



College of Medicine
Department of Molecular
and Cellular Biochemistry
Biomedical Biological Sciences Research Bldg.
741 South Limestone Street
Lexington, KY 40536-0509
859-323-5549
fax 859-257-2283
www.mc.uky.edu/biochemistry

Review of the dissertation work by Maria N. Shmareva

In the dissertation work Maria N. Shmareva studied biodiversity of aerobic methylotrophic bacteria present in hypersaline ecosystems of Russia and Turkey. It is noteworthy that low taxonomic biodiversity is observed in all these saline environments, and, therefore, extensive studies of the microbial communities are necessary to understand the importance of aerobic methylotrophic bacteria in these ecosystems, their interaction with the environment and influence on global geochemical cycles. The goal of this work was to isolate novel methylobacteria from these ecosystems, characterize their physiological and biochemical properties and identify bacterial metabolites that present the industrial interest. Throughout the course of this work Maria N. Shmareva isolated ten methylotrophic strains from hypersaline ecosystems of Russia and Turkey and further characterized these strains identifying seven representative strains of novel species that belong to two novel genera. She found that the halophilic methylobacteria utilize different pathways of C1-metabolism and produce high concentrations of the metabolites — poly- β -hydroxybutyrate and cyclic amino acid ectoine. These metabolites gained increasing interest in the fields of molecular biology, agriculture, food processing, medicine and pharmacy.

The dissertation work by Maria N. Shmareva is important because it lays a foundation for extensive characterization of these microorganisms and it offers numerous potential applications in medicine and various biotechnological industries. Thus, scientific novelty and practical significance of the dissertation work by Maria N. Shmareva are in accordance with the “Regulations on the Order of Academic Degree Awarding” which is approved by the Russian Federation Government Decree №842 on September 24, 2013, and is applied to the dissertation works to earn the degree of candidate of science. Therefore, Maria N. Shmareva is eligible for earning the degree of candidate of science in the field of 03.02.02 – Microbiology.

Sincerely yours,

A handwritten signature in dark ink, appearing to read 'Korotkova'.

Dr. Natalia Korotkova,
Research Assistant Professor
University of Kentucky
Department of Molecular and Cellular Biochemistry
741 South Limestone, BBSRB 267
Lexington KY 40536-0509
P:(859)323-5493
nkorotkova@uky.edu

February 1, 2016