

## **P53 – Geisenheim genetic resources against *Plasmopara viticola***

Scalone, Romain\*; Schmid, Joachim

Hochschule Geisenheim University, Institute of Grapevine Breeding, Geisenheim, Germany

\*Romain.Scalone@hs-gm.de

### **Abstract**

In the framework of the national German research project “VITIFIT” (<https://vitifit.de/>), genetic resources of resistance against the fungus, *Plasmopara viticola* (Peronospora) present within the collection of the department of Grapevine Breeding at the Hochschule Geisenheim University have been evaluated.

Leaf discs assays have been conducted during summers 2020 and 2021 on eighty different accessions, including 26 different American and Asian wild *Vitis* species, two PIWIs and five German grapevine varieties. During summer 2020, a total of 15.629 leaf discs were inoculated using a single fungus-solution with one fixed concentration, incubated in a growth chamber with specific light cycles and pictures of each leaf disc were taken eleven days after inoculation. From these pictures, several information were extracted: scores of sporulation and necrosis (following Possamai *et al.* 2020) were attributed, as well as the fungus-incidence and the percentage of leaf area covered by sporulation were measured. A total of 4.247 on 7.021 leaf discs presenting sporulation were used to measure the percentage of leaf area contaminated by the fungus. During summer 2021, the same protocol was used on similar sampling representing a total of 15.208 tested leaf discs.

Moreover, a screening survey of known *Rpv*-markers (genetic markers linked to a Resistance against *Plasmopara viticola*) present within these accessions was investigated. A total of twenty-seven pairs of primers relative to twelve already known *Rpv*-markers were used to genotype hundred two different accessions (including the eighty accessions tested for resistance plus twenty two more corresponding to additional grapevine varieties, PIWIs and *V. riparia* genotypes).

The comparison of results obtained from both datasets - 2-year leaf discs assays and *Rpv*-screen - allowed us to determine which wild *Vitis* species from Geisenheim collection could possess putative new resistance markers and should be used for future breeding programs in Germany or in the world.

Using these information, several crossings (between resistant wild *Vitis* species without already known *Rpv*-markers and non-resistant grapevine varieties) were conducted to generate F1-populations and to identify/localize new unknown *Rpv*-markers. Five different treatments (control, cold, GA<sub>3</sub>, H<sub>2</sub>O<sub>2</sub>, H<sub>2</sub>O<sub>2</sub> + GA<sub>3</sub>) were tested on two different accessions (*V. berlandieri* and PIWI - 150 seeds per treatment per accession) in order to increase the germination rate of these „resistant x non-resistant“ hybridizations and, then, the production of F1-offsprings.

Results of each experiment (leaf disc assay, *Rpv*-screen, crossings, seed germination) will be discussed at the light of previous results found in the literature.

**Keywords:** genetic resources, wild *Vitis* species, *Plasmopara viticola*, resistance, *Rpv* markers