

Host races of the Bois noir vector *Hyalesthes obsoletus* Signoret in Germany

M. Imo¹, M. Maixner², J. Johannesen¹

¹ Dept. of Ecology, Zoological Institute, University of Mainz, 55099 Mainz, Germany

² Julius Kühn-Institut, Institute for Plant Protection in Viticulture, 54470 Bernkastel-Kues, Germany

Email: Imo@uni-mainz.de

The epidemiology of the grapevine yellows disease Bois noir (BN) is determined by host-plant populations of the vector *Hyalesthes obsoletus* Signoret (Cixiidae) associated with bindweed or stinging nettle. Bindweed used to be the predominant host plant in Germany, but over the last 15 years the abundance of *H. obsoletus* on nettle has been increasing and nettle is now considered to be the main host plant (Langer and Maixner, 2004). This increase in abundance of *H. obsoletus* on nettle coincides with an increase of BN caused by the stolbur tuf-a type. The shift in host-plant use, as well as observed phenological differences between *H. obsoletus* on the two host plants (Maixner *et al.*, 2006), suggest two host races associated with bindweed and nettle, respectively, in Germany. If two host races exist, did they evolve locally in Germany or arise via immigration of nettle-adapted individuals from Southern Europe, maybe Italy, where nettle is the main host plant? Microsatellite genetic analyses of *H. obsoletus* populations caught on different host plants from Germany, Switzerland, France, Italy, Slovenia, Romania, Russia, and Israel were analysed to answer these questions.

Populations across Europe were significantly geographically differentiated. Significant differentiation between *H. obsoletus* populations associated with the two host plants was found in Germany but not elsewhere in the European distribution range. The German *H. obsoletus* populations associated with bindweed and nettle were closer related to each other than to populations from the same host plants in other countries. Combined, the results provide evidence for local host-race evolution in Germany and the lack of host races elsewhere. The host-shift in Germany might be based on a single founder event involving a shift from bindweed to nettle. The results from Germany obey three of the four criteria for defining host races 1) host association and fidelity, 2) sympatry, and 3) genetic differentiation (Dres and Mallet, 2002). The fourth criterium, appreciable gene flow between host races, is likely, but has not been proven yet.

Key words: *Hyalesthes obsoletus*, *host races*, *vector*.

References

- Dres M., Mallet J., 2002. Host races in plant-feeding insects and their importance in sympatric speciation. *Philosophical Transactions of the Royal Society B: Biological Sciences* 357, 471-492.
- Langer M., Maixner M., 2004. Molecular characterisation of grapevine yellows associated phytoplasmas of the stolbur-group based on RFLP-analysis of non-ribosomal DNA. *Vitis* 43, 191-199.
- Maixner M., Langer M., Gerhard Y., 2006. Epidemiological characteristics of Bois noir type I. Extended abstracts, 15th ICVG Meeting, Stellenbosch, 86-87.