

Do planktonic ostracods composition and spatial distribution response to the warming of Antarctic environment?

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Abstract

Since water mass distributions reflect the responses of the ocean to variations in climate, the responses of planktonic animals can be manifested in the behaviour of the indicator species. The distribution of mesozooplankton is influenced by a range of abiotic factors that vary in time and space. In the upper ocean, the boundaries of the horizontal distributions of both individual species and species assemblages are associated with discontinuities at ocean fronts. Planktonic organisms are highly variable in their sensitivities to hydrographic changes; some of them have the potential to be used as indicators of even the most subtle changes in the hydrographic structure within the water column. Planktonic ostracods are a ubiquitous component of plankton communities especially at subthermocline depths. Despite their relatively high abundance and sufficient diversity, they are rarely studied, so their potential value as indicators of observed recently climate warming remains unrealised.

The aim of this study was to investigate the composition structure and spatial distribution of planktonic Ostracoda in the Drake Passage, which connects the southwestern part of the Atlantic Ocean (Scotia Sea) with the southeastern part of the Pacific Ocean and extends into the Southern Ocean. The Drake Passage is an important place to the unimpeded flow of the Antarctic Circumpolar Current, which carries a huge volume of water through the Passage and around Antarctica. This current consists of many hydrographic fronts, which divide the Southern Ocean into several physical and biogeochemical zones. Twelve pelagic ostracod species were indicated at 21 stations situated along a transect between King George Island and Argentina. The Antarctic Zone was evidently distinguished from other two zones in terms of species diversity and abundance, while the Polar Front and Subantarctic Zones were similar in term of taxonomic composition. Comprehensive analysis of ostracod distribution allowed us to indicate species typical for particular zones, namely *Alacia hettacra* as dominated species in Antarctic Zone, *Discoconchoecia elegans* in Polar Front Zone and *Pseudoconchoecia serrulata* in Subantarctic Zone. It has been also clearly shown that *Conchoecia magna* - a mesopelagic species that is widespread throughout tropical and subtropical seas - was distributed further south than described in the literature. So far its occurrence in the Southern Ocean has been restricted to the north of the Subantarctic Front. Our preliminary results indicated that this subtropical species crossed its southern boundary of distribution range and hereby confirmed important role of ostracods in monitoring and modeling the impact of climate warming changes in the pelagic Antarctic ecosystem.

Keywords: ostracods, indicators, climate changes

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