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SPATIAL DISTRIBUTION OF SOFT-BOTTOM POLYCHAETES ALONG WESTERN COAST OF THE NORTHERN ADRIATIC SEA (ITALY)

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ABSTRACT

The composition and spatial distribution of soft bottoms polychaetes in the northwestern Adriatic Sea are described. The basin is characterized by shallow depths (mean depths 33.5 m), high river inputs along the western coast, large annual temperature variations and water stratification during the summer. The sediment composition varied from muds to sands. A total of 135 species, belonging to 37 families, were identified; the average density and biomass were respectively 313 ind. m^{-2} and 17.6 g WW m^{-2}. The cluster analysis on abundance data resulted in four main groups of stations, characterized by different sets of organisms and sediment features. The river inputs and depth seem to be particularly important in structuring these bottom populations.

Key words: polychaetes, distribution, soft-bottom, Adriatic Sea

DISTRIBUZIONE SPAZIALE DEI POLICHETI DI FONDI MOBILI LUNGO LA COSTA OCCIDENTALE DELL'ADRIATICO SETTENTRIONALE (ITALIA)

SINTESI

Nel presente lavoro viene descritta la composizione e la distribuzione dei policheti di fondi mobili nell'Adriatico Nord occidentale. Il bacino è caratterizzato da profondità non elevate, cospicui apporti fluviali lungo il versante occidentale, ampie variazioni di temperatura e stratificazione della colonna d'acqua durante l'estate. La composizione tessiturale del sedimento varia da fanghi a sabbie. Sono state identificate 135 specie appartenenti a 37 famiglie; la densità media e la biomassa erano rispettivamente di 313 ind. m^{-2} e 17.6 g m^{-2} di peso umido. L'analisi multivariata sui dati di abbondanza ha rilevato quattro gruppi principali di stazioni, caratterizzati da una diversa composizione degli organismi e dei sedimenti. Gli apporti continentali e la profondità sembrano particolarmente importanti nella caratterizzazione di queste comunità di fondo.

Parole chiave: policheti, distribuzione, fondi mobili, Mare Adriatico

INTRODUCTION

The northern Adriatic Sea is characterized by shallow depths (mean depth 33.5 m and maximum depth 70 m) and considerable river inputs. These inputs are particularly important on the western coast where the Po River discharges 50% of the total freshwater flow in the northern Adriatic and is the most important allochthonous source of organic matter and nutrients for the entire Mediterranean Sea (Pagnotta *et al.*, 1999).

The shores are predominantly sandy along the northwestern coast and the deposition of fine material from northern rivers is relatively poor, settling along a discontinuous narrow belt. In the area influenced by the Po River, the belt of fine bottom sediments becomes larger and extends southwards. Offshore shelf sands are present (Frignani & Frascari, 1990).

The main oceanographic features of the basin are the annual variation in the density structure of the water column, characterized by a strong summer stratification and a dynamic separation between the waters of the basin proper and the coastal zone (Franco & Michelato, 1992).

The northern Adriatic Sea is undergoing considerable anthropic pressure due to nutrients loading (urban and agricultural development) (Degobbis *et al.*, 2000), commercial fishing and tourism, including the infrastructure to support it. Furthermore, oxygen depletion deriving from natural hydrological processes and/or eutrophication mainly for the area influenced by the Po (Faganeli *et al.*, 1985; Degobbis *et al.*, 1991; Justić, 1991; Vollenweider *et al.*, 1992; Orel *et al.*, 1993a), periodically cause severe hypoxia and even anoxia in the bottom layers resulting in massive local benthos mortality (Aleffi *et al.*, 1992; Rinaldi *et al.*, 1993; Stachowitsch & Fuchs, 1995; Kollmann & Stachowitsch, 2001). In addition, the area is affected by occasional massive mucilage formations (Azam *et al.*, 1999; Degobbis *et al.*, 1999) which, sinking to the bottom, asphyxiate the benthic fauna (Orel *et al.*, 1993b). Despite this environmental stress, the northern Adriatic Sea has been characterized by a rich benthic fauna and studied since the 19th century. In 1934-1936, Vatova (1949) sampled the macrobenthic communities of the northern and middle Adriatic and defined some ecological units as "zoocenoses", based on the dominant species. Subsequent studies on benthic communities have been either localized (Fedra *et al.*, 1976; Aleffi *et al.*, 1996; Mancinelli *et al.*, 1998; Moodley *et al.*, 1998) or very general; in the latter, different data sets have been analysed together to achieve a comprehensive overview of the northern Adriatic benthos (Orel *et al.*, 1987; Scardi *et al.*, 2000). However, regarding the Polychaeta fauna, previous studies have been carried out only for some species and in narrow areas along the northwestern coast (Ambrogi *et al.*, 1993; Castelli *et al.*, 1999). On the contrary, along the northeastern coast, mainly characterized by rocky shores, the first surveys on polychaetes started in the 19th century (Grube, 1840, 1861), and were followed in the 20th century by numerous taxonomic studies; among the most important, we can cite: Fauvel (1934, 1940), Amoureux & Katzmann (1971), Amoureux (1975, 1976), Bellan (1969) and Požar-Domac (1978).

