

# Two new species of the tribe Rhodometrini Agenjo, 1951 from Sichuan, China (Lepidoptera: Geometridae)

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## Abstract

Two new species of the tribe Rhodometrini Agenjo, 1951 are described from Sichuan of China: *Rhodometra rosea* Cui, Xue & Jiang, sp. n. and *Casilda hemirosea* Cui, Xue & Jiang, sp. n. Diagnoses of the new species are provided; illustrations of external features and genitalia of the new species are also presented.

KEY WORDS: Lepidoptera, Geometridae, *Casilda*, *Rhodometra*, diagnosis, morphology, taxonomy, China.

## Dos nuevas especies de la tribu Rhodometrini Agenjo, 1951 de Sichuan, China (Lepidoptera: Geometridae)

## Resumen

Se describen dos nuevas especies de la tribu Rhodometrini Agenjo, 1951 de Sichuan, China: *Rhodometra rosea* Cui, Xue & Jiang, sp. n. y *Casilda hemirosea* Cui, Xue & Jiang, sp. n. Se proporciona la diagnosis de las nuevas especies; también se presentan ilustraciones de los caracteres externos y de la genitalia de las nuevas especies.

PALABRAS CLAVE: Lepidoptera, Geometridae, *Casilda*, *Rhodometra*, diagnosis, morfología, taxonomía, China.

## Introduction

The tribe Rhodometrini Agenjo, 1951 belongs to the subfamily Sterrhinae Meyrick, 1892 (HAUSMANN, 2004). The species of the tribe are mainly distributed in the tropical African area (HAUSMANN, 2004; PARSONS *et al.*, 1999). The forewing colour of the adult is usually pale yellowish and with a rosy postmedial line (HOLLOWAY, 1997; SIHVONEN & KAILA, 2004). Although, the Sc+R<sub>1</sub> of the hindwing is anastomosing with the discal cell at least to the middle which prefers to place Rhodometrini in the Larentiinae Duponchel, [1845], but considering the characters of the genitalia, it belongs to the Sterrhinae (PROUT, 1930-1938).

The genus *Rhodometra* was established by MEYRICK (1892), and the type species *Phalaena sacraría* Linnaeus, 1767 was subsequently designed by LHOMME (1930). It is composed of eleven species distributed all over the world: the type species is almost cosmopolitan, eight species are distributed in the Afrotropical region, and two in the western Neotropical region (PARSONS *et al.*, 1999; HAUSMANN, 2004). At present, only one species, *Rh. sacraría*, has been recorded from China (ZHU & XUE, 1992).

The genus *Casilda* Agenjo, 1952 was established based on the type species *Sterrha consecraría* Staudinger, 1871. It is a small genus composed of four species found throughout the world; the species are known to be distributed in the western Palaearctic and the eastern Afrotropical regions (PROUT,

1912-1916, 1934-1939; AGENJO, 1952; SUTTON, 1963; RAINERI, 1992; VIIDALEPP, 1996; PARSONS *et al.*, 1999; HAUSMANN, 2004). At present, only one species, *C. antophilaria* (Hübner, [1813]) has been recorded from China.

As a result of study of material obtained from recent expeditions and re-examination of collection materials from China, we have discovered several new species of Sterrhinae (CUI *et al.*, 2018a, 2018b, 2019a, 2019b, 2019c; XUE *et al.*, 2018). The purpose of this paper is to describe two new species of the tribe Rhodometrini from China: *Rhodometra rosea* Cui, Xue & Jiang, sp. n. and *Casilda hemirosea* Cui, Xue & Jiang, sp. n., and provide diagnostic characters of the new taxa.

## Materials and methods

Specimens used in this study are deposited in the following collections: Institute of Zoology, Chinese Academy of Sciences (IZCAS), Beijing, China, and Zoologisches Forschungsmuseum Alexander Koenig (ZFMK), Bonn, Germany. Terminology for wing venation follows the Comstock-Needham System (COMSTOCK, 1918) as adopted for Geometridae by SCOBLE (1992) and HAUSMANN (2001); that for genitalia follows PIERCE (1914), KLOTS (1970), and NICHOLS (1989). Photographs of moths were taken with a digital camera. Composite images were generated using Auto-Montage software version 5.03.0061 (Synoptics Ltd). The plates were compiled using Adobe Photoshop software 7.0. Ink (Adobe Systems Software Ireland Ltd).

## Taxonomy

### *Rhodometra rosea* Cui, Xue & Jiang, sp. n. (Figs 1, 4-5, 10)

Material examined: Holotype ♂, CHINA: Sichuan (IZCAS): Batang, Xiaqiong, Bashen Wenquan shanzhuang, 2662 m, 28-29-VII-2014, coll. Pan Xiaodan. Paratypes: Sichuan (IZCAS): 1 ♂, Dukou, Pingdi, 20-VI-1981, coll. Zhang Baolin; 2 ♀♀, Dukou, 1900 m, 22-VIII-1980, 10-VI-1981, coll. Zhang Baolin; 1 ♀, Yanyuan, Jinhe, 1250 m, 2-VII-1984, coll. Liu Dajun; 1 ♀, Huili, Yimen, 31-VII-1974; Sichuan (ZFMK): 1 ♀, Batang (Tibet), Im Tal des Yangtze, 2800 m; 26-IX-1936, coll. H. Höne.

