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● New species and notes of the family Epicopeiidae from China (Lepidoptera, Epicopeiidae)


Wen-Bo YU¹, Zhuo-Heng JIANG^{2,3,4}, Zi-Chun XIONG⁵, Yue PAN^{2,3,6} & Shao-Ji HU^{2,3*}


¹College of Landscape Architecture, Nanjing Forestry University, 159 Longpan Rd., Nanjing 210037, Jiangsu Province, China; 



<https://orcid.org/0000-0002-3166-805X>;  yuwenbo@njfu.edu.cn



²Yunnan Key Laboratory of International Rivers and Transboundary Eco-Security, Yunnan University, Kunming 650500, Yunnan Province, China



³Institute of International Rivers and Eco-Security, Yunnan University, Kunming 650500, Yunnan Province, China

⁴School of Life Science, Westlake University, Hangzhou 310023, Zhejiang Province, China;  <https://orcid.org/0009-0004-1814-6806>;

 jzhsphingidae@gmail.com

⁵Ailaoshan Station for Subtropical Forest Ecosystem Research, Jingdong 676209, Yunnan Province, China;  <https://orcid.org/0009-0008-5639-9926>;  924604320@qq.com

⁶ <https://orcid.org/0000-0002-8143-3064>;  tangerinepan@163.com

*Corresponding author;  <https://orcid.org/0000-0002-1615-9601>;  shaojiu@hotmail.com

Abstract: In this study we describe a new species of the genus *Mimaporina* Wei & Yen, 2017, *Mimaporina pura* sp. nov., based on morphological differences with its allied species. We also report the female of *Amana angulifera* Walker, 1855 for the first time. The diagnostic features including genitalia, adult habitus, habitat and distribution are illustrated.

Keywords: Epicopeiidae, first record, new species, taxonomy, Yunnan Province

● 中国凤蛾科之新发现与评注（鳞翅目：凤蛾科）

余文博¹, 蒋卓衡^{2,3,4}, 熊紫春⁵, 潘越^{2,3}, 胡劭骥^{2,3*}

¹风景园林学院, 南京林业大学, 南京 210037, 江苏省, 中国

²国际河流与生态安全研究院, 云南大学, 昆明 650500, 云南省, 中国

³云南省国际河流与跨界生态安全重点实验室, 云南大学, 昆明 650500, 云南省, 中国

⁴生命科学学院, 西湖大学, 杭州 310023, 浙江省, 中国

⁵中国科学院哀牢山亚热带森林生态系统研究站, 景东 676209, 云南省, 中国

*通讯作者

摘要: 本文基于形态学差异和地理隔离分布, 描述了产于云南省临沧市云县的迷凤蛾属一新种——净面迷凤蛾 *Mimaporina pura* Yu & Jiang, sp. nov., 并对其分布和近似种类进行了讨论。同时本文还首次记述了斜带安凤蛾 *Amana angulifera* Walker, 1855 之雌性。文中所发表与记述的种类附鉴定特征照、成虫整体照、生境图与分布地图。

关键词: 凤蛾科, 首次记录, 新种, 分类学, 云南省

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Introduction

The family Epicopeiidae Swinhoe, 1892 is a small moth group belonging to Geometroidea currently comprised of 10 genera and approximately 26 species. Most of them restricted in the Asian Palaearctic and Oriental regions (Wei & Yen 2017; Huang *et al.* 2019; Zhang *et al.* 2020).

The genus *Mimaporia* was established with *Mimaporia hmong* Wei & Yen, 2017 as the type species from Sapa, Lào Cai Province, Vietnam (Wei & Yen 2017). Later, the second species from Luding, Sichuan Province, China is described, namely *Mimaporia owadai* Huang & Wang, 2019 (Huang *et al.* 2019). In this study, through comparing the differences in wing patterns and genitalia, we describe a new specie, *Mimaporia pura* Yu & Jiang, **sp. nov.**, based on two males collected from high elevation forest in Yun County, Lincang, Yunnan Province, China.

