

The First Record for *Pammene gallicolana* (Lepidoptera, Tortricidae) in Çanakkale Province of Turkey and External and Genital Morphology of the Species

Erol ATAY^{1*} Levent EFİL² Frantisek SLAMKA³

¹Department of Biology, Faculty of Arts and Sciences, Mustafa Kemal University, Hatay, TURKEY

²Faculty of Agriculture, Dep. of Plant Protection, Çanakkale 18 March University, Çanakkale, TURKEY

³Racianska 61 SK-83102, Bratislava, SLOVAKIA

Abstract: This study was conducted in the field and the laboratory. *Pammene gallicolana* was caught in various fruit orchards in light trap and pheromone trap in Çanakkale. In the field studies, totally 23 male and 18 female specimens were collected. Specimens were dissected and male genitalia and wing microscope slides were prepared in the laboratory. We described both the external and genital morphology of the male *Pammene gallicolana* and diagnostic morphological features in detail. As a result of the study, *Pammene gallicolana* is a new record for Çanakkale province.

Keywords: Çanakkale, Lepidoptera, *Pammene gallicolana*, Tortricidae.

Türkiye Çanakkale İlinde *Pammene gallicolana* (Lepidoptera, Tortricidae)'nın İlk Kaydı ve Türün Dış ve Genital Morfolojisi

Öz: Bu çalışma saha ve laboratuvar çalışmaları şeklinde gerçekleştirilmiştir. *Pammene gallicolana*, Çanakkale'deki çeşitli meyve bahçelerinde ışık tuzağı ve feromon tuzakları kullanılarak yakalandı. Saha çalışmalarında toplam 23 erkek ve 18 dişi toplanmıştır. Örnekler laboratuvarında preparat yapımı için hazırlandı, erkek genital ve kanat preparatları yapıldı. *Pammene gallicolana* 'nın dış morfolojisi ve erkek genital organları ayrıntılı olarak tanımlandı. Çalışma sonucu olarak *Pammene gallicolana* Çanakkale için ilk kayıttır.

Anahtar sözcükler: Çanakkale, Lepidoptera, *Pammene gallicolana*, Tortricidae.

INTRODUCTION

The family Tortricidae, which with just over 9000 described species is the second largest lineage in the microlepidoptera (Hancock and Bland, 2015). The genus *Pammene* belongs to the tribe Grapholitini of the subfamily Olethreutinae of the family Tortricidae. The genus is mostly distributed in the Holarctic region, with about 100 species recorded from the Old World. The members are usually variable in maculation and coloration of forewings (Bae and Park, 1998). Kemal and Koçak (2010) have recorded that collected *P. gallicolana* from the gall *Andricus moreae*

(Cynipidae), and also this record of host gall is new to science. Beyarslan et al., (2014) reported *Bracon hebetor* Say, 1835 (Hymenoptera, Braconidae, Braconinae)'s host as *Pammene gallicolana*.

There are 462 species belonging to the family Tortricidae, and 16 species belonging to the genus *Pammene* in Turkey (Koçak and Kemal, 2009).

The first attempt on the checklist of the Turkish moths was listed by Koçak and Kemal (2006, 2007). Totally

4604 moth species were listed together with their synonymous named and updated provincial distributions. Later, the authors (Koçak and Kemal, 2009) reported that the Turkey Lepidoptera fauna was 5128 species belonging to 76 families. In addition, a total of 343 lepidoptera species, 240 Heterocera and 103 Rhopalocera, belonging to the province of Çanakkale were listed by the same authors. The species belonging to the genus *Pammene* are not found in Çanakkale. *P. gallicolana* is a new record for the the lepidoptera fauna of Çanakkale.

MATERIALS AND METHODS

Field Studies: Field studies were carried out in various fruit orchards in Çanakkale province in 2017. All the field works were done under suitable weather conditions (without precipitation and strong winds), and works started early in the morning and continued until sunset. *Pammene gallicolana* was caught in various fruit orchards in Çanakkale with light trap and pheromone trap (Figure 1). In the field studies, totally 23 male and 18 female specimens were collected.



