

# Contribution to the knowledge of Chinese Phasmatodea VI: New taxa and new nomenclature of the subfamily Necrosiinae from the Phasmatodea of China

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## ABSTRACT

This study provides the descriptions of one new genus, eight new species and two new subspecies from the Necrosiinae of China, including *Oedohirasea* **gen. nov.**, *Acanthophasma brevicercum* **sp. nov.**, *Acanthophasma dilatatum* **sp. nov.**, *Cheniphasma parvidentatum* **sp. nov.**, *Oedohirasea huanglianshanensis* **sp. nov.**, *Oxyartes densigranulatus* **sp. nov.**, *Oxyartes nigrigranulatus* **sp. nov.**, *Oxyartes sparsispinosus* **sp. nov.**, *Oxyartes xishuangbannaensis* **sp. nov.**, *Oxyartes despectus yingjiangensis* **subsp. nov.** and *Oxyartes rubris distinctus* **subsp. nov.**; four new combinations are suggested including *Cheniphasma fruhstorferi* (Brunner von Wattenwyl, 1907) **comb. nov.** from *Neohirasea* Rehn, 1904, *Oedohirasea fenshuilingensis* (Ho, 2017) **comb. nov.** from *Neohirasea*, *Oedohirasea pengzhongii* (Ho, 2017) **comb. nov.** from *Neohirasea* and *Oedohirasea wangpengi* (Ho, 2017) **comb. nov.** from *Neohirasea*; the first descriptions of the male of *Neointerphasma minutigranulatum* Ho, 2017 and *O. fenshuilingensis* (Ho, 2017) **comb. nov.** are provided; the taxonomic position of *Neointerphasma* Ho, 2017 is redefined, transferred from subfamily Clitumninae Brunner von Wattenwyl, 1893 to Necrosiinae; *Marmessoidea casignetus* (Westwood, 1859) and *Oxyartes despectus* (Westwood, 1848) are for the first time recorded from China. Keys to the species and a species list for *Acanthophasma* Chen & He, 2000, *Cheniphasma* Ho, 2012, *Oedohirasea* **gen. nov.** and *Oxyartes* Stål, 1875 are provided.

**Key words:** Stick insects, China, taxonomy, new genus, new species, new subspecies, new combinations

中國蝨目之新知VI:中國蝨目長角枝蝨亞科新分類群及新分類命名

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摘要:本文記述中國長角枝蝨亞科一新屬八新種及二新亞種: 膨胸棘蝨屬 *Oedohirasea* **gen. nov.**, 短尾棘蝨 *Acanthophasma brevicercum* **sp. nov.**, 膨股棘蝨 *Acanthophasma dilatatum* **sp. nov.**, 細齒陳蝨 *Cheniphasma parvidentatum* **sp. nov.**, 黃連山膨胸棘蝨 *Oedohirasea huanglianshanensis* **sp. nov.**, 密粒刺異蝨 *Oxyartes densigranulatus* **sp. nov.**, 黑粒刺異蝨 *Oxyartes nigrigranulatus* **sp. nov.**, 疏刺刺異蝨 *Oxyartes sparsispinosus* **sp. nov.**, 西雙版納刺異蝨 *Oxyartes xishuangbannaensis* **sp. nov.**, 褐刺異蝨 盈江亞種 *Oxyartes despectus yingjiangensis* **subsp. nov.** 及赤刺異蝨 顯刺亞種 *Oxyartes rubris distinctus* **subsp. nov.**; 建立四新組合: 弗氏陳蝨 *Cheniphasma fruhstorferi*

(Brunner von Wattenwyl, 1907) **comb. nov.**, 分水嶺膨胸棘蝨 *Oedohirasea fenshuilingensis* (Ho, 2017) **comb. nov.**, 彭氏膨胸棘蝨 *Oedohirasea pengzhongii* (Ho, 2017) **comb. nov.** 及王氏膨胸棘蝨 *Oedohirasea wangpengi* (Ho, 2017) **comb. nov.**; 對新介蝨屬 *Neointerphasma* Ho, 2017進行了修定, 並對微粒新介蝨 *Neointerphasma minutigranulatum* Ho, 2017雄蟲進行首次描述; 報告二新紀錄種: 翅突瑪異蝨 *Marmessoidea casignetus* (Westwood, 1859)及褐刺異蝨 *Oxyartes despectus* (Westwood, 1848); 以及制定棘蝨屬 *Acanthophasma* Chen & He, 2000, 陳蝨屬 *Cheniphasma* Ho, 2012, 膨胸棘蝨屬 *Oedohirasea* **gen. nov.** 及刺異蝨屬 *Oxyartes* Stål, 1875的分類檢索表。

關鍵字: 竹節蟲, 中國, 分類, 新屬, 新種, 新亞種, 新組合

## INTRODUCTION

In China, more than 150 species are recognised in the subfamily Necrosiinae Brunner von Wattenwyl, 1893 (Chen and He, 2008; Hennemann et al., 2008; Ho, 2016, 2017a, unpubl. data; Brock et al., 2020). The diversity of Chinese Necrosiinae is apparently high and most of the taxa are found in the tropical and subtropical forests in the southern parts (Guangdong, Guangxi and Yunnan Provinces) of China.

This study is the sixth of the series on the Contribution to the knowledge of Chinese Phasmatodea. The previous contributions I-V contain descriptions of 65 new taxa (six new genera, 48 new species and 11 new subspecies) and suggestions of 13 new nomenclatures (13 new combinations) from the subfamilies Clitumninae, Dataminae, Necrosiinae and Lonchodinae (Ho, 2013a, 2013b, 2016, 2017a, 2017b). The present paper describes 11 new taxa and suggests four new combinations for the Chinese Necrosiinae.

## MATERIALS & METHODS

The systematic treatment is according to Otte and Brock (2005), Bradler et al. (2014), Robertson et al. (2018), Simon et al. (2019) and Brock et al. (2020). Morphological terms follow Rehn and Rehn (1939), Bragg (2001), Zompro (2004) and Bradler (2009). Ootaxonomic description refers to Clark (1976a, 1976b, 1979, 1988, 1998), Clark-Sellick (1997) and Zompro (2004). Measurements are given in millimeters (mm). The abbreviations used for collections are: HKES: Hong Kong Entomological Society, Hong Kong, China; SEM: Shanghai Entomological Museum, Chinese Academy of Sciences, Shanghai, China; UMO: Hope Entomological Collections, University Museum, Oxford, UK; and GH:

Private collection of George Ho Wai-Chun, Hong Kong, China.

## RESULTS

### Lonchodidae Brunner von Wattenwyl, 1893

### Necrosciinae Brunner von Wattenwyl, 1893

### *Acanthophasma* Chen & He, 2000

*Acanthophasma*, Chen and He, 2000: 33; Zompro, 2004: 304; Otte and Brock, 2005: 38; Chen and He, 2008: 158; Hennemann et al., 2008: 8.

**Type-species:** *Oxyartes varius* Chen & He, 1992: 44, by original designation.

**Distribution:** China (Hunan and Yunnan).

**Notes:** This genus consists of three species and is reported for the first time from Yunnan in southwestern China. A key is only given to males because adult females of all species are unknown.

#### Species included:

1. *Acanthophasma brevicercum* sp. nov.  
Distribution: China (Yunnan)
2. *Acanthophasma dilatatum* sp. nov.  
Distribution: China (Yunnan)
3. *Acanthophasma varium* (Chen & He, 1992: 44, figs. 124a-b). [*Oxyartes varius*]  
Distribution: China (Hunan)

#### Key to the species of *Acanthophasma*

##### Male:

1. Fourth and fifth abdominal tergites with a spine posteromedially. . . . . *A. varium*  
- Fourth and fifth abdominal tergites with a hump posteromedially. . . . . **2**
2. Metanotum with a pair of posterior medial spines, alae tegmina-like. . . . . *A. brevicercum* sp. nov.  
- Metanotum lacking posterior medial spines, alae scale-like. . . . . *A. dilatatum* sp. nov.

***Acanthophasma brevicercum* sp. nov.** (Figs. 1-2, 32, 35)

**Type:** Holotype, 1♂, 2000m, Longchuan, Dehong, Yunnan, China, 10.VI.2017, Bi Wen-Xuan (SEM).

**Differentiation:** *Acanthophasma brevicercum* sp. nov. is related to *A. dilatatum* sp. nov., but can be separated by its larger size, the presence of paired posterior medial spines on the metanotum, the tegmina-like alae and the

indistinct roundly expanded posterolateral angles on the abdominal tergites.

**Description of male (Figs. 1-2, 32, 35):** Small size. Body stout and short. General colouration of body and legs dark brown, with blackish markings.

**Head:** Oval, sparsely covered with small granules. Vertex flat, with a pair of supra-antennal spines. Occiput conically raised, with two pairs of medial spines along median longitudinal furrow, also with a pair of supra-orbital spines. Compound eyes small and rounded, its length about three times length of genae. Antennae long, apices surpassing apices of protarsi, sparsely covered with short bristles; scapus basally flattened, longer than pedicellus; and pedicellus as long as third segment.

**Thorax:** Rough, sparsely covered with small granules. Pronotum rectangular, longer than wide, anterior margin incurved, posterior margin truncate, transverse and longitudinal sulci crossing before middle point; with a pair of posterior medial spines and posterolateral spines. Mesonotum moderately expanded posteriorly, with paired pre-median and post-median spines, also with a bi-spinose hump on the posteromedian area. Mesopleurae with a median spine and a supra-coxal spine. Metanotum square, shorter than median segment, with paired posterior medial spines. Metapleurae with a supra-coxal spine.

**Abdomen:** Sparsely covered with small granules, with indistinct roundly expanded posterolateral angles from second to eighth tergites. Median segment rectangular, about two times wider than long. Second and third tergites with a pair of posterior medial spines. Second to fifth tergites with a small hump posteromedially. Ninth tergum with a small crest posteromedially, also with elongated posterolateral angles, apices rounded. Anal segment shorter than ninth tergum, posterior margin truncate. Poculum cup-shaped, posterior margin rounded and reaching anterior area of anal segment. Cerci cylindrical, short, apices weakly curved upwards, rounded and surpassing posterior margin of anal segment.

**Legs:** Slender, sparsely covered with short bristles. Unarmed. Procoxae and mesocoxae with a short spine. Femora thicker than corresponding tibiae, subapical area of anterodorsal and posterodorsal carinae dilated as a small lamella. Profemora curved basally. Tibiae roughly as long as corresponding femora.

**Wings:** Tegmina indistinct. Alae short, tegmina-like, as long as pronotum.

**Measurements:** See Table 1.

**Distribution:** China (Yunnan).

**Notes:** The female is unknown.

**Etymology:** The specific epithet of this new species is derived from the short cerci in the male.

***Acanthophasma dilatatum* sp. nov.** (Figs. 3-4, 33-34, 36)

**Types:** Holotype, ♂, 2000m, Nanjian, Dali, Yunnan, China, 2.VI.2018, George Ho Wai-Chun (HKES); Paratype, 1 immature ♀, same data as holotype ♂ (HKES).

**Differentiation:** *Acanthophasma dilatatum* sp. nov. is related to *A. brevicercum* sp. nov., but can be separated by its smaller size, the unarmed metanotum, the scale-like alae and the distinctly and roundly expanded posterolateral angles on the abdominal tergites in the male.

**Description of male (Figs. 3-4, 33, 36):** Small size. Body stout and short. General colouration of body and legs dark brown, with blackish markings.

**Head:** Oval, sparsely covered with small granules. Vertex flat, with a pair of supra-antennal spines. Occiput conically raised, with three pairs of medial spines along median longitudinal furrow, also with a pair of short supra-orbital spines. Compound eyes small and rounded, its length about three times length of genae. Antennae long, surpassing apices of protarsi, sparsely covered with short bristles; scapus basally flattened, longer than third segment; and pedicellus shorter than third segment.

