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Green synthesis, properties and application of silver nanoparticles of eggplant

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INTRODUCTION & AIM

Nanoparticles and their synthesis and application have been widely studied in recent years.

The aim of this study was to develop a method for producing green nanoparticles using eggplant extract. UV-Visible spectral analysis and the X-ray diffraction (XRD) assay were used for the characterization of nanoparticles. The size of the nanoparticles was calculated based on the Debye–Scherrerequation. It was determined that a silver nitrate concentration of 1 mM was the most effective for the green synthesis of nanoparticles using eggplant extract. The resulting particles were optimized, and the phytochemical properties of eggplant silver nanoparticles and the effectiveness of their use in therapy were assessed. The work carried out shows the advantages of green synthesis of nanoparticles for a clean and lower cost production of food additives to improve the quality of life of people.

METHOD

The UV-Visible spectroscopy has been proved to be useful for analysis of AgNPs, as method for characterization of the formation and growth of AgNPs. The variation in spectra may be due to the number of particles and the size distribution in the solution. In the present study, absorption spectra of the aqueous component of *Solanum melongena* L. Extract were measured in the range 300-700 nm, using a double beam UV-Vis spectrophotometer.

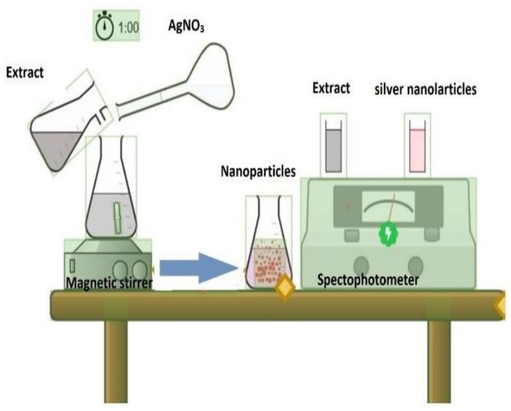

Fig. 1. Preparation for green synthesis of silver nanoparticles

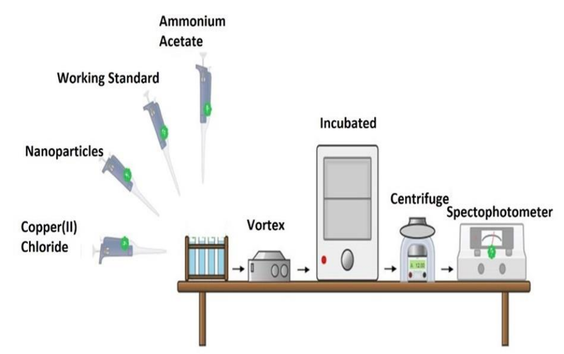

Fig. 2. Procedure for measuring (TA levels)

$$DPPH\_inhibition(\%)=[(Acontrol-Asample)/Acontrol]\times 100$$

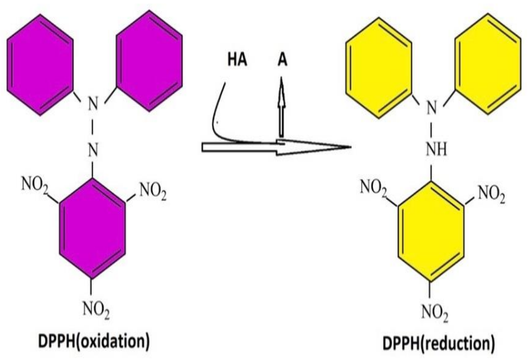

Figure 3. Concept of 2,2-diphenyl-5-picryl hydrazyl radical scavenging capacity

RESULTS & DISCUSSION

Figures 4-7 show the present results of elaboration and the conditions for green synthesis of phytoparticles. A strong surface plasmon resonance was centered at approximately 420 nm, suggesting that the nanoparticles were scattered in the aqueous solution proof for accumulation in the UV-Vis absorption spectrum, the presence of silver nanoparticles.

