Allicin-mediated silver nanoparticles; safety profiling and their *in-Vitro* and *in Vivo* antioxidant potential

*Sarwar Allah Ditta[1], Atif Yaqub[1], Rehan Ullah[1], Fouzia Tanvir[2], Shaista Ali[3]

[1]Department of Zoology, Government College University, Lahore 54000, Pakistan

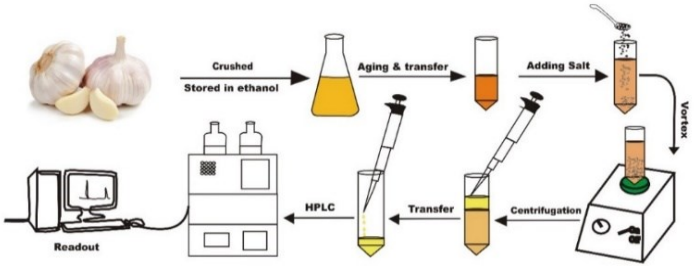
[2]Department of Zoology, University of Okara, Okara 56300, Pakistan

[3]Department of Chemistry, Government College University, Lahore 54000, Pakistan

Abstract (300-word limit)

Allicin is a major component in garlic extract and it gives garlic its characteristic taste and odor. In this study, allicin was extracted from the garlic and used in the synthesis of silver nanoparticles. Allicin exhibited a broader surface plasmon resonance peak at 240 nm, while high performance liquid chromatography yielded one prominent peak corresponding to allicin. The allicin-mediated silver nanoparticles, and chemically synthesized silver nanoparticles were characterized by UV-Visible spectroscopy, Fourier transform infrared spectroscopy, particle size analyzer, zeta potential, and Transmission electron microscopy analyses. The allicin-silver nanoparticles demonstrated good radical scavenging activity (in vitro), and antioxidant potential in albino mice (*in vivo*). The reduced glutathione and catalase activity were significantly elevated ($p<0.05$) and the activity of superoxide dismutase (SOD) was depleted ($p<0.05$) in some groups. The histopathological analysis and all other findings revealed the safer biological nature of allicin-mediated silver nanoparticles in comparison to the chemically synthesized silver nanoparticles. It is concluded that allicin-mediated silver nanoparticles are less toxic and safer for biomedical applications.

Image



Recent Publications (minimum 5)

1. **Ditta, S. A.,** Yaqub, A., Ullah, R., & Tanvir, F. (2021). Evaluation of amino acids capped silver nanoconjugates for the altered oxidative stress and antioxidant potential in albino mice. *Journal of Materials Research*, 1-16.
2. **Ditta, S. A**., Yaqub, A., Tanvir, F., Ullah, R., Rashid, M., Bilal, M. (2021). A histopathological evaluation of amino acids-capped silver nanoconjugates (AgNCs) against cadmium-induced toxicity in albino mice. *Bioinspired, Biomimetic and Nanobiomaterials*, *(Accepted)*.
3. **Ditta, S. A.**, Yaqub, A., & Tanvir, F. (2021). Nanotechnology can Provide Therapeutic Agent by Targeting Molecular Structures of SARS-CoV-2 (COVID-19): A Mini-Review. *Letters in Drug Design & Discovery*, *18*(8), 755-763.
4. Yaqub, A., **Ditta, S. A**., Ashraf, K., Tanvir, F., Ali, S., Naz, M., ... & Ali, S. (2020). Biosensors for mercury and manganese ions by using biosynthesized silver nanoparticles. *Bioinspired, Biomimetic, and Nanobiomaterials*, *9*(4), 213-222.
5. Yaqub, A., Faheem, I., Anjum, K. M., **Ditta, S. A**., Yousaf, M. Z., Tanvir, F., & Raza, C. (2020). Neurotoxicity of ZnO nanoparticles and associated motor function deficits in mice. *Applied Nanoscience*, *10*(1), 177-185.
6. Yaqub, A., Malkani, N., Shabbir, A., **Ditta, S. A**., Tanvir, F., Ali, S., & Ullah, R. (2020). Novel Biosynthesis of Copper Nanoparticles Using Zingiber and Allium sp. with Synergic Effect of Doxycycline for Anticancer and Bactericidal Activity. *Current Microbiology*, 1-13.
7. Yaqub, A., Anjum, K. M., **Ditta, S. A**., Tanvir, F., Yousaf, M. Z. (2019). Post-exposure histopathological studies of albino mice liver to silver nanoparticles prepared from *(Ocimum tenuiflorum)* green synthesis method. *THE JAPS. 29*(6), 1587-1595.
8. Yaqub, A., **Ditta, S. A**., Anjum, K. M., Tanvir, F., Malkani, N., & Yousaf, M. Z. (2019). Comparative Analysis of Toxicity Induced by Different Synthetic Silver Nanoparticles in Albino Mice. *BioNanoScience,* 9(3), 553-563.



Biography (150-word limit)

Mr. Sarwar AD has his expertise in ecotoxicology and Nanobiotechnology. He has been working on the synthesis and analyses of secure and safer nanomaterials (NMs) for different biomedical applications. He has experience in the synthesis and characterization of metallic nanomaterials by using various routes or procedures. Further, he has been utilizing these nanomaterials in Model animals for their altered oxidative stress and other related parameters. He has been serving in the education sector for more than ten years and is experienced in teaching and administration. He is working as a research scholar in the department of Zoology Government College University Lahore, Pakistan. He has published his research in National (Pakistan) and International Impact factor journals.

Email: sarwar.mini@yahoo.com

Notes/Comments:
Thanks

Presenting author details

Full name: Sarwar Allah Ditta
Contact number: 00923234666709
Twitter account: https://twitter.com/SarwarGcu
Linked In account: https://www.linkedin.com/in/sarwar-a-d-59476b114/
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