

## THE FIRST RECORD OF *SYNANTHEDON MESIAEFORMIS* (LEPIDOPTERA, SESIIDAE) IN SLOVAKIA

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**Abstract:** *Synanthedon mesiaeformis* (Herrich-Schäffer, 1846) has been found in Slovakia for the first time. The species was found in the westernmost part of Slovakia in Centnúz (Malacky env.) in May 2009. However, the first mention of the species is dated from 1995 when the female was attracted to flowers of *Ligustrum vulgare* (June 10th 1995) (lgt., coll. A. Lendel).

**Key words:** *Synanthedon mesiaeformis*, Lepidoptera, Sesiidae, Slovakia.

### INTRODUCTION

**Diagnostic characters:** Wingspan: 19–31 mm, antenna whitish yellow distally, eye with white border, deep yellow rings on 2nd and 4th segments, ring on 4th segment distinctly broader, but there are differences between individual population, anal tuft black, hind tibia orange with black ring distally (prepared specimens, fig. 4A, 4B), differences in male genitalia of the related species are especially in the shape of the crista sacculi on valva and in the apical end of aedeagus (these characters are useful in the determination of material from pheromone traps).

**Bionomics:** *Alnus glutinosa* (L.) has been described as the host plant of this species. The larva develops in somewhat winding, flat tunnels between the bark and the wood, 6–8 cm in length, mainly in old trees. The larvae have been found up to 3 m above ground level, but higher parts of trunks had not probably been examined. The larva pupates in a dense cocoon in the bark. The development is biennial according to most authors, DE FREINA (1997) gives a three year cycle for northern Europe. The adults are on wing from the second half of May up to the end of July. The species prefers solitary trees on meadows, in parks, along streams and communications, it rarely occurs in dense forests if the latter are closer to more suitable habitats.

**Distribution:** *Synanthedon mesiaeformis* shows very disjunct distribution yet its host plant is more or less widespread, and symptoms of its presence are quite characteristic and conspicuous. It was described by HERRICH-SCHÄFFER (1846) from southern Russia without giving any concrete locality. Additional known localities have increased very slowly in con-

trast to other *Synanthedon* species probably because of very specific habitat preferences, specific population ethology, elimination of solitary alder trees and an insufficient level of faunistic investigations in several parts of southern and eastern Europe.

### MATERIALS AND METHODS

The study material introduces five specimen of population from Centnúz area, four out of which are females (wingspan: 29 mm, 29.5 mm, 27.5 mm and 25 mm) and one male with a wingspan of 24.5 mm obtained between the years 1995 and 2011. Two adult specimen were observed in wide open space (female attracted to flower of *Ligustrum vulgare* and newly hatched female sitting on the bark near its exuvia). Further three specimen (two female and one male) hatched from found larvae. All development stages of the clearwing moth were documented including the egg, young and adult larva, pupa and their environment interaction. It was found that there exists variability in the colouring of the fourth abdominal segment (distal yellow ring) between the individual isolated populations. The ring appears to be narrower in its central part – reduction of yellow colouring (fig. 4A, 4B) at prepared specimen in observed population.

### RESULTS AND DISCUSSION

**Occurrence in Slovakia:** *Synanthedon mesiaeformis* (Herrich-Schäffer, 1846) (Slovak: podobník piliarkovitý) has been found in Slovakia for the first time. The species was found in the westernmost part of Slovakia in Centnúz (Malacky env.) between the municipi-

palities Jakubov, Záhorská Ves, Vysoká pri Morave and Láb in May 2009. However, the first mention of the species is dated from 1995 when the female was attracted to flowers of *Ligustrum vulgare* (June 10th 1995) (lgt., coll. A. Lendel). This discovery was the reason to engage in research in the locality reflecting the bionomy of the species. The emergency holes (fig. 1A) were found at first only in the trunk of one old alder (*Alnus glutinosa*) growing along the river bank. The infected tree (fig. 1B) is situated something about 100 metres from the place of the first finding 14 years ago. A newly hatched female (fig. 2A, 2B) was observed in hot and sunny weather sitting on the bark near its exuvia (fig. 2C) at 10.30 AM on May 25th 2009. A larva was found on the same place the next year, on April 18th 2010, e.l. May 17th 2010 a male hatched (cocoon with exuvia in fig. 2D). The following year, on May 13th 2011 several places were found on the host tree in the cracks in the bark, where the frass produced by larvae got trapped (fig. 2E). It's a sign of its presence in the wood under the bark. Three larvae were confirmed this way, two adult ones (overwintered twice) (fig. 2F, 2G) and a young one (overwintered once) (e.l. June 6th and 10th 2011 two females hatched). Emergency holes (three of them) were discovered on nearby old trees for the first time and 400 metres to the south frass with a young larva on a slightly wounded tree, which was growing slanted towards the water. The larva revealed itself by its frass, which got trapped in the upper part of the bended part of the tree. Although this place is not in such an open space as the

