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Title: *Physico-chemical features of fresh and warm waters of West Greenland as microbial communities environment*

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Geothermal activity in Greenlandis mainly known from few parts of coast area, including Scoresbysund in East, where thermal water has temperature of 62°C, and Disko located in opposite side, with warmest water around 18°C. Thermal springs, occurring in Paleogene basaltic pile and Precambrian gneisses of south-west Disko, represent typical fissure groundwater of deeper circulation under permafrost layer. Based on hydrogeological investigations carried out in summer season of 2012 the physico-chemical and isotopic composition (^{18}O i ^{2}H) of Disko warm waters and fresh water of west Greenland has been determined. Hydrogeochemically, thermal waters vary compared with fresh waters of springs, recharged from thaw of ice and snow, or lakes waters, located in the vicinity of the Polonia glacier. Thermal waters have higher mineralization (electrical conductivity EC up to 1712 µS/cm) and temperature (in examined springs to 14,4°C). The predominant ions are: Cl^-, Na^+, Ca^+. The fresh waters of springs and lakes have low mineralization (EC ranged from 25 to 76 µS/cm) and temperature depending on air temperature. In their chemical composition predominate HCO_3- and Ca^{2+}.

Two types of water (fresh and warm) are the environment of different aquatic habitats for microbial communities.In the examined water samples abundance and biomass of bacteria were low, and typical for ultraoligotrophic environments of polar regions. Extremely low number of bacteria occur in the cold springs (an order of magnitude less than in the lakes) 0.51 $x10^5$ cells ml^{-1}. The highest number of bacteria was found in one of the shallow lake in south Disko (4.91 x 10^6 cells ml^{-1}). Specific for springs were very large size of bacterial cells (max. 0,14 um^3), usually almost twice than in the reservoirs. Significant was an increase in the bacterioplankton the percentage of curved shape of bacteria from cold spring (4,8%), recharging the lake system, to the largest lake (15,2%). Cold water of one Disko spring (No Z1) was dominated by rods (80%), and curved forms was hardly noted. In some of the warm spring (Z2) percentage of cocci and curved cells was similar, and in others (Z8) proportions were reversed compared to the Z1 - rods accounted for less than 60% and a curved forms form nearly 30% of bacteria. PCR-DGGE showed the presence of only 16 OUT-s (Operational Taxonomic Units). Higher biodiversity was found in springs water compared to the reservoirs - from 4 to 18 OTU-s. Lakes in terms of bacterial taxonomic composition were similar to each

other, while the springs were different from reservoirs, but also showed significant differences between them. The lowest number of OTU-s was in the spring with temperature of 1,7°C (only 4), the highest one in waters of three warm springs, respectively 18, 16 and 15 OTU-s. In the lake system located in neighborhood of the Polonia glacier 5 to 13 OTU-s were recorded. This suggests that different environmental conditions of those springs.