Evaluation of Entomotoxic Potential of Protease Inhibitors from *Amburana cearensis* seeds against *Plodia interpunctella* larvae

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**INTRODUCTION:** *Plodia interpunctella* is a cosmopolitan pest that attacks stored cereals and derivatives. Alternative methods of control are aimed at reducing the use of toxic pesticides. Plant bioactive proteins are known for their toxic potential and antimitabolite against herbivorous insects. Among these protease inhibitors which interfere with protein digestion in the gut of insects have great potential biopesticide. We evaluate the entomotoxic potential from the protein fraction of the seeds *Amburana cearensis*, rich in protease inhibitors against *P. interpunctella*. MATERIAL AND METHODS: After extraction, the crude extract was fractionated with ammonium sulfate. Among the fractions obtained, the corresponding fraction of the range of 0-30% showed greater inhibition to the enzyme trypsin. To determine the inhibitory effect of the enzyme fractions on intestinal homogenate of insect, about 30 larvae were dissected, and guts were homogenized and subjected to centrifugation. The resulting supernatant was used to analyze the inhibitory activity of the fractions. Bioassays with artificial diet containing increasing concentrations of inhibitor were employed to analyze the effect inhibitor on the development and profile of intestinal enzymes of *P. interpunctella* larvae. After the bioassay larvae were dissected and homogenates submitted to intestinal proteases pattern analysis by SDS-PAGE containing gelatin. RESULTS AND DISCUSSION: Inhibition assays showed that the fraction 0-30% promoted inhibition of trypsin at 81.5% and 80% for intestinal homogenate. The zymograms and in vitro assays demonstrated the inhibition of the intestinal proteases of larvae. The inhibitor produced 10% of larval weight when incorporated into an artificial diet at a level of 0.2% (w/w). Interestingly with 0,2% there was a dramatic reduction in inhibition for 50% and anticipating the transition from larvae to pupae. CONCLUSION: These findings suggest that the inhibitor interfered with the expression of proteases and the insect’s life cycle, probably acting on the transition mechanisms of larval stages.

**Keywords:** Protease inhibitors, *Plodia interpunctella*, entomotoxic potential.

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