The first occurrence of *Phyllocnistis vitegenella* Clemens, 1859 (Lepidoptera: Gracillariidae) on *Vitis vinifera* L. in Bulgaria

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ABSTRACT

The leafminer *Phyllocnistis vitegenella* Clemens, 1859 (Lepidoptera: Gracillariidae) is reported as a new species for Bulgarian fauna. Mines in grapevine leaves were observed in July 2018 in a private vineyard located in the northwestern part of the country (village Butan). Probably the species entered Bulgaria from Romania, where it has been detected since 2013. The species was found on *Vitis vinifera* L. and *Parthenocissus quinquefolia* (L.) Planch. This is the sixth record of the leafminer in Europe after Italy, Slovenia, Switzerland, Hungary and Romania. The American grape leafminer has a potential to become a serious pest for Bulgarian vineyards.

Key words: *Phyllocnistis vitegenella*, Bulgaria, *Vitis* spp.

INTRODUCTION

Among invasive herbivore insects, leafminers represent an important group. Many leafminers are known as economic pests of agricultural crops (Kirichenko et al., 2018). They are introduced to new continents and spread through various pathways such as horticultural trade and accidental transport of adults and pre-imaginal stages in containers and vehicles. They may also spread long distances with air currents (Kirichenko et al., 2018). Due to the lack of natural enemies in the new habitat, their effective control may be a real problem. According to Kirichenko et al. (2018) in recent years, leafminers have attracted much attention due to increasing invasion records. Last few years, two species of leafminers originated from North America, invaded Old Continent and they are now being considered as serious pests for vineyards. These species are *Phyllocnistis vitegenella* Clemens, 1859 (Lepidoptera: Gracillariidae) and *Antispilla oinophylla* van Nieukerken and Wagner, 2012 (Lepidoptera:Heliozidae) (Cean, 2014). In Europe, the native leafminer, which is known to attack vineyards is *Holocacista rivillei* (Stainton, 1855) (Lepidoptera: Heliozidae). It was recorded from French mainland, Greek mainland, Italian mainland, Malta, Sicily, Slovenia, South European Russia, Spanish mainland, Croatia, Bulgaria, Ukraine, Turkey, Georgia, Kazakhstan, Uzbekistan, and Turkmenistan (Nieukerken et al., 2012; Cean, 2014; Fauna Europaea, 2018). This is the sixth record of the American grape leaf miner in Europe after Italy, Slovenia, Switzerland, Hungary and Romania. The species has a potential to become a serious pest for Bulgarian vineyards. This study reports *P. vitegenella* Clemens, 1859 (Lepidoptera: Gracillariidae) as a new species for Bulgarian fauna and a new pest on *Vitis vinifera* L. in the country.

MATERIALS AND METHODS

Mines in grapevine leaves were observed in July 2018 in a private vineyard located in the northwestern part of the country (village Butan). The leaves with symptoms, larvae and adults were collected. The observations were recorded with a digital camera. The biological materials (infested leaves, larvae and adults) have been deposited at University of Forestry, Plant Protection Department, Laboratory of Entomology, Sofia, Bulgaria. The nomenclature used here for the genus *Phyllocnistis* Zeller, 1848 was according to Fauna europaea (2018).
RESULTS AND DISCUSSION

Genus *Phyllocnistis* Zeller, 1848 is one of the more speciose genera in the Gracillariidae and currently, 90 valid names are known across the globe (Davis and Wagner, 2011).

In Europe the genus *Phyllocnistis* Zeller, 1848 is represented by 10 species, 4 of them known are from Bulgaria - *Phyllocnistis labyrinthella* (Bjerkander, 1790), *Phyllocnistis saligna* (Zeller, 1839), *Phyllocnistis unipunctella* (Stephens, 1834) and *Phyllocnistis valentinensis* Hering, 1936 (Drenowski, 1909; Beiger, 1979; De Prins and De Prins, 2018; Fauna Europaea, 2018). The American grape leafminer is the fifth species from genus *Phyllocnistis* found in Bulgaria. *P. vitegenella* was observed in Europe for the first time in 1995 in the north-east of Italy, but it was recorded in 1997 (Posenato et al., 1997a; 1997b). In Slovenia, the species was detected in 2004 (Seljak, 2005). In Switzerland, it was recorded in 2009 in Ticino (south part of Switzerland) (Cara and Jermini, 2011). Later in 2014, the species was observed in Hungary (Szabóky and Takács, 2014). In Romania, *P. vitegenella* was found for the first time in 2013, in the eastern part of the country (Ureche, 2016). While in Bulgaria, mines made by feeding larvae were detected in private vineyard in July 2018 on *V. vinifera* L. Probably the species entered Bulgaria from Romania, where it has been detected since 2013. Several mines made by *Phyllocnistis vitegenella* were observed in each affected leaf (Figures 1 and 2). Although it is a monophagous species and has a restricted host range, occurring on *Vitis* spp., we found also several leaves with
mines on *Parthenocissus quinquefolia* (Vitaceae) in the same private vineyard (Figure 3a and b). Sapfeeding instars create a long serpentine, subepidermal mine on the upper surfaces of the host leaf (Davis and Wagner, 2011). The slender mine leads in a terminal widened pupation chamber. The whole length of the central part of the mine has a broad, dark and cloudy frass line (Urehe, 2016). The American grape leafminer *P. vitigenella* develops three to four generations per year and overwinters as adults in diapause (Baldessari et al., 2011; Ureche, 2016). In Romania, *P. vitigenella* completes three generations per year, and the overwintering adults appear in October (Ureche, 2016). In Italy, it develops four generations per year (Baldessari et al., 2011; Ureche, 2016). In Bulgaria, adults and larvae were observed and collected at 14th of August (Figures 4 and 5).

According to Lips and Jermini (2013), *P. vitigenella* had no negative influence on growth and yield quantity and
quality of grapevine Merlot in Southern Switzerland, but its rapid spreading in the last few years in several European countries suggests a great potential to become a real pest soon (Nieuwerken et al., 2012; Ureche, 2016).

CONCLUSION

From the practical and research perspective regarding \textit{P. vitigenella} in Bulgaria, further research is required in order to evaluate the biology, ecology and measures for effective control of this pest, as well as its spreading rate and habitat in the country.

REFERENCES


