

# The morphology of egg chorion of *Bembecia scopigera* (Scopoli, 1763) with data on a new host plant and contribution to Turkish distribution (Lepidoptera: Sesiidae)

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## Abstract

The egg chorion morphology of *Bembecia scopigera* (Scopoli, 1763) are examined in SEM and described. *Onobrychis atropatana* is identified as a new host plant for *B. scopigera*. The distribution in Turkey of the species is given a new province record. The photos of eggs in SEM, adult female and eggs on host plant are given. KEY WORDS: Lepidoptera, Sesiidae, *Bembecia scopigera*, host plant, egg chorion, SEM, Turkey.

**La morfología del corion del huevo de *Bembecia scopigera* (Scopoli, 1763) con datos sobre una nueva planta nutricia y contribución a la distribución en Turquía (Lepidoptera: Sesiidae)**

## Resumen

Se examina en SEM y se describe la morfología del corion del huevo de *Bembecia scopigera* (Scopoli, 1763). *Onobrychis atropatana* se identifica como nueva planta nutricia para *B. scopigera*. Se da la distribución de la especie en Turquía con el registro de una nueva provincia. Se dan las fotos del huevo en SEM, de la hembra y el huevo sobre la planta nutricia.

PALABRAS CLAVE: Lepidoptera, Sesiidae, *Bembecia scopigera*, planta nutricia, corion huevo, SEM, Turquía.

## Introduction

*Bembecia scopigera* is one of the most common species known as harmful of sainfoin. *B. scopigera* of detail bionomic were given by BOURNIER and KHIAL (1968). ŠPATENKA and LAŠTŮVKA (1990) gave redescription of the species and said that the caterpillar of it was monophagus in the roots of *Onobrychis viciifolia* and also affects cultivated crops. TAMER & ÖZER (1990) investigated the biology of *B. scopigera* on sainfoin (*Onobrychis viciifolia*) in Ankara province. The biology of *B. scopigera* was investigated in laboratory and under natural conditions, and infestation rates on *Onobrychis sativa* fields were determined by GÜLTEKIN & GÜÇLÜ (1997).

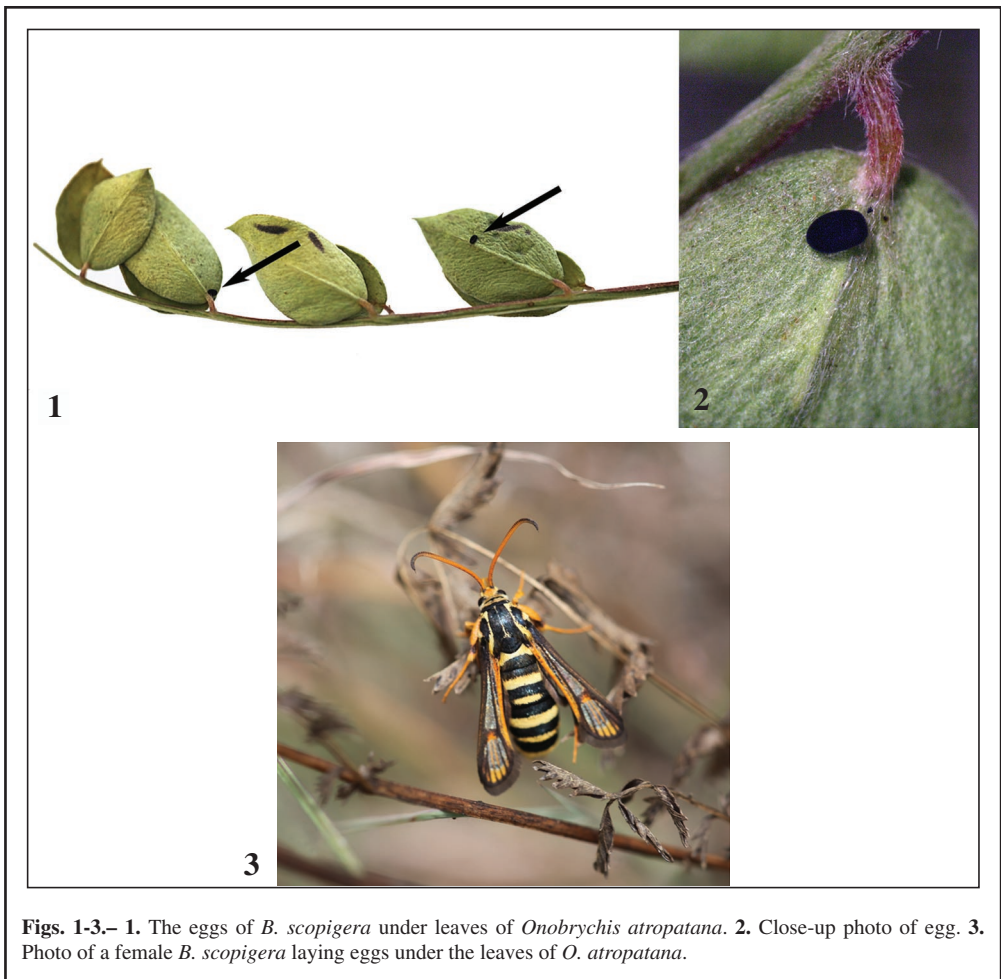
Detail egg chorion morphology of some Sesiidae species was studied in scanning electron microscope. TOSEVSKI *et al.* (1996) compared the chorion morphology of eggs of 7 species from the genus *Chamaesphecia* and gave their sizes and SEM photos of eggs. NAUMANN and SCHROEDER (1980) gave measurements size of eggs of *Chamaesphecia tenthrediniformis* and *C. empiformis* with electron and light microscopy images. BAŖOWSKI (2013) studied the egg morphology of 7 species from different genera. MASO and RIBES (1990) examined the fine structure of egg chorion of *Sesia apiformis*. Until now only *B. megillaeformis* belonging to the genus *Bembecia* of egg chorion was examined using scanning electron microscope (BAŖOWSKI, 2013).