**Thorax:** Rough, sparsely covered with small granules. Pronotum rectangular, longer than wide, anterior margin weakly incurved, posterior margin truncate, transverse and longitudinal sulci crossing before middle point; with a pair of posterior medial spines and posterolateral tubercles. Mesonotum moderately expanded posteriorly, with paired pre-median and post-median spines, also with a small bi-tuberculate hump on posteromedian area. Mesopleurae with a median spine-like tubercle and a supra-coxal spine. Metanotum square, shorter than median segment. Metapleurae with a supra-coxal spine.

**Abdomen:** Sparsely covered with small granules. Median segment rectangular, about two times wider than long. Second to eighth tergites with a small hump posteromedially, also with roundly expanded posterolateral angles. Ninth tergum with a small crest posteromedially, also with elongated posterolateral angles, apices obtuse. Anal segment roughly as long as ninth tergum, posterior margin truncate. Poculum cup-shaped, posterior margin rounded and reaching posterior area of anal segment. Cerci cylindrical, short, straight, apices rounded and surpassing posterior margin of anal segment.

**Legs:** Slender, sparsely covered with short bristles. Unarmed. Procoxae and mesocoxae with a short spine-like tubercle. Femora thicker than corresponding

tibiae, subapical area of anterodorsal and posterodorsal carinae dilated, lamella-like. Profemora curved basally. Tibiae roughly as long as corresponding femora.

**Wings:** Tegmina indistinct. Alae small, reduced, scale-like.

**Description of female (Fig. 34):** Generally similar to male. Body stout, sparsely covered small granules. General colour of body and legs brown, with blackish markings.

**Head:** As in male, occiput conically raised, with one pair of supra-antennal, one pair of supra-orbital and three pairs of occipital medial spines.

**Thorax:** As in male. Pronotum rectangular, with a pair of posterior medial spines. Mesonotum moderately expanded posteriorly, with paired pre-median and post-median spines, also with a bi-tuberculate hump on posteromedian area. Metanotum unarmed, shorter than median segment. Mesopleurae with a median tubercle and a supra-coxal spine, also with a few enlarged granules on lower margin.

**Abdomen:** Second to ninth tergites with more distinct roundly expanded posterolateral angles than male, also with distinct lateral and median longitudinal carinae and a small posteromedian hump. Posterior margin of anal segment rounded. Subgenital plate short and flattened. Cerci as in male.

**Legs:** As in male, unarmed. Femora thicker than corresponding tibiae, with dilated subapical area on anterodorsal and posterodorsal carinae.

**Wings:** Tegmina indistinct. Alae small, scale-like.

**Measurements:** See Table 1.

**Distribution:** China (Yunnan).

**Notes:** The description of the female is based on an immature individual. Measurements are only given to the holotype male. Further material especially of the adult female and its eggs are needed for knowing the complete morphological characters of this species.

**Etymology:** The specific epithet of this new species is derived from the dilated subapical area on the anterodorsal and posterodorsal carinae of the femora in the both sexes.

### *Cheniphasma* Ho, 2012

*Cheniphasma*, Ho, 2012: 217; Ho, 2013c: 528.

**Type-species:** *Cheniphasma serrifemoralis* Ho, 2012: 217, by original designation.

**Description:** Small size. Apterous. Dull colouration, brown to greenish brown or dark brown. Body cylindrical,



rugose and granulose. Head oval, dorsoventrally flattened. Vertex and occiput flat, unarmed. Antennae long and filiform. Thorax tuberculate and granulose in female, spinose in male. Pronotum rectangular, with two anterior medial spines. Mesonotum elongate, moderately expanded posteriorly; medially armed with a pair of tuberculate or spinose lamellae in female, only with a pair of median medial spines in male. Metanotum with a pair of posterior medial spines. Abdomen granulated and wrinkled, narrowing posteriorly. Second to eighth tergites with a granule or tubercle posteromedially. Female praeopercular organ distinct on posteromedian area of seventh sternum. Subgenital plate of female scoop-shaped, reaching or surpassing posterior margin of anal segment. Anal segment of male posteriorly emarginated. Poculum of male cup-shaped. Cerci of both sexes with rounded apices, male with longer cerci. Female anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with serrations or dentations, dentations indistinct in male. Tibiae with indistinct dentations. Egg capsule oval. Micropylar plate rounded.

**Distribution:** China (Guangdong and Yunnan) and Vietnam.

**Notes:** The description of genus is amended because new taxa are added. Changes of the description focus on the variation of armature on thorax and legs. Other description largely follows the original description. Currently four species are recognised, including *Cheniphasma granulatum* Ho, 2013, *C. fruhstorferi* (Brunner von Wattenwyl, 1907) **comb. nov.** [transferred from *Neohirasea* Rehn, 1904; type-locality from Vietnam, not occurring in China], *C. parvidentatum* **sp. nov.** and *C. serrifemoralis* Ho, 2012. This genus is substantially known only from southern China (Guangdong and Yunnan) and northern Vietnam (Hoa Binh and Lang Son). Only two species are present in China. Yunnan (China) and Hoa Binh (Vietnam) are the new locations for *Cheniphasma*. Based on the currently recognised distribution of *Cheniphasma* in China, the floristic habitat in the southwestern and northwestern parts of Guangxi is similar to southwestern Guangdong and southeastern Yunnan. Although there is no record of *Cheniphasma* from Guangxi, further collecting of specimens in the region could discover certain populations.

#### Species included from China:

##### 1. *Cheniphasma parvidentatum* **sp. nov.**

Distribution: China (Yunnan)

##### 2. *Cheniphasma serrifemoralis* Ho, 2012: 217, figs. 1a-g, 2a-b

Distribution: China (Guangdong)

#### Key to the species of *Cheniphasma* from China:

#### Female:

1. Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with small and rounded dentations. . . . . *C. parvidentatum* **sp. nov.**
- Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with distinct serrations. . . . . *C. serrifemoralis*

#### Male:

1. Posterior margin of anal abdominal segment weakly emarginated, posterolateral angles not elongated and not curved inwards. . . . . *C. parvidentatum* **sp. nov.**
- Posterior margin of anal abdominal segment deeply emarginated, posterolateral angles elongated and curved inwards. . . . . *A. serrifemoralis*

#### *Cheniphasma parvidentatum* **sp. nov.** (Figs. 5-8, 37-42)

**Types:** Holotype, ♀, 1500m, Jinping, Honghe, Yunnan, China, 28.VIII.2019, George Ho Wai-Chun (HKES); Paratypes, 10♀, 14♂ & 47 eggs (naturally laid by paratypes ♀), same data as holotype ♀, George Ho Wai-Chun (HKES).

**Differentiation:** *Cheniphasma parvidentatum* **sp. nov.** is closely related to *C. serrifemoralis* Ho, 2012, but can be separated by the more robust body, the presence of spine-like tubercles on the lateral margins of mesonotum and the indistinct armature on legs in the female and the presence of enlarged granules on the lateral margins of mesonotum and the weakly emarginated posterior margin of the anal abdominal segment in the male.

**Description of female (Figs. 5-6, 37, 41):** Small size. Body robust, distinctly larger than male. General colouration of body and legs brown or dark brown.

**Head:** Oval, longer than wide, sparsely granulated. Vertex flattened. Occiput gently convex, posterior margin with six small swellings, median longitudinal furrow distinct, lateral longitudinal furrows indistinct. Compound eyes oval and small, its lengths about four times length of genae. Antennae filiform, not surpassing apices of protarsi, sparsely covered with short bristles; scapus flattened basally, roughly as long as third segment, longer than pedicellus.

**Thorax:** Rough, granulated and wrinkled. Pronotum rectangular, longer than wide, roughly as long as head; anterior margin incurved, with a pair of short spine-like tubercles, apices weakly pointing forwards, posterior margin rounded, transverse and longitudinal sulci crossing at middle point. Mesonotum moderately expanded posteriorly, mediolongitudinally not carinate; medially elevated with a pair of tuberculate lamellae, dorsally bearing a few short tubercles; anterior, pre-median and posterior area with paired, short spine-like medial tubercles, lateral margins interspersed with a few spine-like tubercles. Metanotum with a pair of

spine-like medial tubercles posteriorly, apices pointing posteriorly. Mesopleurae and metapleurae with a few spine-like tubercles on lower margin. Mesosternum and metasternum with indistinct granulations. Metapleurae with a short supra-coxal tubercle.

**Abdomen:** Cylindrical, tapering posteriorly. Wrinkled and sparsely granulated. Median segment broader than long, shorter than metanotum, longer than second tergum, with a pair of short spine-like medial tubercles posteriorly. Median segment to seventh tergites with a short tubercle posteromedially, apex curved posteriorly. Posteromedian area of seventh sternum with distinct praeopercular organ, formed by two tubercle-like structures, apices pointing posteriorly. Eighth and ninth tergites with a small crest posteromedially, apex obtuse. Anal segment longer than ninth tergum, with two small emarginations on posterior margin, posterolateral angles pointed. Subgenital plate scoop-shaped, median longitudinal carina distinct, apex rounded and surpassing posterior margin of anal segment. Cerci short, flattened, apices rounded and not surpassing posterior margin of anal segment.

**Legs:** Slender and long, sparsely covered with short bristles. Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with weakly developed dentations. Profemora incurved basally. Tibiae lacking noticeable armature, roughly as long as corresponding femora.

**Description of male (Figs. 7-8, 38, 42):** Small size. Body slender and slim, distinctly smaller and more slender than female. General colouration of body and legs brown.

**Head:** Obscurely granulated. Oval, gently constricted behind compound eyes, as long as pronotum. Vertex flat. Posterior margin of occiput with six small and indistinct swellings, median and lateral longitudinal furrows indistinct. Compound eyes rounded and small, its lengths about three times length of genae. Antennae long and filiform, sparsely covered with short bristles, apices of antennae surpassing apices of protarsi; scapus flattened basally, longer than pedicellus, shorter than third segment.

**Thorax:** Inconspicuously covered with small granules, also interspersed with a few enlarged granules. Pronotum rectangular, longer than wide, transverse and longitudinal sulci crossing at middle point; anterior margin gently curved inwards, posterior margin rounded, with a pair of anterior medial spines, apices pointing forwards. Mesonotum elongated, broadly emarginated medially, with paired medial spines medially, lateral margins with a few minute pits and enlarged granules, median longitudinal carina indistinct. Metanotum trapezoidal, constricted posteriorly, longer than median segment, with a pair of medial spines posteriorly. Mesopleurae and metapleurae with a supra-coxal spine.

**Abdomen:** Slender, with short wrinkles and inconspicuous

granulations. Median segment rectangular, longer than wide, shorter than metanotum. Second to eighth tergites with a short tubercle posteromedially. Second to seventh tergites parallel-sided. Eighth tergum gently expanded posteriorly, roughly as long as ninth tergum. Anal segment as long as eighth tergum, laterally swollen, with a small emargination on posterior margin. Poculum cup-shaped, posterior margin rounded, reaching anterior area of anal segment, median elevation indistinct. Cerci long, cylindrical, distinctly curved inwards, apices swollen, rounded and not surpassing posterior margin of anal segment.

**Legs:** Slender and long, sparsely covered with short bristles. Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with small and inconspicuous dentations, subapical area of anteroventral and posteroventral carinae with a minute tooth. Profemora incurved basally. Tibiae lacking noticeable armature, roughly as long as corresponding femora.

**Vomer:** Very minute, length about 1.0 mm, oblong, symmetrical, apex obtuse.

**Measurements:** See Table 2.

**Description of egg (Figs. 39-40):** Capsule brown, oval, densely granulated, interspersed with a few enlarged granules, posterior pole rounded. Micropylar plate rounded, with a short median longitudinal carina. Micropylar cup placed at posterior margin of micropylar plate. Median line short, about one-third of micropylar plate. Operculum brown, densely granulated, with a small dish-like capitulum, marginally thickened.