The present study constitutes the first comprehensive survey carried out along the western coast of the northern Adriatic (from Trieste to Ancona) in order to determine the composition, structure and spatial distribution of the soft bottoms polychaetes.

MATERIAL AND METHODS

Within the framework of the PRISMA 1 Project (financed by the Italian Ministry of Research), carried out in May 1995, forty stations were sampled along the

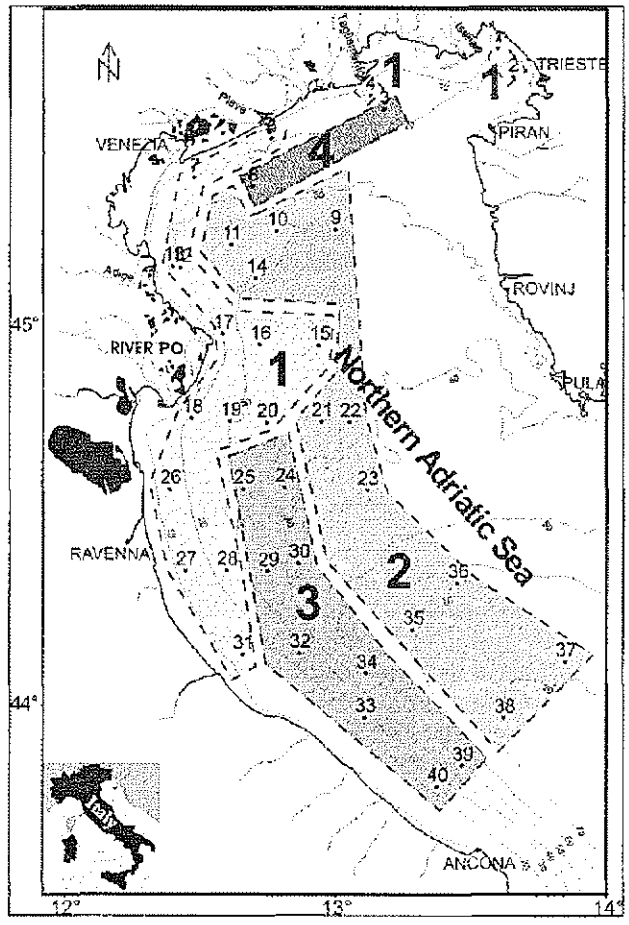

Fig. 1: Map of the study area showing the sampling stations. The four delimited areas (1, 2, 3, 4) correspond to the dendrogram groups.
Sl. 1: Zemljevid obravnavanega območja z vzorčevalnimi postajami. Štiri označeni predeli (1, 2, 3, 4) ustrezajo skupinam v dendrogramu.

western Adriatic coast, at depths ranging from 12 to 70 m (Fig. 1). At each station, five samples were collected with a 0.1 m^2 van Veen grab, sieved through a 1 mm mesh and preserved in buffered 4% formalin. Biomass (wet weight: WW) determinations were made by weighing formalin-preserved samples, following blotting on absorbent paper. Abundances were adjusted to 1 m^2. Species were grouped in feeding guilds according to Fauchald & Jumars (1979). Four main groups were considered: suspension feeders (SF), surface-deposit feeders (SDF), subsurface-deposit feeders (SSDF) and carnivores/omnivores (C). The sediment textural characteristics were taken both from Brambati *et al.* (1983) and Frascari *et al.* (2000). The latter analysed the sediment features in the same PRISMA 1 Project.

Univariate analyses used included: number of species, as a measure of alpha diversity, abundance and biomass. Multivariate analysis was performed using the Bray-Curtis similarity index on double square root transformed abundance data, using group-average clustering (PRIMER software package developed at the Plymouth Marine Laboratory) on the species determined for each station.

RESULTS AND DISCUSSION

At all stations, the polychaetes dominated in species number in comparison with other main macrobenthic taxonomic groups, such as molluscs, crustaceans and echinoderms (Fig. 2). A total of 6260 polychaetes were collected and 135 species were determined from 37 families. The dominant family in terms of species richness and abundance was by far Spionidae with 17 species and a total of 702 organisms (11.3% of the total), followed by Maldanidae and Sabellidae both with nine species and 507 (8.1%) and 273 (4.3%) individuals respectively. The most frequent species were *Lumbrineris gracilis* (75%), *Ampharete acutifrons* (63%), *Spiophanes kroyeri* (63%), *Levinsenia gracilis* (60%), *Spiochaetopterus costarum* (58%) and *Melinna palmata* (58%) (Append. 1).