In this study, new host plant of *B. scopigera* was found and egg's chorion morphology was studied using SEM. Also distribution of this species is briefly evaluated and contributed to the distribution of the species from Turkey.

### Material and Methods

A female specimen of *B. scopigera* was collected from Ardahan, Posof, northeast of Sarıdarı Village (41° 33' N / 42° 49' E), 19-VIII-2014, A. Hasbenli leg. The specimen was seen laying three eggs on plant's leaves (Figs. 1-3) and then it was caught using by sweep net. Leaves were placed into a storage box with eggs and brought to the laboratory. One of the three eggs was examined chorion surface by scanning electron microscopy. Other eggs were stored in a petri dish at room temperature to observe colour changes in chorion. The specimen is deposited in Zoological Museum of Gazi University (ZMGU).

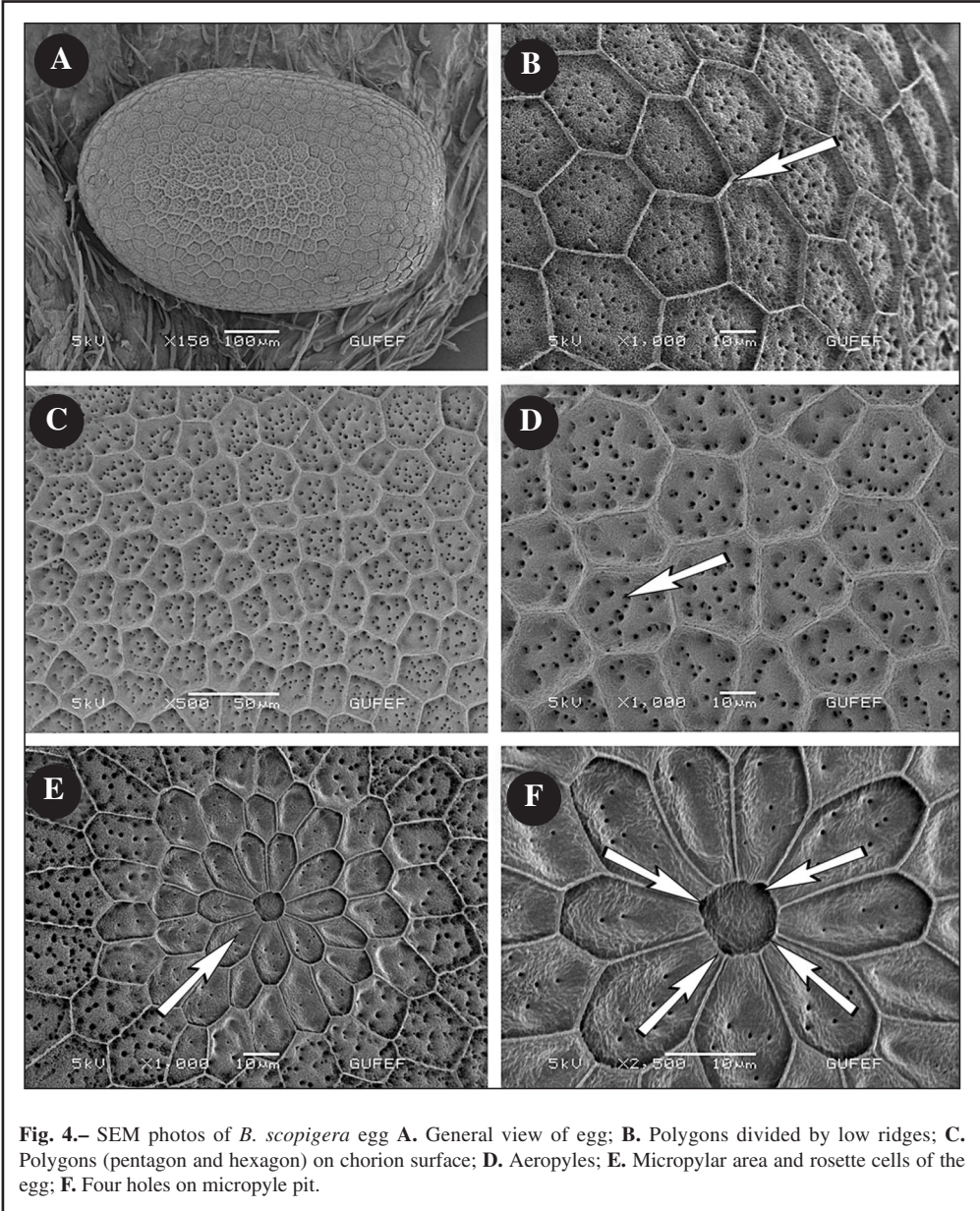
For SEM study, 72 hours old eggs of *B. scopigera* without contact of any chemicals were mounted with double sided tape on stubs and coated with gold in a Polaron SC 502 Sputter Coater. They were examined with a Jeol JSM 5600 Scanning Electron Microscope at 10 kV.



