

## Contribution to the knowledge of Chinese Phasmatodea XV: New taxa and new nomenclature of the subfamilies Necrosiinae and Lonchodinae (Lonchodidae) from the Phasmatodea of China II

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### ABSTRACT

This paper describes six new taxa including one new subspecies, two new species and three new genera from the Necrosiinae and Lonchodinae of China. They are namely, *Neosceles hainanensis elongatus* **subsp. nov.**, *Korinnis xizangensis* **sp. nov.**, *Paracarausius damingshanensis* **sp. nov.**, *Longicarausius* **gen. nov.**, *Neopericentrus* **gen. nov.** and *Paracarausius* **gen. nov.** A total of 17 new combinations are suggested: *Korinnis notata* (Chen & Zhang, 2008) **comb. nov.** [*Aruanoidea*], *Longicarausius gracilicornis* (Ho, 2021) **comb. nov.** [*Carausius*], *Longicarausius luchunensis* (Ho, 2017) **comb. nov.** [*Carausius*], *Longicarausius yingjiangensis* (Ho, 2017) **comb. nov.** [*Carausius*], *Marmessoidea adelpha* (Günther, 1940) **comb. nov.** [*Sipyloidea*], *Neosceles hainanensis hainanensis* (Chen & He, 2002) **comb. nov. & sen. str.** [*Sosibia*], *Neopericentrus wenxuanii* (Ho, 2017) **comb. nov.** [*Neosinophasma*], *Paracarausius novus* (Ho, 2017) **comb. nov.** [*Carausius*], *Paracarausius rugosus* (Brunner von Wattenwyl, 1907) **comb. nov.** [*Carausius*], *Paramarmessoidea alata alata* (Ho, 2018) **comb. nov.** [*Marmessoidea*], *Paramarmessoidea alata elongata* (Ho, 2018) **comb. nov.** [*Marmessoidea*], *Paramarmessoidea guangdongensis* (Ho, 2013) **comb. nov.** [*Marmessoidea*], *Paramarmessoidea hainanensis hainanensis* (Ho, 2016) **comb. nov.** [*Marmessoidea*], *Paramarmessoidea hainanensis yinggelingensis* (Ho, 2016) **comb. nov.** [*Marmessoidea*], *Paramarmessoidea liuxingyuei* (Ho, 2018) **comb. nov.** [*Marmessoidea*], *Spinomarmessoidea mista* (Chen & He, 2008) **comb. nov.** [*Aruanoidea*], and *Varieganecroscia dianica* (Ho, 2017) **comb. nov.** [*Necroscia*]. One new synonym is suggested: *Spinomarmessoidea damingenis* Gao & Li, 2023 **syn. nov.** is synonymised with *Marmessoidea mista* (Chen & He, 2008) **comb. nov.** Korinnini Günther, 1953, *Korinnis* Günther, 1932, *Neosceles* Seow-Choen, 2016, *Paramarmessoidea* Seow-Choen, 2021, *Varieganecroscia* Seow-Choen, 2016 and *Paracarausius rugosus* (Brunner von Wattenwyl, 1907) **comb. nov.** are for the first time recorded from China. Species list for Chinese *Korinnis*, *Marmessoidea* Brunner von Wattenwyl, 1893, *Neosceles*, *Paramarmessoidea*, *Spinomarmessoidea*, and *Varieganecroscia* are provided.

**Key words:** stick insects, China, taxonomy, new genus, new species, new subspecies, new combinations, new synonym, new record

### INTRODUCTION

Lonchodidae Brunner von Wattenwyl, 1893 is the largest stick insect family within the Phasmatodea, with two subfamilies, namely Necrosiinae Brunner von Wattenwyl, 1893, and Lonchodinae Brunner von Wattenwyl, 1893 (Brock and Büscher, 2022; Brock et al., 2024). In China, Lonchodidae has the highest diversity of taxa and more than 250 species have been described (Chen and He, 2008; Hennemann et al., 2008; Brock et al., 2024).

This study is additional to the previous studies of the Necrosiinae and Lonchodinae from China (Ho, 2017a, 2020), the present work describing six new taxa including three new genera, two new species and one new subspecies. It proposes 17 new combinations, one new synonym, and reports six new records (one tribe, four genera and one species) from the Necrosiinae and Lonchodinae in China.

### MATERIALS & METHODS

The systematic treatment is according to Otte and Brock (2005), Komoto et al. (2011), Bradler et al. (2014), Bradler and Buckley (2018), Robertson et al. (2018), Bank and Bradler (2022), Brock and Büscher (2022) and Brock et al. (2024). Morphological terms are based on Bragg (2001), Hennemann and Conle (2008), and Brock and Büscher (2022). The Chinese names of all species mentioned in this paper have been provided and standardised for consistent use in the literature, enabling other researchers to reference them in the future. Measurements are provided in millimetres (mm). The abbreviations used for collections are: HKES: Hong Kong Entomological Society, Hong Kong, China; HBU: Hebei University, Hebei, China; IZCAS: Institute of Zoology, Chinese Academy of Sciences, Beijing, China; SYSBM: Museum of Biology, Sun Yat-Sen University, Guangzhou, China; and ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany.

### RESULTS

**Lonchodidae Brunner von Wattenwyl, 1893**

**Necrosiinae Brunner von Wattenwyl, 1893**

**Korinnini Günther, 1953**

**Type-genus:** *Korinnis* Günther, 1932: 66.

**Distribution:** China, India, Malaysia, Philippines and Thailand.

**Notes:** Korinnini Günther, 1953 consists of two genera and eight species (Brock and Büscher, 2022; Brock et al., 2024). Korinnini and *Korinnis* Günther, 1932 are firstly reported from China. The Chinese name for both the tribe and genus were subsequently adopted from Cai (1987).

### *Korinnis* Günther, 1932

**Type-species:** *Korinnis potameis* Günther, 1932: 67, by original designation.

**Distribution:** China, India, Malaysia, Philippines and Thailand.

**Notes:** *Korinnis notatus* (Chen & Zhang, 2008) **comb. nov.** is here transferred to *Korinnis* Günther, 1932 from the genus *Necroscia* Audinet-Serville, 1838, based on the morphological and genital characteristics. Currently two species are known from China.