Meanwhile, the female and its genitalia of the unique rare moth of Epicopeiidae, *Amana angulifera* Walker, 1855, is reported and illustrated for the first time. The distribution map, biological notes, and ecological records of the Epicopeiidae species in this study are given.

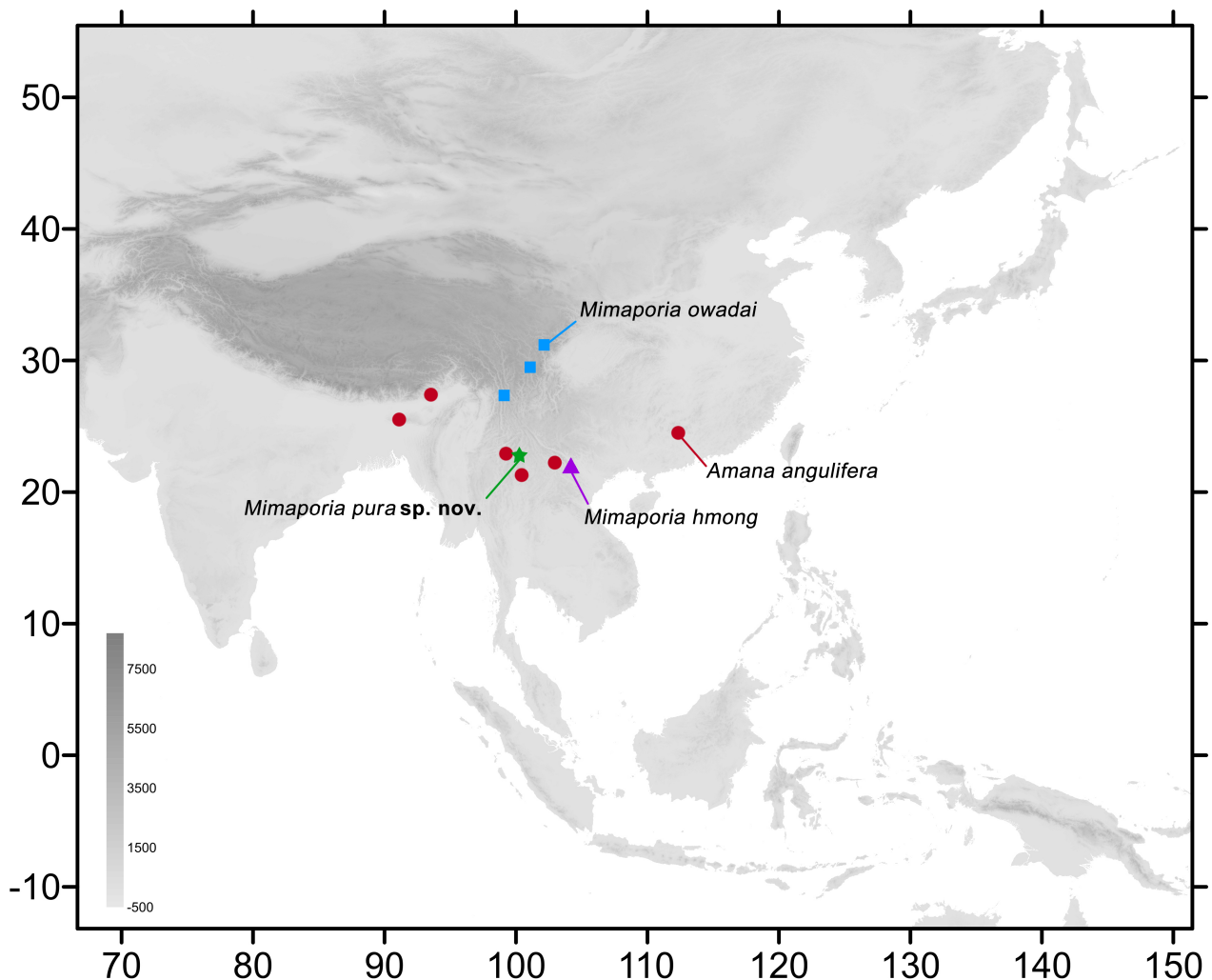


FIGURE 1. Distribution of Epicopeiidae species in this study. Purple triangle indicates record of *Mimaporina hmong*, blue squares indicate records of *Mimaporina owadai*, green star indicates record of *Mimaporina pura* **sp. nov.** and red circles indicate records of *Amana angulifera*.

