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AMELIORATION OF CCL4 INDUCED LIVER INJURY IN SWISS ALBINO MICE BY ANTIOXIDANT RICH LEAF EXTRACT OF CROTON BONPLANDIANUS BAILL

Somit Dutta[1], Arnab Sen[2] and Tapas Kumar Chaudhuri[3]

[1]First Author Affiliation (University of North Bengal, India)
[2]Second Author Affiliation (University of North Bengal, India)
[3]Third Author Affiliation (University of North Bengal, India)

The progress in industrialization has blessed mankind with a technologically superior lifestyle but poor management of industrial waste has in turn poisoned nature. One such chemical is carbon tetra chloride (CCl4), which is a potent environmental toxin emitted from chemical industries and its presence in the atmosphere is increasing at an alarming rate. Presence of CCl4 in human body is reported to cause liver damage through free radical mediated inflammatory processes. Kupffer cells present in the liver are potentially more sensitive to oxidative stress than hepatocytes. Kuffer cells produced tumor necrosis factor-α (TNF-α) in response to reactive oxygen species (ROS), that might further cause inflammation or apoptosis. In this study hepatoprotective capacity of antioxidant rich extract of Croton bonplandianus Baill. (CBL) was evaluated on CCl4 induced acute hepatotoxicity in murine model. Hydro-methanolic extract of C. bonplandianus leaf was used for evaluation of free radical scavenging activity. Liver cells of experimental mice were damaged using CCl4 andsubsequently hepatoprotective potential of the plant extract was evaluated using series of in-vivo and in-vitro studies. In the hepatoprotective study, silymarin was used as a positive control. Antioxidant enzymes, pro-inflammatory markers, liver enzymatic and biochemicalparameters were studied to evaluate hepatoprotective activity of Croton bonplandianus leaf extract. Free radical scavenging activity of CBL extract was also observed in WRL-68 cell line. The phytochemicals identified by GCMS analysis were scrutinized using in-silico molecular docking procedure. The results showed that CBL extract have potent free radical scavenging capacity. The biochemical parameters were over expressed due to CCl4 administration, which were significantly normalized by CBL extract treatment. This finding was also supported by histopathological evidences showing less hepatocellularnecrosis, inflammation and fibrosis in CBL and silymarin treated group, compared to CCl4 group. ROS generated due to H2O2 in WRL-68 cell line were normalize in the highest group (200 µg/ml) when compared with control and negative control (CCl4) group. After molecular docking analysis, it was observed that the compound α-amyrin present in the leaf extract of C. bonplandianus has better potentiality to protect hepatocellular damages than the standard drug Silymarin. The present study provided supportive evidence that CBL extract possessespotent hepatoprotective capacity by ameliorating haloalkane induced liver injury in the murine model. The antioxidant and anti-inflammatory activities also affirm the same. The synergistic effects of the phytochemicals present in CBL are to be credited for all the hepatoprotective activity claimed above.

somitimmuno@gmail.com