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A species list of the sublittoral soft-bottom macrobenthos of Cyprus

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In this study we report, for the first time, a comprehensive list of the sublittoral soft-bottom macrobenthos of Cyprus. Epifauna were distributed over a broader range of depths than infaunal species. The greatest percentage of infauna occurred within a depth range of 20-40m. Only 1.0% of the soft-bottom macrobenthic fauna were represented by Red Sea migrants; this supported results from previous studies which suggest that the overall migration path is east to west in the coastal waters of Cyprus. However, the recent arrival of an algal migrant species, Caulerpa racemosa, *may prove to be problematic in the future, due to its advancing colonization around the Cyprus coast.*

INTRODUCTION

In past years, there has been considerable interest in the description of Mediterranean benthic communities (see review, PERES, 1967). In fact, many of the benthic communities in the northwest region of the Mediterranean are some of the most well described in the world (BELLAN-SANTINI, 1985; FREDJ *et al.*, 1990, 1992). Although much of this work has concentrated on western regions, few studies have been conducted in the eastern Mediterranean (GAMULIN-BRIDA, 1967; PERES, 1967; POR *et al.*, 1972; THELIN *et al.*, 1985; VITIELLO *et al.*, 1985). Recent interests in the speciation and biogeography of Mediterranean fauna has resulted in the development of an extensive data bank on marine fauna (protist excluded) of the Mediterranean (MEDIFAUNE) (FREDJ et al., 1990; BELLAN-SANTINI, 1992; FREDJ *et al.*, 1992). This data bank will allow for comparisons between the biogeographic origins of Mediterranean versus the overall marine fauna. For example, it has been estimated that Indo-Pacific species constitute 5% of the overall marine fauna of the Mediterranean in comparison to the 12% found in the southeastern Mediterranean.

The Suez Canal has been shown to be the main link for the dispersion of biota between the Red Sea and the eastern Mediterranean (STEINITZ, 1967; POR, 1971; KIMOR, 1972). In fact, as many as 20% of the decapod species off the Israeli Mediterranean coast are represented by Eritrean fauna that have undergone Lessepsian migration (i.e., the migration of fauna through the Suez Canal) (GALIL, 1992). Thus, with the ongoing immigration of Red Sea species into the eastern Mediterranean, via the Suez Canal since 1869, a greater understanding of the biota in this region is vital to the existing data bank.

To date, previous work on the benthos of Cyprus has mainly centered on Echinodermata and Mollusca (DEMETROPOULOS, 1969, 1971; DEMETROPOULOS and HADJICHRISTOPHOROU, 1976). In this study we report for the first time, the sublittoral macrobenthos (macroalgae and seagrasses included) of Cyprus. This species list also includes an update on some of the new Indo-Pacific migrants found in Cyprus.

MATERIAL AND METHODS

Macrofauna were collected from 6 sublittoral stations off the coast of Cyprus during the period of 1972-1993 (Fig. 1). Infaunal benthic samples were obtained using an "orange-peel" grab sampler, while epibenthos were collected using a dredge sampler. Both infauna and epifauna were collected at depths that ranged from 2-150 m; the sampling depths within this depth range at each station consisted of the following: 2 m; 5m; 10 m; 20 m; 30 m; 50 m; 60 m; 100 m; 150m. (Table 1). Granulometric analyses on sediments were

