



## Potential Toxicity Investigation of Copper -Doped River Water of Nën-Shkodra Lowland (Albania) on a Plant Bio-test

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**Abstract:** Various natural and anthropogenic copper sources have progressively increased its environmental concentration, getting a hazardous threat to plant, animal and human health due to bio-accumulation tendency and toxicity. In the present investigation the *Allium cepa* L. test was used to assess the toxicological tendency of some riverside water samples taken in Nën-Shkodra lowland (Albania) and to evaluate the toxic potency of copper, experimentally added in analyzed natural waters. Roots of onion bulbs were exposed for 48 h to three doses, representing respective  $\frac{1}{4}EC_{50}$ ,  $\frac{1}{2} EC_{50}$  and  $EC_{50}$  of  $CuSO_4$ -loaded samples. Macro and microscopic endpoints of onion roots grown in unloaded and copper-loaded samples, such as: morphological aberrations, mitotic and phase indexes, interphase nuclear volume and DNA content, chromosomal aberration frequency and types were evaluated and compared. There was a distinct difference of toxicity rate between two groups of natural samples. The results showed obvious metal concentration-dependence of all parameters, revealing that excess copper can cause strong phyto-, cyto- and genotoxic effects on onion roots. Chromosome stickiness, bridges and fragments, c-mitosis and disintegrated nuclei were mostly detected. This approach resulted to be successfully applicable for biological monitoring of water pollution, especially in developing countries as Albania.

**Keywords:** water pollution, *Allium cepa* test, copper, phytotoxicity, genotoxicity, nuclear DNA content

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