Effects of silver and calcium nanoparticles on vase life and some physiological traits of 'Konst Coco' Alstroemeria cut flower

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Abstract

The industry of cut flower production is a branch of modern agriculture nowadays. One of the problems in this industry is post-harvest wastes. This research was performed to evaluate the interaction of nano silver and nano calcium particles with four concentrations (0, 10, 20 and 40 mg/L) on the quality and vase life of Alstroemeria cut flowers, cv. 'Konst Coco', in a factorial experiment based on a completely randomized design with 3 replications. The recorded traits included morphological and physiological factors as: Flower vase life, relative fresh weight, solution uptake, total dissolved solids, total chlorophyll, *ion leakage*, ACC oxidase enzyme activity and microbial proliferation. Results revealed that all treatments increased flower vase life of Alstroemeria in comparison to control. The 40 mg/L concentration of calcium and silver nano particles treatment was the most effective treatment in increasing the vase life. This treatment increased the vase life about 14 days as compared to control. Evaluation of microbial proliferation showed that all treatments decreased microbial population in the solution and there were not any microbial proliferation in the treatments with 40 mg/L of silver nano particles until 15th day of the experiment. Other measured traits such as solution uptake and total dissolved solids were also increased by applying calcium and silver nano particles. Reduction of chlorophyll, ACC enzymes activity and *ion leakage* decreased significantly in all treatments as compared to control. Therefore, the results suggest that 40 mg/L nano silver particles and 40 mg/L nano calcium particles can be used commercially to extend the vase life and keep the quality of Alstroemeria cut flowers.

Keywords: Vase life, Enzyme activity, Nano particles, Microbial proliferation.

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