



PAPER

Caralluma pauciflora based Ag-NPs activate ROS - induced apoptosis through down-regulation of AKT, mTOR and p13K signaling in human gastric cancer (AGS) cells

Renuga Devi Navaneethan, Packia Lekshmi N C J, Mariselvam Ramaiah, Rajeswari Ravindran, Ananth Kumar T, Arunachalam Chinnathambi, Sulaiman Ali Alharbi, Ananthi Sivagnanam and Ponnani Kaja Mideen Mohemedibrahim

Published 21 February 2024 • © 2024 IOP Publishing Ltd. All rights, including for text and data mining, AI training, and similar technologies, are reserved.

[Nanotechnology](#), Volume 35, Number 19

Citation Renuga Devi Navaneethan *et al* 2024 *Nanotechnology* **35** 195102

DOI 10.1088/1361-6528/ad26d9

1. Received 19 June 2023
2. Revised 27 December 2023
3. Accepted 6 February 2024
4. Published 21 February 2024



Method: Double Anonymous

Revisions: 3

Screened for originality? Yes

[Buy this article in print](#)

Journal RSS

Sign up for new issue notifications

Abstract

The phytochemicals found in *Caralluma pauciflora* were studied for their ability to reduce silver nitrate in order to synthesise silver nanoparticles (AgNPs) and characterise their size and crystal structure. Thunbergol, 1,1,6-trimethyl-3-methylene-2-(3,6,9,13-tetram, Methyl nonadecanoate, Methyl cis-13,16-Docosadienate, and (1R,4aR,5S)-5-[(E)-5-Hydroxy-3-methylpent were the major compounds identified in the methanol extract by gas chromatography–mass spectrum analysis. UV/Vis spectra, Fourier-transform infrared spectroscopy, x-ray diffraction, scanning electron microscope with Energy Dispersive X-ray Analysis (EDAX), Dynamic Light Scattering (DLS) particle size analyser and atomic force microscope (AfM) were used to characterise the *Caralluma pauciflora* plant extract-based AgNPs. The crystal structure and estimated size of the AgNPs ranged from 20.2 to 43 nm, according to the characterization data. The anti-cancer activity of silver nanoparticles (AgNPs) synthesised from *Caralluma pauciflora* extract. The AgNPs inhibited more than 60% of the AGS cell lines and had an IC50 value of 10.9640.318 g, according to the findings. The cells were further examined using fluorescence microscopy, which revealed that the AgNPs triggered apoptosis in the cells. Furthermore, the researchers looked at the levels of reactive oxygen species (ROS) in cells treated with AgNPs and discovered that the existence of ROS was indicated by green fluorescence. Finally, apoptotic gene mRNA expression analysis revealed that three target proteins (AKT, mTOR, and p13K) were downregulated following AgNP therapy. Overall, the findings imply that AgNPs synthesised from *Caralluma pauciflora* extract could be used to treat human gastric cancer.

Export citation and abstract

BibTeX

RIS

← **Previous** article in issue

Next article in issue →



physicsworld | podcasts

Access this article

The computer you are using is not registered by an institution with a subscription to this article. Please choose one of the options below.