

A new genus *Circumplema* in the subfamily Epipleminae (Lepidoptera: Uraniidae), with descriptions of a new species from China

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Abstract: A new genus *Circumplema* **gen. nov.** in the subfamily Epipleminae is erected, containing the new species *C. sinensis* **sp. nov.** from China. The images of adults (spread and living materials) and genitalia are provided, and compared with a similar species *Europlema koreana* Sohn, 2022.

Key words: Uraniidae; Epipleminae; taxonomy

环双尾蛾属——中国双尾蛾亚科一新属一新种记述（鳞翅目：燕蛾科）

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摘要: 本文建立双尾蛾亚科1新属: 环双尾蛾属 *Circumplema* **gen. nov.**, 描述1新种: 中华环双尾蛾 *C. sinensis* **sp. nov.**。文中提供了新种的成虫标本照、生态照和外生殖器图, 并与近缘物种 *Europlema koreana* Sohn, 2022 进行了对比。

关键词: 燕蛾科; 双尾蛾亚科; 分类

Introduction

The subfamily Epipleminae was established by Hampson in 1892. It is the most diverse lineage within the family Uraniidae (Minet & Scoble 1999). To date, this subfamily comprises more than 600 species in 70 genera (Sohn & Yen 2005). Up to now, 12 genera of Epipleminae have been recorded from China: *Chaetoceras* Warren, 1896, *Chundana* Walker, 1862, *Dysaethria* Turner, 1911, *Epiplema* Herrich-Schäffer, [1855], *Europlema* Holloway, 1998, *Eversmannia* Staudinger, 1871, *Monobolodes* Warren, 1898, *Oroplema* Holloway, 1998, *Orudiza* Walker, 1861, *Phazaca* Walker, 1863, *Pterotosoma* Warren, 1903, and *Warrenioplema*

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Holloway, 1998 (Chu *et al.* 2004; Fu *et al.* 2020).

In this study, we describe a new species (*Circumplema sinensis* **sp. nov.**) with external appearance similar to *Europlema koreana* Sohn, 2022. However, genitalia structure shows significant differences and does not conform to the known genera. Therefore, we establish a new genus in the subfamily Epipleminae, *Circumplema* **gen. nov.**, to accommodate this new species.

Material and methods

Specimens were collected by 220V/450W mercury and DC black light lamps in Hubei and Yunnan. Dissection and preparation of genital sections were performed using standard methods (Kononenko & Han 2007). A Nikon Z6II camera was used to photograph specimens. Photos of the genitalia slides were taken using the Olympus Photo microscope. Further processing used Helicon Focus software and Adobe Photoshop CC2019. All examined specimens are deposited in the collection of Northeast Forestry University (NEFU) in Harbin, China.

Taxonomy

Circumplema **gen. nov.**

Type species. *Circumplema sinensis* **sp. nov.**

Description. Adult. Head white; antennae filiform. Thorax white. Abdomen white, each segment with black scales. Forewing ground color with white; postmedial line dark brown, wavy; antemedial and medial areas covered with grey patches; subterminal and terminal areas dark brown mixed with black; apex white. Hindwing white; antemedial line dark brown, discontinuous; postmedial line dark brown, wavy, excurved at M_3 ; basal area with grey patches; marginal shade dark brown, mixed with white in the posterior half; the R_s and M_3 with tails at outer margin.

Male genitalia. Uncus sickle-shaped. Tegumen triangular, coalescence with vinculum. Socii present, finger-shaped. Valva tongue-shaped, covered with dense hair; clavus long, finger-shaped, apex pointed, with a small protuberance near the apex, narrowed in middle; sacculus straight; basal saccular process long and slender; costa with a bulge at the middle of valva. Juxta slit-shaped. Aedeagus slightly curved, with a small protuberance at middle. Vesica membranous, with a knife-shaped cornuti.

Female genitalia. Papillae anales hoof-shaped. Apophysis posterioris ca 4× the length of apophysis anterioris. Ductus bursae tubular, anterioris part sclerotized. Corpus bursae oval-shaped, densely covered with graniculi, signum heart-shaped.

