

An interesting antimicrobial activity of egg wax from *Amblyomma cajennense* (Fabricius) (Acari: Ixodidae)

S. LIMA-NETTO^{1, 5}, R. MENDONÇA¹, M. R. FRANZOLIN⁴, C. L. UTESCHER³, S. OROZCO³, C. MÁXIMO-ESPINDOLA¹, M. LABRUNA² & D. BARROS-BATTESTI¹

¹Laboratório de Parasitologia, Instituto Butantan, São Paulo, Brazil

²Departamento de Medicina Veterinária Preventiva e Saúde Animal, Faculdade de Medicina Veterinária e Zootecnia-USP, São Paulo, Brazil

³Serviço de Controle de Qualidade, Instituto Butantan, São Paulo, Brazil

⁴Laboratório de Bacteriologia, Instituto Butantan, São Paulo, Brazil

⁵Corresponding author. E-mail: solnetto@butantan.gov.br

Abstract

The antimicrobial activity of substances present in the egg wax of *Amblyomma cajennense* (Fabricius) was studied, focusing on bacteria, fungi and yeast. Wax was extracted using chloroform/methanol (2:1), and antimicrobial activity was evaluated by the solid culture diffusion assay method, with evaluations at 24, 48 and 72 hours after inoculation. The best results were obtained against yeasts, fungi and Gram-positive bacteria. For enteroviruses, no cytopathic effect in Vero cell cultures was observed for at least 48 hours, and the cell morphology was preserved, suggesting a very interesting potential virustatic activity.

Key words: *Amblyomma* ticks, antimicrobial activity, Gené's organ, tick egg wax, virustatic activity

Introduction

The medical and economic importance of ticks has long been recognized due to their ability to transmit diseases to humans and animals (Castro 1997; Estrada-Peña & Jongejan 1999). Parasitic diseases are a global problem and a major obstacle to animal health; they may result from endoparasites living inside the body or ectoparasites, such as ticks, mites, flies, and fleas. Among the latter, ticks are very important and harmful bloodsucking external parasites of all classes of terrestrial vertebrates worldwide (Guglielmone *et al.* 2006).

In addition to their potential to cause harm, bloodsucking parasites like ticks have been exhaustively studied because of the richness of their genome. These parasites have been evolutionarily selected to achieve a balance between their own physiology and that of their natural hosts (Nuttall 2002). In this context, we know that ticks deal successfully with the immunological response, and with the inflammation and blood coagulation system of their hosts (Ribeiro *et al.* 1985; Ribeiro 1995). Elucidating such mechanisms in ticks can therefore yield valuable information essential to the development of new drugs (Nuttall 2002). Female ixodid ticks lay their egg masses on the ground where they are exposed to the soil microflora, protecting them from desiccation by covering them with a waxy substance secreted by Gené's organ. Recently, Arrieta *et al.* (2006) showed that the egg wax from *Amblyomma hebreum* Koch was able to inhibit the growth of some microorganisms.

Chemicals obtained from animals and plants have been a part of human civilization ever since our early ancestors began exploiting natural compounds to improve and enrich their lives. Animals