### Species included in China:

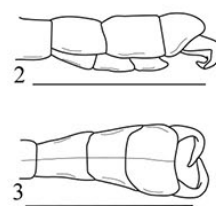
1. *Korinnis notatus* (Chen & Zhang, 2008: 245, figs. 1-3) **comb. nov.** 刺胸婆羅螞 [Aruanoidea notata; China (Yunnan)]
2. *Korinnis xizangensis* **sp. nov.** 西藏婆羅螞 [China (Xizang)]

### *Korinnis xizangensis* **sp. nov.** (Figs. 1-3)

**Types:** Holotype, ♂, Beibeng, Motuo, Xizang, China, 20 August 2013, Wu Chao (IZCAS); Paratype, 1♂, same data as holotype (HKES).

**Diagnosis:** *Korinnis xizangensis* **sp. nov.** can be separated from other species by the presence of curved spines on the pronotum, the unarmed mesonotum and the pale white anal region of alae. *Korinnis xizangensis* **sp. nov.** is similar to the general appearance of *K. notatus* (Chen & Zhang, 2008) **comb. nov.**, but can be separated by the distinctly larger size, the presence of a pale spot on tegmina, the pale white anal region of alae and the black apices of femora and tibiae.

**Description of male (Figs. 1-3):** Small size. General colour of body and legs yellowish-brown. Body slender, sparsely covered with short bristles.



**Figures 1-3.** *Korinnis xizangensis* **sp. nov.** 1. Male, habitus. 2. Male, apex of abdomen, lateral view. 3. Male, apex of abdomen, dorsal view. Scale bars = 10 mm. Photo and drawings by author.

**Head:** Oval, sparsely covered with small granules. Compound eyes small and rounded. Occiput flat. Occipital furrows distinct. Antennae dark brown, long and filiform, surpassing apices of protarsi; scapus as long as third segment, pedicellus shorter than scapus.

**Thorax:** Pronotum rectangular, longer than wide, anterior margin gently curved inwards, posterior margin truncate, transverse and longitudinal sulci crossing before middle area, with a pair of spines positioned before transverse sulcus, apices pointing forwards, also with a row of enlarged granules along each side of longitudinal sulcus. Mesonotum indistinctly swollen post-medially, densely covered with small granules, with a long furrow along lateral margins. Mesopleurae with small granules. Mesosternum with indistinct granulation. Metapleurae rugose, lacking granulation. Metasternum smooth.

**Abdomen:** Cylindrical, parallel-sided from second to seventh tergites. Eighth tergum gently expanded posteriorly. Ninth tergum as long as eighth tergum, gently expanded posteriorly. Anal segment shorter than ninth tergum, with a broad U-shaped emargination on posterior margin. Poculum small, cup-shaped, tapering posteriorly, posterior margin pointed and surpassing anterior margin of anal segment. Cerci long and cylindrical, strongly curved inwards, with pointed apices.

**Legs:** Slender and sparsely covered with short bristles. Unarmed. Apices of all femora and tibiae black. All femora thicker than corresponding tibiae. Profemora curved basally.

**Wings:** Tegmina small, with a pale spot in anterior area, posterior margin subtruncate. Alae long, apices reaching anterior area of eighth tergum, costal region green, anal region pale white, apices grayish black.

**Measurements:** See Table 1.

**Distribution:** China (Xizang).

**Notes:** The female is unknown.

**Etymology:** This new species is named after its type locality, Xizang, China; adjective.

**Necrosiini Brunner von Wattenwyl, 1893*****Marmessoidea* Brunner von Wattenwyl, 1893  
(= *Trigonophasma* Kirby, 1904: 436, synonymised  
by Brock, 1999: 175)**

**Type-species:** *Necrosia marmessus* Westwood, 1859: 49, by original designation.

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

**Notes:** Currently three species are recognised in China.

**Species included in China:**

1. *Marmessoidea adelpha* (Günther, 1940: 245) **comb. nov.** 寬翅瑪異蠟 [*Sipyloidea*; China (Fujian)]
2. *Marmessoidea bispina* (Redtenbacher, 1908) 雙刺瑪異蠟 [*Asceles bispinus*; China (Hainan, Guangxi, Zhejiang, Fujian, Guizhou & Yunnan) & Vietnam]
3. *Marmessoidea casignetus* (Westwood, 1859) 翅突瑪異蠟 [*Necrosia*; China (Yunnan) & India (Assam)]

***Marmessoidea adelpha* (Günther, 1940) **comb. nov.****

*Sipyloidea adelpha*, Günther, 1940: 245; Bi et al., 2001: 256; Otte and Brock, 2005: 316; Chen and He, 2008: 177; Hennemann et al., 2008: 38; Lampe et al., 2010: 143; Ho, 2017a: 42; Brock and Büscher, 2022: 544.

**Type:** Holotype, ♂, 2300m, Kuatun (Fukien), 27.40 n. Br. 117.40 ö. L. J. Klapperich, 17 June 1938 (ZFMK).

**Distribution:** China (Fujian).

**Notes:** This species is here transferred to *Marmessoidea* Brunner von Wattenwyl, 1893 from the genus *Sipyloidea* Brunner von Wattenwyl, 1893, and may potentially be

a synonym of *Marmessoidea bispina* (Redtenbacher, 1908). The validation of this synonym will only be possible after additional specimens are collected from the type locality.

***Neosceles* Seow-Choen, 2016**

**Type-species:** *Neosceles rayi* Seow-Choen, 2016: 160, by original designation.

**Distribution:** Brunei, China, Indonesia and Malaysia.

**Notes:** *Neosceles hainanensis* (Chen & He, 2002) **comb. nov.** is here transferred to *Neosceles* Seow-Choen, 2016 from the genus *Necrosia* Audinet-Serville, 1838, based on the morphological and genital characteristics. Currently, one species and two subspecies are recognised in China.

**Species included in China:**

1. *Neosceles hainanensis* (Chen & He, 2002, in Chen et al., 2002: 107) **comb. nov.** 海南新蓄蠟 [*Sosibia*; China (Guangxi & Hainan)]
  - 1.1. *Neosceles hainanensis elongatus* **subsp. nov.** 海南新蓄蠟 長體亞種 [China (Guangxi)]
  - 1.2. *Neosceles hainanensis hainanensis* (Chen & He, 2002, in Chen et al., 2002: 107, figs. 9a-b) **comb. nov. & sen. str.** 海南新蓄蠟 海南亞種 [*Sosibia*; China (Hainan)]

***Neosceles hainanensis elongatus* **subsp. nov.**  
(Figs. 4-9)**

**Types:** Holotype, ♀, Shiwandashan, Shangsi, Guangxi, China, 17 July 2016, George Ho Wai-Chun (HKES); Paratypes, 23 eggs (laid by holotype female), same data as holotype (HKES).

