

ORIGINAL ARTICLE

# Review of the genus *Eugauria* Snellen (Lepidoptera: Crambidae: Musotiminae) in China, with descriptions of two new species

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**Abstract** Three species of the genus *Eugauria* Snellen are reported, in which two species are described as new to science, named *E. arcuosa* Chen & Wu, **sp. nov.** and *E. crenata* Chen & Wu, **sp. nov.** The adults and genitalia structures of all species are described and illustrated. A key to the species of the genus is provided.

**Key words** Lepidoptera, Crambidae, Musotiminae, *Eugauria*, new species.

## 1 Introduction

The genus *Eugauria* was erected by Snellen in 1901, based on the monotype, *E. compactalis* Snellen, 1901 from Java. The genus was formerly placed in the subfamily Acentropinae (Klima, 1937), synonymized with *Cataclysta* by Shaffer *et al.* (1996), revalidated and transferred to the subfamily Musotiminae by Speidel and Mey (1999).

So far, only one species, *E. albidentata* (Hampson, 1897), was reported in the genus. It is distributed from Java to Taiwan (Shibuya, 1928). In this paper, two additional species from China are described as new to science.

## 2 Materials and methods

The examined specimens are from the collection of the Institute of Zoology, Chinese Academy of Sciences (IZCAS). The material was sampled mainly by light traps. Illustrations of the genital structure were made with a camera lucida. Methods of dissection, morphometric characters and terminology follow Yoshiyasu (1985).

The types and other specimens examined are deposited in IZCAS, Beijing, China.

## 3 Taxonomy

### *Eugauria* Snellen, 1901

*Eugauria* Snellen, 1901. *Tijdschr. Ent.*, 43: 290; Speidel & Mey, 1999. *Tijdschr. Ent.*, 142: 138. Type species: *Eugauria compactalis* Snellen, 1901, by monotypy.

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Descriptions. Small size. Head and thorax dark; labial palpi upturned, second segment slender and third segment pointed; maxillary palpi upturned; proboscis relatively short.

Venation (Fig. 1). Forewing with vein Sc arising from base to middle of costa;  $R_{1-5}$  arising from the upper angle of cell,  $R_1$  close to but not stalked with  $R_{2+3+4}$ ,  $R_2$ ,  $R_3$  and  $R_4$  anastomosed,  $R_{2+3+4}$  stalked with  $R_5$ ;  $M_1$  arising from 1/3 of discocellulares;  $M_2$  arising above lower angle of cell;  $M_3$  stalked with  $Cu_1$ , arising from lower angle of cell;  $Cu_2$  arising from before lower angle of cell. Hindwing with Sc+ $R_1$  and Rs stalked, arising from before upper angle of cell;  $M_1$  arising from upper angle of cell;  $M_2$ ,  $M_3$  and  $Cu_1$  arising nearby of lower angle of cell;  $Cu_2$  arising before lower angle of cell.

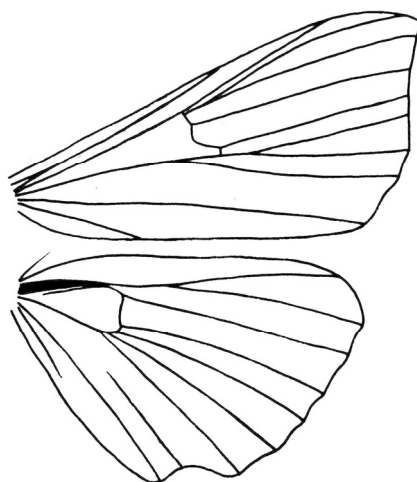


Fig. 1. Venation of *E. arcuosa* Chen & Wu, **sp. nov.**

Wing patterns. Forewing dark fuscous; a dark spot at upper angle of cell, sometimes blurry; a larger white patch at postmedial area, extending from costa to  $Cu_1$ ; a smaller crescent white patch present or absent, at the outside of the apical yellow band; a yellow band between the white patches. Hindwing dark fuscous; a dark spot at middle of cell, sometimes blurry; anal angle with an incision; submarginal band with 5 connected black eye spots, eye spots with silvery spots centrally.

