterior margin rounded and reaching anterior area of anal segment. Cerci flattened, with an indistinct elevation near base, distinctly curved inwards, apices rounded.

Legs: Slender and long. Unarmed, sparsely covered with short bristles. All femora thicker than corresponding tibiae. Profemora curved basally.

Description of female (Fig. 7-9, 30, 32): Small size. Body robust, distinctly more robust than male. General colour of body brown and legs brown with small blackish



Figures 25-28. *Interphasma indistinctum* sp. nov. 25. Male, habitus. 26. Female, habitus. 27. Male, head and thorax, dorsolateral view. 28. Female, head and thorax, dorsolateral view. Scale bars = 5 mm. Photos by author.



Figures 29-32. *Interphasma pusillum* sp. nov. 29. Male, habitus. 30. Female, habitus. 31. Male, head and thorax, dorsolateral view. 32. Female, head and thorax, dorsolateral view. Scale bars = 5 mm. Photos by author.

markings.

Head: Oval, longer than pronotum. Sparsely covered with small granules and interspersed with a few enlarged granules. Occiput moderately convex, with distinct median longitudinal furrow, lateral furrows and posterior swellings indistinct. Genae with an inconspicuous blackish postocular band. Compound eyes oval, its length about two times that of genae. Antennae short, with short bristles, reaching subapical area of profemora, with 13 to 14 segments; scapus dorsoventrally flattened, basally constricted, distinctly carinate mediolongitudinally, longer than third segment; pedicellus shorter than third segment.

Thorax: Rough, wrinkled, with small granules and interspersed with a few enlarged granules. Pronotum trapezoidal, gently expanded posteriorly, anterior margin curved inwards, posterior margin truncate, transverse and longitudinal sulci just crossing at middle point. Mesonotum gently expanded posteriorly, median longitudinal line distinct. Metanotum wider than long, longer than median segment.

Abdomen: Cylindrical, tapering posteriorly, with small granules and interspersed with a very few enlarged granules. Median segment wider than long. Seventh sternum with a dorsoventrally and basally flattened praeopercular organ on posteromedian area, elongated posteriorly, tapering apically, apex pointed and reaching anterior area of anal segment. Ninth tergum longer than eighth tergum, with a small crest posteromedially. Anal segment shorter than ninth tergum, posterior margin rounded, with a small notch medially. Supra-anal plate indistinct. Subgenital plate scoop-shaped, mediolongitudinally carinate, tapering posteriorly, apex pointed and reaching posterior margin of anal segment. Cerci short, flattened, tapering apically, apices pointed and not surpassing posterior margin of anal segment.

Legs: Slender and long. Unarmed. Femora thicker than corresponding tibiae. Profemora curved at base.

	Holotype Male	Paratype Males	Paratype Females
Body	31.0	28.0-31.0	27.0-31.0
Head	2.0	2.0	2.5-3.0
Antennae	7.0	7.0-8.0	5.0-6.0
Pronotum	2.0	2.0	2.0
Mesonotum	6.0	5.0-6.0	5.0-6.0
Metanotum	3.0	3.0	2.5-3.0
Median segment	1.5	1.0-1.5	1.0
Cerci	0.8	0.8	0.5
Profemora	14.0	12.0-14.0	9.5-11.5
Mesofemora	8.0	7.0-8.0	6.0-7.0
Metafemora	11.0	9.0-11.0	8.0-10.0
Protibiae	15.5	13.0-15.0	10.5-13.0
Mesotibiae	8.5	7.0-8.5	6.0-7.5
Metatibiae	13.0	10.5-13.0	8.0-11.0

Table 2. Measurements of *Interphasma pusillum* sp. nov.

Measurements: See Table 2.

Description of egg (Figs. 19-20): Capsule brown, surface rough, densely punctuated; oval, posterior pole rounded. Micropylar plate oval, tapering and pointed apically. Micropylar cup placed at posterior margin of micropylar plate. Median line short, placed behind micropylar cup, about one-fifth length of micropylar plate. Operculum centrally depressed.

Measurements: Length, 1.6 mm; width, 1.3-1.4 mm; height, 1.0 mm.

Distribution: China (Yunnan).

Etymology: The specific epithet of this new species is derived from the small size of both sexes.

