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Monitoring the leafhopper *Scaphoideus titanus* Ball and the planthopper *Hyalesthes obsoletus* Signoret in Northern Italy

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Abstract: Results of a four-year (1999-2002) research project conducted in vineyards in Lombardy and Emilia-Romagna (Northern Italy) are briefly explained. The main objective was the monitoring of the cicadellid *Scaphoideus titanus*, vector of golden flavescence, and the cixiid *Hyalesthes obsoletus*, vector of the ampelopathy called "bois noir". These hoppers were monitored with yellow sticky traps and with a sweeping net. A distribution map of *S. titanus* in both regions was drawn and in Emilia-Romagna its advance towards the east was noted. Data on the presence of *H. obsoletus* in vine-growing districts were also obtained; for monitoring this species sticky traps in the canopy, even when placed only slightly above ground level, were less successful than a sweeping net passed over weeds (especially *Urtica* and *Convolvulus*) in vineyards and along their borders. A profile of the hopper fauna of the vineyard agrosystem of both regions was also defined. About a hundred species were identified, some of which are known or suspected to be vectors.

Key words: vineyards, hoppers, vectors, sticky traps, insect net, Lombardy, Emilia-Romagna.

Introduction

Following new acute phases and the spread of grapevine yellows in many vinegrowing districts in Northern Italy, during the period 1999-2002 the Institute of Entomology at Piacenza started collaboration with other agencies to carry out a phytosanitary survey of Lombardy and Emilia-Romagna, in order to re-examine and broaden monitoring activity in the main vine-growing areas of both regions to determine the presence, distribution and phenology of the vectors of the phytoplasmas in question. Such research on a more limited scale had already been carried out by the Institute at the end of the eighties.

In recent years the problem of golden flavescence ("Flavescence dorée", FD), which is transmitted by the leafhopper *S. titanus* Ball (Arzone & Alma, 1997; Belli *et alii*, 2002), has been added to by the spread of another ampelopathy, the so called "Bois noir" (BN), which is transmitted by the planthopper *Hyalesthes obsoletus* Signoret (Maixner, 1994; Sforza *et alii*, 1998) and whose symptoms are very similar to those of FD. BN is now considered a more serious and diffuse ampelopathy than previously believed. The present paper summarizes the monitoring activity conducted and the results obtained over a four-year period.

Material and methods

The monitoring work, carried out from May-June to September-October, involved most provinces of Lombardy and the whole Emilia-Romagna. It was carried out mostly by means of yellow sticky traps placed in the canopies in the rows of vines, and in some vineyards also by sampling with an insect net, sweeping herbaceous plants in vineyards and along the borders and shaking the vine foliage. In the Institute of Entomology in Piacenza 2,854 sticky

traps were examined and several thousand hoppers were identified. Other monitoring data are reported in tab. 1.

Table 1. Data on monitoring of hoppers using sticky traps in vineyards.

YEAR	PROVINCES	LOCALITIES	VINEYARDS	TRAPS
LOMBARDY				
1999	Pavia, Milan	14	14	181
2000	Pavia, Milan, Lodi, Bergamo, Brescia, Mantua, Sondrio	59	86	880
2001	Pavia, Mantua, Como, Sondrio	15	15	120
2002	Mantua, Como, Sondrio	24	29	174
EMILIA-ROMAGNA				
1999	Piacenza	1	1	182
2000	Piacenza, Parma, Reggio Emilia, Modena, Bologna, Ferrara, Ravenna, Forlì-Cesena, Rimini	57	62	1,074
2001	Piacenza, Bologna, Ferrara, Ravenna, Forlì-Cesena, Rimini	40	48	95
2002	Piacenza, Modena	10	11	148

Results and discussion

This work allowed the authors to study the presence, spread and phenology of the two most important hoppers of phytopathologic interest in vinegrowing districts of both the regions; to obtain specimens for molecular analyses in order to detect phytoplasmas; and also to draw the profile of the hopper fauna in the vineyard agrosystem.

