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Veterinarni Medicina

NeemAzal T/S – toxicity to early-life stages of common carp (*Cyprinus carpio* L.)

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In the European Union, the use of the insecticide NeemAzal T/S (standardised variant 1% of the active ingredient azadirachtin) is authorised in organic agriculture. The objective of this study was to determine the toxic effects of NeemAzal T/S at concentrations of 3, 10, 30, and 60 mg/l on the morphometric and condition characteristics, mortality, hatching, and histopathology of early-life stages of common carp (*Cyprinus carpio* L.) as a non-target aquatic organism, as well as related effects of NeemAzal T/S on selected indices of oxidative stress in the same organism. The embryo-larval

toxicity test was performed according to OECD Guidelines 210 (Fish, Early-life Stage Toxicity Test). NeemAzal T/S exposure induced slow hatching on the first day and increased cumulative mortality in groups exposed to the insecticide. No effect on morphometric or condition characteristics was observed after 31 days of exposure. Histopathological changes of the gills were found at the highest concentration of 60 mg/l of NeemAzal T/S. Exposure at 30 mg/l was associated with significantly ($P < 0.01$) increased glutathione peroxidase and glutathione S-transferase ($P < 0.05$) activities compared to the control group. The content of oxidised lipids was significantly higher ($P < 0.05$) in the 3, 10, and 30 mg/l experimental groups than in the controls. NeemAzal T/S exerted a significant negative influence on histopathological parameters in the embryo and larvae of common carp, as well as on the indices of oxidative stress in the same organism.

Keywords:

Neemazal T/S; embryo-larval toxicity test; azadirachtin; oxidative stress;

histopathology; insecticide

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