

## 13.5 SUBLITTORAL ECOLOGY

The fauna of the sublittoral mud sampled by the MNCR in the mid-estuary consisted of the polychaetes *Ophryotrocha hartmanni*, *Malacoceros fuliginosus* and *Capitella capitata* and the oligochaetes *Tubificoides benedii*, *T.pseudogaster* and *T.swirencoides*. The species richness of the sublittoral mud of the mid-estuary was considered as low (Brazier *et al.*, 1998).

In the lower estuary, the benthic sublittoral community contains a greater diversity of polychaetes and high numbers of bivalves such as the horse mussel *Modiolus modiolus*, *Abra alba*, the pullet carpet shell *Venerupis senegalensis*, striped venus *Chamelea gallina*, smooth artemis *Dosinia lupinus* and sand gaper *Mya arenaria* have been recorded. The community is particularly rich at Lloyd's Hailing adjacent to Mussel Scarp.

### 13.5.1 Results of Subtidal Survey

A total of 49 species were found in the subtidal samples, comprising mainly annelids, with a small molluscan and crustacean component. Representatives of the nemertea, echinodermata and phoronida were also found (see Appendix 13.4 for species matrix).

The most numerous species over the whole site was the polychaete worm *Capitella capitata*, this species typically occurs in muddy sand and feeds on micro-organisms and detritus. It frequently occurs in enormous numbers in areas of organic enrichment, such as areas exposed to sewage (Fish & Fish, 1989) and can indicate polluted conditions (Hayward & Ryland 1995). On the Tyne, this species was found in very high numbers in some of the subtidal samples, e.g. 107,370 individuals per m<sup>2</sup> at sampling station TC9.

The second most abundant species over the whole site was the polychaete worm *Ophryotrocha hartmanni*. Other dominant species were the oligochaetes *Tubificoides benedii* and *Tubificoides pseudogaster* and the polychaete *Malacoceros fuliginosus*. These species typically occur in disturbed environments or those exposed to organic enrichment.

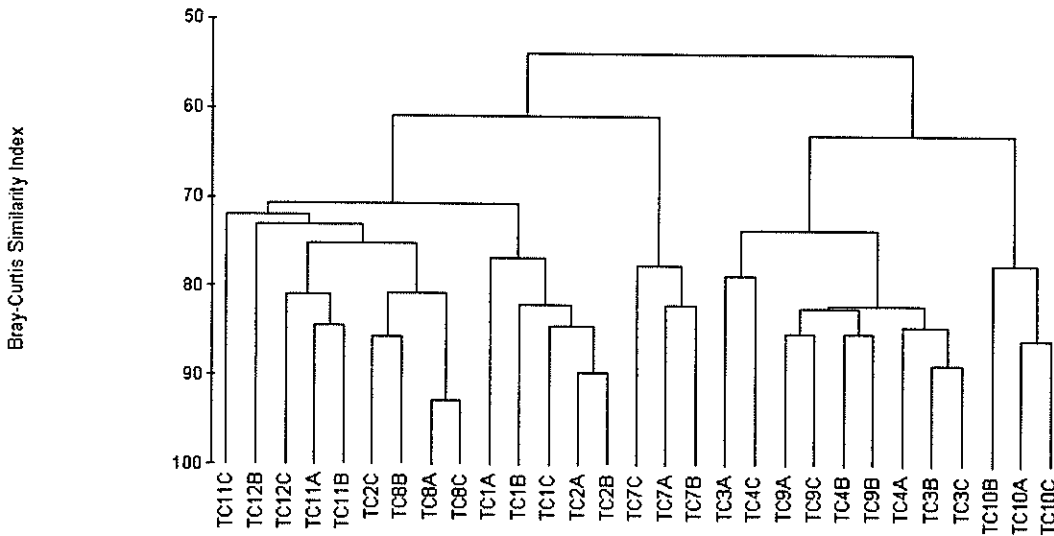
Multivariate analysis of the samples by PRIMER, indicated that fauna of the subtidal samples are much more similar in composition than the intertidal samples (see Figure 13.5.1). This is probably due to the similarity of the environment at each site in terms of type of sediment and other factors which affect community composition such as wave exposure and salinity. As illustrated in Figure 13.3.4, all the subtidal samples comprise sandy mud. The level of biomass at each site varied between 20.46 g/m<sup>2</sup> and 636 g/m<sup>2</sup> with a mean of 193.11 g/m<sup>2</sup>. There was a mean number of species at each subtidal sampling station of 12.47.

At each subtidal sampling station the fauna was generally either dominated by *C.capitata* or *T.benedii*. Those stations in the centre of the channel e.g. TC1, TC2 tended to be dominated by *T.benedii* whereas those stations towards the banks of the River or in Howdon dock, were dominated by *C.capitata*. The fauna of the sites conformed to either of the following biotopes, as described by Connor *et al.* (1997): IMS.Cap (*Capitella capitata* in enriched sublittoral muddy sediments), IMU.Tub (*Tubificoides* spp. in reduced salinity infralittoral muddy sediment) or IMU.CapTub (*Capitella capitata* and *Tubificoides* spp. in reduced salinity infralittoral sediment).

Almost all the species encountered on the survey are what one would expect to find on the estuary (Garwood, P., *pers. comm.*), except for a single species of *Euchone* sp., which does not fit any of the known British genus. It is in all probability an immigrant species which inhabits estuarine localities and is in the process of spreading around the UK. It therefore is probably of very little significance in respect to this study (Garwood, P., *pers. comm.*). No individuals of the nationally scarce *Molgula oculata* were recorded in any of the samples.

The level of diversity, measured by the Shannon-Weiner diversity at different points in the River Tyne is illustrated in Figure 13.6. From this figure it can be seen that the sites in the

centre of the estuary are in general more diverse than those in inlets such as Howdon dock. Site TC7 is the most diverse (Mean value = 1.6) and sites TC9 and TC10, which are in Howdon Dock, the least (0.34 and 0.39 respectively). The low level of diversity at these sites is most likely due to the dominance of the infauna by very high numbers of *C.capitata*.



**Figure 13.5.1** Dendrogram of Bray-Curtis similarity index (log(x+y)) of subtidal samples from the River Tyne.