

Synthesis and characterization of gold nanoparticles from *Delphinium cashmerinum* and its anticancer and antibacterial activity

Mohammad Ashaq Sofi # Gulzar Ahmed Rather, Anima Nanda

¹Department of Biomedical engineering, Sathyabama Institute of Science and Technology
Chennai-60500, India. #Email: sofiashaq11@gmail.com

Abstract: Nanoparticle research is currently an area of intense scientific research, due to a wide variety of potential applications in the field of nanomedicine. In spite of the recent domination of the synthetic chemistry as a method to discover and produce drugs, yet it is difficult to treat so many diseases because of lack of effectiveness and more side effects. Therefore, development and search of novel and effective anticancer and antibacterial agents in the form of nanoparticles to overcome resistance is gaining importance. Taken together, the present study is being sought to evaluate the anticancer and antibacterial properties of gold nanoparticles synthesized from a herb *Delphinium cashmerinum*.

The aqueous leaf extract of *Delphinium cashmerinum* was taken and then treated with gold chloride. After 24 hours of incubation the colour changed into ruby red colour indicates the formation of gold nanoparticles. These gold nanoparticles were characterized by UV-visible spectrometric analysis which shows the absorption peak at 540nm confirms the presence and formation of gold nanoparticles. The gold nanoparticles were further analyzed through FE-SEM microscopy which shows gold nanoparticles are well dispersed and spherical in shape and in the range of 40 - 60 nm. The cyto-toxicity assay was performed against cancer cell lines (HEP-2) using colorimetric MTT assay. The toxicity towards (HEP-2) cells was found significant with its IC 50 value 55.14 µg/ml compared with its normal Vero cell with IC 50 near about 215.79 µg/ml. Further antimicrobial activity was performed by using two different human pathogens like *Staphylococcus aureus* and *Escherichia coli* by disc diffusion method.

These biologically synthesized gold nanoparticles showed good zone of inhibition against the all three pathogens. This anti-proliferative activity towards (HEP-2) cells could be extended to anticancer studies after evaluating its toxicity in in-vivo analysis

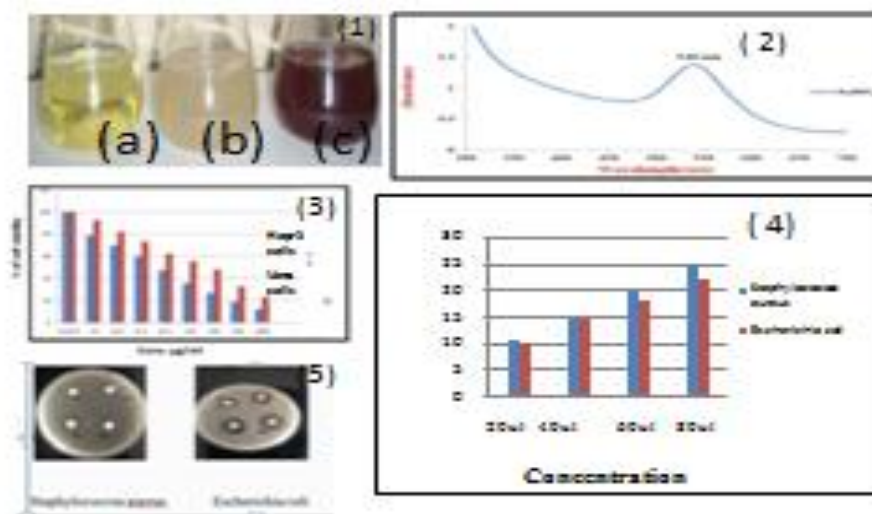


Figure 1: Visual observations of *Delphinium cashmerinum* gold nanoparticles .a) HAuCl_4 .b) aqueous leaf extract of *Delphinium cashmerinum* before adding HAuCl_4 c) *Delphinium cashmerinum* gold nanoparticles after adding HAuCl_4

Figure 2: Shows the peak of gold nanoparticles at exactly 540 nm confirms the synthesis of silver AuNps from *Delphinium cashmerinum*

Figure 3: Graph showing cell viability of vero and HEP-2 cell line against different conc.of gold nanoparticles.

Figure 4 & 5: showing antimicrobial activity of synthesized gold nanoparticles

References:

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