

New records of Chinese Necrosiinae (Phasmatodea: Diapheromeridae).

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ABSTRACT

One genus, *Tagesoidea* Redtenbacher, 1908, and three species, *Necrosia robustior* (Redtenbacher, 1908), *Sosibia platycerca* Redtenbacher, 1908 and *Tagesoidea tages* Westwood, 1859, of the subfamily Necrosiinae (Phasmatodea: Diapheromeridae) are reported for the first time from China. The male *N. robustior* and female *S. platycerca* are described and illustrated for the first time.

Key Words: Necrosiinae, *Necrosia robustior*, *Sosibia platycerca*, *Tagesoidea tages*, China.

中國長角枝虫脩亞科新紀錄 (虫脩目: 笛虫脩科)

何維俊

摘要: 本文記述中國長角枝虫脩亞科1新紀錄屬, 蜚虫脩屬 *Tagesoidea* Redtenbacher, 1908和3新紀錄種, 健角臂虫脩 *Necrosia robustior* (Redtenbacher, 1908), 扁尾健虫脩 *Sosibia platycerca* Redtenbacher, 1908及斑翅蜚虫脩 *Tagesoidea tages* Westwood, 1859; 並首次描述雄性健角臂虫脩和雌性扁尾健虫脩。

INTRODUCTION

The phasmid subfamily Necrosiinae contains only one tribe, the Necrosiini although it has been suggested that some genera may be divided into two tribes in relation to the morphology of the appendicular ovipositor (Bragg, 2001). The subfamily consists of 620 valid species, and is mainly distributed over tropical and subtropical regions (Phasmid Species File Online by Brock, 2013), most of them are winged and able to fly and. No revision work has been carried-out for this subfamily and it is poorly studied. In China, there are more than 100 species of Necrosiinae (Hennemann *et al.*, 2008; Chen and He, 2008; Chen and Zhang, 2008; Ho, 2012a, 2012b, 2013a, 2013b). They are abundant in the southern and southwestern regions including Guangdong, Guangxi, Hainan and Yunnan.

MATERIALS

The types of *Tagesoidea tages* Westwood, 1859, *Necrosia robustior* (Redtenbacher, 1908), and *Sosibia platycerca* Redtenbacher, 1908 were assessed by the descriptions in the relevant literature (Westwood, 1859; Redtenbacher, 1908; Brock, 1998, 1999; Hennemann and Conle, 2013) and images downloaded from Phasmid Species File Online (Brock, 2013). The material discussed below is deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS), Naturhistorisches Museum Wien, Vienna, Austria (NHMW), Hope Entomological Collections, University Museum, Oxford, United Kingdom (UMO) and the private collection of George Ho Wai-Chun, Hong Kong (GH).

The descriptions and illustrations of male *N. robustior* and female *S. platycerca* are based on material collected from Damingshan, south-central Guangxi, China. The collecting trip was conducted in July 2012. The specimens were collected directly by hand at night due to their nocturnal behaviour using a hand torch to spot them on plants. All specimens examined had the apices of femora and tibiae without area apicalis.

Measurements of the specimens are given in millimeters.

RESULTS

Genus *Necrosia* Audinet-Serville, 1838

Type-species: *Necrosia roseipennis*, Audinet-Serville, 1838: 250 [= *Necrosia prasina* (Burmeister, 1838)], by subsequent designation of Kirby, 1904: 436.

= *Aruanoidea* Brunner von Wattenwyl, 1893: 84 [Synonymised by Hennemann, 1998: 121]

Notes: Ten species are currently recognised in China (Hennemann *et al.*, 2008; Chen and He, 2008; Chen and Zhang, 2008; Ho, 2010, 2013b).

Necrosia robustior (Redtenbacher, 1908)

Aruanoidea robustior, Redtenbacher, 1908: 526.

Brock, 1998: 54.

Otte & Brock, 2005: 214.

Type: Holotype: ♀, Than-Moi, Tonkin, Vietnam, VI–VII, Fruhstorfer, H., catalog no. 1038 (NHMW).

Other material examined: 11♂♂, 7♀♀, Damingshan, Wuming Country, Guangxi Autonomous Region, China, 28–31.VII.2012, George Ho Wai-Chun, GH00402–419 (GH).