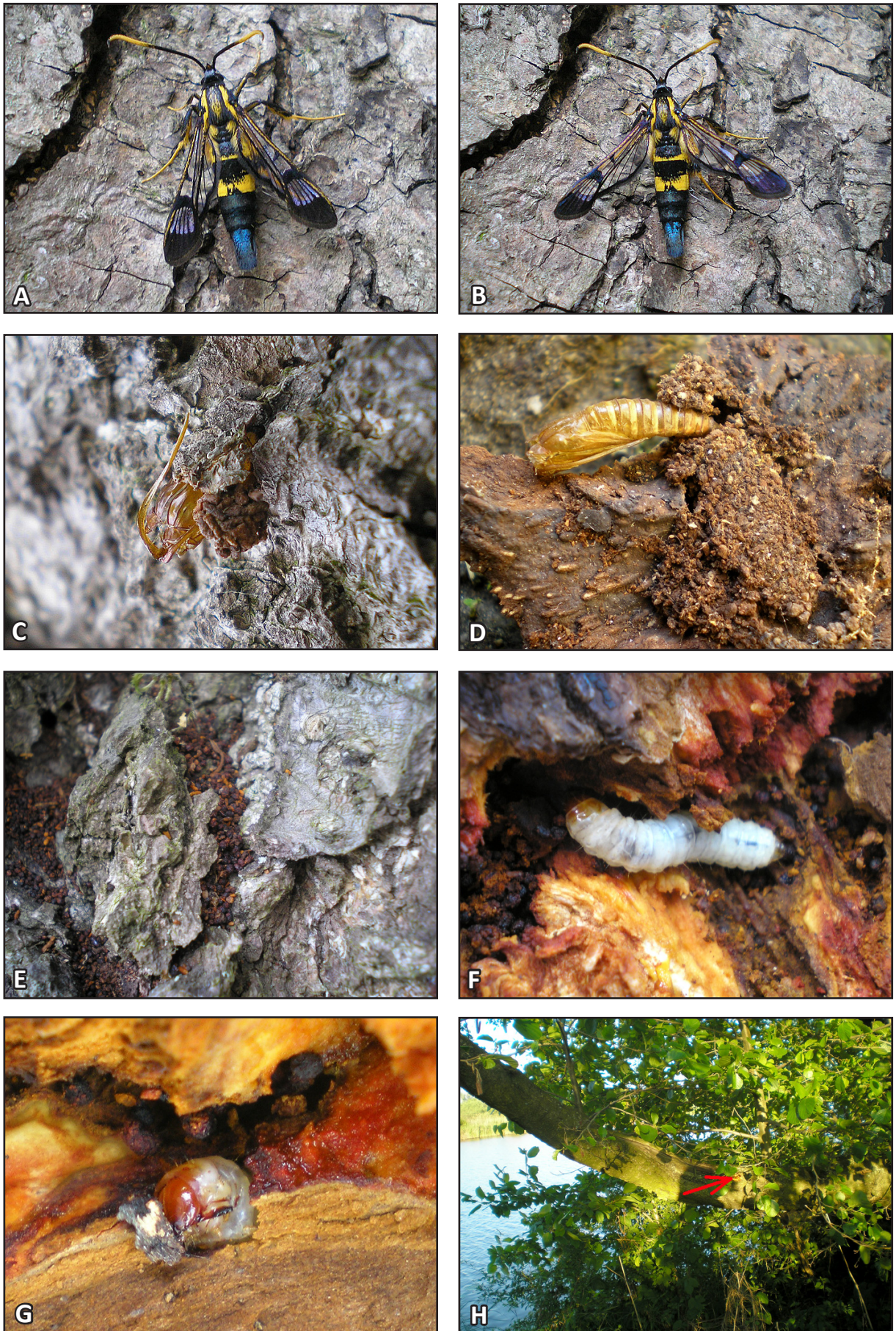
original habitat, the part of the tree with the larva is still heated by the sun (fig. 2H). Apart from a single young larva (fig. 3A), no other larvae or emergency holes were found. Although the newest markers of presence of the species in the surroundings are significant, it still remains evident that the population is preferentially bound to one site. The host tree grows near water, in low vegetation, which is regularly cut. It's an old tree marked by anthropological activity. Some of its main branches had been sawn off. The emergency holes were found from 30 cm to 2 meters above ground, reaching maximum at one meter. There was no trace of the species in the upper parts. The holes are found mainly in bends, cracks in the bark and in wounded places, predominantly in the northern part of the tree, less elsewhere. In the southern part, which is infected by other insects, they weren't found at all. The locality is situated at an altitude of 140–149 meters above the sea level. It is 30 km by air distance from the nearest known area in SE Moravia in the Czech Republic (LAŠTŮVKA & LAŠTŮVKA 2008). Somewhat further are localities in SW Hungary and in East Poland.

