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STUDIES ON PROTEASE INHIBITORS IN THE BARK EXTRACT OF *Spondias xerophila*

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Proteases are enzymes capable of conducting proteolysis by hydrolytic cleavage of specific peptide bonds in their target proteins. In spite of the fact that these proteins are extremely indispensable for the survival and the maintenance of their host organisms, they can be potentially damaging when over-expressed or present in high concentrations. Hence, their activity must be strictly regulated. An important means of regulation involves the interaction of these enzymes with substances, mostly proteins, called protease inhibitors. Depending on the type of the protease they inhibit, there are different types of protease inhibitors. Since proteases are crucial for disease propagation, inhibitors of such proteases are emerging with promising therapeutic uses. There are various reports on the occurrence of protease inhibitors in seed and bark extracts of plants belonging to a variety of families. The objectives of this study were to detect the occurrence of aspartic and serine protease inhibitors in the bark of *Spondias xerophila* and to develop an assay procedures to study their properties.

The bark extract of *Spondias xerophila* exhibited both aspartic and serine protease inhibitory activity. When dialysis was carried out against different buffer systems, the inhibitory activity was always increased after dialysis. When the fractions obtained from cation exchange chromatography on CM-cellulose were subjected to the aspartic protease inhibitory assay, no significant activity was observed in any of the eluted fractions. In contrast, a significantly high serine protease inhibitory activity was exhibited by the second eluted fraction obtained from the cation exchange chromatography at pH 5.5. The aspartic protease inhibitory activity was greatly reduced after 15 days when incubated at 4°C, room temperature and 37° C whereas the serine protease inhibitory activity was stably maintained at 4° C and at room temperature.

Accordingly, the bark of *Spondias xerophila* contains both aspartic and serine protease inhibitors. The Serine protease inhibitory activity is comparatively high. The Aspartic protease inhibitor is not thermo-stable, has a molecular weight higher than 10 kDa and cannot be partially purified using ion exchange chromatography. The Serine protease inhibitor is also not thermo-stable and has a molecular weight higher than 10 kDa. However, it can be partially purified using cation exchange chromatography.