

COMPARATIVE STUDY OF EFFECTS OF CHEMICALLY AND GREEN SYNTHESIZED SILVER NANOPARTICLES ON STAPHYLOCOCCUS AUREUS

Timotina M.¹, Aghajanyan A.A.^{2,3}, Trchounian K.^{2,3}, Gabrielyan L.S.²

¹Russian-Armenian University, Yerevan, Armenia

²Yerevan State University, Yerevan, Armenia

³Scientific-Research Institute of Biology, Yerevan State University, Yerevan, Armenia

Staphylococcus aureus is a well-known gram-positive bacterium, which is widely spread in the environment. It can lead to various serious diseases, including skin and respiratory ones, as well as to cause mortality. *S. aureus* takes second place worldwide as a death-associated pathogen. Previously, antibiotics were used as a first-line therapy against *S. aureus*. However, it becomes more difficult to apply them due to antibiotic resistance, which is an urgent problem of biomedicine and needs finding of new approaches [1]. Silver nanoparticles (Ag NPs) are considered a promising alternative to antibiotics since they have a great potential to overcome antibiotic resistance and be applied as antimicrobial agents [2-4]. In this work, the effects of colloidal silver nanoparticles (“Tonus-Less”, Armenia) and silver nanoparticles, synthesized using soil *Stevia rebaudiana* extract, on *S. aureus* MDC5233 (Microbial Depository Center, NAS, Yerevan, Armenia) were investigated. Both types of nanoparticles demonstrate significant antibacterial effects. In the presence of 50 µg/mL Ag-NPs, synthesized using *S. rebaudiana* extract, growth rates of *S. aureus* decreased ~70%, in comparison with control culture. Chemically synthesized Ag NPs demonstrated more noticeable antibacterial effect: bacterial growth rate decreased ~80%. Moreover, the inhibition the colonies forming units (CFU) of *S. aureus* ~70 and 60% was detected in the presence of chemically and green synthesized Ag NPs, respectively. Therefore, chemically and green synthesized Ag NPs demonstrate bactericidal effect against *S. aureus* and can be used as promising antimicrobial agents. However, NPs green synthesis is a cost-effective and environmentally friendly method in comparison with chemical synthesis.

Bibliographic references

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