	Holotype Male	Paratype Male
Body	47.0	46.0
Head	2.5	2.5
Antennae	43.0	38.0
Pronotum	2.5	2.5
Mesonotum	8.0	8.0
Metanotum	5.5	5.5
Median Segment	2.5	2.5
Tegmina	2.5	2.5
Alae	29.0	30.0
Profemora	12.0	11.5
Mesofemora	9.5	9.0
Metafemora	12.0	12.0
Protibiae	9.5	9.5
Mesotibiae	7.5	7.0
Metatibiae	11.0	11.5

**Table 1.** Measurements of *Korinnis xizangensis* **sp. nov.**



**Diagnosis:** *Neoasceles hainanensis elongatus* **subsp. nov.** is similar to the nominate *N. hainanensis hainanensis* (Chen & He, 2002) **comb. nov. & sen. str.**, but it can be distinguished by its larger size, more elongate body (body length shorter than 83 mm in the nominate subspecies), longer subgenital plate, indistinct elevations on the anteroventral and posteroventral carinae of profemora and mesofemora, more apically pointed elevations on the anteroventral carina of metafemora and longer wings in the female.

**Description of female (Figs. 4-7):** Large size. Body elongate and slender. General colouration of body grayish-green, legs brownish-green with small blackish markings.

**Head:** Oval, shorter than pronotum, weakly constricted after compound eyes. Sparsely covered with small granules. Vertex and occiput flattened, median and lateral longitudinal furrows distinct, posterior margin with small swellings. Compound eyes small and rounded. Antennae long and filiform; scapus basally flattened, as long as third segment, longer than pedicellus.

**Thorax:** Sparsely granulated. Pronotum rectangular, longer than wide, anterior margin weakly incurved, posterior margin rounded, transverse and longitudinal sulci crossing before middle area. Mesonotum shorter than combined length of metanotum and median segment, median longitudinal carina distinct, also interspersed with a few enlarged and acute granules. Mesopleurae and metapleurae with a few enlarged and acute granules. Metanotum longer than median segment, shorter than mesonotum.

**Abdomen:** Cylindrical, tapering posteriorly, lacking granulation. Seventh sternum with two inconspicuous, short, carina-like preopercular organ posteromedially. Eighth tergum shorter than combined length of ninth tergum and anal segment. Anal segment longer than ninth tergum, posterior margin with a small and broad U-shaped emargination, posterolateral angles rounded. Supra-anal plate distinct, small, with median longitudinal carina, tapering posteriorly, posterior margin pointed and projecting over posterolateral angles of anal segment. Subgenital plate scoop-shaped, long, tapering posteriorly, posterior apex emarginated and surpassing the posterior margin of supra-anal plate. Cerci long, cylindrical, apices rounded and projecting over the posterior margin of anal segment.

**Legs:** Slender and long. Femora thicker than corresponding tibiae. Profemora basally curved, anteroventral and posteroventral carinae inconspicuously wavy. Anteroventral and posteroventral carinae of mesofemora inconspicuously wavy. Anteroventral carina of metafemora distinctly wavy with triangular elevations. Protibiae and mesotibiae lacking elevation. Anteroventral carina of metatibiae distinctly wavy.

**Wings:** Tegmina small, distinctly elevated pre-medially, posterior margin subtruncate. Alae long, apices reaching posterior area of sixth tergum, costal region grayish green, anal region grayish brown.

**Measurements:** See Table 2.

**Description of egg (Figs. 8-9):** Capsule greenish-brown, surface wrinkled; bullet-shaped, posterior pole pointed. Micropylar plate oval, anteriorly and posteriorly pointed. Micropylar cup located at posterior area of micropylar plate. Median line distinct. Operculum flattened, marginally thickened, with a small rounded elevation centrally.

**Measurements:** Length, 5.2 mm; width, 1.6 mm; height, 1.4 mm.

**Distribution:** China (Guangxi).

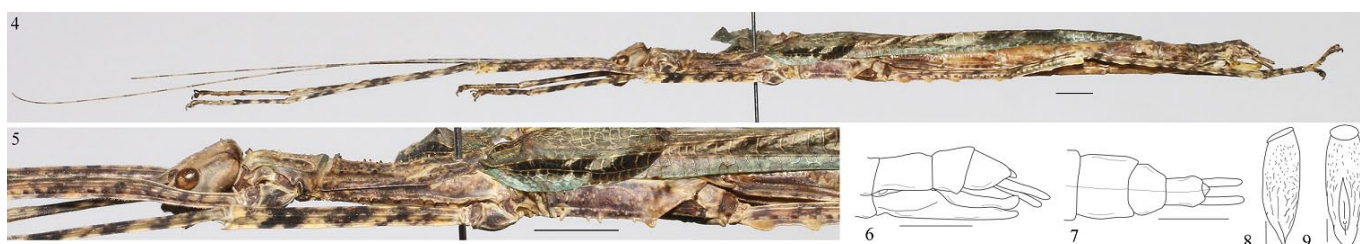
**Notes:** The male is unknown. Although this new subspecies is only known from one female specimen, the morphological features of the specimen are clearly different from those of the nominate subspecies mentioned in the diagnosis section. Further specimens collected from the type locality are necessary for a better understanding of the relationship with the nominate subspecies.

**Etymology:** This new subspecies is named for its elongated body in comparison to the nominate subspecies; adjective.

### *Paramarmessoidea* Seow-Choen, 2021

**Type-species:** *Phasma annulata* Fabricius, 1798: 189, by original designation.

**Distribution:** China, India, Malaysia, Myanmar, Thailand and Vietnam.



**Figures 4-9.** *Neoasceles hainanensis elongatus* **subsp. nov.** 4. Female, habitus. 5. Female, head and thorax, lateral view. 6. Female, apex of abdomen, lateral view. 7. Female, apex of abdomen, dorsal view. 8. Egg, lateral view. 9. Egg, dorsal view. Scale bars: habitus, head, thorax and apex of abdomen = 10 mm; egg = 1 mm. Photos and drawings by author.