***Interphasma robustum* sp. nov.** (Figs. 10-14, 21-22, 33-36, 41)

Types: Holotype, ♂, 2000m, Xinping, Yuxi, Yunnan, China, 23 June 2019, George Ho Wai-Chun (HKES); Paratypes, 2♀, 16 eggs, same data as holotype ♂ (HKES).

Differentiation: *Interphasma robustum* sp. nov. is similar to *I. huanglianshanense* Ho, 2017, but can be separated by the presence of a distinct median hump on poculum and the strongly curved downwards upper and lower margins of semi anal abdominal segments in the male and the absence of triangularly expanded posterolateral angles on seventh abdominal tergum and the rounded posterior margin of praeopercular organ on the posteromedian area of seventh abdominal sternum in the female.

Description of male (Figs. 10-11, 33, 35): Small size. Body slender and slim. General colour of body brown and legs brown with small blackish markings.

Head: Oval, as long as pronotum, with a few small

granules. Vertex with two obscure elevations between compound eyes. Occiput flat, occipital furrows indistinct. Genae with a blackish postocular band. Compound eyes rounded, its length about two times that of genae. Antennae short, apices reaching subapical area of profemora, with 18 segments; scapus flattened and constricted basally, median longitudinal carina distinct, as long as combined length of pedicellus and third segment; pedicellus shorter than third segment.

Thorax: Sparsely covered with a few small granules. Pronotum with rounded posterior margin, anterior margin curved inwards. Mesonotum slender and elongate, gently expanded posteriorly, lateral margins with a few small pits. Metanotum longer than median segment, with a few small pits along lateral margins.

Abdomen: Sparsely covered with a few granules. Median segment rectangular, wider than long. Parallel-sided from second to seventh tergites. Eighth tergum gently expanded posteriorly. Second to eighth tergites with a few small pits along lateral margins. Eighth tergum as long as than ninth tergum. Anal segment elongated posteriorly, longer than ninth tergum, dilated into two distinct semi-tergites, tapering posteriorly. Inner margins of semi-tergites curved inwards in dorsal view, apices rounded with a few minute teeth; upper and lower margins strongly curved downwards. Poculum cup-shaped, with a rounded hump basally, posterior margin rounded and reaching anterior area of anal

segment. Cerci with an indistinct elevation near base, curved inwards, apices rounded and reaching middle area of semi-tergites.

Legs: Very slender and long. Distinctly unarmed, only sparsely covered with short bristles. All femora thicker than corresponding tibiae. Profemora curved basally.

Description of female (Fig. 12-14, 34, 36): Small size. Body robust, distinctly larger and more robust than male. General colour of body brown and legs brown with small blackish markings.

Head: Oval, longer than pronotum. Sparsely covered with small granules and interspersed with a few enlarged granules. Occiput moderately convex, with indistinct median longitudinal furrow, posterior swellings indistinct. Genae with a blackish postocular band. Compound eyes oval, its length about two times that of genae. Antennae with short bristles, reaching middle area of profemora, with 15 segments; scapus dorsoventrally flattened, basally constricted, distinctly carinate mediolongitudinally, longer than pedicellus; pedicellus shorter than third segment.

Thorax: Rough, densely covered with small granules and interspersed with a few enlarged granules. Pronotum trapezoidal, gently expanded posteriorly, anterior margin gently curved inwards, posterior margin truncate, transverse and longitudinal sulci just crossing



Figures 33-36. *Interphasma robustum* sp. nov. 33. Male, habitus. 34. Female, habitus. 35. Male, head and thorax, dorsolateral view. 36. Female, head and thorax, dorsolateral view. Scale bars = 5 mm. Photos by author.



Figures 37-40. *Interphasma yunnanense* sp. nov. 37. Male, habitus. 38. Female, habitus. 39. Male, head and thorax, dorsolateral view. 40. Female, head and thorax, dorsolateral view. Scale bars = 5 mm. Photos by author.

after middle point. Mesonotum gently expanded posteriorly, median longitudinal line distinct. Metanotum square sized, longer than median segment.

Abdomen: Cylindrical, gradually tapering posteriorly. Densely covered with small granules and interspersed with a few enlarged granules. Median segment wider than long. Seventh sternum with dorsoventrally flattened praeopercular organ on posteromedian area, posterior margin rounded. Eighth tergum almost as long as ninth tergum. Ninth tergum with a small crest posteromedially. Anal segment shorter than ninth tergum, with rounded posterior margin. Supra-anal plate indistinct. Subgenital plate scoop-shaped, mediolongitudinally carinate, tapering posteriorly, posterior margin pointed and reaching posterior area of anal segment. Cerci short, apices pointed and not surpassing posterior margin of anal segment.

