Treatment of *Anticarsia gemmatalis* with Synthetic Proteases Inhibitors: 
Differential Expression of Serine Proteases Genes

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**INTRODUCTION:** *Anticarsia gemmatalis* is considered one of the major pest of soybean. Insect-pest control strategies based on the use of protease inhibitors have been studied and the knowledge of digestive enzymes are fundamental. This study aimed to assess the serine proteases gene expression of *A. gemmatalis* when fed diets containing serine proteases synthetic inhibitors.

**MATERIAL AND METHODS:** The caterpillars midgut of fifth instar were collected at 6, 12, 24 and 48 h after fed with diets containing Berenil and Benzamidine serine proteases inhibitors. We performed RNA extraction, cDNA synthesis, amplification using degenerate primers for serine proteases; sequencing and gene expression analysis of the sequences obtained by RT-PCR.

**RESULTS AND DISCUSSION:** Three distinct genes of serine protease of *A. gemmatalis* genome were isolated and named AGEM 1, AGEM 2 and AGEM 3, indicating that the genes are organized into multigene family. It was verified that gene expression of AGEM 2 excelled in comparison to gene AGEM 1 and 3, indicating that this should be expressed in greater amounts in the intestinal tract of the insect. The described genes expressed sensitive and/or insensitive trypsins to synthetic Benzamidine inhibitor, where there was an increase in expression during treatment with the inhibitor compared to control. The synthetic Berenil inhibitor was potentially effective in suppression of trypsins genes indicating that the trypsins secondary activation site S2\(^\prime\), being free from interaction with inhibitors, is extremely important in the adaptation of the insect to protease inhibitors.

**CONCLUSION:** The differential expression of insect digestive proteases is very important for elucidating the adaption mechanism of agricultural pests to protease inhibitors.

Keywords: differential expression, *Anticarsia gemmatalis*, serine proteases, protease inhibitors.

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