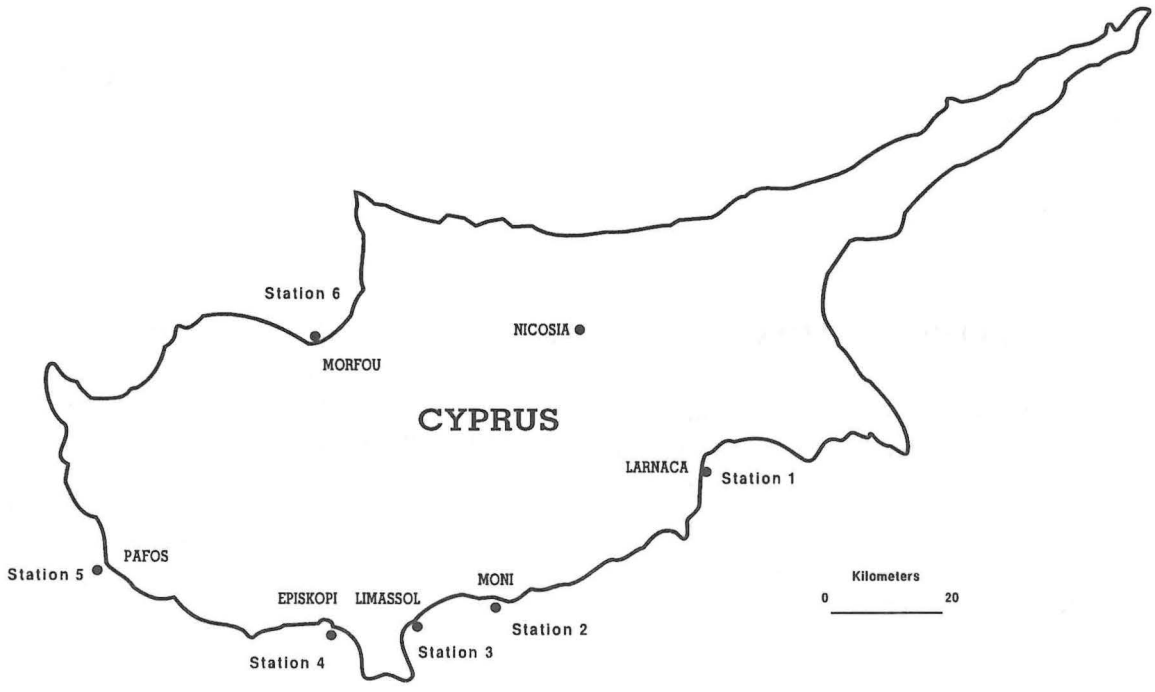

Fig. 1. Map of Cyprus showing the 6 stations along the coast where sublittoral macrobenthos were collected

conducted at selected stations and revealed that sampling depths between 2 and 50 m had approximately 30 to 50% fines (<63 mm); at depths greater than this the percent fines increased to >50 %. Twenty grab samples were taken at each depth and then combined for analyses. Macrofauna, algae, and seagrasses were separated by passing sediments through a 500 mm sieve; specimens were then placed in 70% alcohol and identified using a dissecting microscope. All macrobenthos were identified using the following sources: TORTONESE (1965); TEBBLE (1966); ZARIQUIEY ALVAREZ (1968); DEMETROPOULOS (1969); PARENZAN (1970); DEMETROPOULOS (1971); GOSNER (1971); FAUVEL (1923); DEMETROPOULOS and HADJICHRISTOPHOROU (1976 a,b); PARENZAN (1976); FAUVEL (1927); RIEDL (1983); FISCHER *et al.* (1987); SABELLI *et al.* (1990).

RESULTS AND DISCUSSION

Macrofauna

The sublittoral soft-bottom macrofauna of Cyprus showed a fairly uniform distribution around the island (Table 1). However, epifauna occurred over a greater range of depths when compared to infauna. The greatest percentage of infauna occurred within a depth range of 20-40 m. The preferential settlement of infaunal larvae at these depths was likely controlled by the higher amounts of organic matter and fine-grained sediments found in these regions (HADJICHRISTOPHOROU and ARGYROU, 1993). This relationship has been well established for many infaunal communities, particularly subsurface feeding detritivores and deposit-feeders (see review, LEVINTON *et al.*, 1984). Conversely, many of the epifaunal species were less restricted in their distribution presumably due to a greater efficiently in moving across different habitats (i.e., seagrass beds, rock, sandy and muddy substrates) in response to changes in food availability. There is a significant advantage to greater mobility in these sediments due to very patchy distribution of food resources (BIANCHI *et al.*, 1996).

The fauna of the Levantine Basin is characterized as having the highest abundance of Lessepsian migrants in the Mediterranean (GALIL, 1992). The path of migration, from the Canal into the Mediterranean, generally occurs in a longshore movement which results in the virtual exclusion of Cyprus as an area of settlement (POR *et al.*, 1972). Our findings supported this hypothesis, with only 1.0% of the total soft-bottom sublittoral macrobenthos of Cyprus being represented by Lessepsian migrants (Table 1). This percentage does not include the following four migrants that were found on hard substrates: *Malleus regulus*, *Pinctata radiata*, *Strombus decorus raybaudii*, *Brachiodontes variabilis*. Despite the high salinities that these migrants are confronted with when passing through the Bitter Lakes, temperature is considered to be the single most important factor for successful migration (POR, 1978).

Macroalgae and Seagrasses

Most of the macroalgal species were found at the southern stations (3 and 4) with seagrasses occurring in a more uniform distribution around the island (Table 1). The principal factors affecting distribution of marine phytobenthos are temperature, luminosity, salinity, ecological type of substrate, and hydrodynamism. Additionally, differences in the distribution of marine phytobenthos can largely be explained by differences in anthropogenic activities (i.e., sedimentation and input of nutrients, etc) (BIANCHI *et al.*, 1995). Macroalgae and seagrasses have also been successful in their migration through the Suez Canal (LIPKIN, 1972). The seagrass *Halophila stipulacea*, (a Red Sea migrant) was well established in the southeastern coast of Cyprus and seemed to co-occur in the same habitats as the green algae *Caulerpa prolifera* and *Caulerpa racemosa* (a Red Sea migrant).

