

Macrobenthic communities of the Belgian Continental Shelf: analysis of combined data collected over a six-year period

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Within the frame of different research projects, a large number of stations on the Belgian Continental Shelf (BCS) were sampled for the macrobenthos between 1994 and 2000. These samples cover a diverse range of habitats: from the sandy beaches to the open sea, from the gullies in between sandbanks to the top of the sandbanks, and from coarse sandy to clay sediments. To investigate the large-scale spatial distribution of the macrobenthos of the BCS, the data of all these research projects – 768 sample places in total – were combined and analyzed. By means of several multivariate techniques (Two Way Indicator Species Analysis, Detrended Correspondence Analysis and Cluster analysis), 10 sample groups were distinguished. Each sample group is found in a particular physico-chemical environment and contains a specific set of species.

Four sample groups are differing drastically, both in habitat and species composition, and are considered to represent four macrobenthic communities. A first community, the *Abra alba*–*Mysella bidentata* community, is found at sites, situated mainly in the gullies of the western Coastal Banks, with fine sandy sediments and relatively high mud contents. The high macrobenthic diversity (N_0 : 25 species/sample on average) and densities (5356 ind/m² on average) are characteristic for this group. The dominant species are the bivalves *Abra alba*, *Spisula subtruncata* and *Mysella bidentata*, the polychaetes *Lanice conchilega* and *Sthenelais boa*, and the crustacean *Pariambus typicus*. The second community, the *Nephtys cirrosa* community, is found in stations with medium sandy sediments and a very low mud content. This group is less diverse (N_0 : 7 species/sample on average) and the densities are low (402 ind/m² on average).

The macrobenthic diversity and densities of the third community, the *Ophelia limacina*–*Glycera lapidum* community, are very low, respectively 5 species/sample and 180 ind/m² on average. This community is found at stations with coarse sandy sediments and is typically situated on the sandbanks further off-shore (Flemish banks, Hinder banks and Zeeland banks).

The fourth community, the *Eurydice pulchra*–*Scolelepis squamata* community, is exclusively found at the high intertidal sandy beaches and is characterized by a low diversity (N_0 : 5 species/sample on average) and high densities (305 ind/m² on average). Typical species are the crustaceans *Eurydice pulchra* and *Bathyporeia spp* and the polychaete *Scolelepis squamata*.

Of course these macrobenthic communities are not isolated from each other and five specific transitional species associations were found. The transition between the *Abra alba*–*Mysella bidentata* and the *Nephtys cirrosa* community is characterized by a decreasing diversity, mainly caused by a decrease in mud content. This transitional species association contains high densities (1263 ind/m² on average) of the polychaete *Magelona mirabilis*. The transition between the *Nephtys cirrosa* and the *Ophelia limacina*–*Glycera lapidum* community is characterized by decreasing densities and coincides with a gradual transition between medium and coarse sandy sediments. From the *Nephtys cirrosa* to the *Eurydice pulchra*–*Scolelepis squamata* community, transitional species associations, related to the transition from the subtidal to the intertidal environment, were found. No transitional species associations were found between the *Abra alba*–*Mysella bidentata* and *Ophelia limacina*–*Glycera lapidum* communities, nor between the *Ophelia limacina*–*Glycera lapidum* and the *Eurydice pulchra*–*Scolelepis squamata* communities.

The spatial distribution of the macrobenthos of the BCS is thus characterized by four drastically different communities, 'connected' with each other by means of gradual transitional species associations.