Bollettino della Società Paleontologica Italiana	23 (1)	1984	21-51	2 pls.	Modena, Aprile 1985

Paleoclimatic record from 4 cores (Gulf of Taranto, Ionian Sea) Evidence from Foraminifera and Ostracoda

M. Moncharmont-Zei*, B. Russo**, F. Sgarrella*, G. Bonaduce***, P. Mascellaro***

* Institute of Paleontology
University of Naples

** Institute of Geology
and Geophysics
University of Naples

*** Zoological Station of Naples
Villa Comunale, Naples

KEY WORDS — Foraminifera, Ostracoda, Quaternary, Paleoclimatology, Ionian Sea.

SUMMARY — The ostracods and foraminifers from four cores collected from different bathyal environments in the Gulf of Taranto, Italy, were examined. Detailed study of the planktonic foraminifers indicated a succession of assemblages from warm to cold environments which documented the climatic evolution occurring in the sediments. The data, as mean percent ratios of planktonic foraminifers in a fixed volume, were utilized to construct paleoclimatic curves. Moreover, the presence and abundance of some benthic ostracod species, chosed as paleoclimatic indicators by comparison to foraminiferal paleoclimatic curves, were used to examine the presence and quantitative distribution of ostracods within defined paleoclimatic ranges. From the presence and abundance of selected benthic ostracod species, paleoclimatic curves were also constructed. These curves and trends agreed with those of the planktonic foraminifers indicating a « cold » period associated with the end of the last glaciation and a « warm » period which as a whole corresponds to the Holocene. Benthic foraminifers and ostracods, always inferior in number to planktonic foraminifers, were represented by species characteristic to bathyal environments. Their abundance indicated a maximum during the Glacial period and a great reduction during the Holocene period.

RIASSUNTO — [Dati paleoclimatici su 4 carote del Golfo di Taranto (Mar Jonio) tratti da Foraminiferi ed Ostracodi] — *Sono state esaminate 4 carote prelevate mediante carotiere a gravità nel Golfo di Taranto (Mar Jonio) in ambiente batiale. L'analisi è stata condotta su Foraminiferi planctonici, Foraminiferi bentonici ed Ostracodi bentonici.*

Lo studio dettagliato dei Foraminiferi planctonici ha messo in evidenza una successione di associazioni a carattere caldo e freddo che testimoniano l'evoluzione climatica verificatasi durante la sedimentazione. Sono state costruite le curve paleoclimatiche per mezzo dei dati forniti dai rapporti percentuali dei Foraminiferi planctonici.

Sono state inoltre individuate alcune specie di Ostracodi bentonici quali possibili indicatori paleoclimatici comparando le curve paleoclimatiche dei Foraminiferi planctonici e la presenza e frequenza delle specie di Ostracodi bentonici. Utilizzando le specie di Ostracodi considerate indicative si sono costruite curve paleoclimatiche basate esclusivamente su di esse. Le curve, ottenute con i Foraminiferi planctonici e gli Ostracodi bentonici, forniscono un andamento molto simile e mettono in evidenza un periodo freddo correlabile con la fine dell'ultima glaciazione e uno complessivamente caldo correlabile con l'Olocene.

I Foraminiferi bentonici e gli Ostracodi bentonici, sempre subordinati ai Foraminiferi planctonici, sono rappresentati da specie caratteristiche di ambienti batiali. Sono abbondanti durante il Glaciale e si riducono fortemente nell'Olocene.

Maria Moncharmont-Zei, Bianca Russo e Franca Sgarrella hanno studiato i Foraminiferi, Gioacchino Bonaduce e Patrizia Mascellaro gli Ostracodi. Il lavoro è stato discusso ed elaborato insieme.

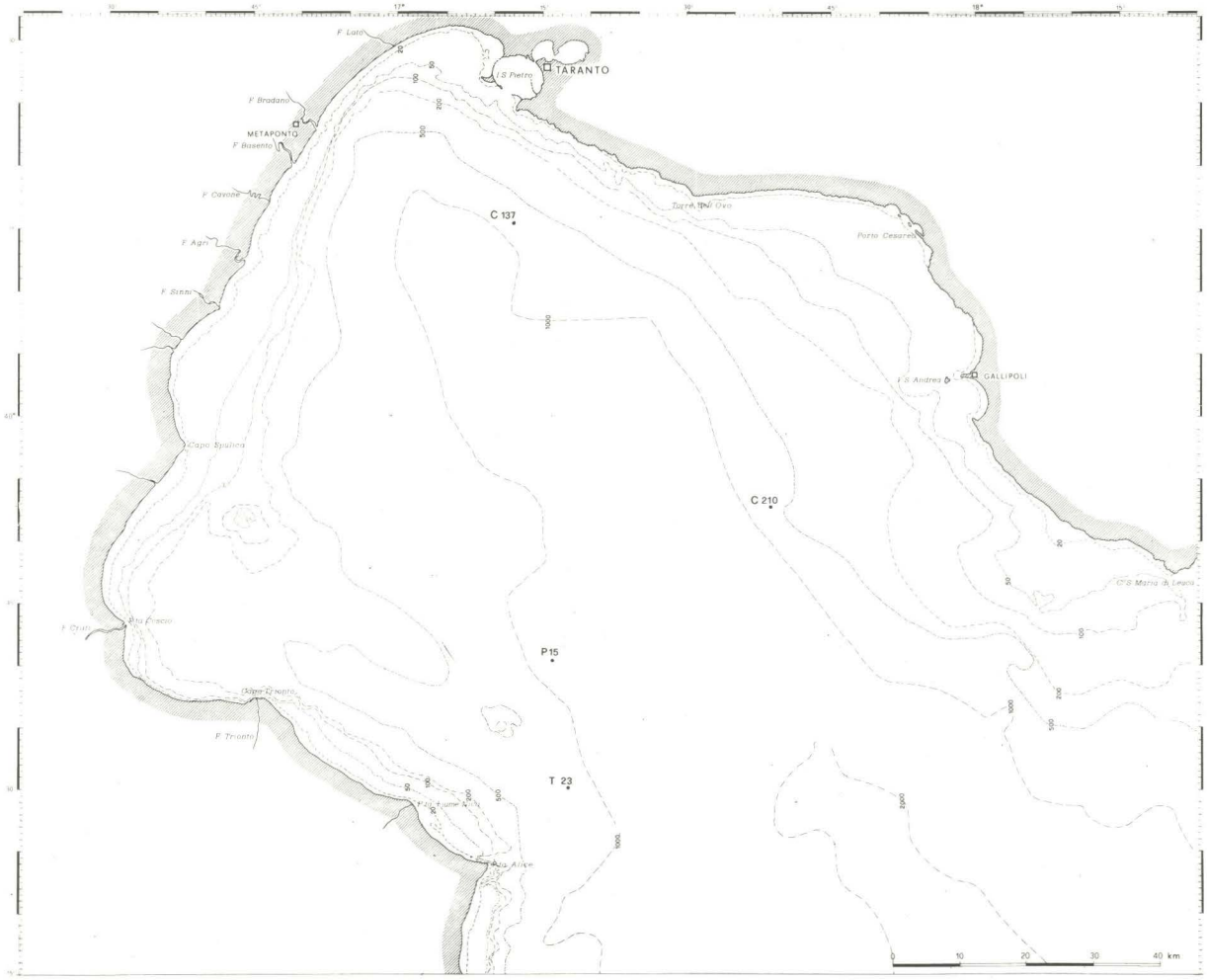
INTRODUCTION

During the past five years, the Gulf of Taranto (Ionian Sea) has been widely investigated for its geomorphology, sedimentology, micropaleontology, mineralogy, palinology and hydrography, within the Research Program « Oceanografia e Fondi marini » of the Italian National Research Council. The Gulf of Taranto program (principal investigator Prof. T. Pescatore, Geology Department of the University of Naples) included 4 cruises of the CNR oceanografic vessels Bannock and Marsili from 1978 to 1982. Preliminary results are reported below (Belfiore *et al.* 1982).

1. Two distinct areas divided by the axis of the Taranto canyon were identified. The eastern and western sectors appear clearly distinct in terms of both their sedimentology-mineralogy and microfaunistic assemblages (foraminifers and ostracods).
2. A preliminary study of the microfauna of several cores up to 3 meters in length suggested that periods of warm and cold paleoclimates alternated from Glacial to Recent.

Research by Bé and Tonderlund (1971) on the distribution of living planktonic foraminifers in the world oceans has demonstrated the fundamental importance of these organisms as paleoclimatic indicators. From this point of view, the interval from the last glacial phase until Recent has been investigated by Blanc-Vernet *et al.* (1969), Herman (1970), Blanc-Vernet *et al.* (1972, 1974, 1975); Blanc *et al.* (1972, 1975, 1976) in the Mediterranean Sea, mostly in the Siculo-Tunisian area, in the Aegean Sea and northwestern Mediterranean (south of Provence). Würmian and post-glacial climatic fluctuations were identified on the basis of planktonic foraminifers, pteropods and clay minerals.

The present research focuses on the detailed study of foraminifers and ostracods of 4 gravity cores col-



Text-fig. 1 - Location of the core-stations in the Gulf of Taranto.

lected in bathyal environments (491, 830, 840 and 943 m depth respectively). The aim of our research was the following:

1. Reconstruction of the evolution of paleoclimate from Würm to Recent using planktonic foraminifers in sediments collected in bathyal environment.
2. Identification of new paleoclimatic markers and indicators among benthic ostracods and foraminifers.
3. Stratigraphic correlation from core to core using paleontological and paleoclimatic analyses.

MATERIALS AND METHODS

The research is based on the examination of four cores. Text-fig. 1 shows the area of the stations sampled and Table 1a indicates the location, water depth and length of the cores examined. Each core was cut vertically into 2 equal parts and from one section a sample of 50 cc volume and 5 cm thick was taken at each 10 cm of core-length (Table 1b). Each sample was washed using 150 mesh sieve and the residue dried at 50°C. A fraction of the residue (from microsplitter) was scanned to study foraminifers by total picking while the entire residue was examined for ostracods by picking both adults and juvenile forms. All species of foraminifers and ostracods were identified. The species percentage of the planktonic and benthic foraminifers was calculated on the basis of a fraction of each sample and percentage lower than 1% were indicated by (x). In the case of ostracods, all the adults specimens were counted and the presence of juveniles was noted and indicated by (x). The previous data are reported in Tables 2 to 14.

In the present study, we have taken into consideration only the most significant species from the climatic viewpoint, in order to obtain curves showing the climatic evolution throughout a considered interval. In particular, we have defined:

1. Warm and temperate-warm assemblages characterized by *Globigerinoides ruber,* associated with other species of *Globigerinoides* and *Hastigerina siphonifera, Orbulina universa, Globigerina digitata, G. rubescens,* and *Globorotalia truncatulinoides.*
2. Cold or temperate-cold association characterized by *Globigerina pachyderma, Globorotalia scitula, Globigerina quinqueloba, G. atlantisae,* and *G. bulloides.*

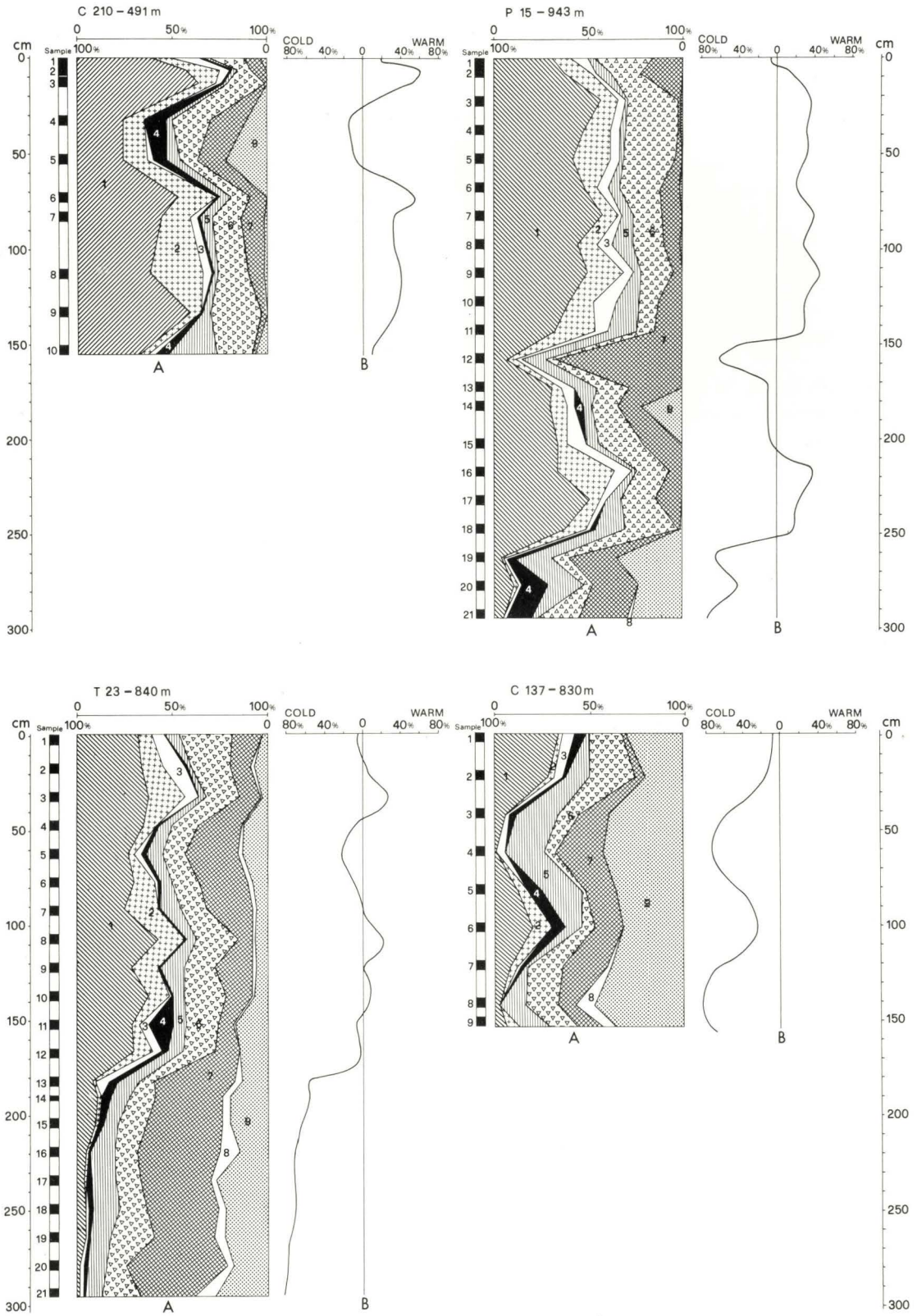
On the total number of the planktonic specimens (Table 2 to 5) the percentage of each species for every sample was calculated. The cold species per-

Core	Lat.	Long.	Water-depth (m)	Length (cm)
C 210	39°53'75"	17°38'7"	491	155
P 15	39°40'2"	17°16'0"	943	295
T 23	39°30'0"	17°18'0"	840	296
C 137	40°15'55"	17°12'5"	830	156

Tab. 1a - Location, water-depth and length of the cores.

