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**Behavioral Responses of Aquatic Invertebrates as a Promising Endpoint for Detection of the Toxic Effects (a Review)**

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**ABSTRACT**

The article analyzes modern approaches in application of behavioral reactions of aquatic organisms as endpoints (test criteria) for the toxicity evaluation in the water quality control systems and biotesting. Parameters of the behavioral modification have some significant advantages as compared with classic lethal and sublethal toxicological test-criteria: instant responses, sensitivity, ability to detect low concentrations of toxicants, non-lethality for the test objects, etc. The locomotor activity of hydrobionts (fishes, crustaceans) has been successfully applied in the continuous water quality monitoring − real-time biological early warning systems (BEWS), which have been implemented in water management in many countries.  
The locomotor activity of aquatic organisms (mainly planktonic crustaceans) changes relevantly in response to the toxicants' impact (pharmaceuticals, cyanotoxins, heavy metal xenobiotics, etc.). Studies have shown the possibility of the following indicators of locomotor activity to be used as behavioral test criteria: swimming time, swimming rate, distance traveled, frequency of limb movements, number of turns, angle of turn, relax time, etc.

The use of artificial intelligence (computer models of deep learning based on artificial neural networks) is proposed to analyze large datasets on the test organisms' behavior to identify patterns specific to the certain toxicants' impact and toxicity factors' identification.

**KEY WORDS:** [behavioral reactions](https://search.begellhouse.com/index.php?word_search=behavioral+reactions&facet_search=&facet=all&site=dl), [test-criterion](https://search.begellhouse.com/index.php?word_search=test-criterion&facet_search=&facet=all&site=dl), [toxicity](https://search.begellhouse.com/index.php?word_search=toxicity&facet_search=&facet=all&site=dl), [biotesting aquatic invertebrates](https://search.begellhouse.com/index.php?word_search=biotesting+aquatic+invertebrates&facet_search=&facet=all&site=dl" \t "_blank)