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## SYNTHESIS OF SILVER NANOPARTICLES FROM *Camellia sinensis* WASTE AND EVALUATION OF THEIR CYTOTOXIC EFFECT

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### Abstract

Silver nanoparticle synthesis was achieved using waste tea produced from tea factories and investigated their anticancer activity. The waste material was heated with deionized water at 45°C and then the solution was filtrated. The filtrate was reacted with silver nitrate to yield the silver nanoparticles (AgNPs). The structure of AgNPs was determined by spectroscopic analysis. The cytotoxic effect of extract and AgNPs were performed using the human lung carcinoma cell lines (A549), colon adenocarcinoma cell lines (DLD-1), and mouse fibroblasts (L929) cell lines by MTT assay. In UV-Vis measurement, the maximum absorption was observed at 445 nm. The nanoparticles morphology was established by Transmission electron microscopy (TEM) and particle size was determined as 17.6 nm. The structure of AgNPs was presented as a face-centered cubic structure by X-ray Diffraction (XRD) analysis. The high negative value of zeta potential (-31.3 mV) displayed the stability of the nanostructure. The yield of AgNPs was calculated by elemental analysis as 72.35%. AgNPs exhibited an outstanding effect on A549 and DLD-1 cell lines at 1.0 mg/mL with the lethal effect of 89.3% and 83% respectively. AgNPs synthesized from waste tea may be promising agents for cancer treatment. Since silver nanoparticles synthesized from waste tea revealed excellent cytotoxic effects against various cancer cells.

**Key words:** apoptosis, *Camellia sinensis*, cytotoxicity, silver nanoparticles, tea, waste material

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