

## The inclusion white phosphorus in the natural cycle of matter. Cultivation of resistant microorganisms.

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### Abstract

For the first time different taxonomic groups of microorganisms are inoculated on culture medium containing white phosphorus as the single source of phosphorus. On these media microorganisms grew and have not experienced phosphorus starvation. It is the world's first example of the inclusion of white phosphorus in the biosphere cycle of elemental phosphorus. Obviously, bacteria consume dissolved products of white phosphorus oxidation (phosphate, phosphate and hypophosphite) and thus shift chemical equilibrium towards its further oxidation. It noticeably accelerates the process of white phosphorus detoxification. It is shown that the resistance of microorganisms cultures to white phosphorus depends on their taxonomic affiliation. Fungi of the *Trichoderma* genus are adapted to it better than *Aspergillus*, *Aspergillus* are adapted better than streptomycetes and streptomycetes, in turn, is better than the bacteria of the genus *Pseudomonas*. Comparing the two *Streptomyces* cultures, we have shown that resistance to white phosphorus is a sign that can be enhanced or weakened depending on culture conditions. The nature and contents of the white phosphorus oxidation products have been studied by <sup>31</sup>P NMR method. The highest concentration corresponds to 5000 times excess of MPC of white phosphorus in wastewater and to 100000000 times excess in drinking water!