SUMMARY AND CONCLUSION

Reactive oxygen species including superoxide anion radical, hydroxyl radical and hydrogen peroxide are formed and degraded by all aerobic organisms, which cause oxidative damage of all major groups of biomolecules (DNA, protein, lipids and small cellular molecules), which in turn leads to cardiovascular and neurodegenerative diseases aging, cancer and liver diseases. The antioxidant defence systems including enzymes (superoxide dismutase, catalase, glutathione peroxidase Glutathione S transferase and glutathione reductase) and non-enzyme defence (glutathione, vitamins C) play an important role in scavenging oxidants and preventing cell injury. Antioxidants can inhibit or delay the initiation or propagation of oxidative chain reaction and thus prevent or repair cell damage caused by reactive oxygen species. In recent years, natural product extracts of therapeutic relevance are of paramount importance as reservoirs of structural and chemical diversity. A recent review on national pharmacopoeias from several countries reveals at least 120 distinct chemical substances from different plants that have utility as life saving drugs. This has been achieved through chemical and pharmacological screening of only 6% of the total plant species. Untapped, hidden wealth in the flora needs to be unearthed and explored to cure diseases like heart disease, cancer, diabetes, AIDS etc. Till now, great interest in finding natural antioxidants from plant materials has been drawn more and more attention. Plant material and products thereof are rich sources of a variety of biologically active compounds such as antioxidant and radical scavenging activities. Foods containing phytochemical such as alkaloids and phenolic compounds have potential protective effects against many diseases.

The present study

✓ *Crinum asiaticum* (L.) was collected and authenticated by Rev Dr. S. John Britto SJ, Director, The Rapinat Herbarium and Centre for Molecular Systematics, St. Joseph College (Autonomous), Thiruchirapalli, Tamil Nadu, India. The voucher specimen was deposited at the Rapinat herbarium and the voucher number is RHCBP15. Eethanolic extract were prepared from this plant by soxhlet apparatus. This extract was used for hepatoprotective study.
✓ Lycorine was purchased from Sigma Aldrich, Bangalore for hepatoprotective analysis.
✓ Mice were divided into seven groups each group compressing six mice.
✓ Experimental mice administered with CCl₄ (2 ml) twice a week for a period of 8 weeks, it showed increased level of liver marker enzymes such as AST, ALT, ALP and LDH, lipid peroxides, lipids (Cholesterol, TG, HDL, VLDL, LDL) and protein profiles (albumin and globulin) and decreased activities of antioxidant (CAT, SOD, GRD, GST and GPX) and mitochondrial TCA cycle enzymes such as ICDH, SDH, MDH and KDH.
✓ The membrane bound enzymes Ca²⁺ and Mg²⁺ dependent ATPase were increased in CCl₄ induced group of mice, at same time Na⁺²⁺ dependent ATPase activities reduced in CCl₄ induced group of mice.
✓ C. asiaticum and lycorine when administered to CCl₄ induced group of mice showed reduced level of liver marker enzymes, lipid peroxidation level, lipids and protein profiles and enhanced activities of antioxidant, TCA cycle enzymes and Membrane bound enzymes.
✓ The expressions of MMPs (Matrix metalloproteinase) and Lactated dehydrogenase were screened to monitor the protective effect of C. asiaticum and lycorine against CCl₄ induced toxicity. When CCl₄ administered group of mice showed up regulation of MMP and LDH activity. However, mice administered with C. asiaticum and lycorine to the CCl₄ induced group of mice shows the down regulation of MMP and LDH activity.
✓ DNA gets more fragmented in CCl₄ induced group of mice, but it was normalized by C. asiaticum and lycorine treatment.
✓ Histopathological assessment of different liver segments of the control and experimental animals were done by light microscope and scanning microscope. It shows liver necrosis and loss of cell boundaries in CCl₄ induced group of mice. But after treatment with C. asiaticum and lycorine regenerated the hepatocyte and its boundaries.
✓ Transmission electron microscope study of C. asiaticum and lycorine treated to CCl₄ induced group of mice confirmed the regeneration of rough endoplasmic reticulum, normalization of the mitochondrial size and increases in hepatic
glycogen granules. There by confirming its protective activity during oxidative stress generated by CCl4.

✓ Proteomics database was used to analyze the changes in protein expression in control and experimental animals. Two dimensional gel electrophoresis analyses showed up regulation of ATP synthase, HSP60 and Regucalcin in the liver of experimental mice.

The present investigation provided new insight of the antioxidant and hepatocyte protective nature of *Crinum asiaticum* and lycorine in CCl4 induced toxicity in Swiss albino mice, which was evidenced from this protective effects which could possibly due to decline in toxicity and enhancement in the antioxidant status of hepatic tissues upon treatment with *Crinum asiaticum* and lycorine.