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## Antioxidant activity and hepatoprotective effects of *Centaurea incana* on CCL<sub>4</sub>-induced liver toxicity in rats

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**Aim:** The aim of the present study was to investigate the potential antioxidant and hepatoprotective effects of *Centaurea incana* on the free radical damage of liver caused by carbon tetrachloride in rats.

**Methods:** For study of preventive effect of extract methanolic of *Centaurea incana* on CCL<sub>4</sub>-induced hepatotoxicity, our study carry out on rats as follows: The animals were randomly divided in to 4 different groups comprising 7 animals each. Group I served as controls and received an injection of vehicle (olive oil) alone; Acute liver injury in rats was induced by a single intraperitoneal injection with CCL<sub>4</sub> dissolved in an equal volume of olive oil at a dose of 3 mL/kg body weight, group II, which is well documented to induce hepatotoxicity. Group III was administered methanolic extract of *Centaurea incana* at a dose of 500 mg/kg alone. In group IV was administered Methanolic extract of *Centaurea incana* at a dose of 500 mg/kg and was injected by CCL<sub>4</sub> i.p., at a dose of 3 ml/kg body weight. After 4 weeks of treatment, All of the animals were sacrificed 24 h after administration of CCL<sub>4</sub>, and blood was collected, serum separated and stored at -20°C.

**Results:** The single intraperitoneal injection with CCL<sub>4</sub> caused severe hepatotoxicity in rats, as evidenced by the significant elevation of serum AST and ALT activities after the administration of CCL<sub>4</sub>, the concentration of MDA, an end product of lipid peroxidation, in the rats treated with CCL<sub>4</sub> was increased 2.7-fold when compared with the vehicle control rats. However, pre-treatment with *Centaurea incana* significantly prevented the elevation of serum AST and ALT activities induced by CCL<sub>4</sub> treatment. Consistent with the serum AST and ALT activities, pre-treatment with *Centaurea incana* for 4 weeks to the rats resulted in a significant decrease in the concentration of hepatic MDA when compared with the CCL<sub>4</sub> group.

**Conclusion:** Our investigation provided convincing data that *Centaurea incana* decrease the lipid per-oxidation and liver enzymes, and increase the anti-oxidant defense system activity in the CCL<sub>4</sub>-treated rats. The mechanisms underlying hepatoprotection of the methanolic extract of *Centaurea incana* may be related to both its radical scavenging properties and indicate effects as a regulator of antioxidative systems.

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