**Notes:** *Paramarmessoidea guangdongensis* (Ho, 2013) **comb. nov.**, *P. hainanensis hainanensis* (Ho, 2016) **comb. nov.** and *P. hainanensis yinggelingsensis* (Ho, 2016) **comb. nov.** are hereby transferred to *Paramarmessoidea* Seow-Choen, 2021 from the genus *Marmessoidea* Brunner von Wattenwyl, 1893, due to their morphological, genital, and egg characteristics. Currently, two species and two subspecies are recognised in China.

Additionally, two other species and two subspecies from Vietnam, including *P. alata alata* (Ho, 2018: 184, figs. 13-16, 30-31) **comb. nov.** [*Marmessoidea*; Vietnam], *P. alata elongata* (Ho, 2018: 185, fig. 32) **comb. nov.** [*Marmessoidea*; Vietnam], and *P. liuxingyuei* (Ho, 2018: 187, figs. 17-18, 33) **comb. nov.** [*Marmessoidea*; Vietnam], are also here transferred to *Paramarmessoidea* from *Marmessoidea* due to their morphological and genital characteristics.

#### Species included in China:

1. *Paramarmessoidea guangdongensis* (Ho, 2013a: 532, figs. 3-6) **comb. nov.** 廣東副瑪異蠟 [*Marmessoidea*; China (Guangdong)]
2. *Paramarmessoidea hainanensis* (Ho, 2016: 319) **comb. nov.** 海南副瑪異蠟 [*Marmessoidea*; China (Hainan)]
  - 2.1. *Paramarmessoidea hainanensis hainanensis* (Ho, 2016: 319, figs. 5-10, 19) **comb. nov.** 海南副瑪異蠟 海南亞種 [*Marmessoidea*; China (Hainan)]
  - 2.2. *Paramarmessoidea hainanensis yinggelingsensis* (Ho, 2016: 320) **comb. nov.** 海南副瑪異蠟 鸚哥嶺亞種 [*Marmessoidea*; China (Hainan)]

#### *Spinomarmessoidea* Seow-Choen, 2021

**Type-species:** *Spinomarmessoidea sharonae* Seow-Choen, 2021: 672, by original designation.

	Holotype Female
Body	95.0
Head	6.0
Antennae	84.0
Pronotum	5.5
Mesonotum	13.0
Metanotum	9.0
Median Segment	6.0
Tegmina	13.0
Alae	53.0
Profemora	25.0
Mesofemora	17.0
Metafemora	26.0
Protibiae	27.0
Mesotibiae	16.0
Metatibiae	27.0

**Table 2.** Measurements of *Neoasceles hainanensis elongatus* subsp. nov.

**Distribution:** China and Malaysia.

**Notes:** Currently, one species is recognised in China.

#### Species included in China:

1. *Spinomarmessoidea mista* (Chen & He, 2008: 110, figs. 75a-b) **comb. nov.** 刺粒刺瑪異蠟 [*Aruanoidea mista*; = *Spinomarmessoidea damingenis* Gao and Li, 2023 **syn. nov.**; China (Guangdong, Guangxi, Guizhou & Yunnan)]

#### *Spinomarmessoidea mista* (Chen & He, 2008) **comb. nov.**

*Aruanoidea mista*, Chen and He, 2008: 110, figs. 75a-b. *Necroscia mista*, Ho, 2013b: 22, 2017a: 12; Brock and Büscher, 2022: 537.

*Spinomarmessoidea damingenis*, Gao and Li, 2023: 282, figs. 2-4. **syn. nov.**

**Type:** Holotype, ♂, Heishiding, Fengkai, Guangdong, China, 10 September 1985, De An (Lan Dean) (SYSBM).

**Other material examined:** 1 immature ♂, 2 immature ♀, Heishiding, Fengkai, Guangdong, China, 25-27 July 2011, George Ho Wai-Chun (HKES); 2♂, 2♀, Damingshan, Wuming, Guangxi, China, 28-30 July 2012, George Ho Wai-Chun (HKES); 2♀, Jinping, Yunnan, China, 4 September 2016, George Ho Wai-Chun (HKES); 1♂, Dashuhe, Daozhen Guizhou, China, 17-26 August 2004, Shi Fuming (HBU).

**Distribution:** China (Guangdong, Guangxi, Guizhou & Yunnan).

**Notes:** This species matches the characteristics of *Spinomarmessoidea* Seow-Choen, 2021 and is here transferred from the genus *Necroscia* Audinet-Serville, 1838. *Spinomarmessoidea damingenis* Gao & Li, 2023

**syn. nov.** is the corresponding sex of this species and here synonymised. This species may also possibly be found in other provinces, such as Fujian, Hunan, and Jiangxi, in South China, as well as in neighbouring countries like Vietnam.

### ***Varieganecrosia* Seow-Choen, 2016**

**Type-species:** *Varieganecrosia bicolor* Seow-Choen, 2016: 248, by original designation.

**Distribution:** Brunei, China, Indonesia, Malaysia and Sri Lanka.

**Notes:** *Varieganecrosia dianica* (Ho, 2017) **comb. nov.** is here transferred to *Varieganecrosia* Seow-Choen, 2016 from the genus *Necrosia* Audinet-Serville, 1838, based on the morphological and genital characteristics. Currently, one species is recognised in China.

#### **Species included in China:**

1. *Varieganecrosia dianica* (Ho, 2017a: 12, figs. 12-15, 32-39) **comb. nov.** 滇雜斑角臀蠟 [Necrosia; China (Yunnan)]

### **Lonchodinae Brunner von Wattenwyl, 1893**

#### ***Longicarusius* gen. nov.**

**Type-species:** *Carausius luchunensis* Ho, 2017a: 48, by present designation.

**Diagnosis:** *Longicarusius* gen. nov. is similar to *Carausius* Stål, 1875, but can be separated by the slenderer and thinner body, the oblong head, the flattened occiput of head and the less wavy posterodorsal carina of protibiae in both sexes and the smooth egg capsule surface.

