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● New discovery of *Callambulyx diehli* Brechlin & Kitching, 2012 from Zhejiang, China (Lepidoptera, Sphingidae)

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Abstract: *Callambulyx diehli* Brechlin & Kitching, 2012 is newly recorded from Zhejiang (Longquan, Lishui), China. In this study we also discuss its distribution and similar species. Description, images of male, genitalia and habitat are provided.

Keywords: New record, Sphingidae, taxonomy, Zhejiang Province

● 云越绿天蛾之浙江省新纪录及其讨论（鳞翅目：天蛾科）

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摘要: 本文报道产于浙江省丽水市的一天蛾科省级新纪录种——目天蛾亚科 Smerinthinae 的云越绿天蛾 *Callambulyx diehli* Brechlin & Kitching, 2012, 并对其分布和近似种类进行了讨论。文中记述的该种附简要描述、分类特征图与生境图。

关键词: 新纪录, 天蛾科, 分类学, 浙江省

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Introduction

Callambulyx diehli Brechlin & Kitching, 2012 is a widely distributed species mainly found in SW and SE China, Thailand, Laos, Vietnam, Cambodia, Myanmar, Malaysia and Indonesia. In this paper, we collected a male from Longquan, Lishui, Zhejiang in April of 2024, where is close to Fujian Province with terrain gradually decreases from southeast and northwest to central, showing a sloping trend from southwest to northeast. This area belongs to the subtropical monsoon climate zone with warm and humid climate, distinct seasons and abundant rainfall, providing a suitable habitat for various creatures.

This new record of *Callambulyx diehli* not only showing the high biodiversity of Zhejiang Province but also refresh the northernmost range area of *Callambulyx diehl*, showing that global warming is changing the distribution of many species.

Material and methods

Voucher specimens of allied species examined in this study are deposited in the following collections: ANUC—Insect Collection of Anhui Normal University, Wuhu, China.

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 was used as light source. Images of the genitalia were taken using a Canon G9 camera mounted on an Olympus CX31 microscope under reflection or transmission lights. Zerene Stacker (version 1.04) was used for image stacking. All images were edited further using Adobe Photoshop CS6. The dissected genital structures were stored in pure glycerol in a plastic centrifugal tube placed beside the type specimen in the collection.

Taxonomy

Genus *Callambulyx* Rothschild & Jordan, 1903 绿天蛾属

Callambulyx Rothschild & Jordan, 1903, *Novit, zool* 9 (Suppl.): 173 (key).

Type species. *Ambulyx rubricosa* Walker, 1856.

Callambulyx diehli Brechlin & Kitching, 2012 云越绿天蛾

Figs 1–2

Callambulyx diehli Brechlin & Kitching, 2012, *Entomo-Satsphingia* 5 (3): 56–60. **Type locality:** Mt. Silawa, Sumatra, Indonesia.

Material examined. CHINA: 1♂, Dasai Villiage (286 m), Lanju Township, Lishui, Zhejiang, 25-IV-2024, Ming Yan leg. (ANUC).

Diagnosis. Male (Fig. 1): Head—dark greenish with green-whitish hairs; thorax—dark greenish with triangle light green patch dorsally on each side; abdomen—light green on upperside with a straight orange line dorsally, lateral side with olive stripe on each segment. Forewing narrow triangular with sharp apex, outer margin waved obviously and distal portion of inner margin slightly concave; upperside ground green with olive lines, middle area with a dark greenish oblique slightly curved through costa area to tornus, a black-purple patch towards tornus to basal, a white sharp line from apex towards to the vein M1, marginal area covered with green-whitish scales; underside—ground color green-yellowish, pattern almost the same as upperside but basal to middle area in rose-red. Hindwing—upperside rose-red, tornus area in grey-green with two black patches, marginal area in greenish; underside—ground color green-yellowish with three olive ziazga lines on middle area.

Male genitalia (Figs 2A–C): Uncus curved downwards, with sharp apical hook. Gnathos much shorter than uncus. Saccus stick shaped, much longer than uncus and valve. Valve tongue-shaped, with terminal part circular, apex rounded. Sacculus heavy and thick, separated to two sharp hook lobe upwards. Phallus straight and slender, anterior lobe sclerotize covered with tine teeth.



FIGURE 1. Habitus of *Callambulyx diehli* Brechlin & Kitching, 2012, ♂, Lanju, Lishui, Zhejiang, China: **A** upperside **B** underside. Scale bar = 10 mm.

