

## MORPHOLOGY, BIOLOGY AND DISTRIBUTION OF *Stigmella irregularis* Puplesis (LEPIDOPTERA: NEPTICULIDAE)

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### Abstract

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New data on the morphology, biology and distribution are given for *Stigmella irregularis* Puplesis, 1994, a species described after several males from Crimea. A combination of black head, ochreous orange frontal tuft, creamy collar and scape, and hindwing black androconial scales are characteristic of the male. The female specimens collected by the present authors together with males, and described for the first time here, having the same morphological characters combined with the transversal forewing band, have been preliminarily attached to this species. *Stigmella irregularis* develops in the leaves of *Pyrus amygdaliformis* Vill., adults were collected near *Pyrus elaeagrifolia* Pallas, and other *Pyrus* species are also possible host plants. The indistinctly yellow larva forms a narrow, later only slightly dilating mine, with dropping accumulation in its first half. All other nepticulid species mining on *Pyrus* spp. show green or greenish white larvae. Judging from the occurrence of adults and larvae, the species either produces two or just one extended generation per year. It is known from Crimea, Croatia, Greece (incl. Crete and Rhodos), and Sicily; here it is reported from Croatia for the first time, and the first exact faunistic data are supplied for Greece.

*Stigmella irregularis*, biology, *Pyrus*, female, distributional data

Species of the genus *Stigmella* Schrank, 1802 are leaf miners and the mines of their larvae are usually good ascertainable. The distribution of individual species and species composition of certain areas are therefore comparatively fair known (cf., e.g. Laštůvka & Laštůvka, 1997 for central and van Nieukerken, 2007 for whole Europe). One of few exceptions is *Stigmella irregularis* Puplesis, 1994. This species has been described after several males from Crimea and placed in a separate species group ("*S. irregularis* group") because of its characteristic external and especially male genital morphology. The female and bionomics remained unknown. Puplesis (1994) gives in his original description that this species group comprises two species, the second of them should be an undescribed species from Greece.

We could collect and investigate the *Stigmella irregularis* in Greece, Croatia and Sicily, we obtained several new data on its morphology and bionomics, which we bring in this contribution.

### *Stigmella irregularis* Puplesis, 1994

**Material:** **Croatia**, Krk, Lakmartin, iii.2008, 1 ♂ e.l. (larva 6.x.2007); **Greece**, Préveza, Thesprotikó, 14.vi.1996, 1 ♂, 1 ♀, 11.vi.1998, 3 ♂♂, 1 ♀; Fokida, Itéa, 26.v.1999, 1 ♀; Fthiotis, Agios Charalambos, 22.vi.1997, 2 ♂♂; Viotia, Chai-ronia, 13.vi.1998, 1 ♀; Achaia, Kalavrita, 20.vi.1997, 1 ♂, 5.vi.1999, 1 ♀; Glástra, 4.vi.1999, 1 ♀; Messinia, Pírgos, 18.vi.1998, 3 ♂♂, Proastio, 19.vi.1998, 1 ♂; Lakonia, Apidia, 18.vi.1996, 3 ♂♂, Nea Marathea, 17.vi.1997, 2 ♂♂, Skoutari, 16.vi.1998, 1 ♂, all lgt. A. & Z. Laštůvka, coll. A. Laštůvka; Rhodos, Kolombia, 40 m, 4.–5.vii.2000, 1 ♀, lgt. M. Fibiger, coll. ZMUC; **Italy, Sicily**, Solarino, 20.vi.2000, 2 ♂♂, Francavilla di Sicilia, 23.vi.2000, 4 ♂♂, lgt. A. & Z. Laštůvka, coll. A. Laštůvka.

### Diagnostic characters

Male (Fig. 1). Wingspan 3.6–4.8 mm. Head black, frontal tuft ochreous orange; collar and scape greyish creamy. Thorax and forewing brownish black, with a greyish golden lustre; forewing underside black. Hindwing covered by black androconial

scales, black also on underside. Abdomen black, legs greyish black, distal parts paler.