Etymology. The generic name is derived from the Latin word “circum”, which means circle, referring to the vinculum and the tegumen coalescing and becoming circular shaped.

Diagnosis. In external appearance, this new genus is similar to *Europlema* Holloway, 1998, but can be distinguished by the following characters: (1) male genitalia: vinculum and tegumen coalescence, present as board wing-shaped, socii and clavus present; in *Europlema* vinculum U-shaped, socii and clavus absent; (2) female genitalia: apophysis posterioris ca 4× the length

of apophysis anterioris, ductus bursae long; in *Europlema* apophysis posterioris ca 2× the length of apophysis anterioris, ductus bursae very short, sclerotized.

Distribution. China (Hubei, Yunnan).

***Circumplema sinensis* sp. nov.** (Figs. 1–3)

Description. Adult (Figs. 1A, 1B, 3B, 3D). Wingspan 15–19 mm in male, female 18–20 mm. Head white; labial palpus up-curved; antennae filiform. Thorax, patagium and tegula white. Abdomen white, each segment with black scales. Forewing ground color with white; postmedial line dark brown, wavy; antemedial and medial areas covered with grey patches; subterminal and terminal area dark brown mixed with black; apex white. Hindwing white; antemedial line dark brown, discontinuous; postmedial line dark brown, wavy, excurved at M_3 ; basal area with grey patches; marginal shade dark brown, mixed with white in the posterior half; the R_s and M_3 with tails at outer margin; terminal line with a small dot at M_3-Cu_1 .

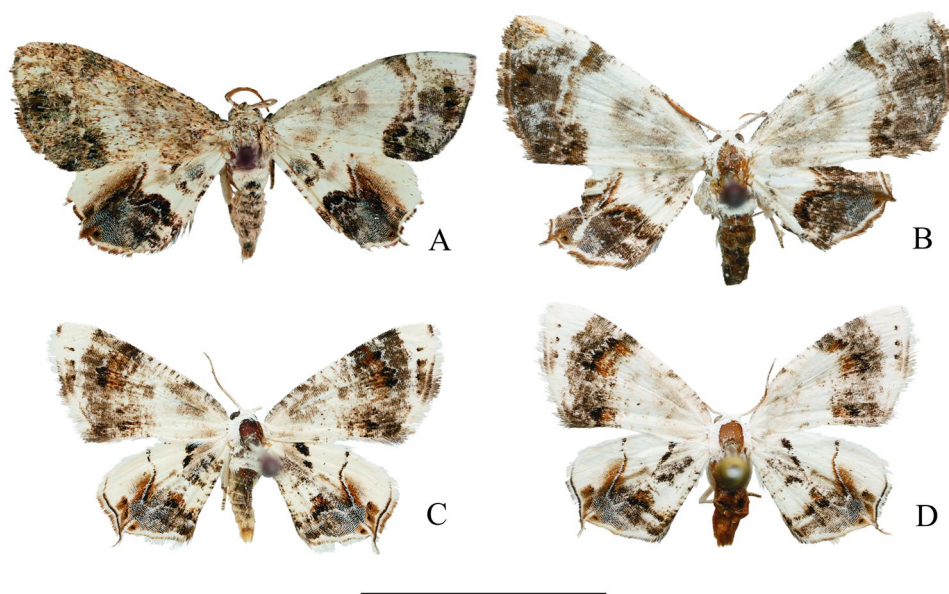


Figure 1. Adults of *Circumplema* and *Europlema* spp. A. *C. sinensis* sp. nov., male, holotype (Hubei); B. *C. sinensis* sp. nov., female, paratype (Hubei); C. *E. koreana*, male (Hubei); D. *E. koreana*, female (Anhui). Scale bar = 1 cm.