**Measurements:** Length, 2.2 mm; width, 1.6 mm; height 2.0 mm.

**Distribution:** China (Yunnan).

**Etymology:** The specific epithet of this new species is derived from the small dentations on the carinae of the femora in the both sexes.

### *Marmessoidea* Brunner von Wattenwyl, 1893

*Marmessoidea*, Brunner von Wattenwyl, 1893: 85; Rehn, 1904: 73; Kirby, 1904: 371; Redtenbacher, 1908: 509; Brock, 1999: 89, 175; Bragg, 2001: 565; Zompro, 2004: 314; Otte and Brock, 2005: 192; Chen and He, 2008: 156; Hennemann et al., 2008: 14; Mandal and Yadav, 2010: 9; Ho, 2016: 318, 2018a: 182.

**Type-species:** *Necroscia marmessus* Westwood, 1859: 49, by original designation (= *Trigonophasma* Kirby, 1904: 436, synonymised by Brock, 1999: 175).

**Distribution:** China, India, Indonesia, Malaysia, Philippines, Singapore and Vietnam.

**Notes:** Currently five species and two subspecies are

recognised in China (Ho, 2016: 318, 2018a: 182).

***Marmessoidea casignetus* (Westwood, 1859)** (Fig. 43)

*Necroscia casignetus*, Westwood, 1859: 147, pl. 20: 5.

*Trigonophasma casignetus*, Kirby, 1904: 373.

*Sipyloidea casignetus*, Redtenbacher, 1908: 544.

*Marmessoidea casignetus*, Otte and Brock, 2005: 193.

**Type:** Holotype, ♀, Assam, India, Major Jenkins, no. 665 (UMO).

**Other material examined:** 1♀, Yingjiang, Dehong, Yunnan, China, 5.VII.2019, George Ho Wai-Chun (GH).

**Differentiation:** This species is related to *Marmessoidea bispina* (Redtenbacher, 1908), but can be easily separated by the brown colouration, the more slender body and the brown granulations on the mesonotum.

**Distribution:** China (Yunnan) and India (Assam).

**Notes:** This species is firstly reported from China.

### ***Neointerphasma* Ho, 2017**

*Neointerphasma*, Ho, 2017: 519.

**Type-species:** *Neointerphasma minutigranulatum* Ho, 2017b: 520, by original designation.

**Description:** Small size. Apterous. Body short, robust and dorsoventrally flattened, unarmed. Head oval, inconspicuously covered with sparse and minute granules. Vertex and occiput flat. Compound eyes small and rounded. Antennae segmented, surpassing apices of protibiae. Thorax sparsely covered with minute and inconspicuous granules. Pronotum square in both sexes. Mesonotum distinctly pre-medially swollen in female, indistinctly swollen pre-medially in male. Abdomen inconspicuously and sparsely granulated, medially swollen in female, tapering posteriorly in male. Female seventh sternum lacking noticeable praeopercular organ. Anal segment with rounded posterior margin in female, weakly emarginated in male. Supra-anal plate small and indistinct in both sexes. Female subgenital plate scoop-shaped, tapering posteriorly, apex pointed. Male poculum cup-shaped. Cerci flattened and apically pointed in both sexes. Legs slender, unarmed. Egg capsule oval, with rounded micropylar plate.

**Distribution:** China (Yunnan).

**Notes:** Ho (2017b: 519) originally placed *Neointerphasma* Ho, 2017 in the tribe Medaurini Hennemann & Conle, 2008 [Family Phasmatidae Gray, 1835, Subfamily Clitumninae Brunner von Wattenwyl, 1893] based on a single female specimen. However, the present author recently discovered the corresponding male of *N. minutigranulatum* Ho, 2017 [type-species of *Neointerphasma*] and considered it to

be a member of Necrosiinae. In fact, *Neointerphasma* matches the features of Necrosiinae including the long and filiform antennae in the both sexes, the short supra-anal plate and the short subgenital plate in the female and the non-spilt anal abdominal segment and the well-developed vomer in the male. *Neointerphasma* obviously violates the main features of Medaurini and even the 'Lanceocercata' group in Phasmatidae by the robust body structure in the female and the non-spilt anal abdominal segment and the well-developed vomer in the male (Hennemann and Conle, 2008; Bradler et al., 2014; Simon et al., 2019). Undoubtedly, *Neointerphasma* is a member of Necrosiinae. *Neointerphasma* is closely related to *Neohirasea* Rehn, 1904, but can be easily separated by the small size, the flattened body, the pre-medially swollen mesonotum and the unarmed legs in the both sexes. Therefore, the new material provides further information for understanding the appropriate taxonomic position for this genus. This genus only consists of one species and the male is firstly described.

### **Species included:**

1. *Neointerphasma minutigranulatum* Ho, 2017b: 520, figs. 29-30, 108-110, 162-163.

Distribution: China (Yunnan)

***Neointerphasma minutigranulatum* Ho, 2017** (Figs. 9-11, 44)

*Neointerphasma minutigranulatum*, Ho, 2017b: 520, figs. 29-30, 108-110, 162-163.

**Types:** Holotype, ♀, 2400-2500m, Weibaoshan, Weishan, Dali, Yunnan, China, 16.VIII.2015, Bi Wen-Xuan (SEM); Paratypes, 11 eggs, same data as holotype ♀ (SEM); 3♀, 2450-2580m, Weibaoshan, Weishan, Dali, Yunnan, China, 7.VII.2017, Bi Wen-Xuan (HKES & SEM).

**Other material examined:** 2♂, 3♀, 2300m, Weishan, Dali, Yunnan, China, 3.VI.2018, George Ho Wai-Chun (GH).

**Description of male (Figs. 9-11, 44):** Small size. Body short, stout and dorsoventrally flattened, distinctly smaller and more slender than female. Unarmed and apterous. General colouration of body and legs brown, with sparse and small blackish markings.

**Head:** Oval, sparsely and inconspicuously covered with minute granules. Vertex and occiput flat. Median longitudinal furrow distinct, lateral longitudinal furrows indistinct. Genae with one short and thin postocular carina behind compound eyes. Compound eyes small and rounded, its length about three times of genae. Antennae long and filiform, distinctly segmented, with 22 segments, sparsely covered with short bristles; scapus basally flattened, as long as third segment, longer than pedicellus.



**Thorax:** Wrinkled and sparsely covered with minute and inconspicuous granules. Pronotum square, roughly as long as head, anterior margin weakly incurved, posterior margin truncate, transverse and longitudinal sulci crossing at middle point. Mesonotum pre-medially swollen weakly. Metanotum rectangular, wider than long, longer than median segment.

**Abdomen:** Sparsely covered with minute and inconspicuous granules, laterally carinate. Dorsoventrally flattened. Median segment narrow, about two times wider than long. Anal segment longer than ninth tergum, posterior margin with a small emargination. Poculum cup-shaped, posterior margin rounded and reaching anterior area of anal segment. Cerci long and straight, tapering apically, apices pointed and surpassing posterior margin of anal segment.

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

**Vomer:** Apical part symmetrical, gradually constricted apically, apex pointed.

**Measurements:** See Table 3.

**Distribution:** China (Yunnan).

**Notes:** The male is described and illustrated for the first time. The measurements of females are also provided.

### ***Oedohirasea* gen. nov.**

**Type-species:** *Neohirasea fenshuilingensis* Ho, 2017a: 16, by present designation.

**Differentiation:** *Oedohirasea* gen. nov. is similar to *Neohirasea* Rehn, 1904, but can be separated by its smaller size, the robust body and the thick-built thorax in the both sexes, the medially swollen mesonotum in the female and the comparatively short mesonotum (not more than three times length of pronotum) in the male.

**Description:** Small size. Apterous. Dull colouration, brown to dark brown. Body stout, robust, cylindrical; rough, with wrinkles and granules. Head oval, lacking spines. Occiput gently convex or elevated with a hump. Thorax rough, wrinkled and granulated, unarmed or with spines and/or tubercle-like spines. Pronotum rectangular, with two anterior medial spines or tubercles. Mesonotum granulated, with spines or spine-like tubercles, distinctly swollen medially in female, indistinctly swollen medially or expanded posteriorly in male. Mesopleurae and metapleurae with a short supra-coxal tubercle. Abdomen cylindrical, wrinkled and granulated, tapering posteriorly. Female seventh sternum with indistinct praeopercular organ posteromedially, usually formed by carina- or tubercle-like structure. Female subgenital plate short, scoop-shaped. Male poculum small, cup-shaped. Supra-anal

plate indistinct. Cerci short and flattened in both sexes. Legs thick-built, with distinct or indistinct dentations or serrations. Egg capsule oval. Micropylar plate oval.

**Distribution:** China (Guizhou and Yunnan).

**Notes:** This new genus consists of four species. *Oedohirasea* gen. nov. matches the features of Necrosiinae including the long and filiform antennae in the both sexes, the short supra-anal plate and the short subgenital plate in the female and the non-spilt anal abdominal segment and the well-developed vomer in the male. *Oedohirasea* gen. nov. is closely related to *Neohirasea* Rehn, 1904 and shares the features including the absence of wings, spinose thorax and the absence of capitulum on the egg operculum. The diagnostic character of *Oedohirasea* gen. nov. is the robust body and thick-built thorax in the both sexes. Based on a recent molecular work (Bradler et al., 2014), *Neohirasea* is related to *Sipylodea* Brunner von Wattenwyl, 1893 and both genera are the members of Necrosiinae. Therefore, *Oedohirasea* gen. nov. is considered to be a member of Necrosiinae.

**Etymology:** Feminine. The specific epithet of this new genus is derived from the words 'Oedo' (= swollen) referring the distinct medially swollen mesonotum in the female) and 'hirasea' referring to the close relationship with *Neohirasea* Rehn, 1904.

### **Species included:**

1. *Oedohirasea fenshuilingensis* (Ho, 2017a: 16, figs. 40-41, 70-74, 274-275). [*Neohirasea*] **comb. nov.**  
Distribution: China (Yunnan)

2. *Oedohirasea huanglianshanensis* sp. nov.  
Distribution: China (Yunnan)

3. *Oedohirasea pengzhong* (Ho, 2017a: 22, figs. 53-56, 67, 95-103). [*Neohirasea*] **comb. nov.**  
Distribution: China (Guizhou)

4. *Oedohirasea wangpeng* (Ho, 2017a: 26, figs. 62-64, 69, 115-123, 280-281). [*Neohirasea*] **comb. nov.**  
Distribution: China (Yunnan)

### **Key to the species of *Oedohirasea* gen. nov.**

#### **Male:**

1. Thorax unarmed. . . . . *O. pengzhong* **comb. nov.**  
- Thorax with spines or tubercle-like spines. **2**
2. Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with rounded elevations. . . . . *O. wangpeng* **comb. nov.**  
- Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with serrations. **3**

3. Post-median area of pronotum with a pair of tubercle-like spines.  
*O. huanglianshanensis* **sp. nov.**  
 - Post-median area of pronotum unarmed.  
*A. dilatatum* **sp. nov.**

#### Female:

1. Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with serrations.  
*O. fenshuilingensis* **comb. nov.**  
 - Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with rounded elevations. **2**  
 2. Mesonotum with one tuberculate hump on mesonotum medially. *O. pengzhong* **comb. nov.**  
 - Mesonotum with two tuberculate humps on mesonotum pre-medially and medially.  
*O. pengzhong* **comb. nov.**

#### *Oedohirasea fenshuilingensis* (Ho, 2017) **comb. nov.** (Figs. 12-14, 45, 47)

*Neohirasea fenshuilingensis*, Ho, 2017a: 16, figs. 40-41, 70-74, 274-275.

**Types:** Holotype, ♀, 1300-1400m, Fenshuiling, Jinping, Yunnan, China, 4.IX.2016, George Ho Wai-Chun (HKES); Paratypes, 8 eggs (naturally laid by holotype ♀), same data as holotype ♀ (HKES).

**Other material examined:** 4♀, 6♂, 1800-2000m, Jinping, Honghe, Yunnan, China, 25-26.VIII.2019, George Ho Wai-Chun (GH).

