

Accepted Manuscript

Evaluation of antibacterial and antioxidant potential of the zinc oxide nanoparticles synthesized by aqueous and polyol method

Siba Soren, Sanjeet Kumar, Sanjibani Mishra, Padan K. Jena, Satish K. Verma, Purnendu Parhi



PII: S0882-4010(17)30823-9

DOI: [10.1016/j.micpath.2018.03.048](https://doi.org/10.1016/j.micpath.2018.03.048)

Reference: YMPAT 2864

To appear in: *Microbial Pathogenesis*

Received Date: 3 August 2017

Revised Date: 24 March 2018

Accepted Date: 26 March 2018

Please cite this article as: Soren S, Kumar S, Mishra S, Jena PK, Verma SK, Parhi P, Evaluation of antibacterial and antioxidant potential of the zinc oxide nanoparticles synthesized by aqueous and polyol method, *Microbial Pathogenesis* (2018), doi: 10.1016/j.micpath.2018.03.048.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Evaluation of Antibacterial and antioxidant potential of the zinc oxide nanoparticles synthesized by aqueous and polyol method

Siba Soren^a, Sanjeet Kumar^b, Sanjibani Mishra^a, Padan K Jena^c, Satish K Verma^d, Purnendu Parhi^{*a}

^aDepartment of Chemistry, Ravenshaw University, Cuttack, Odisha, India

^bAmbika Prasad Research Foundation, Cuttack, Odisha, India

^cDepartment of Botany, Ravenshaw University, Cuttack, Odisha, India

^dDepartment of Botany, Banaras Hindu University, Varanasi, India

*Correspondence to Dr Purnendu Parhi, Email: pparhi@ravenshawuniversity.ac.in

Abstract

In this paper, we have reported the synthesis, characterization, and evaluation of antimicrobial and antioxidant potential of monodispersed Zinc Oxide (ZnO) nanoparticles synthesized by the room temperature precipitation (aqueous phase) and polyol method (organic phase). ZnO nanoparticle synthesized by both the methods had shown excellent DPPH (2,2-diphenyl-1-picrylhydrazyl) free radical scavenging, metal chelating (MC), ABTS (2,2'-azino-bis(3-ethylbenzothiazoline-6-sulphonic acid), hydroxyl radical and superoxide radical scavenging activity (SAS). Scavenging activities were assayed within a concentration range of 25 to 75 ng ml⁻¹. The antibacterial activities with MIC were investigated against two Gram-positive bacteria *Streptococcus mutans* (MTCC 497) and *S. pyogenes* (MTCC 1926); three Gram negative bacteria *Vibrio cholerae* (MTCC 3906), *Shigella flexneri* (MTCC 1457) and *Salmonella typhi* (MTCC 1252). ZnO nanoparticles synthesized by the polyol method showed better MIC values against both Gram-positive and Gram-negative bacteria as compared to particles synthesized by aqueous precipitation method. Present study demonstrates the successful synthesis of ZnO nanoparticles with antioxidant property and significant broad spectrum antibacterial activity against several clinical bacterial pathogens.

Key Words: Nanoparticles, Zinc oxide, Bacteria, Antibacterial, Antioxidant

Download English Version:

<https://daneshyari.com/en/article/8749490>

Download Persian Version:

<https://daneshyari.com/article/8749490>

[Daneshyari.com](https://daneshyari.com)