**Description:** Medium-sized for Lonchodinae. Apterous. Body slender, cylindrical, male distinctly slimmer and smaller than female; rugose, with small granulations. Head oblong. Vertex unarmed or with a pair of small horns between compound eyes. Occiput flat. Antennae filiform, slender, apices surpassing middle area of protibiae. Thorax slender, rough and wrinkled, sparsely granulated, also interspersed with a few short, spine-like tubercles or enlarged granules. Pronotum rectangular, longer than wide. Mesonotum elongate and slender, longer than combined length of metanotum and median segment. Metanotum longer than median segment. Abdomen cylindrical, wrinkled and sparsely granulated. Median segment rectangular, longer than wide. Female sixth tergum lacking or with small elevations or crest-like structures post-mediolaterally. Female seventh sternum with a small hump-like, spine-like or horn-like preopercular organ posteromedially. Male anal segment split into two semi-tergites, female with emarginated posterior margin. Supra-anal plate distinct in female, indistinct in male. Female subgenital plate scoop-shaped, posterior margin pointed and

reaching posterior margin of supra-anal plate. Supra-anal plate small and distinct. Male poculum small, cup-shaped, weakly elevated medially. Cerci short and flattened. Legs slender, lacking noticeable armature. Femora thicker than corresponding tibiae. Anterodorsal and posteroventral carinae of profemora raised. Posteroventral carinae of mesofemora and metafemora with a few small teeth. Posterodorsal carina of protibiae distinctly raised. First segment of protarsi lacking or with a small semi-circular lamella dorsally. Egg capsule oval, surface smooth. Micropylar plate oval. Operculum with closed-stalked and rounded capitulum centrally.

**Distribution:** China.

**Notes:** *Longicarusius gracilicornis* (Ho, 2021) **comb. nov.**, *L. luchunensis* (Ho, 2017) **comb. nov.** and *L. yingjiangensis* (Ho, 2017) **comb. nov.** are hereby transferred to *Longicarusius* gen. nov. from the genus *Carausius* Stål, 1875. Currently, three species are recognised in this new genus. Once the morphological, genital, and egg characteristics of certain other *Carausius* species are known, they may also be classified within this genus.

**Etymology:** Masculine. The specific epithet of this new genus is derived from the words 'Longi' (= slender and long body) and 'carausius' referring to the morphological similarity to *Carausius* Stål, 1875.

#### **Species included:**

1. *Longicarusius gracilicornis* (Ho, 2021: 14, figs. 5-8, 19-22) **comb. nov.** 細角長竹異蠟 [*Carausius*; China (Yunnan)]
2. *Longicarusius luchunensis* (Ho, 2017a: 48, figs. 203-206, 231-238, 290-291) **comb. nov.** 綠春長竹異蠟 [*Carausius*; China (Yunnan)]
3. *Longicarusius yingjiangensis* (Ho, 2017a: 51, figs. 211-212, 248-252) **comb. nov.** 盈江長竹異蠟 [*Carausius*; China (Yunnan)]

#### ***Neopericentrus* gen. nov.**

**Type-species:** *Neosinophasma wenxuani* Ho, 2017b: 524, by present designation.

**Diagnosis:** *Neopericentrus* gen. nov. is similar to *Pericentrus* Redtenbacher, 1908, but can be separated by the smaller size, the slenderer body, the absence of clusters of spines on thorax, the weakly swollen mesonotum with unarmed lateral margins, the absence of expanded posterolateral angles from sixth to seventh tergites, the less developed armature on abdomen and the less distinct armature on the anterodorsal and posterodorsal carinae of mesofemora and metafemora.

**Description:** Small size for Lonchodinae. Apterous. Body robust, cylindrical; surface rough, with lamellae, granules and wrinkles. Head oval. Vertex armed with a pair of small triangular horns between compound eyes. Occiput gently convex, with two pairs of small



lamellae. Antennae filiform, slender, apices surpassing middle area of protibiae. Thorax rough and granulated. Pronotum trapezoidal, gently expanded posteriorly. Mesonotum parallel-sided, with three pairs of lamellae. Abdomen cylindrical, rough, tapering posteriorly. Median segment rectangular, wider than long. Fourth and fifth tergites with expanded posterolateral angles. Seventh sternum with a crest-like preopercular organ posteromedially. Subgenital plate scoop-shaped, posterior margin notched and surpassing posterior margin of supra-anal plate. Supra-anal plate small and distinct. Cerci short and flattened. Legs slender. Femora thicker than corresponding tibiae. Anterodorsal and posterodorsal carinae of profemora with small serrations. Anterodorsal, posterodorsal, anteroventral and posteroventral carinae of mesofemora and metafemora with small serrations, medioventral carina indistinct. Tibiae with a few small serrations.

**Distribution:** China.

**Notes:** This new genus only consists of the type-species *Neopericentrus wenxuani* (Ho, 2017) **comb. nov.** Ho (2017b: 524) originally placed *Neosinophasma wenxuani* Ho, 2017 in the tribe Medaurini Hennemann & Conle, 2008 [Family Phasmatidae Leach, 1815, Subfamily Clitumninae Brunner von Wattenwyl, 1893], based on a single female specimen. This specimen resembles the general appearance of other taxa in the genus *Neosinophasma* Ho, 2017. However, by reexamining the specimens in more detail and making further comparisons to other taxa, it is considered to be closely related to *Pericentrus* Redtenbacher, 1908 within Lonchodinae and is here transferred to the new genus *Neopericentrus* **gen. nov.** from *Neosinophasma*. In fact, *Neopericentrus* **gen. nov.** matches the general features of Lonchodinae including the absence of wings, the long and slender antennae, the longer median segment and the genital structure in the female. *Neopericentrus* **gen. nov.** obviously violates the main features of Clitumninae by the long antennae with apices surpassing apices of profemora, the parallel-sided scapus and the indistinct medioventral carina on mesofemora and metafemora in the female. The characteristics of both the male and the eggs of the genus remain unknown, and additional specimens collected from the type locality are essential for clarifying its taxonomic classification. The remaining species of *Neosinophasma*, including *N. biangulatum* (Chen & Zhang, 2008), *N. tangliangi* Ho, 2017 and *N. yunnanense* Ho, 2017, exhibit the characteristics of *Neosinophasma*.

**Etymology:** Masculine. The specific epithet of this new genus is derived from the words 'Neo' (= new) and 'pericentrus' referring to the morphological similarity to *Pericentrus* Redtenbacher, 1908.

#### Species included:

1. *Neopericentrus wenxuani* (Ho, 2017b: 524, figs. 37-38, 120-124) **comb. nov.** 文烜新束棘螽 [*Neosinophasma*; China (Xizang)]

#### *Paracarusius* **gen. nov.**

**Type-species:** *Carausius novus* Ho, 2017a: 49, by present designation.

**Diagnosis:** *Paracarusius* **gen. nov.** is similar to *Carausius* Stål, 1875, but can be separated by the thick-built and elevated carina-like armature on the vertex of head and the strongly raised and waved posterodorsal carina of protibiae in both sexes, the short and straight anal abdominal segment in the male and the fimbriated egg capsule.

