ABSTRACT

Lithiasis (kidney stone) is a common recurrent worldwide problem. *Salvadora persica* which belongs to the family Salvadoraceae, a plant commonly used as folklore medicine for Lithiasis in the southern parts of India. Relevant scientifically proven data supporting this claim were lacking and hence a detailed study using the leaves of this plant was planned. Pharmacognostic studies of leaves of *Salvadora persica* have brought to light microscopic features as well as preliminary phytochemical data of diagnostic values. The alcoholic (95%) and aqueous extracts of leaf powder of *S.persica* were evaluated for its inhibitory potential on Lithiasis (stone formation) induced by oral administration of 0.75% ethylene glycolated water to adult male albino wistar rats for 28 days. Alterations were observed in urinary concentration of crucial ions viz calcium, oxalate and phosphate, serum urea, creatinine, uric acid, lipid peroxidation, activities of tissue enzymic (superoxide dismutase, glutathione peroxidase) and non-enzymic (glutathione, vitamin C and vitamin E) antioxidants, along with an increased activity of oxalate metabolizing enzymes GAO and LDH in hyperoxaluric group. These abnormal biochemical aberrations were attenuated with treatment of alcoholic and aqueous extracts of *S.persica* in curative and preventive regimens (CR and PR). Histopathological findings also showed signs of improvement after treatment with the extracts both in the curative and preventive regimens. Evaluation of biochemical parameters indicated that alcoholic extract show evidence of more antilithiatic activity than aqueous extract. Consequently, the compounds present in the alcoholic extract of leaves of *S.persica* were isolated. Triterpenes betulin and β-amyrin were isolated from the alcoholic extract and characterized by UV, IR, NMR and Mass spectroscopical studies.

As very less quantity of betulin (0.0018%) was present in the leaf powder, β-amyrin (0.040%) was screened for antilithiatic activity using ethylene glycol induced hyperoxaluria model. Crystal deposition, as indicated by increased stone forming constituents in urine such as Calcium, Oxalate, Phosphate, elevated serum levels of Urea, Creatinine, Uric acid and decreased concentrations of inhibitors such as Magnesium and Potassium in urine was observed in calculi-induced rats. Increase in oxidative milieu in hyperoxaluria, was evident by increased lipid peroxidation, oxalate synthesizing enzymes LDH and GAO and decreased enzymic and non-enzymic antioxidants exemplified the damage induced by oxalate. Advocation of β-amyrin enhanced the magnesium level in
urine and antioxidant status thereby preventing membrane injury, and alleviating the micro-environment favourable for stone formation. Based on the biochemical parameters, the antilithiatic activity of alcoholic extract and β-amyrin were compared. The alcoholic extract was found to be more active than β-amyrin. This is attributed to the presence of β-amyrin along with other compounds in the alcoholic extract. In conclusion, the protective effect of alcoholic extract of *S. persica* could be of therapeutic use to mankind for the treatment of lithiasis.