Other Red-Sea migrants such as the green alga *Cladophora patentiramea* (BOUDOURESQUE and VERLAQUE, personal comm.) and the brown alga *Stypopodium shimperi*, have been recorded in Cyprus, however, they were not included in Table 1. because they were not present in the sublittoral stations studied. *Caulerpa racemosa* was undergoing proliferative growth around most of the island, with greatest abundance in the east and southeast regions. This species has been reported in the eastern Mediterranean in both underdeveloped and developed forms (LIPKIN, 1972). *C. racemosa* was found at all of our stations in both underdeveloped and developed stages (HADJICHRISTOPHOROU and ARGYROU, 1993). It was not clear as to what was controlling the growth of *C. racemosa* off the coast of Cyprus, though its spread was clearly characteristic of an invasive species. The eastern Mediterranean is highly oligotrophic with phosphorus (P) being more limiting factor than nitrogen (N) (KROM *et al.*, 1991). Moreover, macroalgae in coastal carbonate-rich environments tend to be P limited as opposed to siliciclastic environments where macroalgae are more N limited (LAPOINTE *et al.*, 1992). Further work is needed on Cyprus to determine if the proliferation of *C. racemosa* is controlled by local nutrient dynamics and/or differences in grazing intensity or successional competition along the coast.

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Table 1. List of sublittoral benthos collected at 6 stations off the coast of Cyprus during the period of 1972-1993. Benthic Habit: I=Infauna and E=Epifauna; Location: Station 1=Larnaca, Station 2=Moni, Station 3=Limassol, Station 4=Episkopi, Station 5=Pafos, Station 6=Morfou; Depth

**=Red Sea migrant.*

CLASSIFICATION	LOCATION	BENTHIC HABIT	DEPTH (meters)	RED-SEA MIGRANT
ALGAE				
CHLOROPHYCEAE				
Caulerpaceae				
Caulerpa prolifera	1-4	-	2-60	
Caulerpa racemosa	2,3	-	2-60	*
Codiaceae				
Codium bursa	3	-	60	
Udotea petiolata	1,3	-	40-60	
PHAEOPHYCEAE				
Dictyotaceae				
Padina pavonia	5	-	2	
Cystoseiraceae				
Cystoseira barbata	3,5	-	2-5	
Cystoseira adriatica	3	-	30	
Sargassaceae				
Sargassum vulgare	4	-	5	
RHODOPHYCEAE				
Corallinaceae				
Lithophyllum sp.	3	-	5	
Pseudolithophyllum expansum	3,4	-	20-60	
Rhodomelaceae				
Vidalia volubilis	3,4	-	30-100	
Rhodymeniaceae				
Botryocladia botryoides	3	-	60-100	
Rhodymenia ardissonei	3	-	40	

Table 1. continued

ANGIOSPERMAE				
Potamogetomaceae				
Cymodocea nodosa	1-5	-	2-20	
Posidonia oceanica	1-5	-	5-30	
Hydrocharitaceae				
Halophila stipulacea	1-4	-	5-60	*
PORIFERA				
Spongiidae				
Cacospongia scalaris	3,4	E	30	
Ircinia dendroides	3	E	30	
Grantiidae				
Leuconia aspera	4	E	60	
Suberitidae				
Suberites carnosus	3	E	20-30	
Suberites domuncula	3,4	E	30-60	
Sycettidae				
Sycon raphanus	3,4	E	20-40	
Clionidae				
Cliona viridis	3	I	10-30	
CNIDARIA				
ANTHOZOA				
Hormathiidae				
Adamsia palliata	3,4	E	10-60	
Calliactis parasitica	4	E	20	
Alcyoniidae				
Alcyonium palmatum	3	E	100	
Pteroeididae				
Pteroeides spinosum	3	E	100	
HYDROZOA				
Diphyidae sp.	4	E	10-20	

Table 1. continued

Lytocarpia myriophyllum	*4*	*E*	*40*	
Lytocarpia sp.	*3*	*E*	*100*	
ANNELIDA				
POLYCHAETA				
Amphinomidae				
Hermodice carunculata	*2,3*	*E*	*5-60*	
Aphroditidae				
Aphrodita aculeata	*3*	*E*	*20*	
Hermonia hystrix	*1,2,3,4,6*	*E*	*10-100*	
Sigalionidae				
Pholoe minuta	*3*	*E*	*2-10*	
Sthenelais boa	*2,3*	*E*	*2-50*	
Eunicidae				
Diopatra neapolitana	*2,3*	*E*	*2-10*	
Eunice floridana	*2*	*E*	*20-50*	
Eunice pennata	*2,3*	*E*	*5-100*	
Marphysa sanguinea	*2*	*E*	*5-30*	
Marphysa bellii	*2,3*	*E*	*10-20*	
Nematonereis unicornis	*3*	*E*	*5-10*	
Onuphidae				
Hyalinoecia brementi	*2*	*E*	*50*	
Hyalinoecia tubicola	*2,3,4,6*	*E*	*10-150*	
Onuphis eremita	*2,3*	*E*	*5-150*	
Lumbrinereidae				
Lumbrineris impatiens	*2,3*	*E*	*5-150*	
Glyceridae				
Glycera convoluta	*2,3*	*E*	*2-150*	
Glycera rouxii	*2,5*	*E*	*5-50*	
Goniadidae				
Goniada norvegica	*2,3*	*E*	*20-60*	

