

P4 – A very strange ‘Riesling’

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Abstract

‘White Riesling’ is one of the most important grapevine varieties in Germany and the development of new clones is dependent on the genetic diversity within this traditional variety. For this purpose, the Department of Grapevine Breeding in Geisenheim houses the world’s largest genetic resources of ‘White Riesling’ with almost 1,200 clones.

Within this collection, some accessions originating from the single vineyard site “Saarburger Rausch” in the Moselle wine region were examined in detail as their ampelographic characteristics are deviating from those of ‘White Riesling’. To verify whether the accessions “Saarburger Rausch” are ‘White Riesling’, nine standard Simple Sequence Repeat markers (SSRs) for identification of varieties were analyzed. One accession (SB 17-117) has a profoundly unusual SSR-profile. That “very strange Riesling” shows all alleles of ‘White Riesling’ but a third allele is present at four out of the nine SSR-loci analyzed. White Riesling is diploid and usually has a maximum of two distinct alleles at one locus.

The most obvious explanation for the occurrence of more than two alleles are differences in the genotypes of the two distinct cell layers of grapevine, the outer tunica layer(L1) and the inner cell layers (L2). Grapevine varieties composed of genetically different cell layers are called periclinal chimeras and are very common with ‘Pinot meunier’ or ‘Pinot gris’ being prominent examples. To test the hypothesis of SB 17-117 being a periclinal chimera, the L2 cell layer was examined independently by planting dormant cuttings in order to produce adventitious roots which are composed of L2 only. Surprisingly the three alleles at four loci were also detected from DNA of adventitious roots and hence the three alleles of SB 17-117 cannot be explained by chimerism.

A second hypothesis assumes that SB 17-117 is polyploid. Polyploid grapevine varieties are carrying more than two alleles per marker which could theoretically be different and lead to the presence of three or more different alleles. Flow cytometry was used to analyze ploidy levels and unravel the genetic background of SB 17-117.

Keywords: genetic resources, White Riesling, SSR marker, cell layers, polyploidy, tri-allelic, flow cytometry