

# Long-term comparison of polychaete species inhabiting soft-bottom habitats of the "Cap de Creus" continental shelf (northwestern Mediterranean Sea).

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The macrofauna present at eight stations in the northern part of the Cap de Creus Natural Park (Catalonia, northwestern Mediterranean Sea) initially sampled by Guille during the late 1960s<sup>(1)(2)(3)</sup> was reassessed in July 2009; however in this case and due to the research project in which the work was carried out, comparisons only could be done in a qualitative way due to the different mesh size used. This poster follows a previous one presented at the IPC9<sup>(4)</sup> where other set of communities were reassessed.

**METHODOLOGY.** The eight stations sampled in 1970-72 in the northern part of the "Cap de Creus" between 75 and 108 m depth were reassessed in 2009. All samples (1970-72 and 2009) were taken with Van Veen grabs (0,10 m<sup>2</sup> in 1970-72; 0,08 m<sup>2</sup> in 2002). During the 2009 campaign, at each station, two grab samples were obtained for the analysis of macroinfaunal composition and one additional sample for sedimentological analysis (organic matter, granulometry and calcimetry). Macrofaunal samples were immediately sieved on board (RV Dolores) through a 0.5 mm mesh (in 1970-72 the used mesh was 1 mm). Dry weight biomass data was obtained in the 2009 samples but unfortunately this data was not obtained in the 1970-72 campaign.

Multidimensional scaling analysis (MDS) was performed with the 8 stations sampled. The ranked matrix of similarities among samples was constructed using the Bray-Curtis similarity measure on square root transformed data. Accidental species (presence in less than 10% of all samples) were not used in the analysis. Care was taken to homogenise the level of systematic expertise between both studies and the European Marine Register System (ERMS database) was used for final nomenclature.

**RESULTS.** A total of 2375 belonging to 176 species of polychaetes were identified in 2009. The MDS ordination yielded two set of samples from two different benthic communities located in the area; the Littoral Sandy Mud (former Detritic Mud Community<sup>(2)</sup>) (LSM; average grain size 178.9 µm) and the Terrigenous Coastal Mud Community (TCM; average grain size 221.2 µm). LSM was described in the past as a community with a variable proportion of silt-clay percentage where the fine sands were replaced by coarse sand and gravel which has an important contribution in weight when granulometrical analysis are done in surface sediments. On the other hand, the TCM was characterized by percentage weight contents of silt-clay higher than 75%; nevertheless, the samples that were analyzed in this study are near the zone of transition with the previous community and the granulometrical values were lower (23-54%). The most abundant species in density (ind m<sup>-2</sup>) and biomass (mg dw m<sup>-2</sup>) for both LSM and TCM communities are indicated in the tables below. Numbers are given for the eight most abundant species. Density numbers for the eight more abundant species in 1970-72 are also included but in this case mesh size used was 1 mm<sup>(4)</sup>.

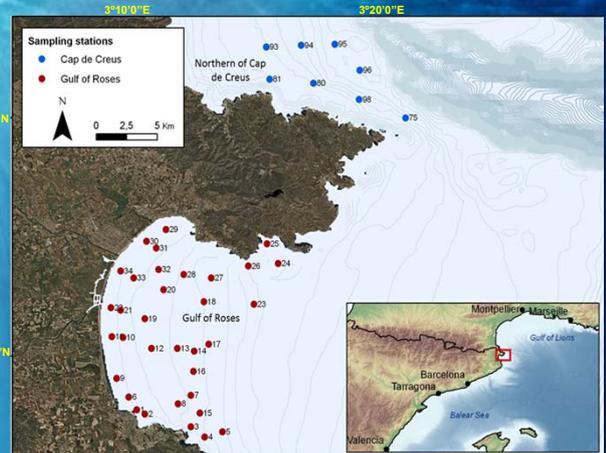
## LSM - Littoral Sandy Mud (4 stations)