Table 1. continued

Hesionidae				
Hesione pantherina	1	E	20	
Hesione sp.	2	E	10-50	
Nephtyidae				
Nephtys caeca	1-3	E	5-10	
Nephtys ciliata	3	E	100	
Nephtys hombergii	1-3	E	2-150	
Nephtys sp.	2	E	5-30	
Nereidae				
Neanthes fucata	3	E	10	
Neanthes pelagica	2,3	E	20-150	
Phyllodocidae				
Eteone longa	2	E	5	
Mysta siphodonta	2	E	5	
Eteone sp.	2	E	10	
Syllidae				
Exogone gemmifera	2	E	5	
Pectinariidae				
Amphictene auricoma	2,3	I	10-60	
Ampharetidae				
Melinna palmata	3	I	5	
Orbiniidae				
Orbinia cuvieri	2	I	10	
Phylo foetida	2	I	10	
Naineris laevigata	2	I	30	
Naineris sp.	2	I	20	
Scolaricia typica	2	I	5	
Capitellidae				
Capitella capitata	2,3	I	10-100	

Table 1. continued

Capitella sp.	2	I	50	
Notomastus sp.	2,3	I	10-100	
Flabelligeridae				
Pherusa plumosa	2,3	I	5-50	
Maldanidae				
Euclymene lumbricoides	3	I	10-150	
Oweniidae				
Owenia fusiformis	2	I	10	
Sabellidae				
Branchiomma bombyx	3,4	I	60-100	
Sabella pavonina	6	I	50	
Serpulidae				
Hydroides norvegica	4	I	20	
Serpula vermicularis	3	I	10-30	
Sternaspidae				
Sternaspis scutata	1,2,3,4,6	I	30-100	
Terebellidae				
Amphitrite edwardsi	2	I	50	
Amphitrite gracilis	3	I	5	
Amphitrite johnstoni	3	I	10	
Lanice conchilega	1	I	20-40	
Trichobranchidae				
Terebellides stroemi	2,3	I	10-50	
SIPUNCULIDA				
Golfingiidae				
Golfingia vulgaris	2,3,5	E	5-20	
Sipunculidae				
Sipunculus nudus	2	E	10	

Table 1. continued

TENTACULATA				
BRYOZOA				
Membraniporidae				
Membranipora membranacea	4	E	30	
Microporidae				
Micropora complanata	4	E	30-40	
Tubucellariidae				
Margaretta cereoides	4	E	30	
MOLLUSCA				
PLACOPHORA				
Chitonidae				
Chiton olivaceus	2,3	E	5-30	
GASTROPODA				
Fissurellidae				
Diodora italica	3	E	10-20	
Haliotidae				
Haliotis tuberculata lamellosa	3	E	5	
Trochidae				
Calliostoma granulatum	4	E	20-60	
Calliostoma laugieri	2	E	50	
Calliostoma zizyphinum	3,4	E	10-30	
Clanculus cruciatus	3	E	5	
Gibbula adansonii	2,3	E	5-20	
Gibbula ardens	3	E	5	
Gibbula varia	3	E	5-10	
Jujubinus striatus	3,4	E	30-40	
Jujubinus exasperatus	2-4	E	5-60	
Turbinidae				
Bolma rugosa	2,3	E	5-30	

Table 1. continued

Tricoliidae					
	Tricolia pulla	**2,3**	**E**	**2-40**	
	Tricolia speciosa	**2,3,6**	**E**	**5-20**	
Neritidae					
	Smaragdia viridis	**1-4**	**E**	**2-30**	
Rissoidae					
	Rissoa monodonta	**4**	**E**	**20**	
	Rissoa similis	**3**	**E**	**30**	
	Rissoa ventricosa	**2,3**	**E**	**2-10**	
Turritellidae					
	Turritella communis	**3,4**	**E**	**10-100**	
	Turritella turbona	**2,3**	**E**	**5-100**	
Cerithiidae					
	Bittium reticulatum	**2,3,4,6**	**E**	**5-60**	
	Cerithium kochi	**3**	**E**	**2-20**	*
	Cerithium vulgatum	**2,3,4,6**	**E**	**2-40**	
Epitoniidae					
	Epitonium clathratulum	**4**	**E**	**20**	
	Epitonium commune	**2**	**E**	**50**	
	Epitonium turtoni	**2-4**	**E**	**5-60**	
Eulimidae					
	Eulima bilineata	**2**	**E**	**10**	
	Eulima glabra	**2,3**	**E**	**50-60**	
Calyptraeidae					
	Crepidula unguiformis	**2-4**	**E**	**5-50**	
Aporrhaidae					
	Aporrhais pes-pelecani	**3,4**	**E**	**40-100**	
Naticidae					
	Natica dillwynii	**2,3,6**	**E**	**5-30**	