Material and methods

Voucher specimens examined in this study are deposited in the following collections: **JZHC**—private collection of Zhuo-Heng Jiang, Kunming, China; **KIZAS**—collections of the Kunming Institute of Zoology, Chinese Academy of Science.

Prior to molecular analysis, specimens were spread for morphological comparison based on habitus. Male and female forewing lengths were measured to 0.5 mm precision using a ruler. Then the whole abdomens were removed and placed into a 1.5 ml microcentrifuge tube, treated with 1 ml 10% sodium hydroxide solution to digest soft tissue for 1 h at 70°C. The treated abdomens were then neutralized with 2% acetic acid and dissected in a water-filled Petri dish under a stereomicroscope to remove residual tissues, scales and hairs. The genitalia were then transferred to 80% glycerol for 12 h to render them transparent.

Habitus images were taken using a Canon 7D camera in conjunction with a Canon MP-E 65mm f/2.8 1-5X Macro Lens, and a Canon MT-24EX Macro Twin Lite Flash as a light source. Images of the genitalia were taken using a Canon G9 camera mounted on an Olympus CX31 microscope under reflection or transmission lighting. Zerene Stacker (version 1.04) was used for image stacking. All images were edited further using Adobe Photoshop CS6. The dissected genital structures are now stored in pure glycerol in a plastic centrifuge tube placed beside the type specimen in the collection.

Taxonomy

Genus *Mimaporina* Wei & Yen, 2017 迷凤蛾属

Mimaporina Wei & Yen, 2017; *Zootaxa*, 4254 (5): 537–550; **TS**: *Mimaporina hmong* Wei & Yen, 2017.

Mimaporina pura Yu & Jiang, sp. nov. 净面迷凤蛾

<https://zoobank.org/3F5034A5-7B55-449B-A2D6-D9EB41FEAF46>

Figs 2–4

Type locality: Yun County (2240m), Lincang, Yunnan, China.

Type material. CHINA: Holotype, ♂ (KIZAS), Yun County (2240 m), Lincang, Yunnan, VII-2019, Zi-Chun Xiong leg.; **PARATYPE**, 1♂ (JZHC), Yun County (2240m), Lincang, Yunnan, VII-2019, Zi-Chun Xiong leg.

Etymology. The name “*pura*” comes from the feature of its clean and uniform pattern on hindwings.

Diagnosis: Male (Figs 2A–D; 3). Head deep chestnut in color, with saddle-brown microtrichia and unipectinate antenna; anterior margin of thorax bears a transverse band of yellowish-brown setae, and mesothorax chestnut, with mesothoracic tegula marked by two longitudinal ivory-colored stripes; dorsal side of abdomen deep chestnut with light chestnut stripes across each segment, while ventral side orange with pale yellow stripes. Forewings nearly as broad as hindwings, with a dorsal ground color of deep chestnut and featuring three corn-silk-colored bands formed by patterns within wing cells, each band converging toward tornus and bordered by scales in saddle brown; ventral side almost identical to dorsal side, though with a lighter chestnut ground color and softer-edged bands. Dorsal side of hindwings has a corn-silk-colored ground with a heavily brown-toned outer margin marked by a band of corn-silk-colored spots; ventral side resembles dorsal side, though with slightly more diffuse patterns along outer margin.

Male genitalia (Fig. 4A–E). Uncus slender and curved downwards at distal one third. Juxta broad U-shaped, with a trapezoid process at middle area. Saccus slightly sclerotized, with triangular process dorsally, terminal part blunt. Valva long tongue shaped, apex rounded. Aedeagus short and thick, apex part wider than middle part, with a strongly sclerotized capitate process.

Female. Unknown.

Distribution: Currently known from SW Yunnan (Lincang) of China (Fig. 1).

