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TWO YEARS OF THE LEAFHOPPER *SCAPHOIDEUS TITANUS* DYNAMICS ON PERGOLA HYBRID VINE IN A HOME GARDEN

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ABSTRACT

The grapevine leafhopper Scaphoideus titanus Ball 1932 is an invasive species of North American origin reported in Europe in the 1950s in France where it was accidentally introduced. Shortly after, the species was identified as a natural vector of the phytoplasma associated with the Flavescence Dorée disease in French vineyards. The species quickly spread to other European countries, including Romania. This paper presents data regarding density and population dynamics of S. titanus recorded during two years of monitoring with yellow sticky traps on a pergola hybrid vine in a home garden in Northern Bucharest area. The nymphs were caught from the end of May (2021) until early August (2020) and mid-July (2021). The adults have appeared from the beginning of July until end of October in 2020 and until the middle of October in 2021, with a peak in September 2021 and August 2020.

INTRODUCTION

The American grapevine leafhopper *Scaphoideus titanus* Ball 1932, (Auchenorrhyncha: Cicadellidae) is a pest specialized on grapevine and it is the main natural vector of '*Candidatus* Phytoplasma vitis', the causative agent of flavescence dorée disease on grapevine (EPPO, 2016). It is an invasive species that was accidentally introduced in Europe in the 1950s (Papura et al., 2012) and its first incidence was reported in 1958 on French vineyards. Nearly at the same time it was also reported from Italy (Vidano 1964) and Switzerland (Baggiolini et al. 1968). At the present, *S. titanus* is widely spread in many vine growing areas across the countries from Western Europe, but also in vineyards from Central and Southern Europe (Tancik & Seljak 2017). In Romania, the species was recorded for the first time in 2009 (Chireceanu et al. 2011) and is reported to be present in vineyards in different areas. *S. titanus* is monovoltine and overwinters as eggs under the bark of vine canes.

The goal of this research was to evaluate the population dynamics of *S. titanus* adults and nymphs on a pergola hybrid vine in a home garden, on which we had previously observed a consistent presence of this species.

MATERIAL AND METHODS

Insects sampling was carried out during 2020-2021 on hybrid vines conducted as pergola located in a private home garden in Northern Bucharest area.

On this we noticed in previous years that the pest developed a large population in the absence of any chemical intervention. One yellow sticky trap (21 x 29.7 cm) produced by UBB Cluj Napoca was installed vertically inside the canopy of leaves, approximately 180 cm above the ground in April each year. From April to December the trap was checked every week and replaced with a new one. The population dynamics was designed on the basis of weekly nymphs and adults captures per trap.

All the captured *S. titanus* individuals (Fig. 1) were identified and counted under a laboratory stereomicroscope (ZEISS Stemi 2000-C).

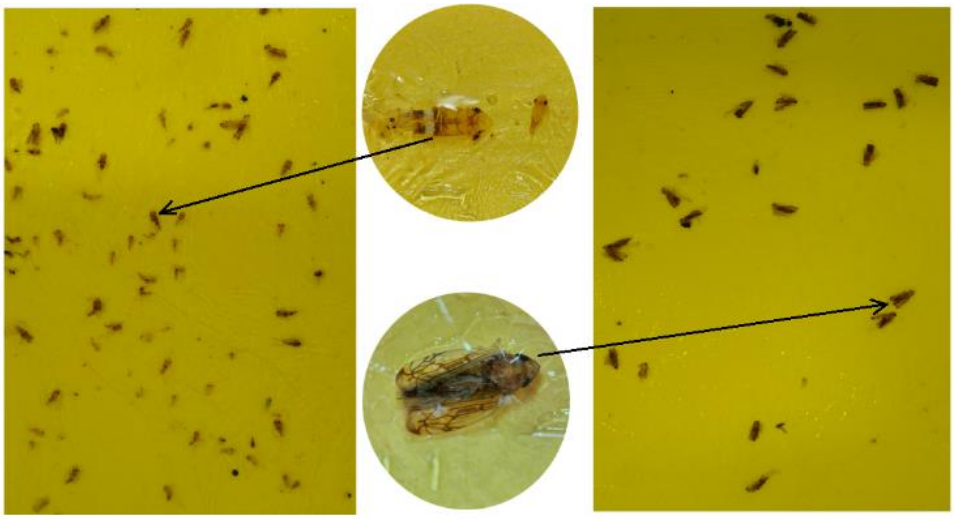

Figure 1. Adults and nymphs of *Scaphoideus titanus* on a yellow sticky trap

Density of pest per trap was appreciated using the scale proposed by Krnjajić (2007) as follows: 1-25 specimens per trap were considered as low population density, 25-100 as moderate and over 100 as high population density.

