

BACTERICIDE ACTIVITY OF ESSENTIAL OILS AND MILK'S IONS AGAINST *XYLELLA FASTIDIOSA*

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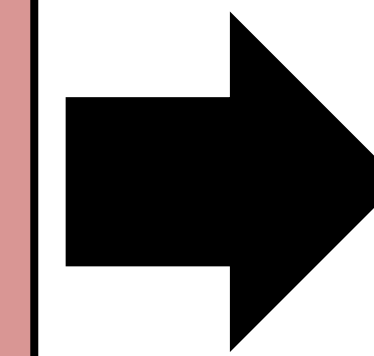
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INTRODUCTION



Xylella fastidiosa is a bacterium attacking the xylem of plants, transmitted by xylem-feeding insects. Its presence in Italy was reported in Apulia in 2013 in olive orchards, and it is now widely spread in the region, causing the Quick Olive Decline Syndrome (QODS) leading to dessication, yield losses and eventually death of the trees.

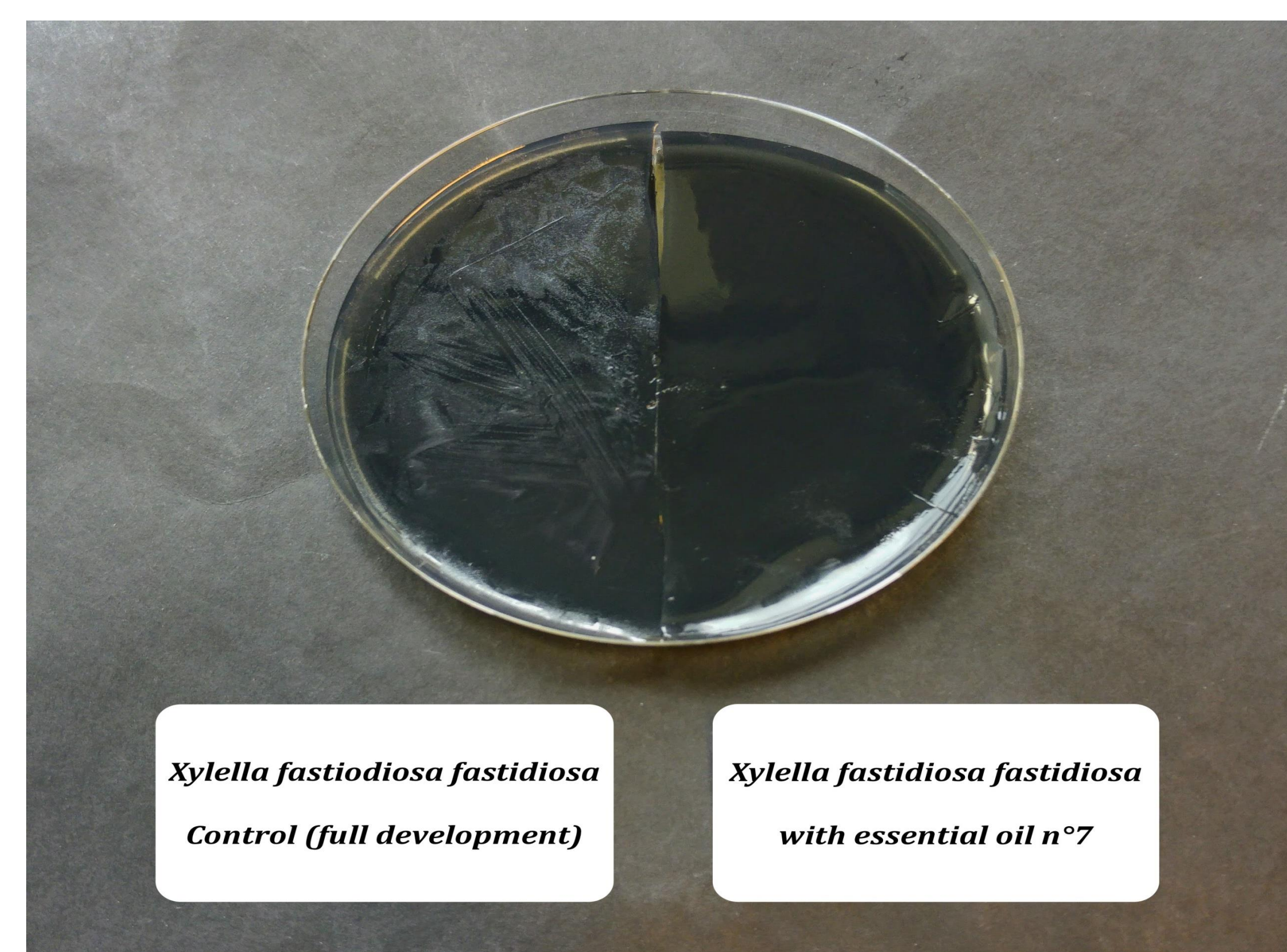
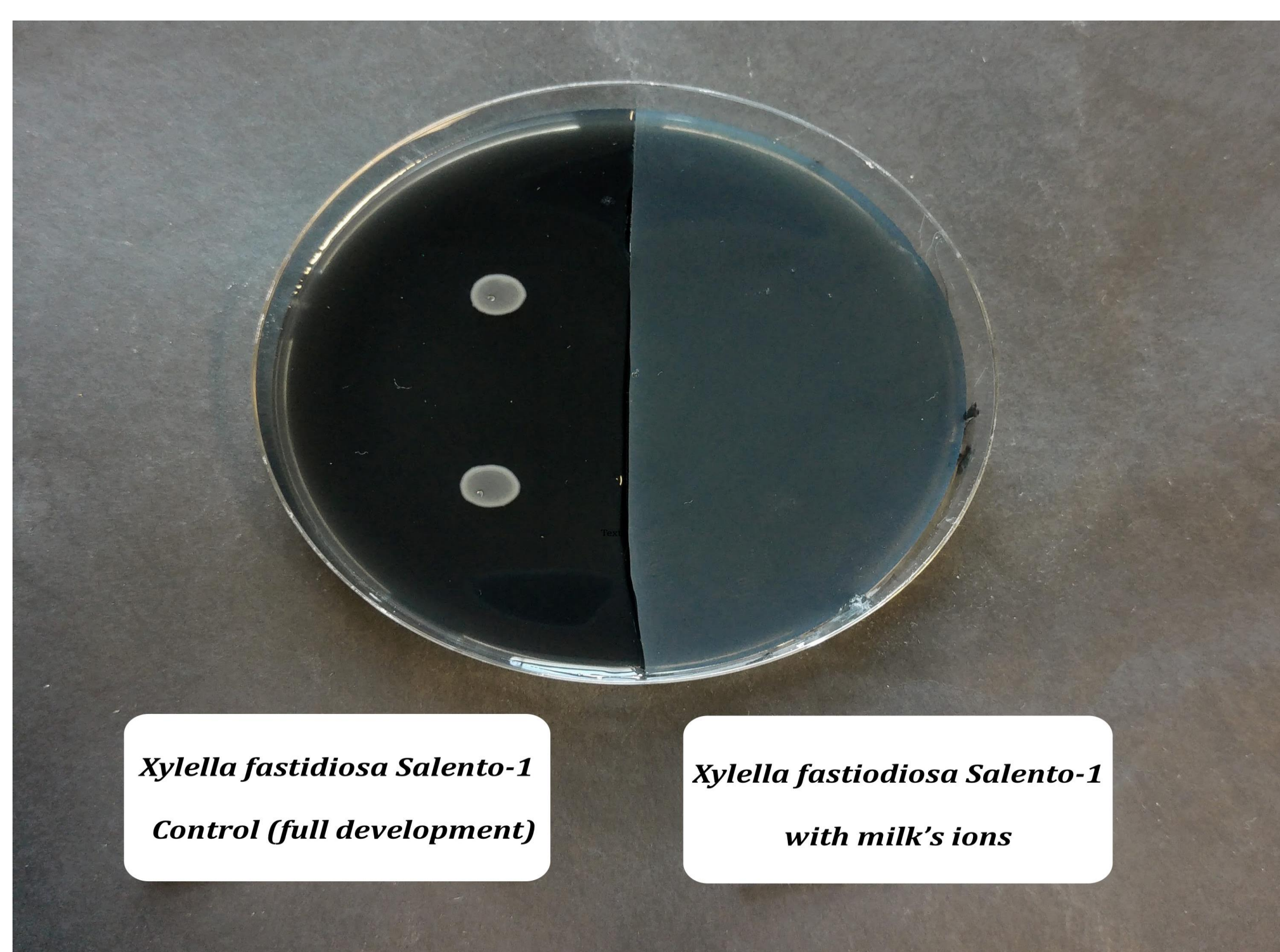
Currently there is no successful eradication of this plant pathogen once it is established in an area, because it has a wide host range and vectors are abundant. The containment of the affected area and the uprooting of affected olive trees are the options chosen by the European Union, which currently makes the situation in Apulia critical.



We are currently testing the potential application of lactoperoxidase yielded active ions and essential oils against *Xylella fastidiosa*.

IN VITRO RESULTS

Three subspecies, namely *fastidiosa*, *multiplex* and *pauca Salento-1* (the one present in Italy) were tested. All the subspecies have been inhibited in presence of the lactoperoxidase yielded active ions. Different concentrations and ratios were tested. At the optimal ratio of substrates, inhibition could be observed on dilutions up to 3X the initial volume. 12 essential oils also were selected to be tested *in vitro* on the pathogen, based on literature and previous screening tests. A drop of pure essential oil was applied on a filter in the center of the plate before incubation. Three of them managed to inhibit the *in vitro* growth of all the subspecies.



IN VIVO TESTS



The next step is to evaluate the efficacy of these promising substances as biocontrol agents *in vivo*, as well as their non-phytotoxicity. To achieve so, innovative methods are currently developed to inject the products directly in the xylem vessels of the trees.



PERSPECTIVES

In vitro tests show high potential for lactoperoxidase and essential oils treatments against *Xylella fastidiosa*. Depending on the *in vivo* results, it could be a precious help to cure and protect the Mediterranean olive orchards.