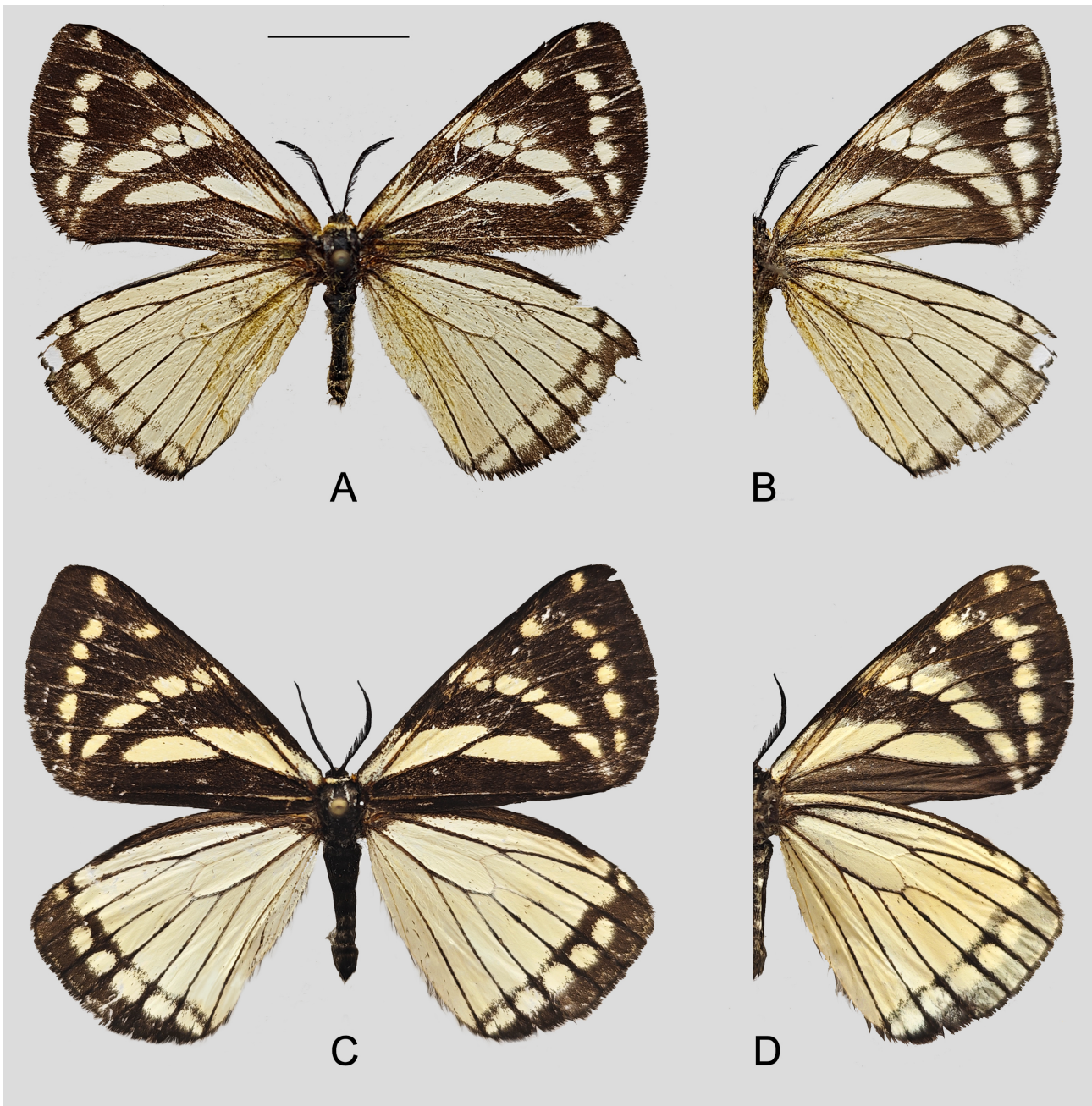


FIGURE 2. Habitus of *Mimaporis pura* sp. nov.: A, B male, holotype, Yun County, Lincang, Yunnan, China C, D male, paratype, Yun County, Lincang, Yunnan, China. Scale bar = 10 mm.

