Title Evaluation of nano silver particles on microbial flora and proliferation of cherry brandy rose vase solution

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Abstract

Vase solution microbial population and flora (kind) play an important role on vase life reduction of cut flowers, especially roses. Vase solution microbes affect cut flower vase life by toxic metabolite production and xylem blockage. In order to study the biocidal effect of nano silver particles and some conventional biocides on microbial proliferation and kind, Cherry Brandy roses were treated in a completely randomized design with: citric acid (at 300, 600 or 900 mg l^{-1}), aluminum sulphate (at 100, 200 or 300 mg l^{-1}), hydroxyquinoline citrate (at 200, 300 or 400 mg l^{-1}), calcium hypochlorite (at 400, 600 or800 mg l^{-1}), sodium hypochlorite (at 400, 600 or 800 mg l^{-1}), colloid of nano silver particles (1, 2.5 and 5 %), tap water, or sterilized distilled water (control). Results indicate that nano silver particles, HQC and calcium hypochlorite were the most effective treatment in controlling microbial proliferation. This was while SDW was the least effective treatment. Sodium hypochlorite was only efective at high concentrations until day 4. Aluminum sulphate was also only efective until day 4. Citric acid and tap water did not control microbial proliferation at all. Cherry Brandy vase solution microbial flora consisted of 2 kinds of yeasts, 6 kinds of fungi and 26 bacterial colonies. Between the isolated fungi, one isolate was *Trichoderma harzianum* and the 5 rest were different strains of *Fusarium solani*. Identified bacterial isolates were *Bacillus sp.*, *Coccus spp.*, *Streptomyces sp.*, *Pectobacterium sp.*, *Burkholderia sp.* and *Pseudomonas sp*. Identified *Bacillus sp.* isolates were *B. polymexa*, *B. subtilis*, *B. megaterium* and *B. circulans*. As nano silver particles, hydroxyquinoline citrate and calcium hypochlorite did not contain any microbes, they were considered as effective biocides. But, considering different aspects of biocide application such as their effects on vase life and their side effects, nano silver particles were the best and safest treatment group.