CORE C - 210		CORE P - 15		CORE T - 23		CORE C - 137	
Samples	Interval in cm	Samples	Interval in cm	Samples	Interval in cm	Samples	Interval in cm
1	0-4	1	0-5	1	0-5	1	0-5
2	4-9	2	5-10	2	15-20	2	20-25
3	10-15	3	20-25	3	30-35	3	40-45
4	30-35	4	35-40	4	45-50	4	60-65
5	50-55	5	50-55	5	60-65	5	80-85
6	70-75	6	65-70	6	75-80	6	100-105
7	80-85	7	80-85	7	90-95	7	120-125
8	110-115	8	95-100	8	105-110	8	140-145
9	130-135	9	110-115	9	120-125	9	151-156
10	150-155	10	125-130	10	135-140		
		11	140-145	11	150-155		
		12	155-160	12	165-170		
		13	170-175	13	180-185		
		14	180-185	14	190-192		
		15	200-205	15	202-207		
		16	215-220	16	217-222		
		17	230-235	17	232-237		
		18	245-250	18	247-252		
		19	260-265	19	262-267		
		20	275-280	20	277-282		
		21	290-295	21	291-296		

Tab. 1b - Number of samples of the cores, and intervals sampled.



Text-fig. 2 - A. Change in composition of the planktonic foraminiferal assemblages in the studied cores.
B. Climatic curves.
1) *Globigerinoides* spp. 2) *Hastigerina* spp. + *Globorotalia truncatulinoides* + *Orbulina universa* + *Globigerina digitata* + *G. rubescens* + *G. calida*. 3) *Globigerina calabra* + *Neogloboquadrina dutertrei* + *Globigerina cariacoensis* + *Globigerinidae* (not det.). 4) *Globorotalia inflata*. 5) *Globigerinita glutinata*. 6) *Globigerina bulloides*. 7) *Globigerina quinqueloba* + *G. atlantisae*. 8) *Globorotalia scitula*. 9) *Globigerina pachyderma*.

centages were expressed as negative values while positive values were given to the warm percentages. For each sample the algebraic sum of the previous values was calculated to show the climatic oscillations (Text-fig. 2).

RESULTS AND DISCUSSION

Analysis of the cores is reported proceeding from the top to the base and assuming as datum-line the recent assemblages of the Gulf of Taranto (Belfiore *et al.*, 1981).

Planktonic Foraminifers

Core C-210 (Table 2)

The microfauna of the top of the core showed a temperate-warm character with the clear prevalence of *Globigerinoides ruber* and *Globigerina bulloides* and it conforms with the present-time assemblages found in the eastern sector of the Gulf of Taranto.

A greater abundance of all the « warm » forms was noticed in the range between 5 to 20 cm and 70 to 135 cm. The assemblages from 20 to 70 cm show an increase of *Globigerina quinqueloba* and *G. pachyderma* associated with *Globorotalia inflata* and a reduction of the « warm » species.

In the basal part of the core *Globigerinita glutinata, Globigerina bulloides* prevailed and *Globorotalia inflata* occurred commonly.

Core P-15 (Table 3)

The temperate fauna of the top of the core, consisting of *Globigerina bulloides, Globigerinoides ruber* and *Globigerina quinqueloba,* reflects the typical present-time assemblages of the western sector of the Gulf of Taranto.

From 10 to 150 cm, the fauna is characterized by a peculiar abundance of *Globigerinoides* spp. The interval 150-205 cm shows the abundance of « temperate » forms and the presence of *Globigerina pachyderma;* within this interval we noticed, at about 160 cm, a sharp increase of *Globigerina quinqueloba* (67%) but not an accompanying increase of the other « cold » species. Consequently the sudden appearance of a great increase of *Globigerina quinqueloba* could be caused by other controlling factor(s), different from temperature changes.

Between 205 and 250 cm all the « warm » forms were well represented. Finally, the base of the core

SPECIES	CORE C 210 Water-depth 491 m									
SAMPLES	1	2	3	4	5	6	7	8	9	10
HANTKENINIDAE										
Hastigerina pelagica (d'ORBIGNY)						X				
Hastigerina siphonifera (d'ORB.)	1	6	5	1	2	9	7	7	3	
GLOBOROTALIIDAE										
Globorotalia inflata (d'ORB.)		X	X	11	7	X	1	X	X	6
Globorotalia truncatulinoides (d'ORB.)		X								3
GLOBIGERINIDAE										
Globigerina atlantisae CIFELLI & SMITH		2		2						
Globigerina bulloides d'ORB.	18	7	20	20	9	11	15	16	27	19
Globigerina digitata BRADY			1	2		2	X			
Globigerina pachyderma (EHRENBERG)	3			11	22		1	2		7
Globigerina quinqueloba NATLAND	9	7	1	17	15	9	12	8	3	1
Globigerina rubescens HOFKER	7	5	1	6	9	X	7	20	1	
Globigerinoides quadrilobatus (d'ORB.)							1			
Globigerinoides ruber (d'ORB.)	33	47	59	17	20	41	33	26	59	28
Globigerinoides sacculifer (BRADY)		2		1		4	X			
Globigerinoides tenellus PARKER	1	1	2	2	2	1	7	10	X	4
Globigerinoides trilobus (REUSS)	6	7	3	4	2	7	3	2		1
Neogloboquadrina dutertrei (d'ORB.)										1
Orbulina universa d'ORB.	2	7	2	2	2	9	1	1	2	1
Globigerinita glutinata (EGGER)	4	3	2	4	7	6	7	2	4	25
Globigerinidae	16	6	4		3		4	6		4
Counted specimens	151	531	333	144	262	597	262	270	394	134

Tab. 2 - Distribution of the planktonic foraminifers in core C-210.

SPECIES	CORE P 15 Water-depth 943 m																				
SAMPLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
HANTKENINIDAE																					
Hastigerina pelagica (d'ORBIGNY)															X						
Hastigerina siphonifera (d'ORB.)	3	7	3	2	3	4	2	3	3	5	4	1	X	4	3	6	4	2			
GLOBOROTALIIDAE																					
Globorotalia inflata (d'ORB.)														5				3	5	14	15
Globorotalia scitula (BRADY)																		X			1
Globorotalia truncatulinoides (d'ORB.)						X												3		2	
GLOBIGERINIDAE																					
Globigerina atlantisae CIFELLI&SMITH		1	X			1	X	1		X				X	2		2		2	2	
Globigerina bulloides d'ORB.	31	16	27	28	27	21	15	16	17	10	9	5	17	14	23	17	18	28	9	5	22
Globigerina calabra COLAL.& SART.																	X			X	
Globigerina cariacoensis ROGL&BOLLI																			1		1
Globigerina digitata BRADY		X		3		X	2	2	3	X	1	X	1		X						
Globigerina pachyderma (EHRENBERG)			1	1		1		1				X		22				X	34	24	27
Globigerina quinqueloba NATLAND	16	21	1	1	4	10	11	8	5	13	15	67	28	12	19	7	12	1	24	22	26
Globigerina rubescens HOFKER	2	5	3	7	16	2	2	4	9	7	16	4	3	2		22		6	1		
Globigerinoides quadrilobatus (d'ORB.)		1								X								X			
Globigerinoides ruber (d'ORB.)	31	24	52	43	39	41	54	42	40	36	23	5	30	26	29	30	49	31	3	11	5
Globigerinoides sacculifer (BRADY)		X					1		1	X				X				X			
Globigerinoides tenellus PARKER		6	2	2	2	5	1	2	3	2	5	1	X	X	3	4	2	4	1		
Globigerinoides trilobus (REUSS)		6	3	3	1	2	2	1	6	2	5	1	1	3	2	X		2			
Orbulina universa d'ORB.	5	2	3	2	1	1	2	1	4	X			X	3	1	2	2	1		X	
Globigerinita glutinata (EGGER)	3	8	1	3	2	6	6	11	4	12	15	13	12	4	7	3	8	16	20	19	3
Globigerinidae	9	2	4	5	5	6	2	8	5	12	7	3	7	4	10	9	3	1			
Counted specimens	196	216	276	237	417	438	262	871	244	636	222	573	311	282	375	253	311	244	268	1094	211

Tab. 3 - Distribution of the planktonic foraminifers in core P-15.

SPECIES	CORE T 23 Water-depth 840 m																				
SAMPLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
HANTKENINIDAE																					
Hastigerina pelagica (d'ORBIGNY)	X																				
Hastigerina siphonifera (d'ORB.)	3	4	2	2	1	X	3	3	3	2	2	5					1				
GLOBOROTALIIDAE																					
Globorotalia inflata (d'ORB.)		1		X	2	2	1	X	X	X	13	3	5	5	3	1	2	3	X	2	X
Globorotalia scitula (BRADY)		2	1	1	2	3	2	1	2	1	1	X	4	4	4	10	3	4	6	3	12
Globorotalia truncatulinoides (d'ORB.)		X	X		X			X	X			X	X	X	X	1	X	X			
GLOBIGERINIDAE																					
Globigerina atlantisae CIFELLI&SMITH	2	X	1						1								X				
Globigerina bulloides d'ORB.	27	21	18	14	12	14	13	22	16	22	17	17	8	14	15	12	13	14	23	10	20
Globigerina calabra COLAL.& SART.																			X		
Globigerina cariacoensis ROGL&BOLLI												1			X		X		X		
Globigerina digitata BRADY			2	1		X	2	2	1	4	2	X									
Globigerina pachyderma (EHRENBERG)	2	6	2	13	12	7	5	6	5	6	16	14	13	19	19	14	26	21	22	17	26
Globigerina quinqueloba NATLAND	15	11	10	23	28	26	25	8	19	14	8	13	43	35	40	44	36	38	32	54	29
Globigerina rubescens HOFKER	2	5	14	3	2	9	11	6	9	3	X	3		2	1				X	1	
Globigerinoides quadrilobatus (d'ORB.)												X							X		
Globigerinoides ruber (d'ORB.)	32	33	31	29	24	26	21	38	26	34	24	24	5	9	6	3	4	5	5	2	2
Globigerinoides sacculifer (BRADY)			1	2								X									
Globigerinoides tenellus PARKER		1	4	2	1	2	1	1	1	X	1	1	1		1						
Globigerinoides trilobus (REUSS)			2	2	2	2	3	4	2	4	4	4	3	2	3	2					
Neogloboquadrina dutertrei (d'ORB.)					2	1															1
Orbulina universa d'ORB.	2	2	1	1	X	1	2	3	1	2		1			X						
Globigerinita glutinata (EGGER)	8	2	4	7	9	6	11	5	13	6	7	8	11	10	8	13	11	14	11	10	9
Globigerinidae	7	12	7		2					1	5	4	7				3	1		1	1
Counted specimens	264	265	245	205	216	300	292	354	261	192	225	363	215	176	312	182	231	343	327	297	256

Tab. 4 - Distribution of the planktonic foraminifers in core T.-23.

was characterized by the clear prevalence of all the « cold » forms, the abundance of *Globorotalia inflata* and the presence of *Globorotalia scitula.*

Core T-23 (Table 4)

The top of the core, as in P-15, was characterized by a temperate assemblage in which *Globigerinoides ruber, Globigerina bulloides* and *G. quinqueloba* prevail.

In the vicinity of 160 cm alternate occurrence of temperate-warm and temperate-cold assemblages were observed. The warm events were not strongly evident and of rather short duration. Only between 145 to 160 cm was *Globorotalia inflata* particularly abundant.

From 175 cm to the base of the core the « cold » species (especially *Globigerina quinqueloba, G. pachyderma* and *Globorotalia scitula*) were particularly abundant.

It was noted that in this core only *Globorotalia scitula* was present from the base up to near the top.

Core C-137 (Table 5)

The whole core is characterized by a clear predominance of *Globigerina pachyderma* and *G. quinqueloba.* The « warm » forms are either absent or scarcely represented and they show a slight increase only in the intervals within the top 20 cm, and between 70 to 120 cm.

The presence at the top of the core of a « cold » fauna not corresponding to that of the recent sediments of the Gulf of Taranto suggests the erosion of the younger sediments.

The Benthic Microfauna

Ostracods

Interpretation of paleoclimates using single species and/or assemblages of planktonic foraminifers is very advanced and result in a high level of confidence. The same does not seem to be true for the benthic microfauna, especially as far as foraminifers and ostracods are concerned. Knowledge on the paleoclimatic significance of the Pliocene-Recent benthic ostracod species is extremely scarce, especially with regard to the Mediterranean area. In particular, the deep-water ostracods have not been the subject of paleoclimatic investigations except for several papers by Ruggieri (1971, 1977) and Colalongo (1966) who indicated that *Cytheropteron testudo* Sars, *Mullerina proble-*

SPECIES	CORE C 137 Water-depth 830 m								
	SAMPLES	1	2	3	4	5	6	7	8	9
HANTKENINIDAE										
Hastigerina siphonifera (d'ORBIGNY)		1								
GLOBOROTALIIDAE										
Globorotalia inflata (d'ORB.)		6	1	4		8	7	2		
Globorotalia scitula (BRADY)							X	2	10	7
Globorotalia truncatulinoides (d'ORB.)		X				4	4	X		
GLOBIGERINIDAE										
Globigerina atlantisae CIFELLI & SMITH			2	1	4		2			
Globigerina bulloides d'ORB.		17	24	11	6	2	7	18	17	15
Globigerina pachyderma (EHRENBERG)		30	20	39	42	35	31	38	47	36
Globigerina quinqueloba NATLAND		2	3	15	21	16	13	24	9	13
Globigerina rubescens HOFKER			3			1	5	4		
Globigerinoides ruber (d'ORB.)		33	29	5	1	12	19	8	3	6
Globigerinoides sacculifer (BRADY)		X								
Globigerinoides tenellus PARKER				1		X	1	X		X
Globigerinoides trilobus (REUSS)		1					X			
Neogloboquadrina dutertrei (d'ORB.)		X		2	5			1		1
Orbulina universa d'ORB.		1				X	1			
Globigerinita glutinata (EGGER)		2	13	22	21	21	9	2	14	16
Globigerinidae		6	5							6
Counted specimens		297	252	354	221	234	180	175	161	415

Tab. 5 - Distribution of the planktonic foraminifers in core C-137.

matica (Seguenza) and *Actinocythereis dunelmensis* (Norman) are paleoclimatic « cold » marker species. In the deep-water sediments of the Mediterranean from the Pliocene to Holocene, *Cytheropteron testudo* was the only species sufficiently represented to be used for climatic interpretations. The present-day geographic distribution of this species is restricted to the Atlantic water with a temperature range of 4-10°C.

Other « cold » forms migrated into the Mediterranean at different times during the Pleistocene after the arrival of *Cytheropteron testudo* (Ruggieri e Sprovieri, 1977). They adapted to the evolving environment and are still living in the Mediterranean. These forms have been defined « delayed northern guests ».

Analysis of the cores

The paleoclimatic curves of the 4 cores obtained by means of the planktonic foraminifers define 5 climatic ranges, namely, cold, cold-temperate, temperate, warm-temperate and warm. These have been assumed as the base for singling out ostracod species of possible paleoclimatic significance.

Tables 7, 8, 9 and 10 show the quantitative distribution of all the species found. The presence of juvenals is marked by (x).

A reduced number of species, pertaining to the near-shore environment, appear to contaminate some of the samples. These species, mainly attributable to the genera *Callistocythere, Leptocythere, Loxoconcha, Semicytherura, Xestoleberis, Paracytheridea* and *Urocythereis,* have not been taken into consideration in the following analysis of the cores.

Core T-23 (Table 7)

The top of the paleoclimatological curve based on planktonic foraminifers (Text-fig. 3A), indicates a long period of alternating « temperate-cold » and « temperate-warm » phases, followed by a very cold period down to the base of the core.

