CHAPTER VI: SUMMARY OF FINDINGS

6.1 Summary

In recent years, there have been lot of interest generated in the usage of plant derived natural products though the number of industrially employed enzymes of plant origin is still small. Proteolytic enzymes are of interest due to their immense therapeutic and biotechnological potential. Plant latex which are rich in proteases are being explored for such application. They receive added attention due to broad substrate specificity and activity in wide range of pH, temperature, in presence of organic compounds and other additives. In the current study ten latex producing medicinally important plants, (Tabernaemontana divaricata, Plumeria rubra, Plumeria alba, Plumeria frangipani, Allamanda cathartica, Artocarpus altilis, Jatropha curcus, Jatropha gossypifolia, Euphorbia antiquorum and Calotropis gigantea) were screened for wound healing, milk clotting and stain removal properties. CE of C. gigantea, T. divaricata and A. altilis showed promising results in terms of target activities and hence they were purified by cation exchange chromatography and further by gel exclusion chromatography. IAA completely inhibited caseinolytic activity of PE of C. gigantea and T. divaricata supporting the cysteine protease nature. PE from A. altilis was inhibited by PMSF indicating the protease to be serine. Study could identify a novel cysteine protease (24.1 kDa) from T. divaricata with fibrinogenolytic, fibrinolytic, milk coagulating and blood destaining properties. Purified enzyme exhibited stability over a wide range of pH and temperature. Results suggest that this protease from T. divaricata can be developed as potential therapeutic agent and in other biotechnological applications. As per our knowledge this is the first report on the purification of cysteine protease from T.divaricata with above mentioned biological activities. Observations of present in vitro studies need to be extended to in vivo studies in animal models for their potential application.

6.2 Conclusion

Interest towards development of green chemistry technologies via enzyme-based approaches is taking a leap due to increasing ecological / environmental concerns, growing scientific awareness, legal boundaries and inadequacies of existing methods/practice. Proteases have got immense pharmaceutical and biotechnological potential. Plant latex represents an invaluable resource for pharmaceutical and biotechnological innovations. Simple and economic purification procedure along with easy availability of the plant latex could be explored as a platform for large-scale production of the enzyme. Study could identify T. divaricata, C. gigantea and A. altilis as source of proteases with multifaceted utility
desirable for their commercial applications particularly in food, pharmaceutical and detergent industry. Results of the study conclude latex from *T. divaricata* as the source of novel cysteine proteases with highest wound healing, milk clotting and detergent like (blood destaining) activities.