

DISTRIBUTION OF AEROBIC ENDOSPOREFORMING BACTERIA IN SEDIMENT COLUMN OF BLACK SEA

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Aerobic endosporeforming bacteria (AEB) represent very useful group of bacteria for geological and ecological investigations. They are comparatively simple for determination, isolation, cultivation, and can survive in sedimentary rocks for a long periods of time (Nicholson W. L., 2002). In closed sea basins with a big river infows, like a Black sea, number of mesophilic (i.e., allochthonous) AEB in different layers of bottom sediment can strongly correlate with intensity of river inflow. But, natural gradients of different scales can occur in sediment column. Because temperature sediments of Black Sea (appx. +9°C) is not advantaged for mesophiles, we supposed that comparison of dependences from depth of portions of meso- and psychrophilic AEB in sediment column can answer question about origins of the mesophilic AEB in sediments and, hence, applicability it for geological reconstructions (Mandic-Mulec I. et al., 2015, & Nicholson W. L., 2002).

Samples of Black sea bottom sediments were collected in 2011 by Bremen university expedition “Meteor” in five points (numbered 242, 233 and 249 on the shelve of Turkey, and 258 and 269, shelve of Crimean peninsula, respectively), with depth from 880 to 2000 km. Kerns were divided on sectors for 5 cm (from ‘0’ on bottom surface); samples of point 249 were not used. Work was conducted using classic microbiological methods and statistical calculations. Pasteurized and unpasteurized suspensions of sediments were inoculated in meat-peptone agar, and then cultivated with temperatures 25°C for counting colony of mesophiles and 5°C for psychrophiles, respectively, in five repeats. Dependence of portions of psychrophilic AEB from depth demonstrate a random character, taking values over a broad range (from 0 to 400%), that can be explained by existance of local ecological gradients.

In contrast, portions of mesophilic AEB in all investigated points, independently on location, reveal two “hills”, approximately on depths 5-10 cm and 20-25 cm (those age is 100-200, and 400-500 year, respectively)(Smith L. D. S. & Cato E., 1974). It can be reflexion of climatic changes in area of the Black sea during last 1000 year. These results can be applied in paleoclimatological research and investigation of ecological effect of anthropogenic climate change.

References

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Nicholson W. L. (2002) Cellular and Molecular Life Sciences 59: 410-416
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