The ostracod assemblages characteristic of the defined types of intervals are the following:

« Temperate-warm » interval: *Argilloecia acuminata, A. levis, A. micra, Bairdia conformis, Bythoceratina reticulata, Bythocypris tenera, Krithe caudata, K. monosteracensis, Paracytherois mediterranea, Polycope inflata, P. ovalis, P. parareticulata, P. reticulata, P. striata, P. tholiformis, P. vasfiensis* and *Tuberculocythere tetrapteron.*

« Temperate-cold » interval: *Argilloecia acuminata, A. micra, A. levis, Bairdia conformis, Bythocypris obtusata, B. tenera, Cytheropteron hadriaticum, C. venustum, Echinocythereis* sp. 1, *Krithe caudata, K. monosteracensis, Macrocypris adriatica, Paracytherois flexuosa, P. mediterranea, Polycope inflata, P. reticulata, P. striata* and *P. vasfiensis.*

« Cold » interval: *Argilloecia acuminata, A. levis, A. micra, Bathycythere vanstraateni, Bythocypris lucida, B. tenera, Cytheropteron hadriaticum, C. latum, C. venustum, Echinocythereis* sp. 1, *Henryhowella sarsi, Krithe caudata, K. monosteracensis, Loxoconchidea minima, Macrocypris adriatica, Microxestoleberis profunda, Paracytherois flexuosa, P. mediterranea, Pedicythere mirabilis, P. phryne, P. tessellata, Polycope inflata, P. ovalis, P. parareticulata, P. striata, P. vasfiensis* and *Tuberculocythere tetrapteron.*

Paleoclimatological remarks — The ostracod assemblages characteristic of each interval were:

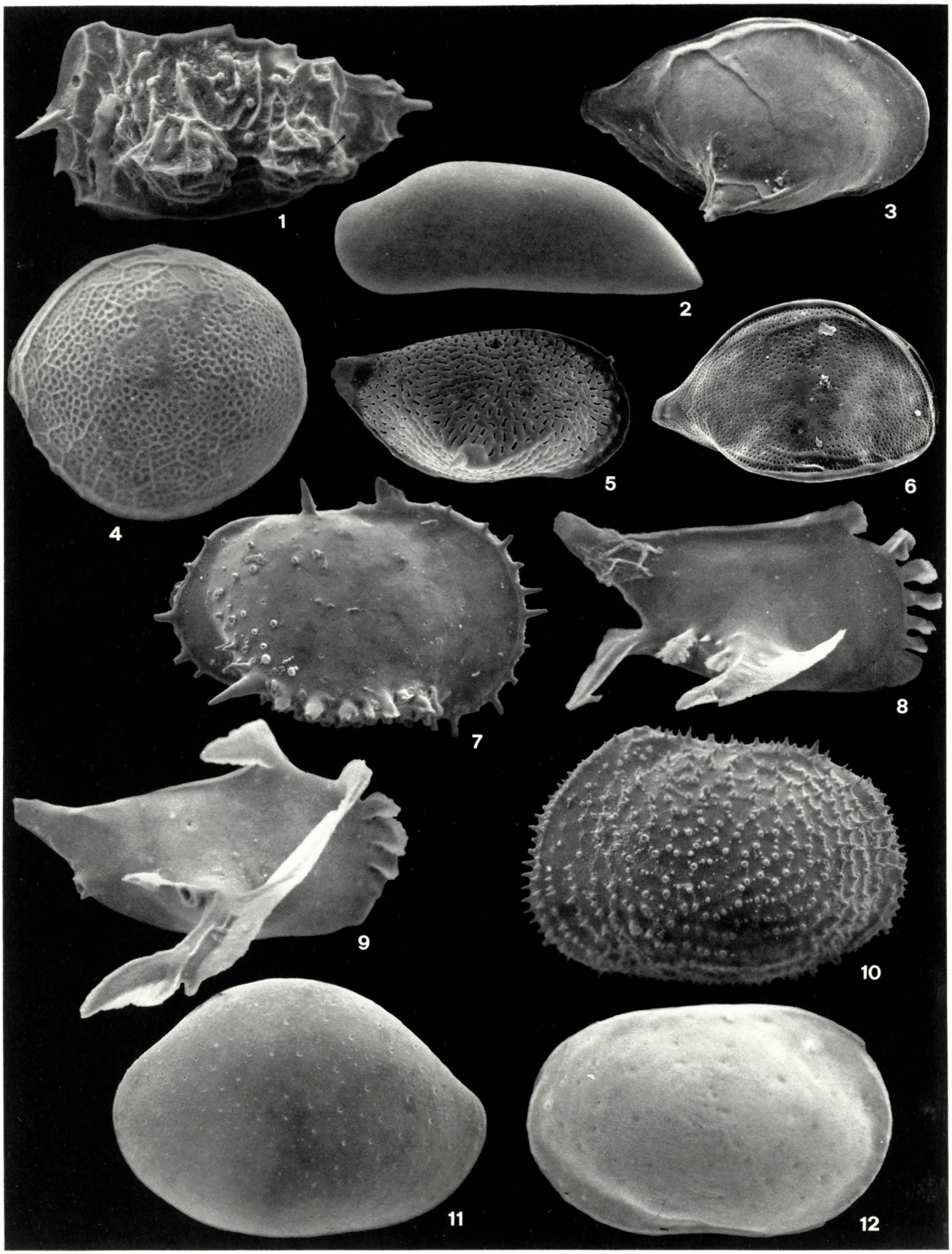
« Temperate-warm » interval: *Bythoceratina reticulata* and *Polycope tholiformis.*

« Temperate-cold » interval: *Bythocypris obtusata.*

« Cold » interval: *Bathycythere vanstraateni, Bythocypris lucida, Cytheropteron latum, Henryhowella sarsi, Loxoconchidea minima, Microxestoleberis profunda, Pedicythere mirabilis, P. phryne* and *P. tessellata.*

EXPLANATION OF PLATE 1

Fig. 1 - *Tuberculocythere tetrapteron.* Left valve (x 215).
Fig. 2 - *Macrocypris adriatica.* Left valve (x 30).
Fig. 3 - *Cytheropteron* aff. *C. rotundatum.* Right valve (x 130).
Fig. 4 - *Polycope parareticulata.* Left valve (x 150).
Fig. 5 - « *Pedicythere* » *tessellata.* Right valve (x 120).
Fig. 6 - *Cytheropteron testudo.* Right valve of juvenals (x 115).
Fig. 7 - *Bathycythere vanstraateni.* Right valve (x 57).
Fig. 8 - *Pedicythere phryne.* Right valve (x 192).
Fig. 9 - *Pedicythere mirabilis.* Right valve (x 62).
Fig. 10 - *Echinocythereis* sp. 1. Left valve (x 57).
Fig. 11 - *Bairdia conformis.* Left valve (x 62).
Fig. 12 - *Loxoconchidea minima.* Right valve (x 225).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Core C-137 (Table 8)

The paleoclimatic curve based on the planktonic foraminifers (Text-fig 3A) showed a general trend to cold climate all along the core with two cold minima.

The related ostracod assemblages were the following:

« Cold-temperate » interval: *Argilloecia acuminata, A. micra, Buntonia textilis, Bythocypris obtusata, B. reflexa, Henryhowella sarsi, Krithe caudata, K. monosteracensis, Loxoconchidea minima, Macrocypris adriatica, Paracytherois mediterranea, Polycope demulderi, P. inflata, P. ovalis, P. parareticulata, P. reticulata, P. striata, Tuberculocythere tetrapteron, Cytheroma variabilis, Cytheropteron* aff. *C. alatum, C. hadriaticum, C. monoceros, C.* aff. *C. rotundatum, C. venustum, Parakrithe dimorpha, Pedicythere tessellata* and *Polycopsis quadridentata.*

« Cold » interval: *Argilloecia acuminata, A. levis, A. micra, Cytheroma variabilis, Cytheropteron* aff. *C. alatum, C. hadriaticum, C.* aff. *C. rotundatum, C. testudo, C. venustum, Henryhowella sarsi, Krithe caudata, K. monosteracensis, Loxoconchidea minima, Macrocypris adriatica, Paracytherois mediterranea, P. oblonga, Pedicythere mirabilis, P. phryne, P. tessellata, Polycope inflata, P. parareticulata, P. reticulata, P. striata, P. vasfiensis* and *Tuberculocythere tetrapteron.*

Paleoclimatological remarks — The species occurring exclusively in the defined intervals were the following:

« Cold-temperate » interval: *Buntonia textilis, Bythocypris obtusata, B. reflexa, Polycope demulderi, P. ovalis, Polycopsis quadridentata, Cytheropteron monoceros* and *Parakrithe dimorpha.*

« Cold » interval: *Paracytherois oblonga, Pedicythere mirabilis, P. phryne* and *Polycope vasfiensis.*

Observations — Because of the very similar paleoclimatological environment of the 2 types of interval represented in this core, most of the species occur in common in both of them.

Core P-15 (Table 9)

The paleoclimatic curve based on planktonic foraminifers (Text-fig. 2) showed a « temperate » character for the top of the core followed by a long « warm » period, below which a more « temperate » interval was registered. The base of the core was characterized by a « cold » climate.

The corresponding ostracod assemblages were the following:

« Temperate » interval: juveniles of *Argilloecia, Krithe, Polycope* and *Loxoconchidea minima.*

« Warm » interval: *Argilloecia acuminata, A. levis, A. micra, Bairdia conformis,. Bythoceratina reticulata, Bythocypris obtusata, B. tenera, Krithe caudata, Polycope inflata, P. striata, Propontocypris* n. sp. 1 and *Tuberculocythere tetrapteron.*

« Cold » interval: *Argilloecia acuminata, A. caudata, A. levis, A. micra, Bathycythere vanstraateni* (juvenals), *Henryhowella sarsi* (juvenals), *Krithe caudata, K. monosteracensis, Loxoconchidea minima, Macrocypris adriatica, Paracytherois mediterranea, P. oblonga, Polycope inflata, P. parareticulata, P. vasfiensis* and *Tuberculocythere tetrapteron.*

Paleoclimatological remarks — In this core, we selected the species which occurred in the defined intervals only.

« Warm » interval: *Bairdia conformis, Bythocypris obtusata, Polycope striata* and *Propontocypris* n. sp. 1.

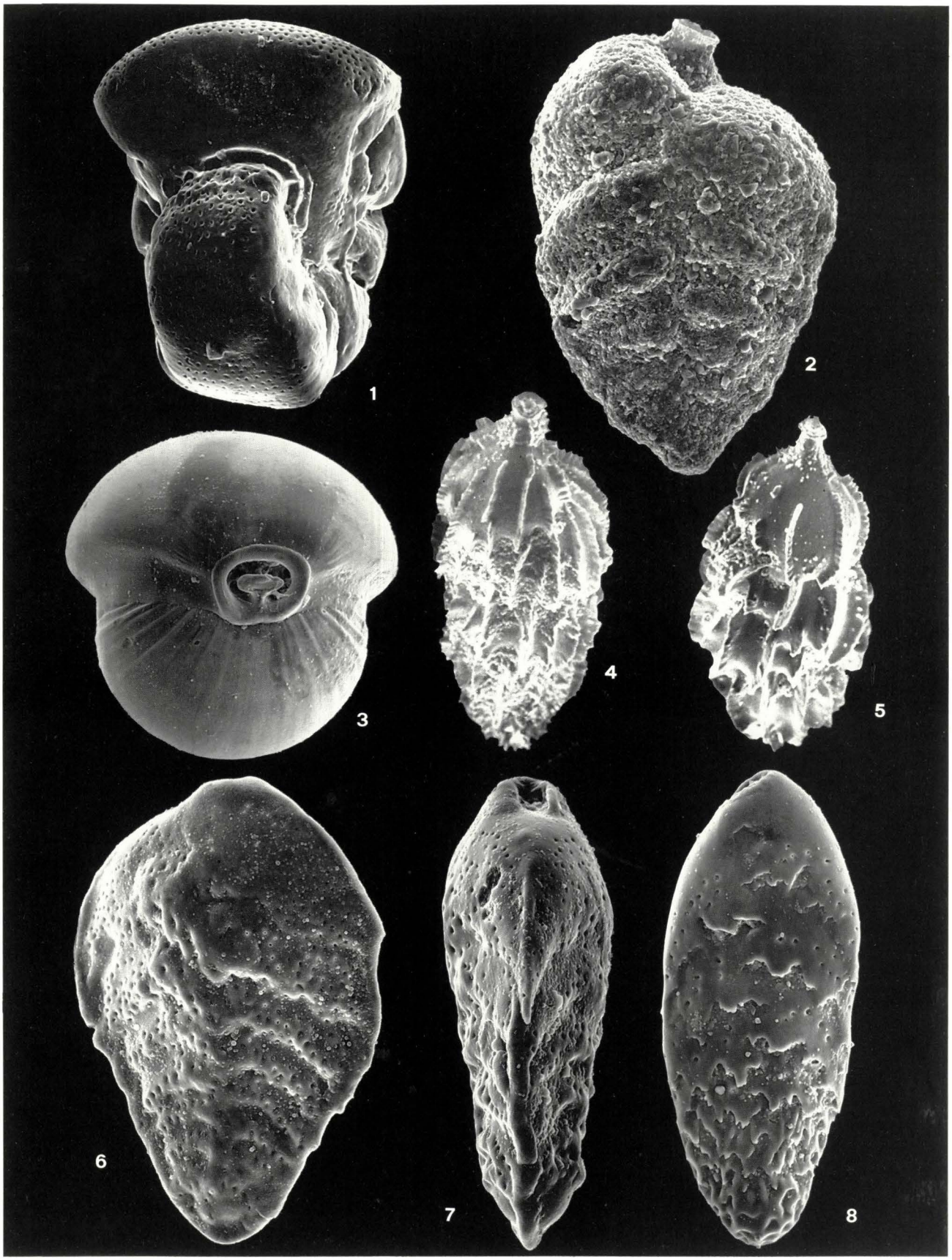
« Temperate » interval: none.

« Cold » interval: *Bathycythere vanstraateni, Henryhowella sarsi, Krithe monosteracensis, Macrocypris adriatica, Paracytherois mediterranea, Polycope parareticulata* and. *P. vasfiensis.*

Observations — *Bythoceratina reticulata* and *Bythocypris tenera* occurred commonly in « warm » and « temperate » intervals. *Loxoconchidea minima* and *Paracytherois oblonga* occurred commonly in « cold » and « temperate » intervals.

