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The Phytoplankton of the Present-Day Central Caspian Sea

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During 2004–2008 the seasonal species succession of phytoplankton species and the quantitative structure of the phytoplankton community were examined in the area of the central part of Caspian Sea. A change in the type of diatom species dominant in the phytoplankton was noted: instead of the large-cell diatoms *Pseudosolenia calcar-avis* and *Dactyliosolen fragilissimus*, which traditionally dominated in the 1960s–1980s, *Pseudo-nitzschia seriata*, *Cerataulina pelagica*, and *Chaetoceros peruvianus*, all new species for Caspian Sea, now prevail during the spring-summer bloom.

A winter bloom of *Cerataulina pelagica* was for the first time observed in this area in the second half of February 2008 (up to 10^6 cells/l) at a temperature of 11.4°C when the water layer was uniform in temperature down to a depth of 120 m. The bloom occurred down to 100 m depth, and cells were practically equally distributed in the upper 50 m. The phytoplankton biomass in the upper layer reached 5.6 g/m^3 , with half that value at a depth of 100 m. The *C. pelagica* bloom was accompanied by development of *Pseudo-nitzschia seriata* (up to 10^6 cells/l).

Pseudo-nitzschia seriata and *Cerataulina pelagica* were the main dominant species in the Black Sea phytoplankton during the 1970s–1980s, but according to our observations the coccolithophorid *Emiliania huxleyi* and the pennate diatom *Pseudo-nitzschia pseudodelicatissima* presently dominate there. Our research in the central Caspian Sea showed presence of *E. huxleyi* and *P. pseudodelicatissima* in the plankton phytocenosis. In addition, some dinoflagellate species new for the Caspian Sea and the coccolithophorid *Braarudosphaera bugelowii* were found.

The change in the diatom component of the bloom phytoplankton community has led to a decrease in ecosystem productivity. Despite the fact that during May and October–November the diatoms bloom biomass reached $0.15\text{--}0.2 \text{ g C/m}^3$, it was twice as low as in the 1970s–1980s when *Pseudosolenia calcar-avis* dominated. The change in dominant diatom species and the increasing role of picoplankton in the primary production of the ecosystem demonstrate that the stability of the pelagic ecosystem in the central Caspian Sea is currently limited.



This is a map of the Caspian Sea including a small locator map. The drainage basin of the Caspian Sea is in yellow. The map is based on USGS and Digital Chart of the World data. Note the Aral Sea boundaries are circa 1960, not current boundaries. Wikipedia Commons at en.wikipedia.org. January 8, 2007. Accessed February 2009.