

**High concentration of copper in vineyard soil favours the development of wood necrosis caused by the *Botryosphaeria dieback* pathogen *Neofusicoccum parvum*.**

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After decades of copper applications on grapevines to control downy mildew, high copper accumulation has been measured in many French vineyard soils. Copper can induce phytotoxicity, and its accumulation in plants modifies the morphology, biochemistry or physiology of plant organs. It may also disturb the plant-pest and pathogen interactions. The effect of copper contamination in vineyard soils on the plant sensitivity to pathogenic attacks has so far received very limited attention.

The present study investigated the sensitivity of potted grapevines to inoculation of *Neofusicoccum parvum*, a pathogenic fungus involved in *Botryosphaeria dieback*, at 3 different concentrations of copper in the soil (3, 108 and 325 mg Cu.kg<sup>-1</sup>). We also studied the microflora associated with the wood trunk tissues using

- a fingerprinting method, Single Strand Conformation Polymorphism (SSCP) and
- a next-generation sequencing method, pyrosequencing 454.

Results show that high doses of copper in soil promoted the development of wood necrosis caused by *N. parvum*, and modified the composition of the associated microflora. In particular, the bacterial communities of woody tissues were different in the plants inoculated or not with *N. parvum*, unlike the global fungal communities, which seemed to be relatively similar in both types of plant.

Cartography of the microbiote colonizing wood tissues of grapevines, inoculated or not by *N. parvum*, are presented. In conclusion, high concentration of copper in soil has an influence on the fungal microbiota and permits more *N. parvum* attacks.

Further studies have been developed to verify whether high soil concentrations of copper and GTD development are correlated in vineyards.