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RESEARCH ARTICLE

A new record of the genus *Calymma* Hübner, 1823 (Lepidoptera: Erebidae) from Uzbekistan

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Abstract

This study was conducted in the Fergana Valley, located in eastern Uzbekistan, during the 2023–2024 period. The genus *Calymma* Hübner, 1823 and the species *Calymma communimacula* (Denis & Schiffermüller, 1775) are reported for the first time from Uzbekistan. Several adult specimens were collected using light traps from Chimgan, the Kuvasay foothills, and the city of Fergana in the Fergana Valley, Uzbekistan. The species was identified based on external morphology. We provide a detailed description of the collected specimens and document diagnostic characters with photographs of the male and female genitalia. The discovery of *C. communimacula* in Uzbekistan represents the second known location of the species in Central Asia and confirms its presence in the region. This finding contributes new data to the Lepidoptera fauna of Central Asia and highlights the importance of continued entomological surveys in the region.

Keywords

Calymma communimacula, new record, Fergana Valley, Uzbekistan

Introduction

The family Erebidae (superfamily Noctuoidea) is one of the largest families of moths, encompassing a diverse array of moth lineages. *C. communimacula* is the sole species of the monotypic genus *Calymma* Hubner, 1823 within Erebidae. This species was first described by Denis & Schiffermüller in 1775 and has been historically placed in subfamilies Eublemminae (Erebidae) or Acontiinae (Noctuidae) in past classifications (Bernardi 1775). *C. communimacula* is primarily known from the Palearctic region, with a distribution spanning central and southern Europe and extending through Turkey to Transcaucasia and the Middle East (Kaltenbach 1856; Patocka 1996; Klyuchko et al. 2009; Beshkov and Nahirnić 2016; Nowacki et al. 2018; Leraut 2019; Anikin et al. 2019; Koçak and Çerçi 2021; Seven 2023; EFSA et al. 2023; Beshkov et al. 2024). However, its presence in Central Asia has been poorly documented and largely overlooked. Until our study, its regional occurrence was suggested only by a single, unpublished record from the Jalal-Abad Region of Kyrgyzstan by Norbert Keil in 2017, available on the Barcode of Life Data System (BOLD) (accession: LPALE2487-23). Beyond this database entry, no formal publications have detailed the occurrence or morphology of this species within the region.

Documenting the occurrence of *C. communimacula* in new regions is important for understanding biogeographic distribution patterns and local biodiversity. This study provides the first confirmed and detailed record of *C. communimacula* for the fauna of Uzbekistan. This finding represents the second known locality for the species in Central Asia, corroborating its presence in the region following the initial record from Kyrgyzstan. Background information on its taxonomy and known distribution is provided, along with a discussion of the significance of this finding.

The Lepidoptera fauna of Uzbekistan, especially in the Fergana Valley, remains understudied. Therefore, our finding of *C. communimacula* not only fills a significant gap in the national fauna but also provides the first detailed, published morphological data for the species from Central Asia, establishing a crucial baseline for future faunistic and ecological studies on Erebidae in the area.

Materials and methods

The material analyzed in this study was collected during field surveys conducted in 2023–2024 in the Fergana Valley, located in eastern Uzbekistan. The surveyed localities included the foothill regions of Kuvasay and Chimgan, as well as the vicinity of the city of Fergana. The specimens were caught by light traps (DRL-250). After killing the specimen with ethyl acetate, it was pinned and labelled. Due to the absence of genitalia illustrations in scientific sources, the specimens were identified based solely on their external morphological characteristics (Rennwald 2024). The Robinson (1976) method was utilized for the dissection and extraction of genitalia

from the specimens. Approximately 10% potassium hydroxide (KOH) was used to macerate the entire abdomen. The cleaned abdominal segments and genital organs were dehydrated overnight in 96% ethanol before mounting on Euparal. The genitalia of male and female were dissected and prepared under a Leica S8APO stereo microscope (Shanghai MSS International Trade Co., Ltd., China). An adult specimen of the species was photographed with a Canon EOS 1100D camera mounted on the Olympus BX41 stereomicroscope (Shanghai MSS International Trade Co., Ltd., China). The material is deposited at the Zoology Research Laboratory of Fergana State University (FSU).

Results

Superfamily Noctuoidea Latreille, 1809

Family Erebidae Leach, 1815

Subfamily Boletobiinae Guenée, [1858]

Tribe Eublemmini Forbes, 1954

Genus *Calymma* Hübner, 1823

***Calymma communimacula* (Denis and Schiffermüller, 1775)**
Fig. 1

Calymma communimacula (Denis and Schiffermüller, 1775):85. Type locality: Vienna, Austria.

Material: FSU 2024118002, 1♂; 1♀ Uzbekistan, Fergana province, Chimgan village, apple orchard, 40°15'57.2"N 71°32'33.8"E, 11.VIII.2023, leg. Muminjon Mukhammedov. FSU 2023277005, 2♂; 1♀ Uzbekistan, Fergana province, Kuvasay district, Arsif village, peach orchard, 40°25'49.3"N 71°57'22.7"E, 27.VII.2023.2024, leg. Bekzod Abdikakhorov. FSU 2023258004, 1♂ Uzbekistan, Fergana province, Fergana city, apple orchard, 40°24'34.9"N 71°48'09.5"E, 23.VIII.2023, leg. Elyor Botirov. FSU 2023039001, 1♂ Uzbekistan, Fergana province, Chekshura village, apple orchard, 40°23'11.6"N 71°42'45.9"E, 03.IX.2023, leg. Malikjon Shermatov.