S. titanus

The distribution map of this cicadellid in Lombardy and Emilia-Romagna in 2000 is reported in fig. 1. In Lombardy, especially the widespread monitoring activity conducted during 2000 indicated the presence of this cicadellid in most vinegrowing areas. A comparable situation was observed in the Oltrepò Pavese (Pavia) where its presence had been recorded over a long period previous to this study, and in others provinces (Milan, Lodi, Bergamo and Mantua). In Valtellina (Sondrio) this leafhopper was previously unknown. In 2001 *S. titanus* was also identified in the province of Como, along the northern part of the Lake Como. Its absence from some vineyards in the province of Brescia (in Valtenesi and Franciacorta) during 2000 may be the result of effective insect control, because it had been found in these areas in the eighties. In the Oltrepò Pavese area too, our research during this year demonstrated the absence of populations in several vineyards following insecticide treatment, while in 1999 the presence of the pest was found in nearly all the vineyards monitored (Cravedi & Nicoli Aldini, 2000).

In Emilia-Romagna *S. titanus* was recorded about twelve years ago, but only in the western part of the region (province of Piacenza); in 2000 a remarkable spread of this leafhopper eastwards was noted. At present its advancing front is located in the eastern part of the province of Bologna and in the province of Ferrara.

Moreover this insect has also been found recently in some central and southern areas of the Italian peninsula (Santinelli *et alii*, 2003).

Sticky traps placed in the canopy are almost exclusively effective for monitoring adults, while immature stages of *S. titanus* are generally captured rarely, or there are remarkable divergences between one trap and another. These traps are useful for monitoring nymphs only if placed close the base shoots or other foliage where juvenile stages live. Otherwise visual inspection of the lower surface of the leaves is better for determining their presence.

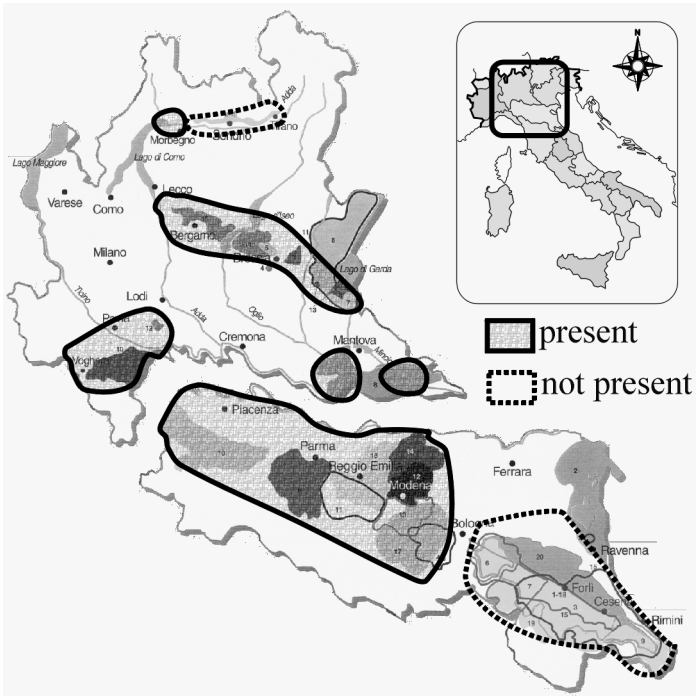

Fig. 1. *S. titanus* in the main grapevine growing areas of Lombardy and Emilia-Romagna in 2000.

H. obsoletus

In the period 1999-2001 our investigations allowed us to obtain some data on the regional distribution of this cixiid in vineyards. Its presence, always in low density, in Lombardy (provinces of Pavia, Bergamo and Sondrio) and Emilia-Romagna (provinces of Piacenza, Modena, Bologna, Ravenna and Rimini) was evidenced during 2000 by sticky traps placed at a certain height on the rows.

