RESUMO SIMPLES - ECTOPARASITOS: SISTEMÁTICA, EPIDEMIOLOGIA E CONTROLE

BETWEEN TEMPERATE AND TROPICAL LINEAGES: HOW DO RHIPICEPHALUS SANGUINEUS SENSU STRICTO AND RHIPICEPHALUS LINNAEI RESPOND TO FIPRONIL?

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Rhipicephalus sanguineus sensu lato complex, the brown dog tick, as it is popularly known, is the most widespread tick in the world. Recent research has identified two genetically distinct lineages, R. sanguineus sensu stricto (temperate lineage) and R. linnaei (tropical lineage). Understanding the susceptibility of these organisms to acaricides is essential for control strategies and early diagnosis of resistant populations, since physiological differences can

influence the response to molecules. The objective of this work was to evaluate engorged larvae and nymphs of R. sanguineus ss and R. linnaei exposed in vitro to different concentrations of fipronil. The species used were from a colony maintained in the laboratory (CEUA IV/UFRRJ nº 9812271021), at the Centro de Pesquisa Clínica e Inovação Tecnológica em Medicina Veterinária – Laerte Grisi. A stock solution of fipronil (5 mg/mL) was prepared from 0.025 mg of the active ingredient diluted in 40% DMSO, 12.5% acetone, 2% Triton X-100, and N-methylpyrrolidone in sufficient quantity (q.s.p.) to make up 100%. From this stock solution, serial dilutions were obtained in distilled water, larvae from 1.562 to 100 µg/mL, and nymphs from 3.125 to 200 µg/mL. As a negative control, the diluents used were 1.6% DMSO, 0.5% acetone, 0.08% Triton X-100, 3.2% N-methylpyrrolidone, and distilled water q.s.p. 100%. The assays were performed in triplicate, with approximately 30 engorged larvae or nymphs of R. sanguineus ss and R. linnaei immersed for five minutes in 2 mL microtubes (Eppendorf®) containing 0.5 mL of the test solution. Subsequently, the solutions were drained, and the ticks were dried on absorbent paper and placed in 3 mL syringes adapted with identification. The syringes were stored in climate-controlled chambers with constant temperature and humidity (27 °C ± 2 °C and 80 ± 10% RH) for 21 days to complete ecdysis. After this period, mortality was assessed, and ticks that did not complete ecdysis were considered dead. These data were tabulated and used to calculate the adjusted mortality rate and probit analysis to determine lethal concentrations (LC_{50}), with a 95% confidence interval, using the RStudio Team program. In larval assays, R. sanguineus ss showed high mortality rates at all concentrations evaluated, ranging from 84.94% in the first concentration to 100% in 25 and 100µg/mL. R. linnaei showed lower sensitivity at fipronil, with mortalities of 9.51% and 24.78%, in 1.562 and 3.125µg/mL respectively, but there was a linear increase in the mortality with 87.97% in 6.25µg/mL and approximately 100% from 12.5µg/mL. In nymphal assays, R. sanguineus ss also demonstrated high susceptibility, with a mortality of 83.86% in 3.125µg/mL and above 90% from 6.25µg/mL. Rhipicephalus linnaei showed lower mortality at the lowest concentrations, like larval assay, with 18.57% in 3.125µg/mL and 38.75%, in and 6.25µg/mL, although the values gradually increased, reaching between 79.17% and 94.51% at intermediate (12.5µg/mL) and higher (200 µg/mL) concentrations. Regarding the LC_{50} for R. linnaei larvae, it was 3.83µg/mL (IC95%; 3.41-4.30) and 7.55µg/mL (IC95%; 5.71-9.54) for nymphs, however for R. sanguineus ss it was not possible to estimate the value, indicating the need for further assays with lower concentrations than

those used in this study. These results suggest that R. linnaei is less sensitive to fipronil compared to R. sanguineus ss, in both larvae and nymphs stages.

Palavras-chave: tick; acaricide; ecdysis; sensitivity.