



## **TITLE: Implementation of silver nanoparticles green synthesized with leaf extract of *Coccinia grandis* antimicrobial agents against head and neck infection MDR**

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### **ABSTRACT (upto 300 words)**

**Background:** Head and neck infections (HNI) associated with

multidrug resistance (MDR) offer several health issues on a global scale due to inaccurate diagnosis.

**Objectives:** This study aimed to identify the bacteria and Candidal isolates and implement the silver nanoparticles green synthesized with leaf extract of *Coccinia grandis* (Cg-AgNPs) as a therapeutic approach against HNI pathogens.

**Methods:** The Cg-AgNPs were characterized by the UV-visible spectrophotometer, FT-IR analysis, Zeta particle size, Zeta potential, and field emission scanning electron microscope (FE-SEM) analysis to validate the synthesis of nanoparticles. Additionally, the antimicrobial activity of Cg-AgNPs was presented by the zone of inhibition (ZOI), minimum inhibitory concentration (MIC), minimum

bactericidal/fungicidal concentration (MBC/MFC), and antibiofilm assay. Moreover, the cell wall rupture assay was visualized on SEM for the morphological study of antimicrobial activities, and the in-vivo toxicity was performed to evaluate the impact of Cg-AgNPs on various biological parameters.

**Results:** Different bacterial strains (*Staphylococcus aureus*, *Acinetobacter baumannii*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa*) and *Candida* sp. (*Candida albicans*, *Candida tropicalis*, *Candida orthopsilosis*, and *Candida glabrata*)

85.01±5.19% respectively. However, *C. albicans* and *C. orthopsilosis* revealed 23mm and 21mm of ZOI. Subsequently, they were identified. The MIC, MBC, and anti-biofilm potential of Cg-AgNPs were found to be highest against *A. baumannii*; 1.25 µg/ml, 5 µg/ml, and micromorphology of the cell wall rupture assay has confirmed the efficacy of Cg-AgNPs with no significant alteration in biological parameters.

**Conclusion:** The green synthesized Cg-AgNPs have multifunctional activities like antibacterial, anticandidal, and antibiofilm activity with no toxicity and can be introduced against the HNI pathogens.



### **BIOGRAPHY (upto 200words)**

Dr. Debasmita Dubey works as an Assistant Professor in the Department of Medical Research, IMS & SUM Hospital, SOA University, Odisha, India. She was awarded her Ph.D. in Microbiology from Utkal University, India. She has worked on AMR and the development of new antimicrobial agents for more than ten years in indigenous plants of Odisha and published 47 articles in both national and international journals.

She has been awarded a JSPS Fellow by the Japan Society for the Promotion of Science. She has been awarded an Inspire Fellowship for the program and a CSIR research associate for her Post-doctoral program.

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