**Partial Purification and Characterization of Phytocystatin from *Calotropis* *procera* with Antibacterial Activities**

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**Abstract:**

Phytocystatins are large family of plant bioactive protein inhibitors of papain-like cysteine proteases. In this study, we present the partial purification of phytocystatin isolated from *Calotropis* *procera* latex.The Phosphate buffer extract from the latex of *C.procera* with papain inhibitory activity was concentrated by cold acetone precipitation and was further subjected to purification using ammonium sulphate fractionation and Hydrophobic chromatography on Phenyl sepharose column. Cold acetone precipitated extract gave 9.6% protein yield with 63% inhibition of protease. An estimated molecular weigth of 18 kDa was obtained on sodium dodecyl sulphate (SDS) polyacrylamide gel electrophoresis and optimum temperature and pH at 600C and 6.0 respectively.The fifty percent inhibitory concentration (IC50) of the inhibitor on Papain enzyme was 23.10±1.2 µg/ml with inhibitor binding constant (Ki) of 8.0µg/ml, suggested high affinity between inhibitors and enzymes.Chemical modification of some key amino acids present in the binding site of the partially purified phytocystatin, revealed the presence Cysteine and Histidine. More interestingly, phytocystatin presents a strong antimicrobial activity against human pathogens such as *Staphylococcus aureus* and *Enterococcus faecalis*, which is a new property for this family of protease inhibitors. These results highlight the biotechnological potential of phytocystatin from latex of this plant.