plants. Two years of evaluation in field condition where NAC was applied in plants showing severe CVC symptoms, revealed that application of NAC to the roots was able to improve the production and fruit size in both diseased and healthy plants, indicating that this molecule has also a beneficial effect to the plant. Thus we investigated the antioxidative property of NAC and confirmed that treated plants showed a reduction of reactive oxygen species and induction of antioxidant enzymes. These results reinforce the potential of NAC to control *X. fastidiosa*. We believe that NAC application in healthy plants could help to avoid pathogen infection since plants with less oxidative stress are physiologically better and prompter to trigger defense responses against phytopathogens.

Evaluation of field treatments to reduce the impact of *Xylella fastidiosa* infections in olive trees

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Abstract: So far no effective field applicable therapeutic strategy exists to combat the severe diseases associated to *X. fastidiosa*. Therefore, various experimental applications to seek for a sustainable approach for the mitigation of the impact of the infections on olive trees were explored. In 2015-2016, four field trials were set in the infected area in southern Italy: (i) trial 1 consisted of an olive grove with medium to high incidence of disease symptoms; (ii) trials 2 and 3 consisted of olive groves with very low incidence of infected and symptomatic trees and (iii) trial 4 was a new plantation with 3-years old *Xylella*-free olive plants. Applications included (i) different elicitors of plant resistance (fosetyl aluminium, acibenzolar-S-methyl, COS-OGA, σ–β Hairpin proteins, cerevisanae) and (ii) N-acetylcysteine (NAC), a mucolytic agent previously showed to have a beneficial impact in reducing symptoms associated to *X. fastidiosa* in citrus (1). Periodic surveys included (i) sampling for laboratory tests to determine the incidence of the infections; (ii) symptom scoring using 0-5 empirical scale of severity. The overall results showed that only the treatments with NAC, through endotherapy and/or complexed to organic substances added to the soil, determined a noticeable amelioration of the symptoms. None of the elicitors produced any measurable positive impact on the diseased trees. These preliminary encouraging results, prompted for further targeted experiments currently ongoing.

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The endophytic bacterial community of healthy and *Xylella*-infected olive sapwood

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Abstract: Endophytic bacteria are of biotechnological and agronomic interest as they promote plant healthiness by producing and secreting plant growth regulators, and antagonizing phytopathogens through the induction of resistance mechanisms, and the supply of nutritional elements. One of the factors that may influence the behavior of olive towards the 'quick decline syndrome' is the nature of the endophytic microbial community occurring in sapwood. Objectives of the research was to characterize the bacterial endophytic population occurring into the xylem of healthy and *Xylella*-infected olive trees by an isolation-dependent approach. Preliminary results indicate that under field conditions, the population level of cultivable endophytic bacteria is highly variable, being mainly affected by the host genotype, host age, and wilting severity. Among the different group are *Pseudomonas*, *Bacillus*, *Lysinibacillus*, *Pantoea*, *Microbacterium*, *Stenotrophomonas*, and *Methylobacterium* spp. Bacteria of the *Methylobacetrium* genus occupy the same ecological niche of *X.*

fastidiosa subsp. *pauca*. It has been reported as potential biocontrol agent of the pathogen, being its population higher in citrus plant showing mild symptoms of variegated chlorosis. Further research is in progress to better characterize the different *Methylobacterium* strains, using both biochemical and molecular approaches, and to evaluate its activity in reducing the severity of olive quick decline syndrome.

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Attempts to develop sustainable biocontrol strategies of *Xylella fastidiosa* infections in olive

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Abstract: *X. fastidiosa* is a plant pathogenic bacterium, which is causing the 'Olive Quick Decline Syndrome' (OQDS), on olive trees in the southern part of Apulia region. The knowledge of mechanisms regulating olive- *X. fastidiosa* interactions is fundamental to develop biocontrol strategies. In Pierce's Disease (PD) the pathogen virulence relies on a fine balance between motile cells, which move and proliferate in xylem vessels, and sticky cells forming a biofilm and responsible for vessels blockage and insect acquisition. This different behaviour is regulated by diffusible signalling factors (DSF), synthesised by a bacterial rpfF-gene, that regulate genes inducing biofilm formation. DSFs produced by the olive-infecting strain (CoDiRO) of *X. fastidiosa* were analysed by Gas Chromatography-Mass Spectrometry analysis. Preliminary results showed that a family of unsaturated fatty acids, with a chain length of 12-18 carbon atoms, is produced. They will be further characterised by nuclear magnetic resonance (NMR). These studies may be applied in a "pathogen confusion" strategy for mitigating *X. fastidiosa*-infections by altering DSFs level in planta. Pursuing this approach, a plant viral-based vector has been engineered to induce rpfF transient expression. This approach would make *X. fastidiosa* cells less motile and more sticky in xylem vessels, thus lowering their virulence. A model system is being evaluated to verify the DSF expression and accumulation directed by a viral-rpfF recombinant vector.

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