

## The Preimaginal Stages of *Eulithis peloponnesiaca* (REBEL, 1902) (Lepidoptera, Geometridae)

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**Summary:** In May 2024, the authors managed to collect larvae of *Eulithis peloponnesiaca* (REBEL, 1902) from the Taygetos Mountains in the Peloponnese, Greece. During the breeding process in the laboratory, the first photographs of the larva, pupa and live adult were obtained for this endemic species. The photographs are accompanied by descriptions of the early stages.

**Rezumat:** În luna mai 2024, autorii au reușit să colecteze larve de *Eulithis peloponnesiaca* (REBEL, 1902) în Munții Taygetos din Peloponez (Grecia). În urma creșterii în laborator au fost realizate primele fotografii ale larvei, pupei și adultului viu aparținând acestei specii endemice. Fotografiile sunt însoțite de descrieri ale stadiilor preimaginale.

### Introduction

*Eulithis peloponnesiaca* (REBEL, 1902) is one of the least known Geometridae in Europe. The number of specimens in museums and private collections is very limited. It is an endemic, highly localized species, known only from the Taygetos mountain range in southern mainland Greece (Peloponnese) (HAUSMANN and VIIDALEPP 2012).

### Material and methods

On May 9-11, 2024, the authors searched for *E. peloponnesiaca* larvae on *Ribes uva-crispa* L. (ssp. *austro-europeum* Bornm.) bushes in the Taygetos mts, in the remote area of the Vassilitsa Forest (δάσος της Βασιλικής) along the heavy, rocky roads which all end up in the small summer settlement of Aghios Diomitrios (36°55'11.6"N 22°21'33.6"E). According to local sources it is the most elevated hamlet in the Peloponnese. This settlement can be reached either from the Western (Ionian) part of the Taygetos, through the mountain villages of Saïdona and Exochori ascending the Mavrovouno mt., or from the Eastern (Spartian) part via a long and winding unpaved road. Larvae were collected by beating *R. uva-crispa* bushes on top of a cloth spread on the ground. Twelve larvae belonging to two different species were collected. Seven larvae belonged to *Macaria wauaria* (LINNAEUS, 1758) while other five, with different shapes and colors, were suspected to represent *E. peloponnesiaca*. The larvae were transported to Cluj (Romania) where they were reared on *Ribes* twigs brought from the area where the larvae were collected. Unfortunately, some of

the larvae managed to pass through the holes in the plastic lid through which the twigs reached the water tank and drowned. The larvae that survived pupated between May 19 and May 21: three dark brownish-brown pupae and one greenish-yellow pupa, trapped in a loose silk weave among the *Ribes* leaves. Three specimens of *M. wauaria* hatched from the dark pupae and one female of *E. peloponnesiaca* hatched from the greenish-yellow pupa on 4.06.2024 (Fig.1 a,b,c).

### Description

REBEL (1902) gives an accurate description of the adult, emphasizing the light-yellow background color fragmented by brown drawings and bands, which gives it a distinctive wing pattern, unmistakable among other species of the genus. The shape of the wings resembles that of *Eulithis prunata* (LINNAEUS, 1758), and the yellow ground color of the forewings resembles that of *Eulithis mellinata* (FABRICIUS, 1787), or of *Gandartis pyraliata* (DENIS and SCHIFFERMÜLLER, 1775). The description is complemented by an accurate and detailed black and white drawing.

PROUT (1912) describes the moth and the larva, but the color drawing is only reproduced in the supplementary volume of 1931.

HAUSMANN and VIIDALEPP (2012) summarize the description by REBEL (1902) and mention a wingspan of 31-34 mm. The two authors illustrate for the first time the genital armature in males and females and publish the first color photographs of the adult for both sexes.

PÜNGELER (1903) succeeded in growing the newly described species in captivity. Eggs laid in June-July



Fig. 1. Adult of *Eulithis peloponnesiaca*: A. dorsal, B. lateral, C. prepared specimen.

overwinter. Larvae hatch in mid-March and reach the last instar by mid-April, when they pupate. The moth emerges in the second half of May.

**Ova:** PÜNGELER (1903) describes the egg as follows: the egg is reddish, elongated oval, somewhat flattened and is attached with one of the flat sides. The end later broken through by the caterpillar is cut off straight and has a slightly bulging edge, the surface is unicolor, dull, finely latticed.

