

Green Synthesis of Gold Nanoparticles Using *Acacia Nilotica* Leaf Extract and Evaluation of Drug Loading and Anticancer Activity

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Abstract

The reducing potential of phenolic constituents present in the leaf extract of *Acacia nilotica* was exploited for the green synthesis of gold nanoparticles (*An*-GNPs). Gold chloride was reduced under sunlight using the leaf extract in the presence of polyvinyl alcohol to obtain stabilized gold nanoparticles. The formation and average size of *An*-GNPs were confirmed using the surface plasmon resonance and FESEM data. The *An*-GNPs showed a spherical shape and a negative zeta potential. The *An*-GNPs were stable in saline at physiological pH and biocompatible with zebrafish larvae, as revealed by the *in-vivo* toxicity study. The observed *in-vitro* cytotoxic activity against K-562 leukemia cells by 6-mercaptopurine-loaded-*An*-GNPs indicated the suitability of the latter as a vehicle for anticancer drug delivery.

Keywords: *Acacia nilotica*; Leaf extract; Gold nanoparticles; 6-Mercaptopurine; Anticancer activity