Amphipods and benthic biocoenosis on the Coasts of Alboraya-Albuixech (Spain, Gulf of Valencia, Western Mediterranean)

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The studied zone, north of Valencia city, corresponds to a typical sandy coast ecosystem of 5 km length. This area is suffering an important anthropic pressure (residual waters flows, fisheries, and urban, industrial, touristic and agricultural activities) which originates a general regression. Harbours and breakwaters, are the hard substrates that can be found there.

GINER (1989) studied the infralittoral biocoenosis distribution based on the molluscan fauna, and MARTI (1989) using information from amphipod fauna contributes to a better characterization of these biocoenosis in the area.

Different methods have been used to take samples of the different types of biocoenosis such as scoop net, Aberdeen double side anchor dredge, Agassiz trawl and scraped surfaces 25x25 cm, from 21 stations (15 from soft substrates and 6 from hard ones). The location of these stations were chosen on purpose to define the whole conditions of the studied area.

RESULTS.

SUPRALITORAL ZONE.

* LDL biocoenosis:

It can be found along the shoreline. The sediment is formed by a mixture of pebbles and fine sand, on which masses of several types of organic debris and Posidonia oceanica rhizome fibrils are located. This biocoenosis is characterized by the existence of high density populations of Orchestia platensis together with sporadic specimens of Talorchestia deshayesii.

MEDIOLITORAL ZONE.

* AP biocoenosis:

Species mentioned by LEDOYER (1968), BELLAN-SANTINI & LEDOYER (1973) from shallow algae populations and from high polluted areas as Jassa marmorata, Corophium acutum, C. insidiosum, Caprella aquilibra and Elasmopus rapax have been located on artificial rocky substrates at the study area. Among all of them, the last species characterizes the Mytilus galloprovincialis and Corallina elongata facies, and it is only found in those facies at the studied area.

INFRALITTORAL ZONE.

* SFHN biocoenosis:

It has a very slow specific richness, with only dispersed individuals from nearby biocoenosis, Corophium sextonae, Harpinia pectinata, Siphonocoetes sabatieri and Urothoe poseidonis can be found. It may be due to the sensitiveness of this group to highly polluted waters, pointed out by DAVIN (1981), and to the artificial structures settled --harbours, breakwaters, urban effluents-- which also alter the hidrological and sedimentary factors.

* SFBC biocoenosis:

It reaches 9-10 m depth where the upper limit of the P. oceanica meadows is settled. The existence of Perioculodes longimanus, Pariambus typicus, Ampelisca brevicornis, Leucothoe incisa, Microprotopus maculatus and Urothoe poseidonis helps to the precise characterization of this biocoenosis.

High densities of Siphonocoetes sabatieri and Gammarus crinicornis, typical species from low salinity environments, are found in some sectors of this biocoenosis under the influence of fresh-waters flows. Fluctuations in the populations of these species can be observed, and there is a substitution from S. sabatieri to G. crinicornis in winter probably due to the variability of the hidrological and sedimentary factors and to the opportunist nature of them.

* Posidonia oceanica meadows:

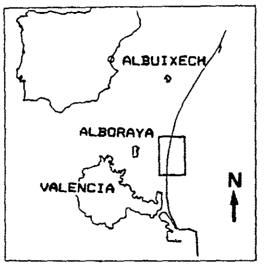
It shows a high regression degree (1 or 2 shoots/m2 to -10 m) buried by sandy sediment where dense Caulerpa prolifera patches are developed. This biocoenosis is characterized in the sampled area by Ericthonius punctatus, Maera inaequipes, Orchomene humilis and by Leucothoe richiardii which are found in the meadow and in the enclaves of biological sciaphilic concretionated algae and porifera. All these species have been already mentioned in the rhizome terraces of P. oceanica (CHEVREUX, 1910; HARMELIN, 1964; LEDOYER, 1962; LEDOYER, 1968).

* SGCF biocoenosis:

It is found in big pot-holes and channels in the P. oceanica meadows. The existence of Monoculodes carinatus, Pontocrates arenarius, Ceradocus semiserratus, Guernea coalita y Socarnes erythrophtalmus, characterizes this biocoenosis perfectly.

* Enclaves of circalitoral biological concretionated masses:

They are developed on the dead rhizome terraces of P. oceanica. These enclaves are identified by the presence of Iphimedia serratipes, Lysianassa pilicornis and Pseudoprotella phasma, typical species of circalittoral zone and coralligenous bottoms, and also by the exclusive localization of an unidentified species of Maera.



