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## PROTEASE INHIBITORY ACTIVITY OF SOME MEDICINAL PLANTS IN SRI LANKA

**B. D. S. Jayawardana, H. K. I. Perera, S. Rajapakse**

*Department of Biochemistry, Faculty of Medicine, University of Peradeniya*

Proteases constitute one of the largest classes of potential drug targets. Protease inhibitors play a vital role in the regulation of protease activity. Many protease inhibitors have displayed promising therapeutic activities in humans against viral and parasitic infections, cancer, inflammatory, immunological, respiratory, cardiovascular and degenerative disorders. The objective of this study was to investigate protease inhibitory activity of the plant parts specified below.

Water extracts (2%) were prepared using fresh plant parts. Plants and parts used were *Mangifera zeylanica* bark, *Sesbania grandiflora* bark, immature bark, flower, leaves and seeds, *Terminalia bellerica* bark and seed, *Terminalia catappa* bark, immature bark, fruit and leaves and *Terminalia chebula* bark and seed. Plant extracts were used as the source of protease inhibitors. All the extracts were used at equal concentrations for each assay. Pepsin inhibitory assay was performed using hemoglobin as the substrate at pH 2 (phosphoric acid buffer). Trypsin inhibitory assay was performed using casein as the substrate at pH 7.6 (phosphate buffer). Reaction mixtures were incubated at 37 °C and the reaction terminated using trichloroacetic acid after 30 min. Appropriate controls and blanks were used. Absorbance of the acid soluble peptide products was recorded at 280 nm and percentage inhibitory activity was determined. All the experiments were conducted in triplicate two or three times.

Maximum pepsin inhibitory activity was shown by *Terminalia catappa* bark (98%) followed by *Sesbania grandiflora* bark (67%). *Mangifera zeylanica* bark (31%), *Terminalia bellerica* bark (16%), *Terminalia bellerica* seeds (14%), *Terminalia chebula* seeds (13%), *Terminalia chebula* bark (11%) and *Terminalia chebula* leaf (10%) showed the inhibitions as indicated. Other plant parts did not show pepsin inhibitory activity.

The maximum trypsin inhibitory activity was shown by *Sesbania grandiflora* bark (95%) followed by *Terminalia catappa* bark (86%). *Mangifera zeylanica* bark (39%), *Terminalia bellerica* seeds (18%), *Terminalia chebula* bark (8%), *Terminalia bellerica* bark (7%) and *Terminalia chebula* seeds (6%) showed the inhibitions as indicated. Other plant parts did not show trypsin inhibitory activity.

In our study, barks of *Sesbania grandiflora* and *Terminalia catappa* showed the highest protease inhibitory potential. In traditional medicine, various parts of *S. grandiflora* and *T. catappa* are used for therapeutic purposes. Antimicrobial and antiulcer activities of the *S. grandiflora* bark extracts and various pharmacological properties of *T. catappa* leaf extracts have been reported.

In conclusion, *S. grandiflora* and *T. catappa* barks demonstrated potent protease inhibitory activity. Further studies are necessary to isolate, characterize and elucidate the structures of these protease inhibitors.