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The effect of white phosphorus on the *Aspergillus niger* AM1 and AM2 survival. The origin of these strains

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Abstract

The ability of microorganisms to easily adapt to their surrounding conditions and form specific ecosystems that exist in the most extreme environments is well known. White phosphorus is one of the most dangerous environmental pollutants, it is nevertheless widely used in various industries and for military purposes. The release of the investigated toxicant into the environment presents a serious concern. In our work, microbial cultures adapted to the presence of white phosphorus in the medium, oxidized it to phosphate, and used it as a source of a biogenic macroelement. In previous studies, we demonstrated for the first time the biodegradation of white phosphorus by the molds *Aspergillus niger*. However, studying the mechanisms of resistance of the fungus to such a toxic substance is essential. Confocal microscopy method was shown that white phosphorus has little effect on the ratio of living and dead cells in the colonies of fungi, i.e. resistance to it is very high.

It became clear that *Aspergillus niger* AM1 demonstrates the ability to utilize glyphosate herbicide. This gives our study a weighty practical significance.

Additionally, the phylogenetic relationship of *A. niger* AM1 with other *A. niger* strains from the NCBI database capable of biodegradation was studied. It turned out that

the closest relatives of the *A. niger* AM1 were strains from China that are proficient in extracting phosphates from minerals.

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