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Green Synthesis of Silver Nanoparticles from De-oiled Rhizomes of Curcuma longa L. and Its Biomedical Potential(Book Chapter)

Ganesan, S., Mehalingam, P., Selvam, G.S.

[a]Department of Biotechnology, V.V. Vanniaperumal College for Women (Autonomous), Virudhunagar, India
[b]Research Department of Botany, V.H.N. Senthikumara Nadar College (Autonomous), Virudhunagar, India
[c]Department of Biochemistry, School of Biological Sciences, Madurai Kamaraj University, Madurai, India

Abstract

The present study deals with the synthesis of silver nanoparticles using de-oiled rhizomes of Curcuma longa aqueous extracts and its biomedical potential. Tumeric is the rhizome of Curcuma longa (Zingiberaceae) and Curcumin is extracted from it. Curcumin finds extensive use in the pharmaceutical industry. Synthesis of silver nanoparticles from 1 mM silver nitrate solution using the extract of turmeric spent was done. The colour changed from pale yellow to dark brown indicating the synthesis of silver nanoparticles. The synthesized silver nanoparticles were characterized by UV visible spectroscopy, XRD, FTIR and Zeta potential. These green synthesised silver nanoparticles were tested for antimicrobial activity by agar well diffusion method against seven human pathogenic strains such as Bacillus subtilis, Staphylococcus aureus, Streptococcus faecalis, Klebsiella pneumoniae, Pseudomonas aeruginosa, E.coli and Candida albicans. The zone of inhibition increased with increase in the concentration of silver nanoparticles in well diffusion method. Anticancer activity of silver nanoparticles was tested on breast cancer cell line, MCF-7. Cytotoxic effect was observed in tested sample concentrations after 48 h treatment. It also revealed that increase in concentration of drug showed increased cytotoxicity over the MCF-7 cell line. This efficient biomedical potential of the synthesized silver nanoparticles paves the way for its application in the area of nano-medicine.

Author keywords

Anticancer activity | Antimicrobial activity | MCF-7 | Tumeric spent

Indexed keywords

Engineering controlled terms: Bacteriology | Cell culture | Drug delivery | Escherichia coli | Fourier transform infrared spectroscopy | Metal nanoparticles | Silver compounds | Synthesis (chemical) | Ultraviolet visible spectroscopy

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Mehalingam, P.; Research Department of Botany, V.H.N. Senthikumara Nadar College (Autonomous), Virudhunagar, India;