Diagnosis: This species is related to *Necrosia westwoodi* Kirby, 1904 [Malay Peninsula, Malaysia and Singapore], but can be separated by its tegmina which has smaller yellowish spot in both sexes; hind margin with deep V-shaped emargination in male; and long and cylindrical cerci in female.

Description of male (Figs. 1–3): Medium-sized, 64–70 mm. Two colour forms including green form and brown form. General color of body and wings uniformly green or brown. Body slim and slender. Similar to female, but distinctly thinner.

Head: Green colour form with a pale yellow postocular stripe; brown colour form with two pale yellow postocular stripes. Smooth, lacking granulation. Oblong, slightly longer than pronotum. Vertex flat, with two flattened

depressions between eyes, segregated by median furrow, the depressions distinctly carinate marginally. Occiput flat, with six small swellings at hind margin. Eyes brown with darker markings, rounded and prominent, about 1.4 x the length of the genae. Antennae bluish green dorsally and dark brown ventrally, with pale rings; very long and filiform, longer than the total length of body; the first segment cylindrical, longer than second segment; second segment as long as third segment.

Thorax: Pronotum brown, with inconspicuous and small granules; rectangular, becoming parallel-sided at a quarter of its length, transverse and longitudinal sulci crossing before middle. Mesonotum blackish brown, sparsely covered with small and brownish granules; elongate, 3 x the length of the pronotum, as long as the combined length of metanotum and median segment, broadly emarginated medially. Mesosternum blackish brown, granulated as in mesonotum. Mesopleurum, metapleurum and metasternum green or brown, smooth. Metanotum longer than median segment.

Abdomen: Green form with brown markings, brown form with light brown markings. Cylindrical and smooth. Becoming parallel-sided from the second to seventh terga. Second to fifth terga roughly equal in length. Eighth tergum gently expanded posteriorly. Ninth tergum moderately constricted at two-thirds. Anal segment the shortest among all terga, with deep V-shaped emargination at hind margin, apices thickened and curved inward, inner surfaces with small teeth. Poculum smooth, cup-shaped, tapering posteriorly, apex pointed. Cerci flattened, apices rounded.

Wings: Tegmina with yellow longitudinal stripe marginally in green form, with pale yellow longitudinal stripe marginally in brown form; with a small yellow spot near the elevated shoulder. Alae green with yellow longitudinal stripe marginally in green form, or brown with buff brown markings in brown form; long, reaching posterior of sixth tergum.

Legs: Yellowish brown, with blackish bands. Very slender and slim. Profemora curved basally, distinctly longer than mesonotum.

Measurements are given in Table 1.

Notes: The male is here described and illustrated for the first time.

Distribution: Guangxi (Damingshan), China. Also Vietnam [Type locality].

Genus *Sosibia* Stål, 1875

Type species: *Sosibia nigrispina*, Stål, 1875: 87, by subsequent designation of Rehn, 1904: 71.

Notes: Seven species are recognised in China (Chen and He 2008; Hennemann *et al.*, 2008).

***Sosibia platycerca* Redtenbacher, 1908**
Sosibia platycerca, Redtenbacher, 1908: 536.

Brock, 1998: 50.

Otte & Brock, 2005: 324

Types: Syntype: ♂, Than-Moi, Tonkin, Vietnam, VI–VII, Fruhstorfer, H., catalog no. 1064 (NHMW); Syntype: 2♂♂, 2000–3000 ft., Montes Mauson, Tonkin, IV–V, Fruhstorfer, H., catalog no. 1064 (NHMW).

Other material examined: 6♂♂, 4♀♀, Damingshan, Wuming Country, Guangxi Autonomous Region, China, 30–31.VII.2012, George Ho Wai-Chun, GH00420–429 (GH).

Diagnosis: Related to *Sosibia truncata* Chen & Chen, 2000 [Hong Kong and Guangdong, China], but can be separated by its rounded hind margin of the anal segment in female; and elongate and curved inward cerci in male.

Description of female (Figs. 4–6): Medium-sized, 59–66 mm. General colour of body, legs and wings brown. Head and thorax granulated. Whole body covered with long setae, denser in legs. Similar to male, but distinctly bigger and robust.

Head: Sparsely covered with small and rounded granules. Oblong, about 1.3 longer than wide. Vertex flat, with a small and rounded elevation between the bases of antennae. Occiput slightly convex, median and lateral furrows distinct, with a broad U-shaped carina placed at the anterior region of the occiput. Genae with a short postocular carina behind eyes. Eyes light brown, rounded and small, length about 2.5 x that of the genae. Antennae brown, with darker apices, filiform, longer than forelegs; the first segment distinctly constricted basally, 1.5 x longer than the second segment; third segment cylindrical, as long as second segment.