Distribution. France, Italy, Hungary, Serbia, Albania, Bulgaria, Austria, Ukraine, and as far as Turkey, to southern parts of Russia and Middle East, Kyrgyzstan, *Uzbekistan (this study).

Biology. The larvae feed on Coccidae (Hemiptera: Sternorrhyncha), scale insects (Leraut 2019; EFSA et al. 2023).

Flight-time: Adult specimens have been recorded in the Fergana Valley between July – September.

Description. Male (Fig. 1A). Forewing length 10.7 mm, width 7 mm, forewing span 23.8 mm, body length 9.5 mm, antennae filiform, setose (Fig. 2A), length 5.7 mm. General coloration light pinkish beige. A distinct, with large olive-toned spot is present in the medial region of the forewing, fringe light brown. Hindwing length 8.5 mm, width 6.8 mm. Hindwing concolorous with forewing.

Female (Fig. 1B). Forewing length 10 mm, width 6 mm, forewing span 22 mm, body length 8 mm, antenna filiform type (Fig. 2B), length 5.3 mm. Medial olive-toned spot slightly darker; upper part slightly narrowed. Hindwing length 8 mm, width 6 mm.

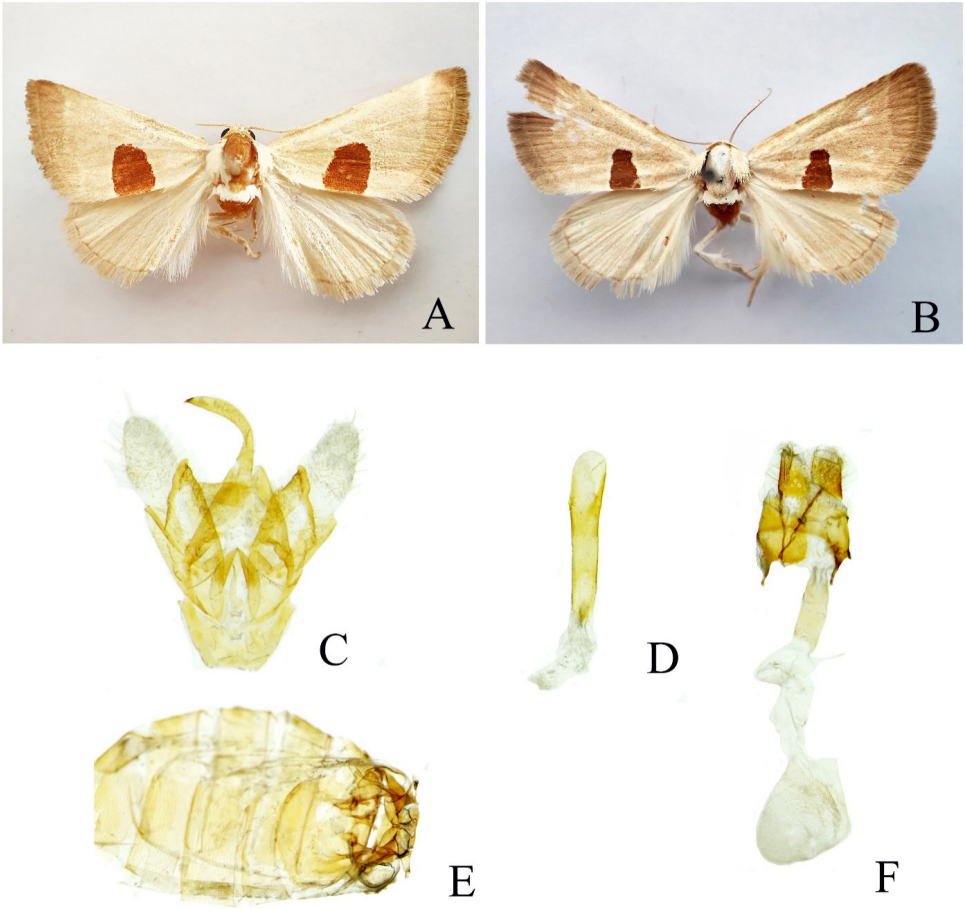

Figure 1. *Calymma communimacula*: **A** – adult, male; **B** – adult, female; **C–D** – male genitalia: **C** – armature genitals; **D** – aedeagus; **E** – female tympanal organ; **F** – female genitalia.

Figure 2. Antennae of *Calymma communimacula*. **A** – male, **B** – female.

Conclusion

This discovery is the second documented occurrence in Central Asia, corroborating a previous unpublished record from Kyrgyzstan and confirming the species' presence in the region. *C. communimacula* has been recorded in Lebanon as a natural enemy of *Didesmococcus unifasciatus* (Archangelskaya, 1923) (Hemiptera: Sternorrhyncha: Coccidae). Considering that *D. unifasciatus* was first described from Uzbekistan and is widely distributed across Central and Western Asia (EFSA et al. 2023), the occurrence of *C. communimacula* in Uzbekistan, and other parts Central Asia appears likely. As a result of field surveys conducted during 2023–2024 in three localities in the southern parts of the Fergana Valley (Chimgan, Kuvasay, and the vicinity of the city of Fergana), male and female specimens of *C. communimacula* were collected and subjected to detailed morphological analysis. The antennae of males filiform, setose, in females they filiform and lacked setae. In both sexes, a large olive-toned spot was present in the medial region of the forewing; in females, this spot appeared darker and slightly narrowed in the upper part. In addition, the genitalia of both sexes were dissected and documented, with diagnostic characters illustrated photographically. The obtained morphological parameters provide important criteria for the accurate identification of *C. communimacula*, for the determination of sexual dimorphism, and for assessing population-level variation across different regions.

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