

First record of *Argyresthia trifasciata* Staudinger, 1871 in Bulgaria (Insecta: Lepidoptera: Argyresthiidae)

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Abstract. *Argyresthia (Blastotere) trifasciata* Staudinger, 1871, a shoot mining moth known as pest on some Cupressaceae representatives, is recorded for the first time in Bulgaria. Photographs of the moth, its genitalia and the damage caused on the host plant are provided.

Key words: pest, *Juniperus*, mining moth.

Introduction

In the period 2016 – 2018 a study about pests associated with Cupressaceae family was carried out. Plants from the genera *Chamaecyparis* Spach, *Cupressus* L., *Juniperus* L., *Platyclusus* Spach, *Sequoiadendron* J. Buchholz, *Thuja* L. and x *Cupressocyparis* Dallim. in twenty-four towns, seven villages and two resorts on the territory of Bulgaria were inspected. Among the other pests the mining moth *Argyresthia (Blastotere) trifasciata* Staudinger, 1871 (Lepidoptera: Argyresthiidae) was also found. The species appeared new for Bulgaria, and according to Essl & Rabitsch (2002) is considered potentially invasive. The genus *Argyresthia* Hübner, 1825 comprises 46 species in Europe (Agassiz 2013). Prior to this study 13 species of this genus (R. Tomov, personal communication) were listed for the Bulgarian fauna. *A. trifasciata* is believed to originate from the Swiss Alps, but there are records of the species in many European countries – Latvia, France, Sweden, Denmark, Great Britain, Germany, Netherlands, Norway, Switzerland, Italy, Spain, Poland, Belgium, Austria, Hungary, Slovenia, Slovakia, Finland and the Czech Republic (Lopez-Vaamonde *et al.* 2010, Konečná & Šefrová 2014, Aarvik *et al.* 2017). According to some authors it has human assisted introduction (Smith *et al.* 2007), and spreads by wind and through the transport of plants (Konečná & Šefrová 2014). No previous records from Bulgaria and the neighbouring countries were found in the literature, therefore we report it as a new species for the country.

Material and Methods

The material was collected from two separate locations in Sofia: a public green area (W Bulgaria, Sofia, UTM: 34T 694883 E 4724621 N, 1.ii.2018, leg. S. Ruseva) and a nursery (W Bulgaria, Sofia, UTM: 34T 700255 E 4723711 N, 30.iii.2018, leg. S. Ruseva), in both cases on *Juniperus scopulorum* Sarg. "Skyrocket". From the first location shoots were collected and kept in a Petri dish at room temperature in the laboratory in the University of Forestry, Sofia. The second sample consisted of cuttings from trunks with diameters of 2-4 and 4-6 cm put in plastic boxes and kept under the same conditions. When emerged, three of the moths (one male and two females) were pinned, spread and preserved at the collection of the National Museum of Natural History, Sofia. Other eight moths were preserved unpinned in dry condition in the collection of the University of Forestry, Sofia after examination. Male genitalia of one of the specimen were extracted and permanently mounted on a slide by the technique of Robinson (1976), then observed and photographed under an Amplival (Carl Zeiss Jena) compound microscope equipped with a digital camera Canon EOS 1300D.

Results and Discussion

Familia Argyresthiidae Bruand, 1850

Argyresthia (Blastotere) trifasciata Staudinger, 1871

The moth can be easily recognised by its characteristic wing pattern (Fig. 1A). In the pinned specimen, the head is covered with white scales, the antennae are filiform reaching the third fascia of the forewing, the labial palps are porrect, tapering. The forewing length is 4.08 mm (male), 4.20 mm, 4.44 mm (females). Like the other members of the family, the wings are elongated, narrow, with long fringes especially on the hindwings. The forewings are golden-brown with three complete white transverse fasciae. The hindwings are grey-brown. The male genitalia in the genus *Argyresthia* are relatively conservative, the most distinguishing characters are found in the phallus (Fig. 1B) and the shape of the sclerotised fork of segment 8. The damage caused by the larval feeding (Fig. 2) is found on the terminal shoots which stem tissues are mined; the leaves die and become brown. Small circular openings made by the larva are visible.



Fig. 1. Adult of *Argyresthia trifasciata*: A - female, Sofia, e. l. 16.iv.2018, scale bar 2 mm. B - male genitalia of a specimen from the same locality with a fork of segment 8 at left (left arm broken off during preparation) and phallus below, scale bar 250 μ m.

The species is univoltine (with a single generation per year). According to Konečná & Šefrová (2014) the moth overwinters in pupal stage while in other publications (Agassiz 2004, Gomboc 2003) it is mentioned that it overwinters as larva. Our observations showed that overwintering stage is larva. The flight period is from early May to early June (Gál & Szeöke 2000, Gomboc 2003, Soika & Łabanowski 2014). In our study (in laboratory conditions) two adult specimens emerged from the shoots sample earlier, at the beginning of April. Five adult specimens emerged from the 4-6 cm cuttings on 16.iv.2018, and another four moths from the 2-4 cm cuttings on 18.iv.2018. According to some studies (Agassiz 2004, Konečná & Šefrová 2014) the larvae pupate in the ground while in our study adults emerged from cocoons spun on the bark.

The larvae of *A. trifasciata* feed on Cupressaceae species, mainly on the genus *Juniperus*, and other not spiked species (Lopez-Vaamonde et al. 2010): *J. scopulorum* “Skyrocket”, *J. scopulorum* “Grey Owl”, *J. chinensis* L., *J. sabina* L., *J. horizontalis* Moench, *J. virginiana* L. (Soika & Łabanowski 2014), *Thuja* sp. (Essl & Rabitsch 2002, Gomboc 2003), *Chamaecyparis* sp. (Essl & Rabitsch 2002, Gomboc 2003, Lopez-Vaamonde et al. 2010) and × *Cupressocyparis leylandii* (A.B.Jacks. & Dallim.) Dallim. (Gomboc 2003, Kollár & Hrubík 2009, Lopez-Vaamonde et al. 2010). The affected plants lose their aesthetical value – their terminal shoots became hollow, dry and grey-brown due to the larval feeding. In case of a heavy infestation the whole plant appeared physiologically weakened and more prone to diseases. In the course of our study the species was found only in Sofia on *J. scopulorum* “Skyrocket”. It is difficult to predict the possible invasion of this pest in Bulgaria, therefore areas with this plant species should be monitored.



Fig. 2. Damage on shoots of *Juniperus scopulorum* “Skyrocket” caused by mining larvae of *Argyresthia trifasciata*. A - general view of shoots. B - detail of a damaged shoot. The white arrows show circular openings made by larvae. Scale bars 5 mm.

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