

Nutraceutical *Rumex Nervosus* as A Natural Drug Candidate; Its Metabolite Profiling and Pharmacological Estimation for Health Applications

Arusa Aftab^{1*}, Sidra Islam¹, Zubaida Yousaf¹, Zainab Maqbool¹, Zill-e- Huma Aftab²

¹Department of Botany, Lahore College for Women University, Lahore, Pakistan.

²Institute of Agricultural Sciences, University of the Punjab, Lahore, Pakistan.

*E-mail: arusa.aftab@lcwu.edu.pk

ABSTRACT

Introduction: *Rumex nervosus* Vahl. a miraculous plant form Arabian Peninsula and East African areas. It possess massive therapeutic phytochemicals including omeprazole, sitosterols, fatty acids, flavonoids and carotenes. Omeprazole (a commercial drug) is used to treat stomach ulcers, gastroesophageal reflux and cardiac disorders. Beta-sitosterol (commercial drug) reduces cholesterol levels and body swellings. It is also known to manage rheumatoid arthritis.

Objective: The present study was planned to evaluate the pharmacological potential and metabolite profiling of *Rumex nervosus* through various extracts.

Methodology: The extraction was done using different solvents (Petroleum ether, Chloroform, n-Hexane, Butanol, Methanol, and distilled water) through soxhlet extraction method. Serial dilutions (100-3.125mg/mL). The biological activities; antimicrobial, anti-diabetic, Hemolytic, anti-inflammatory, antioxidant (DPPH radical Scavenging, Total anti-oxidant and total phenolic content assays) were performed. The potential extracts were further analyzed for phytochemicals through GC-MS and Network pharmacology (In silico approach).

Result: The plant showed best antioxidant activity ($86.7\% \pm 1.92$) at 100mg/mL with distilled water extract. The highest anti-inflammatory activity (90.64 ± 2.34) (88.31 ± 2.37) was given by n-butanol and distilled water extracts at 100mg/ mL. The optimum anti-diabetic activity (92.78 ± 1.89) was observed at 100mg/mL with n-butanol. The maximum zone of inhibition (36.67 ± 0.32) was with n-butanol against *Pseudomonas aeruginosa* and (30.47 ± 0.32) with n-butanol against *Xanthomonas oryzae* at 100 mg/mL. The maximum fungal zone of inhibition (22.33 ± 0.40) was noticed with n-butanol against *Fusarium oxysporum* and (16.20 ± 0.25) with n-butanol at 100mg/mL against *Aspergillus niger*. Hemolysis activity was highest (4.12 ± 0.01) with methanol extract at 3.125 mg/mL. *R. nervosus* showed best activities with n-butanol and distilled water extract. GCMS and network pharmacology combined approach identified seven phytochemicals associated with oxidative stress and infectious diseases (1-Tetradecanol, Stigmast-5-ene, Phthalic acid 2-ethylhexyl isohexyl ester, A-Norcholestan-3-one, 5-ethenyl-, (5.beta.)-, Omeprazole). Degree score method selected 10 top hub genes, including AKT1, TNF, and EGFR, as potential targets for the identified phytochemicals. Omeprazole and 1-Tetradecanol are currently being used as medicines for treating gastric problems and inflammation.

Conclusion: *R. nervosus* was confirmed a potential source of these compounds through multifaceted approach hence could be a safe significant therapeutic source.

Keywords: Drug, Metabolite, Omeprazole, Pharmacology, Rumex.

ACKNOWLEDGEMENT

The acknowledgement for this study goes to Lahore college for women university lahore, Pakistan.

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