RESUMO SIMPLES - ECTOPARASITOS: SISTEMÁTICA, EPIDEMIOLOGIA E CONTROLE

IMPACT OF METARHIZIUM ANISOPLIAE ON OVIPOSITION, VIABILITY, AND HATCHING OF AEDES AEGYPTI EGGS.

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Aedes aegypti (Diptera: Culicidae) is considered the main vector of arboviruses in the world, including dengue, Zika, chikungunya, and urban yellow fever. Its remarkable vector competence is related, among other reasons, to its great ability to adapt to urban environments, high anthropophilia, and rapid reproduction, influenced by the hematophagy performed by females, which enables the occurrence of the vitellogenic phase of oogenesis. In addition, after maturation, each female is capable of laying about 80 to 120 eggs in a single

clutch, which are highly resistant to desiccation and remain viable for months, facilitating the persistence of the vector in urban environments, especially in tropical and subtropical climates. Its control is mainly carried out through the use of synthetic insecticides, chemicals whose inappropriate use has promoted the development of resistance in mosquito populations, in addition to generating environmental impacts. In this sense, the use of bioinsecticides for vector control proves to be a viable and sustainable alternative, mainly due to the good results presented in their veterinary and agricultural use. Entomopathogenic fungi (EPFs), such as Metarhizium anisopliae, for example, have shown promising results in controlling vectors such as A. aegypti, with low environmental impact and high efficacy in interrupting the mosquito's life cycle. Thus, this study aimed to analyze the reproductive biology of female A. aegypti after 48 hours of exposure to M. anisopliae. The biological parameters evaluated were the number of eggs laid after blood feeding and their viability (hatching rate). For this purpose, two groups of Rockefeller strain insects aged 6 to 8 days were formed: the control group (CTR), exposed to 0.03% Tween 80, and the treated group (TTO), exposed to M. anisopliae isolate CG 153 at a concentration of 1 x 107 conidia/mL. The CTR consisted of a cage housing 180 females and 90 males (n = 270), and the same arrangement was used for the TTO, with exposure for the mosquitoes in both groups carried out using the impregnated filter paper method for 48 hours. After exposure, the papers were removed from the breeding cages and the females were fed 5 mL of bovine blood provided by donors. After feeding, a filter paper moistened with sterile distilled water was inserted into the cages and kept for 4 days for oviposition. The eggs obtained were quantified using a binocular stereomicroscope and placed in hatching conditions. The generation (F1) was separated into triplicates containing 30 females and 15 males (n = 135) for both CTR and TTO. A fourth cage with the same arrangement (n = 45) was separated for CTR and another for TTO, and a new exposure was performed in both groups under the same conditions already described. A 13.2% reduction in oviposition was observed in F0 females when comparing TTO (2,990 eggs) with CTR (3,444 eggs), with a hatching rate of 83% in CTR and 40% in TTO. In F1, the reduction in oviposition was 62.6% between TTO (mean 323 eggs ± 269 SD) and CTR (mean 862 eggs ± 525 SD), but this difference was not statistically significant (Welch's t-test = 1.51; p = 0.22). In cages subjected to re-exposure, the reduction in oviposition reached 78.9% between TTO (282 eggs) and CTR (1331 eggs). Exposure of A. aegypti to the fungus M. anisopliae reduced oviposition and egg viability between the CTR and TTO groups in the different exposed generations,

highlighting the significant potential of M. anisopliae as a tool for vector control, since it was able to interfere with the reproductive biology of A. aegypti, thus contributing to the reduction of arbovirus transmission.

Palavras-chave: entomopathogenic fungi; biological control; dengue mosquito; control bioagent.