Table 1. continued

	Natica hebraea	*1,2,3,4,6*	*E*	*5-60*	
	Natica settepassii	*4,6*	*E*	*20-40*	
	Neverita josephina	*2-4*	*E*	*2-50*	
Cassidae					
	Phalium granulatum	*4*	*E*	*5*	
Muricidae					
	Bolinus brandaris	*2,3,4,6*	*E*	*10-100*	
	Buccinulum corneum	*2,3,6*	*E*	*5-40*	
	Fasciolaria lignaria	*3*	*E*	*30*	
	Fusinus rostratus	*4,6*	*E*	*20-30*	
	Hadriania oretea	*3*	*E*	*30*	
	Hexaplex trunculus	*2,3,4,6*	*E*	*2-40*	
	Nassarius costulatus cuvierii	*3*	*E*	*2-10*	
	Nassarius gibbosulus	*4*	*E*	*5-10*	
	Nassarius mutabilis	*2-6*	*E*	*2-30*	
	Pisania striata	*3*	*E*	*5*	
	Pollia dobrignyi	*2,3*	*E*	*10-20*	
Mitridae					
	Mitra cornicula	*3*	*E*	*5*	
Turridae					
	Bela nebula	*2,4*	*E*	*5-50*	
	Fehria taprurensis	*4*	*E*	*20*	
	Mangelia attenuata	*2,4*	*E*	*10-30*	
	Mangelia unifasciata	*3*	*E*	*2-30*	
	Raphitoma echinata	*2,3*	*E*	*10-60*	
	Raphitoma purpurea	*2,4*	*E*	*20-30*	

Table 1. continued

Conidae				
	Conus mediterraneus	**2,3,4,6**	**E**	**5-50**
Cavoloniidae				
	Cavolinia tridentata	**2**	**E**	**30**
Acteonidae				
	Acteon tornatilis	**2**	**E**	**5**
Bullidae				
	Bulla striata	**2**	**E**	**10**
Akeridae				
	Akera bullata	**3,4,6**	**E**	**20-30**
Redusidae				
	Retusa truncatula	**2,3**	**E**	**10-30**
Cylichnidae				
	Cylichna cylindracea	**3**	**E**	**20**
	Scaphander lignarius	**2**	**E**	**20**
Philinidae				
	Philine catena	**2**	**E**	**30**
	Philine aperta	**2-5**	**E**	**5-100**
Oxynoidae				
	Lobiger serradifalci	**3,4**	**E**	**20-60**
	Oxynoe olivacea	**3,4**	**E**	**10-60**
Aplysidae				
	Aplysia fasciata	**3**	**E**	**5**
Cypraeidae				
	Luria lurida	**2,3**	**E**	**10-30**
Haminoeidae				
	Haminoea hydatis	**2-4**	**E**	**5-100**

Table 1. continued

Haminoea navicula	2	E	5-10	
Pyramidellidae				
Euparthenia bulinea	2	E	20	
Turbonilla rufa	2-4	E	5-30	
Lamellariidae				
Lamellaria latens	4	E	20	
Pleurobranchidae				
Pleurobranchus membranaceus	2,3	E	10-60	
Polyceridae				
Polycera sp.	4	E	30	
Columbellidae				
Columbella rustica	3,6	E	2-30	
Mitrella scripta	2,3	E	5-30	
Siphonariidae				
Williamia gussonii	3	E	60	
SCAPHOPODA				
Dentaliidae				
Dentalium dentalis	1,2,3,4,6	I	10-100	
Dentalium panormum	4	I	10-100	
Fustiaria rubescens	2-5	I	2-60	
Dentalium vulgare	2,3	I	2-60	
Siphonodentaliidae				
Cadulus sp.	4	I	30-100	
LAMELLIBRANCHIATA				
Veneridae				
Chamelea gallina	2,3,4,6	I	5-60	
Dosinia lupinus	2-4	I	2-20	
Globivenus effosa	2	I	20	

Table 1. continued

Gouldia minima	1-4	I	5-60	
Pitar rudis	2	I	30-50	
Venus casina	2	I	5-10	
Venus verrucosa	2,3	I	10-20	
Veneridae				
Irus Irus	3	I	5	
Paphia aurea	3,4,6	I	10-150	
Tapes decussatus	3	I	2	
Venerupis senegalensis	1,3	I	5-40	
Donacidae				
Donax semistriatus	2,4	I	5	
Donax trunculus	3	I	2	
Donax venustus	2	I	5	
Sanguinolariidae				
Azorinus chamasolen	2,3	I	50-100	
Tellinidae				
Tellina fabula	2	I	5	
Tellina pygmaea	2	I	5-30	
Tellina balaustina	2,3	I	5-30	
Tellina distorta	5	I	10	
Tellina incarnata	2,3	I	5	
Tellina nitida	2,3,6	I	2-30	
Tellina planata	2,3	I	2-50	
Tellina pulchella	2,4	I	5-30	
Semelidae				
Abra alba	2,3	I	10-50	
Abra longicallus	2	I	5-10	
Abra segmentum	2	I	30	
Abra prismatica	2	I	50	

