Minutes Leafhopper and Planthopper Vector Training School

Monday, July 5th:

After presentation of the final workshop program and presentation of the participants, M. Maixner gave on overview of the sampling region, the viticulture around Bernkastel-Kues, and the phytoplasma vectors and grapevine yellows diseases present in this region. H. Hoch presented a comprehensive introduction to the Auchenorrhyncha taxonomy and systematics as well as the identification of major groups. She spoke then about the biology and species identification of Cixiids including *Hyalesthes obsoletus*, the vector of Bois noir. P. Weintraub gave an introduction to the phytoplasma-vector relationships and attempts to control vectoring Auchenorrhyncha species.

In the afternoon, field work was carried out during a trip through the steep slope vineyards of Bernkastel-Kues. The participants had the opportunity to sample *H. obsoletus* from bindweed and *Macropsis fuscula* from blackberry. The use of different types of sticky traps and emergence traps was demonstrated in the field.

Tuesday, July 6th:

The work started with a talk of M. Maixner about sampling strategies and the appropriate timing of sampling activities. Then, the Auchenorrhyncha catches of the previous day were sorted and the participants started with the preparation of male genitalia for species identification. The initial steps of DNA extraction from individual *H. obsoletus* were carried out.

The field trip in the afternoon led to the vineyards of Kesten where *H. obsoletus* was collected from nettle in abandoned vineyards and fallow areas. The extraordinary high population density allowed the sampling of hundreds of specimens for subsequent transmission trials. These were carried out with groups of vectors on the experimental hosts *Vicia faba* and *Catharanthus roseus* and with individual planthoppers on an artificial feeding medium. The last activity of the day was the completion of the DNA extraction and first studies of the male genitalia of different Auchenorrhyncha species.

Wednesday, 7st:

M. Maixner spoke about the phytoplasmas detection in grapevine yellows vectors and about transmission trials. J. Johannesen and M. Imo presented new data on the analysis of the genetic structure o *H. obsoletus* populations and demonstrated some analyses used in population genetics. The identification of Auchenorrhyncha was continued. H. Hoch and P. Weintraub showed with *H. obsoletus* how vibration signals

that are used by planthoppers and leafhoppers to communicate, can be made audible. Also in the morning, PCR tests with the previously extracted DNA samples were started.

Another excursion was carried out during the afternoon. The objective of this trip was to collect *Oncopsis alni*, the vector of alder yellows and Palatinate grapevine yellows, from *Alnus glutinosa*. The activities in Veldenz and Noviand yielded not more than 35 *O. alni* that were subsequently used for transmission trials. The unusual low numbers of collected vectors were attributed to the high temperature that probably prompted the insects to retreat to higher branches in the trees. Sound recording from this species was not possible because almost only females were caught. The day ended with the gel electrophoresis of the PCR products. Several of the tested *H. obsoletus* specimens where positive with stolbur-specific primers.

Thursday, 8nd:

The influence of the habitat structure on the occurrence of *H. obsoletus* and the different epidemiological cycles of Bois noir was discussed by M. Maixner. Thereafter, the digestion of PCR-amplified tuf-fragments was carried out to determine the host specific tuf-types that were found in *H. obsoletus*. Identification of leafhoppers and planthoppers as well as the sound recording were also continued during the morning.

The last field trip led to steep slope vineyards of the villages of Wehlen, Zeltingen and Platten with the objective to collect *H. obsoletus* from different host plants and to search for *Reptalus panzeri.* The participants suffered from temperatures around 35 °C but showed a considerable endurance. *H. obsoletus* could be collected from *Artemisia vulgaris* and nettle, though the vector's density was low compared to the area sampled on Tuesday. Only two specimens of *R. panzeri* were found in a fallow field. Back in the lab, the vectors used for transmission trials were removed from their faba been hosts. Participants took them for testing at home, while the beans will be tested in Bernkastel.

Friday, July 9rd:

The tuf-typing of stolbur strains was finished with gel elektrophoresis of the digested PCR products and documentation. Reference samples showed the typical profiles for the host specific tuf-types 'a', 'b', and 'c'. The workshop was closed at noon after a final discussion of the program and the results.