



Antilithiatic effect of *Peucedanum grande* C. B. Clarke in chemically induced urolithiasis in rats



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ABSTRACT

Ethnopharmacological relevance: Duqu (*Peucedanum grande* C. B. Clarke) has been used by Unani physicians since ancient times in retention of urine, renal and bladder calculi, nephritis and other associated disorders in different dosage forms.

Aim of the study: The aim of the study was to evaluate the antiurolithiatic activity of *Peucedanum grande* C. B. Clarke in experimental model.

Materials and methods: The experiment was carried out in male Sprague Dawley rats divided into 5 groups of 8 animals each. Animals of negative control received 1 ml of 5% Gum acacia throughout the study. Remaining four groups received Ethylene glycol 0.75% and Ammonium chloride 1% by adding in their drinking water for first seven days to induce urolithiasis. From 8th day, positive control received 1 ml of 5% Gum acacia, standard control received Cystone in the dose of 750 mg/kg while test groups A and B were treated with hydroalcoholic extract of test drug in the dose of 56 mg/kg and 97 mg/kg respectively up to 21 days, thereafter the animals were sacrificed. Number of CaOx crystals in urine, levels of serum calcium, phosphorus, creatinine, urea, urinary calcium and sodium were observed. Kidney homogenate analysis and histopathology were also carried out.

Results: Test drug reduced number of CaOx crystals in urine ($p < 0.001$); levels of serum calcium, phosphorus, creatinine, ($p < 0.001$) urea, ($p < 0.05$); urinary calcium ($p < 0.001$) and sodium decreased significantly in standard and test groups. The urine volume increased significantly ($p < 0.05, 0.01$) in both the test groups. Histopathology of kidney showed no CaOx crystal deposition in both the test groups.

Conclusion: On the basis of above findings, it can be concluded that the test drug possesses significant antiurolithiatic activity.

1. Introduction

Urolithiasis is a common disease and the third commonest disorder of urinary tract (Munjal, 2012). Relapse even after treatment is another associated problem. The exact cause of this condition is obscure yet the postulation that normal urine contains both solvents and solutes and when the concentration of the solutes increases they cannot be held in solution is the most favourable explanation of urolithiasis which in turn depends on certain predisposing factors. Increased concentration of constituents of stone, change in urinary pH, decreased urine volume

and presence of bacteria influence the formation of stone (Kumar et al., 2002, 2004). Kidney stone formation is a complex process that results from a succession of several physicochemical events including supersaturation, nucleation, growth aggregation and retention within the renal tubules (Bouanani et al., 2010). The geographical condition causing high temperature, and increased perspiration resulting in concentrated urine is also an important factor, which finally increases urinary crystallization (Abbagani et al., 2010). Protein rich diet increases the risk for calcium oxalate and upper urinary tract stones (Lopez and Hoppe, 2010). The aetiology of this disease is multi-

Abbreviations: CaOx, Calcium Oxalate; IAEC, Institutional Animal Ethics Committee; GFR, Glomerular filtration rate; EG, Ethylene Glycol; CPCSEA, Committee for the Purpose of Control and Supervision of Experiments on Animals; PG., *Peucedanum grande* C. B. Clarke; AC, Ammonium Chloride; NIUM, National Institute of Unani Medicine

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