Abstract

In this research the combination of the two methods of induction of resistance and biological control using silica and silver nanoparticles (retardants chemical induction) and *T. harzianum*, *T. viride* (agent biocontrol many of plant pathogens), Order to induce resistance in cucumber against Fusarium stem and root rot Negin in cultivars and the Festival, respectively than pathogenic agent *Fusarium oxysporum* f.sp. *radicis-cucumerinum* resistant and susceptible are the were evaluated in the laboratory and greenhouse. The effect of petri dishes in 5, 10, 30, 50 and 100 ppm silica and silver nanoparticles by taking control in three replications (only two times sterilized containing distilled water) was conducted in order to determine effective dose range. Investigate the effect silica nanoparticles results in preventing the growth of pathogenic fungi row of three and five days after showed that Different concentrations of silica nanoparticles in comparison with control treatments had over effect of growing colony diameter And was significant in 1% level, So that between most effective treatments to reduce the concentration of colony diameter ppm 50 disease *Fusarium oxysporum* f.sp. *radicis-cucumerinum* 43 has; But the inhibitory effect on the growth of silver nanoparticles did not fungus, Testing was conducted in a completely randomized design in the lab. In greenhouse experiments of susceptible cultivar and resistant cultivar Festival was used Negin, The pots containing sterilized soil resistant and sensitive seed cultivars to became implanted number four seeds in each pot And at seedling stage with pathogenic fungi infecting became And after spending two weeks the seedlings are infected, 6-4 leaf stage by Alysytvrhay bio (*T. harzianum*, *T. viride*) and abiotic (silica nanoparticles and silver), and the interaction between living and non-living triggers both types the treatment and became Induction resistance and indices, including enzymes peroxidase, polyphenol oxidase, catalase and total phenolic content of and total protein content in the tissues of treatment plants were measured. It's a completely randomized design with factorial arrangement of consists of nine original invoice (treatments applied) and five sub-plots (measured values) with three replications was conducted in greenhouse conditions. The results obtained showed that between treatment, between cultivars between days sampling and their interactions in plants treated with induced resistance in comparison with the healthy control and infected plants was significant

in level 5% and 1%, So that the highest level activity of phenolic compounds in resistant cultivars Festival treated with both factors antagonistic *T. harzianum, T. viride* with 73/0 in a maximum total protein in the Festival (tolerance) treated with silver nanoparticles 100 ppm with 123 a group and tenth was observed in the timeframe and the enzyme peroxidase, polyphenol oxidase and catalase enzyme activity the highest rate of change of the a combination treatment *T. harzianum, T. viride* in cultivar festival was observed incurred. So that the highest amounts of these compounds induce of the third day after the application has reached its to the maximum amount on the seventh day And then declined, but continues to the healthy control and infect the next on days showed significant differences.

Keywords: *Fusarium oxysporum,* resistance, silica, silver, *Trichoderma harzianum, Trichoderma viride*

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Effect silica and silver nanoparticles and biological agents *Trichoderma harzianum* and *Trichoderma viride* on cucumber resistance to the pathogen *Fusarium oxysporum* f.sp. *radicis-cucumerinum*

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