**Description of male (Figs. 12-14, 45, 47):** Small size. Body slender, distinctly smaller and more slender than female. General colouration of body and legs dark brown.

**Head:** Covered with sparse and small granulations. Oval, longer than wide. Vertex flat. Occiput distinctly elevated with a hump, dorsally bearing a few granules. Posterior margin of occiput with indistinct swellings. Median and lateral longitudinal furrows indistinct. Compound eyes oval and small, its lengths about three times length of genae. Antennae filiform, not reaching apices of protarsi, covered with sparse long and dense short bristles; scapus flattened basally, shorter than third segment, longer than pedicellus.

**Thorax:** Rough, granulated and wrinkled. Pronotum rectangular, longer than wide, roughly as long as head, with a pair of anterior medial spines; anterior margin incurved, posterior margin rounded, transverse and longitudinal sulci crossing at middle point. Mesonotum constricted pre-medially, gently swollen medially, median longitudinal carina indistinct; medially with a spinose hump, also with paired posterior medial and median spines. Metanotum centrally with a pair of medial spines. Mesopleurae and metapleurae with a

spine-like supra-coxal tubercle.

**Abdomen:** Cylindrical, tapering posteriorly. Wrinkled and granulated. Median segment broader than long, shorter than metanotum. Median segment to sixth tergites with a curved spine posteromedially, apex pointing posteriorly. Seventh to ninth tergites with a pair of small humps posteromedially. Anal segment as long as ninth tergum, with a small V-shaped emargination on posterior margin, posterolateral angles rounded. Poculum cup-shaped, medially elevated, posterior margin rounded and reaching anterior area of anal segment. Cerci short, flattened, apices pointed and not surpassing posterior margin of anal segment.

**Legs:** Slender and long, sparsely covered with short bristles. Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with two to three distinct serrations, serrations on ventral carinae smaller than serrations on dorsal carinae. Profemora curved basally. Anterodorsal and posterodorsal carinae of tibiae with indistinct serrations, anteroventral and posteroventral carinae unarmed.

**Vomer:** Apical part symmetrical, gradually constricted apically, apex pointed.

**Measurements:** See Table 4.

**Distribution:** China (Yunnan).

**Notes:** The male is described and illustrated for the first time. The measurements of females are also provided.

#### *Oedohirasea huanglianshanensis* **sp. nov.** (Figs. 15-17, 46, 48)

**Type:** Holotype, 1♂, 1300-1400m, Huanglianshan, Luchun, Honghe, Yunnan, China, 7.IX.2016, George Ho Wai-Chun (HKES).

**Differentiation:** *Oedohirasea huanglianshanensis* **sp. nov.** is similar to *O. fenshuilingensis* (Ho, 2017) **comb. nov.**, but can be easily separated by the presence of paired tubercle-like medial spines on the anterior margin and post-median area of pronotum, the bi-laminate armature on the pre-median area of mesonotum and the distinct armature on the dorsal carinae of tibiae in the male.

**Description of male (Figs. 15-17, 46, 48):** Small size. Body stout and slender. General colouration of body and legs brown.

**Head:** Covered with sparse and small granulations. Oval, longer than wide. Vertex flat. Occiput distinctly elevated with a small hump, dorsally bearing a few enlarged granules. Lacking noticeable swellings on posterior margin of occiput. Median and lateral longitudinal furrows indistinct. Compound eyes oval and small, its lengths about three times length of genae. Antennae filiform, not reaching apices of protarsi, covered with



sparse long and sparse short bristles; scapus flattened basally, longer than third segment; and pedicellus as long as third segment.

**Thorax:** Rough, granulated and wrinkled. Pronotum rectangular, longer than wide, roughly as long as head, with paired tubercle-like medial spines anteriorly and post-medially; anterior margin incurved, posterior margin rounded, transverse and longitudinal sulci crossing at middle point. Mesonotum constricted pre-medially, indistinctly swollen medially, median longitudinal carina weakly elevated; pre-median area obscurely elevated, bearing a pair of tubercle-like spines anteriorly and a pair of lamellae posteriorly; also with paired tubercle-like posterior medial and median spines, lateral margins with a few tubercle-like spines. Metanotum centrally with a pair of tuberculate lamellae. Mesopleurae and metapleurae with a tubercle-like supra-coxal spine.

**Abdomen:** Cylindrical, tapering posteriorly. Wrinkled and granulated. Median segment broader than long, shorter than metanotum. Second and third tergites with paired tubercle-like post-median medial spines. Second to sixth tergites with a curved tubercle-like spine posteromedially, apex pointing posteriorly. Seventh to ninth tergites with a pair of small humps posteromedially. Anal segment as long as ninth tergum, with a small V-shaped emargination on posterior margin, posterolateral angles rounded. Poculum cup-shaped, medially elevated, posterior margin rounded and reaching anterior area of anal segment. Cerci short, flattened, apices obtuse and not surpassing posterior margin of anal segment.

**Legs:** Slender and long, sparsely covered with short bristles. Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of femora with two to three distinct serrations, serrations on ventral carinae smaller than serrations on dorsal carinae. Profemora curved basally. Tibiae longer than corresponding femora, anterodorsal and posterodorsal carinae with indistinct serrations, anteroventral and posteroventral carinae lacking noticeable armature.

**Vomer:** Apical part symmetrical, gradually constricted apically, apex truncate.

**Measurements:** See Table 5.

**Distribution:** China (Yunnan).

**Notes:** The female is unknown.

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

### ***Oxyartes* Stål, 1875**

*Oxyartes*, Stål, 1875: 18; Kirby, 1904: 324; Redtenbacher, 1908: 474; Bragg, 2001: 316; Zompro, 2004: 316; Otte and Brock, 2005: 242; Chen and He, 2008: 184; Hennemann et al., 2008: 18; Mandal and

Yadav, 2010: 12; Ho, 2017a: 28, 2018b: 3.

**Type-species:** *Phasma (Acanthoderus) despectum*, Westwood, 1848: 80, pl. 39, by subsequent designation of Kirby, 1904: 324.

**Description:** Medium-sized. Mainly brown. Body slender and elongate, female more robust than male. Head oval. Mesonotum usually granulated and wrinkled, unarmed or armed with a few tubercles and/or spines. Abdomen wrinkled, unarmed or with spines and/or crest-like structures, also with longitudinal carinae. Female seventh sternum rarely with praeopercular organ. Female subgenital plate scoop-shaped, flattened, tapering posteriorly, posterior apex pointed. Male poculum small, cup-shaped. Anal segment with two to four emarginations on posterior margin in female, weakly emarginated medially in male. Cerci cylindrical, straight or weakly curved inwards in both sexes. Legs lacking noticeable armature, usually with small spines near apices of anteroventral and posteroventral carinae of femora in both sexes. Tegmina indistinct. Alae scale-like or tegmina-like. Egg capsule oval. Micropylar plate oval.

**Distribution:** China (Guangdong, Guangxi and Yunnan), Bangladesh, India, Laos, Thailand and Vietnam.

**Notes:** Currently 15 species and four subspecies are recognised from this Oriental genus and 11 species and three subspecies are recognised from China.

### **Species included:**

#### **1. *Oxyartes densigranulatus* sp. nov.**

Distribution: China (Yunnan)

#### **2. *Oxyartes despectus* (Westwood, 1848: 80, pl. 39: 5). Distribution: Bangladesh (Silhet), China (Yunnan) and India (Assam, Arunachal Pradesh, Meghalaya and Nagaland)**

##### **2.1. *Oxyartes despectus despectus* (Westwood, 1848: 80, pl. 39: 5).**

Distribution: Bangladesh (Silhet) and India (Assam, Arunachal Pradesh, Meghalaya and Nagaland)

##### **2.2. *Oxyartes despectus yingjiangensis* subsp. nov.**

Distribution: China (Yunnan)

#### **3. *Oxyartes dorsalis* Chen & He, 2008: 185, figs. 150a-d.**

Distribution: China (Yunnan)

#### **4. *Oxyartes guangdongensis* Chen & He, 2008: 186, figs. 151a-c.**

Distribution: China (Yunnan)

5. *Oxyartes jinpingensis* Ho, 2017a: 29, figs. 124-127, 156163.

Distribution: China (Yunnan)

6. *Oxyartes lamellatus* Kirby, 1904: 374. [= *Oxyartes honestus* Redtenbacher, 1908: 475; = *Oxyartes spinosissimus* Carl, 1913: 46]

Distribution: China (Guangxi) and Vietnam

7. *Oxyartes nigrigranulatus* sp. nov.

Distribution: China (Yunnan)

8. *Oxyartes rubris* Ho, 2017a: 31, figs. 128-131, 164-171, 282-283.

Distribution: China (Yunnan)

8.1. *Oxyartes rubris distinctus* subsp. nov.

Distribution: China (Yunnan)

8.2. *Oxyartes rubris rubris* Ho, 2017a: 31, figs. 128-131, 164-171, 282-283.

Distribution: China (Yunnan)

9. *Oxyartes sparsispinosus* sp. nov.

Distribution: China (Yunnan)

10. *Oxyartes xishuangbannaensis* sp. nov.

Distribution: China (Yunnan)

11. *Oxyartes yunnanus* Chen & He, 2008: 184, figs. 149a-c.

Distribution: China (Yunnan)

### Key to the species of *Oxyartes* from China:

#### Female:

1. Mesonotum with spines. . . . . 2
  - Mesonotum with granules or tubercle-like granules. . . . . 5
2. Fifth and seventh abdominal tergites lacking posteromedian lamella. . . . . 3
  - Fifth or seventh abdominal tergites with a posteromedian lamella. . . . . 4
3. Fifth abdominal tergum with posterior humps. . . . .
  - . . . . . *O. despectus yingjiangensis* subsp. nov.
  - Fifth abdominal tergum lacking posterior humps. . . . .
    - . . . . . *O. guangdongensis*
4. Pronotum unarmed. *O. sparsispinosus* sp. nov.
  - Pronotum with spines on pre-median area. . . . .
    - . . . . . *O. lamellatus*
5. Eighth and ninth abdominal tergites with a posteromedian tubercle. . . . . 6
  - Eighth and ninth abdominal tergites lacking posteromedian tubercle. . . . . 10

6. Sixth abdominal tergum with a hump-like structure. . . . . 7
  - Sixth abdominal tergum lacking hump-like structure. . . . . 8
7. Anterior area of mesonotum with a spinose hump. . . . .
  - . . . . . *O. rubris distinctus* subsp. nov.
  - Anterior area of mesonotum with a tuberculate hump. . . . .
    - . . . . . *O. rubris rubris*
8. Mesonotum densely granulated. . . . .
  - . . . . . *O. densigranulatus* sp. nov.
  - Mesonotum sparsely granulated. . . . . 9
9. Alae shorter than pronotum. . . . . *O. dorsalis*
  - Alae longer than pronotum. . . . .
    - . . . . . *O. xishuangbannaensis* sp. nov.
10. Alae distinct, tegmina-like. . . . . *O. jinpingensis*
  - Alae indistinct, scale-like. . . . . 11
11. Eighth and ninth abdominal tergites with a crest-like structure. . . . . *O. densigranulatus* sp. nov.
  - Eighth and ninth abdominal tergites lacking crest-like structure. . . . .
    - . . . . . *O. yunnanus*

#### Male:

1. Median segment to ninth tergum lacking posteromedian granule. . . . . 2
  - Median segment to ninth tergum with a posteromedian granule or tubercle. . . . . 4
2. Alae distinct, tegmina-like. . . . . *O. jinpingensis*
  - Alae indistinct, scale-like. . . . . 3
3. Ninth abdominal tergum parallel-sided. . . . .
  - . . . . . *O. sparsispinosus* sp. nov.
  - Ninth abdominal tergum laterally swollen. . . . .
    - . . . . . *O. yunnanus*
4. Mesonotum unarmed. . . . . 5
  - Mesonotum with spines. . . . . 7
5. Posterior apex of alae pointed. . . . .
  - . . . . . *O. xishuangbannaensis* sp. nov.
  - Posterior apex of alae obtuse. . . . . 6
6. Anterior area of mesonotum with spines. . . . .
  - . . . . . *O. rubris distinctus* subsp. nov.
  - Anterior area of mesonotum with granules. . . . .
    - . . . . . *O. rubris rubris*
7. Pronotum with spines on pre-median area. . . . .
  - . . . . . *O. lamellatus*
  - Pronotum unarmed. . . . . 8
8. Poculum medially elevated, apically pointed. . . . .
  - . . . . . *O. densigranulatus* sp. nov.
  - Poculum medially rounded, not elevated medially. . . . . 9
9. Ninth abdominal tergum parallel-sided. . . . .
  - . . . . . *O. despectus yingjiangensis* subsp. nov.