RESULTS AND DISCUSSIONS

The capture dynamics of the grapevine leafhopper *Scaphoideus titanus* was designed for both adult and nymph stages each monitoring years, the figure 2 for 2020 and the figure 3 for 2021.

In 2020, the nymphs of *S. titanus* were trapped for eleven weeks from the fourth week of May until the first week of August (fig. 2). In 2021, the nymphs were caught for nine weeks, from the third week of May until the third week of July (fig. 3). Our observations show a somewhat earlier activity of the nymphs compared to other studies that show that the period of the presence of nymphs was from June-July 2009, June-August 2010, June-September 2011 in Romania (Chireceanu, 2014), June-July 2014 in Slovakia (Tóthová, 2015). The highest captures of nymphs have been observed towards the end of June, 693 specimens in 2020 and 184 specimens in 2021.

The captures of the adults started from the first week of July in both years, until the end of October in 2020 and mid-October in 2021. The peak of adults' presence on trap was recorded in August 2020 (136 specimens) and in September

2021 (288 specimens). According to other authors, the capture of adults was done in the same period as that found by us, for example: July-end of September 2011 in Italy (Riolo, 2014), July-mid September (Bosco, 1997).

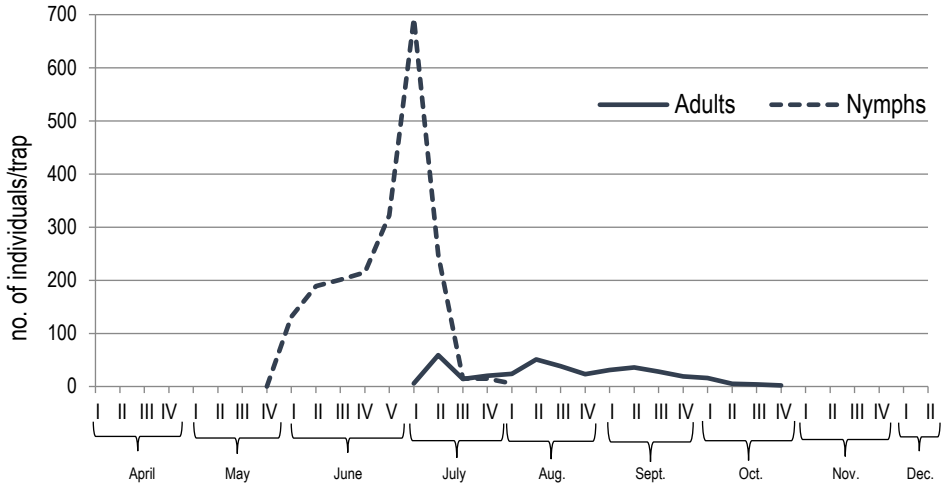

Figure 2. Population dynamics of adults and nymphs of *S. titanus* in 2020

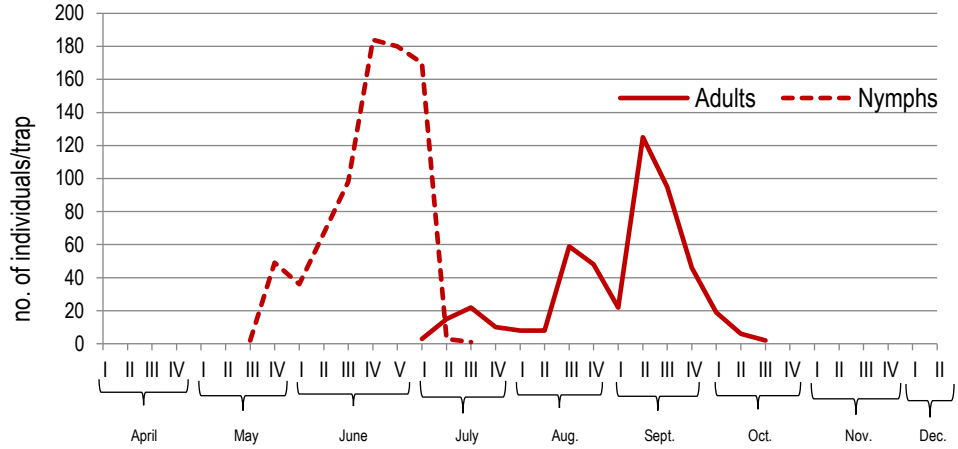

Figure 3. Population dynamics of adults and nymphs of *S. titanus* in 2021

The total number of nymphs in 2020 was 2.58 times higher than in 2021 and the total number of adults in 2020 was 1.30 times smaller than in 2021 (fig. 4).