During 2002, following the spread and rather serious symptoms of BN, a monitoring activity specifically directed at *H. obsoletus* was carried out in the province of Modena. The planthopper was found in 9 out of 10 vineyards investigated, in some of these being very common between the end of June and the end of August, with a peak around the second half of July. A correlation between its abundance and the presence of its main herbaceous hosts (*Urtica*, *Convolvulus*) in vineyards or along their borders was recognized. Almost all of the specimens (298 out of 315) were collected by sweeping net on weeds.

The importance of regular sweeping with an entomological net during the period of the adult's activity in order to monitoring this planthopper must be underlined. This method provided much better results than the use of sticky traps, even when these are placed near ground level (50 cm or less from the ground), as suggested by some authors (Weber & Maixner, 1998; Braccini & Pavan, 2000).

Other hoppers

By studying all the material collected in vineyards, about a hundred species of hoppers were identified, belonging to the families Cixiidae, Delphacidae, Dictyopharidae, Tettigometridae, Issidae, Flatidae, Cercopidae, Membracidae, Cicadellidae. Some species (*Metcalfa*, *Empoasca*, *Zygina*) are important because of direct damage to the grapevine, while other common species (tab. 2) are known or suspected to be vectors (Arzone & Alma, 1997; Braccini & Pavan, 2000; Nicoli Aldini, 2001); their role in the epidemiology of grapevine yellows deserves more investigation.

Table 2. Common species of hoppers known or suspected to be vectors, present in vineyards in Lombardy and Emilia-Romagna.

CIXIIDAE	CICADELLIDAE
Hyalesthes obsoletus Signoret	*Neoaliturus fenestratus* (Herrich-Schäffer)
DELPHACIDAE	*Macrosteles* spp.
Laodelphax striatellus (Fallén)	*Scaphoideus titanus* Ball
FLATIDAE	*Anoplotettix fuscovenosus* (Ferrari)
Metcalfa pruinosa (Say)	*Euscelidius variegatus* (Kirschbaum)
CERCOPIDAE	*Euscelis* spp.
Philaenus spumarius (Linné)	*Psammotettix* spp.

References

Arzone, A. and Alma, A. 1997: Auchenorrinchi vettori di agenti fitopatogeni in Italia (Rhynchota Homoptera). – Ann. Accad. Agric. Torino 139: 205-225.

Belli, G., Bianco, P.A., Casati, P. and Scattini, G. 2002: La flavescenza dorata della vite in Lombardia. – Quaderni della Ricerca, Regione Lombardia e Università degli Studi di Milano, Epitesto srl, Milano: 50 pp.

Braccini, P. and Pavan, F. 2000: Auchenorrinchi potenziali vettori di fitoplasmi associati a giallumi della vite. – L'Informatore agrario 56 (47): 103-107.

Cravedi, P. and Nicoli Aldini, R., 2000: Lo *Scaphoideus titanus*, vettore della flavescenza dorata della vite in Oltrepò pavese. – Vignevini 27 (9): 56-60.

Maixner, M. 1994: Transmission of German grapevine yellows (Vergilbungskrankheit) by the planthopper *Hyalesthes obsoletus* (Auchenorrhyncha: Cixiidae). – Vitis 33: 103-104.

Nicoli Aldini, R. 2001: Cicaline della vite e del vigneto in Lombardia. – Regione Lombardia e Università Cattolica del Sacro Cuore, Epitesto srl, Milano: 60 pp.

Santinelli, C., Santoni, M., Braccini, P., Botti, S. and Bertaccini, A. 2003: Trovato in Umbria *Scaphoideus titanus*, vettore della flavescenza dorata. – L'informatore agrario 59 (15): 81-82.

Sforza, R., Clair, D., Daire, X., Larrue, J. and Boudon-Padieu, E. 1998: The role of *Hyalesthes obsoletus* (Hemiptera: Cixiidae) in the occurrence of bois noir of grapevines in France. – Journal of Phytopathology 146 (11-12): 549-556.

Weber, A. and Maixner, M. 1998: Habitat requirements of *Hyalesthes obsoletus* Signoret (Auchenorrhyncha: Cixiidae) and approaches to control this planthopper in vineyards. – IOBC/wprs Bulletin 21 (2): 77-78.