



PROTECTIVE EFFECTS OF LEAF EXTRACTS OF *Hydrocotylbonariensis* (ARALIACEAE) AGAINST LIVER AND KIDNEY DAMAGE IN RATS FOLLOWING THE CONSUMPTION OF GALACTOSE RICH DIET

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Abstract

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The study investigated the efficacy of *Hydrocotylbonariensis* leave extract in providing tissue protection against dietary galactose-induced tissue oxidative stress. Fifty six (56) weanling rats were employed in the study. The control group was placed on AIN-93 diet while the diet of the test groups was supplemented with 30% galactose. Mechanisms of action of the extract were determined by measuring the malondialdehyde level. The level of reduced glutathione (GSH), the activities of catalase and superoxide dismutase (SOD) were also determined. Malondialdehyde (MDA) levels of tissues of animals fed galactose diet significantly increased ($P < 0.05$) when compared with the control. The liver had the highest level of malondialdehyde compared with the kidney. The level of GSH and the activities of catalase and superoxide dismutase were significantly reduced in the tissues of rats fed galactose diet. The extract reduced oxidative stress significantly in rats fed galactose diet. It also reduced the degree of tissues peroxidation, increased the level of GSH, tissue catalase and SOD activity. It therefore suggests that *Hydrocotylbonariensis* protects against galactose [FJPAS 1(1) 2016].

1.0 Introduction

Galactose is a simple monosaccharide that serves as an energy source and as an essential component of glycolipids and glycoprotein. Galactose contributes to energy metabolism via its conversion to glucose by the enzymes that constitute the Leloir pathway. Defects in the genes encoding these proteins lead to the metabolic disorder galactosemia [1]. The defect in galactose metabolism due to galactose enzyme (galactokinase) deficiency or disorder results in inability to utilize galactose which results in galactosemia, galactosuria and cataract. It occurs when one of the enzymes converting galactose to glucose is mutated. As a result, galactose levels in the blood and the tissues accumulate leading to serious complications such as an enlarged liver, kidney failure, cataract and brain damage [2].

Free radicals can be defined as molecules or molecular fragments containing one or more unpaired electrons in atomic or molecular orbital [3]. Free radicals are highly unstable molecules that interact

quickly and aggressively with the molecules in the body causing damage. They have been implicated in the pathogenesis of many diseases such as cataract, cancer, diabetes, hypertension, etc. [4, 5]. The rise in free radicals associated with antioxidant deficiency is said to result in tissue damage.

During consumption of galactose rich diet, free radicals are generated. Studies have indicated that free radicals production and subsequent lipid peroxidation are normal sequel to the rise in oxygen consumption with exercise. Consequently, antioxidant supplementation may detoxify the peroxide produced during exercise and diminish muscle damage and soreness [6]. *Hydrocotylbonariensis* (large leaf pennywort), once a member of the family Apiaceae, now in the family Araliaceae and of the genus *Hydrocotyl* is an herbaceous, hairless, creeping, perennial plant, prostrate, with creeping lateral stems [7]. They are mostly found in Africa and America. Its common name in West Africa, Nigeria is Karo. Its habitats are beach dunes, moist, open sandy areas, wet