ABSTRACT

Oxidative stress is a major cause of several metabolic and genetic disorders. Natural antioxidants have an edge over synthetic ones with respect to safety concern, health benefits, potency and availability. Ever since the discovery of crude drugs from natural resources, there have been an urge to characterize and validate the bioactivity using modern techniques. The present investigation was designed to screen and validate the biopotency of the *Crinum asiaticum* (L) and lycorine in averting oxidative damage caused by carbon tetra chloride using Swiss albino mice as the model system. Two-dimensional gel electrophoresis, MALDI-TOF and peptide mass fingerprint analyses revealed differential protein expression in the liver of the CCl₄ induced, *C.asiaticum* and lycorine treated mice. HSP60, ATP synthase and Regucalcin have been identified, the up-regulation of which has significant role in maintaining the integrity of cellular proteins, ATP production, and calcium regulation. The hepatoprotective activity of *Crinum asiaticum* and lycorine was assessed from the assay of serum and liver pathological markers such as Aspartate Transaminase (AST), Alanine Transaminase (ALT), Lactate Dehydrogenase (LDH) and Alkaline Phosphatase (ALP) besides ascertaining the serum, hepatic and mitochondrial antioxidant status in control and experimental groups of mice. The contents of enzymatic and non-enzymatic antioxidants showed variations between the control and treatment groups. The extent of damage due to oxidative stress was evidenced from the banding patterns of matrix metalloproteinase and Lactate dehydrogenase. The impact of different treatments on the membrane properties as well as intracellular organelles of the liver was revealed by Scanning Electron microscopy (SEM) and Transmission Electron Microscopy (TEM) and it is interesting to observe that administration of *Crinum asiaticum* and lycorine (200 mg and 5 mg/kg b.w.) rescued the hepatocytes from CCl₄ induced oxidative damage without affecting its cellular function and structural integrity. The present findings signify the hepatoprotective potency of *Crinum asiaticum* and lycorine by attenuating the markers of CCl₄ mediated oxidative stress and antioxidant competence.

Keywords:
Oxidative stress, Metabolic and genetic disorders, *Crinum asiaticum* and lycorine MALDI-TOF, Free radicals.