Table 1. continued

Mactridae				
	Mactra stultorum	*2,4*	*I*	*5-10*
Pharellidae				
	Ensis ensis	*2,4*	*I*	*5-20*
	Phaxas adriaticus	*2,3*	*I*	*10-100*
	Phaxas pellucidus	*1*	*I*	*40*
Corbulidae				
	Corbula gibba	*1,2,3,4,6*	*I*	*10-100*
Lyonsiidae				
	Lyonsia norvegica	*3*	*I*	*30*
Pandoridae				
	Pandora albida	*4*	*I*	*5-10*
Thraciidae				
	Thracia pubescens	*4*	*I*	*60-100*
Cuspidariidae				
	Cuspidaria cuspidata	*4*	*I*	*100*
	Cuspidaria rostrata	*4*	*I*	*100*
Nuculanidae				
	Nuculana commutata	*3,4*	*I*	*100*
	Nuculana pella	*4*	*I*	*20-30*
	Nuculana sp.	*4*	*I*	*20*
Nuculidae				
	Nucula nitidosa	*2,3*	*I*	*30-60*
	Nucula nucleus	*1,4*	*I*	*20-100*
	Nucula sulcata	*2-4*	*I*	*5-100*
Solemyidae				
	Solemya togata	*1-3*	*I*	*2-30*
Arcidae				
	Arca noae	*2,3,4,6*	*E*	*10-100*

Table 1. continued

	Barbatia barbata	1,4	E	10-100	
Noetidae					
	Striarca lactea	4,6	E	10-100	
Glycymeridae					
	Glycymeris glycymeris	1-4	I	5-40	
	Glycymeris insubrica	2,4,6	I	5-20	
Mytilidae					
	Modiolula phaseolina	2-4	E	10-100	
	Modiolus adriaticus	6	E	20	
	Modiolus barbatus	3	E	10-30	
	Modiolus modiolus	4	E	30	
	Musculus costulatus	2	E	30	
	Modiolarca subpicta	3,4	E	40-100	
Pinnidae					
	Pinna nobilis	2,4,6	I	10-30	
Pectinidae					
	Aequipecten opercularis	2,4,6	E	20-50	
	Chlamys glabra	2	E	30	
	Chlamys flexuosa	4,6	E	20-60	
	Chlamys varia	3,4	E	30-100	
	Lissopecten hyalinus	2,3,4,6	E	10-100	
	Pecten jacobaeus	4,6	E	20-40	
Spondylidae					
	Spondylus gaederopus	6	E	10	
Limidae					
	Lima hians	3	E	20-60	
Anomiidae					
	Anomia ephippium	2-4	E	5-60	
Carditidae					

Table 1. continued

Glans aculeata	2,3,6	I	5-60	
Glans trapezia	3,4	I	5-60	
Venericardia antiquata	3	I	5-30	
Thyasiridae				
Axinulus croulinensis	2	I	20-50	
Thyasira flexuosa	2-4	I	20-100	
Thyasira planata	3	I	100	
Lucinidae				
Anodontia fragilis	1-4	I	10-50	
Ctena decussata	2,3	I	5-30	
Lucinella divaricata	2	I	5-10	
Loripes lacteus	2,3	I	2-30	
Myrtea spinifera	1-4	I	20-60	
Montacutidae				
Tellimya ferruginosa	2	I	5-10	
Cardiidae				
Acanthocardia aculeata	3	I	30	
Acanthocardia echinata	2,3,4,6	I	10-100	
Acanthocardia tuberculata	2,3,4,6	I	5-50	
Cerastoderma dule	1-3	I	2-20	
Parvicardium exiguum	1,2,3,4,6	I	2-100	
Parvicardium ovale	3	I	60	
Parvicardium scabrum	2,3	I	10-20	
Plagiocardium papillosum	1,2,3,4,6	I	5-100	
CEPHALOPODA				
Octopodidae				
Octopus macropus	3,4	E	30-40	
Octopus sp.	3	E	30	

Table 1. continued

Octopus vulgaris	4	E	5-20	
Eledone moschata	3	E	60	
Sepiolidae				
Sepiola rondeletii	3	E	100	
ARTHROPODA				
CRUSTACEA				
Cirripedia				
Scalpelidae				
Scalpellum scalpellum	3	E	60-100	
Stomatopoda				
Squillidae				
Rissoides desmaresti	2	E	20	
Rissoides pallidus	2	E	20	
Euphausiacea				
Euphausia sp.	3	E	60-100	
Decapoda				
Penaeidae				
Parapenaeus longirostris	3	E	100	
Solenocera membranacea	3,4	E	20-100	
Alpheidae				
Alpheus glaber	2,3,4,6	E	10-100	
Alpheus macrocheles	2	E	30	
Athanas nitescens	2,3	E	5-30	
Hippolytidae				
Hippolyte inermis	2	E	5	
Hippolyte sp.	3	E	30	
Processidae				
Processa canaliculata	2-4	E	20-100	

