Thematic Section: Biochemical Research. **Full Paper**
Subsection: Bioinorganic Chemistry. *Reference Object Identifier* – ROI: jbc-02/16-46-5-1
Publication is available for discussion in the framework of the on-line Internet conference "*Butlerov readings*".
http://butlerov.com/readings/
Submitted on July 07, 2016.

Aspergillus niger AM1 culture growth in medium with two phosphorus sources. The validity of the definition "biodegradation" with respect to white phosphorus

© **Anton Z. Mindubaev**,[1] **Shamil Z. Validov**,[2] **Alexandra D. Voloshina**,[1]
Natalia V. Kulik,[1] **Salima T. Minzanova**,[1] **Lubov G. Mironova**,[1]
Dmitry G. Yakhvarov,[1] and **Azamat Yu. Akkizov**[3]

[1] *Institute of Organic and Physical Chemistry named after A.E. Arbuzov. Kazan Scientific Center of the Russian Academy of Sciences. Arbuzov St., 8. Kazan, 420088. Republic of Tatarstan. Russia. E-mail: mindubaev@iopc.ru, mindubaev-az@yandex.ru*

[2] *Kazan (Volga Region) Federal University. University St., 18. Kazan, 420008. Republic of Tatarstan. Russia.*

[3] *Kabardino-Balkarian State University named after H.M. Berbekov, Chernyshevskogo St., 173. Nalchik, 360004. Russia.*

*Supervising author; +Corresponding author

Keywords: biodegradation, detoxication, white phosphorus, toxicity, metabolism, *Aspergillus niger* AM1, culture medium.

Abstract

Aspergillus niger AM1 culture is registered in the international database of nucleotide sequences GenBank. This is the first registered microorganism strain that is resistant to white phosphorus. The calculation showed that the transition metal salts concentration in the modified Pridhem-Gottlieb medium is too small for abiotic disproportionation of white phosphorus introduced in it. P_4 excess, depending on the concentration, comprises in terms of Cu^{2+} from 25 to 25000 times! Hence, there is reason to talk about biodegradation. Inoculation of *A. niger* AM1 in medium containing just two sources of phosphorus (phosphate and white phosphorus) demonstrated that P_4 does not exhibit toxic properties in relation to this microorganism. In the presence of white phosphorus it grows at the same rate as in the absence thereof. This is the only example of the lack of white phosphorus toxicity to a living organism.