**Character of the locality:** The area is situated approximately between the municipalities Jakubov, Záhorská Ves, Vysoká pri Morave and Láb. Centnůz is a slow flowing water reservoir, approximately 2.5 km long, several meters wide – in some places up to 80 m (fig. 3B). It is part of Zohorský kanál which is a branch of the Morava river. Its northern part is situated in Šmolzie reserve. This area is mostly covered with flood-plain forest (*Fraxino-Ulmetum*). It is



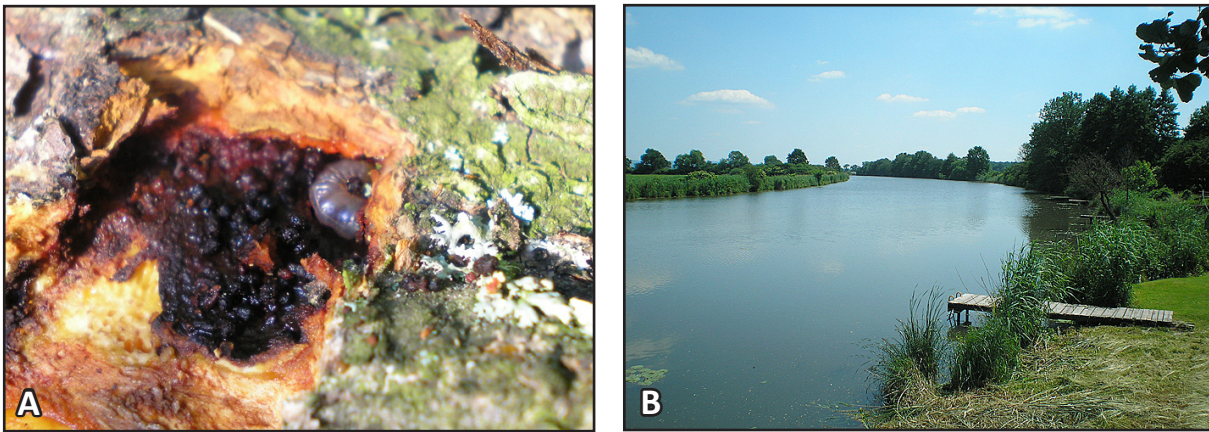
**Figure 1.** *Synanthedon mesiaeformis*, A – emergency holes, B – host tree.





**Figure 2.** *Synanthedon mesiaeformis*, A – a newly hatched female sitting on the bark, B – disturbed female and its warning pose, C – exuvia, D – exuvia with cocoon (sight under the bark), E – frass in the cracks in the bark, F – adult larva feeds in tunnels beneath the bark, G – adult larva (detail of its head), H – a slightly wounded tree, which was growing slanted towards the water (arrow indicates location of young larva).





**Figure 3.** *Synanthedon mesiaeformis*, A – young larva, B – Centnúz water reservoir.

worth to mention the presence of the beaver – *Castor fiber*. The central part of the canal is extended and resembles a lake. Fields are located in the vicinity of both banks (eastern and western). The absence of forest growth in these parts provides a high supply of light all day long and warmth near the watercourse. Impassable blackthorn shrubs are located right at the bank, which alternate with a zone of old trees such as the European Ash – *Fraxinus excelsior*, White Willow – *Salix alba* and European Alder – *Alnus glutinosa*. It is possible to access the water in these places, which is often used by cottage people, tourists or fishermen, who dwell here, camp here often and affect the site with their activity. The anthropogenic influence like cutting grass, sawing and breaking the lower branches causes a thinning of the undergrowth, enables uncovering of host trees and penetration of sun rays, which have a positive effect on the species. A substantial part of this area consists of moist meadows with moisture-loving grasses and reed with an abundance of rare Lepidoptera species like *Thumatha senex*, *Pelosia obtusa*, *Spilosoma urticae*, *Chilodes maritimus*, *Phragmatiphila nexa*, *Archanara dissoluta*, *Archanara neurica* and other moisture-loving common reed moths, very rare here is *Ostrinia palustralis*, there is a numerous population of *Heteropterus morpheus*, on the *Sanguisorba officinalis* growing near the water live the monophage *Maculinea nausithous*, *Maculinea teleius* and *Diachrysia zosimi*. *Acrionicta strigosa*, *Cyclophora pendularia* and other rare species attract from the alders to the light of lamp at the night. The southern part of Centnúz consists of flood-plain forests with more hornbeams, linden and maple trees.