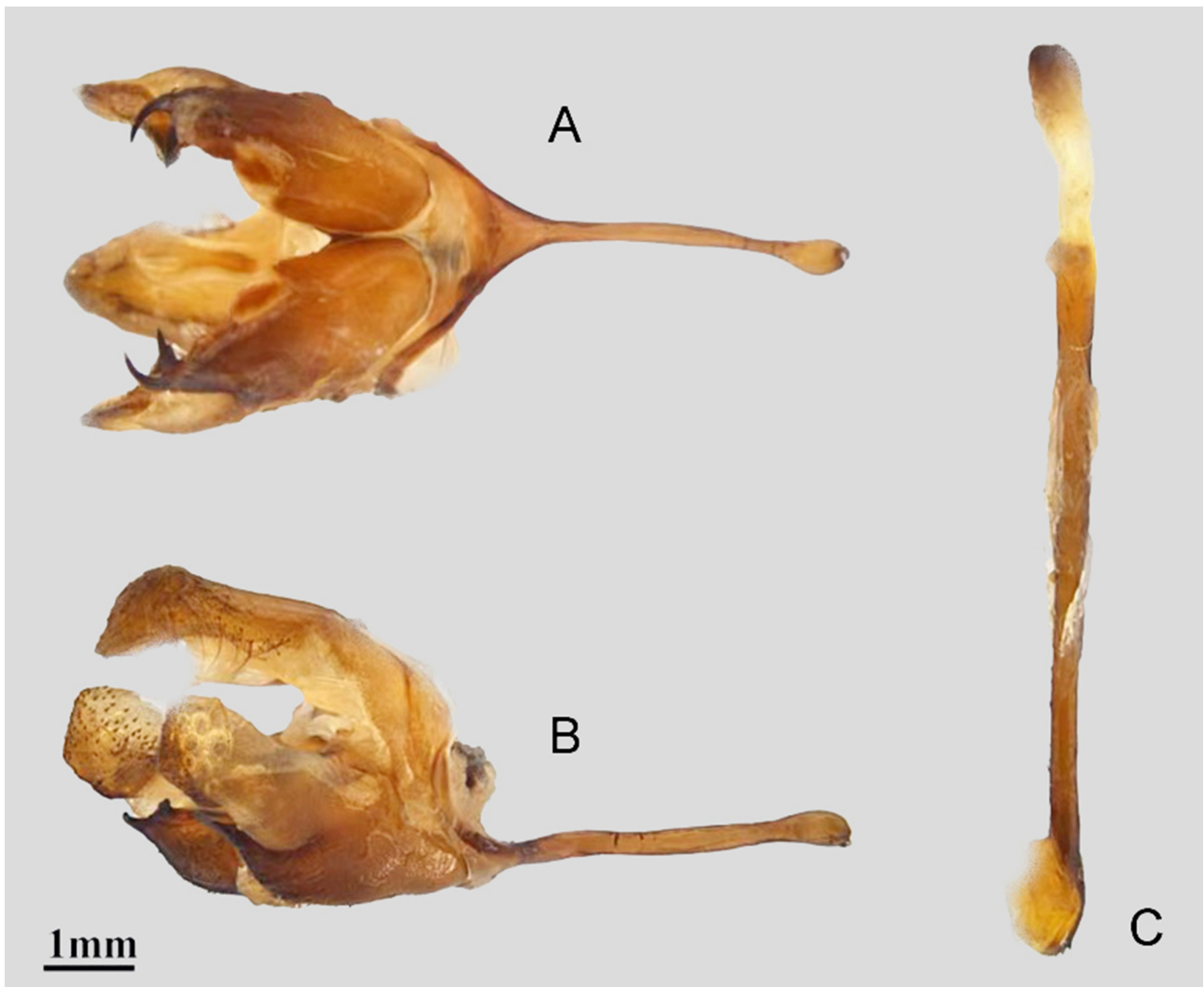


FIGURE 2. Male genitalia of *Callambulyx diehli* Brechlin & Kitching, 2012, Lanju, Lishui, Zhejiang, China: **A** ventral view **B** lateral view **C** phallus.

Female: Similar to male, but wings broader and ground pattern slightly darker and more extensive, antennae much slender.

Distribution. China (Yunnan, Guangxi, Guizhou, Hainan, Fujian, Zhejiang), Thailand, Laos, Vietnam, Cambodia, Myanmar, Malaysia, Indonesia.

Biological notes. Adults were collected from low elevation monsoon evergreen broad-leaved forest (Fig. 3), attracted to light trap in the nighttime.

Remarks. This splendid moth is very similar to allied species, *Callambulyx tatarinovii* (Bremer & Grey, 1853) which occurs most area of central, north and east China. *C. diehli* replace *C. tatarinovii* in more southern region, it seems South Zhejiang may be the north most boundary and intersection of these two species.



FIGURE 3. Habitat of *Callambulyx diehli* Brechlin & Kitching, 2012, Lishui, Zhejiang, China.

Discussion

Callambulyx diehli is a typical subtropical moth which ranged in SW and SE China, Thailand, Laos, Vietnam, Cambodia, Myanmar, Malaysia and Indonesia. The new discovery of the *Callambulyx diehli* in this study adds a valuable record to the diversity of Sphingidae in Zhejiang Province. Thus we recommend enhancing the survey and monitoring efforts of Sphingidae in Zhejiang Province and its surrounding areas. This will not only help us gain a more comprehensive understanding of the species, distribution, and ecological habits of sphingidae, but also provide more detailed data support for related research and conservation efforts. Additionally, by monitoring the dispersion of species range and speed, we can indirectly assess the impact of climate warming on biodiversity, thus providing a scientific basis for formulating more effective protection measures.

Over the past century, the global average temperature has increased due to changes in solar radiation, variations in Earth's orbital parameters, and intensifying human activities. Against such a climatic backdrop, some subtropical species such as the *Callambulyx diehli* may continue to spread towards higher latitudes area, thereby exerting profound impacts on biodiversity in China and even globally.

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Additional information

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