EXPLANATION OF PLATE 2

Fig. 1 - *Paromalina coronata* (Parker and Jones). Apertural view (x 80). Sample T 23-8.
Fig. 2 - *Siphotextularia heterostoma* Fornasini. (x 210). Sample T 23-8.
Fig. 3 - *Pyrgo comata* (Brady). Apertural view (x 85). Sample T 23-15.
Figg. 4, 5 - *Uvigerina* aff. *U. latalata* R.E. and R.C. Stewart. (x 130). Sample T 23-15.
Fig. 6 - *Bolivina dilatatissima* Silvestri. (x 220). Sample T 23-7.
Fig. 7 - *Bolivina dilatatissima* Silvestri. Edge view (x 270). Sample T 23-7.
Fig. 8 - *Bolivina albatrossi* Cushman. (x 200). Sample T 23-19.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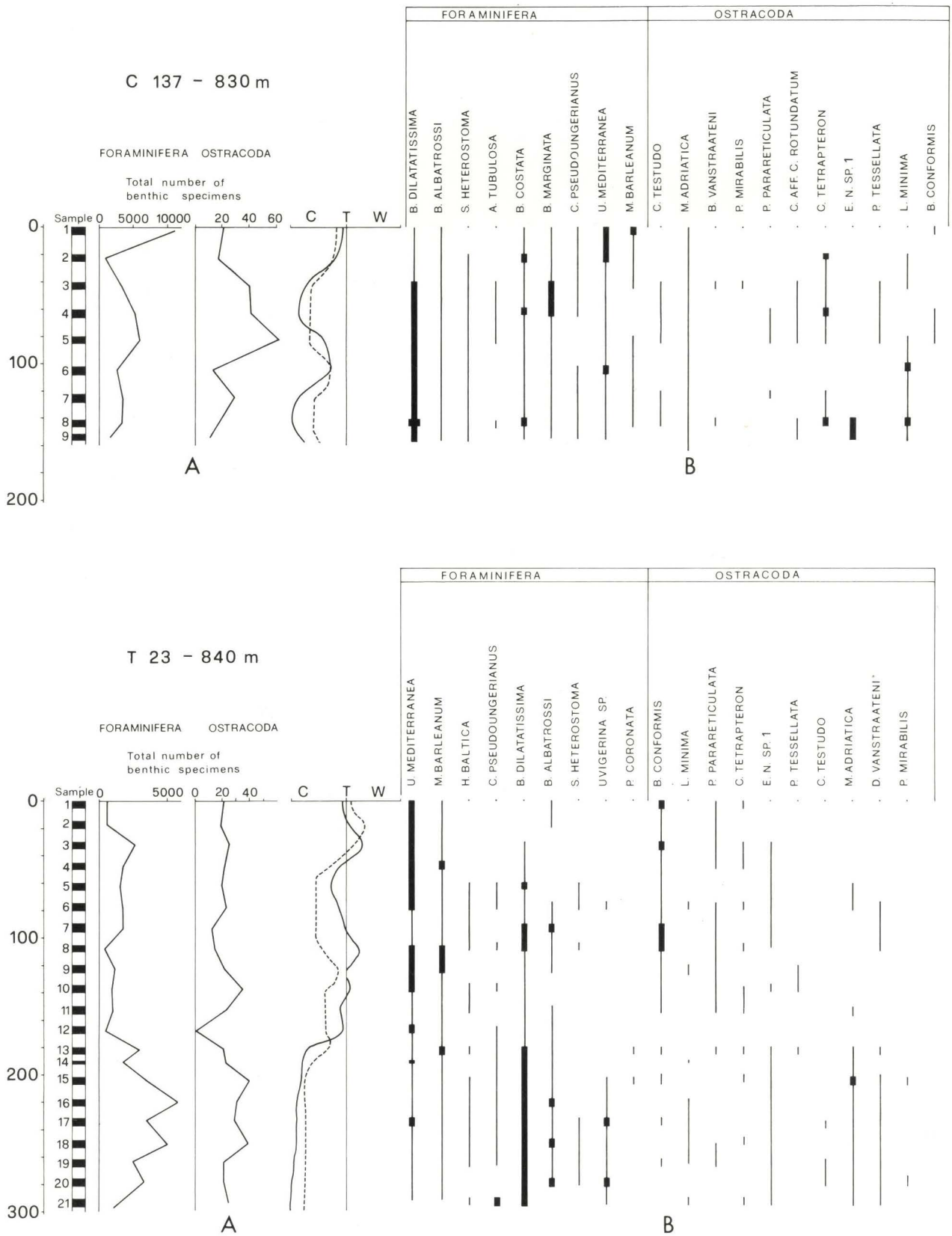
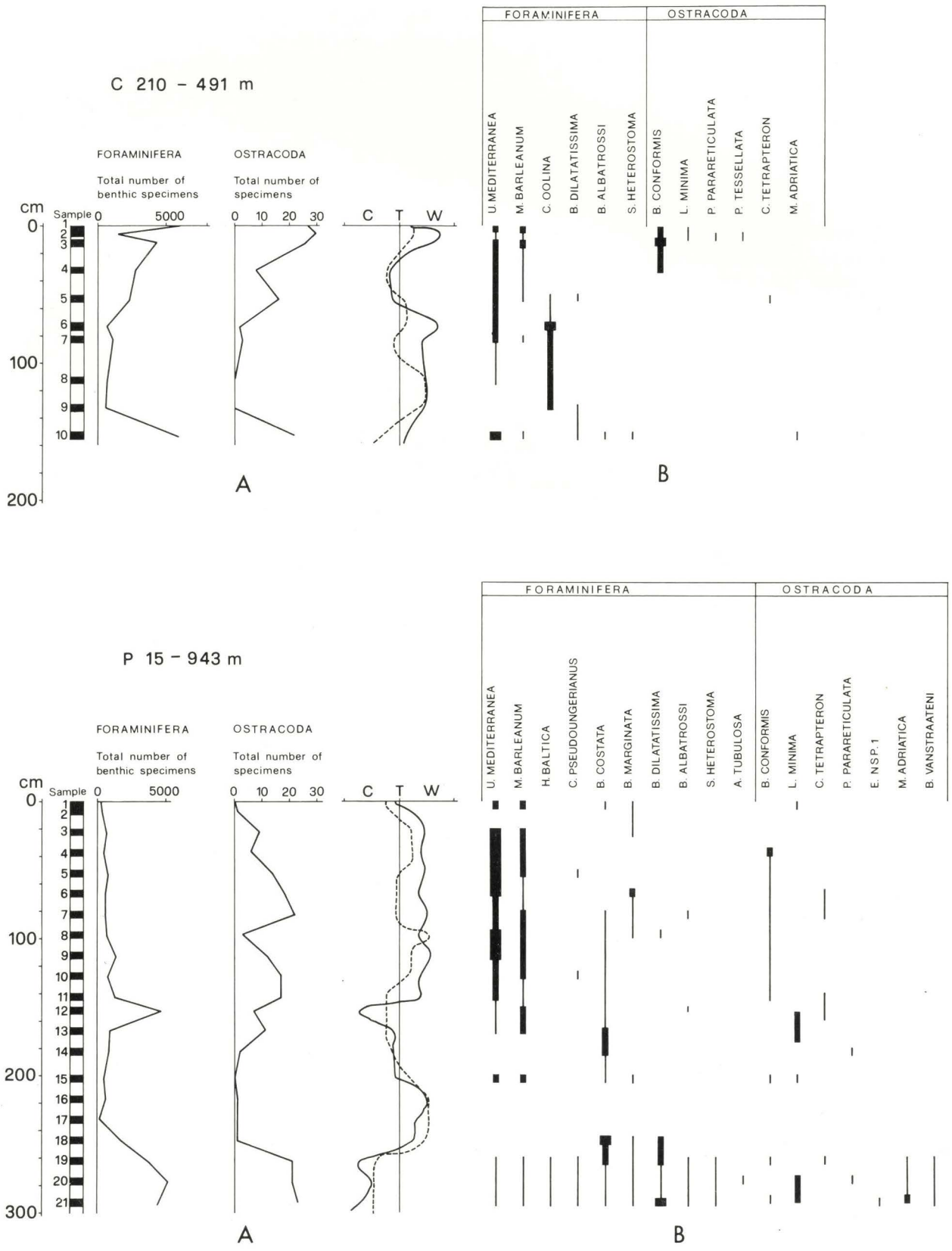


Text-fig. 3 - A. Diagrams of the total numbers of the benthic foraminifers and ostracods and related climatic curves (— foraminifers; ..... ostracods) based on 50 cc samples in collection conditions.
B. Distribution and abundance of the most significant species of the benthic foraminifers (— 0,5% to 10%; ▬ 10% to 30%; ■ > 30%) and of the ostracods.



Text-fig. 4 - A. Diagrams of the total numbers of the benthic foraminifers and ostracods and related climatic curves (— foraminifers; ..... ostracods).
B. Distribution and abundance of the most significant species of the benthic foraminifers (— 0,5% to 10%; ▬ 10% to 30%; ■ > 30%) and of the ostracods.

Core C-210 (Table 10)

The planktonic foraminifers' paleoclimatic curve (Text-fig. 2A) shows two « warm » periods separated by a « temperate-cold » interval. The ostracod assemblages characteristic of each type of interval were the following:

« Warm » interval: *Argilloecia acuminata, A. levis, A. micra, Bairdia conformis, Bythocypris obtusata, B. tenera, Cytheroma variabilis, Cytheropteron hadriaticum, C. sulcatum, C. venustum, C. zinzulusae, Loxoconchidea minima, Pedicythere tessellata, Polycope inflata, P. parareticulata* and *P. vasfiensis.*

« Temperate » interval: *Argilloecia acuminata, A. micra, Bairdia conformis, Krithe caudata, Polycope ovalis* and *P. reticulata.*

Paleoclimatological remarks — The species occurring exclusively in the cited intervals are listed below:

« Warm » interval: *Argilloecia levis, Bythocypris obtusata, B. tenera, Cytheroma variabilis, Cytheropteron hadriaticum, C. sulcatum, C. venustum, C. zinzulusae, Loxoconchidea minima, Pedicythere tessellata, Polycope inflata, P. parareticulata* and *P. vasfiensis.*

« Temperate » interval: *Krithe caudata.*

Marker and Indicator Species

From the analysis given previously and by comparison of the assemblages corresponding to each climatic range in all the cores, it was possible to isolate those species which seem to be characteristic of every range.

Table 6a shows the climatic distribution pattern for all the species selected in each climate range of every core. We defined « markers species » as those which characterized a climatic range, only by their presence. In the analysis of the Tables (7, 8, 9, 10) we observed that other species, with a wider climatic range, seem to indicate a precise climate only when particularly abundant: we define these as « indicators species » (Tab. 6b). The species considered of major paleoclimatic significance are illustrated in Plate 1.

The small number of cores examined cannot allow the definitive identification of new paleoclimatic marker or indicator species but only the paleoclimatic trend of a selected number of species. Moreover it is worth mentioning that at the warm-peaks on the planktonic foraminifer paleoclimatic curves corresponds a minimum number of ostracode specimens and viceversa. It was possible to construct a paleoclimatic curve based on ostracods for the 4 cores, which matches that obtained using planktonic foraminifers (Text-figs. 3A, 4A) by taking into account the paleoclimatic value given to *marker* species, the relative quantitative changes in number of *indicator* species and the quantitative changes of the total number of specimens per sample.

Species	Cold	Temp.-cold	Temp.	Temp.-warm	Warm
Argilloecia acuminata	+	+	+	+	+
Argilloecia levis	+	+	+	+	+
Argilloecia micra	+	+		+	+
Bairdia conformis		+	+	+	+
Bathycythere vanstraateni	+				
Buntonia textilis		+			
Bythoceratina reticulata			+	+	+
Bythocypris lucida	+				
Bythocypris obtusata		+			+
Bythocypris reflexa		+			
Bythocypris tenera	+	+	+	+	+
Cytheroma variabilis	+	+			+
Cytheropteron aff. *C. alatum*	+	+			
Cytheropteron hadriaticum	+	+			+
Cytheropteron latum	+				
Cytheropteron monoceros		+			
Cytheropteron aff. *C rotundatum*	+	+			
Cytheropteron sulcatum					+
Cytheropteron testudo	+				
Cytheropteron venustum	+	+			+
Cytheropteron zinzulusae					+
Echinocythereis sp. 1	+	+			
Henryhowella sarsi	+	+			
Krithe caudata	+	+	+	+	+
Krithe monosteracensis	+	+		+	
Loxoconchidea minima	+	+	+		+
Macrocypris adriatica	+	+			
Microxestoleberis profunda	+				
Paracytherois flexuosa	+	+			
Paracytherois mediterranea	+	+		+	
Paracytherois oblonga	+		+	+	+
Parakrithe dimorpha		+			
Pedicythere mirabilis	+				
Pedicythere phryne	+				
Pedicythere tessellata	+	+			
Polycope demulderi		+			
Polycope inflata		+		+	+
Polycope ovalis		+	+	+	+
Polycope parareticulata		+		+	+
Polycope reticulata		+	+	+	+
Polycope striata		+		+	
Polycope tholiformis					+
Polycope vasfiensis		+		+	+
Polycopsis quadridentata		+			
Propontocypris n. sp. 1					+
Tuberculocythere tetrapteron		+			

Tab. 6a - List of the species selected in each climatic range of all the cores and their climatic significance.

SPECIES	MAX COLD	COLD	COLD TEMP.	TEMP.	WARM TEMP.	WARM
Cytheropteron testudo	———	———	———			
Macrocypris adriatica	———	———	———			
Bathycythere vanstraateni		———	———			
Pedicythere mirabilis		———	———			
« *Pedicythere* » *tessellata*		———	———			
Echinocythereis sp. 1		———	———			
Loxoconchidea minima		———	———			
Polycope parareticulata		———	———	———		
Cytheropteron aff. *C. rotundatum*		———	———	———		
Tuberculocythere tetrapteron		———	———	———		
Bairdia conformis		———	———	.....	.....	

Tab. 6b - Ostracods as markers (———) and indicators (.....).

Benthic foraminifers

In all the levels of the cores examined the benthic foraminifers were less abundant than in assemblages of planktonic foraminifers characteristic of bathyal environments.

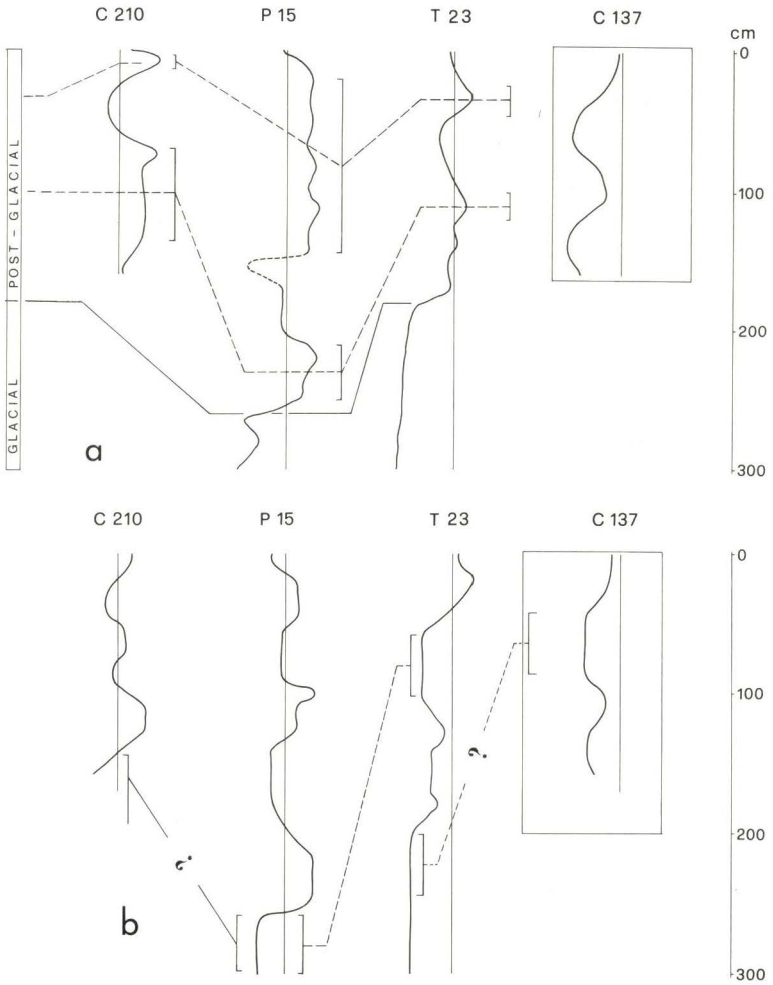
The list of the species and their percentages, calculated on the total number of the benthic foraminifers observed for each sample, are reported in the Tables 11 to 14. Examination of the data indicated that the distribution and frequency of each species changed along the cores (Text-fig. 3A). The whole C-210 core and the top of the cores P-15 (down to 220 cm) and T-23 (down to 170 cm) showed a generally lower number of specimens with a predominance of *Uvigerina mediterranea, Melonis barleanum* and *Cassidulina* spp., while *Planulina ariminensis, Hyalinea baltica, Cibicides pseudoungerianus, Gyroidina* spp., and *Bolivina* spp. occurred in lesser abundancies.

