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“Building Bridges for Better Health”

Faculty of Medical Sciences, University of Sri Jayewardenepura
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Methods: The cystinuria samples were prepared with the following concentrations; 40, 60, 70, 75, 80, 90, 100 and 120 mg/dL. The pH of each cystinuria sample was altered with acetic acid and were subjected to different temperatures i.e., +4°C and 37°C, for 15, 30 and 45 minutes. Samples were centrifuged at 2000 rpm for 5 minutes and the sediments were observed microscopically for cystine crystals. Then acetone was added to cystinuria solutions with the ratio of cystinuria:acetone, 8:1, 4:1, 2:1 and 1:1 and sediment observed for cystine crystals.

Results: The cystine crystals were present in the concentrations of ≥ 100 mg/dL of cystinuria at pH 5 in both, 37°C and +4°C, 30 minutes after the addition of acetic acid. With the addition of acetone, cystine crystallization had occurred in the cystinuria of ≥ 75 mg/dL at pH 5 at both 37°C and at +4°C, 30 minutes after the addition of acetic acid. The number of cystine crystals per High Power Field (HPF) was highest in cystinuria:acetone 8:1 and the number was lesser in cystinuria:acetone 2:1 and 4:1 with the deposition of amorphous phosphate over the cystine crystals. There was no crystal formation in cystinuria:acetone 1:1.

Conclusions: The optimum conditions for cystine crystallization are pH 5 at 37°C and +4°C, 30 minutes after acidifying with acetic acid at the minimum concentration of 100 mg/dL cystinuria and cystinuria:acetone 8:1 with minimum concentration of 75 mg/dL.

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Antimicrobial activity of silver nanoparticles capped with crude extract of *Garcinia zeylanica* and garcinol Wijekoon HPSK¹, Ekanayaka EMAK¹, Peiris MMK², Arachchi NDH³, Palliyaguru L³, Kumarasinghe UR³, Gunasekara TDCP², Fernando SSN², Jayaweera PM³

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Objectives: Biosynthesis of stable silver nanoparticles (AgNPs) from *Garcinia zeylanica* crude aqueous extract and 95% pure garcinol and to investigate their antimicrobial activity.

Methods: Five milliliters of crude aqueous extract of dried pericarp of *Garcinia zeylanica* and 0.05% (w/v) garcinol were added drop wise into 95 ml of 0.001M AgNO₃ solutions separately. pH of the solutions was adjusted to 7. The formation of AgNPs was confirmed by UV-Visible spectrophotometry. The antimicrobial activity of synthesized AgNPs was tested against *Pseudomonas aeruginosa* (ATCC 27853), *Escherichia coli* (ATCC 25922), *Staphylococcus aureus* (ATCC 25923) and *Candida albicans* (ATCC 10231) by well diffusion method.

Results: UV-Visible peaks indicated the presence of small (9.5nm) and large (40.3nm) AgNPs from *Garcinia* extract and medium sized (12.5 nm) AgNPs from garcinol and confirmed by Transmission Electron Microscopy (TEM). The colour changes observed in solutions ranged from straw color to reddish brown (small), greenish brown (large) and brown (medium) respectively. The mean zones of inhibition (ZOI) of small AgNPs against *E. coli*, *P. aeruginosa*, *S. aureus* and *C. albicans* were 12.6 mm, 13 mm, 11 mm, and 10.66 mm, respectively. Mean ZOI of large AgNPs against the above organisms were 11 mm, 10.66 mm, 10 mm and 10 mm, respectively. Mean ZOI of garcinol capped AgNPs (medium) against *E. coli*, *P. aeruginosa*, *S. aureus* and *C. albicans* were 11.33 mm, 10 mm, 10 mm, 12 mm respectively.

Conclusions: *G. zeylanica* and garcinol were successfully used for biosynthesis of AgNPs. Antimicrobial activity of AgNPs decreased with their increasing particle size. *G. zeylanica* and garcinol capped AgNPs can be used as potential antimicrobial agents in future applications.