

**ESTIMATION OF THE TOXICITY OF A METAL/
CARBON NANOCOMPOSITE OF COPPER BY BIOTESTING**

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The toxic effect of a metal/carbon copper nanocomposite (Me/C Cu NC) on higher plant seeds and the bacterial sensor “Ecolum-8” was evaluated. A significant inhibitory effect of 0.1% nanomaterial on the seedlings of radish seeds was established. Some stimulating effect on the development of the roots of this culture was found at a concentration of $1 \cdot 10^{-8}$ %, but it was insignificant (by 11.3%). When wheat was used as a test object, its root growth was inhibited when the seeds were treated with the nanocomposite at a concentration of 0.1 and 0.01% (a decrease of 30.2 and 79.6%, respectively). No stimulating effect on the wheat root system was revealed. The preparation also had no effect on the development of the aerial part of wheat seedlings, with the exception of 60.0% growth inhibition in the option of treatment with a 0.1% MeC Cu NC solution. Lyophilized cells of *Escherichia coli* K12 TG1 strain (pXen7) containing the full *lux*-operon of *Photobacterium luminescens* were used as a second biotesting object. Based on bioluminescence analysis, it was found that all studied concentrations of the copper nanocomposite were highly toxic for the bacterial strain (the toxicity index >70%). The value of the toxicological parameter EC_{50} , corresponding to the concentration of the substance that causes 50% inhibition of the luminescence of the sensory microorganism as compared with the control, turned out to be lower than the minimum tested concentration of the MeC Cu solutions. The calculation was made mathematically, and the probable value of EC_{50} was equal to 0.016 $\mu\text{g} / \text{ml}$.

Key words: biotesting, higher plant seeds, bioluminescence, bacterial sensor “Ecolum-8”.

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