

# *Stigmella magdalенаe* (Lepidoptera: Nepticulidae), new to the Belgian fauna

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**Abstract.** *Stigmella magdalенаe* (Klimesch, 1950) is mentioned here for the first time from Belgium. On 23 August 2009, several leaf mines were found on *Sorbus aucuparia* L. at Arlon (province of Luxembourg), in the military camp Lagland, leg. J.-Y. Baugnée. On 28 August 2010, five mines were found on *Sorbus aucuparia* in a second Walloon locality, at Bévercé (province of Liège), in the valley Trôs Marets, leg. B. van As. Information on the biology and the distribution of this species are presented.

**Résumé.** *Stigmella magdalенаe* (Lepidoptera: Nepticulidae), espèce nouvelle pour la faune belge *Stigmella magdalенаe* (Klimesch, 1950) est signalé pour la première fois en Belgique. Le 23 août 2009, plusieurs mines ont été trouvées sur *Sorbus aucuparia* L. à Arlon (Province de Luxembourg), dans le camp militaire de Lagland, leg. J.-Y. Baugnée. Le 28 août 2010, cinq mines sont observées également sur *Sorbus aucuparia* dans une seconde localité wallonne, à Bévercé (Province de Liège), dans la vallée du Trôs Marets, leg. B. van As. Les informations relatives à la biologie et à la répartition du papillon sont résumées.

**Samenvatting.** *Stigmella magdalенаe* (Lepidoptera: Nepticulidae), een nieuwe soort voor de Belgische fauna *Stigmella magdalенаe* (Klimesch, 1950) wordt hier voor het eerst gemeld voor België. Op 23 augustus 2009 werden enkele bladmineerders op *Sorbus aucuparia* L. gevonden te Arlon (provincie Luxemburg), in het militair kamp Lagland, leg. J.-Y. Baugnée. Op 28 augustus 2010 werden ook vijf mineerders op wilde lijsterbes waargenomen te Bévercé (provincie Luik) in de vallei van Trôs Marets, leg. B. van As. Details over de levenswijze en de verspreiding van deze kleine vlinder worden gegeven.

**Key words:** *Stigmella magdalенаe* – Lepidoptera – Nepticulidae – Belgium – Faunistics – Leafminer – *Sorbus*.

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## Introduction

*Stigmella* Schrank, 1802 (Lepidoptera: Nepticulidae) is one of the largest leafminer moth genera which includes 107 known species in Europe (van Nieukerken 2011a). At present, 48 species have been recorded from Belgium (De Prins & Steeman 2011). Like many other leafminer moths, faunistical knowledge about Belgian *Stigmella* species has, for a long time, remained poor, but the situation has strongly improved in recent years in response to intensive surveys by the Leaf Miners Group. In addition, several papers have been published, including that of van Nieukerken (2006) which provides many interesting data for 30 species of *Stigmella*. However, in regard to neighbouring countries, a number of additional species are expected, particularly in Wallonia.

One of these expected species, *Stigmella magdalенаe* (Klimesch, 1950), has recently been recorded in two localities from southern and eastern Belgium. On 23 August 2009 some vacated mines were observed on Rowan, *Sorbus aucuparia* L., at Arlon (province of Luxembourg), in the military camp of Lagland, at the edge of the Landbruch marshland nature reserve, leg. J.-Y. Baugnée (figs. 1–2). Later, on 28 August 2010, five mines were found on Rowan at Bévercé (province of Liège), in a valley of the river Trôs Marets, leg. B. van As. In both localities, mines of two other moths were also observed on Rowan, namely *Stigmella nylandriella* (Tengström, 1848) and *Phyllonorycter sorbi* (Frey, 1855). The identification of the mines was kindly confirmed by Willem Ellis.

## Life cycle and biology

*Stigmella magdalенаe* is a univoltine species. Adults are very small ochreous moths of 3.9–4.6 mm in wingspan, flying mainly in May–June (Schoorl *et al.* 1985; Johansson *et al.* 1990). The egg is laid at the underside of the leaf. The green larva occurs from late June to August and mines mainly *Sorbus aucuparia*, more rarely other woody Rosaceae such as *Sorbus intermedia* (Ehrh.) Pers., *Sorbus torminalis* (L.) Crantz, *Cotoneaster integerrimus* Med., *Malus sylvestris* (L.) Mill., and *Amelanchier spicata* (Lam.) Koch (Schoorl *et al.* 1985, Johansson *et al.* 1990, see also Ellis 2010 and Pitkin *et al.* 2011).

