

Evaluation of white phosphorus genotoxicity. Growth of bacterial culture in a medium with potassium phosphite as a sole source of phosphorus.

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Abstract

Our previous studies have demonstrated the absence of white phosphorus toxicity for *Aspergillus niger* AM1. However, the toxic properties of the substances are of different nature. It is of great interest to study the genotoxicity – a possible source of mutations. In the present study the genotoxicity of white phosphorus is evaluated using the Ames test, which demonstrated the absence of toxicity. White phosphorus is not a mutagen, as well as its oxidation products (oxygen-containing phosphorus acids). This probably means that in the course of P₄ metabolism phosphine is not formed, whose genotoxicity has been already proved. However, the latter statement needs to be tested. In previous studies, we investigated the structure of white phosphorus metabolites in the culture medium, in which hay bacillus (*Bacillus subtilis*), selected earlier from sewage sludge, containing 0.1% of white phosphorus, grew. The signals characteristic for phosphate and phosphite were observed in the ³¹P NMR spectrum. So, the possibility of observing the bacterial growth in culture medium containing phosphite as the sole phosphorus source caused interest. Such plating of bacterial culture was performed. In media with potassium phosphite as the sole source of phosphorus the growth of colonies was not observed, however, initially smooth agar surface got covered with nicks - depressions were formed as a result of bacterial metabolism. That is, the phosphite is hard of digestion substrate for a given bacterial culture. This result correlates well with the data obtained earlier, that separated from OCB bacteria are resistant to white phosphorus, but can not digest it.