Male genitalia. Uncus and gnathos slender; gnathos with dorsal teeth at apex; tegumen with inverse V-shaped ridge dorsally; valva broadened from base to distal; transtilla present; sacculus broad and sclerotized, usually with a spine-like apical harpe; vinculum long; saccus rounded; juxta plate-like; aedeagus slender and sclerotized.

Female genitalia. Anal papillae narrow, with long setae; apophysis posterioris and anterioris relatively short; ostium bursae sclerotized; ductus seminalis arising from below ostium bursae; corpus bursae membranous, usually with signa.

Biology. The species of *Eugauria* feed on ferns, just as *Nephrolepis* Schott.

Distribution. Oriental Region (China, Malaysia).

Remarks. The species of this genus are difficult to separate by external characters. The main difference is on the white patches of forewing. *E. albidentata* and *E. arcuosa* Chen & Wu, **sp. nov.** own a small crescent white patch at the outside of the apical yellow band of the forewing, while *E. crenata* Chen & Wu, **sp. nov.** is absent of such a patch (black arrow in Figs. 2a, 3a). Moreover, the shape of the inner edge of the larger white patch is different in these species, which is strongly incurved in *E. crenata* Chen & Wu, **sp. nov.**, smooth in *E. arcuosa* Chen & Wu, **sp. nov.** and intermediate in *E. albidentata* (white arrow in Figs 2a–4a).

Differences in genital structures are quite obvious in these species. In male genitalia, *E. albidentata* can be differentiated by the basal half of the valval costa strongly sclerotized and the small and papilla-like transtilla. *E. arcuosa* Chen & Wu, **sp. nov.** can be separated by having a bifid transtilla, the sacculus without an apical harpe and the aedeagus with a branch at base. *E. crenata* Chen & Wu, **sp. nov.** can be distinguished by the broader valva, the valval costa not strongly sclerotized, and the slender and finger-like transtilla. In female genitalia, *E. arcuosa* Chen & Wu, **sp. nov.** and *E. crenata* Chen & Wu, **sp. nov.** can be distinguished by the presence of the signa.

**Key to the species of *Eugauria*.**

1. Forewing with a small white crescent patch at outside of apical yellow band (black arrow in Figs 2a, 3a); inner edge of the inner and larger white patch smooth or slightly incurved (white arrow in Figs 2a–4a). Male genitalia with sacculus broad..... 2  
Forewing without small crescent patch; inner edge of white patch strongly incurved. Male genitalia with sacculus narrow .....  
..... *E. crenata* Chen & Wu, sp. nov.
2. Forewing with inner edge of the inner and larger white patch slightly incurved. In male genitalia, apex of uncus pointed, basal half of valval costa strongly sclerotized, transtilla papilla-like and aedeagus without branch..... *E. albidentata*  
Forewing with inner edge of the inner and larger white patch smooth. In male genitalia, apex of uncus rounded, valval costa weakly sclerotized, transtilla bifid and aedeagus with a sclerotized apical branch..... *E. arcuosa* Chen & Wu, sp. nov.

***Eugauria albidentata* (Hampson, 1897) (Figs 2, 5)**

*Cataclysta albidentata* Hampson, 1897. *Trans. Ent. Soc. Lond.*, 1897: 153. Type-locality: Java.

*Eugauria compactalis* Snellen, 1901. *Tijdschr. Ent.*, 43: 291, pl. 181, fig. 12. Type-locality: Java.

*Eugauria albidentata*: Speidel & Mey, 1999. *Tijdschr. Ent.*, 142: 138.

