

Pharmaconference 2018: In vitro antimicrobial analysis of Green Matrix Stabilized Silver Nanoparticles- Asma Irshad- University of Agriculture Faisalabad, Faisalabad-Pakistan

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Abstract:

The use of antibiotics has reduced the incidence of infectious diseases. But their extensive use has led to drug-resistant bacteria, which is a major public health issue worldwide. The silver nano-particles have been recognized as efficient broad spectrum antimicrobial agent but cause tissue oxidation. It uses mushroom glucans as reducing and capping agent to reduce its toxicity.

In the current study glucan coated silver nano-particles (Glucan-AgNPs) from four *Pleurotus* spp., were characterized for antimicrobial, biofilm inhibition, mutagenicity and carcinogenicity potential activities through in vitro analysis. The antimicrobial activity was performed by using well diffusion method and subsequently by minimum inhibitory concentration against bacterial strains [*Escherichia coli* (ATCC 15597), *Staphylococcus aureus* (ATCC 25923) and *Bacillus subtilis* (ATCC 23857)] collected from Department of Microbiology of our University. The anti-biofilm potentials of Glucan-AgNPs were performed by comparing positive and negative controls through phase contract microscopy. Carcinogenicity potentials analysis was determined by the spectrophotometric analysis of hemolytic activity. The mutagenicity analysis was performed by comparing Glucan-AgNPs with background micro titration plate against *Salmonella typhimurium* strains TA98 and TA100 in Ame's test.

By comparing the positive and negative controls the results have shown that Glucan-AgNPs exhibited excellent antimicrobial activity against bacterial strains. The results of biofilm inhibition analysis showed that Glucan-AgNPs were excellent agents to inhibit microbial biofilm. Carcinogenicity potentials analysis by hemolytic assay revealed that Glucan-AgNPs were non-hemolytic. The results of mutagenicity analysis showed Glucan-AgNPs were

non-mutagenic against *Salmonella typhimurium* strains TA98 and TA100.

From the present research it is concluded that the mushrooms glucans extracted from *Pleurotus* spp. possess strong reducing and capping property through which they get attached to AgNPs and enhance their in vitro biological activities. Glucan-AgNPs can be used as novel, naturally occurring, rapid acting broad spectrum nano-antibiotic. Furthermore, teamwork of biochemists and pharmacist is required to further improve its specificity and stability profile. Moreover, such conferences offer excellent platform to develop fruitful collaboration.

According to the regional survey of the year 2018, the worldwide pharmaceuticals showcase was worth \$934.8 billion in 2018 and will reach \$1170 billion in 2021, developing at 5.8%, concurring to a later pharma showcase investigate the report. This can be a quickened pace compared to 5.2% for a span of 12 months before 2017 but is slower than the other two huge healthcare fragments, therapeutic gear and healthcare administrations. The biggest pharma showcase all the worldwide pharmaceutical explanatory testing advertises estimate was esteemed at USD 4.4 billion in 2018 and it is evaluated to develop with CAGR of 8.1% over the estimated period. Expanding R&D speculations, expanding center on the item quality & security, control is imperative drivers of the development of the advertising. Expanding R&D speculations is one of the basic maintainability techniques. Within the later a long time, the R&D cost is expanding and expected to proceed to extend over the figure period. The pharmaceuticals industry is ruled by the U.S., which holds around 45% of the worldwide showcase share since it is driven by the administrative situation and the nearness of the well-established outsourcing framework. Driving industry players designate around 20% of their turnover to R&D to preserve a

competitive edge. Increase in complexity and number of benchmarks, which a single item may comply with, is driving significant development within the pharmaceutical expository testing administrations outsourcers inclusive is for musculoskeletal drugs. These are medications for infections such as rheumatoid- and osteo- joint pain, osteoporosis, carpal burrow disorder, tendonitis, rotator sleeve tear, strong dystrophy, myasthenia gravis, lupus erythematosus, and others. Major drugs in this section incorporate Piroxicam Glaxo, Dolonex, Felden, and Piroxicam Pfizer. The fragment accounted for 14% of the worldwide add up to in 2018. Cardiovascular, oncology and anti-infective drugs are the moments third and fourth biggest markets.

Keywords: Glucan coated silver nano-particles, in vitro, antimicrobial agents