IN VITRO EVALUATION OF BACTERICIDAL EFFECT OF SILVER AND SILVER-GOLD NANOPARTICLES COATED WITH SILICON DIOXIDE ON XANTHOMONAS FRAGARIAE

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Xanthomonas fragariae, causes angular leaf spot in strawberries. Annually causes losses in the agricultural sector worldwide. Current laws prohibit the use of antibiotics in the field, reducing alternatives for its control. Given this situation, there is a continuing search for new treatment options. In recent years, nanoparticles (NPs) of noble metals such as silver and gold have been employed to control a wide variety of plant pathogenic bacteria and fungi with better results than conventional treatments. There are also studies that support the NPs do not affect environmental processes of natural regeneration. To irradiate NPs at the same wavelength which have their maximum absorbance may trigger the effect of Surface Plasmon Resonance (SPR) for increasing the bactericidal effect.

In this work was evaluated on X. fragariae the bactericidal effect of silver NPs (AgNPs) and silver-gold (Ag-AuNPs) coated with silicon dioxide (@SiO₂) obtained by combining the techniques of assisted laser ablation and chemical synthesis. By applying treatments based on NPs and irradiation at the beginning of the exponential growth phase of bacteria was determined the minimum inhibitory concentration (MIC) of the treatments with efficient bactericidal effect compared to control samples which do not apply any kind of treatment. Also the influence of SPR in the bactericidal effect was evaluated.

Keywords: Xanthomonas fragariae, Surface Plasmon Resonance, Silver-gold nanoparticles

References:


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