

Investigating the pathogenic and beneficial microorganisms that naturally colonize the healthy wood tissues of Esca foliar-symptomatic and asymptomatic vines

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Fungal and bacterial microflora colonizing the wood tissues of grapevines which expressed esca-symptomatic foliar symptoms or not, were characterized and compared. Both trunk and rootstock of 10 year-old vines were sampled. Depending on whether the wood tissues were necrotic or not, the fungal and bacterial communities were different. Observations over a period of one year, using a fingerprinting method, Single Strand Conformation Polymorphism (SSCP), and the ITS-DNA sequencing of cultivable fungi and bacteria, showed that shifts occurred in the fungal and bacterial communities colonizing the “apparently healthy wood tissues”. However, whatever the sampling time, spring, summer, autumn or winter, the microbial communities colonizing the healthy tissues of asymptomatic or symptomatic plants were not significantly different. High-throughput sequencing indicated that diverse assemblages of fungi (515 OTUs) and bacteria (222 OTUs) colonise the non-necrotic tissues. Numerous plant protective fungi, such as *Trichoderma* spp., and bacteria, such as *Bacillus* spp. and *Pantoea agglomerans*, have been isolated in these wood tissues. Pathogenic fungi, such as *Botryotrichum* spp., *Phaeoaniella chlamydospora* were also identified in these non-necrotic tissues. Regarding such microflora, several questions are still the matter of speculation: (i) What is the role of the microbial communities that colonise the non-necrotic wood tissues of the grapevines? (ii) What are the interactions between fungal and bacterial communities? (iii) What are the abiotic factors that have most influence on microbial communities in the wood tissues, leading to a decrease in microbial diversity in the “apparently healthy wood tissues” and to the development of necroses?