

Received:February,2.2009 Accepted:October,7.2009

Abstract

Experimental tidal flats with peaks and trenches were constructed in a tidal flat mesocosm system (TFMS). The effects of changes in absolute elevation, i.e., changes in datum level on the structure of the benthic communities and sediment matter were investigated. Further, planktonic larvae of the Japanese littleneck clam (*Ruditapes philippinarum*) were added, and the relationship between larval settlement and the peaks and trenches was investigated. In terms of the structure of macrobenthic communities, the spatial distribution of the biomass of each feeding type corresponding to the areas of peaks and trenches was maintained, although the datum level was lowered from 0.3 m to 0 m. Macrobenthic biomass, as a whole, did not change with variations in the datum level. However, when the datum level was lowered, feeding type of macrobenthos altered from subsurface deposit-feeding types to suspension and surface deposit-feeding types. This may be due to the increase in flux of particulate organic matter, and the increase in the abundance of sedimentary organic matter and bacteria in the trenches. Moreover, it is thought that physical accumulation in trenches is also an important factor. The spatial distribution of meiobenthic biomass was similar to that observed in macrobenthos with variations in the datum level; however, the biomass as a whole decreased. The deviations of biomass of the sediment matter and bacteria at the areas of peaks and trenches increased when the datum level was lowered. Trenches exhibited the highest density of Japanese littleneck clams; this tendency was similar to that observed in suspension-surface deposit feeders, and may be attributable to physical accumulation. The juvenile density was too large for these animals to have been initial settlers; thus, they were probably relocated individuals. It is thought that juveniles actively drifted in the TFMS.