- Ninth abdominal tergum laterally swollen.  
*O. dorsalis*

***Oxyartes densigranulatus* sp. nov.** (Figs. 18-21, 49-52, 59-60)

**Types:** Holotype, ♀, 1500m, Baoshan, Yunnan, China, 1.VII.2019, George Ho Wai-Chun (HKES); Paratypes, 4♀, 5♂ & 19 eggs (naturally laid by holotype ♀ & paratypes ♀), same data as holotype ♀, George Ho Wai-Chun (HKES).

**Differentiation:** *Oxyartes densigranulatus* sp. nov. is closely related to *O. yunnanus* Chen & He, 2008, but can be separated by the presence of a small hump on the posteromedian area of second to seventh abdominal tergites and the tegmina-like alae in the female and the medially elevated poculum in the male.

**Description of female (Figs. 18-19, 49, 51):** Medium-sized. General colour of body and legs brown. Body slender and elongate, larger and more robust than male.

**Head:** Oval, roughly as long as pronotum, densely covered with small granules. Vertex and occiput flat, with six small swellings on posterior margin, median and lateral longitudinal furrows distinct. Compound eyes small and oval, its lengths about three times length of genae. Antennae long and filiform, surpassing apices of protarsi, sparsely covered with short bristles; scapus basally flattened, as long as third segment, longer than pedicellus.

**Thorax:** Rough, densely covered with small granules. Pronotum rectangular, anterior margin weakly curved inwards, posterior margin rounded, transverse and longitudinal sulci crossing before middle area. Mesonotum parallel-sided, median longitudinal carina indistinct, densely granulated, interspersed with a few enlarged granules. Metanotum longer than median segment. Metapleurae with a few acute granules on lower margin.

**Abdomen:** Densely covered with small and obscure granules and interspersed with a few enlarged granules, median and lateral carinae distinct. Median segment to seventh tergites with a small hump posteromedially. Third tergum to anal segment with longitudinal carinae. Eighth and ninth tergites with a small crest posteromedially. Seventh sternum with a pair of spine-like praeopercular organ on posteromedian area. Eighth tergum longer than ninth tergum. Anal segment as long as ninth tergum, posterior margin with distinct posterolateral angles and posteromedian elevations, forming four small posterior emarginations. Subgenital plate scoop-shaped, flattened, mediolongitudinally carinate, posterior margin rounded and reaching posterior margin of anal segment. Cerci short, straight, apices obtuse and not surpassing end of abdomen.

**Legs:** Slender and long. Unarmed. Sparsely covered with short bristles. Anteroventral and posteroventral

carinae of femora with two to four small spines subapically. Profemora incurved basally. Tibiae roughly as long as corresponding femora, medioventral carina elevated basally.

**Wings:** Alae short and tegmina-like.

**Description of male (Figs. 20-21, 50, 52):** Medium-sized. Body slender, distinctly smaller and more slender than female. General colour of body and legs greenish brown.

**Head:** Oval, with sparse and inconspicuous granulations. Vertex and occiput flat, posterior margin with six small swellings. Compound eyes oval, its lengths about two-and-a-half times length of genae. Antennae long and filiform, surpassing apices of protarsi; scapus flattened basally, as long as third segment, longer than pedicellus.

**Thorax:** Sparsely covered with small and inconspicuous granules. Pronotum rectangular, transverse and longitudinal sulci crossing before middle point, anterior margin weakly curved inwards, posterior margin rounded. Mesonotum broadly emarginated medially, median longitudinal line indistinct, with two rows of spines placed between median longitudinal line and lateral margins, each row with five to eight spines varied in different individuals; lateral margins with a very few enlarged granules. Metanotum longer than median segment.

**Abdomen:** Slender, with sparse and inconspicuous granulations. Second to seventh tergites parallel-sided. Eighth tergum expanded posteriorly, longer than ninth tergum. Anal segment as long as ninth tergum, posterior margin thickened and weakly emarginated. Poculum cup-shaped, medially elevated distinctly, apically pointed, posterior margin rounded and reaching middle area of anal segment. Cerci cylindrical, long, gently curved inwards, apices rounded and not surpassing posterior margin of anal segment.

**Legs:** Slender and long. Sparsely covered with short bristles. Anteroventral and posteroventral carinae of femora with two to three small spines subapically. Profemora distinctly curved at base. Tibiae roughly as long as corresponding femora.

**Wings:** Alae short and tegmina-like.

**Measurements:** See Table 6.

**Description of egg (Figs. 59-60):** Capsule brown, oval, posterior pole rounded, sparsely granulated. Micropylar plate oval, anterior and posterior margins rounded. Micropylar cup placed near posterior area of micropylar plate. Median line long, almost as long as micropylar plate. Operculum blackish brown, centrally elevated with a small and closed-stalked capitulum, apically rounded.

**Measurements:** Length, 3.5 mm; width, 2.0 mm; height



3.0 mm.

**Distribution:** China (Yunnan).

**Etymology:** The specific epithet of this new species is derived from the dense granulations on the mesonotum in the female.

***Oxyartes despectus yingjiangensis* subsp. nov.**  
(Figs. 53-56)

**Types:** Holotype, ♀, 1000m, Yingjiang, Dehong, Yunnan, China, 3.VII.2019, George Ho Wai-Chun (HKES); Paratypes, 1♀, 2♂, 6 eggs (naturally laid by holotype & paratype ♀), same data as holotype ♀ (HKES); 2♂, 570m, Nabang, Yingjiang, Dehong, Yunnan, China, 19.VI.2017, Bi Wen-Xuan (HKES & SEM).

**Differentiation:** *Oxyartes despectus yingjiangensis* subsp. nov. is closely related to the nominate *O. despectus despectus* (Westwood, 1848), but can be separated by the smaller size in the both sexes, the more robust body, the short tubercles on the lateral margins of mesonotum and the unarmed metanotum in the female and the presence of five pairs of spines on the mesonotum in the male.

**Description of female (Figs. 53, 55):** Generally as in nominate race. Medium-sized. General colour of body and legs brown. Head as in nominate race, with small and sparse granules. Vertex flat and unarmed. Occiput with six small swellings on posterior margin. Antennae as in nominate race. Thorax generally as in nominate race, rough, with wrinkles and obscure granulations. Mesonotum as in nominate race, with one paired anterior medial, two paired posterior medial spines, two paired pre-median, one paired post-median and one paired posterior spines, but less developed, comparatively smaller in size, lateral margins interspersed with a few short tubercles (distinctly spine-like in nominate race). Metanotum distinctly unarmed. Abdomen generally as in nominate race, with small granules and wrinkles. Median segment to seventh tergites with less developed hump posteromedially. Eighth and ninth tergites with a small crest posteromedially. Seventh sternum lacking noticeable praeopercular organ. Anal segment with four small posterior emarginations on posterior margin. Subgenital plate and cerci as in nominate race. Legs as in nominate race, anteroventral and posteroventral carinae of femora with three to six small spines subapically. Alae as in nominate race.

**Description of male (Figs. 54, 56):** Generally as in nominate race, but body more robust. Head as in nominate race, with sparse and inconspicuous granulations. Vertex flat and unarmed. Occiput with six small swellings on posterior margin. Antennae long and filiform. Thorax as in nominate race, small and inconspicuous granules. Mesonotum generally as in nominate race, broadly emarginated medially, but only with ten spines including one paired anterior medial, one paired posterior medial, two paired pre-median and

one paired post-median spines; lateral margins with a very few enlarged granules (with tubercle-like granules in nominate race). Abdomen as in nominate race. Anal segment as long as ninth tergum, posterior margin thickened and weakly emarginated. Poculum cup-shaped, posterior margin rounded, reaching posterior area of anal segment. Cerci cylindrical, long, straight, apices rounded and not surpassing posterior margin of anal segment. Legs as in nominate race, anteroventral and posteroventral carinae of femora with one to four small spines subapically. Alae as in nominate race.

**Measurements:** See Table 7.

**Distribution:** China (Yunnan).

**Notes:** The nominate race *Oxyartes despectus despectus* (Westwood, 1848) is not occurred in China and only found in Bangladesh and India.

**Etymology:** The specific epithet of this new subspecies is derived from the type-locality, Yingjiang, Yunnan, China.

***Oxyartes nigrigranulatus* sp. nov.** (Figs. 22-23, 57-58, 61-62)

**Types:** Holotype, ♀, 2000m, Xiping, Yuxi, Yunnan, China, 23.VI.2019, George Ho Wai-Chun (HKES); Paratypes, 2♀, 21 eggs (naturally laid by paratypes ♀), same data as holotype ♀, George Ho Wai-Chun (HKES).

**Differentiation:** *Oxyartes nigrigranulatus* sp. nov. is related to *O. yunnanus* Chen & He, 2008, but can be separated by its smaller size, the comparatively more robust body, the presence of sparse and black granules on the mesonotum and the crest-like structure on the posteromedian area of eighth and ninth abdominal tergites in the female.

**Description of female (Figs. 22-23, 57-58):** Medium-sized. General colour of body and legs brown to dark brown. Body slender and elongate.

**Head:** Oval, roughly as long as pronotum, sparsely covered with small granules. Vertex and occiput flat, with six small swellings on posterior margin, median longitudinal furrow distinct, lateral longitudinal furrows indistinct. Compound eyes small and oval, its lengths about three times length of genae. Antennae long and filiform, surpassing apices of protarsi, sparsely covered with short bristles; scapus basally flattened, longer than pedicellus; and third segment as long as combined length of scapus and second segment.

**Thorax:** Sparsely covered with small granules. Pronotum rectangular, anterior margin curved inwards, posterior margin rounded, transverse and longitudinal sulci crossing before middle area. Mesonotum parallel-sided, median longitudinal carina indistinct, interspersed with a few small and black granules, posteromedian area

with a small hump. Mesosternum interspersed with a few small and black granules. Metanotum longer than median segment. Metapleurae with a few small and black granules on lower margin.

**Abdomen:** Sparsely covered with small granules, also with longitudinal carinae. Median segment to seventh tergites with a small horn-like tubercle posteromedially. Eighth and ninth tergites with a small crest posteromedially. Seventh sternum lacking noticeable praeopercular organ. Eighth tergum longer than ninth tergum. Anal segment as long as ninth tergum, posterior margin with distinct posterolateral angles and posteromedian elevation, forming four posterior emarginations. Subgenital plate scoop-shaped, posterior margin rounded and reaching posterior margin of anal segment. Cerci short, straight, apices obtuse and not surpassing end of abdomen.

**Legs:** Slender and long. Unarmed. Sparsely covered with short bristles. Anteroventral and posteroventral carinae of femora with one to three small spines subapically. Profemora incurved basally. Medioventral carina of tibiae elevated basally.

**Wings:** Alae reduced and scale-like.

**Measurements:** See Table 8.

**Description of egg (Figs. 61-62):** Capsule olive brown, oval, posterior pole rounded, smooth. Micropylar plate oval, anterior margin rounded, posterior margin slightly pointed. Micropylar cup placed near posterior margin of micropylar plate. Median line long, almost as long as micropylar plate. Operculum blackish brown, centrally elevated with a small and closed-stalked capitulum, apically flattened.