The number of species varied from 51 in st. 10 to only 3 species in st. 25. The highest values were found in zones A and B (Fig. 3). The average density was 313 ind. m^{-2} with maximum values of 1,420 ind. m^{-2} (st. 9) and minimum values of 56 ind. m^{-2} (st. 25); the highest densities were observed in the same two areas (A and B), in which the highest number of species was found (Fig. 4). These two zones are characterized by mixed sediments where sands dominate (Brambati *et al.*, 1983), constituting a quite heterogeneous habitat and thus favouring higher species richness than fine and homogeneous sediments (Gray, 1974). Despite this fact, in A and B both the number of species and density are higher than would have been expected, since they are located offshore in deeper areas (25-30 m in A and 40-50 m in B) while in general, shallow coastal zones directly influenced by river inputs, where organic matter content is high, as in the vicinity of the Po delta, could be thought to be more favourable for the development of those populations. In addition, zone A is considered an area of sedimentary instability, due to the effects of anthropic factors, such as trawling fisheries and the long term effects of dumping operations carried out for years and stopped a couple of years before this study was initiated.

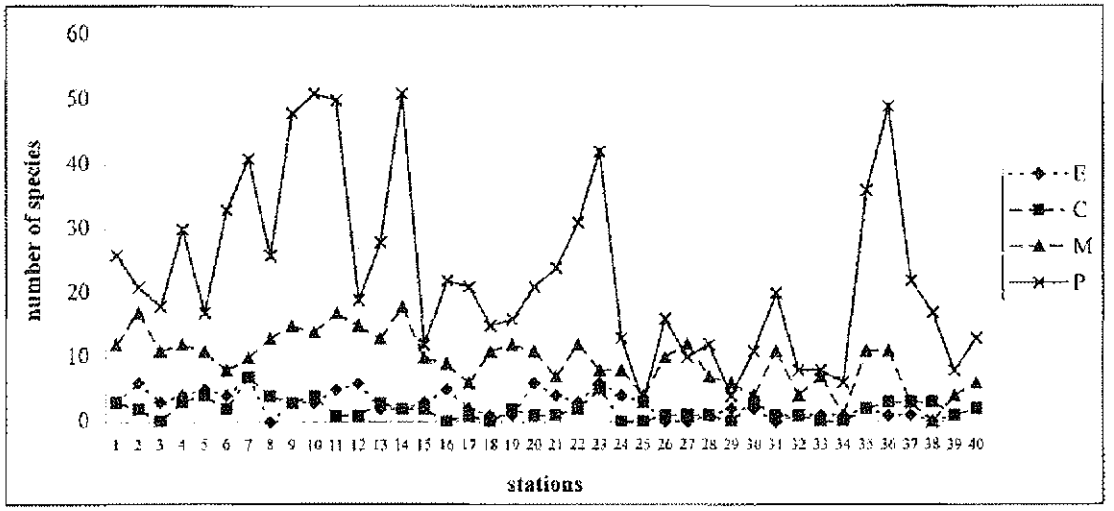

Fig. 2: Number of species of the main macrobenthic taxa (polychaetes, molluscs, crustaceans, echinoderms) at each station.
Sl. 2: Število vrst glavnih makrobentoških taksonov (mnogoščetinci, mehkužci, raki in iglokožci) na posamezni postaji.

