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ECOLOGICAL IMPLICATIONS IN THE TUBE MORPHOLOGY AND EPIBIOTA OF A POPULATION OF DITRUPA ARIETINA (POLYCHAETA, SERPULIDAE)

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Résume: *La morphologie particulière du tube, observée dans une population de Ditrupa arietina, a été mise en correlation avec les characteristiques du milieu. On examine aussi les organismes épibiontes sur les tubes de ce polychète.*

The morphology and composition of Polychaete tubes are often influenced by environmental factors. On the other hand, dense assemblages of tubes can modify the habitat. High densities of tube-builder worms, in fact, stabilize the bottom, increase spatial heterogeneity and change sediment grain-size composition, thereby exerting an effect on abundance, diversity and also succession in soft-bottom communities (GALLAGHER et al., 1983).

I analyzed the tube morphology of a population of the polychaete Ditrupa arietina in relation to environment, together with the epibiota found on the tubes. D. arietina, a cosmopolitan species typical of soft-bottoms, is particularly common in circalittoral muddy-detritic sediments where often it occurs in dense assemblages of empty tubes that probably indicate the instability of the superficial sediment layer (BELLAN, 1964). The tube of Ditrupa has a peculiar "elephant-tooth" shape (similar to that of Mollusca Scaphopoda). The maximum diameter of the tube is a few millimeters behind the opening (Fig.1A). The tube consists of two calcareous layers: an internal opaque layer, and an external transparent, bright layer. The narrower part of the tube is embedded in the bottom; the wider part, that contains the opening, protudes above the bottom to allow the filter-feeding activity (ZIBROWIUS,1968a) (Fig.1A).

The population of D.arietina studied (over 4,000 specimens, one-third composed by empty tubes) was collected with a "Charcot" dredge in the Gulf of Policastro (southern Tyrrhenian sea, Italy). The area was located at a depth of 30m about 1km in front of the River Castrocucco, and the sediment was a "silty sand".

Most of the tube examined had one or two restrictions in the anterior half that were due to a thinning of the external transparent layer (as occurs around the opening, Fig. 1B). Around these restrictions a ring was sometimes formed by encrustations of sediment or of remains of epibiotic organisms (mostly Foraminifera). In addition, the section of the tube going from the last restriction to the opening often consisted of the internal opaque layer only (Fig. 1B). These restrictions can be interpreted as previous openings of the worm's tubes. They indicate that the animal lengthened the tube to displace the opening above the sediment surface, probably as result of bottom instability. In fact, the sampling area, which is in front of the River Castrocucco, is probably subjected to changes in the sediment level.

Another interesting feature of the Ditrupa population studied was the high abundance and diversity of the epibiotic organisms present mostly on the living tubes. The most abundant was Cibicides lobatulus (Foraminifera) always present in the vicinity of the tube opening and also on the operculum of the worm (Fig. 1D). Also abundant was Hydroides norvegica (Serpulidae). The Hydroides tubes often encircled the opening of the Ditrupa tubes, with the distal part erect (Fig. 1C). Other epibiotic forms were Eunice vittata, Lysidice ninetta and Pomatoceros sp.(Polychaeta); juveniles of Anomia ephippium (Bivalvia); Hydroida; Briozoa; colonies of benthic Diatoms Navicula sp. and Grammatophora oceanica; red algae such as Seirospora interrupta and Polysiphonia sp

I did no find Cibicides refulgens (Foram.) and Bugula ditrupae (Briozoa) observed on Ditrupa tubes by ZIBROWIUS (1968b).

A single tube often hosted many epibiotic organisms, several of which held other epibiotic species (Fig. 1C).

In conclusion, the tube morphology of the studied D. arietina population shows that this species can, to some extent, react to sediment dynamics. Furthermore, as the Ditrupa tube provides a support for larval settlement of many taxa, a high density of this worm greatly affects species composition and diversity of soft-bottom communities.