**Description:** Medium-sized for Lonchodinae. Apterous. Body slender, cylindrical; rugose, with sparse granulations. Head oval. Vertex with thick-built and elevated carina-like armature between compound eyes. Occiput flattened or weakly convex. Antennae filiform, slender, apices surpassing middle area of protibiae. Thorax slender, rugose and sparsely granulated. Pronotum rectangular, longer than wide. Mesonotum broadly emarginated medially, longer than combined length of metanotum and median segment. Metanotum longer than median segment. Abdomen cylindrical, rugose and sparsely granulated. Median segment rectangular, longer than wide. Female seventh sternum with a small crest-like preopercular organ posteromedially. Male anal segment split into two short and straight semi-tergites, as long as eighth tergum, female with emarginated posterior margin. Supra-anal plate distinct in female, indistinct in male. Female subgenital plate scoop-shaped, posterior margin pointed and reaching posterior margin of supra-anal plate. Male poculum small, cup-shaped, weakly elevated medially. Cerci short and flattened. Legs slender. Femora thicker than corresponding tibiae. Profemora with a rounded and elevated lamella near apex on posteroventral carina in female. Posterodorsal carina of protibiae strongly raised and waved, anteroventral carina strongly raised. Posteroventral carina of mesofemora and metafemora with two small teeth near apices. First segment of protarsi lacking or with a small semi-circular lamella dorsally. Egg capsule oblong, fimbriated, and fringed with feather-like bristles. Micropylar plate elliptical or oval. Operculum with rounded capitulum centrally.

**Distribution:** China and Vietnam.

**Notes:** This new genus currently includes *Paracarusius damingshanensis* **sp. nov.**, *P. novus* (Ho, 2017) **comb. nov.** and *P. rugosus* (Brunner von Wattenwyl, 1907) **comb. nov.** (Fig. 16), here transferred from the genus *Carausius* Stål, 1875. Once the morphological, genital, and egg characteristics of certain other *Carausius* species have been identified, they could also be categorised within this genus.

**Etymology:** Masculine. The specific epithet of this new genus is derived from the words 'Para' and 'carausius' referring to the morphological similarity to *Carausius* Stål, 1875.

**Species included:**

1. *Paracarusius damingshanensis* sp. nov. 大明山副竹異蠟 [China (Guangxi)]
2. *Paracarusius novus* (Ho, 2017a: 49, figs. 207-210, 239-27) comb. nov. 新副竹異蠟 [*Cararusius*; China (Yunnan)]
3. *Paracarusius rugosus* (Brunner von Wattenwyl, 1907: 275) comb. nov. 皺副竹異蠟 [*Cararusius*; China (Guangxi) & Vietnam]

***Paracarusius damingshanensis* sp. nov.** (Figs. 10-15, 17-20)

**Types:** Holotype, ♀, Damingshan, Wuming, Guangxi, China, 31 July 2012, George Ho Wai-Chun (HKES); Paratypes, 1♀, 1♂, 37 eggs (laid by holotype and paratype females), Damingshan, Wuming, Guangxi, China, 30 July 2012, George Ho Wai-Chun (HKES).

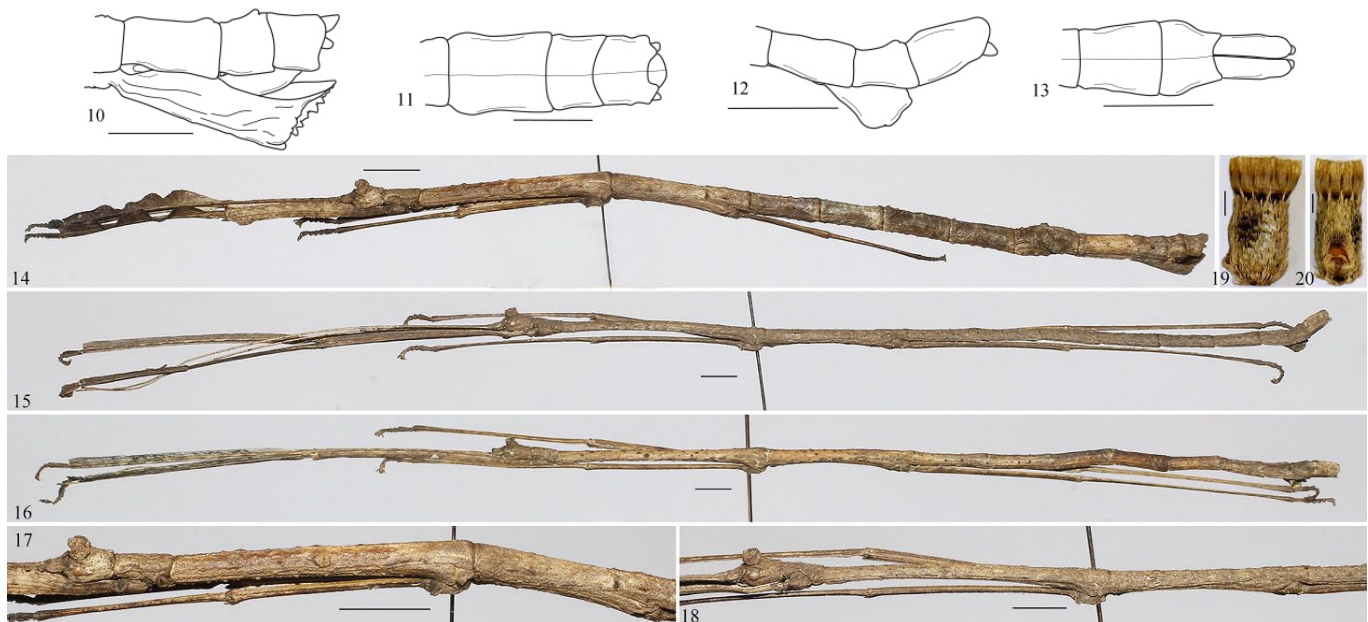
**Diagnosis:** *Paracarusius damingshanensis* sp. nov. is similar to *P. novus* (Ho, 2017) comb. nov., but can be separated by the larger size and the more robust body in both sexes, the presence of enlarged granules on mesonotum and metanotum and the small crest-like preopercular organ on seventh sternum in the female and the more thick-built crest on vertex of head and the broader anal segment in lateral view in the male. The general appearance of the male is similar to *P. rugosus*

(Brunner von Wattenwyl, 1907) comb. nov., but can be separated by the comparatively more robust body, the less granulations on thorax and the absence of black granules on thorax and abdomen in the male.