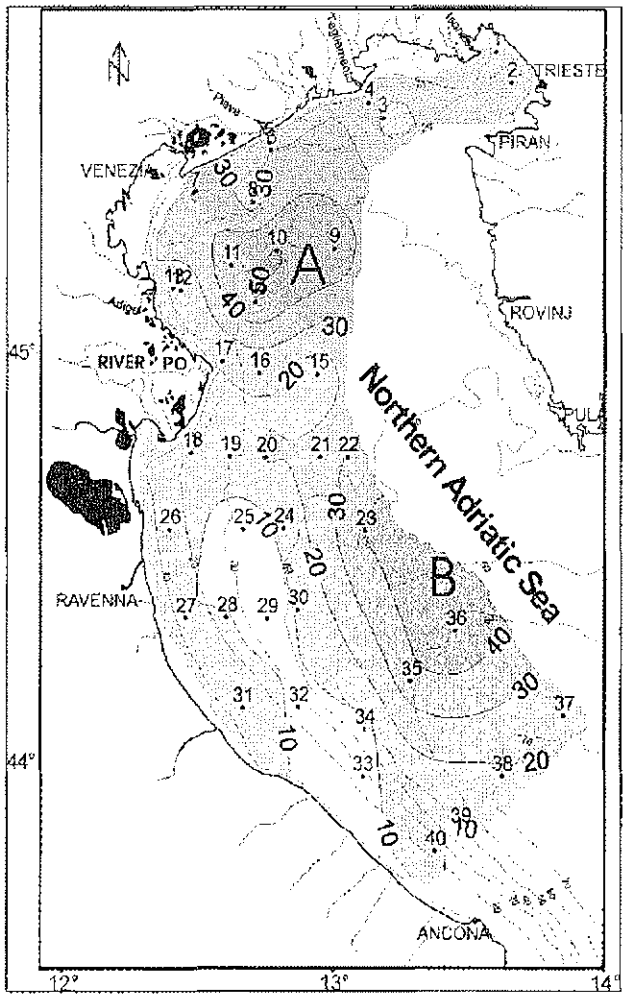

Fig. 3: Contours of the species richness; A and B indicate the zones of highest values.
Sl. 3: Vrstna pestrost; A in B označujeta cone z največjo gostoto.

The average biomass was 17.6 g WW m^{-2}, with considerable differences among the stations. The highest value was 172.8 g WW m^{-2} in st. 1, due to the presence of the tube-dwelling polychaete *Chaetopterus variopedatus*, whereas the minimum value of 1.73 g WW m^{-2} was found at st. 15, where density was also low. The biomass values can help explain the evident differences found between muddy and prevalently sandy bottoms, since densities are highest in fine sands, but with lower values of biomass than in stations characterized by muddy sediments; this is mainly due to the prevalence of small size polychaetes.

Over the whole area, the dominant species were: *Owenia fusiformis*, characteristic of sandy sediments, *Maldane glebifex*, characteristic of muddy bottoms, and *L. gracilis*, without any definite preference for a specific type of sediment.

Cluster analysis on abundance data evidenced four main groups of stations (Fig. 5) characterized by different community types and different sediment features. Area 1 (Fig. 1) was located along the coastline in muddy bottoms influenced by the main North Adriatic rivers inputs (Isonzo, Tagliamento, Piave, Adige, Po). The most abundant and frequent species of this community were: *M. glebifex*, *L. gracilis*, *S. costarum* and *A. acutifrons* (Tab. 1). The mean species richness in this group was 21 species, while average density was 260 ind. m^{-2}. The biomass was the highest (27 g WW m^{-2}), due to large species such as *C. variopedatus*, *Marphysa sanguinea* and *Glycera unicornis*.

Inside this wide group, differences were clear between stations located north and south of the Po River delta. The mean species number and density of the northern stations (st. 1-13) were, respectively, 27 species and 358 ind. m^{-2}, whereas lower values for both parameters (16 species, 182 ind. m^{-2}) were recorded at the stations influenced by the Po. In the latter zone, high sedimentation rates, high organic matter inputs and periodic hypoxic conditions prevail so that the community is affected by environmental instability (Crema *et al.*, 1991; Tahey *et al.*, 1996).

In Area 2 (Fig. 1) sandy sediments dominated and diversity and density had the highest values, with averages of 38 species and 554 ind. m^{-2} (Tab. 2), while the biomass values were low due to the presence of smaller polychaetes than those found in Area 1. The most representative species were: *O. fusiformis*, *Myriochele oculata*, and *Nothria conchylega*, which prefer medium size muddy sands with shell debris (Glémarec, 1991; Ambrogi *et al.*, 1995). In the deepest stations (60-70 m) *Aponuphis fauveli* was dominant (310 ind. m^{-2} in st. 35) and replaced *A. bilineata* also found in the stations of this group, but at a maximum depth of 40 m.

The third group of stations (Area 3) is located along the offshore border of Area 1, south of the Po River delta. Muddy bottoms dominate as in Area 1, but in deeper waters (mean depths of 33 m versus 20 m in Area 1) and with lower organic matter content in the sediments (Frascari *et al.*, 2000). The dominant species were: *Sthenolepis yhleni* and the burrowing polychaete *Sternaspis scutata*, which jointly represented 69% of the polychaetes abundance and 83% of the biomass. Diversity and density values were lower than in the other groups and reached an average value of 8 species and 84 ind. m^{-2}; the biomass values were the lowest there.

Stations 3 and 8 (Area 4) constitute the smallest group in the dendrogram and are located in the area between the Isonzo River and the Gulf of Venice, at 10 to 25 m depth (Orel *et al.*, 1987). This zone is characterized by coarse sandy bottoms with beachrocks, defined as medium to fine sandstones with carbonate cement by Brambati *et al.* (1983). The dominant species were *A. bilineata* and *Prionospio caspersi*; the latter was

Tab. 1: Distribution of the dominant species in the four areas identified by cluster analysis. (A) total abundance, (F) frequency as percentage of presences at the stations of each area.
Tab. 1: Rasprostranjenost dominantnih vrst na štirih predelih, opredeljenih z grozdičasto analizo. (A) celokupna abundanca, (F) frekvenca kot delež navzočnosti na postajah na vseh predelih.