Male genitalia (Fig. 2A). Uncus sickle-shaped, with short setae. Tegumen triangular ca 3× the length of uncus. Socii long, finger-shaped, terminal part slightly expanded. Valva tongue-shaped, covered with dense hair; clavus long, finger-shaped, apex pointed, with a small protuberance near the apex, narrowed in middle; sacculus straight; basal saccular process long and slender, covered with setae; costa bar-shaped, extends before cucullus, with a bulge at terminal part. Juxta membranous, slit-shaped. Vinculum and tegumen coalescence, present as broad wing-shaped. Aedeagus tubular-shaped, slightly curved, with a small protuberance at middle, coecum ca 1/3× the length of aedeagus. Vesica membranous, with a knife-shaped and

sclerotized cornuti.

Female genitalia (Fig. 2B). Papillae anales hoof shaped, covered with short setae. Apophysis posterioris long, ca 4× the length of apophysis anterioris. Ostium bursae flat, membranous. Ductus bursae tubular, anterioris part sclerotized, approximately as long as corpus bursae. Corpus bursae membranous, oval-shaped, densely covered with graniculi, with a heart-shaped, serrated signum.

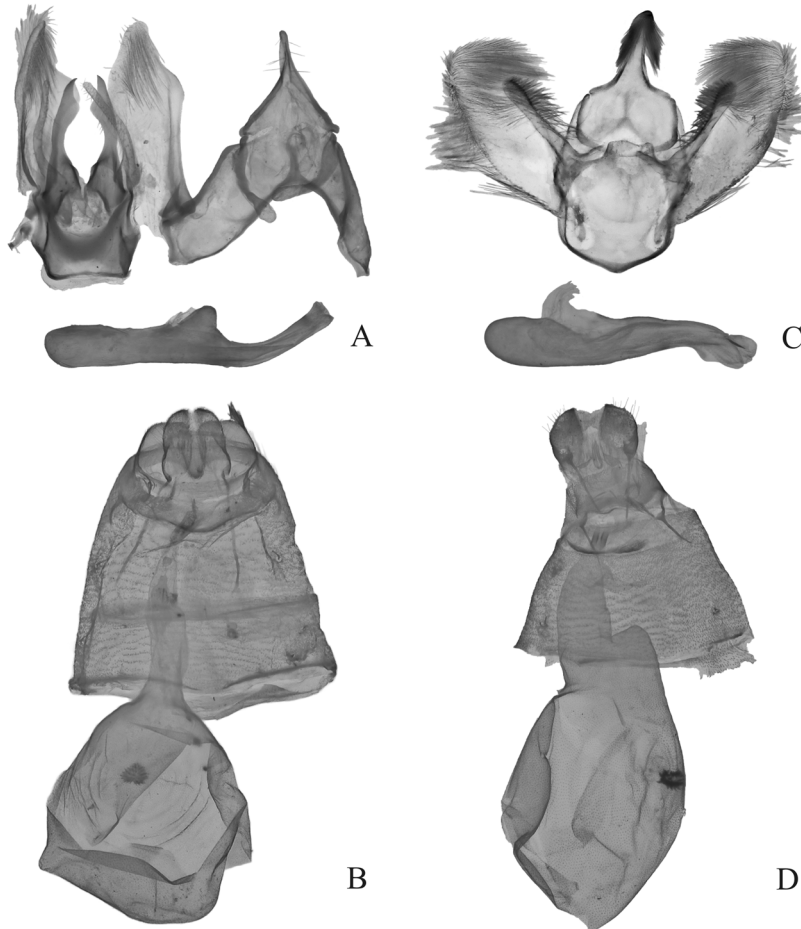


Figure 2. Genitalia of *Circumplema* and *Europlema* spp. A. *C. sinensis* sp. nov., male, holotype, genit. prep. no. hmx-200-1; B. *C. sinensis* sp. nov., female, paratype, genit. prep. no. hmx-204-2; C. *E. koreana*, male, genit. prep. no. hmx-208-1; D. *E. koreana*, female, genit. prep. no. hmx-208-2.