**Description of female (Figs. 10-11, 14, 17):** Medium-sized. Body elongate and slender, more robust than male. Body surface rough, wrinkled and granulated. General colouration of body brown, legs brown with a few small and whitish markings.

**Head:** Oval, shorter than pronotum, weakly constricted after compound eyes. Rough, densely covered with small granules. Vertex with a thick-built and elevated carina-like armature between compound eyes, U-shaped in dorsal view. Occiput flattened, median and lateral longitudinal furrows distinct, posterior margin with small swellings. Compound eyes small and rounded. Antennae filiform; scapus dorsoventrally flattened, constricted basally, as long as combined length of third segment and pedicellus; third segment longer than pedicellus.

**Thorax:** Rough and granulated, also interspersed with a few enlarged granules. Pronotum rectangular, longer than wide, anterior margin gently incurved, posterior margin rounded, transverse and longitudinal sulci crossing at middle area. Mesonotum longer than combined length of metanotum and median segment, broadly emarginated medially, median longitudinal line



**Figures 10-20.** *Paracarusius* gen. nov. spp. 10. *Paracarusius damingshanensis* gen. nov. & sp. nov., female, apex of abdomen, lateral view. 11. *Paracarusius damingshanensis* gen. nov. & sp. nov., female, apex of abdomen, dorsal view. 12. *Paracarusius damingshanensis* gen. nov. & sp. nov., male, apex of abdomen, lateral view. 13. *Paracarusius damingshanensis* gen. nov. & sp. nov., male, apex of abdomen, dorsal view. 14. *Paracarusius damingshanensis* gen. nov. & sp. nov., female, habitus. 15. *Paracarusius damingshanensis* gen. nov. & sp. nov., male, habitus. 16. *Paracarusius rugosus* (Brunner von Wattenwyl, 1907) gen. nov. & comb. nov., male, habitus. 17. *Paracarusius damingshanensis* gen. nov. & sp. nov., female, head and thorax, dorsolateral view. 18. *Paracarusius damingshanensis* gen. nov. & sp. nov., male, head and thorax, dorsolateral view. 19. *Paracarusius damingshanensis* gen. nov. & sp. nov., egg, lateral view. 20. *Paracarusius damingshanensis* gen. nov. & sp. nov., egg, dorsal view. Scale bars: apex of abdomen, head, thorax and habitus = 10 mm; vomer and egg = 1 mm. Drawings and photos by author.



distinct. Mesosternum with distinct longitudinal carina. Metanotum longer than median segment.

**Abdomen:** Cylindrical, rough, wrinkled and with sparse granulations. Median segment rectangular, longer than wide, longer than pronotum. Sixth tergum with a pair of lateral crest-like structures. Seventh sternum with a small, inconspicuous crest-like preopercular organ posteromedially. Eighth tergum almost as long as combined length of ninth tergum and anal segment. Anal segment as long as ninth tergum, posterior margin with a small and broad U-shaped emargination, posterolateral angles rounded. Supra-anal plate distinct, small, with median longitudinal carina, tapering posteriorly, posterior margin rounded and projecting over posterolateral angles of anal segment. Subgenital plate boat-shaped, median longitudinal carina distinct, posterolateral areas raised, also with a few short tubercles situated at posterior area, posterior margin pointed and reaching posterior margin of supra-anal plate. Cerci short, flattened, apices rounded and not projecting over posterior margin of anal segment.

**Legs:** Slender and long. Femora thicker than corresponding tibiae, shorter than mesonotum. Profemora basally curved, anterodorsal carina distinctly waved with small rounded elevations, posteroventral carina distinctly elevated, subapical area raised with a rounded lamella. Posteroventral carina of mesofemora and metafemora with two small teeth near apices. Posterodorsal carina of protibiae strongly raised and waved, anteroventral carina strongly raised. First segment of protarsi with a small semi-circular lamella dorsally.

**Description of male (Figs. 12-13, 15, 18):** Body slender and long, distinctly slimmer and thinner than female. General colouration of body brown, legs brown with inconspicuous blackish markings.

**Head:** Oval, weakly constricted posteriorly after compound eyes, almost as long as pronotum. With sparse granulations. Vertex with a pair of thick-built

and carina-like armature between compound eyes, U-shaped in dorsal view. Occiput flattened, with distinct median and lateral longitudinal furrows, posterior margin with small swellings. Compound eyes rounded and small. Antennae long and filiform; scapus dorsoventrally flattened, weakly constricted basally, longer than third segment; pedicellus shorter than third segment.

**Thorax:** Sparsely covered with small granules, also interspersed with a few enlarged granules. Pronotum rectangular, longer than wide, anterior margin weakly incurved, posterior rounded, transverse and longitudinal sulci crossing at middle area. Mesonotum slender and elongate, longer than combined length of metanotum and median segment, broadly emarginated medially, median longitudinal line distinct. Metanotum longer than median segment.

**Abdomen:** Slender and cylindrical, with small and inconspicuous granules, also interspersed with a few enlarged granules. Median segment rectangular, longer than wide, longer than pronotum. Seventh tergum as long as combined length of eighth and ninth tergites. Eighth tergum expanded posteriorly, longer than ninth tergum. Anal segment as long as eighth tergum, split into two semi-tergites, inner margin almost straight at posterior area, interior surfaces with a few small dentations, posterior margin rounded. Poculum cup-like, medially elevated, posterior margin rounded and reaching posterior area of ninth tergum. Cerci short, flattened, apices rounded and not surpassing apices of semi-tergites.

**Legs:** Slender and long, lacking noticeable armature. Profemora incurved basally, anterodorsal carina waved with small teeth. Posteroventral carina of mesofemora and metafemora with two small teeth near apices. Medioventral carina of tibiae raised. Posterodorsal carina of protibiae strongly raised.