Legs: Slender and long. Unarmed. All femora thicker than corresponding tibiae. Profemora curved at base.

Measurements: See Table 3.

Description of egg (Figs. 21-22): Capsule brown, surface rough, densely punctuated; oval, posterior pole rounded. Micropylar plate oval, rounded anteriorly. Micropylar cup placed at posterior margin of micropylar plate. Median line short, placed behind micropylar cup, about one-fifth length of micropylar plate. Operculum centrally depressed.

Measurements: Length, 1.6-1.7 mm; width, 1.4 mm; height, 1.4 mm.

Distribution: China (Yunnan).

Etymology: The specific epithet of this new species is derived from the robust body of both sexes.

***Interphasma yunnanense* sp. nov.** (Figs. 15-18, 23-24, 37-41)

Types: Holotype, ♂, 2300m, Weishan, Dali, Yunnan, China, 3 June 2018, George Ho Wai-Chun (HKES); Paratypes, 9♂, 7♀, same data as holotype ♂ (HKES); 3♂, 4♀, 2450-2580m, Weibaoshan, Weishan, Dali, Yunnan, China, 7 July 2017, Bi Wen-Xuan (SEM); 10♂, 13♀, 11 eggs, 2000m, Nanjian, Dali, Yunnan, China, 2 June 2018, George Ho Wai-Chun (HKES).

Differentiation: *Interphasma yunnanense* sp. nov. is related to *I. robustum* sp. nov., but can be separated by its slender and elongate body in both sexes, the straight lower margin of semi anal abdominal segments in the male and the apically blunt praeopercular organ on the posteromedian area of seventh abdominal sternum in the female.

Description of male (Figs. 15-16, 37, 39): Small size. Body slender and slim. General colour of body brown and legs brown with small and obscure blackish markings.

Head: Oval, longer than pronotum, with a few small granules. Vertex with two obscure elevations between compound eyes. Occiput flat, median longitudinal furrow distinct, lateral furrows indistinct. Genae with a black postocular band. Compound eyes small and rounded, its length about three times that of genae. Antennae short, reaching subapical area of profemora, with 17 to 18 segments; scapus flattened and constricted at base, median longitudinal carina distinct, shorter than third segment, longer pedicellus.

Thorax: Sparsely covered with a few small granules. Pronotum rectangular, longer than wide, anterior margin gently curved inwards, posterior margin truncate, transverse and longitudinal sulci crossing at middle point. Mesonotum gently expanded posteriorly after post-median area, with a few small pits along lateral

	Holotype Male	Paratype Females
Body	36.0	36.0-42.0
Head	2.0	3.5-4.0
Antennae	8.0	7.0
Pronotum	2.0	3.0
Mesonotum	7.0	7.5-8.5
Metanotum	4.0	3.0-4.0
Median segment	1.5	1.5-2.0
Cerci	1.0	0.5
Profemora	13.0	13.5-14.0
Mesofemora	8.0	8.0
Metafemora	11.0	10.0-11.0
Protibiae	14.0	13.5-16.0
Mesotibiae	8.0	8.5
Metatibiae	12.0	12.0-13.0

Table 3. Measurements of *Interphasma robustum* sp. nov.

margins. Metanotum longer than median segment, with a few small pits along lateral margins.

Abdomen: Covered with a few small granules. Median segment trapezoidal, gently expanded posteriorly. Parallel-sided from second to seventh tergites. Eighth tergum gently expanded posteriorly. Second to seventh tergites with a few small pits along lateral margins. Eighth tergum as long as ninth tergum. Anal segment elongated posteriorly, longer than ninth tergum, dilated into two semi-tergites, moderately tapering posteriorly, medially emarginated in lateral view. Inner margins of semi-tergites gently curved inwards in dorsal view, apices blunt, with a few minute teeth; lower margin straight in lateral view. Poculum cup-shaped, posterior margin rounded, reaching posterior area of ninth tergum. Cerci short, flattened, curved inwards, apices swollen and rounded.

Legs: Slender and long. Unarmed. All femora thicker than corresponding tibiae. Profemora curved basally.