Holotype. ♂, **China**, Hubei, Huanggang, Yingshan County, Wujiashan National Forest Park, 10-VI-2022, leg. JX WANG & ZG XU, genit. prep. no. hmx-96-1. **Paratypes.** 1♂, **China**, Yunnan, Pu'er, Simao District, 15–19-VII-2009, leg. HL HAN & MJ QI, genit. prep. no. hmx-110-1; 1♂, **China**, Yunnan, Pu'er, Manxieba, 14-VI-2007, leg. HL HAN, genit. prep. no. hmx-200-1; 2♀, **China**, Hubei, Huanggang, Yingshan County, Wujiashan National Forest Park, 9-VI-2022, leg. JX WANG & ZG XU, genit. prep. no. hmx-204-2, hmx-233-2.

Etymology. The specific epithet is based on the distribution region of this new species.

Remarks. This new species is similar to *Europlema koreana* Sohn, 2022, but can be distinguished from the latter by the following characters: (1) Forewing: the terminal area covered with grey patches, with white scales near the apex; in *E. koreana* the terminal area is white, with row formed by three black dots. (2) Hindwing: outer margin with two tails at R_s and M_3 ; in *E. koreana* with only one tail at M_3 . (3) Male genitalia: the uncus is sickle-shaped; the socii and clavus present; the aedeagus with a small protuberance at middle; in *E. koreana* the uncus is lanceolate-shaped, covered with long hair; the socii and clavus absent; the aedeagus is tube-shaped, without protuberance. (4) Female genitalia: the apophysis posterioris long, ca $4\times$ the length of apophysis anterioris, the signum is heart-shaped; in *E. koreana* the apophysis posterioris ca $2\times$ the length of apophysis anterioris, the signum is elliptical shaped.

The living materials were examined from Hubei, Fujian and Guizhou with images (Fig. 3B), 28-V-2024, (Fig. 3C), 11-IV-2024 and (Fig. 3D), 23-VI-2024. Therefore, this new species is also distributed in Fujian and Guizhou.

Distribution. China (Hubei, Fujian, Guizhou, Yunnan).

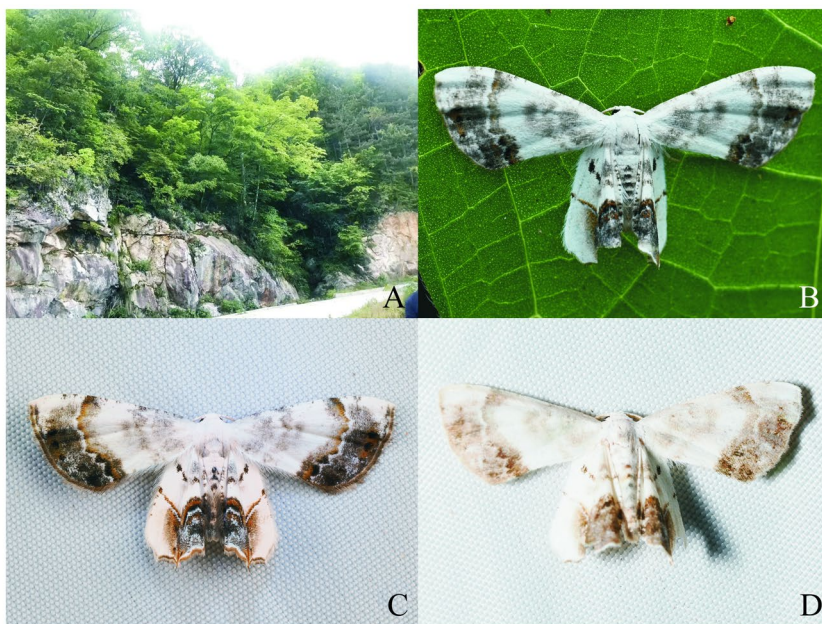


Figure 3. Habitat and living adults of *Circumplema sinensis* **sp. nov.** A. Habitat photo in Hubei, Huanggang, Wujiashan National Forest Park (Photo by JX WANG); B–D. Living adults photos, collected from: B. Hubei, Wujiashan National Forest Park (Photo by CR. DU); C. Fujian, Fuzhou, Shoushan township Xixia Village (Photo by Z. PENG); D. Guizhou, Libo County, Maolan National Nature Reserve (Photo by Z. PENG).

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