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Biosynthesis and characterization of silver nanoparticles using *Morus alba* L. and their antioxidant activity

Asha Singh[1]*, Sadhana Shrivastava[1], Monika Sharma[2], Chandrakant Sharma[2] and Sangeeta Shukla[1]

[1]UNESCO-Trace Element Satellite Centre,
School of Studies in Zoology, Jiwaji University, Gwalior (M.P.)
[2] Department of Bioscience and Biotechnology, Banasthali University, Bansthali, Rajasthan
*Email: ashasgh87@gmail.com

Nanobiotechnology is a rapidly growing scientific field of producing and constructing devices utilizing nanosized paricles of about nanometer scale level (1 to 100 nm). Now-a-days nanoparticles were potentially used in life sciences and human health care applications [1]. Silver nanoparticles are playing a major role in the field of biomedical nanotechnology and nanomedicine. In the present study silver nanoparticles were prepared using *Morus alba* leaf extract as reducing agent by a simple, cost-effective and eco-friendly process. The formation of synthesized nanoparticles were characterized by UV-Visible spectrophotometer which showed absorbance peak in range of 620-646 nm (Figure 1).

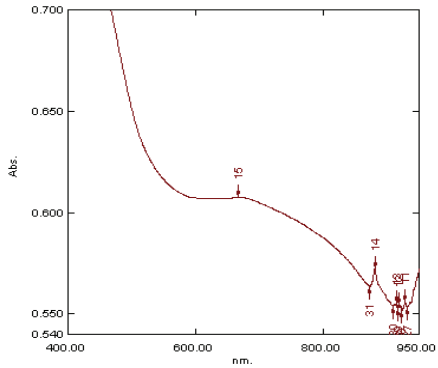

Figure 1: UV-Visible spectrum of synthesized silver nanoparticles

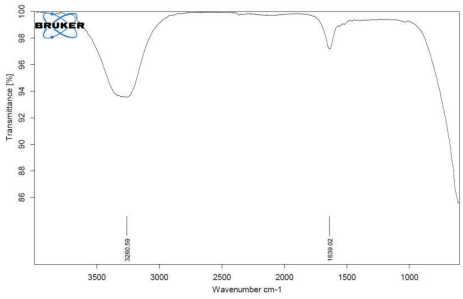

Figure 2: FTIR spectrum of synthesized silver nanoparticles

The functional groups present in plant extract were investigated by FTIR. Bioreduction were observed in the region of 400-4000 cm^{-1} with major peaks at 3260.59, that could be assigned to the C-H stretching of carbonyl bond and 1639.02 cm^{-1} are secondary amine N-H stretch (Figure 2).

The zeta potential and particle size distribution of the silver nanoparticles were determined using MALVERN Dynamics Light Scattering (DLS) Instrument with zetasizer Version 7.11. A negative zeta potential value of -13.3 mV was observed which proved the stability of the silver nanoparticles and particle size of nanoparticles was observed within the range of 50-57 nm (figure 3).

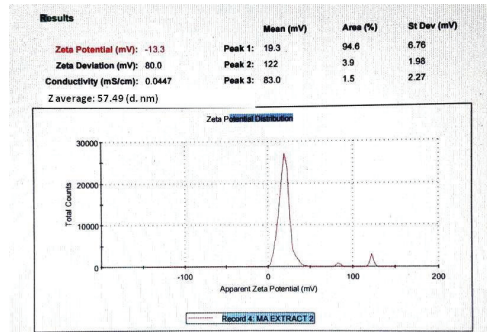

Figure 3: zeta potential of synthesized silver nanoparticles

The antioxidant activity of *Morus alba* derived AgNPs were checked using DPPH assay to quench the reactive oxygen species (ROS) which play important role in the development of cancer, cardiovascular diseases, inflammation and associate disorders [2]. Here the antioxidant activity of AgNPs was compared with standared ascorbic acid. Present results showed the antioxidant activity and IC_{50} of *Morus alba* mediated AgNPs were found in the range of 70-80% and 20-50 µg/ml. These results indicate that *Morus alba* mediated AgNPs could work as potent antioxidant which might be due to capping of flavonoids present in plant extract.

References

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