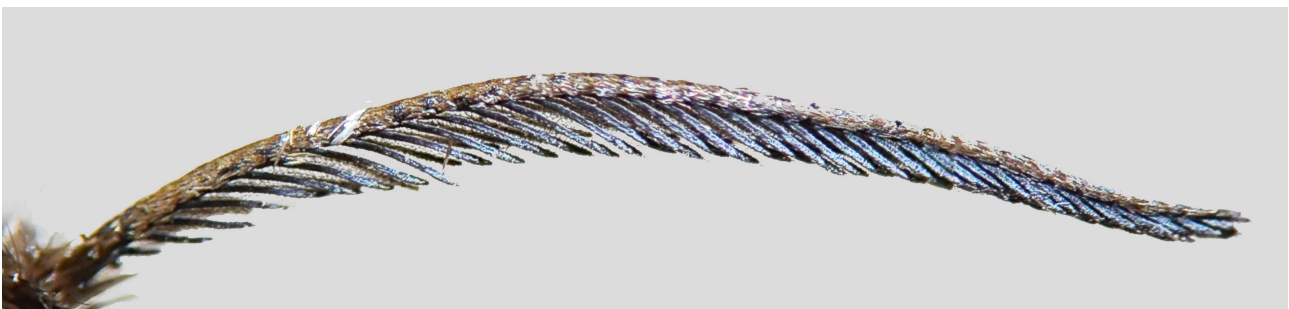


FIGURE 3. Enlarged male antenna of *Mimaporis pura* sp. nov.