Male genitalia (Fig. 2). Genital capsule length 0.28 mm; valva pointed distally, without any internal lobes; uncus broad, hemispheric from ventral view; central process of gnathos distinctly larger than lateral horns; vinculum strongly concave; transverse bar of transtilla distinctly concave; aedeagus with numerous small cornuti, constricted in its distal half.

Female (Fig. 3). Wingspan 3.8–4.8 mm. Head black, frons ochreous orange; collar and scape greyish creamy. Thorax brown with a golden lustre. Forewing in its basal half brown, golden orange lustrous; broad, light golden transversal band with blurred inner margin; distal part of forewing brown or black, purple lustrous. Hindwing and cilia light greyish brown. Abdomen greyish brown. The female specimens did not reared. They were collected together with males and they show common characters with them, so that we presuppose they belong to this species.

Female genitalia (Fig. 4). Length 0.33 mm. Last abdominal segments elongate; anal papillae flat; both apophyses long and slender; 8th tergite with groups of about 9 small setae on both sides, several individual setae below them; 7th segment with small groups of dense short setae and groups of very long scales laterally; corpus bursae large, ovoid, with pectinations especially in its distal part; bursa accessoria small, wrinkled.

## Comments

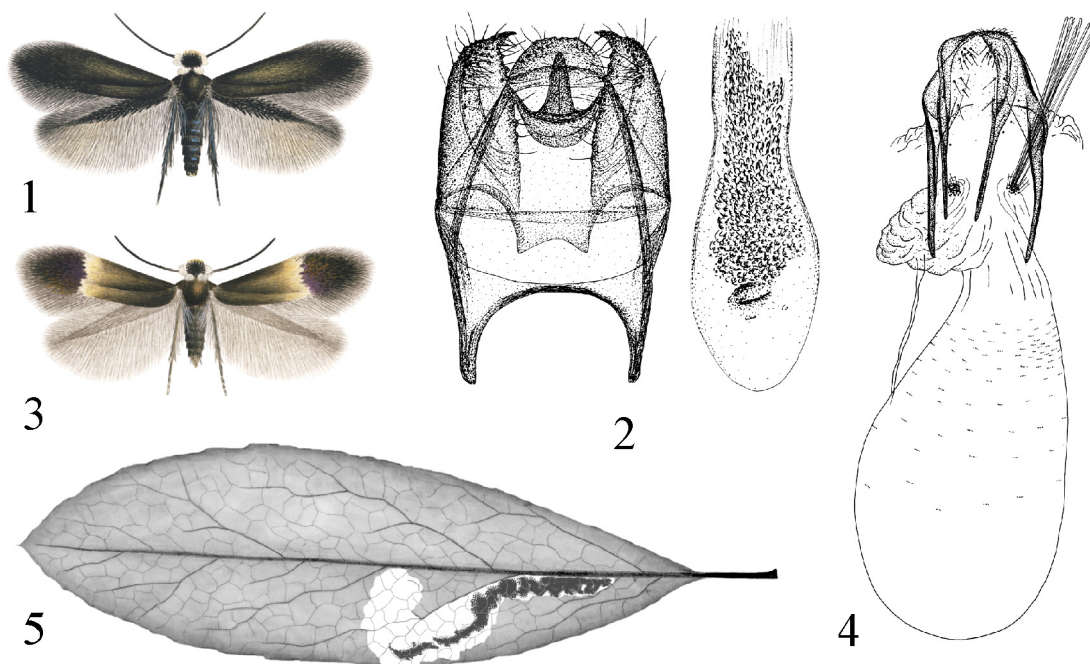
The specimens from Greece, Croatia and Sicily differ from the Crimean type material by the presence of distinct hindwing androconial scales in male. Puplesis (1994) takes this character for species specific. We consider all specimens as conspecific, and the absence of the androconial scales in Crimean specimens only for the manifestation of the local variability (or specificity of a local population).

## Biology

The larvae have been found in the leaves of *Pyrus amygdaliformis* Vill. in Croatia, and adults have been usually collected near *Pyrus elaeagnifolia* Pallas in Greece, other *Pyrus* species are also possible host plants. The indistinctly yellow larva forms a narrow, later slightly dilating mine, with dropping accumulation in its first half (Fig. 5). All other nepticulid species mining on *Pyrus* spp. show green larvae, or greenish white in *Ectoedemia atricollis* (Stainton, 1857) respectively. Adults have been collected between May 26th and August 24th, which indicates two generations per year, but it could also be one very extended generation.