**Measurements:** Length, 3.0 mm; width, 2.0 mm; height 2.2 mm.

**Distribution:** China (Yunnan).

**Notes:** The male is unknown.

**Etymology:** The specific epithet of this new species is derived from the black granulations on the thorax in the female.

***Oxyartes rubris distinctus* subsp. nov.** (Figs. 63-66)

**Types:** Holotype, ♀, 1500m, Jinping, Honghe, Yunnan, China, 28.VIII.2019, George Ho Wai-Chun (HKES); Paratypes, 3♀, 2♂, 27 eggs (naturally laid by holotype & paratypes ♀), same data as holotype ♀ (HKES).

**Differentiation:** *Oxyartes rubris distinctus* subsp. nov. is similar to the nominate *O. rubris rubris* Ho, 2017, but can be separated by its larger size and more elongate and slender body in the both sexes, the distinct spinose hump on the anteromedian area of mesonotum, more distinct granulations on thorax and abdomen in the

female and the presence of well-developed anterior medial spines on the pronotum in the male.

**Description of female (Figs. 63, 65):** Medium-sized. General colour of body and legs greenish brown to brown, with light brown markings. Body slender and elongate. Head as in nominate race. Pronotum as in nominate race. Mesonotum rough, elevated with a spinose hump on anteromedian area, bearing four to six spines; lateral margins with more developed and enlarged acute granules. Metanotum with more distinct granulations. Abdomen generally as in nominate race, but with more distinct granulations. Legs and alae as in nominate race.

**Description of male (Figs. 64, 66):** Medium-sized. Body slender, smaller and more slender than female. General colour of body and legs brown. Head and thorax generally as in nominate race. Mesonotum lacking noticeable wrinkles, less rough, with granulations, anteromedian area with paired well-developed medial spines. Abdomen, legs and alae as in nominate race.

**Measurements:** See Table 9.

**Description of egg:** As in nominate race.

**Distribution:** China (Yunnan).

**Etymology:** The specific epithet of this new subspecies is derived from the distinct spinations on the anteromedian area of mesonotum in the both sexes.

***Oxyartes sparsispinosus* sp. nov.** (Figs. 24-27, 67-70)

**Types:** Holotype, ♀, 2000m, Baoshan, Yunnan, China, 30.VI.2019, George Ho Wai-Chun (HKES); Paratypes, 4♂, same data as holotype ♀, George Ho Wai-Chun (HKES).

**Differentiation:** *Oxyartes sparsispinosus* sp. nov. is related to *O. rubris* Ho, 2017, but can be easily separated by the more slender body and the presence of two rows of spines on the mesonotum in the both sexes, the presence of a crest on the posteromedian area of fifth abdominal tergum in the female and the scale-like alae in the male.

**Description of female (Figs. 24-25, 67, 69):** Medium-sized. General colour of body and legs dark brown. Body slender, distinctly larger and more robust than male.

**Head:** Oval, roughly as long as pronotum, sparsely covered with small granules. Vertex flat. Occiput gently convex, with six distinct swellings on posterior margin, median and lateral longitudinal furrows distinct. Compound eyes small and oval, its lengths about four times length of genae. Antennae long and filiform, surpassing apices of protarsi, sparsely covered with short bristles; scapus longer than pedicellus, as long as

third segment.

**Thorax:** Sparsely covered with small granules. Pronotum rectangular, longer than wide, anterior margin weakly curved inwards, posterior margin rounded, transverse and longitudinal sulci crossing at middle area. Mesonotum parallel-sided, with weak median longitudinal carina, with one paired anterior medial spines; also with two rows of spines placed between median longitudinal carina and lateral margins, each row of spines with four spines, lateral margins with a few tubercle-like granules. Metanotum longer than median segment, lateral margins with a few tubercle-like granules.

**Abdomen:** Sparsely covered with small granules and with short wrinkles. Third to fifth and seventh to eighth tergites with a horn-like spine posteromedially, spine enlarged on fourth tergum. Fifth tergum with a lamella-like crest posteromedially. Seventh sternum with bifurcated praeopercular organ posteromedially. Eighth tergum longer than ninth tergum. Anal segment as long as ninth tergum, median and lateral longitudinal carinae distinct, posterior margin with four small emarginations. Subgenital plate scoop-shaped, posterior margin rounded and surpassing posterior margin of anal segment. Cerci short, straight, apices pointed and not surpassing end of abdomen.

**Legs:** Slender and long. Unarmed. Sparsely covered with short bristles. Anteroventral and posteroventral carinae of femora with one to three small spines subapically. Profemora incurved basally. Tibiae as long as corresponding femora, medioventral carina elevated basally.

**Wings:** Alae reduced and scale-like.

**Description of male (Figs. 26-27, 68, 70):** Medium-sized. Body slender, smaller and more slender than female. General colour of body and legs brown, with blackish markings.

**Head:** Oval, with sparse and inconspicuous granulations. Vertex flat, unarmed. Occiput flat, posterior margin with six small swellings. Compound eyes oval. Antennae long and filiform; scapus flattened basally, longer than third segment; and pedicellus shorter than third segment.

**Thorax:** Sparsely covered with small granules. Pronotum rectangular, transverse and longitudinal sulci crossing before middle point, anterior margin curved inwards, posterior margin nearly truncate. Mesonotum broadly emarginated medially, median longitudinal line distinct, with one pair of anterior medial spines, also with two rows of spines placed between median longitudinal line and lateral margins, each row of spines with three to four spines, lateral margins with a few enlarged granules. Metanotum longer than median segment.

**Abdomen:** Slender and wrinkled. Second to seventh tergites parallel-sided. Eighth tergum expanded

posteriorly, as long as ninth tergum. Anal segment shorter than ninth tergum, posterior margin thickened and with an indistinct and broad emargination. Poculum cup-shaped, posterior margin rounded and reaching anterior area of anal segment. Cerci cylindrical, apices rounded and not surpassing posterior margin of anal segment.

**Legs:** Slender and long. Sparsely covered with short bristles. Femora roughly as long as corresponding tibiae, posteroventral carina of femora with three small spines subapically. Profemora distinctly curved at base.

**Wings:** Alae reduced and scale-like.

**Measurements:** See Table 10.

**Distribution:** China (Yunnan).

**Etymology:** The specific epithet of this new species is derived from the sparse spinations on the mesonotum in the both sexes.

***Oxyartes xishuangbannaensis* sp. nov.** (Figs. 28-31, 71-74)

**Types:** Holotype, ♀, 500-600m, Menglun, Xishuangbanna, Yunnan, China, 6.IX.2015, George Ho Wai-Chun (HKES); Paratypes, 2♀, 2♂, same data as holotype ♀, George Ho Wai-Chun (HKES).

**Differentiation:** *Oxyartes xishuangbannaensis* sp. nov. is similar to *O. densigranulatus* sp. nov., but can be easily separated by its larger size and more slender body in the both sexes, lacking crest-like structure on the ninth abdominal tergum in the female and the unarmed mesonotum in the male.

**Description of female (Figs. 28-29, 71, 73):** Medium-sized. General colour of body and legs brown, with blackish markings. Body very slender and elongate, more robust than male.

**Head:** Oval, as long as pronotum, sparsely covered with small granules. Vertex and occiput flat, with six distinct and small swellings on posterior margin, median longitudinal and lateral longitudinal furrows distinct. Compound eyes small and oval, its lengths about four times length of genae. Antennae long and filiform, surpassing apices of protarsi, sparsely covered with short bristles; scapus basally flattened, as long as third segment, longer than pedicellus.

**Thorax:** Rough, wrinkled, sparsely covered with small granules, interspersed with a few enlarged granules. Pronotum rectangular, longer than wide, anterior margin weakly curved inwards, posterior margin rounded, transverse and longitudinal sulci crossing before middle area. Mesonotum parallel-sided, median longitudinal line distinct; sparsely granulated, lateral margins interspersed with a few enlarged granules. Metanotum as long as median segment. Metapleurae with a few



enlarged granules on lower margin.

**Abdomen:** Wrinkled, with longitudinal carinae, also sparsely covered with a few small granules. Median segment to ninth tergites with a small granule-like hump posteromedially. Seventh sternum with a carina-like praeopercular organ, bifurcated posteriorly. Eighth tergum longer than ninth tergum. Anal segment as long as ninth tergum, posterior margin with distinct posterolateral angles and posteromedian elevations, forming four small posterior emarginations. Subgenital plate scoop-shaped, flattened, mediolongitudinally carinate, posterior margin rounded and reaching posterior margin of anal segment. Cerci short, straight, apices obtuse and not surpassing end of abdomen.

**Legs:** Slender and long. Unarmed. Sparsely covered with short bristles. Anteroventral and posteroventral carinae of femora with three to five small spines subapically. Profemora incurved basally. Protibiae and mesotibiae roughly as long as corresponding femora, metatibiae longer than corresponding femora, medioventral carina elevated basally.

**Wings:** Alae distinct, short and tegmina-like.

**Description of male (Figs. 30-31, 72, 74):** Medium-sized. Body slender, distinctly smaller and more slender than female. General colour of body and legs brown, with blackish markings.

**Head:** Oval, with sparse and inconspicuous granulations. Vertex and occiput flat, posterior margin with four small swellings. Compound eyes oval, its lengths about three times length of genae. Antennae long and filiform, surpassing apices of protarsi; scapus flattened basally, as long as third segment, longer than pedicellus.

**Thorax:** Sparsely covered with small and inconspicuous granules. Pronotum rectangular, longer than wide, transverse and longitudinal sulci crossing before middle point, anterior margin weakly curved inwards, posterior margin nearly truncate. Mesonotum rough, wrinkled, broadly emarginated medially, median longitudinal line indistinct; unarmed, lateral margins with a few enlarged granules. Metanotum as long as median segment.

**Abdomen:** Slender, with sparse and inconspicuous granulations, with indistinct longitudinal carinae. Second to seventh tergites parallel-sided. Eighth tergum expanded posteriorly, longer than ninth tergum. Anal segment shorter than ninth tergum, posterior margin thickened and emarginated. Poculum cup-shaped, posterior margin rounded, reaching posterior area of anal segment. Cerci cylindrical, long, weakly incurved, apices rounded and surpassing posterior margin of anal segment.

**Legs:** Slender and long. Sparsely covered with short bristles. Anteroventral and posteroventral carinae of femora with two to six small spines subapically. Profemora distinctly curved at base. Mesotibiae

roughly as long as corresponding femora, protibiae and metatibiae longer than corresponding femora.

**Wings:** Alae distinct, short and tegmina-like.

**Measurements:** See Table 11.

**Distribution:** China (Yunnan).

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

## CONCLUSION

In this paper, 11 new taxa including one new genus, eight new species and two new subspecies are described and four new combinations are suggested. Necrosciinae is a speciose subfamily in China and more than 150 species are described (Chen and He, 2008; Hennemann et al., 2008; Ho, unpubl. data). Most taxa are endemic to China. However, some described species are only known from single male or female specimen. This needs further specimen collecting and research to study their taxonomic status and to achieve a comprehensive faunal documentary.

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## TABLES &amp; FIGURES

	<i>Acanthophasma brevicercum</i> sp. nov.	<i>Parapachymorpha apicalis</i> sp. nov.
	Holotype Male	Holotype Male
Body	33.5	29.0
Head	3.5	3.0
Antennae	28.0	25.0
Pronotum	2.0	2.0
Mesonotum	7.5	6.5
Metanotum	1.5	1.5
Median segment	2.5	2.0
Profemora	7.5	8.0
Mesofemora	6.5	6.0
Metafemora	9.0	8.0
Protibiae	7.5	8.0
Mesotibiae	6.5	6.0
Metatibiae	9.0	9.0
Alae	2.0	-

Table 1. Measurements of *Acanthophasma* spp.

