III WORKSHOP ON

Environmental NANOTECHNOLOGY

PROGRAM & BOOK OF ABSTRACTS

December 05th to 08th, 2018

Auditorium of University of Sorocaba

III WORKSHOP ON Environmental NANOTECHNOLOGY

General Information

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Confererence Venue: University of Sorocaba – Rodovia Raposo Tavares km 92,5, Sorocaba – São Paulo State - Brazil

Conference Website: http://uniso.br/hs/III-workshop-nanotecnologia-ambiental/

Publication: III Workshop in Environmental Nanotechnolgy will invited speakers and authors to submit their manuscripts to a Special Issue "Environmental Nanotechnology) to be published in **Energy, Ecology and Environment** – Springer – after a peer review process - https://www.springer.com/energy/journal/40974.

Nanocarrier formulations with acaricide potential on *Rhipicephalus (Boophilus) microplus*

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Rhipicephalus (Boophilus) microplus is a major source of economic losses on brazilian livestock, preventing further development of the sector. Parasitic resistance to commercial acaricide formulations, and the impact of their residues in Food-animal products are driving the search for new molecules and control methods. In this scenario, nanotechnology is an interesting tool, since nanocarriers can improve the bioavailability of active compounds with the increase of aqueous solubility, therefore improving its absorption and tissue distribution, and reducing possible toxic effects. Recent studies have shown that nanoencapsulated formulations permitted the reduction of acaricide concentration without affecting the biological effect of the commercial formulation. The aim of the present study was to evaluate possible acaricidal effect of cypermethrine (CPM) + chlorpyrifos (CPF) based formulations developed from Solid Lipid Nanoparticles (SLN), since these compounds have smaller withdrawal period, and their associations with commercial substances (menthol, cytral, and limonene) against *R. (B.) microplus* larvae. The formulationswere then evaluated at 100 to 0.1 $\mu l.mL^{-1}$ concentrations by the Larval Packet Test (LPT). The treatments were tested in triplicates, and, for each one, negative (water) and positive control (CPM+CPF-based commercial product, at dose indicated by developer: 1,25 $\mu l.mL^{-1}$) were included. The count of live and dead larvae was performed after 24h of incubation at 27 ° C. The results were analyzed by One-way_ANOVA, and the means compared by the Tukey test. The formulations caused 100% mortaity for SLN+CPM+CPF+mentol, and CLN+CPM+CPF+limoneno at 6.25 ul.mL-1, and for SLN_CPM+CPF+citral at 3.12 ul.mL-1, with a dose-dependent effect, and significant differences ($p \leq 0,05$). It was demonstrated that the nanocarrier system evaluated was effective, since the active compouds, even reduced, caused mortality rates similar to those of the commercial reference products. Thus, the SLN system evaluated in the present study can be considered as an option on the development of new acaricides [1]. The present results are a major breakthrough, especially regarding the impact of residues of veterinary drugs in Food-animal products, and also preenting an alternative to delay the development of resistance of ticks against the current synthetic products. New studies are necessary to elucidate the function of these associations, and to validate its efficacy against *R. (B.) microplus*.

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Reference:

[1] AVINASH, B.; VENU, R.; RAJ, M.A.; RAO, K.S.; SRILATHA, C.; PRASAD, T.N. **Vet. Parasitol.**, v.237, p.130-136, 2017.