Enzyme Characterization of Cysteine-Protease of the Soybean Caterpillar *Anticarsia gemmatalis*: Potential Use for Biological Control

Mendonça, E.G.[1], Costa, N.C.S.[1], Hoffmam, Z.B.[1], Oliveira, M.G.A.[1], Guedes, R.N.C.[2], Pilon, A.M.[1], Visôtto, L.E.[1], Moraes, F.C.[1], Oliveira, J.A.[3]

[1]Departament of Biochemistry and Molecular Biology, Bioagro, Federal University of Viçosa, [2]Departament of Animal Biology, Federal University of Viçosa, [3]Departament of Chemistry, Federal University of Viçosa

The enzymatic characterization is necessary to understand the kinetics with which the enzyme achieves its chemical processing efficiently and the factors that affect it. This characterization can be used to search for inhibitors that can interfere with the digestive process of caterpillars such as the soybean caterpillar *Anticarsia gemmatalis*. This inhibition leads to a nutritional deficiency of the insect causing it to mobilize other sources of protein, leading to a metabolic collapse. Thus the characterization of cysteine-proteases is performed using the synthetic substrate L-BApNA with the inhibitor of serine-protease Benzamidine and the inhibitor of aspartic-protease Pepstatina A to that only the cysteine-proteases act. The soluble cysteine-proteases were characterized as the pH of your best performance, showing peaks of activity at pH 8.0 and pH 4.6. Later we used phosphate buffer pH 4.6 containing pepstatina A and benzamidina to establish the temperature at which this enzyme class best practices. The peak activity was at 45° C. The kinetic characterization revealed a K_M of 0.6398 nM and a V_{max} of 42.5563 nM / min. The analysis of chemical modifiers shows cysteine-proteases, independent of calcium. The addition of EDTA increased significantly the activity and the addition of calcium to the medium resulted in a decrease in activity significantly.

Keywords: enzymatic characterization, cysteine-proteases, *Anticarsia gemmatalis*, soybean