Species	Area 1 (18 stations)		Area 2 (11 stations)		Area 3 (9 stations)		Area 4 (2 stations)	
	A (ind. m^{-2})	F (%)	A (ind. m^{-2})	F (%)	A (ind. m^{-2})	F (%)	A (ind. m^{-2})	F (%)
Owenia fusiformis	80	50	1004	73	2	11	8	50
Lumbrineris gracilis	650	94	252	91	6	22	4	50
Maldane glebifex	704	89	50	36	-	-	-	-
Aponuphis fauveli	-	-	586	36	18	11	-	-
Ampharete acutifrons	322	83	124	91	-	-	-	-
Sthenolepis yhleni	70	28	64	64	288	100	-	-
Spiophanes kroyeri	108	67	290	91	8	33	-	-
Sternaspis scutata	140	56	24	36	230	89	-	-
Nothria conchylega	6	6	384	64	-	-	-	-
Spiochaetopterus costarum	326	89	14	27	30	33	2	50
Myriochele oculata	26	39	316	82	2	11	-	-
Laonice cirrata	316	50	12	27	-	-	-	-
Pseudoleiocapitella fauveli	288	50	6	18	-	-	-	-
Aponuphis bilineata	36	22	100	55	-	-	148	100
Prionospio caspersi	6	11	42	36	-	-	98	100

Tab. 2: Average values of species richness, density, biomass and depth in the four areas.
Tab. 2: Povprečne vrednosti vrstne pestrosti, gostote, biomase in globine na štirih predelih.

Area	No. stations	No. species	density (ind. m^{-2})	biomass (g WW m^{-2})	depth (m)
Area 1	18	21	260	27.56	20
Area 2	11	38	553	10.10	45
Area 3	9	8	84	8.39	33
Area 4	2	21	244	10,68	18

Tab. 3: Feeding guilds as percentage of density data (SF =suspension feeders, SDF=surface-deposit feeders, SSDF=subsurface-deposit feeders, C=carnivores/omnivores).
Tab. 3: Prehranjevalni cehi, izraženi kot delež gostote (SF=suspenzijofagi, SDF=vrste, ki se hranijo na površini sedimenta, SSDF=vrste, ki se hranijo tik pod površino, C=karnivori/omnivori).

Feeding guilds	SF (%)	SDF (%)	SSDF (%)	C (%)
Area 1	4	29	44	23
Area 2	25	19	19	37
Area 3	1	16	39	44
Area 4	11	34	10	45

recorded as particularly abundant in coastal sandy bottoms, up to 5 m depth, off the Po delta (Ambrogi *et al.*, 1993). The average species richness, density and biomass were respectively 21 species, 244 ind. m^{-2} and 10.68 g WW m^{-2}.

The polychaete populations were dominated by the subsurface-deposit feeders (44%) and surface deposit feeders in Area 1, where the organisms can use as a direct food source the freshly deposited material coming from the rivers. Carnivores dominated in Areas 2 (37%), 3 (44%) and 4 (45%). Areas 2 and 4 were both characterized by prevalently sandy sediments, in which filter feeders reached the highest values (25% and 11%), while in Area 3 there was a balance between two trophic categories: carnivores (44%) and subsurface-deposit feeders (39%) (Tab. 3).