Table 1. continued

	Processa edulis	*2,3*	*E*	*10-150*
Crangonidae				
	Crangon crangon	*2*	*E*	*10*
	Philocheras fasciatus	*3,4*	*E*	*2-20*
	Pontocaris cataphracta	*2,6*	*E*	*20-50*
	Pontocaris lacazei	*4*	*E*	*100*
Scyllaridae				
	Scyllarus arctus	*3,4,6*	*E*	*10-60*
Callianassidae				
	Callianassa tyrrhena	*2,3*	*E*	*5-60*
Upogebiidae				
	Upogebia pusilla	*2,3*	*E*	*5-60*
	Upogebia deltaura	*3*	*E*	*10-30*
Diogenidae				
	Clibanarius erythropus	*2-4*	*E*	*5-40*
	Dardanus arrosor	*3,4*	*E*	*5-20*
	Dardanus calidus	*4*	*E*	*40*
	Diogenes pugilator	*2-5*	*E*	*2-60*
	Paguristes eremita	*2-4*	*E*	*2-60*
Paguridae				
	Anapagurus bicorniger	*2-4*	*E*	*5-100*
	Anapagurus laevis	*1-4*	*E*	*5-60*
	Cestopagurus timidus	*2-5*	*E*	*2-60*
	Pagurus anachoretus	*1-4*	*E*	*5-30*
	Pagurus cuanensis	*1-4*	*E*	*5-60*
	Pagurus prideaux	*2-4*	*E*	*10-60*
Galatheidae				
	Galathea bolivari	*3*	*E*	*10-100*
	Galathea intermedia	*2-4*	*E*	*20-100*
	Galathea squamifera	*2-4*	*E*	*20-60*

Table 1. continued

Galathea sp.	4	E	30	
Galathea strigosa	2,3	E	5-30	
Porcellanidae				
Porcellana platycheles	2	E	20	
Homolidae				
Homola barbata	3,4	E	100	
Dorippidae				
Ethusa mascarone	2,3,4,6	E	10-100	
Leucosiidae				
Ebalia cranchi	3	E	100	
Ebalia edwardsi	2	E	30	
Ebalia granulosa	4	E	20	
Ilia nucleus	3,4,6	E	20-60	
Calappidae				
Calappa sp.	3	E	5	
Majidae				
Achaeus cranchi	3	E	30	
Inachus dorsettensis	2,3,4,6	E	10-100	
Inachus thoracicus	3,4,6	E	10-60	
Macropodia longirostris	3,4,6	E	5-100	
Macropodia rostrata	3,4	E	5-100	
Epialtinae				
Acanthonyx lunulatus	3	E	5	
Pisinae				
Eurynome aspera	2-4	E	20-100	
Lisa chiragra	3	E	10-40	
Pisa armata	2,3,4,6	E	5-60	
Pisa corallina	2	E	20	
Pisa nodipes	3,4	E	30-60	

Table 1. continued

Pisa tetraodon	*1,3,4*	*E*	*10-60*	
Majinae				
Maja squinado	*2-4*	*E*	*10-40*	
Maja crispata	*3,4,6*	*E*	*5-40*	
Parthenopidae				
Parthenope angulifrons	*2-4*	*E*	*20-40*	
Parthenope massena	*2-4*	*E*	*30-60*	
Thiidae				
Thia sp.	*4*	*E*	*40*	
Pirimiledae				
Pirimela denticulata	*2,3*	*E*	*5-30*	
Portunidae				
Carcinus ornadus	*2-4*	*E*	*2-40*	
Liocarcinus arcuatus	*1,2,3,4,6*	*E*	*2-60*	
Liocarcinus corrugatus	*2-4*	*E*	*10-60*	
Liocarcinus depurator	*2-4*	*E*	*5-100*	
Liocarcinus maculatus	*2-4*	*E*	*5-100*	
Thalamita poissoni	*2*	*E*	*10*	*
Eriphiidae				
Eriphia verrucosa	*2*	*E*	*20*	
Pilumnidae	*2,3*	*E*	*20-30*	
Pilumnus hirtellus				
Xanthidae				
Xantho poressa	*3*	*E*	*5*	
Goneplacidae				
Goneplax rhomboides	*3,6*	*E*	*50-150*	
Palicidae				
Palicus caroni	*3*	*E*	*20-40*	
Grapsidae				
Pachygrapsus marmoratus	*2*	*E*	*10*	

Table 1. continued

Dromiidae				
	Dromia personata	3	E	10-40
Mysidacea				
Lophogastridae				
	Lophogaster typicus	2	E	50
Mysidae				
	Anchialina agilis	2	E	50
Cumacea				
Bodotriidae				
	Iphinoe serrata	2,3	E	2-10
Nannastacidae				
	Cumella limicola	5	E	5
Anisopoda				
Apseudidae				
	Apseudes latreillei	2,3	E	10-60
Isopoda				
Idoteidae				
	Zenobiana prismatica	2,3	E	10
Cirolanidae				
	Eurydice sp.	3	E	100
	Cirolana borealis	2,3	E	50-100
Aegidae				
	Rocinela sp.	3	E	100
Cymothoidae				
	Anilocra physodes	4	E	40-60

