SPECIFIC FEATURES OF NATIVE CHEMOLITHOTROPHIC MICROBIOTA WASTES PRODUCED BY ENERGY INDUSTRY

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The study's aims were to isolate and establish pure cultures of prevailing microorganisms from the aboriginal consortium in coal fly ash (FAAC), describe their physiology, biochemistry and practically-useful properties, and compare the efficiency of bioleaching metals from fly ash using pure cultures and the consortium. Through enrichment cultures on standard media we isolated pure cultures of the microorganisms which were then preliminarily identified using standard techniques. This allowed us to isolate from FAAC pure cultures of three prevailing strains of mesophilic and moderately thermophilic acidophilic chemolithotrophic bacteriae, belonging to *Acidithiobacillus*, such as *Acidithiobacillus ferrooxidans*, and *Sulfobacillus*. The strains exhibited high oxidative activity in leaching the rare metals Gallium and Germanium, as well as some heavy metals, from fly ash substrate. A comparison of oxidative activity of the isolated strains and the aboriginal consortium under mesophilic conditions led to the conclusion about advantage of consortium, because it had arisen from syntrophy of microbes in the community. This should be taken into account at the developing of bacterial preparations that are optimal for the technogenic substrate.

**Key words**: fly ash, aboriginal microbial consortia, acidophilic chemolithotrophic bacteriae, leaching activity, Germanium.

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3. *Vasil'eva T. V., Blayda I. A., Ivanitsa V. A.* The main groups of microorganisms involved in
the biohydrometallurgical process. 


Blayda I. A., Vasileva T. V., Slyusarenko L. I., Khitrich V. F., Ivanitsa V. A. Extraction of rare and nonferrous metals by microbial communities of the ash from burning Pavlograd
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