

Abstract

Parthenium hysterophorus, commonly known as carrot grass or congress weed, presents direct health risks to both humans and animals. Exposure to this plant, particularly in individuals susceptible to allergies, can lead to skin irritation and respiratory issues. The research employed phytochemical analysis to identify the various phytochemical components present in the roots of *Parthenium hysterophorus*. The initial results indicated the presence of alkaloids, coumarins, flavonoids, and essential oils. A methanolic extract of the roots of *Parthenium hysterophorus* roots was prepared and administered orally to experimental animals, Albino mice. In the toxicological assessments, both acute and chronic toxicity studies were conducted to explore the potential adverse effects associated with *Parthenium hysterophorus* roots. The results from the acute toxicity experiments revealed an LD50 value of 0.7g/kg. This suggests the importance of exercising caution when using products derived from *Parthenium hysterophorus*. In contrast, the chronic toxicity evaluation showed no significant change in body weight. However, certain hematological parameters such as erythrocytes, leukocytes, and hemoglobin displayed a significant increase, while platelets and hematocrit did not exhibit significant changes, likely due to the presence of alkaloids and flavonoids. The presence of phenolic-rich compounds in *Parthenium hysterophorus* leads to increased levels of biochemical parameters such as glucose and creatinine, while kidney secretions (ALP, SGOT, SGPT) and total bilirubin levels rise due to the total phenolic content. These findings underscore the potential harmful effects of prolonged exposure to *Parthenium hysterophorus* roots on glucose metabolism, lipid profile, kidney and liver function, and suggest the need for further investigation into their clinical implications. Histopathological observations revealed moderate sinusoidal congestion and hepatocyte cellular swelling in liver tissues, cellular swelling and alterations in renal tubular epithelial cells in the kidneys, and mild congestion in the myocardium. However, there were no observed effects on the brain with *Parthenium hysterophorus*. In conclusion, this study contributes significantly to our understanding of the phytochemical composition of *Parthenium hysterophorus* and its associated toxicological risks. It emphasizes the importance of employing safe practices and conducting further research to fully comprehend its medicinal potential while minimizing adverse effects.