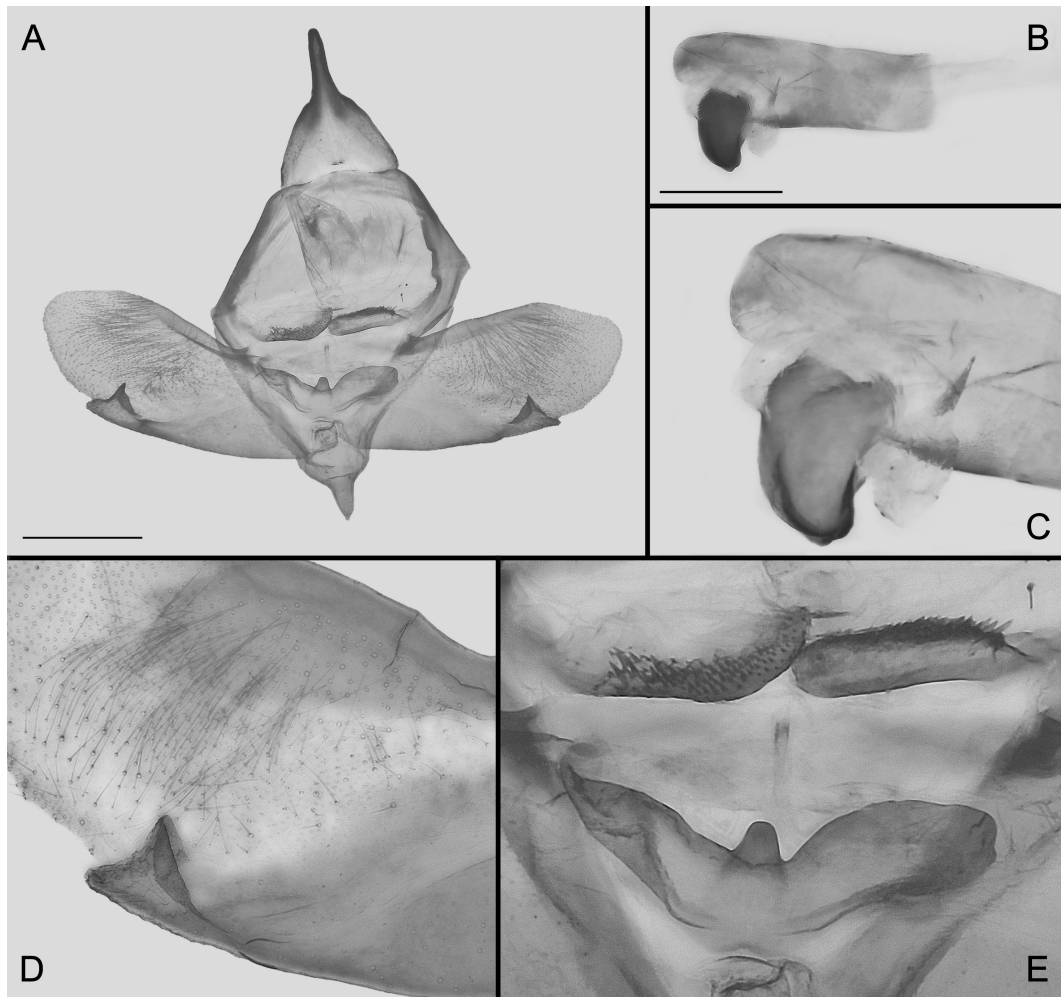


FIGURE 4. Male genitalia of *Mimaporis pura* sp. nov., Yun County, Lincang, Yunnan, China: **A** ventral view **B** aedeagus **C** anterior lobe of process **D** sharp of left valve **E** juxta. Scale bar = 1 mm.



FIGURE 5. Habitat of *Mimaporis pura* sp. nov. from Yun County, Lincang, Yunnan, China.

Genus *Amana* Walker, 1855 安凤蛾属

Amana Walker, 1855; *List of the specimens of Lepidopterous insects in the Collection of the British Musuem. Part – III. Lepidoptera: Heterocera.* p. 662; TS: *Amana angulifera* Walker, 1855.

Amana angulifera Walker, 1855 斜带安凤蛾

Amana angulifera Walker, 1855; *List of the specimens of Lepidopterous insects in the Collection of the British Musuem. Part – III. Lepidoptera: Heterocera.* p. 662; TL: “Khasia Hills, Assam” [Khasi Hills, Meghalaya, India].

Figs 6–9

Material examined. CHINA: 5♂♂1♀ (JZHC), Jinping County (1400 m), Yunnan, 23-X-2024, local collector leg.; 2♂♂ (JZHC), Menghai County (1240 m), Xishuangbanna, Yunnan, 6-IX-2022, Zhao Li leg.; 1♂ (JZHC), Yun County (1630 m), Lincang, Yunnan, 27-X-2019, Li-Lin Zhang leg.



FIGURE 6. Habitus of *Amana angulifera* Walker, 1855: **A, B** male, Menghai County, Xishuangbanna, Yunnan, China **C, D** female, Jinping County, Yunnan, China. Scale bar = 10 mm.

Diagnosis: Male (Figs 6A, B; 9A). Head relatively small, black, adorned with fine chestnut-colored setae; thorax dark brown, also bearing fine chestnut setae; dorsal abdomen starts as black, transitioning to dark brown toward posterior segments, while ventral side orange with dark brown bands between segments. Forewings slightly broader than hindwings, with a nearly black, dark brown ground color. From mid to sub-outer regions, brown and light brown scales scattered, and three distinct golden-yellow bands originate from apex, middle of costal margin, and base, converging at tornus. Among these, central band broadest, followed by sub-outer band. Ventral side of forewings resembles dorsal side but with a paler ground color, and sub-outer and sub-tornal bands less distinct, with orange patch and gold spots at apex. Dorsal side of hindwings chestnut-colored, scattered with dark goldenrod setae and scales from base to sub-outer region, with irregular goldenrod patches at apex and tornus. Ventral side mirrors dorsal side but has a lighter ground color and fainter patches.

Male genitalia (Fig. 7A–C). Uncus slender, ending in a apical hook, slightly curved downwards. Gnathos thin with capitate apex. Saccus slender and slightly sclerotized, terminal part blunt and curved upwards strongly. Valva long tongue shaped, apex rounded. Aedeagus short and thick, apex part with two sharp spikes, one of spike strongly sclerotized and curved in ventral view.