Map of the studied zone

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The food web of *Posidonia oceanica* beds around the Island of Ischia (Gulf of Naples -Italy) : a new trophic index

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The Posidonia oceanica system, characterized by high productiv and biomass partly exported to other coastal systems, supports a v complex food web (Chessa et al., 1982). Many trophic studies can need to define the energy flow through the system: gut cont analysis, calorific measurements, weight data, trophic groups analys etc (ref. Kikuchi et Peres, 1977). The trophic behaviour of mac zoobenthic species sampled by a bottom trawl in different prairies analyzed and a new index is proposed as a feeding behaviour descript The use of such an index allows for a precise description of feeding habits of a species and is useful in direct spat representations and multivariate analysis techniques.
Twelve samples were obtained in different Posidonia prairies around island of Ischia: the first 6 in winter, the others in summ collected at depths ranging from 15 to 25 meters with a bottom tr with a 2 cm mesh, deep frozen and then fixed in 70% alcohol. The contents of each species in each sample were identified, quantified means of an arbitrary code ranging from 0 to 4 (0=absent; 4=v abundant) and recorded in a matrix "species/food items". A multivari analysis was performed on such data to define the principal compone of the trophic model in the studied prairies (fig.1). It is a fact t generally, in such analysis, the observation points are ordered mai on the first two axes, one of which can be mainly related to prey si while on the second the food items are ordered according to type -pl or animal- of prey. If the principal components of such trophic mod are these, it is possible to redescribe the species on the basis these factors. The species were coded on the basis of a two di parameter calculated as follows:

- the first digit represents the feeding habit -vegetarian carnivorous- of the species and is calculated by the formula:

$$\textbf{first digit}=(\Sigma V - \Sigma C)/\Sigma M$$

whe V=abundance of vegetal items; C= abundance of carnivorous ite M=abundance of each considered item. In such a way we can distingu omnivorous organisms (first digit close to 0), pure carnivores (fi digit close to -1), pure herbivores (first digit close to 1).

- The second digit represents the size scale of the prey and calculated by the formula:

$$\textbf{second digit}= \ln\,(\Sigma\,(PS_i \times N_i)/\Sigma M)$$

whe PS_i= mean prey size (size measured in mm or in mg) of prey "i"; N_i= abundance; M= as defined previously. The use of logarithmic sc allows to discriminate microphagous organisms, eating prey items l than 1 mm (second digit negative) from macrophagous ones (second di with positive values).
A total of 76 species were collected, while 26 food items w identified in the gut contents. A matrix was then compiled on the ba of the trophic code and it is possible to see that, plotting different species on a x-y system using the two digits of the code descriptors, a model very close to the multivariate one is obtained. particular we observe that the principal clusters showed by a P.C are reproduced in the new code based trophic model (fig. 1 and Species can be then grouped into trophic categories as shown in fig to be analyzed by common mathematical methods and such groups are far better descriptors then those generally defined only on an empi basis. As one can observe, the two representations -using the i items and trophic index plotted- directly provide a single model of prairie, in which the importance of vegetarian and detritivo organisms is assessed. Predators are represented only by a few spe of fishes plotted in the second quadrant. The model obtained is us to classify the 96 considered species into calculated tro categories as far as the trophic index calculated for each species be considered relatively constant of any ecosystem, while t position in a multivariate analysis model depends on the contribu of other observations considered.
The trophic index described can be considered a valid solution compare data resulting from different investigations and may be use define the differences observed in the feeding behaviour of a spe studied on different temporal or spatial scales. The use of this i allows to get over the first ordination model, given that food i are generally ordered on the basis of size and qualitative compone Our research can thus be directed in the definition of measurable comparable trophic groups and food web models.

P.C.A.

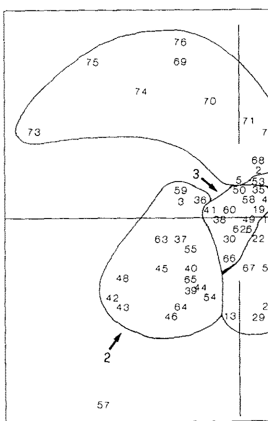
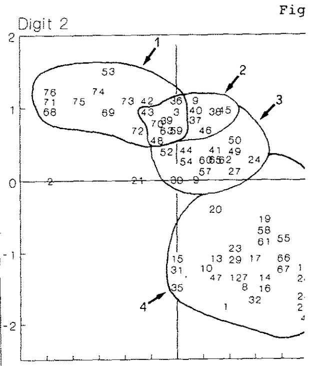


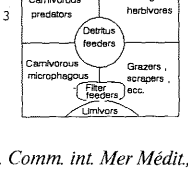
Fig. 1

Classification by two digits co



Fig

Fig.3



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