Description of female (Fig. 17-18, 38, 40): Small size. Body slender, distinctly larger and more robust than male. General colour of body brown and legs brown with small blackish markings.

Head: Oval, longer than pronotum. Sparsely covered with small granules and interspersed with a few enlarged granules. Occiput moderately convex, with distinct median longitudinal furrow, lateral furrows and posterior swellings indistinct. Genae with an inconspicuous blackish postocular band. Compound eyes oval, its length about four times that of genae. Antennae with short bristles, reaching middle area of profemora, with 14 to 16 segments; scapus dorsoventrally flattened, basally constricted, distinctly carinate mediolongitudinally, longer than third segment; pedicellus shorter than third segment.

Thorax: Rough, wrinkled, covered with small granules

and interspersed with a few enlarged granules. Pronotum trapezoidal, gently expanded posteriorly, anterior margin curved inwards, posterior margin truncate, transverse and longitudinal sulci just crossing at middle point. Mesonotum gently expanded posteriorly, median longitudinal line distinct. Metanotum longer than median segment.

Abdomen: Cylindrical, gradually tapering posteriorly. Rough, wrinkled, covered with small granules. Median segment wider than long. Seventh sternum with a short horn-like praeopercular organ on posteromedian area, gently elongated posteriorly, tapering apically, apex blunt. Eighth tergum longer than ninth tergum. Ninth tergum with a small crest posteromedially. Anal segment as long as ninth tergum, with an indistinct notch posteromedially, also with two lateral emarginations, posterolateral angles distinct and pointed. Supra-anal plate indistinct. Subgenital plate scoop-shaped, mediolongitudinally carinate, tapering posteriorly, posterior margin rounded and reaching posterior area of anal segment. Cerci short, apices pointed and not surpassing posterior margin of anal segment.

Legs: Slender and long. Unarmed. Femora thicker than corresponding tibiae. Profemora curved at base.

Measurements: See Table 4.

Description of egg (Figs. 23-24): Capsule brownish gray, surface rough, densely granulated; oval, posterior pole rounded. Micropylar plate oval, tapering and pointed apically. Micropylar cup placed at posterior margin of micropylar plate. Median line short, placed behind micropylar cup, about one-fourth length of micropylar plate. Operculum centrally elevated with an apically blunt and closed capitulum.

Measurements: Length, 1.6 mm; width, 1.4 mm; height, 1.4 mm.

	Holotype Male	Paratype Males	Paratype Females
Body	37.0	32.0-39.0	34.0-44.0
Head	2.5	2.0-2.5	2.5-3.5
Antennae	11.0	8.0-12.0	6.0-8.0
Pronotum	2.0	2.0	2.0-2.5
Mesonotum	7.5	6.5-8.5	6.5-9.0
Metanotum	4.0	3.5-4.0	3.0-4.5
Median segment	1.0	1.0	1.0-2.0
Cerci	0.8	0.8	0.5
Profemora	15.0	13.0-17.0	11.0-17.0
Mesofemora	9.0	8.0-10.0	7.0-10.0
Metafemora	13.0	12.0-14.5	10.0-14.0
Protibiae	16.0	15.0-20.0	12.0-19.0
Mesotibiae	10.0	9.0-12.0	7.0-12.0
Metatibiae	14.0	13.0-17.5	10.5-16.0

Table 4. Measurements of *Interphasma pusillum* sp. nov.

Distribution: China (Yunnan).

Etymology: The specific epithet of this new species is derived from the type locality, Yunnan, China.

CONCLUSION

In this study, four new species of *Interphasma* are described from Yunnan, China. A total of eight species and two subspecies are currently known in Yunnan (Fig. 41). *Interphasma* is principally restricted to China and there is only one species described from Vietnam (Chen and He, 2008; Ho, 2017a, 2020a). Yunnan and Sichuan are the provinces with high species diversity of *Interphasma* and eight and six species are found respectively (Table 5). The complex and discontinuous mountainous areas in Yunnan and Sichuan can stimulate speciation by geographic isolation. Further collecting specimens in various localities in Yunnan and Sichuan can discover more new taxa for the genus. Molecular study can help advance the understanding of their phylogenetic relationship.

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REFERENCES

Bradler, S., 2009. Die Phylogenie der Stab- und Gespenstschrecken (Insecta: Phasmatodea). *Species, Phylogeny and Evolution* 2: 3-139.