Thorax: Distinctly covered with small and rounded granules. Pronotum rectangular, as long as head, anterior margin curved, posterior margin truncate, transverse and longitudinal sulci crossing before middle. Mesonotum about 3.5 x the length of the pronotum, slightly parallel-sided, median line distinct. Metanotum slightly shorter than median segment.

Abdomen: Brown as body. Cylindrical, tapering posteriorly. Sixth tergum to anal segment carinate medially and laterally. The second to sixth sterna with small elevation postero-medially. Second tergum the longest among all terga. Third tergum shorter than the second tergum. Fourth to sixth terga equal in length, shorter than the preceding terga. Seventh sterna lacking preopercular organ. Anal segment as long as ninth tergum, slightly shorter than eighth tergum, gently constricted posteriorly, hind margin rounded. Subgenital plate scoop-shaped, with a short lateral carina, apex pointed, reaching middle of the anal segment. Cerci with long setae, flattened, apices rounded, surpassing hind margin of the anal segment.

Wings: Tegmina brown, oval, apparently shorter than head, tapering posteriorly, elevated with a distinct and small black angle medially. Alae brown, short, reaching fifth tergum, anal region gray.

Legs: Brown, with small and light brown markings. Unarmed. Densely covered with long setae. Profemora distinctly curved basally, shorter than mesonotum.

Measurements in Table 1.

Notes: The female is described here for the first time.

Distribution: Guangxi (Damingshan), China. Also Vietnam [Type locality].

Genus *Tagesoidea* Redtenbacher, 1908

Type-species: *Tagesoidea tages*, Westwood, 1859: 152, by subsequent designation of Brock, 1995: 93.

Notes: The genus *Tagesoidea* Redtenbacher, 1908, with *T. tages* Westwood, 1859, is firstly reported from China.

Tagesoidea tages Westwood, 1859

Necroscia tages, Westwood, 1859: 152, pl. 18: 1.

Calvisia tages, Kirby, 1904: 370.

Tagesoidea tages Redtenbacher, 1908: 565.

Brock, 1995: 93.

Brock, 1999: 119, 180. [Illustration]

Otte & Brock, 2005: 330.

Mandal & Yadav, 2010: 20.

Hennemann & Conle, 2013: 8.

Type: Holotype: ♀, India Orientali, no. 675 (UMO).

Other material examined: ♀, Xishuangbanna, Yunnan Province, China, 3.VI.1958, Zhang Yiran (IZCAS).

Diagnosis: This species is related to *Tagesoidea nigrofasciata* Redtenbacher, 1908 [Borneo, and Malay Peninsula, Malaysia and Sumatra, Indonesia], but can be separated by its smooth thorax and black and white anal region of alae with pale white spots.

Notes: Known only from a single female (Fig. 7) which was collected from Xishuangbanna, Yunnan, southwestern China.

Distribution: Yunnan (Xishuangbanna), China. Also India (Assam) [Type locality] and Malaysia (Perak, Malay Peninsula).

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FIGURES AND TABLES

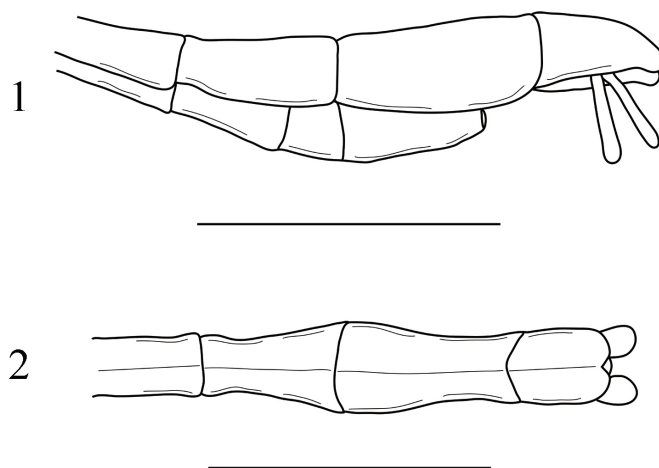


Figure 1–2. Male *Necrosia robustior* (Redtenbacher, 1908) [scale bar 5 mm]. 1. Male, end of abdomen, lateral view. 2. Male, end of abdomen, dorsal view. (Drawing by author)

