RESUMO SIMPLES - ECTOPARASITOS: SISTEMÁTICA, EPIDEMIOLOGIA E CONTROLE

INTERACTION OF THE ENTOMOPATHOGENIC FUNGUS BEAUVERIA BASSIANA WITH EMBRYOS OF THE AQUATIC MODEL ORGANISM DANIO RERIO (ZEBRAFISH)

Haika Victória Sales Moreira (haika-vsm@hotmail.com)

Victor Hugo Machado Luques Dias (vhluques@hotmail.com)

José Henrique Vallim (jose.vallim@embrapa.br)

Ana Paula Andrade Braga (apandradebraga@gmail.com)

Sara Ferreira Abud (sara-abud@hotmail.com)

Pedro Herculano Santos Silva (pedroherculano@gmail.com)

Vânia Rita Elias Pinheiro Bittencourt (vaniabit@gmail.com)

Patrícia Silva Gôlo (patriciagolo@gmail.com)

Vera Lúcia Scherholz Salgado De Castro (vera-lucia.castro@embrapa.br)

Isabelle Da Costa Angelo (isabeleangelo@yahoo.com.br)

Zebrafish are widely used model organisms because of their biological transparency, rapid development, and suitability for toxicological studies. Entomopathogenic fungi such as Beauveria bassiana are important biological control agents against arthropod pests and disease vectors and are increasingly used in agriculture under different commercial formulations, including granules, powders, and liquid products. Given their broad application, this study aimed to

evaluate the potential risk of the entomopathogenic isolate B. bassiana LCMS21 to Danio rerio embryos in aquatic environments. Conidial suspensions were prepared at 1×10^{8} conidia/mL in zebrafish embryo medium and a serial dilution gave the test concentrations (1×10^{7} to 1×10^{3} conidia/mL). The Fish Embryo Toxicity Test (FET) was conducted in 24-well plates with 2 mL per well (CEUA–Embrapa Meio Ambiente, protocol nº 002/2025). Embryos (N = 72) were individually exposed to each treatment (fungi concentrations) or to embryo medium (control), and mortality and developmental abnormalities were monitored for four days. Three independent replicates were performed simultaneously. Exposure to B. bassiana LCMS21 did not significantly increase embryo mortality ($p = 0.2801$). Mortality rates were 10% in the control group, 10% at 1×10^{3}, 14% at 1×10^{4}, 8% at 1×10^{5}, 3% at 1×10^{6}, and 20% at 1×10^{7} conidia/mL. Although the overall frequency of deformities was low ($p = 0.0280$), some developmental alterations were observed, mainly equilibrium loss (72%), followed by minor spinal/caudal defects (1%) and other abnormalities such as pericardial edema, pigment changes, and contractions (2%). Equilibrium alterations were statistically higher than in the control group at 1×10^{3} ($p = 0.0293$), 1×10^{5} ($p = 0.0004$), 1×10^{6} ($p < 0.0001$), and 1×10^{7} conidia/mL ($p = 0.0004$). Overall, mortality did not appear to be a major concern under the tested conditions; however, the occurrence of equilibrium alterations suggests potential sublethal effects of the LCMS21 isolate on early zebrafish development. Further studies are needed to determine whether similar effects occur in later life stages – larvae and adults - or can even be more severe with other fungal isolates.

Palavras-chave: zebrafish; beauveria bassiana; developmental abnormalities; embryos.