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Medicinal importance of senegin for their nephroprotective activity: In-vitro and In-silico molecular study through inhibitory effect on xanthine oxidase

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Objectives: Natural products derived from plants are known for their huge contributions to human health and well-being. Inflammation and oxidative stress are key parameters for the development of kidney injury and related disorders and molecule having good antioxidant potential could be used for the treatment of renal damage. Oxidative stress and inflammatory mediators play important role in renal failure. Excess production of uric acid through xanthine oxidase is also limiting factors in renal failure.

Methods: In order to search better medicine for the treatment of urinary system disorders, medicinal importance of senegin in kidney injury and related disorders has been investigated in this present work through inhibitory potential against xanthine oxidase. Molecular docking and dynamic experiments were performed with senegin against xanthine oxidase to know the therapeutic importance of senegin**.** However literature databases have been also searched to get information against the claimed therapeutic potential of senegin.

Results: Data analysis revealed that senegin is a furanochromone derivative which have neuroprotective and anti-inflammatory effect and used for the treatment of kidney stone. Senegin have calcium channel blocking property and potential effects on kidney stone prevention. Senegin significantly reduced the incidence of CaOx crystal deposition in the kidneys but did not affect urinary citrate or oxalate excretion suggests that senegin could be beneficial in the management of kidney stone disease caused by hyperoxaluria. Data also demonstrate that senegin could prevent renal epithelial cell damage and therefore play a potential role in the prevention of stone formation associated with hyperoxaluria. *In-silico* studies showed that, Senegin exhibited a higher docking score against xanthine oxidase which further support reduction of conversion of xanthine to uric acid.

Conclusions: Senegin prevent renal damage through its antioxidants and anti-inflammatory potential. However protective effect of senegin in kidney could be due to inhibition of xanthine oxidase.