**Figs. 1-3.**– 1. The eggs of *B. scopigera* under leaves of *Onobrychis atropatana*. 2. Close-up photo of egg. 3. Photo of a female *B. scopigera* laying eggs under the leaves of *O. atropatana*.

**Results**

Female specimen of *B. scopigera* was collected from field study while it was singly laying on the bottom surface of leaves of *Onobrychis atropatana* (Figs. 1-2). *O. atropatana* is new host plant for this species.



**Fig. 4.**– SEM photos of *B. scopigera* egg **A.** General view of egg; **B.** Polygons divided by low ridges; **C.** Polygons (pentagon and hexagon) on chorion surface; **D.** Aeropyles; **E.** Micropylar area and rosette cells of the egg; **F.** Four holes on micropyle pit.

Chorion structure of the egg: Freshly laid eggs were dark brown. Their colour didn't change even a few weeks later. The oval shaped eggs were flattened in the micropylar polar (Fig. 4A). The egg examined in scanning electron microscopy was 0,69 mm in height and 0,46 mm in width. The chorion surface was formed of polygons (pentagon and hexagon) divided by low ridges (Fig. 4B). The polygons were different in sizes (Fig. 4C). The egg surface in polygons covered with numerous aeropyles (Fig. 4D). The micropyle pit was surrounded by a rosette of 9 petal shaped cells (Fig. 4E). Rosette and secondary cells were including very few aeropyles. The micropyle pit was containing mutually four holes (Fig. 4F).

