



Genotyping of insulin plant *Costus igneus* using trnH-psbA using intergenic spacer gene trnH-psbA (PTIGS) and Biogenic gold nanoparticles synthesis

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Abstract : The aim of the study was to identify the genotype of plant species *Costus igneus* (*Costus igneus*) using *psbA-trnH* gene sequences followed by phylogenetic analysis and to evolve an alternative ecofriendly method to synthesis gold nanoparticles for biological application. Optimized gold nanoparticles were synthesized using different concentrations of Chloroauric acid (HAuCl₄), plant extract, temperature and pH. The same were characterized for surface plasmon bands, surface morphology, size. The nanoparticles obtained at 1mM concentration of HAuCl₄ at the temperature of about 70° C and at the pH 7. These nanoparticles showed an absorption peak at 538 nm in Ultraviolet-Visible spectrum (Uv-Vis) corresponding to the Plasmon resonance of gold nanoparticles. The size of gold nanoparticles ranged from 17 to 24 nm. The nanoparticles also showed long term stability in terms of aggregation for about 15 days in distilled water under room temperature. In lyophilized form it is showing long term stability for about 3 months under room temperature. Our results demonstrate the synthesis of new genre green gold nanoparticles by using *C.igneus* will provide opportunities towards development of nanoparticles biologically. This green chemistry approach is amenable to large scale production and this renewable plant material offers enormous benefits towards nanoparticles synthesis.

Keywords: *Costus igneus*, Gold nanoparticles, Phytochemically, Plant extract, Temperature.

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