

# Biogenical synthesis of silver nanoparticles from green algae (*Botryococcus braunii*) and its catalytic behaviour for the synthesis of Benzimidazoles

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## Abstract

In recent research interest metal nanoparticles have been synthesized extensively for a variety of applications and gaining enormous research attention in various areas such as chemistry, physics, life science, material science, medical science, nanomedicine and engineering due to size and shape tune able properties. Nanoparticles possess unique optical, magnetic, electronic and catalytic properties with their distinctive feature of size and shape. The chemical synthesis of metal nanoparticles requires chemical reducing agent to convert metal ion to metal nanoparticles and involves undesired use of aggressive and hazardous chemicals. Relative to these chemical syntheses, methods of green synthesis that use ecofriendly compounds as reducing agents in place of hazardous and aggressive chemicals. The emphasis on green synthesis of metal nanoparticles and its catalytic property for a maximum societal benefit with minimal impact on the ecosystem.

In this present study we demonstrated that the aqueous extract of green alga *B.braunii* can reduce silver ions into silver nanoparticles and have the potential to stabilize them. The novel silver nanoparticles were explored and found efficient for reduction of 2-nitroaniline and subsequently in synthesis of 2-arylbenzimidazoles. This provides a greener catalytic approach for synthesis of silver nanoparticles from alga *B.braunii* and its application in a newer synthetic approach for biocatalytic, one pot conversion of 2-nitroaniline to biologically important 2-arylbenzimidazoles.

Synthesized nanoparticles and derivatives of benzimidazoles were characterized by UV, FTIR, X-ray and SEM.

## Biography:

Dr Tejpal Singh Chundawat is associated with The North Cap University, India since 27th January, 2014. Dr Tejpal has completed his Masters degree (Organic Chemistry) from the M. L. S. University, India in 2007. As a Research Associate he spent two years (2007-2009) in R&D Centre at Jubilant Chemsys Ltd., Noida. Dr Tejpal was awarded Doctoral degree (Organic Synthesis) by the Department of Chemistry, University of Delhi in 2014. He is guiding four PhD students under his supervision and published fifteen research papers in reputed SCI journals. He also awarded a research project from DRDO on development of polyurethane for blast mitigation. His area of research is synthesis of nanoparticles and their catalytic behavior in organic synthesis and natural product synthesis.

## Recent publication data:

1. A Short Review on the Valorization of Green Seaweeds and Ulvan: FEEDSTOCK for Chemicals and Biomaterials
2. Review on green nano-biosynthesis of silver nanoparticles and their biological activities: with an emphasis on medicinal plants
3. Green and facile synthesis of Ag nanoparticles using *Crataegus pentagyna* fruit extract (CP-AgNPs) for organic pollution dyes degradation and antibacterial application
4. Controlled biosynthesis of gold nanoparticles with *Coffea arabica* using factorial design

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