Figure 1. Pheromone trap on the oak tree.

Laboratory Studies: Before they were losing body water, the collected specimens were sorted according to body sizes, and were needed with a number 0 insect needles that matched the size of the custom sized boards, strain and inhibition couples were strained in laboratory work. For the drying of the stretched specimens, they kept at room temperature for two weeks in a dark and dry place. Male genital organ was prepared for the identification of the species following morphological examinations and measurements on the male specimens. The needling of the butterflies, stretching of the wings and genital organ preparations were done accordingly the methods which defined in Atay's work (2006). The major taxonomic characters described. Important morphological organs of *P. gallicolana* were photographed and drawn. The specimens stored at the Biology Department of Mustafa Kemal University in Hatay.

RESULTS AND DISCUSSION

Genus *Pammene* Hübner, [1825]: Syn: *Palla* Billberg, 1820; *Pammene* Hübner, [1825]; *Eucelis* Hübner, [1825]; *Hemimene* Hübner, [1825]; *Pseudotamia* Stephens, 1829; *Heusimene* Stephens, 1834; *Orchemia* Guenee, 1845; *Pyrodes* Guenee, 1845; *Trycheris* Guenee, 1845; *Halonota* Stephens, 1852; *Hemerosia* Stephens, 1852; *Phthoroblastis* Lederer, 1852; *Sphaeroeca* Myrick, 1895; *Metasphaeroeca* Fernald, 1908 (Koçak and Kemal, 2009).

***Pammene gallicolana* (Lienig & Zeller, 1846) (Tortricidae):** Syn: *gallicolana* Lienig & Zeller, 1846 (Koçak and Kemal, 2009). The distribution of *Pammene gallicolana* in Turkey; Kırıkkale (Koçak ve Kemal, 2009); Van (Kemal and Koçak, 2010).

The distribution of *Pammene gallicolana* in the world; Great Britain and South Africa (Gaedike, 2014); Austria (Habeler, 2014); Portuguese (Corley et al., 2016); Eastern Europe, Latvia, Czech Republic, Slovakia, Germany, Netherlands, Italy, Austria, Hungary, Romania, Greece (Karsholt and Razowski, 1996).

Material Examined: Çanakkale (39°58'51" N; 26°16'21" E, 66 m.); 10.III.2017 4♂, 1♀; 20.III.2017 6♂, 3♀; 25.III.2017 8♂, 3♀; 30.III.2017 3♂, 5♀; 10.IV.2017 1♂, 3♀; 20.IV.2017 1♂, 2♀; 30.IV.2017 1♀.

Measurements of the Adults: Body Length ♂: 4,5-5 mm, ♀: 5-5,5 mm. Wingspan ♂11-13 mm, ♀ 13-14 mm.

Male (Figure 2): On the head vertex and frons yellowish brown, scales dirty white tipped, these scales are short and not fluffy.



Figure 2. Adults of *Pammene gallicolana* (caught with pheromone trap).

Antenna fuscous light brownish with dark brown ring per segment and with short setae. Labial palpus well developed, not long, yellowish dirty white, the first segment strongly recurved upwards and the second and third segments extend straight reaches; the third segment quite

small. Haustellum is not well developed, quite small and with yellowish dirty white. Eyes are round, large and dark brown. On the head ocelli well developed (Figure 3).