Bragg, P.E., 2001. *Phasmids of Borneo*. Natural History Publications (Borneo), Kota Kinabalu. 772pp.

Brock, P.D., Büscher, T. and Baker, E., 2022. *Phasmida Species File Online. Version 5.0/5.0*. Available from <http://phasimida.speciesfile.org/HomePage/Phasmida/HomePage.aspx>, accessed on 1 October 2022.

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.

Chen, S.C. and He, Y.H., 2008. *Phasmatodea of China*. China Forestry Publishing House, Beijing. 476pp.

Chen, S.C. and 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.

Clark, J.T., 1979. A key to the eggs of stick and leaf insects (Phasmida). *Systematic Entomology* 4: 325-331.

Gray, G.R., 1835. *Synopsis of the Species of Insects belonging to the Family of Phasmidae*. Longman, Rees, Orme, Brown, Green and Longman, London. 48pp.

Hennemann, F.H. and 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.

Ho, G.W.C., 2013a. 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. *Zootaxa* 3620(3): 404-428.

Ho, G.W.C., 2013b. 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(3): 201-222.

Ho, G.W.C., 2016. Contribution to the knowledge of

Provinces	Number of species
Yunnan	8
Sichuan	6
Guizhou	2
Jiangxi	1
Guangxi	1
Shaanxi	1
Xinjiang	1
Gansu	1

Table 5. Comparison of Chinese provinces with the number of species of *Interphasma*.

Chinese Phasmatodea III: Catalogue of the phasmids of Hainan Island, China, with descriptions of one new genus, one new species and two new subspecies and proposals of three new combinations. *Zootaxa* 4150(3): 314-340.

Ho, G.W.C., 2017a. Contribution to the knowledge of Chinese Phasmatodea IV: Taxonomy on Medaurini (Phasmatodea: Phasmatidae: Clitumninae) of China. *Zootaxa* 4365(5): 501-546.

Ho, G.W.C., 2017b. Contribution to the knowledge of Chinese Phasmatodea V: New taxa and new nomenclatures of the subfamilies Necrosiinae

(Diapheromeridae) and Lonchodinae (Phasmatidae) from the Phasmatodea of China. *Zootaxa* 4368(1): 1-72.

Ho, G.W.C., 2020a. New taxa of Clitumninae from Vietnam (Phasmatodea: Phasmatidae). *Zoological Systematics* 45(2): 104-117.

Ho, G.W.C., 2020b. Contribution to the knowledge of Chinese Phasmatodea VI: New taxa and new nomenclature of the subfamily Necrosiinae from the Phasmatodea of China. *Hong Kong Entomological Bulletin* 12(2): 3-28.

