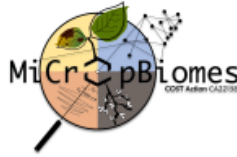


2nd Annual Conference of the MiCropBiomes COST Action

**Exploiting Plant-Microbiomes Networks and
Synthetic Communities to Improve Crops Fitness**



Investigating the impacts of a new sustainable fungicide on plant-associated microbial communities

Sofia Montanari^{1,2*}, Martin Hartmann³, Andrea Nesler⁴, Claudia M. O. Longa², Michele Perazzoli^{1,2}

¹ Centre Agriculture Food Environment (C3A), University of Trento, Via Mach 1, 38098 San Michele all'Adige, Trento, Italy

² Research and Innovation Centre, Fondazione Edmund Mach, Via Mach 1, 38098 San Michele all'Adige, Trento, Italy

³ Institute of Agricultural Sciences, Department of Environmental Systems Science, ETH Zurich, Universitätsstrasse 2, 8092 Zürich, Switzerland

⁴ Bi-PA nv, Technologielaan 7, 1840 Londerzeel, Belgium

[*sofia.montanari@unitn.it](mailto:sofia.montanari@unitn.it)

Keywords: sustainable fungicide, amplicon sequencing, grapevine, phyllosphere, microbiome

Downy mildew (caused by *Plasmopara viticola*) and powdery mildew (caused by *Erysiphe necator*) negatively impact grapevine health and production. Disease management typically relies on the use of conventional fungicides, which raises concerns about environmental sustainability and potential impacts on non-target microorganisms. This study aimed to evaluate the efficacy of a new sustainable fungicide, based on choline pelargonate (CP), against *P. viticola* and *E. necator* and to assess potential side effects on phyllosphere microorganisms under field conditions. Field trials demonstrated the efficacy of CP against grapevine downy mildew and powdery mildew in two vineyards and showed high efficacy against powdery mildew. Phyllosphere microbial communities were isolated from grapevine leaves and bunches of untreated plants (control) and plants treated with CP or with a combination of copper and sulfur as reference fungicides. Results showed that the composition of fungal and bacterial communities associated with grapevine leaves and bunches differed according to vineyard location and seasonal time point. Therefore, the effect of CP on the microbial structure was influenced by vineyard- and season-specific differences in the microbiome composition of the grapevine phyllosphere. This study demonstrated that CP is an effective alternative to manage grapevine diseases, for further development as an alternative solution to conventional fungicides.

Funding: Bioinformatic analyses were partially supported by the COST Action MiCropBiomes, CA22158, supported by COST (European Cooperation in Science and Technology).