

## Ecological and Geographical Characteristics of Phytoplankton in the Eastern Laptev Sea (Autumnal Season 2008)

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The Laptev Sea constitutes the central part of the wide Siberian Arctic shelf. It is considered to be one of the key regions where the changes in the marine environments as a result of the climate variability are the most pronounced (KASSENS et al. 1999, 2009). The marine phytoplankton communities and their structure are directly affected by the changes in temperature conditions, extent of sea-ice cover, water masses circulation, riverine outflow, and other parameters. Therefore, comprehensive analysis of the present state of the pelagic ecosystem and their inter-annual dynamics will indicate the direction of biological feedback processes in the Laptev Sea.

The previous reported evidences for the autumnal phytoplankton in the Laptev Sea are related mainly to the end of the past century (GOGOREV 1994, HEISKANEN and KECK 1996, SOROKIN and SOROKIN 1996, TUSCHLING et al. 2000), and show heterogeneous phytoplankton distribution which is largely dependent on the prevalent hydrography and hydrodynamics. Our research of autumnal phytoplankton in 2008 is the contribution to the environmental monitoring of the Laptev Sea ecosystem, which is carried out in the framework of the multidisciplinary program “Laptev Sea System”. The main aims of our research are: (1) to study the species composition of phytoplankton communities, (2) to reveal the spatial-temporal peculiarities of phytoplankton biomass and species abundance in relation to local hydrological conditions during the investigated period.

The studied phytoplankton samples were collected during the joint Russian-German expedition “TRANSDRIFT XIV” in September 2008. Phytoplankton abundance was determined by cell counting, which provided the basis for biomass calculations according to taxon-specific carbon values. The Shannon index was applied to describe the species diversity.

In total, 95 species were identified (*Dinophyceae* – 45 taxa, *Bacillariophyceae* – 47 taxa, *Chlorophyceae* – 2 taxa, *Chrysophyceae* – 1 taxon). The overall abundance of algae in the water column ranged from 0.01 to  $1.3 \times 10^3$  cell  $\times$  l<sup>-1</sup>. Total phytoplankton biomass in the water column

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varied from 0.02 to 2.41  $\mu\text{g C} \times \text{l}^{-1}$ . The highest values of algal abundance and biomass were observed in the vicinity of the Lena Delta. In general, total abundance and biomass gradually decreased northward. The obtained results indicated that we observed a late stage of a seasonal succession pattern of the phytoplankton community. Diatoms were dominated by species of *Chaetoceros* and *Thalassiosira* genera (*Thalassiosira baltica*, *T. hyperborea*, *Chaetoceros diadema*, *C. socialis*, *C. wighamii*). Dinophysis were mainly represented by *Dinophysis acuminata*, *D. rotundata*, *Gonyaulax spinifera*, *Preperidinium meunierii*, *Protoperidinium bipes*, *P. pallidum*, *P. pellucidum*. Heterotrophic and mixotrophic forms were characteristic of dinoflagellate communities during the investigated period. The highest species diversity was found at the stations in the vicinity of the Lena Delta. Analysis of salinity preferences of algae species showed that algae were represented mainly by marine and brackish-water marine species. The contribution of freshwater species was negligible. In terms of geographical analysis arctic-boreal, arctic-boreal-tropic, and cosmopolitan, species were characteristic of algal communities. Tropical-boreal species are considered to be an indicator of Atlantic water masses. The obtained results generally agree with previously published data on phytoplankton composition and its distribution in the eastern Laptev Sea during autumn (GOGOREV 1994, HEISKANEN and KECK 1996, SOROKIN and SOROKIN 1996, TUSCHLING et al. 2000).

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