Assessment of efficacy and side effects of a new sustainable fungicide against grapevine diseases

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Abstract: Downy mildew (caused by *Plasmopara viticola*) and powdery mildew (caused by *Erysiphe necator*) are responsible for negative impacts on grapevine. Disease management typically relies on conventional fungicide applications, raising concerns about environmental sustainability and human health. This study aimed to evaluate the efficacy of a new fungicide, based on choline pelargonate (CP, patent BE1026779B1), against *P. viticola* and *E. necator* and to assess potential side effects on phyllosphere microorganisms under field conditions. Greenhouse experiments demonstrated that CP reduced the disease severity of both pathogens with no phytotoxic effects on grapevine leaves. Field trials confirmed the efficacy of CP in two experimental vineyards and showed high efficacy against powdery mildew. To assess potential side effects on non-target microorganisms, phyllosphere microbial communities were collected from leaves and bunches of CP-treated and control plants. DNA was extracted, bacterial and fungal communities were analyzed by amplicon sequencing, and statistical analysis will highlight possible changes between CP-treated and control samples. This study demonstrated that CP is an effective fungicide for managing grapevine diseases for further development as an alternative to conventional treatments.

Key words: grapevine, fungicide, downy mildew, powdery mildew, phyllosphere microorganisms