THE EFFECT OF FISH AND BIRD PREDATION ON AN ESTUARINE MACROBENTHIC COMMUNITY: RESULTS OF AN EXCLOSURE EXPERIMENT

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The highly productive benthic fauna in the intertidal areas of the Scheldt Estuary is an important food source for the higher trophic levels in the estuary. During summer and autumn thousands of birds and juvenile fishes visit the mudflats to forage. Previous studies designated the flatfishes flounder (*Platichthys flesus*) and sole (*Solea solea*) and the shelduck (*Tadorna tadorna*) as the most abundant foraging fish and bird species in the brackish part of the estuary. To examine the effects of predation on the benthic fauna, an exclosure experiment was carried out on the mudflat of Appelzak near the Dutch-Belgian border. Fish and bird exclosures and controls were placed on the mudflat at MLW+3m and monitored from July to September 2003. There was no significant effect of the exclosures on sediment properties. In the short timescale considered, the exclosures had little effect on benthos densities. On the other hand, predation seemed to act on the size distribution of *Corophium volutator* and *Nereis diversicolor*, two of the most important macrobenthic species in the mudflat. Stomach analysis of the most abundant fish species and analysis of shelduck droppings demonstrated the size selective predation by these species. The mean size of *C. volutator* was significantly larger in the cages and in the stomachs of fishes, while the size distributions of *C. volutator* in the field and in the droppings of shelducks were similar, showing the selection of larger individuals by fishes and non-size-selective feeding by birds. With regard to *N. diversicolor*, diet analysis of fishes and ducks indicated that they both selected the larger specimens. In the cages, however, a smaller mean size of the ragworm was recorded. *N. diversicolor* biomass was higher under predator-free conditions, but this could be almost fully accounted for by a few larger specimens in the cages. Our results suggest that in this particular situation predation by fishes and birds mainly affects the size distribution of *C. volutator*, resulting in smaller specimens in the mudflat. The patterns for *N. diversicolor* are less clear, but the results indicate that the biomass may be higher under predator-free conditions. In the absence of predation, other mechanisms such as inter- and intraspecific competition will probably become more important.