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ABSTRACT BOOK

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The 3rd International Symposium of Benthological Society of Asia is held in Vladivostok, Russia, from 24 to 27 August 2016, then from 27 to 31 August 2016 is continuing as The First International Youth Freshwater Ecology School. Various aspects of freshwater and marine biodiversity, biology and ecology problems are in the focus of the Symposium papers. Special attention has been paid to conservation of waters in the urban and wildlife areas of Asian region. Water quality and transboundary water ecosystem monitoring and control are considered at the international point of view as well as questions of ecological education and involving of public to water resources protection. The future international cooperation in different branches of benthological fundamental and applied sciences is discussed.

The book will be interesting for specialists in biology, ecology and biogeography, for practical workers, students and public deal with the water ecosystems protection, monitoring and control.

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(O18) THE ROLE OF MICROORGANISMS IN TRANSFORMATION OF SELENIUM IN NATURAL WATERS

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Microbial communities involved in key processes of transformation of selenium in natural waters. In prokaryotes, selenium is readily metabolized and participate in a full range of metabolic functions including assimilation, methylation, detoxification, and anaerobic respiration (Stolz *et al.*, 2006).

The oxyanions selenate and selenite are the dominant forms of selenium that are naturally found in freshwater and saltwater. The distribution of the different species may vary with the environment, but typically soluble selenate and selenite are found in the oxic zone and the insoluble Se(0) is more abundant in the anoxic zone (Heider & Boeck, 1994). In addition, the selenium in sea water is associated with dispersed organic matter, the main source of which are dying of plankton organisms (Golubkina *et al.*, 2012).

Oxyanions of selenium are terminal electron acceptors in anaerobic respiration, forming distinct nanoparticles of elemental selenium: $SeO_4^{2-} \rightarrow SeO_3^{2-} \rightarrow Se^0$.

Although selenite oxidation occurs in oxic water, the sole presence of dissolved oxygen is not enough to transform selenite into selenate. Selenite oxidation is enhanced by factors that favour the abundance of strong oxidants in the water column, such as redox-active transition metals (iron and manganese) and the presence of selenite-oxidizing bacteria (Maher *et al.*, 2009).

Oxidation of elemental selenium to selenite by *Bacillus megaterium* was described in 1981 (Sarathchandra & Watkinson, 1981).

Marine phytoplankton forming the volatile organic compounds dimethylselenide and dimethyldiselenide. Nutrient evaporation of selenium from sea water in the atmosphere is estimated at 5000–8000 tons per year (Nriagu, 1989; Fordyce, 2012).

Key words: *transformation of selenium in natural waters, assimilation, methylation, anaerobic respiration*