**Diagnosis.** The species is different from others by the inner edge of the inner and larger white patch on the forewing slightly incurved. In male genitalia, the basal half of the valval costa is strongly sclerotized, the broad sacculus bears an apical harpe, and the transtilla is small and papilla-like.

**Descriptions.** Adults. Wing span of male 12 mm. Head, thorax and abdomen dark fuscous; labial palpi upturned, dark fuscous on sides, length about 2 times of diameter of compound eyes, 2nd slender and 3rd segment pointed; maxillary palpi upturned; proboscis relatively short. Forewing dark fuscous; a dark spot at upper angle of cell; a larger white patch at postmedial area, extending from costa to  $Cu_1$ , its inner edge slightly incurved; a smaller crescent white patch at outside of the apical yellow band; a yellow band between the white patches; cilia dark fuscous. Hindwing dark fuscous; a black spot at middle of cell; anal angle with an incision; submarginal band with 5 connected black eye spots, eye spots with a silvery spot centrally; cilia dark fuscous.

**Male genitalia.** Uncus slender, pointed at apex; gnathos slender, as long as uncus, apex pointed, with dorsal teeth; tegumen with inverted V-shaped ridge dorsally; valva broadened from base to distal; costa with basal half strongly sclerotized, middle portion projected upwards; transtilla small papilla-like; sacculus broad and sclerotized, with a spine-like apical harpe; vinculum long; saccus large, rounded; juxta plate-like; aedeagus slender and sclerotized.

**Female genitalia.** Unknown.

**Biology.** This species feeds on the ferns of *Nephrolepis* Schott (Yen, Solis & Goolsby, 2004). A life cycle lasts no more than 20 days (Yen, per. comm.).

**Host plants.** *Nephrolepis* sp.

**Material examined.** 1♂, Taiwan, Kuei-shan Is. (24.8°N, 121.9°E), 27 May 1999, Hsiao-Yue Wang (Ny1016); 1♂, Taiwan, Yilan, Fushan (24.7°N, 121.7°E), 620 m, 12 April 2008, Fu-Qiang Chen, deposited in IZCAS.

**Distribution.** China (Taiwan); Java.

***Eugauria arcuosa* Chen & Wu, sp. nov. (Figs 3, 6–7)**

**Diagnosis.** The species is different from others by forewing with the inner edge of the inner and larger white patch smooth. In male genitalia, the apex of the uncus is rounded, the transtilla is bifid, the broad sacculus lacks an apical harpe, and the aedeagus has a branch at the base.

**Descriptions.** Adults. Wing span male 13 mm, female 15 mm. Head, thorax and abdomen dark fuscous; labial palpi upturned, dark fuscous on sides, the length about 2 times of the diameter of compound eyes, the 2nd slender and the 3rd segment pointed; maxillary palpi upturned; proboscis relatively short. Forewing dark fuscous; a black spot at the upper angle of cell; a larger white patch at postmedial area, arising from costa to  $Cu_1$ , the inner edge smooth; a smaller crescent white patch at the outside of the apical yellow band; a yellow band between the white patches; cilia dark fuscous. Hindwing dark fuscous; a black spot at the middle of cell; anal angle with an incision; submarginal band with 5 connected black eye spots, the eye spots with a silvery spot centrally; cilia dark fuscous.

**Male genitalia.** Uncus slender, the apex rounded; gnathos slender, the length about 2/3 of uncus, the apex rounded, with dorsal teeth; tegumen with inverse V-shaped ridge dorsally; valva broadened from the base to the distal, transtilla large and bifid, sacculus broad and sclerotized, folded near the base; vinculum long; saccus large, rounded; juxta round, with the

terminal constricted; aedeagus slender and sclerotized, with a branch at the base.

Female genitalia. Anal papillae narrow, with long setae; apophysis posterioris and anterioris relatively short, apophysis anterioris swollen near the base; ositum bursae sclerotized; ductus bursae relatively short; ductus seminalis arising just below ostium bursae; corpus bursae elliptic, signa consisting of many minute spines, about 1/3 area of corpus bursae.