In the lower sections of the previous cores and all along the C-137 core, the assemblages appeared rich in number of specimens primarily characterized by *Bolivina dilatatissima, B. albatrossi, Uvigerina* aff. *U. latalata, Bulimina costata, B. marginata, Cibicides pseudoungerianus* and *Cassidulina* spp. On the contrary, *Uvigerina mediterranea, Hylinea baltica, Melonis barleanum, Gyroidina altiformis, Siphotextularia heterostoma, Globulina* sp., *Articulina tubulosa* and *Paromalina coronata*, occurred subordinately. *Paromalina coronata*, a typical north-atlantic species characterizing the thanatocoenoses of the Würm glaciation in the Mediterranean (Blanc-Vernet, 1975), was observed only in the T-23 core. Some of the benthic species are illustrated in Plate 2.

PALEOCLIMATIC INTERPRETATION AND CORRELATION BETWEEN CORES

Foraminifers (Text-fig. 5a)

The assemblages of foraminifers in the cores point out a series of climatic fluctuations which took place during sedimentation. As stratigraphic reference for the Upper Pleistocene and of the Holocene, we held in particular consideration the papers of Escalon de Fonton (1968, 1969) regarding the study of the sediments of the caves in Southern France. The paleoclimatic curves obtained for the cores P-15 and T-23, which appeared more significant, were taken as reference in the interpretation of the different events. These cores showed a base marked by a cold period which can be correlated with the end of the last glaciation (Würm IV). This period was characterized by an assemblage primarily consisting of *Globigerina pachyderma, Globorotalia scitula* and *Globigerina quinqueloba*. As far as the benthic foraminifers are concerned, they were abundant in absolute number of species composition, with the presence of *Paromalina coronata*, as a species characterizing the Würmian thanatocoenosis. This period abruptly followed by the warm climate of the Holocene, was marked by two warm events particularly evident in cores P-15 (from 20 to 145 and 210 to 250 cm), and T-23 (from 30 to 45 and 100 to 120 cm). The lower event which directly follows the Glacial, could be attributed to the Alleröd and the upper one to the « climatic optima » (Atlantic and Sub-Atlantic). Both events are characterized by the maximum values of *Globigerinoides ruber* form A, (form typically showing inflate chambers and large openings), *Globigerinoides trilo-*



Text-fig. 5 - Climatic curves and possible stratigraphic correlation among the cores. a = Foraminifers; b = Ostracods.

bus, G. sacculifer, Hastigerina siphonifera, Orbulina universa and generally by the abundance of all the other « warm » species.

In core P-15 (145-210 cm) and in core T-23 (45-90 cm) we notice a temperate-cold event which could correspond to the Boreal. In this assemblage we commonly observed *Globorotalia inflata* which had previously been found in corrispondence with temperate events of the Holocene in the Eastern Mediterranean (Blanc-Vernet, 1972; Pastouret, 1970).

The Glacial-Post Glacial transition, was clearly shown by the assemblage of the planktonic foraminifers, and underlined the sudden reduction of the benthic fauna.

The paleoclimatic curve of the core C-210 generally reflected a warm climate with two more marked fluctuations (5-15 cm and 70-135 cm) which correlated with the two major warmings events of the Holocene observed in the core P-15 and T-23.

All the core C-137, in which the holocenic sedimentation is lacking, was characterized by a continuous cold event, within which a feeble temperate-cold interphase was noticed. The absence of significant chronological reference does not allow any further correlation.

OSTRACODS (Text-fig. 5b)

From the paleoclimatic point of view, the 4 cores did not show a direct correlation with each other even taking into account the different sedimentation rates or the presence of intermediate gaps produced by slumpings and/or bottom currents.

A correlation of cores C-210, P-15 and T-23 is proposed between the base of C-210 (presence of the « cold » species *Macrocypris adriatica*), the base of P-15 (presence of the « cold » species *Macrocypris adriatica* and *Bathycythere vanstraateni*) and the topmost cold peak of T-23 (samples 6, 7, 8 having *Macrocypris adriatica* and *Bathycythere vanstraateni* present).

By comparing cores T-23 and C-137, we noted the presence of *Cytheropteron testudo* in the samples 17, 21 of the first and 3, 4, 5, 7 and 8 of the latter.

Core T 23 - Water-depth 840 m

Tab. 7

Samples	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
No. specimens	23	19	26	23	20	24	13	16	23	35	24	2	21	23	40	31	29	39	21	21	25
Species %	5	4	5	5	4	5	3	3	5	7	5	0.4	4	5	8	6	6	8	4	4	5
Argilloecia acuminata MÜLLER	4	6	4	8	4	5	4	1	7	10	7	x	3	1	6	1	3	2	1	2	3
Argilloecia levis MÜLLER	-	1	2	2	1	1	x	-	x	x	3	-	-	x	1	2	1	x	x	x	-
Argilloecia micra B.C.M.	2	-	1	1	x	1	x	x	-	1	1	1	2	2	x	1	3	3	-	x	2
Argilloecia sp.A	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Argilloecia sp.B	-	-	-	-	-	-	-	1	-	-	-	-	-	-	x	-	-	1	-	-	x
Aurila sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	x	-	x	x
Aurila speyeri (BRADY)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-
Bairdia conformis TERQUEM	3	2	5	1	x	2	2	3	1	x	x	-	x	-	x	-	x	-	x	-	-
Bathycythere vanstraateni SISS.	-	-	-	-	-	x	x	x	-	-	-	-	x	-	x	1	1	2	1	x	x
Buntonia sp.	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	x	-	-	-
Buntonia? sublatissima (NEVIANI)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Bythoceratina reticulata B.C.M.	-	-	-	-	-	-	-	1	1	x	1	-	-	-	-	-	-	-	-	-	-
Bythocypris lucida (SEGUENZA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	x	-
Bythocypris obtusata (SARS)	-	x	x	-	x	x	-	-	-	x	-	-	x	x	x	x	-	-	x	-	-
Bythocypris tenera BREMAN	-	1	x	1	x	x	x	1	1	x	x	-	x	-	2	1	-	-	-	-	-
Callistocythere flavidofusca (RUGG)	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-
Callistocythere folliculosa B.C.M.	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Callistocythere aff. C. lobiancoi MÜLL.	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Callistocythere sp.	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	x	x	-	-	x	-
Cyprideis torosa (JONES)	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-
Cytherella bathyalis n.sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	x	-	-
Cytherella sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-
Cytherella vulgata RUGGIERI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Cytherois sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	x	-	-	-	-	-
Cytheropteron agile COLAL. et al.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Cytheropteron aff.C. alatum SARS	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-
Cytheropteron garganicum B.C.M.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-
Cytheropteron hadriaticum B.C.M.	-	-	-	1	1	1	-	-	-	-	-	-	1	1	2	-	1	1	-	-	-
Cytheropteron latum MÜLLER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	1	-
Cytheropteron monoceros B.C.M.	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cytheropteron? rarepunctatum COLAL.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Cytheropteron retrosulcatum COLAL.	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Cytheropteron rotundatum MÜLLER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	x	-	x
Cytheropteron ruggierii PUCCI	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cytheropteron sp.A	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cytheropteron sp.	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cytheropteron testudo SARS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	x	x	-
Cytheropteron trapetium COLAL.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	x
Cytheropteron venustum B.C.M.	-	2	-	-	1	-	-	-	-	2	1	-	-	1	2	-	-	-	-	1	1
Cytheropteron vespertilio (REUSS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	x	-	-	-	-
Cytheropteron zinzulusae B.C.M.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Costa edwardsi (ROEMER)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-
Echinocythereis sp.1	-	-	x	x	1	1	x	x	-	x	-	-	1	1	1	x	1	1	x	1	x
Henryhowella sarsi (MÜLLER)	-	-	-	x	x	x	-	-	-	x	-	-	x	x	x	x	x	1	x	x	x
Krithe caudata BREMAN	4	1	1	1	2	2	1	2	6	10	4	x	2	1	5	5	4	2	1	1	2
Krithe monosteracensis SEGUENZA	1	-	-	1	x	3	1	x	x	x	2	x	1	3	3	5	4	7	6	4	3
Leptocythere bacescoi (ROME)	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	1
Leptocythere sp.	-	-	-	-	-	-	-	x	-	-	x	-	-	-	-	-	-	1	-	-	-
Loxoconcha littoralis MÜLLER	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-
Loxoconcha sp.	-	-	x	x	-	x	-	x	-	-	-	-	x	x	x	-	x	-	x	x	-
Loxoconcha tumida BRADY	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-

Tab. 7 - Distribution of the ostracods in core T-23.

Core T 23 - Water-depth 840 m

Tab. 7 (*cont.*)

Species \ Samples	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Loxoconcha versicolor MÜLLER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Loxoconchidea minima B.C.M.	-	-	-	-	-	1	-	-	x	-	-	x	-	x	-	1	3	1	2	-	1
Macrocypris adriatica MASOLI	-	-	-	-	1	1	-	-	-	-	1	-	1	1	5	3	x	3	1	2	1
? Macrocypris sp.	-	-	-	x	-	-	-	-	x	x	-	x	-	-	-	-	-	-	-	-	-
Macrocypris sp.1	-	-	-	-	-	-	x	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Microcythere sp.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Microcytherura fulva (BRADY&ROBER.)	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Microcytherura nigrescens MÜLLER	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Microxestoleberis profunda BREMAN	-	x	-	-	-	x	-	-	-	-	-	x	x	-	x	-	x	2	x	1	1
Monoceratina mediterranea SISSINGH	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neocytherideis sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paracytheridea sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-
Paracytherois flexuosa BRADY	-	1	-	-	1	-	-	-	-	-	-	-	-	1	-	-	1	-	x	-	-
Paracytherois mediterranea B.C.M	x	1	1	2	x	-	1	-	2	1	2	-	1	-	1	1	2	2	1	1	2
Pedicythere mirabilis SISSINGH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	1	-
Pedicythere phryne B.C.M.	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-
Pedicythere tessellata B.C.M.	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-	-	-
Polycope demulderi SISSINGH	-	-	-	x	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-
Paradoxostoma sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-
Polycope frequens MÜLLER	-	-	-	x	-	1	-	-	-	x	x	-	-	-	-	-	-	-	-	-	-
Polycope inflata BONADUCE et al.	-	2	1	1	2	1	1	1	-	1	1	-	3	1	2	2	2	2	2	1	1
Polycope orbulinaeformis BREMAN	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Polycope ovalis BONADUCE et al.	1	-	2	-	-	-	-	-	-	1	-	-	x	-	-	2	1	-	1	x	1
Polycope parareticulata B.C.M.	2	x	2	1	-	2	1	1	1	3	x	x	x	-	-	-	-	1	1	-	-
Polycope reticulata MÜLLER	1	1	1	x	x	-	x	1	x	-	x	-	-	-	x	-	-	-	-	-	-
Polycope striata MÜLLER	1	x	2	x	1	1	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Polycope tholiformis B.C.M.	3	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycope tuberosa MÜLLER	-	x	-	-	-	-	-	-	-	1	-	-	x	-	-	-	-	-	-	-	-
Polycope vasfiensis SISSINGH	-	-	-	x	1	1	-	x	x	x	x	x	1	-	1	1	-	x	-	-	-
Polycopsis quadridentata B.C.M.	1	1	-	1	-	-	-	-	1	x	x	-	-	-	-	-	-	-	-	-	-
Paradoxostoma simile MÜLLER	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pontocypria sp.	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Pontocypris acuminata (MÜLLER)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Pontocypris sp.	-	-	-	x	-	-	x	x	-	-	x	-	-	x	x	x	-	-	x	-	x
Pontocypris sp. C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	x	-	-	-
Pontocythere sp.	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pontocythere turbida (MÜLLER)	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-
Propontocypris sp.	-	x	x	-	x	x	-	-	-	1	x	-	-	-	-	-	-	-	-	-	-
Propontocypris sp.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pseudocythere armata B.M.P.M.	-	-	1	-	-	-	-	-	-	-	-	-	-	3	2	2	-	2	-	3	1
Pseudocythere caudata medit. B.M.P.M.	-	-	-	1	-	-	x	-	1	x	-	-	-	-	-	-	-	1	-	-	-
Pseudocythere n.sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Pterygocythereis sp.	-	-	-	-	-	-	-	-	-	-	x	-	-	x	-	-	-	-	-	-	-
Semicytherura rara (MÜLLER)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Semicytherura rarecostata B.C.M.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Semicytherura sp.	-	-	-	x	-	-	-	-	x	-	-	-	x	x	-	x	-	x	x	-	-
Tuberculocythere tetrapteron (B.C.M.)	x	-	1	x	-	x	-	1	-	1	1	-	1	-	1	-	-	2	-	-	1
Urocythereis sp.	-	-	x	x	-	-	-	-	-	-	-	-	x	x	-	-	x	-	-	-	-
Xestoleberis communis MÜLLER	-	-	-	-	x	-	-	-	-	-	-	-	x	x	-	-	-	x	-	-	-
Xestoleberis dispar MÜLLER	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Xestoleberis sp.	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	x	-	-	-	-

Core C 137 - Water-depth 830 m

Tab. 8

Species \ Samples	1	2	3	4	5	6	7	8	9
No.specimens	21	18	40	41	64	16	28	18	13
%	8	7	15	16	25	6	11	7	5
Argilloecia acuminata MÜLLER	1	2	2	2	2	3	2	1	-
Argilloecia levis MÜLLER	-	-	1	-	-	-	1	-	-
Argilloecia micra B.C.M.	-	1	4	-	6	2	-	3	-
Aurila convexa (BAIRD)	-	-	-	-	x	-	-	x	-
Aurila speyeri (BRADY)	x	-	-	-	-	-	-	-	-
Bairdia conformis TERQUEM	x	-	-	x	x	-	-	-	-
Bathycythere vanstraateni SISSINGH	-	-	x	-	-	-	-	1	-
Bonaducecythere hartmanni McKENZIE	-	-	-	-	-	-	1	-	-
Bosquetina dentata (MÜLLER)	x	-	-	-	x	-	-	-	1
Buntonia ? dertonensis RUGGIERI	-	-	-	-	-	1	-	-	-
Buntonia sp.	-	x	x	-	x	-	-	-	-
Buntonia textilis B.C.M.	1	-	-	-	-	-	-	-	-
"Bythoceratina" ? reticulata B.C.M.	-	x	x	-	x	-	-	-	-
Bythocypris ? bosquetiana (BRADY)	-	-	-	-	-	-	-	-	1
Bythocypris obtusata (SARS)	2	-	x	-	x	-	-	-	-
Bythocypris reflexa BREMAN	2	-	-	-	1	-	-	-	-
Bythocypris sp.	-	x	-	-	-	-	-	-	-
? Bythocythere sp.	-	-	-	-	-	-	1	-	-
Callistocythere adriatica MASOLI	1	-	-	-	-	-	-	-	-
Callistocythere badia (NORMAN)	-	-	1	-	-	-	-	-	-
Cluthia keiji NEALE	-	-	x	-	x	-	x	-	-
Cytherella bathyalis n.sp.	-	-	x	-	-	-	x	x	-
Cytherella sp.	-	-	-	-	-	-	x	-	-
Cytheretta adriatica RUGGIERI	-	-	-	-	x	-	-	-	-
Cytherois frequens MÜLLER	-	-	2	-	-	-	1	-	-
Cytherois oblonga MÜLLER	-	-	-	-	1	-	-	-	-
Cytherois sp.	-	-	-	-	-	-	-	-	1
Cytheroma variabilis MÜLLER	-	-	1	-	1	1	-	1	1
Cytheromorpha nana B.C.M.	-	-	-	-	-	-	1	-	-
Cytheropteron aff. C. alatum SARS	-	-	1	1	1	x	1	x	1
Cytheropteron hadriaticum B.C.M.	-	x	-	2	1	-	x	-	-
Cytheropteron monoceros B.C.M.	-	-	x	-	1	-	2	-	-
Cytheropteron rotundatum MÜLLER	-	1	-	-	-	-	-	-	-
Cytheropteron aff. C. rotundatum MÜLLER	-	-	3	2	1	-	-	x	1
Cytheropteron testudo SARS	-	-	x	x	x	-	x	x	-
Cytheropteron venustum B.C.M.	-	x	2	1	2	-	-	1	-
Echinocythereis n.sp.1	-	-	-	-	-	-	-	2	2
Eucythere curta RUGGIERI	-	-	1	-	-	-	-	-	-
Eucythere pubera B.C.M.	-	x	x	-	-	-	-	-	-
Eucytherura complexa (BRADY)	-	-	x	-	-	-	-	-	-
Hemicytherura defiorei RUGGIERI	-	-	-	-	-	-	1	-	-
Hemicytherura gracilicosta RUGGIERI	-	-	-	-	x	-	-	-	-
Hemicytherura videns MÜLLER	1	-	1	-	-	-	-	-	-
Hemicytherura sp.	-	-	-	-	-	-	-	x	-
Henryhowella sarsi (MÜLLER)	2	x	x	1	1	x	x	1	x
Ilyocypris sp.	-	-	x	-	-	-	-	-	-
Krithe caudata BREMAN	2	1	-	1	2	1	-	2	1
Krithe monosteracensis SEGUENZA	1	-	1	2	-	-	3	1	1
Leptocythere ramosa (ROME)	-	-	-	-	1	-	1	-	-
Leptocythere sp.	-	-	-	-	-	-	x	-	-
Loxoconcha sp.	-	x	x	x	x	x	x	-	x
Loxoconcha tumida BRADY	1	-	-	-	-	-	-	-	-

Tab. 8 - Distribution of the ostracods in core C-137.