Table 1. continued

Sphaeromatidae				
Cymodoce truncata	***1,3,4,6***	***E***	***10-60***	
Sphaeroma rugicauda	***2***	***E***	***10***	
Sphaeroma serratum	***2-4***	***E***	***2-100***	
Amphipoda				
Leucothoidae				
Leucothoe spinicarpa	***2-4***	***E***	***60-100***	
Lysianassidae				
Lysianassa longicornis	***3***	***E***	***100***	
Gammaridae				
Gammaridae sp.	***2-4***	***E***	***5-100***	
Epicaridea				
Epicarides sp.	***4***	***E***	***40***	
ECHINODERMATA				
CRINOIDEA				
Antedonidae				
Antedon mediterranea	***3,4,6***	***E***	***5-100***	
HOLOTHUROIDEA				
Holothuriidae				
Holothuria helleri	***3,4***	***E***	***20-40***	
Holothuria impatiens	***3***	***E***	***10-30***	
Holothuria mammata	***2,3***	***E***	***5-30***	
Holothuria sanctori	***3***	***E***	***5***	
Holothuria tubulosa	***1,3***	***E***	***5-30***	
Synaptidae				
Oestergrenia adriatica	***3***	***E***	***5***	
ECHINOIDEA				
Cidaroidea				
Cidaris cidaris	***4***	***E***	***100***	

Table 1. continued

Stylocidaris affinis	3	E	60-100	
Diadematidae				
Centrostephanus longispinus	1,3	E	60	
Toxopneustidae				
Sphaerechinus granularis	3	E	10-20	
Echinidae				
Paracentrotus lividus	3	E	5-10	
Psammechinus microtuberculatus	2-4	E	10-60	
Fibulariidae				
Echinocyamus pusillus	2,3	I	10-30	
Loveniidae				
Echinocardium cordatum	2-5	I	2-30	
Echinocardium mediterraneum	4	I	5-30	
Schizasteridae				
Schizaster canaliferus	1-4	I	20-60	
Brissidae				
Brissopsis lyrifera	2,3,4,6	I	30-150	
Brissus unicolor	2	I	30	
ASTEROIDEA				
Brisingidae				
Brisinga coronata	6	E	20	
Astropectinidae				
Astropecten aranciacus	2,4	E,I	20	
Astropecten bispinosus	2,4,6	E,I	5-50	
Astropecten jonstoni	2,4	E,I	5-20	
Astropecten irregularis	2,3,4,6	E,I	10-100	
Astropecten platyacanthus	1,3,4	E,I	5-60	
Astropecten spinulosus	1-4	E,I	2-100	
Luidiidae				

Table 1. continued

Luida ciliaris	*4*	*E*	*30*	
Chaetasteridae				
Chaetaster longipes	*3*	*E*	*20*	
Goniasteridae				
Peltaster placenta	*4*	*E*	*100*	
Asterinidae				
Anseropoda placenta	*3,4*	*E*	*60-100*	
Ophidiasteridae				
Hacelia attenuata	*3*	*E*	*30*	
Asteriidae				
Marthasterias glacialis	*4*	*E*	*40*	
OPHIUROIDEA				
Ophiomyxidae				
Ophiomyxa pentagona	*3,4*	*E*	*5-100*	
Amphiuridae				
Amphiura brachiata	*2,3*	*I*	*5-30*	
Amphiura chiajei	*1-4*	*I*	*2-150*	
Amphiura filiformis	*3,4,6*	*I*	*50-100*	
Ophiodermatidae				
Ophioderma longicaudum	*2,3*	*E*	*5-20*	
Ophiocomidae				
Ophiopsila aranea	*6*	*E*	*50*	
Ophiuridae				
Ophiura albida	*2,3,4,6*	*E*	*10-150*	
Ophiura grubei	*4*	*E*	*100*	
Ophiura ophiura	*3,4,6*	*E*	*20-100*	
TUNICATA				
ASCIDIACEA				
Clavelinidae				

Table 1. continued

Clavelina lepadiformis	***3,4,6***	***E***	***50-100***	
Polyclinidae				
Aplidium proliferum	***3***	***E***	***100***	
Aplidium sp.	***4***	***E***	***100***	
Ascidiiae				
Ascidia conchilega	***6***	***E***	***30***	
Ascidia mentula	***4***	***E***	***40***	
Ascidia virginea	***3,4***	***E***	***40-100***	
Ascidiella aspersa	***3,4***	***E***	***10-100***	
Phallusia mammilata	***6***	***E***	***50***	
Pyuridae				
Halocynthia papillosa	***4***	***E***	***30***	
Microcosmus claudicans	***3,4***	***E***	***5-100***	
Microcosmus sulcatus	***3***	***E***	***20-40***	
Microcosmus sp.	***3***	***E***	***30***	

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Popis vrsta sublitoralnog makrobentosa mekanih dna područja Cipra

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KRATKI SADRŽAJ

U ovom radu prvi puta iznosimo sveobuhvatni popis vrsta sublitoralnog makrobentosa mekanih dna područja Cipra. Epifauna je rasprostranjena na širem rasponu dubina nego endofauna. Najveći procenat endofaune se javlja unutar dubina od 20 do 40 m. Crvenomorskim migrantima pripada samo 1% makrobentoske faune mekanih dna. Potvrđuju se nalazi prijašnjih studija, koje su nagovjestile da se u obalnim vodama Cipra ukupna migracija odvija od istoka prema zapadu. Međutim, recentni nalazi migratornih vrsta alga *Caulerpa racemosa* mogli bi postati problem u budućnosti zbog povećane pojave na obalama Cipra.