



Screening of natural and eco-friendly compound for their antimicrobial activity against *Xylella fastidiosa*

Del Grosso C¹, Zicca S², Altamura G², Lima G¹

¹ Department of Agricultural, Environmental and Food Sciences University of Molise, 86100 Campobasso, Italy

² National Research Council (CNR), Institute for Sustainable Plant Protection (IPSP), 70126 Bari, Italy

Xylella fastidiosa (Xf) is one of the most dangerous phytopathogenic bacteria capable of infecting a large number of host plants. In the last decade, several outbreaks have been discovered in Europe and the most serious are epidemics due to *X. fastidiosa* pauca (Xfp), the causal agent of Olive Quick Decline Syndrome (OQDS) devastating olives orchards in southern Italy. Despite numerous efforts in evaluating the efficacy of plant protection products and other compounds with potential activity against the pathogen, satisfactory results have not been achieved so far. Given the continuous expansion of the so called "infected demarcated area" in Apulia, i.e. the area where the pathogen is not eradicable and only containment measures are applied, strategies are needed to mitigate the impact and rebuild agriculture and the devastated landscape. In this scenario, we are evaluating against different Xf strains and subspecies the antibacterial activity of novel eco-friendly products and compounds, like a seaweed and plant polyphenols mixture (SWP), others polyphenolic biomolecules (PB) and plant systemic zinc and copper-based formulates (Zn-F and Cu-F). In vitro experiments, determining the minimum inhibitory concentration (MIC) of each product, evidenced a dose-dependent and a broad-spectrum antibacterial activity of the tested products. To further evaluate the potential exploitation of the novel antibacterial products, in vivo experiments are underway on potted olive plants kept under controlled conditions. Olive plants treated with SWP, Zn-F or Cu-F, or untreated as control, were inoculated by grafting Xfp-infected scions from susceptible and resistant olive cultivars. Periodic surveys and diagnostic tests are in progress to monitor plant growth, disease severity and host-colonization by Xfp. Investigations will also begin to elucidate the possible mechanisms of action involved in the antibacterial activity and on effect of the novel products on the plant.

Keywords: antimicrobial activity, polyphenols, *Xylella fastidiosa*, minimum inhibitory concentration