	Holotype Female	Paratype Females	Paratype Males
Body	49.0	42.0-51.0	39.0-45.0
Head	4.5	4.0-4.5	3.0
Antennae	27.0	23.0-26.0	26.0-33.0
Pronotum	4.0	4.0	3.0
Mesonotum	10.0	9.0-11.0	9.0-11.0
Metanotum	3.0	3.0-3.5	3.0
Median segment	2.5	2.0-2.5	2.0
Profemora	13.5	11.5-14.0	13.0-15.0
Mesofemora	11.0	9.0-11.0	10.0-12.0
Metafemora	15.5	13.0-16.0	14.0-17.0
Protibiae	13.5	12.0-15.0	13.5-17.0
Mesotibiae	11.0	10.0-12.0	11.0-13.5
Metatibiae	17.0	15.0-19.0	16.5-17.0

Table 2. Measurements of *Cheniphasma parvidentatum* sp. nov.

	Holotype Female	Females	Males
Body	34.0	29.0-32.0	24.0-28.0
Head	3.5	3.0	2.0
Antennae	12.0	12.0	16.0-18.0
Pronotum	3.0	2.5-3.0	1.5-2.0
Mesonotum	6.0	5.0-6.0	4.5-5.5
Metanotum	2.5	2.0	1.5-2.0
Median segment	1.0	1.5	1.0
Profemora	6.5	6.5-7.0	6.0-7.5
Mesofemora	5.0	5.0	5.0-6.0
Metafemora	7.5	8.0	7.0-8.5
Protibiae	7.0	7.5-8.0	6.5-8.5
Mesotibiae	5.0	5.5-6.0	5.0-6.0
Metatibiae	8.0	8.5-9.0	8.0-10.0

Table 3. Measurements of *Neointerphasma minutigranulatum* Ho, 2017

	Holotype Female	Females	Males
Body	40.0	37.0-41.0	31.0-35.0
Head	4.0	4.0	2.5
Antennae	22.0	20.0-22.0	22.0-27.0
Pronotum	3.0	3.0-3.5	3.0
Mesonotum	7.0	7.0-7.5	6.5-7.0
Metanotum	2.0	2.0	2.5
Median segment	2.0	2.0	1.5
Profemora	11.0	10.0-11.0	10.0-12.0
Mesofemora	9.0	9.0	8.5-10
Metafemora	14.0	12.0-13.0	11.0-14.0
Protibiae	12.0	12.0-13.0	11.0-14.0
Mesotibiae	10.0	9.5-10.5	9.0-11.0
Metatibiae	15.0	14.0-16.0	13.0-16.0

**Table 4.** Measurements of *Oedohirasea fenshuilingensis* (Ho, 2017) **gen. & comb. nov.**

	Holotype Male
Body	31.0
Head	2.5
Antennae	24.0
Pronotum	3.0
Mesonotum	6.0
Metanotum	2.5
Median segment	1.5
Profemora	11.5
Mesofemora	9.0
Metafemora	13.0
Protibiae	13.0
Mesotibiae	11.0
Metatibiae	16.0

**Table 5.** Measurements of *Oedohirasea huanglianshanensis* **gen. & sp. nov.**

	Holotype Female	Paratype Females	Paratype Males
Body	90.0	87.0-91.0	67.0-75.0
Head	5.0	5.0	3.5
Antennae	56.0	50.0-52.0	46.0-55.0
Pronotum	4.5	4.5-5.0	3.0-3.5
Mesonotum	23.0	21.0-24.0	16.5-20.0
Metanotum	7.5	6.5-8.0	6.0-6.5
Median segment	5.0	5.0	3.5-4.0
Profemora	19.0	18.0-20.0	19.0-21.0
Mesofemora	14.0	14.0-15.0	13.0-14.0
Metafemora	21.0	20.0-22.0	19.0-20.0
Protibiae	19.0	18.0-20.0	20.0-22.0
Mesotibiae	14.0	13.0-14.0	13.0-14.0
Metatibiae	24.0	22.0-24.0	21.0-23.0
Alae	4.0	3.5-4.0	1.0

**Table 6.** Measurements of *Oxyartes densigranulatus* **sp. nov.**

	Holotype Female	Paratype Female	Paratype Males
Body	80.0	85.0	56.0-62.0
Head	5.0	5.0	4.0
Antennae	49.0	50.0	47.0-50.0
Pronotum	5.0	5.0	3.5-4.0
Mesonotum	18.0	20.0	13.0-14.5
Metanotum	6.0	6.0	4.0-5.0
Median segment	4.5	5.0	3.5
Profemora	18.0	17.0	15.0-17.0
Mesofemora	13.0	13.0	10.5-12.0
Metafemora	20.0	19.0	15.0-17.0
Protibiae	19.0	17.5	17.0-18.0
Mesotibiae	13.0	13.0	11.0-13.0
Metatibiae	21.0	20.0	17.0-20.0
Alae	4.0	4.0	2.5

**Table 7.** Measurements of *Oxyartes despectus yingjiangensis* subsp. nov.

	Holotype Female	Paratype Females
Body	94.0	86.0-90.0
Head	5.0	4.5-5.0
Antennae	52.0	45.0-50.0
Pronotum	4.5	4.0-4.5
Mesonotum	21.0	21.0
Metanotum	7.5	7.0
Median segment	6.5	5.5-6.0
Profemora	17.0	16.0-17.0
Mesofemora	14.0	13.0-14.0
Metafemora	19.0	17.0-19.0
Protibiae	16.0	15.0-16.0
Mesotibiae	12.0	12.0
Metatibiae	19.0	19.0-20.0

**Table 8.** Measurements of *Oxyartes nigrigranulatus* sp. nov.

	Holotype Female	Paratype Females	Paratype Males
Body	80	84.0-87.0	68.0-70.0
Head	5.5	5.5-6.0	3.5
Antennae	53.0	42.0-60.0	60.0
Pronotum	5.0	5.0	3.5
Mesonotum	18.0	19.0-21.0	16.0-17.5
Metanotum	6.0	6.0	5.0
Median segment	5.5	6.0	4.0
Profemora	19.0	19.0-21.0	19.0-20.0
Mesofemora	13.0	14.0-15.0	12.0-13.0
Metafemora	19.0	19.0-21.0	18.0-20.0
Protibiae	19.0	19.0-21.0	20.0
Mesotibiae	12.0	12.5-13.0	13.0
Metatibiae	20.0	20.0-23.0	21.0
Alae	4.5	4.5	2.5

**Table 9.** Measurements of *Oxyartes rubris distinctus* subsp. nov.

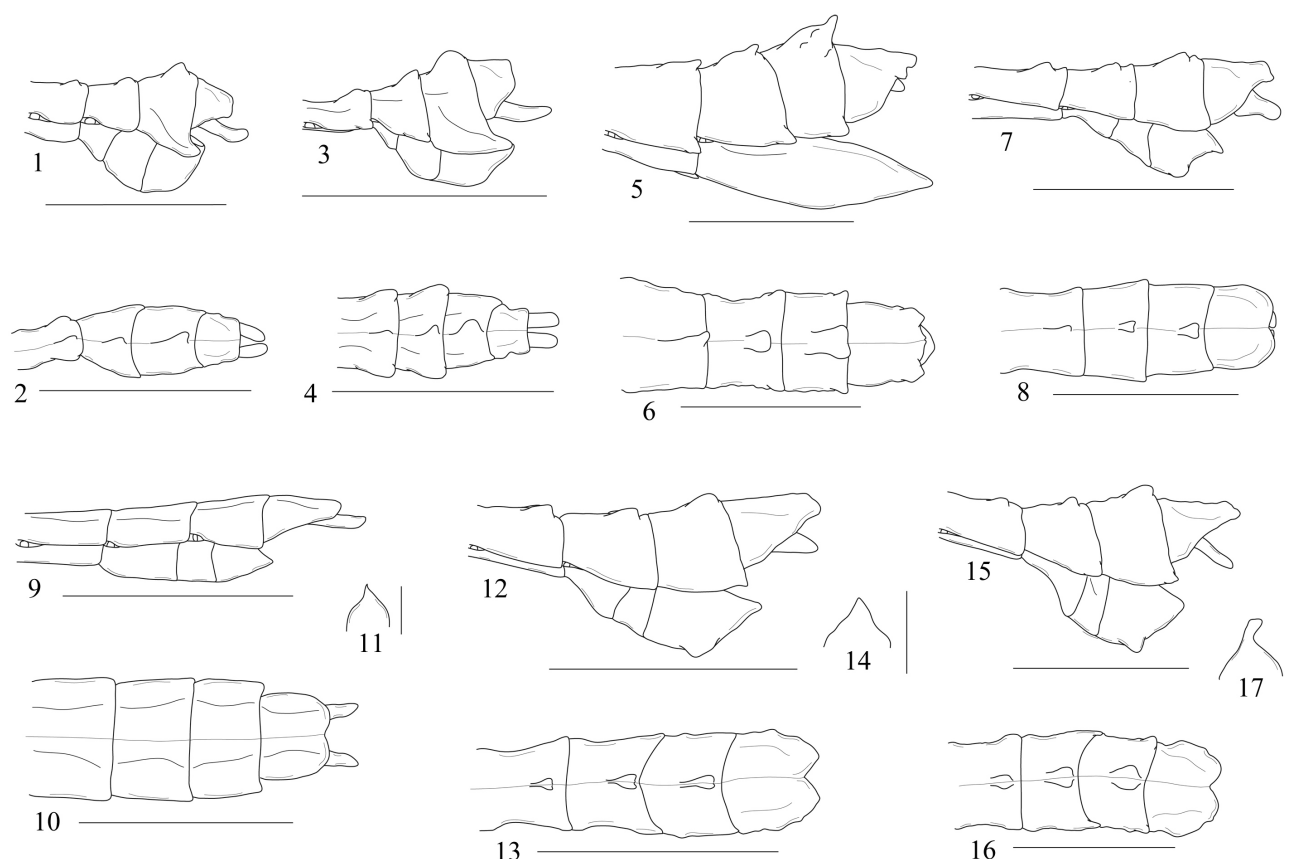


	Holotype Female	Paratype Males
Body	80.0	55.0-57.0
Head	5.0	3.0-3.5
Antennae	50.0	43.0-45.0
Pronotum	4.5	3.0
Mesonotum	17.5	13.0-14.0
Metanotum	6.0	4.0-4.5
Median segment	5.0	3.5
Profemora	18.5	15.0-16.0
Mesofemora	13.0	10.0-11.0
Metafemora	19.0	15.0-15.5
Protibiae	18.5	16.0-17.0
Mesotibiae	13.0	10.5-12.0
Metatibiae	20.0	16.5-18.0