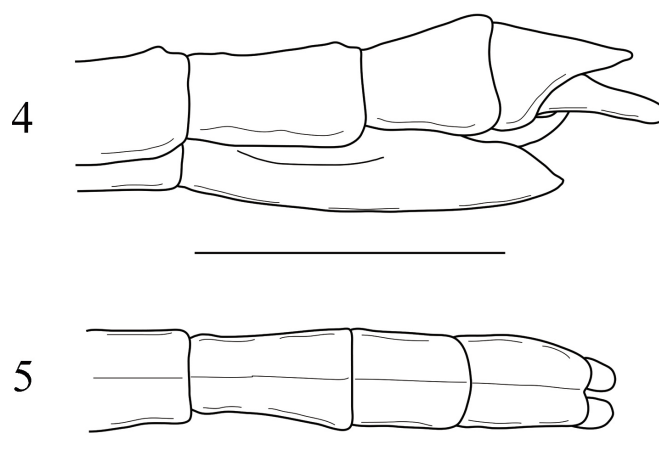


Figure 4–5. Female *Sosibia platycerca* Redtenbacher, 1908 [scale bar 5 mm]. 4. Female, end of abdomen, lateral view. 5. Female, end of abdomen, dorsal view. (Drawing by author)

Body part	Male <i>Necroscia robustior</i> (Redtenbacher, 1908)		Female <i>Sosibia platycerca</i> Redtenbacher, 1908	
	Length mm	Mean (n = 8)	Length mm	Mean (n = 3)
Body	64–70	67.2	59–66	62.7
Head	3	3	4	4
Antennae	65–78	73	40–49	43.7
Pronotum	3	3	4	4
Mesonotum	9–10	9.8	12–14	13
Metanotum incl. median segment	8.5–9.5	9.1	8	8
Profemora	22–24	23.2	12–13	12.3
Mesofemora	15–17	15.3	10–11	10.3
Metafemora	21–24	22	14–14.5	13.8
Protibiae	23–26	23.9	11–12	11.3
Mesotibiae	14–16	15.1	8–9	8.3
Metatibiae	22–27	23.6	14–15	14.3
Tegmina	5	5	3.5–4	3.8
Alae	35–39	36.8	24–25	24.3

Table 1. Measurements of male *Necroscia robustior* (Redtenbacher, 1908) and female *Sosibia platycerca* Redtenbacher, 1908.



Figure 3. Habitus of male *Necroscia robustior* (Redtenbacher, 1908) (Photo by author)



Figure 6. Habitus of female *Sosibia platycerca* Redtenbacher, 1908 (Photo by author)

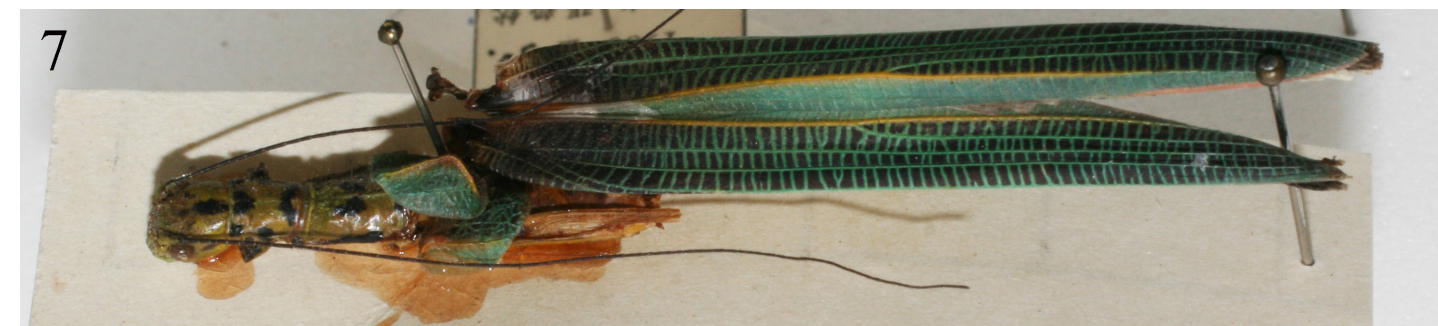


Figure 7. Habitus of female *Tagesoidea tages* Westwood, 1859 (Photo by author)