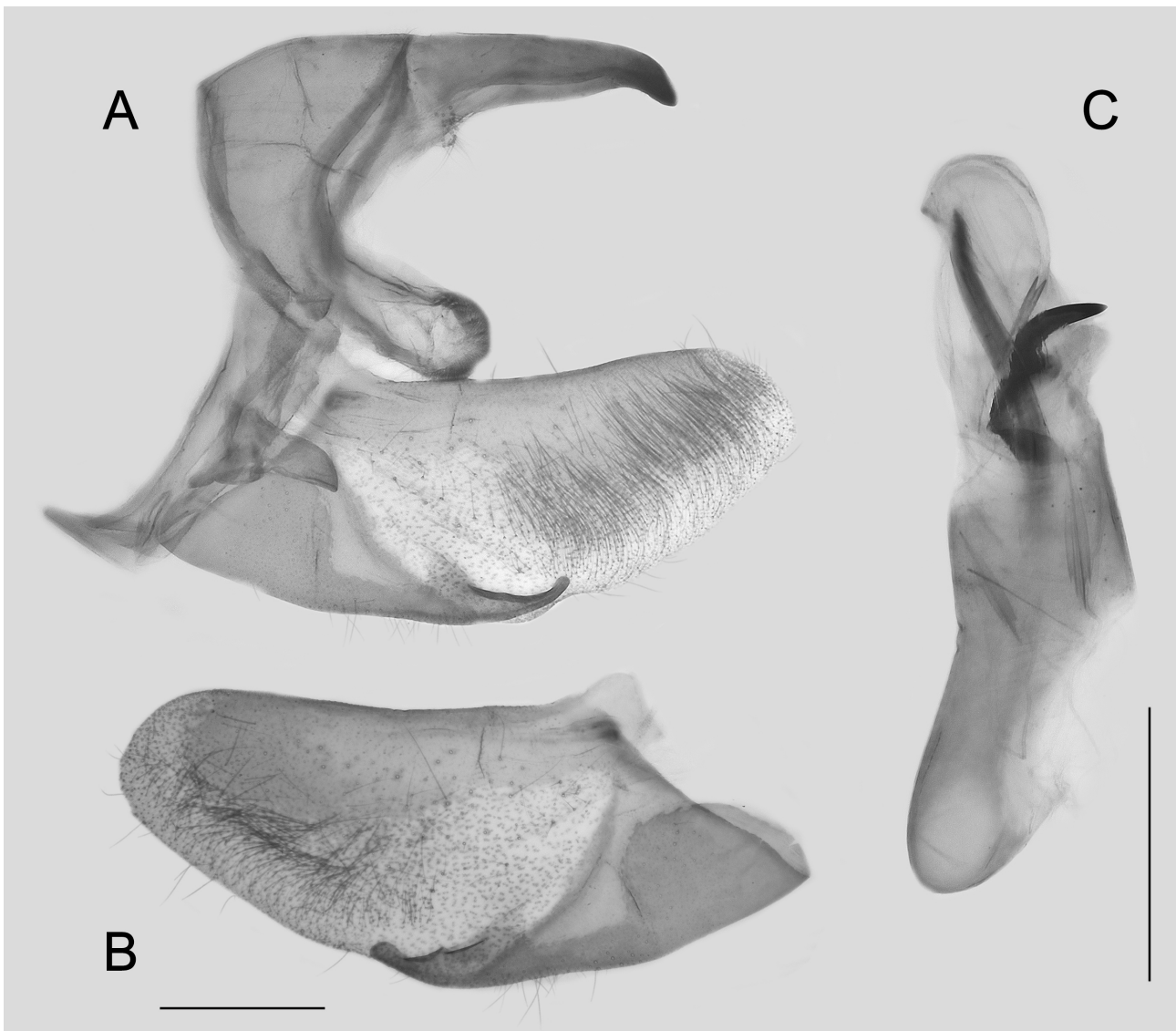


FIGURE 7. Male genitalia of *Amana angulifera* Walker, 1855, Menghai County, Xishuangbanna, Yunnan, China: **A** lateral view **B** left valve **C** aedeagus. Scale bar = 1 mm.

