Antiviral activity observed in the hemolymph of *Podalia sp* (*Lepidoptera: Megalopygidae*)

Mendonça R.Z.1; Carvalho N.D.1; Figueiredo, C. A.2; Oliveira, M. I.2; Silva, P.E; Curti, S. P.2; Mendonça RMZ.3; Giovanni, DNS1; Moraes1; R.H.P1; 
1Laboratório de Parasitologia e Entomologia, Instituto Butantan, São Paulo/SP, 
2Núcleo de Doenças Respiratórias, Centro de Virologia, Instituto Adolfo Lutz, São Paulo/SP, 
3Laboratório de Virologia, Instituto Butantan, São Paulo/SP. 
e-mail: zucatelli@butantan.gov.br

**Introduction:** The control of human viruses is of high interest in human and animal health. Several works have demonstrated the presence of bioactive peptides with therapeutic action in insect hemolymph. However, relatively little data are available on molecules from insects with antiviral activities. **Methods:** In this study, the effects of supplementation of infected culture with hemolymph from larvae of *Podalia* (*Lepidoptera: Megalopygidae*) were investigated. The effect of hemolymph on virus growth was measured on confluent monolayers of infected cells with measles, influenza, herpes, rubella (enveloped virus) and picornavirus (non enveloped virus). The cultures were observed daily for evidence of cytopathic effect. The analyses of the viral titer demonstrated that the addition of 1% of hemolymph decreased significantly (p=0.002) the virus titer. The antiviral protein responsible for this activity was isolated and purified by gel filtration chromatography (Superdex 75) and further fractionated using a Resource-Q ion exchange column system. The analyses of the viral replication by mRNA determination also was performed by qPCR analysis. **Results and Discussion:** Experiments with the purified protein led to a 243-fold reduction in influenza virus production, 729-fold reduction of measles virus and a 2.187-fold reduction of picornavirus production. Assays using RT-PCR to determine viral mRNA present in the treated and infected cells also was performed. The purified antiviral protein was able to reduce at $10^6$ times the replication of herpes virus and $10^4$ times the replication of rubella virus. Heating and freezing seem to have no influence over its antiviral activity. The protein does not display virucidal activity and does not act on receptors on the cell membrane. The observations suggest an intracellular mechanism of action and that the protein may act as a constitutive agent that affects the innate antiviral immune response. **Key words:** Antiviral, hemolymph, Herpes, Podalia, Influenza

Supported by FAPESP 10/52434-6