Partial Resistance of Peritrophic Membrane Proteins of *Danaus plexippus* (Lepidoptera) to Latex Proteases

Pereira, D.A. ¹; Viana, C.A. ¹; Matos, M.P.V. ¹; Queiroz, J.F.N. ¹; Moreno, F.B.M.B. ²; Freitas, C.D.T. ¹; Ramos, M.V. ¹; Freitas, A.L.P. ¹

¹Departamento de Bioquímica e Biologia Molecular, UFC, CE; ²Centro de Ciências da Saúde, Unifor, CE, Brazil

INTRODUCTION: In general, laticifer fluids are rich sources of proteases. Studies show that proteases are involved in plant defense against insects. A possible mechanism of insecticidal action is related to peritrophic membrane (PM) degradation. The objective of this study was to evaluate the susceptibility of PM proteins of *Danaus plexippus* to degradation by laticifer proteases of its host plant, *Calotropis procera* (the milkweed) and related non-host species from the milkweed family (*Plumeria rubra* and *Cryptostegia grandiflora*). MATERIALS AND METHODS: In order to obtain a fraction rich in proteins, the three laticifer fluids were processed following a previously established methodology. The protein fraction of *C. procera* was used to purification of proteases. Which were purified by two ion exchange chromatography steps and analyzed by mass spectrometry (ESI-Q-TOF). The proteolytic activities were characterized by colorimetric assays. For biological assays, the PM were extracted from larvae followed by incubation (1h) with three protein fractions and purified proteases. The degradation of PM proteins was analyzed by electrophoresis. The degradation of PM proteins by purified proteases was also assessed after PM incubation with a chitinase from *C. procera* latex. RESULTS AND DISCUSSION: Three proteases were purified from *C. procera* latex (MW: 26.213, 26.133 and 25.086 Da). The optimum pH for proteolytic activities was 6.0 and they were inhibited by E-64, showing they are cysteine proteases. PM proteins were only partially digested by three laticifer fluids and purified proteases. On the other hand, the previous incubation of PM with a chitinase did not improve the degradation by purified proteases. CONCLUSION: The partial resistance of PM proteins by latex proteases may be one of the mechanisms developed by insect to survive to these toxic molecules presents in their diets.

Keywords: proteases, latex, peritrophic membrane, Lepidoptera

Supported by: CAPES, CNPq and FUNCAP.