**Measurements:** See Table 3.

**Description of egg (Figs. 19-20):** Capsule brown,

	Holotype Female	Paratype Female	Paratype Male
Body	144.0	125.0	111.0
Head	5.5	5.5	4.5
Antennae	50.0	49.0	57.0
Pronotum	6.0	5.0	4.0
Mesonotum	32.0	27.0	27.0
Metanotum	16.5	14.5	14.5
Median Segment	6.5	5.5	5.0
Profemora	27.0	25.0	28.0
Mesofemora	20.0	18.0	19.0
Metafemora	22.0	19.0	22.0
Protibiae	28.0	26.0	32.0
Mesotibiae	20.0	18.0	21.0
Metatibiae	23.0	20.0	26.0

**Table 3.** Measurements of *Paracarusius damingshanensis* gen. nov. & sp. nov.

surface fimbriated, densely fringed with long, feather-like bristles; oblong, posterior pole rounded. Micropylar plate elliptical, anteriorly and posteriorly rounded. Micropylar cup located at posterior area of micropylar plate. Median line indistinct. Operculum strongly elevated marginally, with a stalked and rounded capitulum centrally.

**Measurements:** Length, 6.2 mm; width, 2.5 mm; height, 2.8 mm.

**Distribution:** China (Guangxi).

**Etymology:** This new species is named after its type locality, Damingshan, Guangxi, China; adjective.

### CONCLUSION

The subfamilies Necrosiinae and Lonchodinae are rich in diversity in China, with over 250 species documented (Chen and He, 2008; Hennemann et al., 2008; Brock and Büscher, 2022; Brock et al., 2024; Ho, unpub. data). Collecting additional specimens from remote, primitive forests is expected to reveal a greater number of new species. Ultimately, each specimen collected would enhance our understanding of phasmid biodiversity in China. In future, molecular studies would enhance knowledge and help in distinguishing the validity of species with similar appearance.

### ACKNOWLEDGMENTS

My special thanks go to Paul Brock (Natural History Museum, London, U.K.) for providing valuable comments and suggestions to improve the manuscript. I also wish to thank the Institute of Zoology, Chinese Academy of Sciences, Beijing, China, Beijing Forestry University, Beijing, China, Hebei University, Hebei, China, Shanghai Entomological Museum, Chinese Academy of Sciences, Shanghai, China, and Museum of Biology, Sun Yat-Sen University, Guangzhou, China for giving access to their collections. I also wish to deeply thank Bi Wen-Xuan, Hu Jia-Yao, Lei Yu-Yang, Song Xiao-Bin, and Zhu Jian-Qing for their kind assistance and friendship during the collecting trips in Guangxi, China, and the staff of Damingshan Nature Reserve, Guangxi, China, for their kind help.

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## 中國蠟目之新知XV：中國蠟目長角枝蠟亞科及長角棒蠟亞科（長角棒蠟科）新分類群及新分類命名II

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**摘要：**本文記述中國長角枝蠟亞科及長角棒蠟亞科一新亞種、二新種及三新屬：海南新薔蠟長體亞種 *Neosceles hainanensis elongatus* **subsp. nov.**、西藏婆羅蠟 *Korinnis xizangensis* **sp. nov.**、大明山副竹異蠟 *Paracarusius damingshanensis* **sp. nov.**、長竹異蠟屬 *Longicarusius* **gen. nov.**、新束棘蠟屬 *Neopericentrus* **gen. nov.**及副竹異蠟屬 *Paracarusius* **gen. nov.**；建立十七新組合：刺胸婆羅蠟 *Korinnis notata* (Chen & Zhang, 2008) **comb. nov.**、細角長竹異蠟 *Longicarusius gracilicornis* (Ho, 2021) **comb. nov.**、綠春長竹異蠟 *Longicarusius luchunensis* (Ho, 2017) **comb. nov.**、盈江長竹異蠟 *Longicarusius yingjiangensis* (Ho, 2017) **comb. nov.**、寬翅瑪異蠟 *Marmessoidea adelpha* (Günther, 1940) **comb. nov.**、海南新薔蠟 海南亞種 *Neosceles hainanensis hainanensis* (Chen & He, 2002) **comb. nov. & sen. str.**、文烜新束棘蠟 *Neopericentrus wenxuani* (Ho, 2017) **comb. nov.**、新副竹異蠟 *Paracarusius novus* (Ho, 2017) **comb. nov.**、皺副竹異蠟 *Paracarusius rugosus* (Brunner von Wattenwyl, 1907) **comb. nov.**、長翅副瑪異蠟 長翅亞種 *Paramarmessoidea alata alata* (Ho, 2018) **comb. nov.**、長翅副瑪異蠟 長胸亞種 *Paramarmessoidea alata elongata* (Ho, 2018) **comb. nov.**、廣東副瑪異蠟 *Paramarmessoidea guangdongensis* (Ho, 2013) **comb. nov.**、海南副瑪異蠟 海南亞種 *Paramarmessoidea hainanensis hainanensis* (Ho, 2016) **comb. nov.**、海南副瑪異蠟 鸚哥嶺亞種 *Paramarmessoidea hainanensis yinggelingensis* (Ho, 2016) **comb. nov.**、劉氏副瑪異蠟 *Paramarmessoidea liuxingyuei* (Ho, 2018) **comb. nov.**、刺粒刺瑪異蠟 *Spinomarmessoidea mista* (Chen & He, 2008) **comb. nov.**及滇雜斑角臀蠟 *Varieganecroscia dianica* (Ho, 2017) **comb. nov.**；建議一新同物異名：*Spinomarmessoidea damingensis* Gao & Li, 2023 **syn. nov.**為刺粒刺瑪異蠟 *Spinomarmessoidea mista* (Chen & He, 2008) **comb. nov.**的同物異名；報告六新紀錄：婆羅蠟族 *Korinnini* Günther, 1953、婆羅蠟屬 *Korinnis* Günther, 1932、新薔蠟屬 *Neosceles* Seow-Choen, 2016、副瑪異蠟屬 *Paramarmessoidea* Seow-Choen, 2021、雜斑角臀蠟屬 *Varieganecroscia* Seow-Choen, 2016及皺副竹異蠟 *Paracarusius rugosus* (Brunner von Wattenwyl, 1907) **comb. nov.**；以及制定婆羅蠟屬 *Korinnis*、瑪異蠟屬 *Marmessoidea* Brunner von Wattenwyl, 1893、新薔蠟屬 *Neosceles*、副瑪異蠟屬 *Paramarmessoidea*、刺瑪異蠟屬 *Spinomarmessoidea* Seow-Choen, 2021及雜斑角臀蠟屬 *Varieganecroscia* 的名錄。

**關鍵詞：**竹節蟲·中國·分類·新屬·新種·新亞種·新組合·新同物異名·新紀錄