Ho, G.W.C., 2021a. Contribution to the knowledge

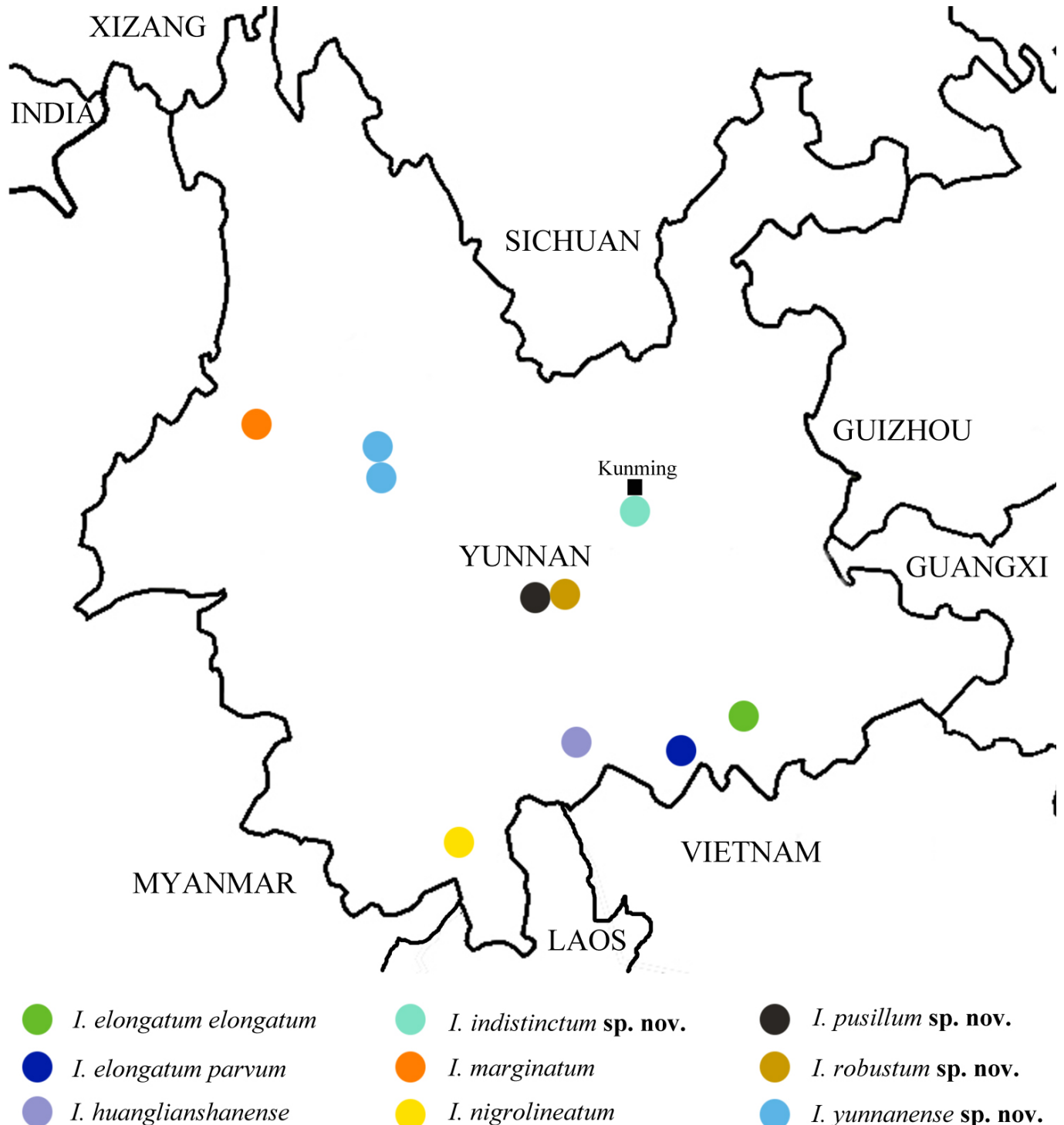


Figure 41. Distribution of *Interphasma* spp. in Yunnan, China. Drawing by author.

of Chinese Phasmatodea VII: A new genus for two new species of Medaurini from China (Phasmatidae: Clitumninae). *Hong Kong Entomological Bulletin* 13(1): 3-11.

Ho, G.W.C., 2021b. Contribution to the knowledge of Chinese Phasmatodea VIII: Four new species of *Carausius* Stål, 1875 from China (Lonchodidae: Lonchodinae). *Hong Kong Entomological Bulletin* 13(1): 12-21.

Ho, G.W.C., 2021c. Contribution to the knowledge of Chinese Phasmatodea IX: First report of Xeroderinae (Phasmatodea: Phasmatidae) from China. *Zoological Systematics* 45(2): 104-117.

Ho, G.W.C. 2021d. Contribution to the knowledge of Chinese Phasmatodea X: Eight new species of *Cnipsomorpha* from China (Phasmatidae: Clitumninae: Medaurini). *Zootaxa* 5026(1): 102-126.

Ho, G.W.C. 2021e. Contribution to the knowledge of Chinese Phasmatodea XI: New taxa and new nomenclature of Medaurini (Phasmatidae: Clitumninae) from China. *Zoological Systematics* 46(3): 234-239.

Ho, G.W.C. and Shi, F.M., 2013. A new species of the genus *Interphasma* Chen & He, 2008 (Phasmida: Clitumninae: Medaurini) from Sichuan, China. *Zootaxa* 3734(4): 492-496.

Li, B.L., Shi, F.M. and Wang, H.J., 2021. Stick insects of the genus *Interphasma* Chen et He, 2008 (Phasmida: Phasmatidae) from China. *Far Eastern Entomologist* 422: 24-32.

Sellick, J.T.C., 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.

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.

Sellick, J.T.C., 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.

Xu, F.L., Yang, M.F. and Guo, G.H., 2010. A new species of the genus *Interphasma* from China (Phasmatodea, Phasmatidae). *Acta Zootaxonomica Sinica* 35(2): 395-397.

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.