Holotype ♂, Hainan, Bawangling, Bureau of forestry (19.1°N, 109.1°E; elev. 145 m), 12 May 2007, Fu-Qiang Chen (Ny1018).

Paratypes: 1♀, Hainan, Jianfengling (18.7°N, 108.9°E), 13 December 1981, You-Jiong Lin (Ny1017); 1♂, Hainan, Ledong, Jianfengling, Chahekou (18.8° N, 108.9° E; elev. 206 m), 4 December 2009, Chao Yang, deposited in IZCAS.

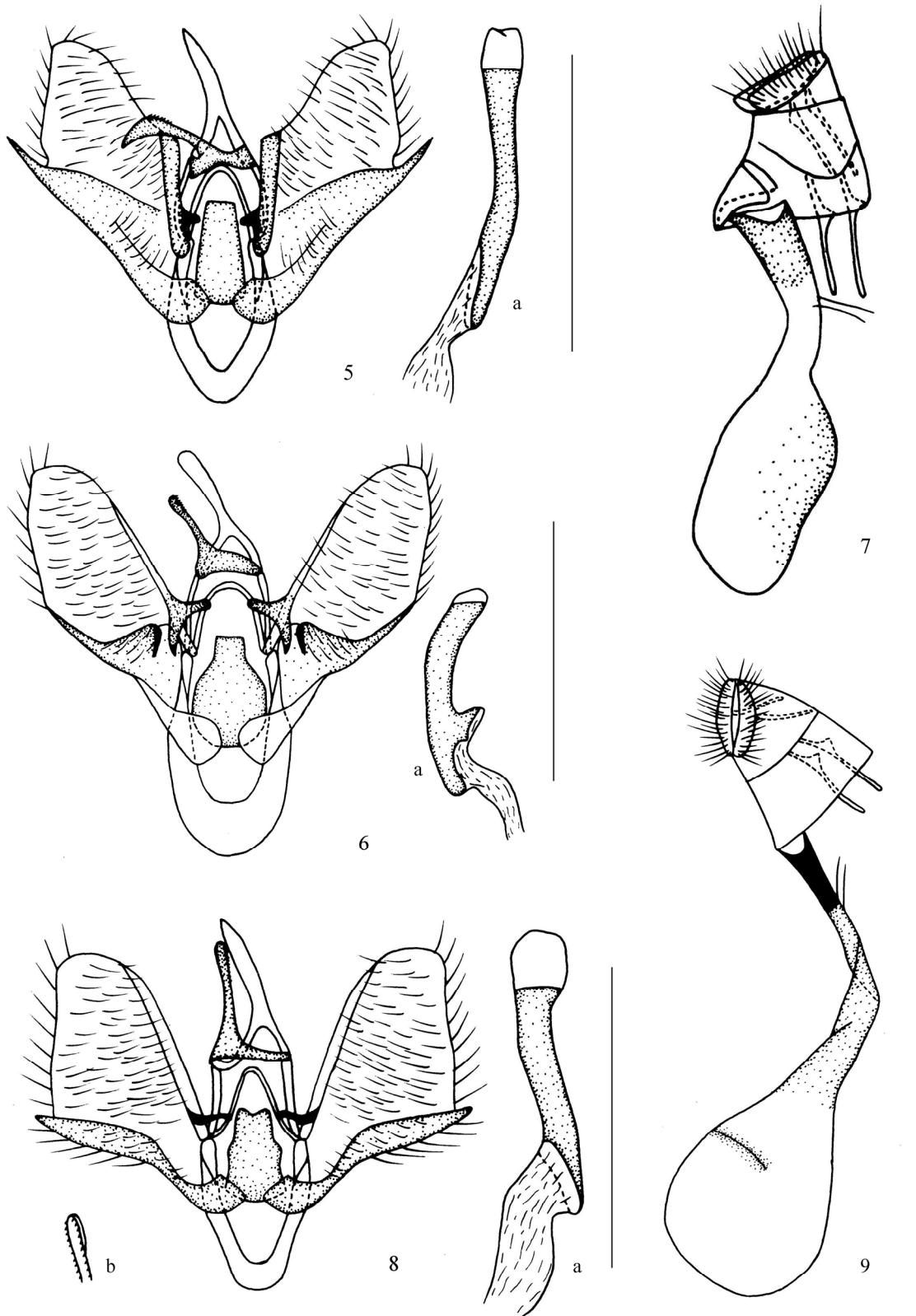
Distribution. China (Hainan).