Core C 137 - Water-depth 830 m

Tab. 8 (*cont.*)

Species \ Samples	1	2	3	4	5	6	7	8	9
Loxoconchidea minima B.C.M.	-	1	2	-	3	2	1	2	1
Macrocypris adriatica MASOLI	1	1	2	4	3	x	1	1	1
Microcythere ? inflexa MÜLLER	-	-	-	-	x	-	-	-	-
Microxestoleberis nana MÜLLER	-	-	-	-	-	-	x	-	-
Monoceratina mediterranea SISSINGH	-	-	-	-	x	-	-	-	-
Neocytherideis subspiralis (BRADY et al)	-	-	-	-	x	-	-	-	-
Paracypris n.sp.1	-	2	-	-	4	-	-	-	-
Paracypris sp.	-	-	-	-	-	x	-	-	-
Paracytheridea bovettensis SEGUENZA	-	-	-	-	-	-	x	-	-
Paracytheridea depressa MÜLLER	-	x	x	x	x	-	-	-	-
Paracytherois mediterranea B.C.M.	-	1	1	2	2	1	-	-	-
Paracytherois oblonga MÜLLER	-	-	3	1	-	-	-	-	-
Paradoxostoma simile MÜLLER	-	-	1	-	x	-	-	-	-
Paradoxostoma sp.	-	1	-	-	-	-	-	-	1
Parakrithe dimorpha B.C.M.	-	-	-	-	1	-	-	-	-
Pedicythere mirabilis SISSINGH	-	-	1	-	-	-	-	-	-
Pedicythere phryne B.C.M.	-	-	-	3	-	-	-	-	-
Pedicythere tessellata B.C.M.	-	-	1	3	1	-	-	-	-
Phlyctocythere pellucida (MÜLLER)	-	-	-	-	x	-	-	-	-
Polycope demulderi SISSINGH	-	x	x	-	4	x	x	-	-
Polycope inflata BONADUCE et al.	1	2	1	1	3	1	1	x	-
Polycope ovalis BONADUCE et al.	1	1	-	-	1	1	-	-	-
Polycope parareticulata B.C.M.	-	-	-	1	3	-	1	-	-
Polycope reticulata MÜLLER	-	x	x	1	1	x	-	-	-
Polycope rostrata MÜLLER	-	-	-	-	-	x	-	-	-
Polycope striata MÜLLER	-	1	x	1	-	1	-	-	-
Polycope vasfiensis SISSINGH	-	-	-	1	x	-	-	-	-
Polycope sp.	-	-	-	-	-	-	-	-	1
Polycopsis quadridentata B.C.M.	-	-	-	-	2	-	-	-	-
Pontocypria spinosa MÜLLER	-	-	x	-	-	-	-	-	-
Pontocypris sp.	-	-	-	-	x	-	x	-	-
Pontocythere turbida (MÜLLER)	x	-	-	-	-	-	x	-	-
Propontocypris sp.	-	-	-	-	x	-	-	-	-
Pseudocythere armata B.M.P.M.	-	1	1	-	-	1	1	-	-
Pseudocythere caudata med. B.M.P.M.	-	-	-	-	2	-	1	-	-
Pseudocythere sp.1	-	-	-	-	2	-	-	-	-
Semicytherura acuticostata (SARS)	1	-	-	-	-	-	3	-	-
Semicytherura diafora BARBEITO-GONZAL.	-	-	1	-	-	1	-	-	-
Semicytherura dispar (MÜLLER)	-	-	-	-	-	-	2	-	-
Semicytherura rara (MÜLLER)	-	-	-	-	1	-	-	-	-
Semicytherura rarecostata B.C.M.	-	-	-	-	3	-	-	-	-
Semicytherura ruggierii (PUCCI)	-	-	1	-	1	-	-	-	-
Semicytherura sp. A	-	-	-	-	1	-	-	-	-
Semicytherura sp.	-	-	-	x	-	-	x	x	-
Tetracytherura angulosa (SEGUENZA)	-	-	-	-	-	x	x	-	-
Tuberculocythere tetrapteron (B.C.M.)	-	3	5	10	4	-	1	2	-
Urocythereis neapolitana ATHERSUCH	1	-	-	-	-	-	-	-	-
Xestoleberis communis MÜLLER	-	-	x	-	x	x	-	-	-
Xestoleberis n.sp.1	1	-	-	-	-	-	-	-	-
Xestoleberis plana MÜLLER	1	-	-	-	-	-	-	-	-
? Xestoleberis profunda (BREMAN)	-	-	x	-	-	-	-	-	-
Xestoleberis sp.	-	-	-	x	-	-	-	-	-

Core P 15 - Water-depth 943 m

Tab. 9

Species \ Samples	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
No. specimens	0	1	9	6	14	18	22	3	12	17	17	7	21	2	0	1	1	1	21	21	23
%	-	0.5	4	3	6	8	10	1	5	8	8	3	10	1	-	0.5	05	0.5	10	10	11
Argilloecia acuminata MÜLLER	x	1	3	2	6	5	6	2	3	3	3	2	6	-	-	x	-	-	5	5	1
Argilloecia caudata MÜLLER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1
Argilloecia levis MÜLLER	x	-	x	1	x	1	1	x	x	2	1	1	1	-	-	-	-	-	1	1	1
Argilloecia micra B.C.M.	-	-	-	-	-	x	-	-	-	1	-	-	-	-	-	-	-	-	-	1	2
Argilloecia n.sp.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-
Argilloecia sp.A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x
Argilloecia sp.B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Bairdia conformis TERQUEM	-	-	-	1	1	1	1	x	x	1	1	-	-	-	x	-	-	-	-	-	x
Bathycythere vanstraateni SISSINGH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	x
Bosquetina dentata (MÜLLER)	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-
Bythoceratina reticulata B.C.M.	-	-	1	-	-	1	2	-	x	-	x	x	1	-	-	-	-	-	-	-	-
Bythocypris obtusata SARS	-	-	-	-	-	-	-	-	1	6	x	1	-	-	-	-	-	-	-	-	-
Bythocypris sp.	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bythocypris tenera BREMAN	-	-	-	-	4	3	2	1	2	2	2	-	2	-	-	-	-	-	-	-	-
Callistocythere sp.	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-
Cytherella bathyalis n.sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	x
Cytheropteron sp.	-	-	-	-	-	x	-	-	-	-	-	-	x	-	-	-	x	-	-	x	x
Cytheropteron venustum B.C.M.	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	1	1	-	-
Echinocythereis sp.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x
Eucytherura n.sp.1	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-
Henryhowella sarsi (MÜLLER)	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	x
Hiltermannicythere turbida (MÜLLER)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x
Krithe caudata BREMAN	x	-	4	x	2	x	3	x	3	x	2	2	5	-	-	-	x	-	1	3	-
Krithe monosteracensis SEGUENZA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	6
Leptocythere? multipunctata (SEG.)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Loxoconcha ? bairdi MÜLLER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Loxoconcha sp.	-	x	-	-	x	-	-	-	-	x	-	-	-	-	-	x	-	-	-	x	x
Loxoconchidea minima B.C.M.	x	-	-	-	-	-	-	-	-	-	1	2	-	1	-	-	-	-	x	3	4
Macrocypris adriatica MASOLI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	4
Microcythere sp.	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-
Microxestoleberis profunda BREMAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-
Paracytherois mediterranea B.C.M.	-	-	-	-	-	-	1	-	1	-	-	x	2	-	-	-	-	-	1	1	1
Paracytherois oblonga MÜLLER	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	-	3	-	1
Polycope inflata BONADUCE et al.	x	-	1	-	1	1	1	-	x	-	2	-	-	-	-	-	-	x	2	1	1
Polycope orbulinaeformis BREMAN	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Polycope ovalis BONADUCE et al.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-
Polycope parareticulata B.C.M.	x	-	-	-	-	-	-	-	-	-	x	-	-	x	-	-	-	-	-	2	-
Polycope sp.	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycope striata MÜLLER	-	-	-	1	x	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycope vasfiensis SISSINGH	-	-	-	-	-	-	x	-	-	-	x	x	-	-	-	-	-	-	x	1	-
Polycopsis quadridentata B.C.M.	-	-	x	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pontocypria spinosa MÜLLER	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pontocypris sp.	-	-	-	x	x	-	-	-	-	-	-	x	x	-	-	-	-	-	x	-	x
Pontocythere turbida (MÜLLER)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-
Propontocypris n.sp.1	-	-	-	-	-	2	x	x	x	2	3	-	-	-	-	-	-	-	-	-	-
Pseudocythere armata B.M.P.M.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-
Pseudocythere n.sp.	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Pseudocythere sp.	-	-	-	-	-	-	-	-	-	-	-	x	-	x	-	-	-	-	-	-	-
Semicytherura sp.	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tenedocythere prava BAIRD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Tuberculocythere tetrapteron (B.C.M.)	-	-	-	-	-	1	1	-	-	-	x	x	-	-	-	-	-	-	1	-	-
Urocythereis sp.	-	-	-	-	-	-	-	-	-	-	x	-	x	-	-	-	-	-	-	-	-
Xestoleberis sp.	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	x

Tab. 9 - Distribution of the ostracods in core P. 15.

Core C 210 - Water-depth 491 m

Tab. 10

Species \ Samples	1	2	3	4	5	6	7	8	9	10
No.of specimens	27	31	26	8	16	2	3	0	0	22
%	20	23	19	6	12	1	2	-	-	16
Argilloecia acuminata MÜLLER	2	4	1	1	6	x	2	-	-	4
Argilloecia levis MÜLLER	-	1	1	-	-	1	-	-	-	-
Argilloecia micra B.C.M.	1	1	-	1	3	-	1	-	-	x
Aurila convexa (BAIRD)	x	-	-	-	-	-	-	-	-	-
Bairdia conformis TERQUEM	5	6	11	2	-	-	-	-	-	-
Buntonia sp.	-	-	-	-	-	-	-	x	-	-
Bythocypris obtusata SARS	5	5	8	-	-	-	-	-	-	-
Bythocypris tenera BREMAN	2	1	1	-	-	-	-	-	-	1
Callistocythere sp.	-	-	-	-	-	-	x	-	-	-
Cytherella vulgata RUGGIERI	-	x	-	-	-	-	-	-	-	-
Cytheridea neapolitana KOFMANN	-	x	-	-	-	-	-	-	-	-
Cytheroma variabilis MÜLLER	-	1	-	-	-	-	-	-	-	-
Cytheropteron cristatum COLALONGO	-	-	-	-	-	-	-	-	-	1
Cytheropteron hadriaticum B.C.M.	-	-	1	-	-	-	-	-	-	1
Cytheropteron sulcatum B.C.M.	-	2	-	-	-	-	-	-	-	-
Cytheropteron venustum B.C.M.	1	-	1	-	-	-	x	-	-	-
Cytheropteron zinzulusae B.C.M.	1	-	-	-	-	-	-	-	-	-
Cytherois sp.	-	1	-	-	-	-	-	-	-	-
Eucytherura complexa MÜLLER	1	-	-	x	-	-	-	-	-	-
Eucythere pubera B.C.M.	1	-	-	-	-	-	-	-	-	-
Hemicytherura gracilicosta RUGGIERI	-	-	-	-	-	-	-	-	-	1
Krithe caudata BREMAN	-	-	-	1	6	1	-	-	-	x
Leptocythere ? multipunctata (SEGUENZA)	1	-	-	-	-	-	-	-	-	-
Loxoconcha sp.	x	x	-	x	-	-	-	-	-	-
Loxoconchidea minima B.C.M.	1	1	-	-	-	-	-	-	-	-
Macrocypris adriatica MASOLI	-	-	-	-	-	-	-	-	-	x
Microcythere "vitrea" B.C.M.	-	1	-	-	-	-	-	-	-	-
"Monoceratina" sp.	-	-	-	-	-	-	-	-	-	1
Paracytherois flexuosa (BRADY)	-	1	-	-	-	-	-	-	-	-
Paracytherois mediterranea B.C.M.	-	-	-	-	-	-	-	-	-	1
Pedicythere tessellata B.C.M.	-	1	-	-	-	-	-	-	-	-
Polycope demulderi SISSINGH	-	-	-	-	-	-	-	x	-	x
Polycope inflata B.C.M.M.P.	-	1	1	-	-	-	-	-	-	2
Polycope orbulinaeformis BREMAN	1	-	-	-	-	-	-	-	-	x
Polycope ovalis B.C.M.M.P.	1	1	-	x	1	-	-	-	-	2
Polycope parareticulata B.C.M.	-	1	-	-	-	-	-	-	-	1
Polycope reticulata MÜLLER	1	x	x	1	x	-	-	-	-	3
Polycope vasfiensis SISSINGH	1	1	-	-	x	-	-	-	-	3
Pontocypria spinosa MÜLLER	x	-	-	-	-	-	-	-	-	-
Pontocypris sp.	-	x	-	-	-	-	-	-	-	-
Propontocypris n.sp. 1	1	x	-	x	x	x	x	-	-	-
Pseudocythere armata B.M.P.M.	1	-	1	-	-	-	-	-	-	-
Pseudocythere caudata med. B.M.P.M.	-	-	-	2	-	-	-	-	-	-
Pseudocythere hastata B.M.P.M.	-	-	-	-	-	-	-	-	-	1
Pterygocythereis sp.	-	-	-	-	-	x	-	-	-	-
Semicytherura sp.	-	x	-	-	-	-	-	-	x	x
Tuberculocythere tetrapteron (B.C.M.)	-	-	-	-	x	-	-	-	-	-
Typhlocythere carinata COLALONGO	-	1	-	-	-	-	-	-	-	-
Xestoleberis sp.	-	x	-	-	-	-	-	-	-	-

Tab. 10 - Distribution of the ostracods in core C-210.