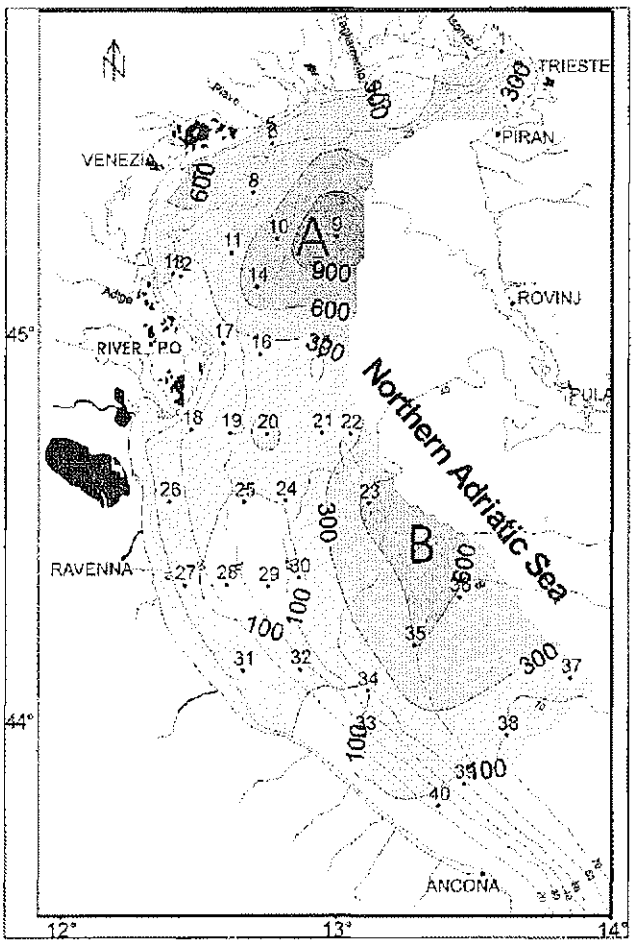

Fig. 4: Contours of density (ind. m^{-2}). A and B indicate the zones of highest values.
Sl. 4: Gostota osebkov (os. m^{-2}). A in B označujeta cone z največjo gostoto.

CONCLUSIONS

The composition and ecological characteristics of the polychaetes in the study area evidenced four zones with different structures. The number of species and the densities were higher off the Venice Lagoon (Area 2), on prevalently sandy sediments. The populations found in muddy sediments were less rich especially south of the Po River delta (Area 1) and in deeper stations (Area 3). On the contrary, biomass was higher in muddy sediments, where the organic matter content is high. Two factors seem to be particularly important in structuring these populations: the influence of the Po (and secondarily of the other rivers input) and depth. The trophic structure was dominated by deposit-feeding polychaetes in the coastal area with muddy sediments, whereas on prevalently sandy sediments, carnivores and filter feeders prevailed.

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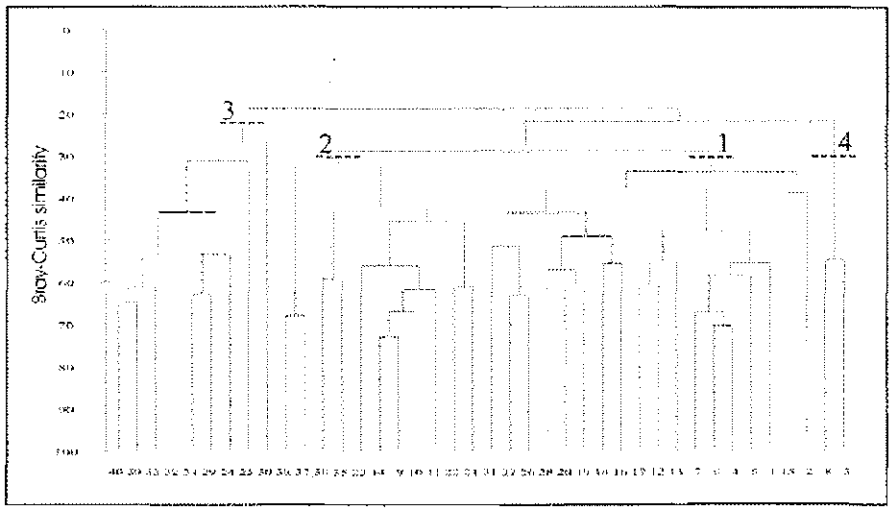

Fig. 5: Dendrogram of the 40 stations on abundance data.
Sl. 5: Dendrogram 40 vzorčevalnih postaj na podlagi podatkov abundance.

PROSTORSKA RAZŠIRJENOST MNOGOŠČETINCEV (POLYCHAETA), NA MEHKEM DNU VZDOLŽ ZAHODNE OBALE SEVERNEGA JADRANSKEGA MORJA (ITALIJA)

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POVZETEK

Avtorji članka opisujejo sestavo in prostorsko razširjenost mnogoščetincev, živečih na mehkem morskem dnu severozahodnega dela Jadranskega morja. Značilnosti tega morskega bazena so njegova plitkost (srednja globina 33,5 m), izdatni rečni vnosi vzdolž zahodne obale Jadranskega morja, velike letne temperaturne spremembe in razslojenost vodnega stolpca v poletnih mesecih. Poleg tega na to območje močno vplivajo ciklični pojavi, kot na primer sluzasti agregati in pomanjkanje kisika, kar lahko povzroča hudo hipoksijo ali celo anoksijo in zatorej množične pogine živih bitij v morju. Avtorji so raziskavo opravili maja 1995 na štiridesetih postajah z van Veenovim grabilom, pri čemer so vzorce precejevali skozi milimetrsko mrežico. Usedline so bile zelo raznolike – od blatnih do peščenih. Določili so 135 vrst, pripadajočih 37 družinam, s povprečno gostoto 313 os. m^{-2} in povprečno biomaso 17,6 g mokre teže m^{-2}. Posledica grozdičaste analize gostote posameznih vrst je bila razdelitev postaj na štiri glavne skupine z različnimi organizmi in značilnimi usedlinami na morskem dnu. Na sestavo teh talnih populacij sta še posebno vplivala rečni vnos in globina morja.