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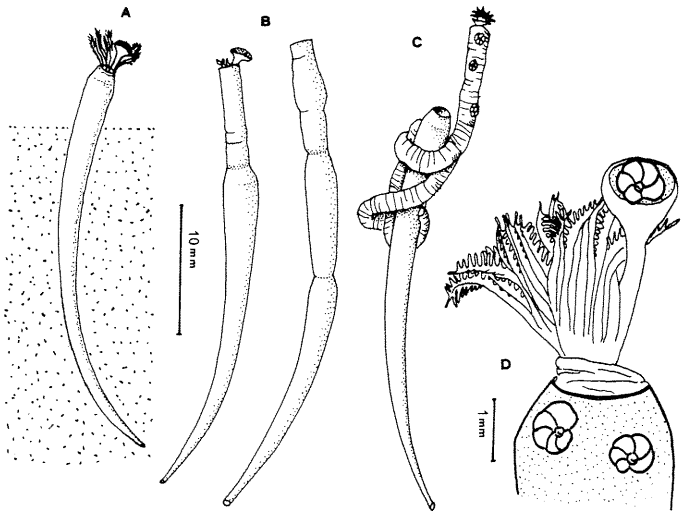
Fig.1: A) Ditrupa arietina embedded in the sediment; B)tubes of Ditrupa with restrictions formed from previous openings; C) Ditrupa tube encircled by the tube of Hydroides norvegica (note some Foraminifera on the Hydroides tube); D) Cibicides lobatulus (Foraminifera) on the vicinity of the Ditrupa tube opening and on the worm's operculum.



Acknowledgements: Thanks to the colleagues who helped to identify epibiotic species.

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THE POLYCHAETA FAUNA OF POSIDONIA OCEANICA MEADOWS OF IZMIR BAY (TURKEY)

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RESUME'

Les polychetes d'un fond à *Posidonia oceanica* du Golfe d'Izmir ont été etudiées. On a trouvé 39 espèces (24 errantes et 15 sédentaires). Parmi ces espèces *Stylarioides eruca* et *Armandia polyophthalma* ont été observées pour la première fois dans les eaux turques.

P. oceanica is widely distributed in the infralittoral zone of the outer part of Izmir Bay, except its inner region where is affected by dense pollution.

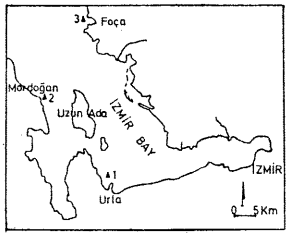

Figure 1: The sampling stations

The fauna and flora of these meadows found in the bay have been investigated for the first time by Geldiay and Kocatas (1972) and its distributions by Güner (1975). Flowering of *P. oceanica* in the Urla shore of the bay and its cartography has been shown by Pergent and Pergent (1983,1985). In this study only the Polychaeta species of *P. oceanica* meadows have been investigated and a total of 39 species have been found. Of the 39 species observed, *Stylarioides eruca* and *Armandia polyophthalma* are the two new species reported for the Turkish waters.

In order to identify the Polychaeta species of *P. oceanica* nine samplings have been done from three stations chosen for this purpose (Fig. 1). Samples have been collected from an area of 400 cm^2. Diversity indices by Margalef's method and relative dominance have been determined.

From these investigations carried out in three stations 24 Errantia and 15 Sedentaria species amounting to 39 species and 573 individuals have been determined. Of the total species determined, two of them which are *Stylarioides eruca* and *Armandia polyophthalma* are newly reported from the waters of Turkey. When these species are compared according to their relative dominance it has been seen that *Nereis zonata* ranks first with 12.4% next *Platynereis dumerillii* and *Nereis pelagica* with 10.3% and 7.4% respectively.

Table 1 : The total number of species and individuals at the stations and the diversity indices

Stations	Number of sampling	Number of species	Number of individuals	Diversity index
Urla	9	28	262	4.85
Mordogan	9	23	110	4.68
Foça	9	27	200	4.91

As can be seen from the table Urla and Foça stations are quite similar in abundance of species whereas Mordogan seems to be much poorer in comparison to the other and this is probably due to the sparseness of meadows.

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