

MARINE BACTERIA LIFE DURING THE POLAR NIGHT (HORNSUND, WEST SPITSBERGEN)

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ABSTRACT

Until recently, it was thought that in the Arctic Sea areas covered by ice, during the polar night, all biological processes are reduced to a minimum due to lack of light and inadequate access to food (ie. Winter dormancy). However, recent studies have shown that during this period more biological activity, than one would expect, sustained despite the fact that primary production in this period drops to almost zero. (Berge, Renaud i in., 2015), (Berge, Daase i in., 2015).

The main area of the presented research was located in a bay in the front of Hans Glacier (Hornsund Fjord, West Spitsbergen). Samples were taken in the profile of 0-55 m depth in the points localised in two different distance from the glacier. Samples were collected during the polar night (January 21st) and five days after the first sunrise (February 19th) in year 2014 . The scope of work described in the laboratory work involved identifying indicators of bacterioplankton structures such as the total number (TBN), bacterial biomass (BBM), mean cell volume (ACV), size structure and morphology (by direct counting methods). The bacterial cells were stained with DAPI fluorochrome, according to the standard methodology described by Porter and Feig (1980), and analyzed using epifluorescence microscopy, image analysis of microscopic sample and macro definitions (Świątecki, 1997). In order to assess the activity of living bacterial cells (L/D), the Molecular Probes Kit test was used. For research studies of biodiversity bacterioplankton molecular methods were used with the PCR-DGGE techniques by. Muyzer et al., 1997 . The results indicate higher abundance and biomass bacterioplankton in fjord water in January than in February, the mean of TBN $3,6 \times 10^5 (\pm 6,3 \times 10^4)$ cells cm^{-3} i $2,8 \times 10^5 (\pm 6,4 \times 10^4)$ cells cm^{-3} respectively and the mean of BBM $13,69 \mu\text{gCdm}^{-3}$ i $10,32 \mu\text{gCdm}^{-3}$ respectively.

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