Female (Fig. 6C, D). Similar to male, but wings broader and ground pattern slightly darker and more extensive, antennae much slender.

Female genitalia (Fig. 8). Anal papillae spindle-shaped. Lamella antevaginalis broad circumferentially, weakly sclerotized with a wide U-shape gap in middle part; ostial lobe long funnel type. Ductus bursae tubular, membranous and short. Corpus bursae ellipsoidal, with a very fine signum.

Distribution: China (Yunnan, Guangdong, Xizang), Vietnam, India (Aniruddha & Subhagit, 2023) (Fig. 1).

Biological notes. Adults were collected from middle elevation monsoon evergreen broad-leaved forest, flying in daytime and sometimes resting on plants (Fig. 9).

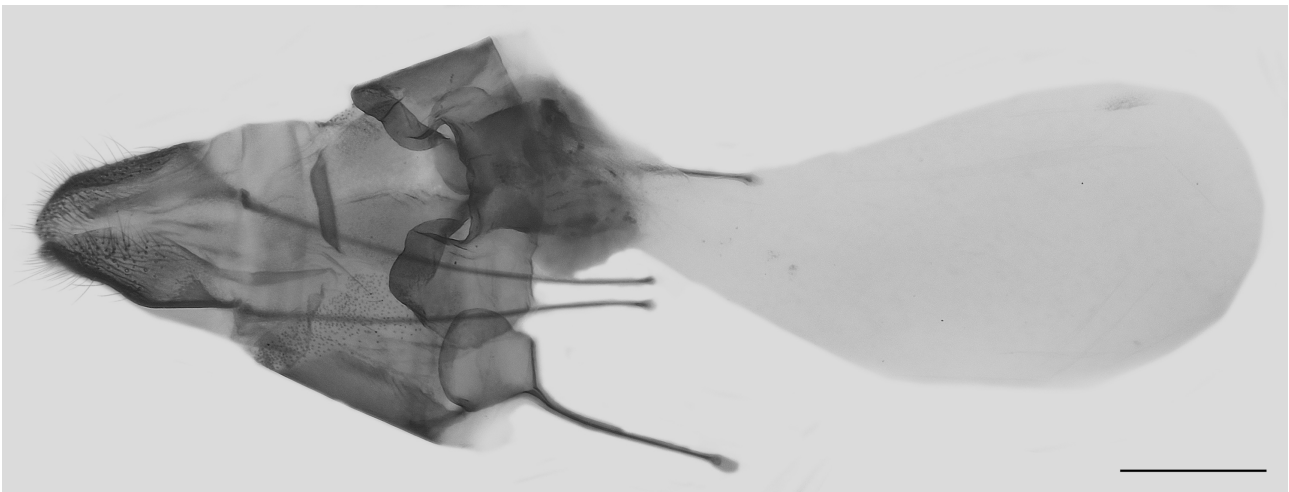


FIGURE 8. Female genitalia of *Amana angulifera*, Ya'an, Jinping County, Yunnan, China. Scale bar = 1 mm.



FIGURE 9. Habitat and living adult record of *Amana angulifera*: A male B Wenshan, Yunnan, China.

Discussion

Mimaporia pura Yu & Jiang, **sp. nov.** can be immediately distinguished by its unique hindwings in creamy with clean and uniform pattern in the genus *Mimaporia*. Its unipectinate antenna (Fig. 3) is similar to *M. hmong* Wei & Yen, 2017, but totally different from *M. owadai* Huang & Wang, 2019 which has bipectinate antenna. The distribution area of *Mimaporia pura* Yu & Jiang, **sp. nov.** near the border of Myanmar and China, and a male *Mimaporia* specimen from northern India in Natural History Museum (Wei & Yen, 2017) is very similar to *Mimaporia pura* Yu & Jiang, **sp. nov.** but hasn't been examined in this study due to the limited condition, thus the distribution of this new species may be much wider than its type locality (Fig. 1), which needs further study in the future.

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Additional information

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