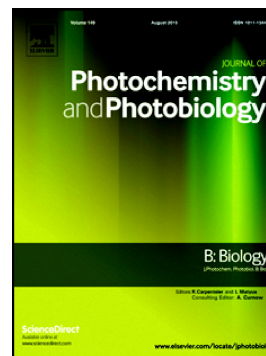


Accepted Manuscript

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PII: S1011-1344(17)31311-8
DOI: doi:[10.1016/j.jphotobiol.2018.02.014](https://doi.org/10.1016/j.jphotobiol.2018.02.014)
Reference: JPB 11148

To appear in: *Journal of Photochemistry & Photobiology, B: Biology*

Received date: 23 October 2017
Revised date: 22 December 2017
Accepted date: 12 February 2018

Please cite this article as: D. Arumai Selvan, D. Mahendiran, R. Senthil Kumar, A. Kalilur Rahiman , Garlic, green tea and turmeric extracts-mediated green synthesis of silver nanoparticles: Phytochemical, antioxidant and in vitro cytotoxicity studies. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Jpb(2017), doi:[10.1016/j.jphotobiol.2018.02.014](https://doi.org/10.1016/j.jphotobiol.2018.02.014)

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Garlic, green tea and turmeric extracts-mediated green synthesis of silver nanoparticles: Phytochemical, antioxidant and *in vitro* cytotoxicity studies

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Abstract

Phyto-synthesis of silver nanoparticles (AgNPs) was achieved using aqueous garlic, green tea and turmeric extracts, and characterized by different spectroscopic techniques. Phytochemical analysis revealed the presence of rich amount of biochemicals in these extracts, which serve as reducing and capping agents for converting silver nitrate into AgNPs. FT IR spectroscopy confirmed the role of biomolecules in the bioreduction and efficient stabilization of AgNPs. UV-Vis DRS spectra showed a band around 450 nm characteristics of AgNPs. XRD patterns revealed the crystalline nature of the synthesized AgNPs with fcc structure. SEM and TEM analysis revealed the spherical shape of the synthesized AgNPs with an average particle size of 8 nm. EDX analysis confirmed the purity of the synthesized AgNPs with a strong signal at 3.2 keV. The antioxidant activity was assessed by ABTS, DPPH, *p*-NDA, H₂O₂ and DMSO scavenging assays, in which the AgNPs synthesized using green method showed remarkable activity with respect to the standard antioxidants ascorbic acid and rutin. *In vitro* cytotoxicity activity was tested on four cancer cell lines such as human breast adenocarcinoma (MCF-7), cervical (HeLa), epithelioma (Hep-2) and lung (A549) along with one normal human dermal fibroblasts (NHDF) cell line. The AgNPs

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