Ključne besede: mnogoščetinci, razširjenost, mehko dno, Jadransko morje

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Append. 1: List of the polychaete species found in this study with their total abundance, frequency and distribution per area.
Priloga 1: Seznam ugotovljenih vrst mnogoščetincev s podatki o njihovi celokupni abundanci, frekvenci in razširjenosti po posameznih predelih.

Family	Species	Tot. abund.	Frequency	Area
Ampharetidae	*Amage adspersa*	10	3	2
	Ampharete acutifrons	223	25	1,2
	Amphicteis gunneri	14	3	2
	Melinna palmata	93	23	1,2,3
	Sabellides octocirrata	5	4	1,2
	Sosane sulcata	19	6	2
Aphroditidae	*Laetmonice hystrix*	1	1	2
Arabellidae	*Arabella geniculata*	2	2	1,2
	Drilonereis filum	12	10	1,2,4
Capitellidae	*Dasybranchus caducus*	1	1	1
	Heteromastus filiformis	8	8	1,2
	Notomastus latericeus	103	13	1,2,3,4
	Notomastus lineatus	1	1	2
	Notomastus sp.	200	22	1,2,3,4
	Pseudoleiocapitella fauveli	147	11	1,2
	Capitellidae indet.	5	3	2,3,4
Chaetopteridae	*Chaetopterus variopedatus*	9	3	1,2
	Mesochaetopterus sagittarius	1	1	2
	Spiochaetopterus costarum	186	23	1,2,3,4
	Chaetopteridae indet.	5	3	1,2
Cirratulidae	*Aphelochaeta marioni*	28	10	1,2,3
	Caulleriella bioculata	3	1	4
	Chaetozone setosa	10	8	1,2,4
	Dodecaceria concharum	2	1	2
	Monticellina dorsobranchialis	1	1	1
	Cirratulidae indet.	116	25	1,2,3,4
Dorvilleidae	*Schistomeringos neglectus*	1	1	2
	Scistomeringos rudolphii	4	3	1,2
Eunicidae	*Eunice vittata*	101	14	1,2,3
	Lysidice ninetta	3	2	1,4
	Marphysa bellii	57	13	1,2,3
	Marphysa sanguinea	10	6	1
	Nematonereis unicornis	29	4	2
Flabelligeridae	*Pherusa monolifera*	6	3	1,2
	Pherusa plumosa	7	2	1,2
	Piromis eruca	1	1	2
Glyceridae	*Glycera alba*	7	4	2,3
	Glycera capitata	9	4	2,3
	Glycera rouxii	36	17	1,2,3
	Glycera sp.	15	8	1,2
	Glycera tesselata	1	1	2
	Glycera tridactyla	9	4	2,4
	Glycera unicornis	58	19	1,2,3,4
Goniadidae	*Goniada maculata*	61	9	1,2,4
	Glycinde nordmanni	1	1	2
Hesionidae	*Gyptis propinqua*	5	3	2
	Ophiodromus flexuosus	3	3	1,2,4
	Hesionidae indet.	3	2	1,2

Family	Species	Tot. abund.	Frequency	Area
Lumbrineridae	*Lumbrineris gracilis*	456	30	1,2,3,4
	Lumbrineris latreillii	86	17	1,2,4
	Lumbrineris sp.	2	2	1,3
	Lumbrineris tetraura	31	13	1,2,3
	Ninoe kinbergi	5	1	2
Magelonidae	*Magelona alleni*	24	11	1,2,3
	Magelona minuta	8	4	2
	Magelona sp.	5	5	1,2
Maldanidae	*Clymenura clypeata*	11	4	1,2
	Euclymene lumbricoides	4	2	2
	Euclymene oerstedi	34	4	1,2
	Euclymene palermitana	66	15	1,2,4
	Maldane glebifex	377	20	1,2
	Metasychis gotoi	1	1	2
	Petaloproctus terricolus	1	1	2
	Praxillella affinis	11	3	2
	Praxillella lophoseta	2	2	2
	Maldanidae indet.	106	16	1,2,3,4
Nephtydae	*Micronepthys* sp.	4	3	1,2,4
	Nepthys hombergi	13	6	2
	Nepthys hystricis	79	20	1,2,3
	Nepthys incisa	28	6	1,2,3
	Nepthys sp.	14	4	1,2,3
Nereididae	*Ceratonereis costae*	1	1	1
	Nereis lamellosa	21	11	1,2,3
	Nereis rava	6	2	1,4
	Nereis sp.	5	4	1,2
	Perinereis sp.	9	5	1,2
Onuphidae	*Aponuphis bilineata*	142	12	1,2,4
	Aponuphis fauveli	302	5	2,3
	Diopatra neapolitana	3	2	1
	Nothria conchylega	195	8	1,2
	Onuphis quadricuspis	5	1	1
	Onuphis sp.	74	4	2
Opheliidae	*Ophelina cylindricaudata*	13	4	2
Orbiniidae	*Orbinia cuvieri*	2	2	1,4
	Phylo foetida	3	2	1
	Scoloplos armiger	2	1	2
Oweniidae	*Myriochele oculata*	172	17	1,2,3
	Owenia fusiformis	547	20	1,2,3,4
Paralacydoniidae	*Paralacydonia paradoxa*	73	11	1,2
Paraonidae	*Aricidea claudiae*	3	1	2
	Aricidea mariannae	157	1	4
	Cirrophorus furcatus	3	2	2
	Levinsenia gracilis	130	24	1,2,3,4
	Paradoneis lyra	58	14	1,2
	Paraonides neapolitana	2	2	1,2
	Paraonidae indet.	366	28	1,2,3,4
Pectinariidae	*Pectinaria auricoma*	37	10	1,2
	Pectinaria belgica	3	3	1,2
	Pectinaria koreni	12	8	1,2

