RESUMO SIMPLES - ECTOPARASITOS: SISTEMÁTICA, EPIDEMIOLOGIA E CONTROLE

INTERFERENCE OF DIFFERENT WATER IMMERSION TIMES ON THE DEVELOPMENT OF FED STAGES OF RHIPICEPHALUS LINNAEI

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Tick survival can be influenced by environmental factors such as temperature, humidity, and physical agents. Immersion in water, depending on the exposure time, can act as a stressor for fed stages, affecting processes such as ecdysis and egg viability. However, studies that systematically evaluate the effects of water immersion on post-engorgement stages, especially in Rhipicephalus linnaei, are still scarce. Thus, the objective of this study was to evaluate the interference of water immersion time on the ecdysis of fed larvae and nymphs and on the reproductive efficiency of engorged females of R. linnaei. 1,000 larvae, 600 nymphs, and 40 fed females from a laboratory colony (CEUA-IV-UFRRJ nº 9812271021) were used. Four experimental groups were formed: three subjected to immersion for 12, 24, and 48 hours, and one control group without immersion. Each group had five replicates containing 50 fed larvae and 30 fed nymphs per replicate, in addition to 10 fed females, with each female considered an experimental unit. Before the start of the experiments, the fed females were weighed (WF) to ensure homogeneity between the groups. The fed stages were placed in cotton-sealed test tubes, using one tube for each stage/replicate. In the immersed groups, 5 mL of water was added, which was

discarded at the end of the stipulated period. Then, the specimens were dried with paper towels, returned to the cotton-sealed tubes, and incubated in a climate-controlled chamber (27 ± 2 °C; 80 ± 10% RH). The incubation period was 21 days for fed larvae, 28 days for fed nymphs, and 42 days for fed females. At the end of incubation, the percentage of molting of the larvae and fed nymphs was evaluated, calculated by: Molting (%) = (total incubated – total dead / total incubated) × 100. For fed nymphs, males and females were also counted after molting. For fed females, the weight of the egg clutches (WE), weight of the kenogynes (WK), and larval hatching rate (LH) were recorded. With these data, the nutrition index (WE / (WF – WK) × 100) and reproductive efficiency (WE × LH × 20,000 / WF) were calculated. Larval hatching data were descriptively analyzed in Microsoft Excel®. Normality was verified using the Shapiro–Wilk test. ANOVA was applied for parametric data and Kruskal–Wallis for non-parametric data, using GraphPad Prism® 8.0.1, considering $p \leq 0.05$. For fed larvae, the mean ecdysis rates were 96.67 ± 2.06% (control), 97.03 ± 2.95% (12 h), 92.32 ± 3.94% (24 h), and 91.60 ± 6.64% (48 h), with no statistically significant difference. For fed nymphs, the following percentages were observed: 96.67 ± 2.72% (control), 99.33 ± 1.22% (12 h), 95.90 ± 2.37% (24 h), and 54.43 ± 17.27% (48 h), with a significant difference only for the 48-hour group ($p < 0.0001$). The number of recovered males and females did not differ between and/or within the groups, with averages of 11.75 ± 3.34 males and 14.20 ± 4.32 females. For fed females, there were no statistical differences in nutrition index, reproductive efficiency, and other parameters evaluated. Average larval hatching rates were observed in the following groups: 66.40 ± 32.89% (control), 45.30 ± 32.56% (12 h), 63.40 ± 33.40% (24 h), and 77.40 ± 22.33% (48 h). These findings aid in understanding the biology of R. linnaei and may contribute to strategies for non-chemical maintenance and/or control of the species. It is concluded that immersion in water for up to 48 hours does not interfere with the biological cycle of R. linnaei larvae and fed females. However, immersion for more than 24 hours significantly compromises the development of fed nymphs.

Palavras-chave: dog tick; biology; immersion test; post-engorgement stages.