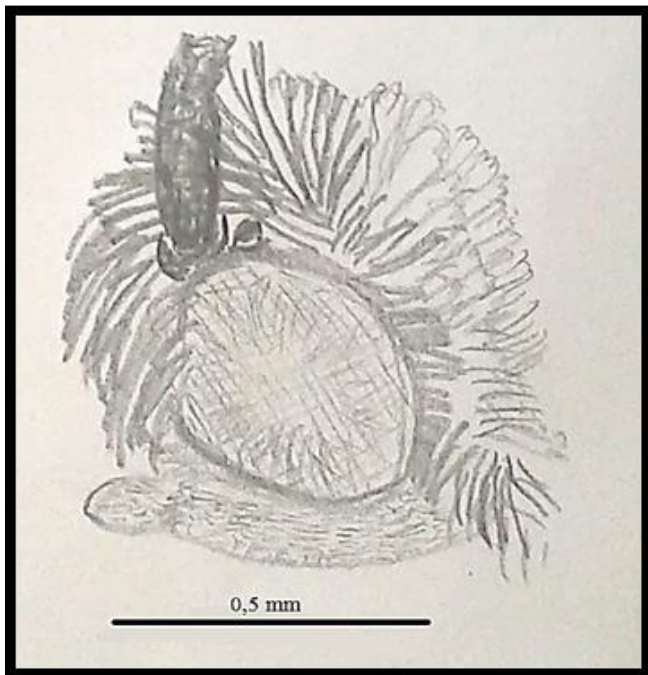


Figure 3. The head structure of *Pammene gallicolana*.

Veins of forewing and hindwing of *Pammene gallicolana* are in Figure 4.

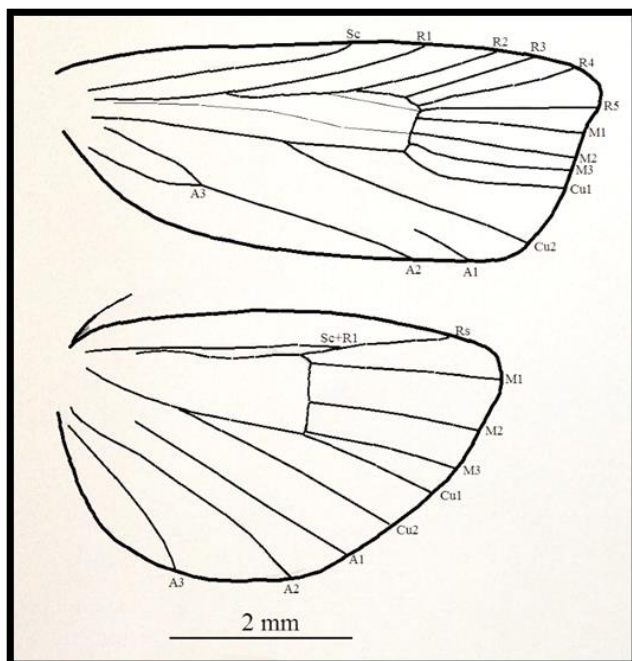


Figure 4. Veins of forewing and hindwing of *Pammene gallicolana*.

Head is 1,50 times wider than its length. Antennae filiform and medium length, densely covered with short cilia, its length 0,65 times longer than forewing length.

On the thorax is grayish brownish; the ventral of the thorax is grayish-brown.

Forewings are long and broad, its length 2,30 times longer than its width. The ground color of the forewing grayish brown with small yellowish brown stains. There are whitish patterns on the coastal margin. There is a large dirty whitish stain in the lower half of the distal region. Fringe is long and light brown. The ventral surface of the forewing is pale brown, with a large pale whitish stain in the lower half of the distal region. Hindwings are broad and its length 1,60 times longer than its width. The ground color of the hindwings brown. The female individual is similar to male. The male genital organ is in Figure 5.



Figure 5. The male Genitalia of *Pammene gallicolana*.

Valva is long and broad, sclerotized, large round at the end, its length 4 times longer than its width and covered with long and frequent hairs. Tegumen strongly sclerotized and protruding posteriorly. Aedeagus long and broad, distinctly narrow beyond middle and similar to a bottle; cornuti present. Sacculus short and narrow, well sclerotized and sparsely with long spines. Saccus small and narrow.

In this study, we described the external and genital morphology of the male *Pammene gallicolana*. The important taxonomic characters belong to *P. gallicolana* were described in detail. Each one of the external and genital taxonomic characters was measured with digital caliper and stereo microscope. This species is a new record for the the lepidoptera fauna of Çanakkale.

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***Corresponding author's:**

Erol ATAY

Department of Biology, Faculty of Arts and Sciences,
Mustafa Kemal University, Hatay, TURKEY

E-mail: eatay@mku.edu.tr