

P84 – Diversity and distribution of viroids in German grape vines and possible future implications for product quality under global warming conditions

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Abstract

Grapevine is a perennial crop, which is cultivated intensively over many decades. This provides optimal conditions for viroids, which need several months or years to be fully established in their host. After the viroids are initially introduced through infected planting material, they are easily transmitted through crop management practices. Since most viroids do not lead to strong regular symptoms in grapes, they are considered to be latent, thus unimportant for the grape producer. This might be the reason, why viroids can be found in most, if not all, grape production areas worldwide. Currently, there are six viroids reported to infect grapevines, of which the Australien grapevine viroid is thought to have evolved through recombination of different viroids present in a single host. Studies in the 1980s showed that the hop stunt viroid (HSVd) is present in Germany. However, other viroids are also present and known to induce yellow spots especially under warm weather conditions like the grapevine yellow speckle viroid 1 (GYSVd-1). Because grapevine is a reservoir for hop-pathogenic viroids like the HSVd and also global warming is likely to increase symptom severity of GYSVd-1 in the future a preliminary survey and subsequent comparative sequence analysis was conducted to get an up-to-date overview of the infection status of German grapes.

The analysis of leaf samples of commercial grape cultivars with reverse transcription and subsequent PCRs show that HSVd and GYSVd-1 are widely distributed in Germany. Furthermore, Sanger sequencing revealed that the dominant HSVd-variant (similar to X06873) is different from variants typically found in other grapes, citrus or hops. The effect of this HSVd-variant as pathogene for hop has not yet been studied. The effect of the “latent” infection of HSVd and GYSVd for grape yield and subsequent wine quality has not yet been determined. These topics need to be addressed in further studies.

Keywords: global warming, risk assessment, reverse transcription, phylogenetic analysis