

## SENNA OCCIDENTALIS AQUEOUS EXTRACT FOR THE SYNTHESIS OF NANOPARTICLES WITH CERIUM, LANTHANUM, COPPER, SILVER AND ZINC SALTS PRODUCES STABLE ANTIMICROBIAL AGENT

Leyanet Barbieria Roque<sup>1</sup>, Olayide Obidi<sup>2</sup>, Erasmo Gámez Espinosa<sup>1</sup>, Marisa Viera<sup>3,4</sup>, Natalia Bellotti<sup>1,5</sup>

<sup>1</sup>Centro de Investigación y Desarrollo en Tecnología de Pinturas (CIDEPINT), Pinturas Especiales, Argentina. <sup>2</sup>Lagos State University, Department of Microbiology, Nigeria. <sup>3</sup>Centro de Investigación y Desarrollo en Tecnología de Pinturas (CIDEPINT), ANELPIRE, Argentina. <sup>4</sup>Universidad Nacional de La Plata, Facultad de Ciencias Exactas, Argentina. <sup>5</sup>Universidad Nacional de La Plata, Facultad de Ciencias Naturales y Museo, Argentina.

The use of aqueous plant extracts to obtain nanoparticles are promising due to their accessibility, low cost and eco-friendliness. The green synthesis of different nanoparticles was carried out to explore their antimicrobial potentials as bioactive components in waterborne coating formulations. Solutions of zinc, cerium, lanthanum, copper, and silver salts at different concentrations were used as sources of metal ions for the synthesis process. Aqueous plant extract of *Senna occidentalis*, a small shrub about 3 ft. high belonging to Leguminosae family was used as reducing and stabilizing agent. The nanoparticles synthesis involved the mixing of 10 ml of the extract in 90mL of each metal salt solution at 60°C and pH 7 with constant stirring. The nanoparticle synthesis was confirmed by UV-vis spectroscopy after 24 hours. The same technique was used to assess the stability of the nanoparticles over time. The characterization of the nanoparticles by transmission electron microscopy and Fourier transformed infrared spectroscopy showed stability after 30 days of synthesis. The antimicrobial activity assays were performed against bacterial and fungal strains: *Escherichia coli*, *Staphylococcus aureus*, *Chaetomium globosum* and *Alternaria alternata*. These microorganisms were selected due to their predominance and role in biodeterioration. Nanoparticles obtained with silver and copper solutions were stable. However, only the silver quasi-spherical nanoparticles showed antimicrobial activity against all tested strains.

**Keywords:** NANOPARTICLES, SENNA OCCIDENTALIS, ANTIMICROBIAL

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**Presenting author's email:** n.bellotti@cidepint.gov.ar