Green synthesis of metal nanoparticles from fruit extract with its antibacterial activity

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Synthesis of metal nanoparticles has received significant attention because of their antimicrobial [1], antibacterial [2], antioxidant capacity. Bio mimetic [3] approach was carried out during synthesis of silver nanoparticles. Bio-inspired methods are advantageous compared to other synthetic methods as they are economical and restrict the use of toxic chemicals as well as high pressure, energy and temperature. In recent time, several groups have been reported to achieve success in the synthesis of Au, Ag, & Pd nanoparticles [4] from various parts of herbal plants.

In the present piece of work, aqueous extracts of citrus fruits were used as reducing and stabilising agent for the synthesis of AgNp using bio reduction method. The condition of formation of AgNp was established by varying concentration and pH of the mixture. At various temperature formation of Ag-NP were studied. After complete reduction, the sample was centrifuged at 12000 rpm then heated and dried, followed by characterization by using UV-Visible, X-RD and SEM techniques. Antibacterial activity of biogenic AgNPs was evaluated by using standard ZOI.

Table 1: Variation of $\lambda_{\max}$ with molar concentration

Sample Number	Molar concentration of AgNO ₃	pH Value	$\lambda_{\max}$
1	1x 10 ⁻³ M	5	425
2	1.5x 10 ⁻³ M	6	418
3	2x10 ⁻³ M	6.5	407

Figure 1: Absorbance of Ag-NPs Synthesized with different molar concentration of AgNO₃ at room temperature

References

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