ABSTRACT

This study focuses on *Onosma bracteatum* Wall, a commonly used medicinal plant, available in leaves, flowers and single-seeded nutlet forms, recognized for its efficacy against colds, coughs and fevers, as well as its multiple medicinal properties. The core purpose of the research was to ascertain major phytochemical constituents, their potential toxicities, Median Lethal Dose 50 (LD_{50}) of ObMe and to analyze histopathological parameters. Different phytochemical presumptive tests were conducted, affirming the presence of glycosides, phenolic compounds, proteins, amino acids, steroids, terpenes, saponins, tannins, terpenoids and flavonoids. FT-IR spectrum peaks, particularly at 3283 cm-1, 1660 cm-1, 1035 cm-1, 637 cm-1 and 480 cm-1, confirmed the presence of 1,2-benzene dicarboxylic acid, bis (2-methyl propyl) ester. This compound is known for its potent anti-proliferative potential against human osteosarcoma, neuroblastoma and lung carcinoma. The presence of phenolic -OH was confirmed by the broad absorption band observed at 3421 cm-1, indicating the existence of phenolic hydroxyl groups. Swiss albino mice were employed for conducting acute and chronic toxicity investigations. Acute toxicity studies in mice revealed an LD50 of 6.1 g/Kg PO. Chronic oral administration at therapeutic doses (250 mg/Kg and 500 mg/Kg) did not significantly affect erythrocyte, leukocyte or platelet levels but showed minor alterations in hematocrit and hemoglobin. The results showed that there was no change in the level of serum Cholesterol, SGOT, TB and SGPT; however, levels of serum Glucose, Creatinine and ALP were changed, indicating some toxicity at therapeutic dose. Fluctuations in glucose, creatinine and ALP levels primarily resulted from the presence of polyphenolic compounds, coumarin and pyrrolizidine alkaloids. Body weight monitoring indicated negligible effects. Histopathological examination of heart, liver, kidney and brain tissues revealed tissue alterations, indicating potential harmful effects from prolonged consumption; mainly pyrrolizidine alkaloids were responsible for the development of chronic damage to the heart and liver. Based on these findings of low toxic potential, it can be concluded that *Onosma bracteatum* Wall is generally safe, but the possibility of harm may arise with prolonged usage and higher doses.