AQUEOUS SOLUTIONS OF DISHWASHING LIQUIDS: PHYTOTESTING TOXICITY

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Today, one of the dangerous factors of environmental pollution, in particular water, is the use of synthetic detergents, which include dishwashing detergents containing surfactants. The method of phytotesting uses for determine the toxicity of environment and compounds. It is based on the sensitivity of plant organisms to exogenous exposure to chemical factors. In particular, garden cress (*Lepidium sativum* L.) is highly sensitive to toxicants.

The aim of this study was to investigate the toxicity of aqueous solutions of dishwashing detergents according to the phytotest using *L. sativum* as a test plant.

The seeds of the test plant (*L. sativum*) of 10 pieces were placed on a filter paper soaked in tap water (control) or a suitable aqueous solution of dishwashing liquid (experiment). The control and experiment were repeated three times. We studied widely used dishwashing detergents (conventionally designated by us DWL1 and DWL2), which contained (according to the manufacturers): DWL1 - 5–15% anionic surfactants, <5% nonionic surfactants, concervantes, flavors, geraniol, limonene; DWL2 - water, <5% anionic surfactants, <5% nonionic surfactants, <5% amphoteric surfactants, NaCl, glycerin, EDTA, fragrant, chamomile extract, dyes, does not contain phosphates, chlorine and soda. Seed germination energy (3rd day), seed germination and biometric-morphometric parameters (length of roots and aboveground part of seedlings) (5th day) were determined. The results were processed statistically using Excel 2010, determining: arithmetic mean and arithmetic mean error; significance of differences on Student's t-test.

It was found that increasing the concentration of both DWL1 and DWL2 leads to a decrease in germination energy and germination of cress salad seeds. At the concentration of DWL1 70% and 100% of the seeds of the test plant did not germinate. At the concentration of DWL2 50% germination energy and seed germination were 17% less than in the control. Significant inhibition of root length and aboveground part under the influence of both studied liquids was noted. In particular, even the concentration of 10% DWL1 led to a significant inhibition of seedling growth: the aboveground part did not develop, and the length of the roots was significantly shorter (73.7 times) compared to the control.

Therefore, the investigated aqueous solutions of surfactant-containing dishwashing detergents are toxic to *L. sativum*. The product, which does not contain phosphates, chlorine and soda, showed less toxicity. The obtained results show the potential danger of getting the investigated detergents into water bodies, represent an additional substantiation of preventive and protective engineering actions.