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Growth of Ag-nanoparticles in an aqueous solution and their antimicrobial activities against Gram positive, Gram negative bacterial strains and Candida fungus

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Abstract

Silver nanoparticles (AgNPs) were synthesized using Ocimum sanctum (Tulsi) leaves aqueous extract as reducing as well as a capping agent in absence and presence of cetyltrimethylammonium bromide (CTAB). The resulting nanomaterials were characterized by UV-visible spectrophotometer, and transmission electron microscope. The UV-Vis spectroscopy revealed the formation of AgNPs at 400-450 nm. TEM photographs indicate that the truncated triangular silver nanoplates and/or spherical morphology of the AgNPs with an average diameter of 25 nm have been distorted markedly in presence of CTAB. The AgNPs were almost mono disperse in nature. Antimicrobial activities of AgNPs were determined by using two bacteria (Gram positive Staphylococcus aureus MTCC-3160), Gram negative Escherichia coli MTCC-450) and one species of Candida fungus (Candida albicans ATCC 90030) with Kirby-Bauer or disc diffusion method. The zone of inhibition seems extremely good showing a relatively large zone of inhibition in both Staphylococcus aureus, Escherichia coli, and Candida albicans strains.

Keywords

Author Keywords: Ocimum sanctum; AgNPs; Morphology; Antimicrobial activities

KeyWords Plus: PROTEIN-PROTEIN INTERACTIONS; SILVER NANOPARTICLES; GREEN SYNTHESIS; PHYSICOCHEMICAL PROPERTIES; GOLD NANOCRYSTALS; ROOM-TEMPERATURE; SURFACTANT; MORPHOLOGY; METAL; NANOSTRUCTURES

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