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Physiological Changes in *Daphnia pulex* Treated with Microcystis at Different Concentrations

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Abstract: Oxidative stress in *Daphnia* is a physiological phenomenon that occurs under unfavorable environmental conditions, such as pollution, UV radiation, lack of oxygen, or extreme temperatures. It is a highly studied topic in ecotoxicology because Daphnia is a model organism sensitive to environmental changes. In this study, *Daphnia pulex*, a species of microcrustacean known for its role in research, was used. The experiment involved acclimating the animals for 5 days before exposing them to the toxin produced by the cyanobacterium *Microcystis aeruginosa* for 72 hours. Four experimental groups were created: a control group (fed with *Desmodesmus* sp.) and three groups treated with different concentrations of *Microcystis* (50%, 75%, 100%) combined with *Desmodesmus*. The cyanobacterium *Microcystis aeruginosa* was isolated from water affected by algal blooms in Lake Ciuperca, Tulcea, and cultivated under controlled conditions. During the experiment, *Daphnia pulex* was monitored daily for water clarity, active movement, and reproduction. After 72 hours of exposure, *Daphnia* was collected, homogenized, and analyzed for the activity of antioxidant enzymes (SOD and CAT), transaminases (TGO and TGP), and total proteins. Three replicates were performed per batch for each analysis. The results showed that SOD activity increased at a 100% *Microcystis* concentration but decreased at 75%. CAT activity decreased in all treated batches. GOT and GPT concentrations also decreased across all batches, while total proteins slightly increased at a 75% concentration, but decreased in the other batches. These findings highlight the physiological changes induced by oxidative stress caused by *Microcystis aeruginosa* toxins, depending on the administered amount.

Keywords: Daphnia pulex; Microcystis aeruginosa; Oxidative Stress; Antioxidant Enzymes; Ecotoxicology.

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