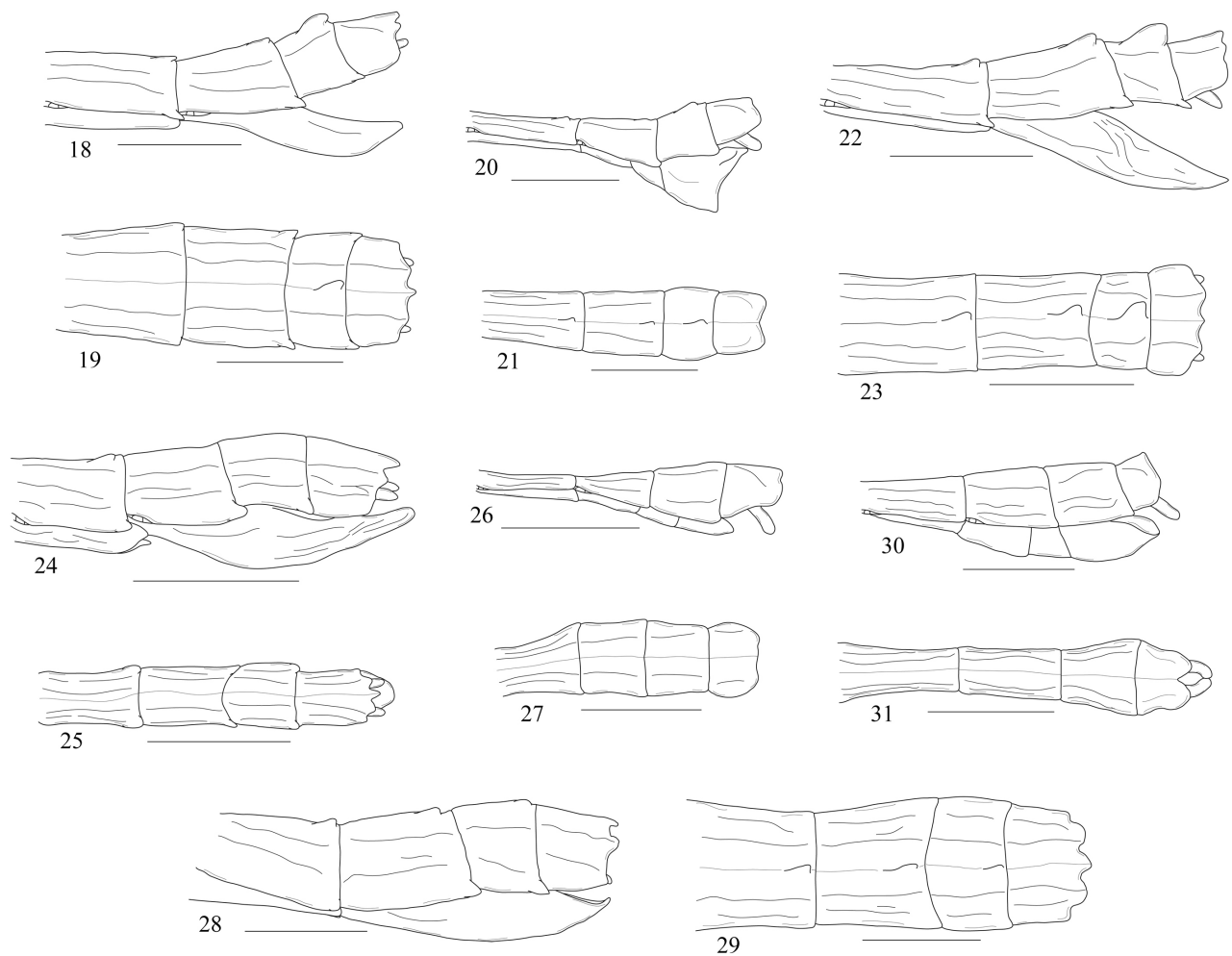
**Table 10.** Measurements of *Oxyartes sparsispinosus* sp. nov.

	Holotype Female	Paratype Females	Paratype Males
Body	103.0	100.0-105.0	78.0-80.0
Head	6.0	6.0	4.5
Antennae	70.0	63.0-65.0	70.0
Pronotum	6.0	6.0	4.0
Mesonotum	24.0	24.0	19.0
Metanotum	7.0	7.0	5.0
Median segment	7.0	6.5-7.0	5.0
Profemora	25.0	24.0-25.0	24.0-25.0
Mesofemora	18.0	17.0-18.0	17.0
Metafemora	25.0	24.0-25.0	23.0
Protibiae	25.0	25.0	27.0
Mesotibiae	17.0	16.0-17.0	17.0-18.0
Metatibiae	28.0	28.0-29.0	27.0-29.0
Alae	8.0	8.0	4.0

**Table 11.** Measurements of *Oxyartes xishuangbannaensis* sp. nov.



**Figures 1-17.** 1. *Acanthophasma brevicercum* **sp. nov.**, male, apex of abdomen, lateral view. 2. *Acanthophasma brevicercum* **sp. nov.**, male, apex of abdomen, dorsal view. 3. *Acanthophasma dilatatum* **sp. nov.**, male, apex of abdomen, lateral view. 4. *Acanthophasma dilatatum* **sp. nov.**, male, apex of abdomen, dorsal view. 5. *Cheniphasma parvidentatum* **sp. nov.**, female, apex of abdomen, lateral view. 6. *Cheniphasma parvidentatum* **sp. nov.**, female, apex of abdomen, dorsal view. 7. *Cheniphasma parvidentatum* **sp. nov.**, male, apex of abdomen, lateral view. 8. *Cheniphasma parvidentatum* **sp. nov.**, male, apex of abdomen, dorsal view. 9. *Neointerphasma minutigranulatum* Ho, 2017, male, apex of abdomen, lateral view. 10. *Neointerphasma minutigranulatum* Ho, 2017, male, apex of abdomen, dorsal view. 11. *Neointerphasma minutigranulatum* Ho, 2017, male, vomer, ventral view. 12. *Oedohirasea fenshuilingensis* (Ho, 2017) **gen. & comb. nov.**, male, apex of abdomen, lateral view. 13. *Oedohirasea fenshuilingensis* (Ho, 2017) **gen. & comb. nov.**, male, apex of abdomen, dorsal view. 14. *Oedohirasea fenshuilingensis* (Ho, 2017) **gen. & comb. nov.**, male, vomer, ventral view. 15. *Oedohirasea huanglianshanensis* **gen. & sp. nov.**, male, apex of abdomen, lateral view. 16. *Oedohirasea huanglianshanensis* **gen. & sp. nov.**, male, apex of abdomen, dorsal view. 17. *Oedohirasea huanglianshanensis* **gen. & sp. nov.**, male, vomer, ventral view. [Scale bars: apex of abdomen = 5 mm; vomer = 1 mm; Drawings by author]



**Figures 18-31.** 18. *Oxyartes densigranulatus* **sp. nov.**, female, apex of abdomen, lateral view. 19. *Oxyartes densigranulatus* **sp. nov.**, female, apex of abdomen, dorsal view. 20. *Oxyartes densigranulatus* **sp. nov.**, male, apex of abdomen, lateral view. 21. *Oxyartes densigranulatus* **sp. nov.**, male, apex of abdomen, dorsal view. 22. *Oxyartes nigrigranulatus* **sp. nov.**, female, apex of abdomen, lateral view. 23. *Oxyartes nigrigranulatus* **sp. nov.**, female, apex of abdomen, dorsal view. 24. *Oxyartes sparsispinosus* **sp. nov.**, female, apex of abdomen, lateral view. 25. *Oxyartes sparsispinosus* **sp. nov.**, female, apex of abdomen, dorsal view. 26. *Oxyartes sparsispinosus* **sp. nov.**, male, apex of abdomen, lateral view. 27. *Oxyartes sparsispinosus* **sp. nov.**, male, apex of abdomen, dorsal view. 28. *Oxyartes xishuangbannaensis* **sp. nov.**, female, apex of abdomen, lateral view. 29. *Oxyartes xishuangbannaensis* **sp. nov.**, female, apex of abdomen, dorsal view. 30. *Oxyartes xishuangbannaensis* **sp. nov.**, male, apex of abdomen, lateral view. 31. *Oxyartes xishuangbannaensis* **sp. nov.**, male, apex of abdomen, dorsal view. [Scale bars = 5 mm; Drawings by author]



**Figures 32-36.** 32. *Acanthophasma brevicercum* **sp. nov.**, habitus of male. 33. *Acanthophasma dilatatum* **sp. nov.**, habitus of male. 34. *Acanthophasma dilatatum* **sp. nov.**, habitus of female (immature). 35. *Acanthophasma brevicercum* **sp. nov.**, male, head and thorax, dorsolateral view. 36. *Acanthophasma dilatatum* **sp. nov.**, male, head and thorax, dorsolateral view. [Scale bars = 5 mm; Photos by author]



**Figures 37-42.** 37. *Cheniphasma parvidentatum* **sp. nov.**, habitus of female. 38. *Cheniphasma parvidentatum* **sp. nov.**, habitus of male. 39. *Cheniphasma parvidentatum* **sp. nov.**, egg, lateral view. 40. *Cheniphasma parvidentatum* **sp. nov.**, egg, dorsal view. 41. *Cheniphasma parvidentatum* **sp. nov.**, female, head and thorax, dorsolateral view. 42. *Cheniphasma parvidentatum* **sp. nov.**, male, head and thorax, dorsolateral view. [Scale bars: habitus, head and thorax = 5 mm; egg = 1 mm; Photos by author]



**Figure 43.** *Marmessoidea casignetus* (Westwood, 1859), habitus of female. [Scale bar = 5 mm; Photo by author]





**Figure 44.** *Neointerphasma minutigranulatum* Ho, 2017, habitus of male. [Scale bar = 5 mm; Photo by author].



**Figures 45-48.** 45. *Oedohirasea fenshuilingensis* (Ho, 2017) **gen. & comb. nov.**, habitus of male. 46. *Oedohirasea huanglianshanensis* **gen. & sp. nov.**, habitus of male. 47. *Oedohirasea fenshuilingensis* (Ho, 2017) **gen. & comb. nov.**, male, head and thorax, dorsolateral view. 48. *Oedohirasea huanglianshanensis* **gen. & sp. nov.**, male, head and thorax, dorsolateral view. [Scale bars = 5 mm; Photos by author].



**Figures 49-52.** 49. *Oxyartes densigranulatus* **sp. nov.**, habitus of female. 50. *Oxyartes densigranulatus* **sp. nov.**, habitus of male. 51. *Oxyartes densigranulatus* **sp. nov.**, female, head and thorax, dorsolateral view. 52. *Oxyartes densigranulatus* **sp. nov.**, male, head and thorax, dorsolateral view. [Scale bars = 5 mm; Photos by author].



**Figures 53-56.** 53. *Oxyartes despectus yingjiangensis* **subsp. nov.**, habitus of female. 54. *Oxyartes despectus yingjiangensis* **subsp. nov.**, habitus of male. 55. *Oxyartes despectus yingjiangensis* **subsp. nov.**, female, head and thorax, dorsolateral view. 56. *Oxyartes despectus yingjiangensis* **subsp. nov.**, male, head and thorax, dorsolateral view. [Scale bars = 5 mm; Photos by author].



**Figures 57-62.** 57. *Oxyartes nigrogranulatus* **sp. nov.**, habitus of female. 58. *Oxyartes nigrogranulatus* **sp. nov.**, female, head and thorax, dorsolateral view. 59. *Oxyartes densigranulatus* **sp. nov.**, egg, lateral view. 60. *Oxyartes densigranulatus* **sp. nov.**, egg, dorsal view. 61. *Oxyartes nigrogranulatus* **sp. nov.**, egg, lateral view. 62. *Oxyartes nigrogranulatus* **sp. nov.**, egg, dorsal view. [Scale bars: habitus, head and thorax = 5 mm; egg = 1 mm; Photos by author]



**Figures 63-66.** 63. *Oxyartes rubris distinctus* **subsp. nov.**, habitus of female. 64. *Oxyartes rubris distinctus* **subsp. nov.**, habitus of male. 65. *Oxyartes rubris distinctus* **subsp. nov.**, female, head and thorax, dorsolateral view. 66. *Oxyartes rubris distinctus* **subsp. nov.**, male, head and thorax, dorsolateral view. [Scale bars = 5 mm; Photos by author]



**Figures 67-70.** 67. *Oxyartes sparsispinosus* **sp. nov.**, habitus of female. 68. *Oxyartes sparsispinosus* **sp. nov.**, habitus of male. 69. *Oxyartes sparsispinosus* **sp. nov.**, female, head and thorax, dorsolateral view. 70. *Oxyartes sparsispinosus* **sp. nov.**, male, head and thorax, dorsolateral view. [Scale bars = 5 mm; Photos by author]



**Figures 71-74.** 71. *Oxyartes xishuangbannaensis* **sp. nov.**, habitus of female. 72. *Oxyartes xishuangbannaensis* **sp. nov.**, habitus of male. 73. *Oxyartes xishuangbannaensis* **sp. nov.**, female, head and thorax, dorsal view. 74. *Oxyartes xishuangbannaensis* **sp. nov.**, male, head and thorax, dorsal view. [Scale bars = 5 mm; Photos by author]