PHYSICAL-MECHANICAL BERRY SKIN TRAITS AS POWERFUL INDICATORS OF RESISTANCE TO *BOTRYTIS* BUNCH ROT

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Abstract (250 words)

The ongoing climate change results in increasing mean air temperature, which is manifested by weather extremes or sudden changes between drought and local heavy rainfalls. These changing conditions are especially challenging for the established grapevine varieties growing under cool climate conditions due to an increased biotic infection pressure. Thus, the scope of most grapevine breeding programs is the selection of mildew fungus-resistant and climatic adapted grapevines with balanced, healthy yield and outstanding wine quality. Since no resistances or candidate genes have yet been described for *Botrytis* bunch rot (BBR), physical-mechanical traits like berry size and thick, impermeable berry cuticles phenotyped with high-throughput sensors represent novel effective parameters to predict BBR. In addition, the same physical berry traits, i.e. berry impedance and berry texture, are correlated with the sensitivity of grape berries towards induced heat stress (HS). Hereby, variety-specific reaction to the controlled HS treatment is probably an indicator for grape sunburn tolerance. Within the cooperative project “WiVitis” the stated physical-mechanical traits will be phenotyped by sensors, microscopic and analytical methods to characterize new and established grapevine varieties as well as recent breeding material from different breeding programs in the Upper Rhine region (Germany, France and Switzerland). This spatial and temporal high-resolution dataset of berry skin traits will be used to verify transferability of BBR and sunburn prediction to unknown genotypes and environments followed by the screening of mapping populations for QTL analysis in order to develop reliable molecular markers for BBR and grape sunburn.

Keywords: Sensor-based phenotyping, biotic stress resilience, QTL analysis, genetic repository, disease prediction.