
FACTORS CONTROLLING INITIAL DEVELOPMENT OF POLAR BRYOZOAN ASSEMBLAGES

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Understanding the population dynamics of adult benthic organisms is almost impossible without understanding the processes related to the initial development of benthic communities. Factors controlling the processes of recruitment, regarded as the input of new individuals into a population or community, seem to be especially important. The bryozoan mode of life includes both a pelagic and a sedentary phase. In addition their meroplanktonic forms exhibit various dispersal strategies from long planktotrophic phase to a short time in the water column as a lecithotrophic larvae. Therefore, bryozoans as group serve as good model organisms for studying processes related to initial phase of benthic community development. This investigation aims to reveal some of the factors controlling the recruitment of bryozoans occurring in polar regions.

The study was conducted in maritime Antarctic at King George Island - the largest of South Shetland Islands (62° S, 58° W) and lasted for almost three months during the austral summer 2010-2011. Two locations contrasting in terms of biological and physical conditions, were selected in Ezcurra Inlet, the branch of Admiralty Bay. At each of three depths (6, 15 and 21 m) we deployed rocks of various sizes together with colonization panels cleaned of any organisms. These installations served as experimental substrates and enabled us to examine recruitment pattern at chosen locations and depths. Information about local bryozoans species pool was established based on identification of species from at least 100 of rocks from each depth. In order to determine larval occurrence in the water column three times during the experiment plankton samples were collected above bottom with the use of a plankton net (20 µm mesh size). During the investigation a wide range of environmental parameters including water temperature, light intensity and movement of the substrate were recorded.

Despite the small distance between the two study locations the species pool had great influence on observed pattern of recruitment. The species composition of new recruits overlapped with those present in nearby assemblages at all examined locations and depths. The dominance structure was identical between the new recruits and the old established assemblages, with *Inversiula nutrix* as the most abundant species in majority of cases at both sites and all studied depths. Number of species and individuals of newly recruited organisms correlated strongly to number of species and individuals recorded in local old assemblages. Although meroplanktonic taxa were not recorded in high numbers, overall taxon richness was higher at location with the most diverse species pool of bryozoans. Regression analysis revealed no influence of rock size on initial development of assemblages. No increase in number of species or individuals with increasing rock size was recorded. There was no clear effect of water temperature and light intensity on observed pattern of recruitment. At the shallower sites movement-loggers indicated the higher intensity of substrate dynamics. At one site a significant decrease in species number at shallower depths was noted which could be the result of a higher disturbance regime. At other site number of species recruited ranged between 12 and 14 species at the three studied depths. Therefore, no clear pattern of these parameter was observed with changing depth.