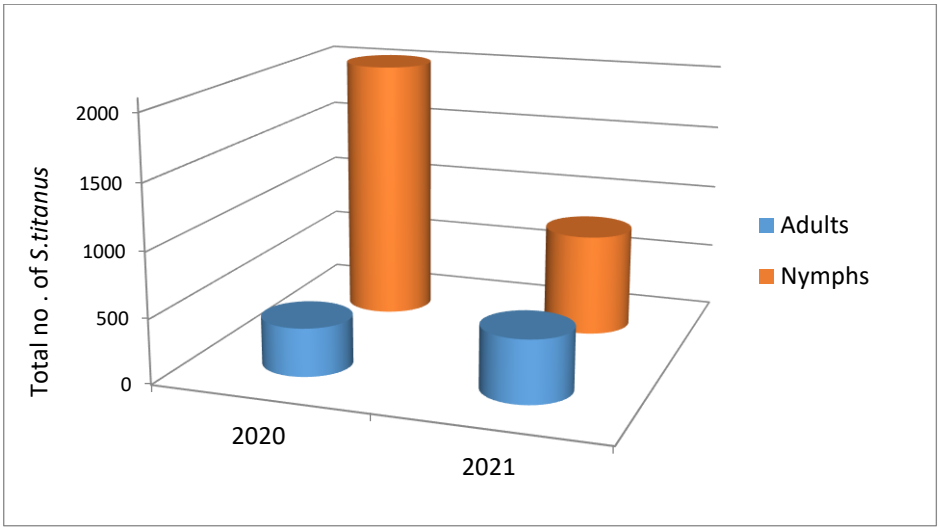

Figure 4. Total number of *S. titanus* in 2020 and 2021

The highest density level of *S. titanus* population has been reached in the second half of June, the beginning of July and the middle of September in 2021 and throughout July and the first half of July in 2020 (Table 1).

Table 1

Scale of density of the population of *S. titanus* (Krnjajić, 2007)

Month/Year	2020	2021	Month/Year	2020	2021
Apr I	-	-	Aug I	**	*
Apr II	-	-	Aug II	**	*
Apr III	-	-	Aug III	**	**
Apr IV	-	-	Aug IV	*	**
May I	-	-	Sept I	**	*
May II	-	-	Sept II	**	***
May III	-	*	Sept III	**	**
May IV	*	**	Sept IV	*	**
June I	***	**	Oct I	*	*
June II	***	**	Oct II	*	*
June III	***	**	Oct III	*	*
June IV	***	***	Oct IV	*	-
June V	***	***	Nov I	-	-
July I	***	***	Nov II	-	-
July II	***	*	Nov III	-	-
July III	**	*	Nov IV	-	-
July IV	**	*	Dec I	-	-
			Dec II	-	-

*1-25 - low population density; ** 25-100 - moderate density;
*** >100 - high population density

CONCLUSIONS

Data in our study showed that in Northern area of Bucharest, the nymphs of the North American leafhopper *Scaphoideus titanus* were caught from the end of May until early August (2020) and mid-July (2021). The adults have appeared from the beginning of July until end of October in 2020 and until the middle of October in 2021, with a peak in September 2021 and August 2020.

The total abundance of *S. titanus* counted 2411 specimens in 2020, of which 376 adults and 2035 nymphs and 1278 specimens in the year 2021, of which 488 adults and 790 nymphs.

ACKNOWLEDGMENT

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