

Nanochemistry and biotechnology

Green synthesis of silver and gold nanoparticles by using extracts of selected medicinal plants

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Nanotechnology, a new emerging and fascinating field of science, permits advanced research in many areas, and nanotechnological discoveries could open up novel applications in the field of biotechnology, electronics, energy, medicine, life sciences and nanotechnology offers an expanding research [1]. Nanoparticles with different shape have been explored for specific biomedical applications in dispersed form [2].

The development of an ecologically friendly and reliable process for the synthesis of metallic nanoparticles is an important step in the field of the nanotechnology.

In the present study, silver and gold nanoparticles have been synthesized by bio-reduction of silver nitrate and chloroauric acid using leaf's extracts of *Melissa officinalis* L., *Menta piperita* and flower's extract of *Calendula officinalis* L. Nanoparticles were characterized using UV-Visible absorption spectroscopy, FTIR, EDX, TEM, and XRD.

The UV-Visible absorption spectra of nanoparticles shows two bands at around 530-560 and 750-1050 nm, which results from transverse and longitudinal surface plasmon resonance respectively. The morphology of nanoparticles was studied by high resolution transmission electron spectroscopy.

1. Nair R., Varghese S.H., Nair B.G., Maekawa T., Yoshida Y., Kumar D.S.

Nanoparticulate material delivery to plants // *Plant Sci* - 2010. - **179**, P. 154-163.

2. Jackson J., Halas N. Surface-enhanced Raman scattering on tunable plasmonic nanoparticle substrates // *Proc Natl Acad Sci USA*, - **101**, P. 17930-17935.