CHAPTER - VII
Summary and Conclusions
SUMMARY AND CONCLUSIONS

The present study is an effort to purify and to study some properties of two enzymes hyaluronidase and phosphodiesterase and the effect of venom on the serum clinical parameters of the rat after envenomization. The venom utilized was collected from the Indian Red Scorpion, *Buthus tamulus*.

The LD_{50} value for the venom of *Buthus tamulus* was found to be 1.7 mg/kg body weight and the antiserum was prepared.

The effect of *Buthus tamulus* venom on some of the serum clinical parameters, such as uric acid, glucose, blood urea nitrogen (BUN), creatinine, total proteins, sodium, potassium, calcium, inorganic phosphorus and enzymes like alanine aminotransferase (SGPT), aspartate aminotransferase (SGOT), lactate dehydrogenase (LDH) and creatinine phosphokinase (CPK) were determined. Some significant results were obtained by this study viz. levels of serum total proteins, uric acid, calcium and potassium were decreased and levels of creatinine, SGOT, SGPT, LDH, BUN, CPK and glucose were elevated four hours after venom administration of three different doses. The changes in the levels of these parameters might be indirectly related to the toxic effects on the target organs by the venom.

The two enzymes such as hyaluronidase and phosphodiesterase were purified by the combination of ammonium sulfate fractionation, ion-exchange and Gel permeation.
The homogeneity and molecular weight were determined by the PAGE and SDS-PAGE respectively.

Hyaluronidase was purified at 19.12 fold with an yield of 44.6%. The molecular weight was estimated to be 76,000. The optimum pH for the enzyme was found to be 4.5. The enzyme activity was completely inhibited by the Heparin at 65 IU. The homogeneity was confirmed by Immunodiffusion, where single precipitin line was obtained.

Phosphodiesterase was purified at 21.48 fold and with an yield of 35.8%. The molecular weight was estimated to be 105,000. The optimum pH was 7.0 and the optimum temperature was found to be 60°C. The enzyme activity was enhanced by the divalent metal ions (Mg²⁺, Ca²⁺ and Mn²⁺) and was inhibited by Dithiothreitol, EDTA, SDS and Glutathione. The homogeneity was confirmed by getting a single precipitin line on Immunodiffusion. The enzyme has shown the hydrolytic effect by hydrolyzing nucleic acids, DNA and RNA. The catalytic activity of both the enzymes were inhibited by the antivenom raised against whole venom.