A study on the food web of the Posidonia oceanica (L.)Delile ecosystem: analysis of the gut contents of Decapod Crustaceans.

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Summary. In the framework of a research carried out in order to define the food web of the vagile fauna living on Posidonia oceanica beds,the gut contents of Decapod Crustaceans are analyzed.
The analysis of data indicates that most Decapod species have "opportunistic-detritivorous" feeding habits.

Résumé. On examine la position de quelques espèces de Crustacés Décapodes dans le reseau trophique de l'herbier de Posidonies de l'Île d'Ischia. L'analyse des données montre que la majorité des espèces a un comportement alimentaire de type détritivore-opportuniste.

- INTRODUCTION-

The trophic complexity of a seagrass ecosystem is very high because of noumerous intermediates of the food web (Nelson,1981). As far as Posidonia oceanica ecosystem is concerned,it is claimed that energy transfer from primary producers to higer trophic levels occurs mainly via "detritus food chains" (Ott & Maurer,1977).

Feeding behaviour of individual taxa can offer an insight in the structure of the food web, particularly when, as in the case of Decapod Crustaceans,they are frequent and occupy a wide range of trophic positions.

In the mainframe of an investigation carried out to define the structure of the food web of the vagile fauna living on Posidonia oceanica prairies around Ischia (Gulf of Napoli) ,the trophic position of Decapods as syntaxon was analyzed.

The study was performed by examining their gut contents.

- MATERIALS AND METHODS -

Samples were taken by means of a "Gangamella" (Cfr. Chessa,1980;Santarelli & Micale,1963) having a 4 cm. mesh, in Posidonia oceanica beds around the Island of Ischia,at dephts ranging from 5 to 33 meters. The animals from each sample were deep frozen and then preserved in alcohol 70%.
The identification of the species was carried out mainly on the basis of the Zariquei-Alvarez (1968) classification.

The gut content of each individual was examined and identified to the lowest possible taxonomic level. The abundance of each food item was arbitrarily coded from 1 to 4. 12 food items (tab.1) were entered in a "species/food items" matrix which was analyzed by the autovectorial technique known as "A.F.C.". This technique was used because it allows the simultaneous representation of both variable and observation points in the same factorial space.

The significance of the axes was tested by the method proposed by Frontier (1974).

Tab. 1 : Food items considered in the analysis-

1)Green Posidonia	(gp)	5)Bryozoa	(br)	9)Amphipods	(an)
2)Brown Posidonia	(bp)	6)Sponges	(sp)	10)Echinoderms	(ec)
3)Algae	(ma)	7)Polychaetes	(po)	11)Molluscs	(mo)
4)Foraminiferids	(fo)	8)Copepods	(co)	12)Diatoms	(di)

Tab 2 : Species considered in the analysis:

1)Clibanarius erythropus	6)Inachus dorsettensis	11)Munida intermedia
2)Dorippe lanata	7)Inachus thoracicus	12)Paguristes oculatus
3) Ethusa mascarone	8)Palemon xiphias	13)Pagurus prideauxi
4)Eurynome aspera	9)Macropodia rostrata	14)Parthenope massena
5)Inachus communissimus	10)Maya verrucosa	15)Pisa muscosa
		16)Pisa nodipes
		17)Processa macrophthalma

- RESULTS -

38 species of Decapods were collected and identified (Tab.2) for a total of 425 individuals;only the most frequent 17 species were considered in the analysis. Among these, the most abundant were:Eurynome aspera,Pagurus prideauxi,Paguristes oculatus and Macropodia rostrata.

The most frequent food items were:brown Posidonia (20.7%),Algae(17.7%), Diatoms (11.8%), Sponges (7.69%), Polychaetes (7.69%),living Posidonia (6.5%),Bryozoa (5.9%).

Brown Posidonia and Algae seem to be the most abundant food items.

The A.F.C. analysis,performed on the "species/food items" matrix , yields 3 significant eigenvalues,accounting for,respectively, 27.5% , 23.5% and 15.5% of the system variance.

