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Research Article

# TNF- $\alpha$ Inhibitory and Anti-Urolithiatic Activity of *Portulaca oleracea* for Potential Effects in Nephritis

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Volume 1, 2025

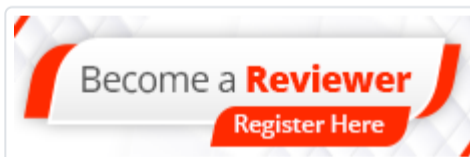
Published on: 22 December, 2025

Article ID: e29496632406609

Pages: 10

DOI: [10.2174/0129496632406609251120061946](https://doi.org/10.2174/0129496632406609251120061946)

Price: \$65



## Abstract

Introduction: Urolithiasis, commonly known as kidney stone disease, can cause excruciating pain and is often difficult to manage with conventional allopathic medicine without resorting to surgical intervention. Recently, a growing body of research has focused on validating the efficacy of traditional medicinal plants, offering hope for alternative management strategies for urolithiasis. In this context, we identified a gap between traditional claims and scientific validation regarding the use of *Portulaca oleracea* in the management of renal calculi.



Methods: Therefore, the present study was designed to evaluate the antiurolithiatic efficacy of the ethanol extract of *Portulaca oleracea* (EEPO) leaves. The study also included phytochemical analysis and molecular docking investigations.

Results and Discussion: Notably, docking studies revealed that quercetin, a key constituent of *P. oleracea*, exhibited high binding affinity toward human TNF-alpha, a pro-inflammatory cytokine implicated in kidney inflammation. At dose level 1000 ( $\mu\text{g}/\text{mL}$ ), the percent inhibitory activity of PO extract was 78.48% while that of Cystone was 73.72 % and that of pure compound quercetin was 82.01%. So the results indicate that Quercetin may be active in the dissolution of stones in case of EEPO, also suggesting the potential of *P. oleracea* extract in the dissolution of renal calculi.

Conclusion: *Portulaca oleracea* leaves exhibit significant antiurolithiatic activity, likely due to the presence of quercetin and other bioactive phytoconstituents, supporting its traditional use and indicating promise for further development as a natural therapeutic agent.

**Keywords:** [Portulaca oleracea L.](#), [urolithiasis](#), [quercetin](#), [TNF-alpha](#), [nephritis](#), [kidney stone disease](#).

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