

DNA metabarcoding for comparative analyses of copper effects on the grapevine phyllosphere mycobiome in organic viticulture

Ditton, Yannick; Fischer, Michael; Behrens, Falk H.

¹Julius Kühn Institute (JKI) – Federal Research Centre for Cultivated Plants, Institute for Plant Protection in Fruit Crops and Viticulture, Siebeldingen, Germany.

Email of corresponding author: yannick.ditton@julius-kuehn.de

Plant protection in organic viticulture strongly depends on the use of copper to control downy mildew (*Plasmopara viticola*), even though its application is controversial due to its detrimental environmental impacts. Investigations on copper toxicity focus mainly on soil microbiota but little is known about its effects on leaf colonizing microorganisms.

The VITIFIT consortium project, which investigates strategies to maintain grapevine health while reducing copper application rates in organic viticulture, includes a focus on analyzing potential effects of copper on the overall phyllosphere mycobiome. Because copper is not specific in its action as a fungicide, off-target effects on various plant-associated fungi are expected. Therefore, vineyards of strategy trials were used to investigate how fungal diversity and the abundance of individual fungi of the grapevine leaf surface mycobiome are affected by the application of copper. Metabarcoding of the ITS1 region was applied to identify fungal OTUs from leaf surfaces by analyzing leaf wash samples.

The results will give insights into copper-induced changes of the fungal community structure. Additionally, specific taxa, which are highly affected in their relative abundance in response to copper treatments can be identified.