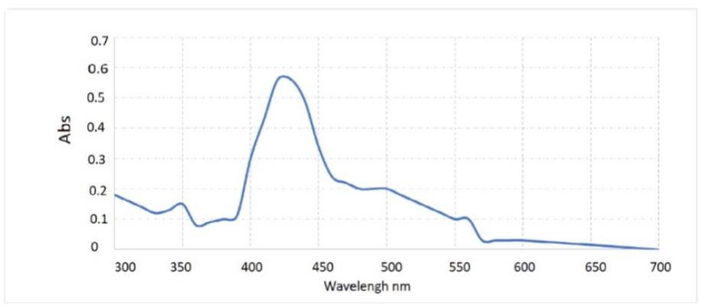

Figure 4. Uv-Visible spectrum of silver nanoparticles. The maximum wavelength was 420 nm.

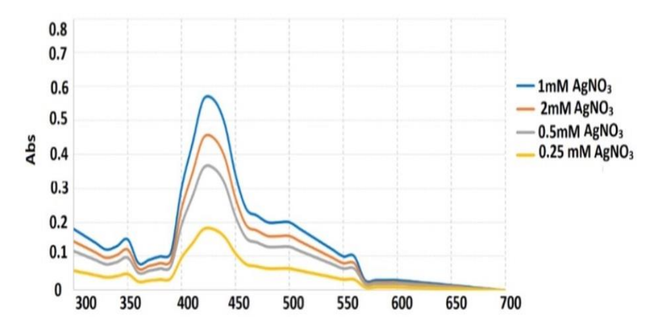

Figure 5. Uv-Visible spectrum of silver nanoparticles at different concentration of $AgNO_3$. 1 mM is the best concentration

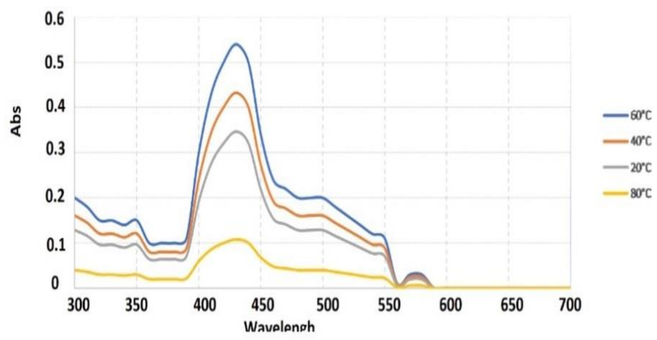

Figure 6. Uv-Visible spectrum of silver nanoparticles at different temperature

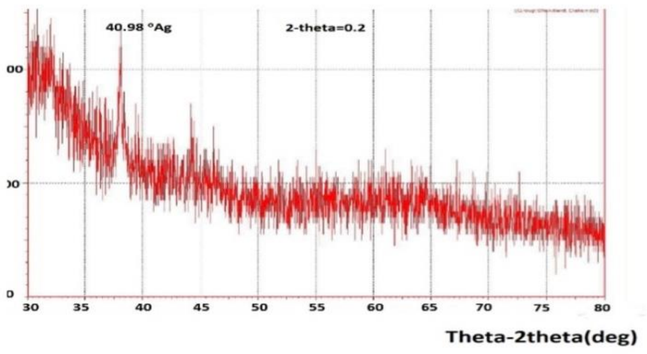

Figure 7. X-Ray difraction paterns of silver nanoparticles

CONCLUSION

In this research, the method of green synthesis of silver nanoparticles with eggplant extract was elaborated; the best conditions for this were 1 mM of $AgNO_3$, 30 min, pH 9, and 60 °C. The green nanoparticles were shown to possess high activity against oxidation.

FUTURE WORK / REFERENCES

The effect of green phytoparticles on eukaryotic cells and the possibility of using them as additional nutrition will be studied further