Description adult (Fig. 1): Antennae yellowish white or yellowish brown dorsally, blackish grey at apex; bipectinate in male, pectination long, filiform at apical one-fifth; filiform in female, ventral side covered with short cilia. Frons yellow, strongly protruding. Labial palpus yellow, extending beyond frons, the terminal segment short and thick. Vertex yellow. Patagia, tegulae and dorsal side of thorax yellow. Hind tibia in male and female with two pairs of spurs. Forewing length: male 18–20 mm; female 18 mm. Forewing pointed at apex, outer margin smooth; hindwing with apex rounded. Forewing yellow; hindwing yellowish white. Forewing with costa rosy at basal one-third; discal spot absent; postmedial line rosy, arising from apex, straight, inclined inwards to middle part of inner margin; fringes pale yellow. Hindwing without transverse line. Underside paler; postmedial line of forewing distinct, yellowish brown, deeper on veins. Venation. Forewing with one areole;  $R_1$ – $R_4$  stalked,  $R_1$ – $R_4$  and  $R_5$  connate; hindwing with  $Sc+R_1$  fused ca. one-half length of discal cell;  $R_s$  and  $M_1$  shortly stalked, veins  $M_3$  and  $CuA_1$  separated.

Male genitalia (Figs 4-5): Uncus thin and digitiform. Socii process-like, small and thick. Gnathos absent. Valva columniform, short, flat with short setae at apex. Saccus rounded and broad. Aedeagus straight with a small spur at subapical part; vesica with a small cornutus.

Female genitalia (Fig. 10): Apophyses anteriores ca. one-half of apophyses posteriors in length. Surrounding of ostium sclerotised. Sterigma rounded and raised at middle of posterior part. Ductus bursae membranous, slightly sclerotised near ostium, shorter than corpus bursae. Corpus bursae long; signum with one vertical bar, slightly sclerotised surrounded, nearly oval-like.

Diagnosis: *Rh. rosea* is very similar to *Rh. sacraria* (Linnaeus, 1767) (Figs 2, 6-7, 11); however, the discal spot of the forewing is absolutely absent in *Rh. rosea*, while in *Rh. sacraria*, it is present or traceable. In the genitalia, the uncus of the male genitalia is narrower with rounded apex in *Rh. rosea*,

while it is broader with acute apex in *Rh. sacraria*; the terminal margin of the sterigma of the female genitalia is rounded in *Rh. rosea*, while it is produced in *Rh. sacraria*; the ductus bursae has irregularly shaped sclerite near the ostium in *Rh. sacraria*, while *Rh. rosea* does not have this character.

Distribution: China (Sichuan).

Etymology: The species is named on the basis of the Latin *roseus*, which refers to the reddish colour of the postmedial line on the forewing.

***Casilda hemirosea* Cui, Xue & Jiang, sp. n.** (Figs 3, 8-9)

Material examined: Holotype ♂, CHINA: Sichuan (IZCAS): Batang, Xiaqiong, Bashen wenquan shanzhuang, 2662 m, 28-29-VII-2014; coll. Pan Xiaodan. Paratypes: Sichuan (IZCAS): 1 ♂, Batang, 2000 m; 13-VIII-1982, coll. Wang Shuyong. Sichuan (ZFMK): 1 ♂, Batang (Tibet), Untere Urwaldzone, 3800 m, 3-X-1936, coll. H. Höne.

Description: Adult (Fig. 3). Male antennae white ventrally at basal part and gradually deep grey towards apex; strongly bipectinate to four-fifths. Frons yellow diffused with reddish scales, strongly protruded. Labial palpi yellowish brown, not extending beyond frons, third segment thick. Vertex yellowish with reddish scales. Patagia yellow. Tegulae yellowish with reddish scales. Hind tibia with two pairs of spurs in male. Forewing length: male 16 mm. Forewing with acute apex; outer margin almost straight. Hindwing with rounded outer margin. Forewing yellow; hindwing paler than forewing. Forewing with costa reddish at basal half; discal spot absent; postmedial line reddish, raising from sub-apex, straight, inclined inwards to apical one-third of inner margin; fringes pale yellow. Hindwing without transverse line. Underside with grey scales between basal part and postmedial line on forewing. Venation. Forewing with one areole;  $R_1$ - $R_4$  stalked,  $R_1$ - $R_4$  and  $R_5$  connate; hindwing with  $Sc+R_1$  fused ca. one-half length of discal cell;  $R_s$  and  $M_1$  shortly stalked, veins  $M_3$  and  $CuA_1$  separated.

Male genitalia (Figs 8-9): Uncus digitiform and acute at apex. Socii short and stout with a small protrusion basally inside. Valva narrow and long; costal margin concave and forming a triangular process at sub-apex; ventral margin densely covered with strong bristles with a very small strongly sclerotised process at middle. Vinculum with a pair of triangular sclerites; Juxta small and strongly sclerotised. Aedeagus with an acute spur vertically at apex; cornutus a stout spur.

Female genitalia: Unknown.

Diagnosis: The species is different from other congeners by the combination of the following characters: the reddish line on the costa of the forewing is ca. one-half length of the costa; the postmedial line of the forewing is extending from the sub-apex to terminal one-third of the inner margin. In the male genitalia, the costal margin of the valva is curved and forms a triangular process subapically; the middle part of the ventral margin of the valva has a very small strongly sclerotised process.

Distribution: China (Sichuan).

Etymology: The species is named based on the Latin *hemi-* and *roseus*, which refers to the pale reddish colour on the basal half of the costa of the forewing.

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