## Discussion

Host plants of *B. scopigera* consist of family Fabaceae. Although ŠPATENKA & LAŠTŮVKA, 1990 said that this species was monophagous to *Onobrychis viciifolia*, there are several host plants of the species. The most known host plants is genus *Onobrychis* such species as *Onobrychis sativa*, *Onobrychis viciifolia*, *Onobrychis toumefortii* (DE FREINA, 1994; ŠPATENKA & LAŠTŮVKA, 1990). *Onobrychis atropatana* is new host plant for this species. According to DE FREINA (1994), also the other known host plants for this species are *Lotus corniculatus*, *Anthyllis vulneraria*, *Doynium pentaphyllum*, *Ononis spinosa*, *Medicago* spp. *Melilotus* spp., *Hippocrepis comosa*, *Lathyrus pratensis*, *Cenaurea* spp.

When we compared our SEM egg photos of *B. scopigera* with *B. megillaeformis* in BAĞOWSKI (2013), there are differences. Egg chorion of *B. megillaeformis* is located many aeropyles such like a spongy and not formed of polygons divided by ridges. The numbers of rosette cells (9) of *B. scopigera* are more than *B. megillaeformis* (6-7).

Even though *B. scopigera* was showed wide distribution from Turkey mentioned in many literatures (ŠPATENKA *et al.*, 1999; NAUMANN & SCHROEDER, 1980 and DE FREINA, 1994), this species have recorded a few provinces from Turkey. When we examined the distribution of the *B. scopigera* in Turkey, it has shown sectional distribution from east to west in the northern part of the country, also it was recorded in the southern part as Mersin, Hatay and Karaman provinces in the Mediterranean region of Turkey (Fig. 5) (KOÇAK & KEMAL, 2009; GARREVOET *et al.*, 2007, SAĞIROĞLU & CAN CENGİZ, 2011; TAMER *et al.*, 1997). The specimen from Ardahan represents a new province record. With further detailed studies that will be made in Turkey, the distribution of this species is expected to expand.

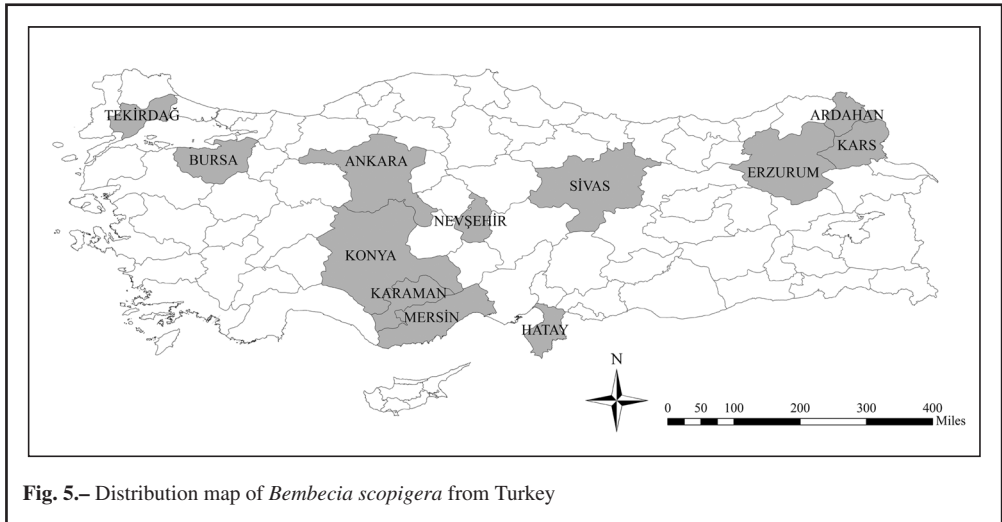


Fig. 5.– Distribution map of *Bembecia scopigera* from Turkey

## Acknowledgments

We wish thank to Dr. Ufuk Özbek for identifying the *Onobrychis atropatana*, D. Erhan Ersoy for



editing photos and Gazi University for providing SEM facilities. Also we thank to Dr. Marek Bałowski and Dr. Antonio Vives who sent the publication. The specimen and its eggs examined in this study were collected during field study within the TANAP Project. We would like to thank for study TANAP Natural Gas Transmission Inc. and ÇINAR Engineering Consulting Inc. performed TANAP EIA Study.

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(Recibido para publicación / *Received for publication* 13-III-2015)

(Revisado y aceptado / *Revised and accepted* 26-V-2015)

(Publicado / *Published* 30-VI-2016)