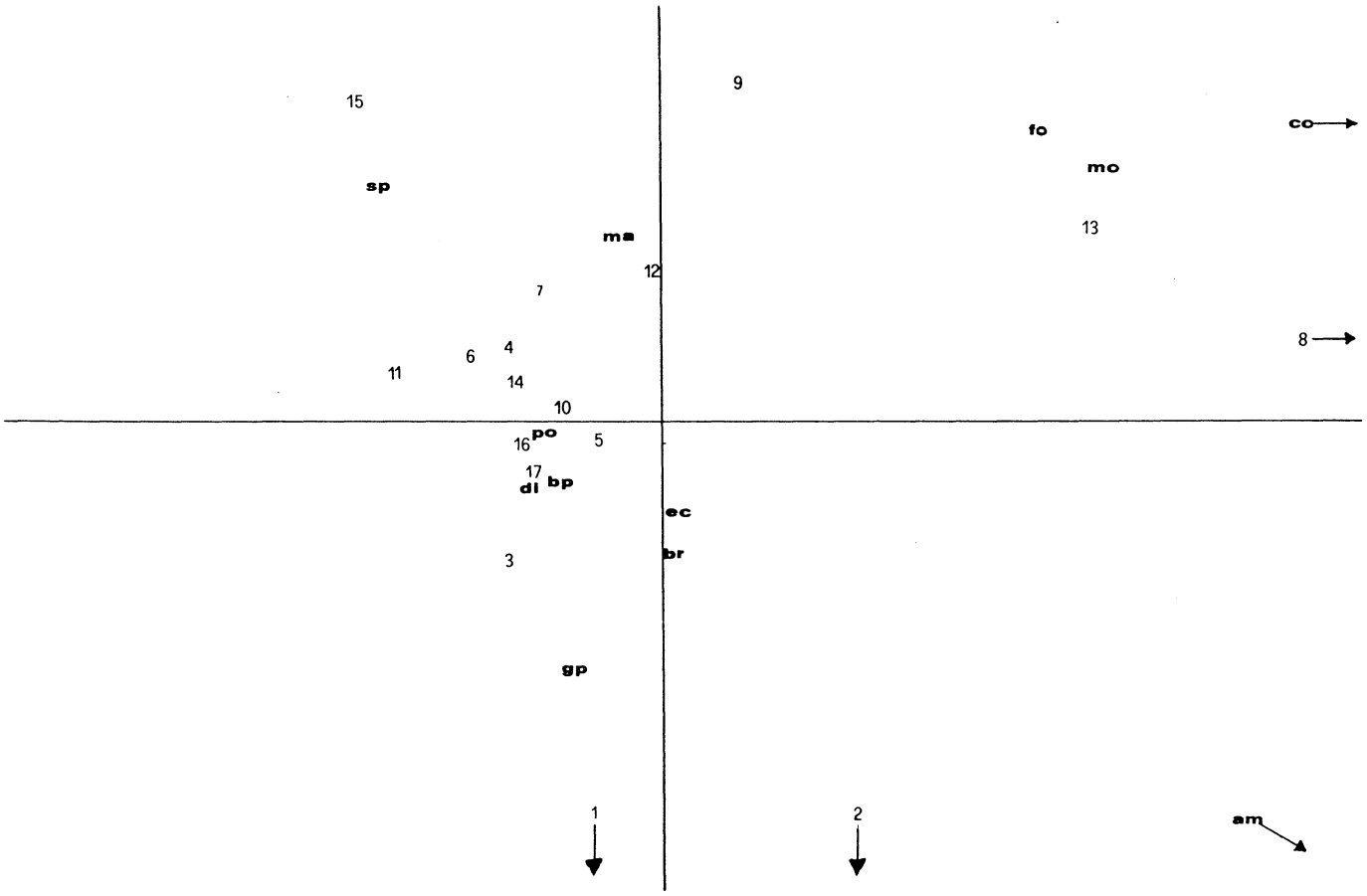
The resulting ordination model is shown in fig 1. It is possible to observe that the majority of Decapods are grouped in a large cluster which contains both plant and animal food item-points .

This cluster is elongated in the space of F2 so as two poles are recognized.The first one is characterized by food item-points "Sponges"

and "Algae";the second consists of Posidonia and its epiphytes(Bryozoa, Diatoms). Pagurus prideauxi is ordinated in the 1st quadrant;food items Foraminifera and Molluscs appeare to be linked to this species.

Lastly the food items Copepods and Amphipods are segregated in the positive space of F1,linked to the species Palemon xiphias.

Fig. 1: Ordination model performed by an A.F.C. technique -



- DISCUSSION AND CONCLUSIONS -

The ordination model clearly shows that the majority of the species and food items are centrally ordinated. Such a configuration does not allow to identify a sharp difference in trophic strategy of the analyzed species,also because the cluster remains compact even when F3 is added.

This seems to indicate that most Decapods have "opportunistic detritivorous" feeding habits,although some species tend to prefere algae and other species tend to feed on Posidonia oceanica and its epiphytes.

The only two species which seem to prefere a carnivorous diet are Pagurus prideauxi and Palemon xiphias,according with the results of Chessa et al. (1983).

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