

## Abstract

The study was conducted to investigate the protective effect of five medicinal plants, *Asteracantha longifolia*, *Asparagus falcatus*, *Epaltes divaricata*, *Vetiveria zizanioides* and *Corriandrum sativum* on carbon tetrachloride and paracetamol induced acute hepatotoxicity in ICR mice. Detailed studies on three medicinal plants, *Asteracantha longifolia*, *Asparagus falcatus* and *Vetiveria zizanioides* were carried out to investigate their antioxidative activity. An attempt was also made to study the toxicological effect of all plant extract used.

Hepatotoxicity was induced by the administration of a single intraperitoneal dose of CCl<sub>4</sub> (0.5 mL kg<sup>-1</sup> CCl<sub>4</sub> in olive oil) in one model and in the other by administration of paracetamol (300 mg kg<sup>-1</sup> in saline) orally, after a 16 h fast. An aqueous extract of the whole plant (0.9 g kg<sup>-1</sup>) was used on pre and post-treatment basis. All plant extracts were able to protect the liver against changes mediated by carbon tetrachloride and paracetamol. These results confirm that all plants under investigation possess antihepatotoxic properties at least against the two hepatotoxins used. Both pre- and post-treatment with the plant extracts decreased the CCl<sub>4</sub> and paracetamol mediated increase in serum enzyme activities and increased the liver reduced glutathione concentration. Histopathological studies also provided supportive evidence for the biochemical analysis. The magnitude of hepatoprotective properties varied among the five plants used. According to the results obtained, plant extracts used in the study are in the following order of increasing hepatoprotective activity, *Corriandrum sativum*, *Epaltes divaricata*, *Vetiveria zizanioides*, *Asparagus falcatus* and *Asteracantha longifolia*.

*Asteracantha*, *Asparagus* and *Vetiveria* were selected on the basis of their high level of hepatoprotective activity for further studies on antioxidant activity. Extracts of all three plants were able to enhance the activities of the antioxidant enzymes, glutathione peroxidase, glutathione reductase and glutathione-S-transferase and reduce the malondialdehyde formation significantly. The magnitude of antioxidant activity varied in the three plants used and is in the increasing order from *Asteracantha* to *Asparagus* and *Vetiveria*. Thus *Vetiveria* has the highest antioxidant activity compared to the other two plants.

No toxicological effects on liver function, haematological parameters (haemoglobin concentration, red blood cell count, white blood cell count and packed cell volume) and histopathology of the body organs were noted in the experimental animals after administering the extracts daily for one month. General condition of the animals did not change and they remained in good health throughout the experiment.

Further studies are required to isolate the active constituents of the three effective plants and to find out the exact mechanism of action.