Tab. 11

SPECIES	CORE C 210 Water-depth 491 m									
	SAMPLES	1	2	3	4	5	6	7	8	9	10
AMMODISCIDAE											
Ammodiscus incertus (d'ORBIGNY)		1	X								
Glomospira charoides (JONES & PARKER)			1								
TEXTULARIIDAE											
Textularia candeiana d'ORBIGNY											X
Textularia conica d'ORBIGNY			1		1	4					X
Textularia pala CZJZEK											X
Bigenerina nodosaria d'ORBIGNY		X		1		2		1			X
Siphotextularia heterostoma FORNASINI											X
ATAXOPHRAGMIIDAE											
Clavulina crustata (CUSHMAN)		X		X	5	3		1			3
FISCHERINIDAE											
Cyclogyra carinata (COSTA)											X
NUBECULARIDAE											
Spiroloculina rotunda d'ORBIGNY										2	
Spiroloculina tenuiseptata BRADY		X	X	1	1						X
MILIOLIDAE											
Quinqueloculina laevigata (d'ORBIGNY)			X								
Quinqueloculina padana PERCONIG											X
Quinqueloculina stelligera SCHLUMBERGER			X								
Quinqueloculina vulgaris d'ORBIGNY		1		2		1					1
Cruciloculina triangularis d'ORBIGNY			X	X							
Pyrgo inornata (d'ORBIGNY)		X									
Pyrgoella sphaera (d'ORBIGNY)		X	X								
Sigmoilina distorta PHLEGER & PARKER		X		1		X					1
Sigmoilina sigmoidea (BRADY)											X
Sigmoilina tenuis (CZJZEK)		1				1	1	1			
Sigmoilopsis schlumbergeri (SILVESTRI)		2	1	3	2	X		2			X
Triloculina oblonga (MONTAGU)		1		X							
Miliolinella subrotunda (MONTAGU)		6		3	4			1	X	2	X
Biloculinella globula (BORNEMANN)						5					
Biloculinella labiata (SCHLUMBERGER)				1	1						X
Nummoloculina contraria (d'ORBIGNY)		X				1					
Articulina tubulosa (SEGUENZA)								1	X		X
NODOSARIIDAE											
Amphycorina scalaris (BATSCH)		1	6	2	1		1		4		4
Astacolus crepidulus (FICHTEL & MOLL)			1								
Lagena striata (d'ORBIGNY)			X								
Lenticulina calcar (LINNEO)				X							
Lenticulina cultrata (LONTAGU)				X							
Lenticulina peregrina (SCHWAGER)				X			1				
Lenticulina rotulata (LAMARCK)		X	1								X
Marginulina costata (BATSCH)			X								
Marginulina glabra d'ORBIGNY		X									X
Saracenaria italica DEFRANCE			X								
GLANDULINIDAE											
Oolina acuticosta (REUSS)			1								
Oolina hexagona (WILLIAMSON)			1								
Fissurina orbignyana SEGUENZA						X					
SPHAEROIDINIDAE											
Sphaeroidina bulloides d'ORBIGNY		2	1	1	4	3				2	
BOLIVINITIDAE											
Bolivina aenariensis (COSTA)							1				
Bolivina alata (SEGUENZA)							10	6	X	2	
Bolivina albatrossi CUSHMAN											2
Bolivina dilatatissima SILVESTRI						X				2	7
Bolivina pseudoplicata H.-ALLEN&EARLAND			3		2	1	5	2	X	2	
Bolivina spathulata (WILLIAMSON)		1			1		2	4			
Bolivina striatula CUSHMAN							4	1			

Tab. 11 - Distribution of the benthic foraminifers in core C-210.

Tab. 11 (*cont.*)

SPECIES	CORE C 210 Water-depth 491 m									
SAMPLES	1	2	3	4	5	6	7	8	9	10
Bolivina variabilis (WILLIAMSON)						1				
ISLANDIELLIDAE										
Cassidulinoides bradyi (NORMAN)						1	6		43	
BULIMINIDAE										
Bulimina aculeata d'ORBIGNY				1						
Bulimina costata d'ORBIGNY	2	2	4	10	13	16	10	65		6
Bulimina elongata d'ORBIGNY				1						
Bulimina etnea SEGUENZA		1					1			
Bulimina marginata d'ORBIGNY	18	12	18	2		1				2
Globobulimina affinis (d'ORBIGNY)						1				
Globobulimina ovata (d'ORBIGNY)					X					
UVIGERINIDAE										
Uvigerina aff. latalata R.E.&R.C.STEWART										2
Uvigerina mediterranea HOFKER	14	9	16	22	17	13	17	4		31
Uvigerina peregrina CUSHMAN		1					1	X		
Uvigerina proboscidea (SCHWAGER)			1		X		1			X
DISCORBIDAE										
Gavelinopsis praegeri (H.-ALLEN&EARLAND)		4	X	1	X	1				
Rosalina bradyi (CUSHMAN)	1									
Rosalina globularis d'ORBIGNY		1		1						
Valvulineria minuta PARKER				2	X					
SIPHONINIDAE										
Siphonina reticulata (CZJZEK)	2	1	1							
ASTERIGERINIDAE										
Asterigerinata adriatica HAAKE								X		
ELPHIDIIDAE										
Cribrononion cuvilleri (LEVY)				1						
CIBICIDIDAE										
Planulina ariminensis d'ORBIGNY	4	3	5	2	5	1	3	9		1
Planulina wullestorfi (SCHWAGER)			1							
Hyalinea baltica (SCHROETER)	3	10	4	2	X	4	1			3
Cibicides lobatulus (WALKER & JACOB)	X	3	1	1						X
Cibicides pseudoungerianus (CUSHMAN)	5	2	2	5	3	1	3			4
PLANORBULINIDAE										
Planorbulina mediterranensis d'ORBIGNY		1								
CAUCASINIDAE										
Fursenkoina tenuis (SEGUENZA)					X	1	1		2	
CASSIDULINIDAE										
Cassidulina crassa d'ORBIGNY	X	4	7	9	3		1			2
Cassidulina laevigata carinata SILVESTRI	2	6	2	2	4		4			6
Globocassidulina subglobosa (BRADY)	15	4	1	1	1		13	4	25	
NONIONIDAE										
Chilostomella oolina SCHWAGER					X	33	15	13	20	
Astrononion stellatum CUSHMAN&EDWARD			X							
Nonionella turgida (WILLIAMSON)		X								
Pullenia quinqueloba (REUSS)			1							X
Rotamorphina? involuta PARKER				1						
ALABALINIDAE										
Gyroidina altiformis R.E.&R.C.STEWART	X	1	1	1	2	1	1			12
Gyroidina neosoldanii BROTZEN	1	2	3	1	13					2
Gyroidina umbonata (SILVESTRI)	3	4	3	1						X
ANOMALINIDAE										
Hanzawaia rhodiensis (TERQUEM)		1		4	3		1			2
Melonis barleanum (d'ORBIGNY)	13	5	11	7	5		2			2
CERATOBULIMINIDAE										
Hoëglundina elegans (d'ORBIGNY)		1								X
Counted specimens	99	196	272	86	147	84	141	23	51	179

Tab. 12

SPECIES	CORE P 15 Water-depth 943 m																				
	SAMPLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ASTRORHIZIDAE																						
Rhabdammina abyssorum M. SARS		X																				
Saccorhiza ramosa (BRADY)		X																				
SACCAMMINIDAE																						
Saccammina sphaerica M.SARS		1																				
AMMODISCIDAE																						
Glomospira charoides (JONES & PARKER)		1																				
Glomospira gordialis (JONES & PARKER)		5																				
NOURIIDAE																						
Nouria polimorphinoides H.-ALL.&EARL.		1																				
LITUOLIDAE																						
Adercotryma glomeratum (BRADY)		1																				
Sphaerammina ovalis CUSHMAN		1																				
Alveolophragmium nitidum (GOES)		1																				
Alveolophragmium wiesneri (PARR)		1																				
TEXTULARIIDAE																						
Textularia calva LALICKER																				2		
Textularia conica d'ORBIGNY				3																		3
Bigenerina nodosaria d'ORBINGY						2					1			4							2	
Siphotextularia heterostoma FORNASINI																				2	1	1
ATAXOPHRAGMIIDAE																						
Clavulina crustata (CUSHMAN)		X									1			4								
Clavulina cylindrica d'ORBIGNY		3																				
Goesella gymnesiaca (COLOM)		X							1												X	
FISCHERINIDAE																						
Cyclogyra carinata (COSTA)		1															X					
NUBECULARIIDAE																						
Spiroloculina grata TERQUEM																					X	
Spiroloculina tenuiseptata BRADY		X									1										X	1
MILIOLIDAE																						
Quinqueloculina padana PERCONIG												5										
Quinqueloculina pygmaea REUSS													3								X	
Quinqueloculina stalkeri LOEBL.&TAPP.		1																				
Quinqueloculina stelligera SCHLUMBER.						2															X	1
Quinqueloculina vulgaris d'ORBIGNY																					X	
Cruciloculina navarroi COLOM						2																
Cruciloculina triangularis d'ORBIGNY											1											
Pyrgo depressa (d'ORBIGNY)																1					X	
Pyrgo elongata (d'ORBIGNY)																						1
Pyrgo inornata (d'ORBIGNY)																						1
Pyrgoella sphaera (d'ORBIGNY)		3							2		2										X	
Sigmoilina distorta PHLEGER&PARKER									2													
Sigmoilina sigmoidea (BRADY)																					1	
Sigmoilina tenuis (CZJZEK)											1			4							1	
Sigmoilopsis schlumbergeri (SILVESTRI)		1				5	2				2			7		2					X	
Miliolinella subrotunda (MONTAGU)				4		2		5		5	7	5	8			2						3
Biloculinella cylindrica TODD																					X	
Biloculinella globula (BORNEMANN)							5		X			9	3								X	
Biloculinella inflata (WRIGHT)																					X	
Biloculinella labiata (SCHLUMBERGER)								3	1	2						1					X	
Articulina tubulosa (SEGUENZA)																					3	
NODOSARIIDAE																						
Nodosaria calomorpha REUSS																					X	
Amphycorina scalaris (BATSCH)						2		3			1		3	4								
Astacolus crepidulus (FICHTEL&MOLL)																1						
Dentalina communis (d'ORBIGNY)							2		2					4								
Lagena nebulosa CUSHMAN									X												X	
Lenticulina calcar (LINNEO)											1											
Lenticulina gibba (d'ORBIGNY)		1				2																
Lenticulina orbicularis (d'ORBIGNY)											2											
Lenticulina peregrina (SCHWAGER)		1		2												2						
Lenticulina rotulata (LAMARCK)									X													
Marginulina glabra d'ORBIGNY									2													
GLANDULINIDAE																						
Oolina acuticosta (REUSS)		1																				
Fissurina staphyllearia SCHWAGER									2													
Parafissurina lateralis (CUSHMAN)																1					X	

Tab. 12 - Distribution of the benthic foraminifers in core P-15.

Tab. 12 (*cont.*)

SPECIES	CORE P 15 Water-depth 943 m																				
SAMPLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
SPHAEROIDINIDAE																					
Sphaeroidina bulloides d'ORBIGNY					2	2				1	5		7								
BOLIVINITIDAE																					
Bolivina alata (SEGUENZA)	4		2					3	2			5	4		12			3			
Bolivina albatrossi CUSHMAN							3					3							8	1	1
Bolivina catanensis SEGUENZA										1				44	1						
Bolivina dilatatissima SILVESTRI								X										27	23	3	31
Bolivina pseudoplicata H.-ALL.&EARL.																				X	
Bolivina spathulata (WILLIAMSON)														26						X	
Bolivina subspinescens CUSHMAN										2											
Bolivina tortuosa (BRADY)																		2			
Bolivina variabilis (WILLIAMSON)														4							
BULIMINIDAE																					
Bulimina aculeata d'ORBIGNY					2																
Bulimina costata d'ORBIGNY	3						3	3	9	4	9	3	11	15	8			36	16	10	6
Bulimina marginata d'ORBIGNY	3	X	2			13	3	2							2			2	2	6	9
Globobulimina affinis (d'ORBIGNY)								X										23	2	1	
Globobulimina sp.																				1	
UVIGERINIDAE																					
Uvigerina aff.latalata R.E.&R.C.STEW.																					5
Uvigerina mediterranea HOFKER	23		35	42	39	36	15	32	40	24	14	10	7		20				5	8	6
Uvigerina proboscidea (SCHWAGER)						5	5		2												
Trifarina angulosa (WILLIAMSON)																					1
DISCORBIDAE																					
Gavelinopsis praegeri (H.-ALL.&EARL.)			2		2																
Rosalina bradyi (CUSHMAN)			2																		
Rosalina obtusa d'ORBIGNY															1						
Valvulineria bradyana (FORNASINI)	5		11	3	2			X			5	13	4		12	X		5			
EPONIDIDAE																					
Eponides turgidus PHLEGER & PARKER																				X	
CIBICIDIDAE																					
Planulina ariminensis d'ORBIGNY					3			1											3	X	1
Hyalinea baltica (SCHROETER)																			7	2	5
Cibicides lobatulus (WALKER & JACOB)	X					2	3														
Cibicides pseudoungerianus (CUSHMAN)					2					1									8	3	6
CAUCASINIDAE																					
Fursenkoina tenuis (SEGUENZA)	3							X				3		4	2						
LOXOSTOMIDAE																					
Loxostomum karrerianum (BRADY)															1						
CASSIDULINIDAE																					
Cassidulina crassa d'ORBIGNY			2	3	2	8	13	6		13	9	5	4		4				2	5	
Cassidulina laevigata carinata SILV.											5	3	4			X	X		3	2	
Globocassidulina subglobosa (BRADY)	3		9	10															2		
NONIONIDAE																					
Chilostomella oolina SCHWAGER	1	X	4					1							2				2	1	2
Nonion depressulum (WALKER & JACOB)															1						
Astrononion stellatum CUSH. & EDW.													4								
Nonionella turgida (WILLIAMSON)													4			X					
Pullenia quinqueloba (REUSS)				3				X													
Rotamorphina? involuta PARKER								X							1						
ALABAMINIDAE																					
Gyroidina altiformis R.E.&R.C.STEWART	1		4	6	3		5	5	9	9	5				4				8	5	3
Gyroidina neosoldanii BROTZEN	5	X	4		10		21	11	14		5		7		2					1	3
Gyroidina umbonata (SILVESTRI)						18					5	19			2					1	
OSANGULARIDAE																					
Osangularia cultur (PARKER & JONES)	X																				
ANOMALINIDAE																					
Hanzawaia rhodiensis (TERQUEM)														7						X	
Melonis barleanum (d'ORBIGNY)	20		15	29	16	5	18	19	12	23	9	19	18		16				5	3	8
CERATOBULIMINIDAE																					
Ceratobulimina artica GREEN																				X	
Hoëglundina elegans (d'ORBIGNY)									5		5									2	3
ROBERTINIDAE																					
Roberina bradyi CUSHMAN & PARKER										1	5									X	
Counted specimens	74	3	46	31	56	39	38	179	43	99	21	37	27	27	118	5	1	56	60	318	68