Family	Species	Tot. abund.	Frequency	Area
Phyllodocidae	*Mysta picta*	10	4	1,2
	Phyllodoce lineata	7	7	1,2
	Phyllodoce sp.	2	2	1,2
	Phyllodocidae indet.	2	2	2
Pilargiidae	*Ancistrosyllis groenlandica*	77	14	1,2,3,4
	Pilargis verrucosa	9	8	1,2,3
Poecilochaetidae	*Poecilochaetus serpens*	38	18	1,2,3,4
Polynoidae	*Harmothoe* sp.	3	2	3
	Polynoidae indet.	55	24	1,2,4
Sabellidae	*Chone acustica*	1	1	2
	Chone collaris	22	7	1,2
	Chone duneri	109	13	1,2,4
	Euchone rosea	89	10	1,2
	Euchone rubrocincta	12	7	2,3
	Jasmineira caudata	2	2	2
	Jasmineira elegans	24	7	2,4
	Megalomma vesiculosum	11	8	1,2
	Myxicola infundibulum	3	1	4
	Sabellidae indet.	16	3	2
Scalibregmatidae	*Scalibregma inflatum*	10	2	2
Serpulidae	*Ditrupa arietina*	2	1	2
	Hydroides norvegicus	1	1	2
	Pomatoceros triqueter	4	2	1
	Serpula concharum	3	2	2
	Serpula vermicularis	3	3	1,4
Sigalionidae	*Psammolyce arenosa*	1	1	2
	Sthenelais boa	3	2	2,4
	Sthenelais limicola	16	4	2
	Sthenelais minor	3	1	2
	Sthenelais sp.	1	1	3
	Sthenolepis yhleni	211	21	1,2,3
Spionidae	*Laonice cirrata*	164	12	1,2
	Polydora caeca	1	1	1
	Polydora flava	26	10	1,2,4
	Polydora sp.	2	2	1
	Prionospio caspersi	73	8	1,2,4
	Prionospio cirrifera	47	10	1,2
	Prionospio malmgreni	149	16	1,2,4
	Prionospio sp.	3	1	2
	Prionospio steenstrupi	4	2	2
	Pseudopolydora antennata	2	2	1,2
	Scolelepis cantabra	1	1	2
	Scolelepis tridentata	3	2	2,4
	Spio decoratus	2	1	2
	Spio filicornis	5	3	1,2,4
	Spio multioculata	14	4	1,4
	Spiophanes bombyx	3	2	1,4
	Spiophanes kroyeri	203	25	1,2,3
	Spionidae indet.	10	5	1,2
Sternaspidae	*Sternaspis scutata*	197	22	1,2,3

Family	Species	Tot. abund.	Frequency	Area
Syllidae	*Syllis armillaris*	3	3	2,4
	Syllis cornuta	15	5	1,2
	Syllis sp.	2	2	1,2
Terebellidae	*Amphitrite cirrata*	3	2	1
	Amphitrite edwarsi	2	1	1
	Amphitrite sp.	16	3	2
	Lanice conchylega	23	9	1,2,3
	Pista cristata	27	8	1,2
	Polycirrus sp.	11	5	2
	Streblosoma bairdi	4	3	2
	Terebellidae indet.	17	6	1,2
Trichobranchiidae	*Terebellides stroemi*	36	16	1,2,3
	Trichobranchus glacialis	1	1	2