The mine is a quite short tortuous corridor with frass arranged in a narrow central black line, but its shape is rather variable. The most frequent is like that shown on fig. 1: a very contorted mine occupying a small area of the leaflet between two lateral veins (Schoorl *et al.* 1985, Johansson *et al.* 1990, Ellis 2010). It may also resemble that of *Stigmella nylandriella* and follow for some distance the outline of the marginal teeth of the leaflets, as shown for example, in pictures on British leafminers (Edmunds 2011). This complicates the specific identification of the mine. However, the gallery of *S. magdalенаe* is narrower and shorter than *S. nylandriella* and has usually linear frass throughout. In addition, the larvae of both species are distinct in their chaetotaxy, particularly on the abdominal segment 10 with three setae in *S. magdalенаe* and only one in *S. nylandriella* (Schoorl *et al.* 1985). On *Malus*, the mine of *S. magdalенаe* can be confused with that of *S. desperatella* (Frey, 1856), a species unknown from Belgium, which

also has green larvae (see Ellis 2010). However, the first has never been confirmed on apple trees outside Fennoscandia (E. van Nieukerken in litt. 2011).

In addition to *Stigmella magdalenae* and *S. nylandriella*, two other *Stigmella* species can mine Rowan: *S. oxyacanthella* (Stainton, 1854) which is widespread in Belgium, and *S. sorbi* (Stainton, 1861), not yet found in this country (De Prins & Steeman 2011).

Many other moth species are reported as leafminers from *Sorbus* spp. in Europe. They belong mainly to the families Gracillariidae, Nepticulidae and Coleophoridae (Hering 1957, Ellis 2010, Pitkin *et al.* 2011).



Fig. 1. *Stigmella magdalenae* (Klimesch, 1950). Belgium, Luxembourg, Arlon, 23.viii.2009, mine on *Sorbus aucuparia*, leg. and photo J.-Y. Baugnée.

latter country, however, the map presented by the MothsIreland Project (Tyner 2007) has only two southern data entries. In France, it is a montane species that is known from the Ardennes, Alpes and Pyrénées, and to be also expected in the Massif Central (van Nieukerken *et al.* 2006). In the Netherlands, *S. magdalenae* is regarded as a quite common species with most records from the northern half of the country (Corver 2010). Here, mines can be locally extremely abundant in some years, for example in forests in the province of Drenthe (Huisman *et al.* 2009). The moth is not yet known from the Grand-Duchy of Luxembourg (M. Hellers in litt. 2011).



Fig. 2. *Stigmella magdalenae* (Klimesch, 1950). Belgium, Luxembourg, Arlon, 23.viii.2009, another mine on *Sorbus aucuparia*, leg. and photo J.-Y. Baugnée.

## Distribution

*Stigmella magdalenae* is a European species, which was previously recorded from Austria, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Lithuania, Norway, Poland, Russia, Slovakia, Slovenia, Sweden, Switzerland, the Netherlands, and Ukraine (van Nieukerken 2011a). A distribution map is given by Schoorl *et al.* (1985) and a country presence map by van Nieukerken (2011b).

After Schoorl *et al.* (1985), it is a northern species common in Fennoscandia, the British Isles and mountains of central Europe, but it is rare and very local in the lowland countries.

*Stigmella magdalenae* seems rather local in Germany, where it is only recorded from Bavaria, Baden-Württemberg, Brandenburg, Saxony and Thuringia (Schoorl *et al.* 1985, Gaedike & Heinicke 1999). For the British Isles, Emmet (1983, sub *S. nylandriella*) indicates that this species is especially common in the north and west of Britain and also occurs in western Ireland. For the

The discovery of *Stigmella magdalenae* in Belgium appears not surprising, since it is reported from several neighbouring countries. The two observations described here are respectively situated in Lorraine and Haute Ardenne, in localities with a relatively cold continental climate, at 350 and 550 m a.s.l. In the country, the species is probably rarer than *S. nylandriella* and confined to colder stations, in agreement with indications of the literature, but this requires confirmation. Due to the size of the tiny adult moth, research on this species will preferably be conducted in the summer, by searching for mines on Rowan and other Rosaceae. The breeding of these mines would be useful in obtaining adults, which would then definitely confirm the regional occurrence of *S. magdalenae*.