## Distribution

The distribution of *Stigmella irregularis* remains insufficiently known. The species has been recorded in Crimea (type locality), the Greek mainland, Crete (van Nieukerken, pers. comm.), Rhodos, Croatia, and Sicily (Laštůvka & Laštůvka 2005). Here recorded for the first time from Croatia, and the first exact faunistic data are supplied for Greece (Fig. 6).



1–5: Morphology and mine of *Stigmella irregularis*, 1 – adult male, 2 – male genital capsule and aedeagus, 3 – adult female, 4 – female genitalia, 5 – mine on *Pyrus amygdaliformis*

6: Present records of *Stigmella irregularis*

### SUMMARY

The contribution brings new data on the morphology, biology and distribution of *Stigmella irregularis* Puplesis, 1994. This species has been described after several males from Crimea and subsequently collected in Greece. Its morphology is quite characteristic. A combination of black head, ochreous orange frontal tuft, creamy collar and scape, and hindwing black androconial scales are characteristic for male. The female specimens collected together with males, and described for the first time here, having the same morphological characters combined with the transversal forewing band are preliminary attached to this species. *Stigmella irregularis* develops in the leaves of *Pyrus amygdaliformis*, adults were collected near *Pyrus elaeagrifolia* Pallas in Greece, other *Pyrus* species are also possible host plants. The indistinctly yellowish larva forms a narrow, later only slightly dilating mine, with dropping accumulation in its first half. All other on *Pyrus* spp. mining Nepticulidae species show green larvae, or greenish white in *Ectoedemia atricollis* (Stainton, 1857). The species develops probably two generations per year, adults have been collected between May 26th and August 24th, but only one extended generation is also possible. *Stigmella irregularis* is known from Crimea, Croatia, Greece (incl. Crete and Rhodes), and Sicily; here given for the first time from Croatia, and first precise faunistic data supplied for Greece.

### SOUHRN

#### Morfologie, biologie a rozšíření drobníčka *Stigmella irregularis* Puplesis (Lepidopera: Nepticulidae)

V příspěvku jsou uvedena nová data k morfologii, biologii a rozšíření drobníčka *Stigmella irregularis* Puplesis, 1994 popsaného z Krymu a následně zjištěného v Řecku. Morfologie tohoto druhu je zcela charakteristická. Pro samce je význačná kombinace znaků černá hlava, okrově oranžový štěteček na čele, krémově zbarvený límec a oční klapky a nápadné černé androkoniální šupinky na zadním křídle. Samičí jedinci byli sbíráni společně se samci. Shodují se s nimi ve většině znaků, navíc mají zlatavě zbarvený příčný pásek na předním křídle. Byli proto předběžně přiřazeni k tomuto druhu. Housenka *Stigmella irregularis* se vyvíjí v listech *Pyrus amygdaliformis* Vill., v Řecku byli dospělci většinou zjištěni v blízkosti *Pyrus elaeagrifolia* Pallas, jako hostitelské rostliny připadají v úvahu i další druhy rodu *Pyrus*. Nevýrazně žlutá housenka vytváří úzkou chodbičkovitou minu, která se jen mírně rozšiřuje a první polovinu má téměř zcela vyplněnou shluky trusu. Ostatní druhy drobníčků (Nepticulidae) minující listy hrušní (*Pyrus* spp.) mají zelené housenky, druh *Ectoedemia atricollis* (Stainton, 1857) je má zelenavě bílé. Druh má pravděpodobně dvě generace v průběhu roku, dospělci byli chyceni mezi 26. květnem a 24. srpnem, ale není vyloučena ani jediná generace se značně protáhlým výskytem dospělců. Drobníček *Stigmella irregularis* je dosud znám z Krymu, Chorvatska, Řecka (včetně ostrovů Kréta a Rhodos) a Sicílie; v této práci je poprvé publikován z Chorvatska a jsou uvedena první konkrétní data o výskytu v Řecku.

*Stigmella irregularis*, biologie, *Pyrus*, samice, rozšíření

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