

ANTIMICROBIAL ACTION OF NANOBIOSILVER FOR CUT FLOWERS

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Storage of decorative qualities of cut flowers is the most important task of the flower industry. The main cause of wilting of cut plants is a violation of the water exchange through the uncontrolled development of microorganisms in the water. As a result, their metabolic products clog the xylem vessels.

The aim of this study was to investigate the antimicrobial action of nanobiosilver on putrid microflora of cut flowers.

The object for research was cut generative shoots of carnations, chrysanthemums and asters and water-soluble bactericidal composition of silver nanoparticles in a matrix of sodium alginate. The cut shoots were placed in vessels filled with protective solutions containing nanobiosilver in a concentration of 5.0, 10.0 and 25.0 mg/L. As a control we used distilled water. Duration of experiment was 10 days. Antibacterial action of nanobiosilver on putrid microflora of cut flowers was investigated using the organoleptic and microbiological methods. The organoleptic method determined the nature and intensity of the odor based on 5-point scale according to GOST 3351-74. Number of mesophilic aerobic and facultative anaerobic microorganisms was determined by the number of colony forming units in 1 cm³ of test solution (GOST 18963-73).

The results of organoleptic studies showed that 10 days after exposure of shoots of cut carnations, asters and chrysanthemums to protective solutions of nanobiosilver in a concentration of 5.0 mg/L there was a complete absence or weak intensity of odor compared to the control. By increasing the concentration of nanobiosilver odor completely disappeared. Also we noticed the suppression of growth of mesophilic aerobic and facultative anaerobic microorganisms in all tested solutions containing nanobiosilver. Their development was only observed in the control variant and was $4.1 \cdot 10^5$. A comparison of the results of antimicrobial action of nanobiosilver on cut flowers with the earlier data on its impact on life expectancy, decorative properties, water balance and biomass of flowers was made. It was concluded that one of the main factors influencing the preservation of decorative qualities of cut flowers is antimicrobial action of nanobiosilver.

It was shown that silver nanobiocomposition in a matrix of sodium alginate can be recommended for protective solutions maintaining cut flowers as an antimicrobial agent.

Keywords: nanobiosilver, cut flowers, antimicrobial action, protective properties.

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