Tab. 13

SPECIES	CORE T 23 Water-depth 840 m																			
SAMPLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ASTRORHIZIDAE																					
Rhabdammina abyssorum M. SARS	X																				
AMMODISCIDAE																					
Ammodiscus incertus (d'ORBIGNY)	3																				
Glomospira charoides (JONES & PARKER)	14																				
Glomospira gordialis (JONES & PARKER)	8																				
Ammolagena clavata (JONES & PARKER)	1																				
LITUOLIDAE																					
Adercotryma glomeratum (BRADY)	3																				
TEXTULARIIDAE																					
Bigenerina nodosaria d'ORBIGNY									3								2		1		
Siphotextularia heterostoma FORNASINI					2	2		3									2		1	2	
ATAXOPHRAGMIIDAE																					
Clavulina crustata (CUSHMAN)	1	2		2						3											
Clavulina cylindrica d'ORBIGNY	3																				
Goesella gymnesiaca (COLOM)								1													
FISCHERINIDAE																					
Cyclogyra involvens (REUSS)				2																	
NUBECULARIDAE																					
Spiroloculina tenuiseptata BRADY								1	3		3			2							
MILIOLIDAE																					
Quinqueloculina laevigata (d'ORBIGNY)							2														
Quinqueloculina stalkeri LOEBL.&TAPP.													2								
Quinqueloculina stelligera SCHLUMBER.																	2			2	
Quinqueloculina vulgaris d'ORBIGNY																		1			2
Cruciloculina triangularis d'ORBIGNY					4			1		3				.							
Pyrgo anomala (SCHLUMBERGER)									3											2	
Pyrgo comata (BRADY)															X						2
Pyrgo depressa (d'ORBIGNY)	1				2	2									X						
Pyrgo inornata (d'ORBIGNY)																					7
Pyrgoella sphaera (d'ORBIGNY)			2		4		7	1		3											
Sigmoilina distorta PHLEGER&PARKER						3															
Sigmoilina sigmoidea (BRADY)																2					
Sigmoilina tenuis (CZJZEK)	3	2				3					3		2				2				
Sigmoilopsis schlumbergeri (SILVESTRI)			2	2					13	10	6	3		3	2			1			2
Triloculina gibba (d'ORBIGNY)															2						
Miliolinella circularis elongata KRUIT																			1		
Miliolinella subrotunda(MONTAGU)	5			8		3		1				6		2		4		4	1	2	5
Biloculinella globula (BORNEMANN)			5								3										
Biloculinella inflata (WRIGHT)				2				1	3												
Biloculinella labiata (SCHLUMBERGER)	1	5	5							3											
Articulina tubulosa (SEGUENZA)					4	2	4						X		X	2	2	X	X	X	
NODOSARIIDAE																					
Astacolus crepidulus (FICHTEL&MOLL)					2																
Lagena nebulosa CUSHMAN									3												
Lagena striata d'ORBIGNY																				2	
Lenticulina calcar (LINNEO)	1																				
Lenticulina cultrata (MONTAGU)										3											
Lenticulina peregrina (SCHWAGER)										3	3										
Lingulina seminuda HANTKEN							2														
Marginulina glabra d'ORBIGNY			2																		
GLANDULINIDAE																					
Oolina acuticosta (REUSS)						2											2				
Oolina hexagona (WILLIAMSON)	1																				
Fissurina orbignyana SEGUENZA																2					2
Fissurina pseudorbignyana (BUCHNER)																2					
Fissurina staphyllearia SCHWAGER								3			3							1			
Parafissurina lateralis (CUSHMAN)															2						
SPHAEROIDINIDAE																					
Sphaeroidina bulloides d'ORBIGNY	3	5		2	2	3		5		6	7		2	3		2	2	4	6	2	2

Tab. 13 - Distribution of the benthic foraminifers in core T-23.

Tab. 13 (*cont.*)

SPECIES	CORE T 23 Water-depth 840 m																				
SAMPLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
BOLIVINITIDAE																					
Bolivina alata (SEGUENZA)													2	2							
Bolivina albatrossi CUSHMAN	1	2				7	11	3	3		6	3	9	7	5	16	17	14	7	15	
Bolivina catanensis SEGUENZA												3									
Bolivina dilatatissima SILVESTRI			7	5	14	9	15	13	3	3	3	3	28	12	28	20	26	18	28	19	22
Bolivina pseudoplicata H.-ALL.&EARL.					2	2									2						
BULIMINIDAE																					
Bulimina aculeata d'ORBIGNY															2		2	1			
Bulimina costata d'ORBIGNY		2	7	2	6	7	7	3		3		12	2	3	3	4	3	5	4	6	9
Bulimina marginata d'ORBIGNY						5			3			3	2	3	5	4		4	6	2	5
Globobulimina affinis d'ORBIGNY													2								2
Globobulimina pacifica CUSHMAN																		1			
Globobulimina pseudospinescens (EMIL.)												6									
Reussella spinulosa (REUSS)														2							
UVIGERINIDAE																					
Uvigerina aff.latalata R.E.&R.C.STEW .						X									9	2	11	4	9	13	7
Uvigerina mediterranea HOFKER	23	30	29	20	20	26	7	21	13	20	3	30	2	11	9	9	15	8		11	
Trifarina angulosa (WILLIMSON)							2														
DISCORBIDAE																					
Gavelinopsis praegeri (H.-ALL.&EARL.)					2									2							
Rosalina bradyi (CUSHMAN)											3										
Rosalina obtusa d'ORBIGNY							2			3				2							
Valvulineria bradyana (FORNASINI)									3		3										
ASTERIGERINIDAE																					
Asterigerinata mamilla (WILLIAMSON)									3												
Asterigerinata planorbis (d'ORBIGNY)																		1			
ELPHIDIIDAE																					
Elphidium advenum (CUSHMAN)													2								
Elphidium macellum (FICHTEL & MOLL)															2						
EPONIDIDAE																					
Eponides turgidus PHLEGER & PARKER			2		2		2		3	3	3						2				
CIBICIDIDAE																					
Planulina ariminensis d'ORBIGNY		5	2	2			2		3	3	6	3		2							
Hyalinea baltica (SCHROETER)					2	2	2	1		3	3		2		5	2	3	4	4		5
Cibicides lobatulus (WALKER & JACOB)														3			2				
Cibicides pseudoungerianus CUSHMAN					2	5		3		10		10	2	12	5	2	5	8	3		15
CAUCASINIDAE																					
Fursenkoina tenuis (SEGUENZA)																			1		
LOXOSTOMIDAE																					
Loxostomum karrerianum (BRADY)									3			3									
CASSIDULINIDAE																					
Cassidulina crassa d'ORBIGNY	6	30	10	20	8	7	10	6	3	3	6	3	7	2	3	7		5	1	6	2
Cassidulina laevigata carinata SILV.			10	5	2	2	6	5	3		15	3	13	17	7	11	7	12	6	12	9
Globocassidulina subglobosa (BRADY)	4	7		2	2				4					2							
NONIONIDAE																					
Chilostomella oolina SCHWAGER										3			2								
Pullenia quinqueloba (REUSS)					2				3				2		2						
Rotamorphina? involuta PARKER	1				2																
ALABAMINIDAE																					
Gyroidina altiformis R.E.&R.C.STEWART	4			5	2	2		1		3		6	2	2	2		3	1	3		
Gyroidina neosoldani BROTZEN	4	7	5		2	3	2	13	4		12	3		3		9			1		
Gyroidina umbonata (SILVESTRI)	1		2	6			7		3	3	3							1			2
ANOMALINIDAE																					
Hanzawaia rhodiensis (TERQUEM)			2								3										
Melonis barleanum (d'ORBIGNY)	5	2	2	13	10	3	10	14	11	6	3		11	3	3	2		1	3		
Paromalina coronata (PARKER&JONES)													X		X						
CERATOBULIMINIDAE																					
Hoëglundina elegans (d'ORBIGNY)	1			2									2		2					2	2
ROBERTINIDAE																					
Robertina brady CUSHMAN & PARKER			2						4				2								
Counted specimens	77	43	41	59	50	59	53	66	37	32	34	33	47	58	57	45	55	78	70	52	45

Tab. 14

SPECIES	CORE C 137 Water-depth 830 m								
	SAMPLES	1	2	3	4	5	6	7	8	9
AMMODISCIDAE										
Glomospira charoides (JONES & PARKER)		X								
Ammolagena clavata (JONES & PARKER)		X								
LITUOLIDAE										
Cyclammina cancellata BRADY		X								
Alveolophragmium nitidum (GOES)		1								
TEXTULARIIDAE										
Texrtularia conica d'ORBIGNY						X		1		
Textularia gramen d'ORBIGNY		X								
Textularia pala CZJZEK				1						
Bigenerina nodosaria d'ORBIGNY		2	7			X		1		
Siphotextularia heterostoma FORNASINI			1	2	3	1	4	2	4	4
ATAXOPHRAGMIIDAE										
Karreriella bradyi (CUSHMAN)		X								
Clavulina crustata (CUSHMAN)		X	1			X	1			
Goesella gymnesiaca (COLOM)						1				
NUBECULARIIDAE										
Spiroloculina grata TERQUEM		X								
Spiroloculina rostrata REUSS					X					
Spiroloculina tenuiseptata BRADY			1		X		1			
MILIOLIDAE										
Quinqueloculina berthelotiana d'ORBIGNY			1							
Quinqueloculina cliarensis H.-ALL.&EARLAND		X								
Quinqueloculina padana PERCONIG		1								
Quinqueloculina stelligera SCHLUMBERGER										X
Quinqueloculina vulgaris d'ORBIGNY			1						1	
Cruciloculina navarroi COLOM		X								
Cruciloculina triangularis d'ORBIGNY				2	2			2		
Pyrgo bulloides (d'ORBIGNY)							1			
Pyrgo comata (BRADY)					X					
Pyrgo depressa (d'ORBIGNY)			1							
Pyrgo inornata (d'ORBIGNY)		X								
Pyrgo lucernula (SCHWAGER)				1						
Sigmoilina distorta PHLEGER &PARKER		X								X
Sigmoilina sigmoidea (BRADY)					X					
Sigmoilina tenuis (CZJZEK)			1		2					
Sigmoilopsis schlumbergeri (SILVESTRI)		3	1	1		2	4	1		X
Triloculina gibba d'ORBIGNY					X					
Triloculina tricarinata d'ORBIGNY			1			X				
Miliolinella circularis elongata KRUIT		X								1
Miliolinella subrotunda (MONTAGU)		X	1			3	4	3	1	
Biloculinella globula (BORNEMANN)				2	2					X
Biloculinella inflata (WRIGHT)			1							
Biloculinella labiata (SCHLUMBERGER)					X					
Articulina tubulosa (SEGUENZA)				2	2	2			1	
Miliolidae										2
NODOSARIIDAE										
Amphicoryna scalaris (BATSCH)		X	1			1				X
Lagena nebulosa CUSHMAN						X			1	
Lagena striata (d'ORBIGNY)							1			
Lenticulina cultrata (MONTAGU)							1			
Lenticulina orbicularis (d'ORBIGNY)		1								
Lenticulina peregrina (SCHWAGER)		X								
GLANDULINIDAE										
Glandulina laevigata (d'ORBIGNY)					X		1			
Oolina hexagona (WILLIAMSON)					X					
Fissurina neptuni (BUCHNER)			1							
Fissurina orbignyana SEGUENZA										X
Fissurina pseudorbignyana (BUCHNER)			1	1						
Fissurina sidebottomi (BUCHNER)			1							
Fissurina staphyllearia SCHWAGER			1							X
Fissurina varioperforata (BUCHNER)			1							

Tab. 14 - Distribution of the benthic foraminifers in core C-137.

Tab. 14 (*cont.*)

SPECIES	CORE C 137 Water-depth 830 m								
	SAMPLES	1	2	3	4	5	6	7	8	9
Parafissurina lateralis (CUSHMAN)				1						
SPHAEROIDINIDAE										
Sphaeroidina bulloides d'ORBIGNY		2			X					1
BOLIVINITIDAE										
Bolivina albatrossi CUSHMAN		X	4	5	8	1	2	6	8	10
Bolivina dilatatissima SILVESTRI		2	9	21	15	21	25	24	34	23
Bolivina spathulata (WILLIAMSON)						2		1		
Bolivina tortuosa (BRADY)				1						
Bolivina variabilis (WILLIAMSON)					X	1				
ISLANDIELLIDAE										
Cassidulinoides bradyi (NORMAN)						X				
BULIMINIDAE										
Bulimina costata d'ORBIGNY		5	16	1	23	8	7	6	11	8
Bulimina etnea SEGUENZA		X								
Bulimina marginata d'ORBIGNY		8	5	14	13	4	7	6	9	10
Globobulimina affinis d'ORBIGNY		1		1		X		2	1	2
UVIGERINIDAE										
Uvigerina aff. latalata R.E.&R.C. STEWART				1		1			4	10
Uvigerina mediterranea HOFKER		24	15	6	2	7	16	6	10	5
Uvigerina proboscidea (SCHWAGER)							1			
Trifarina angulosa (WILLIAMSON)		X				2				
Sagrina dertonensis GIANOTTI							1			
DISCORBIDAE										
Gavelinopsis praegeri (H.-ALLEN&EARLAND)						2	1	2		
Neoconorbina terquemi (RZEHAK)						X				
Rosalina globularis d'ORBIGNY			1			1		1		
Tretomphalus concinnus (BRADY)						2	1			
ASTERIGERINIDAE										
Asterigerinata adriatica HAAKE			1			1		2		
Asterigerinata mamilla (WILLIAMSON)										X
ELPHIDIIDAE										
Elphidium macellum (FICHTEL & MOLL)		X						1		
Cribrononion cuvilleri (LEVY)								1		
CIBICIDIDAE										
Planulina ariminensis d'ORBIGNY		2	1	4	X	1	2	2	1	1
Hyalinea baltica (SCHROETER)		2	1	5	4	1	1	5	2	1
Cibicides lobatulus (WALKER & JACOB)						1		2		
Cibicides pseudoungerianus CUSHMAN		3	3	7	9		1	2	4	6
CASSIDULINIDAE										
Cassidulina crassa d'ORBIGNY		4		5	2	4	2	2		2
Cassidulina laevigata carinata SILVESTRI		1	1	7	X	11	1	10	4	2
Globocassidulina subglobosa (BRADY)		5				2	1			
NONIONIDAE										
Chilostomella oolina SCHWAGER						X				
Pullenia quinqueloba (REUSS)						X	1			
ALABAMINIDAE										
Gyroidina altiformis R.E.&R.C. STEWART		6	7	3	X	3	5	2	1	5
Gyroidina neosoldanii BROTZEN			4		2	X	1	1		
Gyroidina umbonata (SILVESTRI)		X	2	2	X	X	1			X
OSANGULARIIDAE										
Osangularia cultur (PARKER & JONES)		X								
ANOMALINIDAE										
Hanzawaia rhodiensis (TERQUEM)				1		X	1	1		X
Melonis barleanum (d'ORBIGNY)		16	3	1		3	4	2	1	
CERATOBULIMINIDAE										
Hoëglundina elegans (d'ORBIGNY)		2	4	2	X	3		2	3	3
ROBERTINIDAE										
Robertina bradyi CUSHMAN & PARKER				1	X	X				
Counted specimens		170	132	109	171	183	88	119	113	221

As far as we know, *Cytheropteron testudo* does not live any more in the Mediterranean and its latest migration into the Mediterranean occurred during the last cold climatic phase. Consequently, a correlation between the two cores could be proposed between sample 17 of core T-23 and sample 3 of core C-137 corresponding to the last arrival of this species in the Mediterranean. On the other side, the foraminiferal evidence in core C-137 is lacking for the top of the Holocene series. Consequently the correlation proposed is hypothetical.

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(manuscript received November 19, 1982
accepted November 17, 1983)

Maria MONCHARMONT-ZEI
Franca SGARRELLA
Istitute of Paleontology
Largo S. Marcellino, 10 - 80138 Napoli - Italy

Bianca RUSSO
Institute of Geology and Geophysics
Largo S. Marcellino, 10 - 80138 Napoli - Italy

Gioacchino BONADUCE
Patrizia MASCELLARO
Zoological Station of Naples
Villa Comunale - 80121 Napoli - Italy