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Methanol stem extract of Moringa oleifera mitigates glycerol-induced acute kidney damage in rats through downregulation of KIM-1 and NF-kB signaling pathways

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Abstarct

Acute kidney injury was projected to replace acute renal failure as a means to improve clinical diagnosis of the disease. It is associated with nephron loss and a subsequent loss of renal function and there are still no effective drugs to treat this condition [1]. It is typically defined as the reduction in the functional ability of the kidneys to excrete salt, water and metabolic waste products such as creatinine [2]. Acute renal failure (ARF) is a syndrome distinguished by an acute loss of renal function. Mortality from ARF remains high (over 50%), despite the reversibility of this loss in most patients who survive. It is characterized by a rapid, potentially reversible, decline in renal function including rapid fall in glomerular filtration rate (GFR), and retention of nitrogenous waste products over a period of hours or days [3]

Moringa oleifera popularly referred to as wonder plant is a medicinal plant with a remarkable variety of therapeutic purposes. The aim of this study was to assess the ameliorative effect of Moringa oleifera on glycerol-induced acute kidney injury in rats thus renewing interest in the development of new treatment plans. Glycerol (50% v/v in sterile saline, intramuscular) was used to induce acute kidney injury. Group A (control group) received distilled water only, the group B animals (toxicant group) received glycerol alone on the 8th day, and groups C and D animals were given 50 mg/kg and 100 mg/kg of methanol stem extract of Moringa oleifera respectively for seven days and glycerol on the 8th day. Group E animals on the other hand received 100 mg/kg of methanol stem extract of Moringa oleifera alone for seven days and on day 8 received normal saline. To assess renal damage and possible ameliorative effects of the extract, serum blood urea nitrogen (BUN), creatinine, myeloperoxidase, advanced oxidative products, malondialdehyde, superoxide dismutase, reduced glutathione, and protein carbonyl were determined. Histopathological analysis of kidney tissues and immunohistochemical analysis of KIM-1 and NF-κB expressions were also carried out on kidney tissues. The results showed that methanol stem bark extract of Moringa oleifera improves glycerol-induced acute kidney injury by inhibiting markers of inflammation, oxidative stress and renal damage by down regulating KIM-1 and NF-κB signaling pathways. In conclusion, the methanol stem extract of Moringa oleifera blunts glycerol-induced acute kidney injury in rats through its anti-oxidant and anti-inflammatory properties.

Biography:

Professor Adeolu Alex Adedapo, DVM, MSc, PhD FIIA FACN is of the Department of Veterinary Pharmacology and Toxicology, University of Ibadan. He has additional specialist training in the role of biotechnology in Medicinal Plants at the International Institute of Tropical Agriculture, Ibadan, Nigeria (2003), Advanced Leadership Training at the Haggai Institute of Leadership, Singapore (2007, Advanced Training in

Renal pathophysiology techniques at the Center of Cardiovascular Diseases, Texas Southern University, Houston, TX, USA (2009-2010) and IUTOX training on environmental risk analysis with focus on water, air quality and hazardous chemical wastes in 2012. He has published in both national and international journals with over 180 publications to his credit. He is a recipient of Bassir-Thomas Biomedical Foundation award (1998); OMPADEC postgraduate award (2000); National Research Foundation of South Africa (2006-2007); UNESCO award (2008); Senior Fulbright Scholarship (2009-2010); International Union of Toxicology award (2012); University revitalization grant (2015); TETFUND NRF (2015) and many national and global conference travel supports. He belongs to many learned societies such as: Nigerian Veterinary Medical Association, Society of Toxicology (SOT); American Society of Pharmacology and Experimental Therapeutics (ASPET); Society of Medicinal Plant and Economic Development (SOMPED); Physiological Society, London; British Pharmacological Society; American College of Toxicology.

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