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Study of *In-vitro* Antiurolithiatic and Lithotriptic Activities of *Crateva adansonii*

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Background: Urolithiasis clinically stands for the formation and movement of stones in the urinary system and it is one of the most common urinary diseases in the world. The plant; *Crateva adansonii* (Garlic pear tree; Lunuwarana) is used as a traditional remedy for the treatment of urolithiasis.

Objectives: To evaluate *in-vitro* antiurolithiatic and lithotriptic activities of the aqueous stem bark extract of *C. adansonii*.

Methods: Plant extract was prepared by decoction method. Different concentrations of plant extract were mixed with artificial and natural urine. An aliquot of 15 mmol/L CaCl₂ solution followed by 20 mmol/L Na₂C₂O₄ solution were added while maintaining the pH of the medium at 6.5. Antiurolithiatic activity was examined by measuring the optical density of these mixtures at 620 nm followed by calculation of percentage inhibition of nucleation. The investigation of the lithotriptic activity was carried out with a redox titration using KMnO₄ with CaC₂O₄. The percentage of dissolution of calcium oxalate crystals was calculated. Cystone tablets were used as the reference drug.

Results: Results of the spectrophotometric method showed concentration dependant increase in the inhibitory activity of nucleation in both urine media. Plant *C. adansonii* showed the highest mean percentage of nucleation inhibition with a value of 50.82% at the highest concentration of 20 mg/mL in natural urine, whereas Cystone showed 47.08%. In artificial urine, plant extract at the concentration of 20 mg/mL showed a mean percentage inhibition value of 51.90% which is also higher than the reference drug: Cystone (47.47%). The results of lithotriptic activity demonstrated that the aqueous extract of *C. adansonii* was less effective in dissolving CaC₂O₄ crystals in both natural and artificial urine (25.03%, 24.68%), respectively compared to Cystone (36.91%, 35.17%).

Conclusions: The aqueous extract of *C. adansonii* bark exhibits higher antiurolithiatic activity on CaC₂O₄ crystals formation and shows moderate lithotriptic activity in both natural and artificial urine.

Keywords: Antiurolithiatic, Calcium oxalate, *Crateva adansonii*, Cystone, Lithotriptic