**Larva:** The adult larva is almost 30 mm long, slender, slightly flattened. The tubercles are white and have a short, brownish-colored pod. The ground color is light green, mixed with whitish. The dorsal receptacle shimmers through darker and there is a blackish dot on it in the dorsal ring incisions. The subdorsal and lateral lines are whitish in color. The ventral line is white. The head is green with a light

brownish tinge and has some fine black dots on the underside of the head capsule. The thoracic legs are pale brownish green. The post pusher and anal valve are without markings. The stigmas are brown (PÜNGELER 1903).

PÜNGELER (1903) also describes an interesting larval form, brown in color, resembling tree bark.

The adult larvae reared by us are 28-29 mm long. The color is light green mixed with creamy-white and the head is green with a few black dots. The larval body is covered with white warts that carry short brownish fringes. The dorsum is darker and shows a median, black dot. The subdorsal and lateral stripes are whitish. The stigmas are brownish (Fig. 2. a,b).

**Pupa:** The pupa of *E. peloponnesiaca* measures 12-13 mm and rests in a light web between the leaves of the food plant. It is greenish-reddish-yellowish,



Fig. 2. Larva: A. larva of *Eulithis peloponnesiaca*, B. larva of *Macaria wauaria*.



Fig. 3. Pupa: A. dorsal, B. lateral, C. exuvia, D. cremaster.

with black dots and streaks. The blackish ribs of the wing sheaths are conspicuous. The mid abdomen is crisscrossed by a black stripe. The cremaster is strong and has eight hooks arranged in a single row (Fig. 3. a,b,c,d.).

#### Flight period

REBEL describes the species based on 3 specimens (2 ♂♂, 1 ♀) collected on 26.06 from Mount Taygetos (Peloponnese) at about 1200 m altitude. The three specimens were collected in the daytime in the vicinity of *Ribes* bushes, hence REBEL's assumption that the larvae could live on this plant. From the few data we have at our availability, we consider that the flight period is between May 1/2 and the end of June.

#### Habitat

The *R. uva-crispa* bushes from which the larvae were collected are found on either side of the forest roads that cross the Vassilitsa forest reserve, consisting mainly of Greek fir (*Abies cephalonica*) and black pines (*Pinus nigra*) across the Southern Taygetos at an altitude

of 1400 – 1560 m (Fig. 4 a,b). The site is located in a species-poor, extremely dry karst area, in the shade of the centuries-old forest and the mountainside. On the rocky slopes near the forest road, only a few species of butterflies such as *Gonepteryx farinosa*, *G. cleopatra*, *Nymphalis polychloros*, several *Pyrgus* sp., or freshly emerged *Polyommatus escheri* were flying. Some early mountain plants showed their first flowers, such as colonies of *Cyclamen rhodium peloponnesiacum*, *Euphorbia rigida*, or the endemic *Onosma leptantha*, but also solitaires such as *Pyrola chlorantha* and *Cephalanthera rubra* (MARCHANT 2016, STRID 2023).

#### Discussions

While REBEL (1902) includes a fairly accurate black-and-white drawing of the adult, the egg, larva and pupa have not yet been illustrated.

Information on the early stages and especially the illustration of these and of the adult moths of *E. peloponnesiaca* is extremely poor. Following the collection of larvae from *R. uva-crispa* bushes in the Peloponnese, the authors were able to rear and



Fig. 4. Habitat: A. Panoramic view of Mount Taygetos with Profitis Ilias Peak (2405 m), B. Habitat of the species *Eulithis peloponnesiaca* with shrubs of *Ribes uva-crispa*.

photograph the adult larva, pupa and moth, thus completing the literature with their images. As a result, the first photographs of the larva, pupa and live adult are published in this paper.

### Conservation

*E. peloponnesiaca* is an endemic species highly localized in the Taygetos mountain range of the Peloponnese. Though there are strong colonies of *R. uva-crispa* in other mountainous areas of this Greek peninsula, such as Kyllini, Chelmos or Parnonas, to our knowledge this peculiar and easily distinguishable species of geometrid moth has never been reported from either of these regions, although collection activity, mainly in Chelmos, was much higher. The plant also appears to have a wider vertical distribution than *E. peloponnesiaca*, as the latter was probably not found yet above the tree line, whereas the plant occurs up to almost 2200 m. There is no data on the abundance of *E. peloponnesiaca* across its range. Since the habitats of the food plant seem to be restricted to certain microclimatic conditions and altitudinal limits in the Taygetos, we assume that the geometrid species is rare and vulnerable.

Because of the extremely long, sharp thorns that protect the *R. uva-crispa* branches, the effect of grazing by goats seems negligible.

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