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FROM 'BENTHOS-DOMINATED' TO 'ZOOPLANKTON-DOMINATED' MODE- IS IT PLAUSIBLE SCENARIO FOR ARCTIC FJORDS?

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Arctic ecosystems and their food webs are particularly vulnerable to climate-related changes and warmer climate may lead to shift from 'benthos dominated' to 'zooplankton-dominated' mode. Therefore, a Face2Face project (From 'benthos-dominated' to 'zooplankton-dominated' mode?—two faces of Arctic fjords in the changing world) was proposed, to recognise and compare the response of benthic communities to processes occurring in water column, in west Spitsbergen fjords with contrasting hydrographical conditions. Hornsund is mainly dominated by the cold arctic waters derived from the Barents Sea, while Kongsfjorden is to a larger degree influenced by warm Atlantic waters.

We hypothesized that in Arctic coastal waters the structure of pelagic assemblages, which are conditioned by inflowing water masses characteristics, determine organic matter properties, flux and export to the sediments, what in turn leads to enhanced benthos abundance and functionality. Wide spectrum of water column organisms (bacteria, nano- and microplankton, zooplankton), composition of benthic components (bacteria, meiofauna, macrofauna) as well as biochemical characteristics of sediment and water column of two model Arctic fjords were analysed.

The comprehensive study enabled us to observe that first of all pelagic ecosystems are affected by variations in water mass distribution and advection. Zooplankton community in Kongsfjorden was more abundant in comparison to Arctic Hornsund, with 'boreal' and 'ubiquitous' species more numerous in Kongsfjorden. In contrast nano- and microplankton biomass was several times higher in Hornsund, while bacteria numbers and biomass up to 2 times. It is going in accordance with higher concentration of Chl *a* through water column and elevated flux of Chl *a* to the bottom recorded for Hornsund fiord. Availability of organic particles is in turn reflected by the significantly higher biomass of filter feeders macrobenthic organisms, but not in meiofaunal communities, which were highly comparable between fjords in terms their abundance and biomass. Obtained results showed that although ecological response of benthic communities is not unequivocal, differences in environmental conditions of Spitsbergen fjords altered functioning of the pelagic and bottom-dwelling organisms. Changes in structure and functions of ecosystems are taking place in Spitsbergen fjords. But are they occurring due to ongoing warming, are reversible or not? Still remains an open question.