



Phytotoxicity of the aqueous solutions of some dishwashing detergents for dishwashers with phosphonates and without phosphates

Nataliia Tkachuk^a  and Liubov Zelena^b

^aDepartment of Biology of T.H. Shevchenko National University “Chernihiv Colehium”, Chernihiv, Ukraine; ^bDepartment of Virus Reproduction of Danylo Zabolotny Institute of Microbiology and Virology, NAS of Ukraine, Kyiv, Ukraine

ABSTRACT

The influx of insufficiently purified or untreated domestic wastewater into aquatic ecosystems raises the question of the production of environmentally friendly detergents. The purpose of this work was to investigate the toxicity of phosphonate-containing and phosphate-free dishwashing detergents for dishwashers according to the phytotest with a garden cress (*Lepidium sativum* L.). Dishwashing detergents for dishwashers (“All in 1”), widely available in the retail network of Ukraine, were used in concentrations the aqueous solutions from 0.005% to 10.0% for their effect on test indicators of garden cress: energy of seed germination, seed germination and biometric and morphometric indicators of seedlings, which were processed statistically. Some phytotoxic indices were determined for the tested aqueous solutions. It was established that the studied solutions of both phosphonate-containing and phosphate-free detergents are extremely and high toxic according to the calculated indices. The obtained data indicate the danger of the investigated detergents for the hydrosphere, the need to replace with a less toxic agents, in particular, based on biosurfactants.

ARTICLE HISTORY

Received 9 December 2023
Accepted 5 January 2025

KEYWORDS

Dishwashing detergents for dishwashers; *Lepidium sativum*; phytotesting; toxicity