

Ecofriendly Synthesis of Silver Nanoparticles Using Leaf Extracts of Medicinal Plants and Their Characterization †

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Abstract: The biological way of synthesizing nanoparticles has wider properties and benefits in research areas in nanotechnology through medicinal plant extracts due to their lower cost, simple process, and non-toxic property. This method uses the extraction of plants with their bioactive compounds for the synthesis of silver nanoparticles. This research work focused on the synthesis of plant-based silver nanoparticles from three different plant extracts. Their efficacy with antibacterial silver nanoparticles was studied using leaf broth of medicinal plants by *Ocimum sanctum*, *Plectranthus amboinicus*, and *Piper betle*. Biosynthesized silver nanoparticles were characterized by the help of UV-visible spectroscopy for their stability, and physicochemical parameters were studied by dynamic light scattering, Fourier transform infrared spectroscopy, and Field emission scanning electron microscopy. Multidrug-resistant bacteria are increasing globally due to their ESBL (Extended spectrum beta-lactamase); these enzymes confer resistance towards bacteria and make them inactive to act with antibiotics. The antibacterial property of green synthesized silver nanoparticles was treated against antibiotic-resistant strains for their anti-bactericidal effect. To validate their efficacy of silver nanoparticle agar, a good diffusion method was carried out against antibiotic-resistant MDR clinical strain. Each clinical strain was isolated and identified for sequencing and determined their historical and familial relationships between sequences.

Keywords: medicinal plant; silver nanoparticle; clinical strains.

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Conflicts of Interest

The authors declare no conflict of interest.