

## A Novel Investigation of the Effect of Clove (*Syzigium aromaticum*) and Silver Nanoparticles (AgNPs) Conjugated Clove on *N. gonorrhoeae* and Prostate Cancer Cell Line

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### ABSTRACT

Our study highlighted the investigation of effect of clove (*Syzigium aromaticum*) and silver nanoparticles (AgNPs) conjugated clove on each of *N. gonorrhoeae*, prostate cancer cell line PC3 and normal cell HdFn. The study consisted of studying the ability of *N. gonorrhoeae* isolates to biosynthesize the silver nanoparticles based on the colour change from pale yellow to brown. The biosynthetic silver nanoparticles were characterised using several techniques, including the ultraviolet spectrum (UV-vis), a fourier transform infrared spectroscopy (FTIR), X- ray diffraction (XRD) and a transmission electron microscope (TEM). By disc diffusion method the results showed that the clove extract inhibited the growth of *N. gonorrhoeae* at a concentration of 100% with an inhibition zone of 8mm, while the inhibition zone created by AgNPs-clove compound was 13mm. The results also revealed that the rate of inhibitory activity of clove extract on PC3 cell line were 1.59%, 9.54 %, 1154%, 4.54% and 4% at the concentrations of 400, 200, 100, 50 and 25 µg/ml respectively. The rate of inhibition of clove on normal cells HdFn ranges from 48.5 % to 4.8% at the concentration of 400-200 µg/ ml, the IC50 value was 140 µg/ml on PC3 cell line and 142 µg/ ml on the normal cell line. The results also show that the clove coated with AgNPs has higher activity against PC3 cell line than the clove extract alone as it inhibited the cells by .51%, 1.51%, 9.53%, 4% and 151% at the concentrations of 400, 122, 422, .2, and 1 µg/ml respectively. At the same time the clove coated with AgNPs showed a low cytotoxicity against normal cells where the inhibition rates were 33.3%–4.2% at the concentrations of 400 – 25 µg/ml, as well as the results showed significant differences by calculating the value of IC50 when the coated clove compound was applied to both PC3 cell line and normal cell at a concentration of 67.44 ug /ml and 132.5 ug/ml respectively.