### CONCLUSION

A new moth species has been discovered in Slovakia for the first time, which had been known from the neighbouring countries and its presence in Slovakia had been expected. As opposed to the majority of the *Synanthedon* species, *S. mesiaeformis* has a significantly disjunct distribution area, which is proba-

bly related to very specific demands on the biotope, specific population, recessing solitary alders and the lack of fauna research in some regions despite the typical and unmistakable behaviour patterns of the clearwing moth in the environment. The species was described in the middle of the 19th century in South Russia without giving any concrete locality (HERRICH-SCHÄFFER 1846). Gradually it was found in other localities (Table 1 shows the first records in the respective countries). The first mention of the species from Slovakia comes from 1995, when the female was attracted to flowers of *Ligustrum vulgare* (June 10th 1995) in Centnúz area (Malacky env.) in the westernmost part of the country (lgt., coll. A. Lendel). This discovery was the reason to engage in research in the locality reflecting the bionomy of the species. The emergency holes were found at first only in the trunk of one old alder (*Alnus glutinosa*) growing along the river bank. They are located predominantly in the northern part of the tree, from 30 cm above ground to 2 meters, with a maximum distribution up to 1 meter. They are not present in the southern part of the tree, which is infected by another insect. The infected tree is situated something about 100 metres from the place of the first finding 14 years ago. A newly hatched female (fig. 2A, 2B) was observed in hot and sunny weather sitting on the bark near its exuvia (fig. 2C) at 10.30 AM on May 25th 2009. Later several larvae were found in the tree based on the presence of frass trapped in the cracks in the bark. In 2011 the new emergency holes (3 of them) appeared also on nearby trees and even one young larva was found approximately 400 metres to the South. Even despite these additional findings it is clear, that the population of the species depends on one old tree, which is affected by human activity (sawn off branches). The adult is on wing from the second half of May up to the end of July. It prefers sunny biotopes with low undergrowth along a watercourse with maximum length of daily light. Regarding the character of the locality, the anthropogenic influence seems to be significant (grass cutting, collecting wood, staying near water, camping, agricultural activity). The larva is monophaga-

**Table 1.** The first records of *Synanthedon mesiaeformis* in European countries (further localities in these countries discovered later are not given), taken from LAŠTŮVKA & LAŠTŮVKA (2008).

country	first record	site	source
Russia	1846	south Russia	Herrich-Schäffer
Romania	1896	Banat, present SW Romania	Abafi-Aigner
Herzegovina	1912	Konjica	Bartel
Hungary	1930s	SW Hungary	Pazsicky (1941)
Finland	1945	southern coast of Finland	Nordman
Lithuania	1970	southern part of Lithuania	Šulcs et al. (1981)
Bulgaria	1974	Black Sea coast of Bulgaria	Engelhard (1975)
Serbia	1988	Ljig	I. Toševski
Poland	1990	easternmost part of Poland	Buszko & Hołowiński (1994)
Macedonia	1998	Strumica-Dobrošinci	Laštůvka & Laštůvka
Greece	1999	Stomio	Laštůvka & Laštůvka
France	1990s	N of Beziers	Vénéroux, D. Baumgarten & Villemagne-l'Argenière
		NW of Nimes	E. Bettag, D. Bartsch & Bläsius
Turkey	1990s	NW Anatolia	Anduze, D. Bartsch
Spain	2008	between La Jonquera and Figueres in N Catalonia	Špatenka et al. (1999)
Czech Republic	2008	south-easternmost part of the Czech Republic, Soutok, Břeclav env.	Laštůvka & Laštůvka
Slovakia	1995 (2009)	westernmost part of Slovakia, Centnúz, Malacky env.	Laštůvka & Laštůvka
			A. Lendel (2011)

gous. It feeds on the wood of *Alnus glutinosa*. The larva pupates in a dense cocoon in the bark. The development is biennial according to most authors, DE FREINA (1997) gives a three-year cycle for northern Europe. The Centnúz area is a tributary of the Morava river. It can be divided into three parts. The northern and southern parts are mostly covered by flood-plain forest. The central part consists of impassable blackthorn shrubs, which separate old solitary trees with lower undergrowth. Access to water is enabled in these parts. There are moist meadows with common reed. The Centnúz locality is situated at an altitude of 140–149 meters above the sea level. It is 30 km away by air distance from the nearest

locality in the Czech Republic, SE Moravia, Soutok. (Břeclav env.) (LAŠTŮVKA & LAŠTŮVKA 2008). Somewhat further are localities in SW Hungary and East Poland. The study material introduces five specimens of the population, four out of which are females (wingspan: 29 mm, 29.5 mm, 27.5 mm and 25 mm) and one male with a wingspan of 24.5 mm. It was found that there exists a variability in the colouring of the fourth segment (distal yellow ring) between the individual isolated populations. The ring appears to be narrower in its central part – reduction of yellow colouring (fig. 4A, 4B) in observed population.



**Figure 4.** *Synanthedon mesiaeformis*, A – prepared female, B – prepared male.

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