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## References

- Corver S. 2010. *Stigmella magdalenae*. Microlepidoptera.nl - De kleinere vlinders van Nederland. — [www.microlepidoptera.nl](http://www.microlepidoptera.nl) [3 January 2011]
- De Prins W. & Steeman C. 2011. *Catalogue of the Lepidoptera of Belgium*. — [www.phegea.org](http://www.phegea.org) [2 February 2011].
- Edmunds R. 2011. *British leafminers*. — [www.leafmines.co.uk](http://www.leafmines.co.uk) [2 February 2011].
- Ellis W. 2010. *Bladmineerders van Europa / Leafminers of Europe*. — [www.bladmineerders.nl](http://www.bladmineerders.nl) [19 December 2010].
- Emmet A. M. 1983. Nepticulidae. — In: Heath, J. (ed.), *The Moths and Butterflies of Great Britain and Ireland*, volume **1**: 171-267. Harley Books.
- Gaedike R. & Heinicke W. 1999. Verzeichnis der Schmetterlinge Deutschlands. Entomofauna Germanica 3. — *Entomologische Nachrichten und Berichte, Beiheft* **5**: 1–216.
- Hering M. 1957. *Bestimmungstabellen der Blattminen von Europa: einschliesslich des Mittelmeerbeckens und der Kanarischen Inseln*. — W. Junk, 's Gravenhage, I–III, 1185 p. + 86 tables.
- Huisman K. J., Koster J. C., Nieuwerkerken E. J. van & Ellis W. 2009. Microlepidoptera in Nederland in 2006. — *Entomologische Berichten*, Amsterdam **69**(2): 53–65.
- Johansson R., Nielsen E. S., Nieuwerkerken, E. J. van & Gustafsson, B. 1990. The Nepticulidae and Opostegidae (Lepidoptera) of North-West Europe. — *Fauna Entomologica Scandinavica* **23**(1–2), 739 p.
- Lepiforum e.V. 2010. *Bestimmungshilfe für die in Europa nachgewiesenen Schmetterlingsarten*. — [www.lepiforum.de](http://www.lepiforum.de) [20 December 2010].
- Nieuwerkerken E. J. van 2006. Records of mining Lepidoptera in Belgium with nine species new to the country (Nepticulidae, Opostegidae, Tischeriidae, Lyonetiidae). — *Phegea* **34**(4): 125–144.
- Nieuwerkerken E. J. van 2011a. Fauna Europaea: Nepticulidae.— In: Karsholt, O. & Nieuwerkerken, E.J. van (eds), *Lepidoptera, Moths. Fauna Europaea, version 2.4* — [www.faunaeur.org](http://www.faunaeur.org) [22 February 2011].
- Nieuwerkerken E. J. van 2011b. *Nepticulidae and Opostegidae of the World*. — [www.nepticuloidea.info](http://www.nepticuloidea.info) [5 February 2011].
- Nieuwerkerken E. J. van, Laštůvka A. & Laštůvka Z. 2006. The Nepticulidae and Opostegidae of mainland France and Corsica: an annotated catalogue (Lepidoptera: Nepticuloidea). — *Zootaxa* **1216**: 1–114.
- Pitkin B., Ellis W., Plant C. & Edmunds R. 2011. *Leaf and stem mines of British flies and other insects. The Natural History Museum*. — [www.nhm.ac.uk/research-curation/research/project/british-insect-mines](http://www.nhm.ac.uk/research-curation/research/project/british-insect-mines) [10 February 2011].
- Schoorl J. W., Nieuwerkerken E. J. van & Wilkinson C. 1985. The *Stigmella oxyacanthella* species-group in Europe (Nepticulidae: Lepidoptera). — *Systematic Entomology* **10**: 65–103.
- Tyner A. 2007. *Mothsireland Project*. — [www.mothsireland.com/index.htm](http://www.mothsireland.com/index.htm) [9 January 2011]
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