Variation in virus content among individual leaves of susceptible barley infected with *Barley dwarf virus*

Nadine Drechsler[1], Antje Habekuß[2], Thomas Thieme[1], Jörg Schubert[3]
[1]BTL Bio-Test Labor GmbH Sagerheide
[2]Julius Kühn-Institut, Institute for Resistance Research and Stress Tolerance
[3]Julius Kühn-Institut, Institute for Biosafety of Genetically Modified Plants
nadine.drechsler@jki.bund.de

Wheat dwarf virus (WDV) and *Barley dwarf virus* (BDV) are circular single-stranded DNA-viruses belonging to the family *Geminiviridae*. Infected cereals are dwarfed, stunted, show yellow streaks and have a drastically reduced yield or die off early. WDV was first described in 1961 by VACKE in the Czech Republic. Since then it was found throughout Europe. In 2007 a strain infecting mostly barley was described as *Barley dwarf virus* (SCHUBERT *et al*.). It shows about 83-84% nucleotide identity with WDV. Both viruses are transmitted by the leafhopper *Psammotettix alienus* in a persistent non-propagative manner.

To study virus infection a very sensitive qPCR assay was developed. It allows detection and quantification of both viruses due to primers in conserved regions of the coat protein gene. The highly susceptible winter barley 'Rubina' was inoculated with 3 viruliferous leafhoppers under controlled greenhouse conditions. Samples of all leave tips were taken 7, 14, 21 and 28 days after inoculation (dpi) and analyzed with qPCR. Viral copies were detectable in all leaf tips, but virus concentrations varied between leaves. The eldest leaf, which was the inoculated one, had a virus content in the range of 10^3 copies/30 ng plant DNA 7 dpi increasing to 10^5 copies at 28 dpi. The younger leaves had a higher virus DNA content than the eldest one at every sampling date, the youngest reaching viral loads in the range of 10^8 copies 28 dpi. No significant difference could be found between the virus content of the tip and the base of the same leaf.

In conclusion it is advisable to harvest the youngest leaf tip to test plants for virus infection. For experiments where virus contents of plants are compared the leaf tip of the same level should be sampled.

SCHUBERT J, A. HABEKUß, K. KAZMAIER, H. JESKE (2007): Surveying cereal-infecting geminiviruses in Germany – diagnostics anddirect sequencing using rolling circle amplification. *Virus Res.* **127**, 61–70.

VACKE J. (1961): Wheat dwarf virus disease. Biol. Plant. (Praha) **3,** 228-233.