Screening of Medicinal Plant Methanol Extracts for the Synthesis of Gold Nanoparticles by Their Reducing Potential

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Development of nontoxic, clean techniques for the synthesis of metal nanoparticles such as gold has attracted increasing attention in recent years. Although many reports have been published about the biogenesis of gold nanoparticles using several plant extracts such as Neem leaf broth (*Azadirachta indica*), the capacity of a large number of such extracts to form gold nanoparticles has yet to be elucidated. In this research a titrimetric assay was employed for preliminary evaluation of the reducing potential of different medicinal plant extracts. All the extracts were used separately for the synthesis of gold nanoparticles through the reduction of aqueous $AuCl_4^-$. After the screening step, the methanol extracts of *Eucalyptus camaldulensis* and *Pelargonium roseum* were selected for further studies. The reducing ability of these extracts was significantly enhanced as compared to Neem leaf broth (*Azadirachta indica*) which was used as control sample. Transmission electron microscopy, energy-dispersive spectroscopy and visible absorption spectroscopy confirmed the reduction of gold ions to gold nanoparticles. The *E. camaldulensis* and *P. roseum* extracts produced gold nanoparticles in the size ranges of 1.25 – 17.5 and 2.5 – 27.5 nm with an average size of 5.5 and 7.5 nm, respectively.

Key words: *Eucalyptus camaldulensis*, *Pelargonium roseum*, Neem Leaf, Gold Nanoparticles, Synthesis, Plant Extracts, Chloroauric Acid, Reduction, Spectrum