Section 2 Week 7

The Living Element

Part 2 Benthos

2.1

Benthos

The term 'benthos' is used to describe those organisms living on or in the bottom of a water mass or closely related to it. This includes not only the whole range of invertebrate species but also the bottom dwelling (demersal) fish such as flatfishes, gadoids and gobies. The benthic system is characterized by its direct relationship to the type of substrate.

2.2.

Structure and Size

Benthic organisms display a wide range of structures of varying size, lifestyle and ecological roles. For the purpose of methodology benthic organisms are divided into various categories, and different criteria and terms have been coined to describe the various components of this spectrum. Thus in relation to size benthic organisms are designated as :

i) **microbenthos** (<100 mm), comprising bacteria and protists

ii) **meiobenthos** (100-500mm), small metazoa and a few large protists (foraminifera)

iii) **macrobenthos** (>500mm) larger metazoa and

iv) **megabenthos** (very large) large crustaceans, molluscs etc.

This division according to size, and the above- mentioned limits is to some extent an arbitrary one, corresponding to scientists' need to refer to standard categories and to use the equivalent sampling gear. Nevertheless this type of classification relates also to the role that the different categories play in the ecosystem. For instance meiobenthic organisms which usually live among the grains in the sediment, eating mainly bacteria and having densities ranging from a few hundreds to a few million per square metre, have a completely different

role than the large predator species of megabenthos living on the bottom surface with densities of less than 1 individual in 10 square metres.

2.3

Feeding types

However the most important division within benthic fauna is the one which is concerned with feeding types. Every species is a unique combination of morphological elements, internal anatomic structure, physiological peculiarities and ecological preferences. Yet it is possible to distinguish types of organisms which have some characteristics in common, by the way they acquire their food which in turn determines various other parameters of their lives.

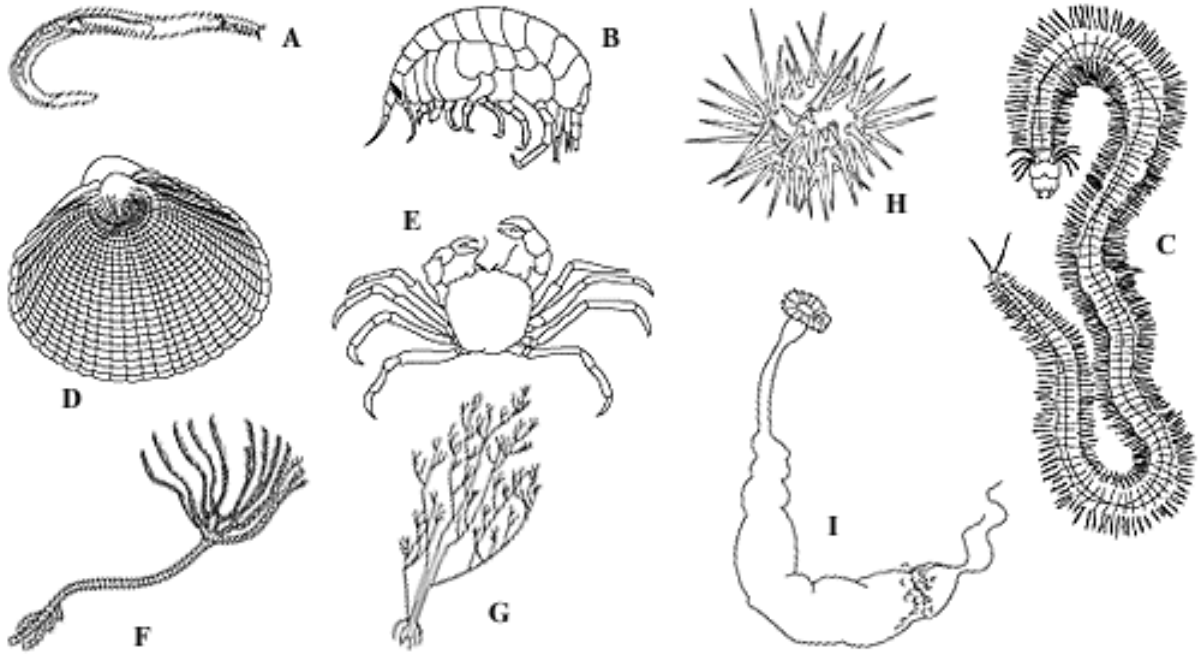

Figure 17. Representative members of Zoobenthos:
A. nematode; B. amphipod; C. polychaete; D. bivalve; E. crab; F. crinoid;
G. hydrozoan; H. sea urchin; and I. sipunculan.

A nematode; B amphipod; C polychaete; D bivalve; E crab; F crinoid; G hydrozoan; H sea urchin; and I sipunculan.

2.3

Feeding types

The main benthic feeding types can be divided in two ways: what they feed on and how they feed. The first category can be divided into **herbivores, carnivores and detritivores** and the second into **suspension feeders, filter feeders, detritus feeders, scavengers, predators.**

2.3.1 Category 1

Herbivores

These are organisms which feed on plant material. They live mainly on plants or on the sediment surface, usually in shallow areas, and have special mouth parts (e.g. radula) which enable them to cut and chew vegetal material.

Carnivores/Predators

These are organisms which feed on live individuals of various sizes. They have well-developed sensory organs, which enable them to detect prey, they are highly mobile in order to pursue their prey and they have special mouth parts, jaws, teeth and extendible pharynxes to capture and consume their prey. Carnivores are found at all depths, on both hard and soft substrates.