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On the Toxic Influence of Cyanotoxins in *Carassius Carassius* Embryo-Larval Development

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Abstract: Cyanobacteria and their toxic products represent a serious problem in many waters. The aim of this study was to find out how crude extract of cyanobacteria can influence the embryonic and larval development of carassius on the basis of embryo-larval toxicity test. Crude extract of cyanobacteria containing the known amount of microcystins LR, YR and RR (90, 9.0 and 0.9 μg·L-1, *i.e.* high, medium and low concentration of the extract), was administered to carassius eggs. The experiments were finished after 8 and 30 days (short- and long-term exposure). Evaluation of the tests was based on the OECD guideline for testing chemicals, direction 210 from 1992. The extract with high concentration caused 94% ($p < 0.01$) embryonic mortality, prolonged hatching, increased numbers of malformed and dead larvae ($p < 0.01$) and a decrease in average total length ($p < 0.01$). Yolk sac dropsy and abnormal behaviour were observed. The extract with medium concentration caused an increase in dead larvae after the short-term exposure ($p < 0.05$) and an increase in malformed ($p < 0.05$) and dead ($p < 0.01$) larvae after the long-term exposure. The extract with low concentration caused an increase in dead larvae only after the long-term exposure ($p < 0.05$). In general, we can conclude that the extract with high concentration results in acute toxicity for embryos of the carassius. The influence of the extract with medium and low concentrations was manifested after the long-term exposure.

Keyword*: Cianotoxins, malformations, fish, embryo-larval toxicity test, hatch*

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