

Nanostructuring of Plant Extracts for the Tick Control in Ruminants

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Abstract: The economic losses, the emergence of resistance and the presence of residues in food of animal origin, as well as in the environment, have fomented the search for new strategies of tick control. The nanostructuring of plant extract with acaricide activity may be an alternative to solve these problems. So far, the acaricide activity of *Eucalyptus* spp extracts has doubled.

Infestation caused by ticks in bovines may generate economic losses due to the reduction of productivity resulting from blood spoliation and discomfort, deaths among cattle, skin lesions, transmission of hemoparasites (*i.e. Anaplasma* spp and *Babesia* spp), waste of milk and meat due to the presence of residues, more labor, and expenses with acaricides [1]. Moreover, the rapid emergence of resistance to the drugs available on the market by *Rhipicephalus (Boophilus) microplus* is another problem which, at times, results in intensification of its use and reduction of the lifespan of these veterinary products. This condition, added to the high cost of the development of new pharmacological bases are factors which discourage investments in this sector of the pharmaceutical industry [2,3]. Considering the problem of economic losses, the emergence of resistance and the presence of residues in food of animal origin, as well as in the environment, the search for new strategies of tick control for the maintenance of sustainability in cattle raising in tropical regions is of utmost importance. In this context, the use of *phytotherapeutics* may be a viable alternative to mitigate the aforementioned problems. Monoterpen-rich plant extracts stand out for their insecticide activity, low toxicity to mammals and low risk of environmental contamination [3]. However, these extracts present some utilization limitations, such as the need for a concentration equal to or higher than 5% in the formula in order to reach 100% acaricide efficiency [3], and for having volatile or instable active ingredients. The encapsulation of drugs in nanoparticles is frequently adopted in the pharmaceutical field to promote its sustained delivery and/or its targeting. After the encapsulation, the active ingredient may also present increased stability, alteration of its bioavailability (ou algo assim, estou sem dicionário aqui) and reduction of toxicity, and the concentration necessary to maintain efficiency. The objective of this Project is to try to increase the efficiency of plant extracts, provided by the Phytotherapy Research Network, in parasite control of ruminants through their nanostructuring. Due to the issue of intellectual property, the results cannot be fully expressed, but the *in vitro* assays carried out with larvae and adult female *Rhipicephalus (Boophilus) microplus*, have been able to double the acaricide activity of *Eucalyptus* spp extracts.

References

- [1] FURLONG, J. Caderno Técnico da Escola de Veterinária da UFMG, 8 (1993) 49:61.
- [2] UILENBERG, G. Tropical Animal Health and Production, 28 (1996) 257:265.
- [3] CHAGAS, A. C. S.; PASSOS, V. M.; PRATES, H. T.; LEITE, R. C.; FURLONG, J.; FORTES, I. C. F. Brazilian Journal of veterinary Research of Animal Science, 39 (2002) 247:253.

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