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Scaphoideus titanus identified in Hungary

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Abstract

Scaphoideus titanus is threatening the grapevine industry in Europe as vector of "flavescence dorée" (FD) quarantine disease. It was recently identified in countries neighbouring Hungary, however *S. titanus* and FD were not recorded during the Auchenorrhyncha fauna monitoring performed in several Hungarian vineyards between 1997 and 2005. In 2006 new sites near the Hungarian borders, in 9 counties, were involved in the surveys. *S. titanus* was found in Bács-Kiskun, Somogy, and Zala counties: this is the first report of this insect in Hungary. The highest populations were recorded in abandoned vineyards near the Serbian border. Analyses to verify phytoplasma presence and identity were carried out in symptomatic grapevines and leafhoppers collected in these places, only the "bois noir" phytoplasmas were identified.

Key words: grapevine, leafhopper vector, "flavescence dorée", "bois noir", phytoplasma detection.

Introduction

Schaphoideus titanus Ball 1932, (Auchenorrhyncha Cicadellidae), is the leafhopper vector of "flavescence dorée" (FD) disease. It is native of North America and its first occurrence in Europe was reported from France (Bonfils and Schvester, 1960), then it spread further to Italy (Vidano, 1964), Switzerland (Baggiolini *et al*., 1968), Slovenia (Seljak, 1987), Spain (Batlle *et al*., 1997) and Portugal (Quartau *et al*., 2001). Recently *S. titanus* has been observed in two countries neighbouring Hungary, Serbia (Magud and Toševski, 2004) and Austria (Zeisner, 2005). FD phytoplasma is reported in France, Italy, Spain, Portugal, Serbia, and Switzerland.

Besides sucking injury to plants, the leafhopper's most relevant damage is caused by its role as a vector transmitting FD, a quarantine pest in the EU and EPPO regions (Boudon-Padieu, 2000). In 1997 the Central Service for Plant Protection and Soil Conservation and the county services started a monitoring of the Auchenorrhyncha fauna in several phytoplasma-infected vineyards in Hungary. Between 1997-2005 "bois noir" (BN; 16SrXII-A) phytoplasma was identified in grapevine samples and in *Hyalesthes obsoletus* Signoret insects. Another cixiid *Reptalus panzeri* (Löw) was found infected with 16SrXII-A subgroup and with 16SrIII group phytoplasmas (Palermo *et al*., 2001).

Materials and methods

In 2006 new sites near the Hungarian borders were involved in monitoring leafhopper fauna in vineyards with yellows symptoms. Surveys were conducted using yellow sticky traps in counties Baranya, Fejér, Győr-Moson-Sopron, Heves, Somogy, Vas, Veszprém and Zala, while in counties Bács-Kiskun, Fejér, Heves, Somogy and Zala vineyards were inspected for the pest. New sites in the vicinity of the borders to Austria, Slovenia, Croatia and Serbia were then inspected, as the probability of *S. titanus* presence was the highest. Ten pieces of yellow sticky traps (CSALOMON®) 10 x 16 cm were placed in one vineyard per county at two-week-intervals between early July and late September. During the inspections (18.05., 05.07., 31.07.–04.08., 09.08., 06.09.) leafhoppers were also collected by a suction trap and an aspirator. In 2006 the Plant Protection Institute of HAS also surveyed experimental vineyards at Dunaföldvár, Érsekhalma and Kecskemét-Katonatelep with suction trap between May and September, while yellow sticky traps were used from August to the end of September.

S. titanus specimens (23 individuals from location in Croatian and Serbian border, figure 1) and symptomatic grapevine plants (26 samples) collected in the vineyards were the leafhopper was captured were tested both in Hungary and Italy in order to identify the phytoplasma present. Nested PCR amplification on nucleic acid extracted with CTAB or chloroform/phenol respectively and amplified in direct PCR with primer pairs P1P7 (Deng and Hiruki, 1991; Schneider *et al*., 1995), followed by R16F2/R2 (Lee *et al*., 1995) were carried out. RFLP profiles of amplified samples and phytoplasma controls (Bertaccini, 2003) were compared after digestion with *Tru9*I restriction enzyme.

Results

During the inspections and the control of yellow sticky traps *S. titanus* specimen were identified in several locations of three counties: Somogy, Zala and Bács-Kiskun (figure 1). The first adults were found on the traps placed out on 5 July and the last ones in late September.

Larval skins were also observed on the lower surface of the leaves. In July and August both males and females were found, while in September females, presumably having started laying eggs, were more frequent on the adaxial surface of grapevine leaves.

In the molecular analysis FD was not detected in *S. titanus* specimens or in grapevine plants sampled. The majority of symptomatic samples collected were infected by BN phytoplasmas, some of the symptomatic samples resulted negative to the molecular analyses.

Discussion

The highest population density of *S. titanus* occurred in abandoned vineyards near the Serbian border. It allows the assumption that the leafhopper was not introduced by propagating material but it has been spreading from the south to the north in a natural way, presumably due to warmer, dryer climatic conditions. The insect was reported in grape growing regions of Serbia since 2004 (Magud and Toševski). The finding of *S. titanus* specimens also in the middle of Hungary indicates that the spread of the species can be rapid and the recent mild winters could have favoured the over wintering of *S. titanus.*

With the occurrence of *S. titanus,* recorded in 2006, the Hungarian viticulture could face the possible spreading of FD phytoplasmas. According to the experience in France, it took about 5 years from finding the first individuals of *S. titanus* at a new, remote location to see the FD symptoms appearance (Boudon-Padieu, personal communication). As the vector was abundant in the vineyards close to the Serbian border, and FD was already identified in Serbia (Duduk *et al*., 2003), it is of utmost importance to conduct a nationwide monitoring for "flavescence dorée" and to set appropriate protocols to control its vector *S. titanus* in Hungary.

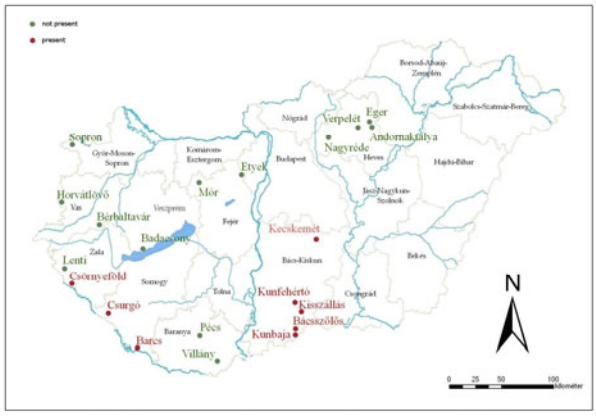

Figure 1. Occurrence of *S. titanus* in Hungarian vineyards (2006).
(In colour at www.bulletinofinsectology.org)

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