

LIPIDS BIOMARKERS ANALYSIS AND IDENTIFICATION OF VIABLE BACTERIA IN ANCIENT PERMAFROST

V.Mamykin¹, E. Vorobyova¹, G.Osipov², T. Dobrovolskaya¹

¹ Moscow State University, Chair of Soil Biology, Department of Soil Science
e-mail: lenav@ps.msu.ru

Ancient permafrost like other natural Earth environments contains a lot of microorganisms that could not be cultivated on nutrient media. Many of these unculturable organisms are in resting state (dormancy, anabiosis), others have unknown requirements. There are some improving techniques for direct investigation of the whole structure of microbial communities in native samples. Besides them GCMS lipids biomarkers analysis is one of the most perspective for astrobiology applications in robotic missions. In this research the ancient microbial community in permafrost from North East Siberia with age 3 Myrs was studied using standard methods of plating onto nutrient media and lipids biomarkers analysis. Spectrum of isolated strains was identified according to biochemical, physiological and morphological features of microorganisms. Both techniques revealed gram-positive bacteria, actinobacteria in particular, as a dominant group in permafrost investigated. Therefore one could conclude: the majority microorganisms that dominate in biomass in native ancient permafrost have good potentialities for resuscitation, and could be indicated and identified.