



SPHERICAL SHAPED SPICES REDUCED SILVER NANOPARTICLES CONTROLLING MULTIDRUG RESISTANT BACTERIAL SPECIES

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Abstract

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India is a hub for spices regularly used in cuisine and medicinal usage. Several records of medicinal plants and their derived secondary metabolites reported to possess redox potential thereby utilized them in biosynthesis of nanoparticles. In the study, 1mM silver nitrate successfully reduced to silver nanoparticles by using spices in a 9: 0.5: 0.5 ratio of AgNO₃: spices extract: lemon juice in presence of sunlight. The spices utilized as a) Cinnamon plus star anise, b) Cardamom and clove and c) only Cardamom. In the result successful synthesis of silver nanoparticles confirmed by plasmon resonance in all sets with absorption maxima at 430-460nm. The SEM result confirmed AgNPs of size 250 ± 65 nm with frequency distribution more common towards 300 nm size. As per EDAX analysis, AgNPs are more in elemental composition of silver and oxygen. As per antibacterial activity, only cinnamon plus star anise base AgNPs are able to control. *E. coli*, *K. pneumoniae* and *Shigella* species. Further with selected antibiotics, synergy is able to reverse resistivity. In summary, use of cinnamon plus star anise together formed spherical rough textured 250 ± 65 nm AgNPs able to control multiple drug resistance human pathogens and hence proved its efficacy for further studies.

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