Etymology. The name is derived from the Latin "*arcus*", corresponding to the shape of inner edge of the white patch.

*Eugauria crenata* Chen & Wu, sp. nov. (Figs 4, 8–9)



Figs 2–4. Adults of *Eugauria* spp. (a. enlargement of forewing). 2. *E. albidentata*. 3. *E. arcuosa* Chen & Wu, sp. nov., holotype, ♂. 4. *E. crenata* Chen & Wu, sp. nov., holotype, ♂.



Figs 5–9. Genitalia of *Eugauria* spp. (a. aedeagus; b. dorsal view of apical gnathos). 5. *E. albidentata*, male. 6–7. *E. arcuosa* Chen & Wu, **sp. nov.**, male and female. 8–9. *E. crenata* Chen & Wu, **sp. nov.**, male and female. Scales bars = 1 mm.

**Diagnosis.** Forewing with the inner edge of the white patch strongly incurved. In male genitalia, the apex of uncus is pointed, the transtilla is finger-like, the narrow sacculus bears an apical harpe, and the valva is broad at apex.

**Descriptions.** Adults. Wing span male 13 mm, female 15 mm. Head, thorax and abdomen dark fuscous; labial palpi upturned, dark fuscous on sides, the length about 2 times of the diameter of compound eyes, the 2nd slender and the 3rd segment pointed; maxillary palpi upturned; proboscis relatively short. Forewing dark fuscous; a black spot at the upper angle of cell; a white patch at postmedial area, arising from costa to Cu<sub>1</sub>, the inner edge strongly incurved; a yellow band at the outside of the white patch; the outside of the yellow band without the crescent patch, which present in other two species of this genus; cilia dark fuscous. Hindwing dark fuscous; a black spot at the middle of cell; anal angle with an incision; submarginal band with 5 connected black eye spots, the eye spots with a silvery spot centrally; cilia dark fuscous.

**Male genitalia.** Uncus slender, the apex pointed; gnathos slender, little shorter than uncus, apex rounded, with dorsal teeth; tegumen with inverse V-shaped ridge dorsally; valva broaden from the base to the distal, transtilla slender, finger-like, sacculus narrow and sclerotized, with a blunt spine-like apical harpe, the harpe shorter than that of *E. albidentata*; vinculum long; saccus large, rounded; juxta plate-like; aedeagus slender and sclerotized.

**Female genitalia.** Anal papillae narrow, with long setae; apophysis posterioris and anterioris relatively short, apophysis anterioris swollen near the base; ostium bursae sclerotized; ductus bursae long, ductus seminalis arising just below ostium bursae; corpus bursae rounded, membranous, signa lined, the length about half diameter of corpus bursae.

**Holotype** ♂, Hainan, Bawangling, Dong'er Forestry-centre (19.1°N, 109.2°E; elev. 1015 m), 8 May 2007, Fu-Qiang Chen (Ny1023), deposited in IZCAS.

**Paratype** 1♀, Hainan, Jianfengling (18.7°N, 108.9°E), 1 December 1981, Zhi-Qing Chen (Ny1025), deposited in IZCAS.

**Distribution.** China (Hainan).

**Etymology.** The name is derived from the Latin "*crenate*", corresponding to the shape of inner edge of the white patch.

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