

# DEMERSAL FISH AND MEGAFUNAAL ASSEMBLAGES ON THE CYPRUS CONTINENTAL SHELF AND SLOPE (EASTERN MEDITERRANEAN)

Giorgos Gitarakos<sup>1\*</sup>, Argyris Kallianiotis<sup>1</sup> and Nicos Hadjistefanou<sup>2</sup>

<sup>1</sup> NAGREF, Fisheries Research Institute, 64007 Nea Peramos, Kavala, Greece - fri@otenet.gr

<sup>2</sup> Fisheries and Marine Research Department, Nicosia, Cyprus

## Abstract

The demersal fish and megafaunal assemblages on the Cyprus continental shelf and slope were sampled for the first time during the MEDITS CY 2005 and 2006 projects. Species distribution and density varied between depth strata. A total of 173 species were recorded, 5 of which were Lessepsian migrants, whereas 1 fish species was recorded for the first time in the Eastern Mediterranean.

**Keywords :** *Demersal, Eastern Mediterranean, Trawl Surveys.*

## Introduction

The Cyprus continental shelf and slope had never been studied before in terms of composition and bathymetric distribution of fish assemblages. This study was a first attempt for such an approach, based on data taken from the MEDITS surveys of 2005 and 2006. The main objective of the study was to determine species assemblages in different depth zones, given that the sampling stations were bathymetrically stratified. Another point taken into consideration was the abundance and biomass changes in each stratum between the two years, since samplings were not carried out during the exact same season.

## Materials and methods

The survey method was the standard MEDITS protocol, i.e. stratified trawl surveys at depths ranging from 10 to 800 m. 25 hauls were conducted each year covering the area from Agia Napa to Chrysochous Bay. Sampling took place in August 2005 and June 2006. For data analysis, the sampling year was noted as 5 for 2005 and 6 for 2006, and the following strata codes were used: A (10-50 m), B (50-100 m), C (100-200 m), D (200-500 m) and E (500-800 m). Thus C14\_5 is haul 14, which belongs to the 100-200 m stratum, sampled in 2005. The dendrogram of similarities between the 50 stations was calculated with PRIMER, using the triangular similarity matrix, based on the Bray - Curtis similarity index, between stations (using 4th square root transformation) [1]. The statistical testing for the differentiation between strata and the determination of the main species responsible for the calculated differences was done with ANOSIM and SIMPER.

## Results and discussion

A total of 172399 individuals were fished (63528 in 2005 and 108871 in 2006), belonging to 173 species (114 osteichthyes, 16 chondrichthyes, 15 cephalopods and 28 crustaceans). The dendrogram of similarities indicates that stations were grouped per stratum (fig. 1).

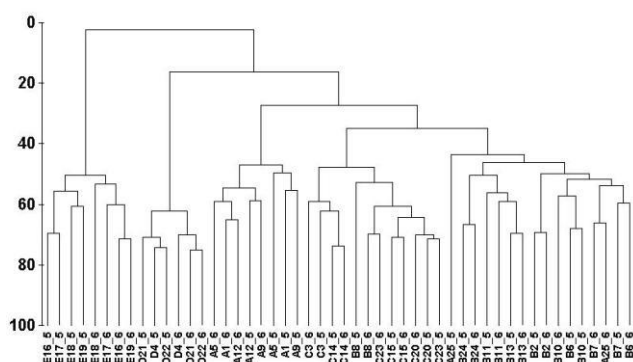


Fig. 1. Dendrogram of similarities for 50 stations (cluster analysis, group-average linkage) sampled during August 2005 and June 2006.

The average similarity was 50,97%, 49,05%, 54,82%, 66,01% and 53,92% for strata A, B, C, D, and E respectively. The only stations that were grouped outside their actual stratum were B8 and A25. Station 8 was the only station in stratum B with high abundance of *Centracanthus cirrus*, *Macroramphosus scolopax* and *Trachurus mediterraneus* during both sampling years. These species were mostly occupying strata C and D in their total appearance. Station 25 was the only station of stratum A located

on the northern shore of Cyprus and presented species that were mainly found in stratum B in the southern part of the island. SIMPER revealed that the main species responsible for the grouping of stratum A stations were: *Serranus hepatus*, *Spicara smaris* and *Serranus cabrilla*. The main species responsible for the grouping of stratum B were: *S. hepatus*, *Lepidotrigla cavillone* and *S. smaris*, for Stratum C: *M. scolopax*, *S. hepatus* and *L. cavillone*, for Stratum D: *Argentina sphyraena*, *Capros aper* and *Aspitrigla cuculus*, and Stratum E: *Plesionika martia*, *Chlorophthalmus agassizii* and *Argyropelecus hemigymnus*. Strata differed between them (ANOSIM,  $R$  global  $>0.75$ ,  $p <0.001$ ). The pair wise comparisons of strata revealed  $R$ -values higher than 0.84 in every case, apart from the test between strata D and E, ( $R = 0.68$ ). These were the deepest strata and differed but overlapped ( $R >0.5$ ). The intra-stratum differentiation between the two sampling years revealed an abundance increase in 2006 for strata C, D and E (252.8%, 376.3% and 92.6% respectively) and decrease for strata A (514%) and B (15.5%). The high abundance in stratum A for 2005 was mainly due to *Spicara smaris* (73.7% of total individuals caught in stratum), which were just being recruited to the fishery [2]. The 2006 sampling took place in June and therefore recruitment did not started yet. The highest abundance increase in 2006 was noticed in stratum D, mainly due to the presence of *A. sphyraena*, *M. scolopax* and *C. aper* that increased by 567%, 1658% and 308% respectively. The increase in stratum C was also significant and was related with the presence of *M. scolopax* (76% of total individuals caught in the stratum). During the MEDITS CY surveys 5 Lessepsian migrant species were caught: 4 fish, *Pteragogus pelycus* (Randall, 1981), *Dussumieria elopoides* (Bleeker, 1849), *Stephanolepis diaspros* (Fraser-Brunner, 1940) and *Upeneus moluccensis* (Bleeker, 1855) [3] and 1 crustacean species, *Thalamita poissonii* (Audouin, 1826) [4]. A deep living species of the family Stomiidae, *Bathophilus nigerrimus* (Giglioli, 1884), was also recorded at a depth of 610 m during the 2006 survey. This species has never been reported before in the eastern Mediterranean. In conclusion, depth zones were characterized by specific assemblages and differentiation between strata was clear.

## References

- 1 - Clarke K. R. and Warwick R. M., 1994. Change in Marine Communities: An Approach to Statistical Analysis and Interpretation. Plymouth Marine Laboratory, Plymouth, 144 pages.
- 2 - Biagi F., Gambaccini S. and Zazzetta M., 1997. Inseidamento e microhabitat di specie ittiche nella fascia costiera toscana. *Biol. Mar. Medit.*, 4 (1): 195-203.
- 3 - D. Golani, L. Orsi-Relini, Enric Massutí and Quignard J.-P., 2002. CIESM Atlas of Exotic Species in the Mediterranean. Vol. 1. Fishes. Briand F. (ed.). CIESM Publishers, Monaco, 256 pages.
- 4 - B. Galil, C. Froglia and Noël P., 2002. CIESM Atlas of Exotic Species in the Mediterranean. Vol. 2. Crustaceans : decapods and stomatops. Briand F. (ed.). CIESM Publishers, Monaco, 192 pages.