

Ameliorating Effect of Aqueous Extract of *Chromolaena odorata* in Carbon Tetrachloride-Induced Toxicity in Wistar Rats

Richard Sunny Ebugosi

Department of Biochemistry, Faculty of Natural and Applied Sciences, Tansian University, Umuanya, Anambra State, Nigeria

Ngozichukwuka Immaculata Achara

Department of Applied Biochemistry, Faculty of Biosciences, Nnamdi Azikiwe University Awka, Anambra State, Nigeria

Obiajulu Christian Ezeigwe

Department of Applied Biochemistry, Faculty of Biosciences, Nnamdi Azikiwe University Awka, Anambra State, Nigeria

Abstract

Medicinal plants, which include *Chromolaena odorata* and their bioactive derivatives, have been reported to have diverse pharmacological functions including detoxifying and ameliorating potential. The study investigated the ameliorating potential effect of aqueous extract of *Chromolaena odorata* leaves on carbon tetrachloride-induced hepatocellular injury in male Wistar rats. The aqueous extract of *C. odorata* was prepared using conventional methods. Phytochemical analysis was carried out according to the methods of Harborne, Obadoni and Ochuka. A total number of thirty-seven rats were used in this experiment; twelve for acute toxicity and twenty-five for carbon tetrachloride induced hepatocellular injury. Biochemical analysis was determined using Randox diagnostic test kits while histological analysis was carried out using Haematoxylin and Eosin method. Statistical analysis of the results obtained were performed using analysis of variance (ANOVA). The result of the phytochemical analysis revealed that flavonoids (10.91±0.00)g/100g content of *C. odorata* leaves was higher followed by alkaloids (7.45±0.00)g/100g, cardiac glycosides (5.22±0.00)g/100g and saponins (4.96±0.00)g/100g. The acute toxicity study conducted revealed that the aqueous extract of *C. odorata* may not be toxic as no death was recorded at a very high dose of 5000mg/kg bodyweight of the animals. The results of biochemical analysis (liver function test) show that Alanine transaminase (ALT) activity (43.33 ± 2.60)IU/L, Aspartate transaminase (AST) (62.33±7.13)IU/L activity, Alkaline phosphatase (ALP) (42.00±1.53)IU/L activity, Direct bilirubin (D. Bil) (1.93±0.09)mg/dl and Total bilirubin (T. Bil) (3.13±0.18)mg/dl concentration of the carbon tetrachloride induced untreated animals were significantly (p<0.05) higher compared with the ALT activity (21.67 ± 1.33)IU/L, AST (21.67±1.33) IU/L activity, ALP (19.33±3.76) IU/L activity, D. Bil (0.93±0.09)mg/dl and T. Bil (2.57±0.15)mg/dl concentration of the group treated with 300mg/kg bodyweight of the aqueous extract. Treatment with 100mg/kg and 300mg/kg bodyweight of the aqueous extract of *C. odorata* for a period of four weeks significantly ameliorated the alterations in the liver function. Therefore, this study revealed that *C. odorata* to some extent was able to ameliorate the alterations in the biochemical parameters caused by carbon tetrachloride on the rats. The results obtained from this study proved that *C. odorata* contains some bioactive compound capable of protecting the liver cell from injuries.

Keywords

Chromolaena odorata, Carbon tetrachloride, Alkaloids, Saponins, Aqueous.