	2009		1970-72 <sup>(1 mm mesh size)</sup>
	ind m <sup>-2</sup>	mg dw m <sup>-2</sup>	ind m <sup>-2</sup>
<i>Paradoneis lyra</i>	159(1)	3.3	5(7)
<i>Galathowenia oculata</i>	75(2)	6.3(8)	---
<i>Monticellina heterochaeta</i>	50(3)	1.0	3
<i>Parapionosyllis brevicirra</i>	50(4)	0.3	---
<i>Dipolydora armata</i>	48(5)	0.2	---
<i>Glycera tessellata</i>	47(6)	2.4	---
<i>Lumbrineris nonatoi</i>	47(7)	3.0	---
<i>Harmothoe spinifera</i>	34(8)	9.7(7)	---
<i>Loimia medusa</i>	4	1963.9(1)	---
<i>Apomatus ampulliferus</i>	2	266.6(2)	---
<i>Sthenelais boa</i>	2	110.2(3)	---
<i>Eunice vittata</i>	8	28.5(4)	---
<i>Malimgreniella castanea</i>	4	23.4(5)	---
<i>Terebellides stroemi</i>	19	15.9(6)	5(8)
<i>Magelona minuta</i>	27	0.2	13(1)
<i>Aponuphis bilineata</i>	---	---	13(2)
<i>Prionospio cirrifera</i>	20	0.3	10(3)
<i>Ampharete acutifrons</i>	---	---	8(4)
<i>Paralacodynia paradoxa</i>	30	3.7	8(5)
<i>Sternaspis scutata</i>	2	0.2	5(6)
Number of species	138		23
Density (ind m <sup>-2</sup> )	1351		120
Biomass (mg dw m <sup>-2</sup> )		2508.0	
Shannon-Wiener Index H'(log2)	5.1		

LSM community was relatively high in species but with not too many individuals by species (high diversity). The density of the assemblage was computed as 1351 ind m<sup>-2</sup> with a biomass of 2.51 g dry weight m<sup>-2</sup> (*Loimia medusa* made almost 80% of this biomass). As it has been said previously it was not possible to make comparisons with the old data taken in the 70s; however, what it was noticeable was that many of the species that were found in the old campaign were still found in our study (larger changes occurred at shallower depths<sup>(4)</sup>).

TCM community mirrors most of the comments that we have emphasized in DM. Diversity was high and the average number of individuals was also similar (1632 ind m<sup>-2</sup>). On the other hand, we did not find large specimens of any polychaete species and, as a consequence, average biomass was quite low (0.31 mg dw m<sup>-2</sup>).

Causes of long-term changes in benthic communities are difficult to establish; local pollution, eutrophication, fisheries activities, predation changes and/or long-term natural changes are some of the usually named controlling factors. In a recent paper<sup>(5)</sup> we came up with the recommendation of a different community nomenclature instead the classical one avoiding the use of named species. Although changes were more acute at shallower rather than deeper communities, general results about the repetition of the 70's work showed variation in the structure, number of species and individuals. In the northern part of the "Cap de Creus", the two assemblages studied (belonging to LSM and TCM communities) showed more similarities than large differences when compared each other probably because they are located close to the border transition between both communities



Distribution of the sampling stations at both sides of the "Cap de Creus". Blue dots indicate the sampling stations associated to this poster. Red stations were presented in IPC9.

## TCM - Terrigenous Coastal Mud Community (4 stations)

	2009		1970-72 <sup>(1 mm mesh size)</sup>
	ind m <sup>-2</sup>	mg dw m <sup>-2</sup>	ind m <sup>-2</sup>
<i>Magelona minuta</i>	239(1)	2.0	---
<i>Monticellina heterochaeta</i>	142(2)	8.0(8)	35(1)
<i>Magelona wilsoni</i>	105(3)	20.0(4)	---
<i>Lumbrineris latreilli</i>	91(4)	9.1(7)	---
<i>Aricidea pseudoarticulata</i>	71(5)	0.7	---
<i>Levinnesia sp.</i>	67(6)	0.4	---
<i>Galatowenia oculata</i>	57(7)	3.9	---
<i>Aphelochaeta marioni</i>	53(8)	2.2	---
<i>Nephtys incisa</i>	2	69.4(1)	5(5)
<i>Notomastus profundus</i>	7	64.0(2)	5(6)
<i>Aponuphis fauveli</i>	17	36.7(3)	---
<i>Goniada emerita</i>	1	12.7(5)	---
<i>Notomastus latericius</i>	2	10.2(6)	2
<i>Levinnesia gracilis</i>	10	0.2	25(2)
<i>Praxillella gracilis</i>	---	---	13(3)
<i>Aricidea assimilis</i>	---	---	8(4)
<i>Prionospio cirrifera</i>	32	0.6	5(7)
<i>Paraprionospio pinnata</i>	4	2.0	5(8)
Number of species	108		34
Density (ind m <sup>-2</sup> )	1632		210
Biomass (mg dw m <sup>-2</sup> )		2508.0	
Shannon-Wiener Index H'(log2)	4.6		



Average abundances (individuals m<sup>-2</sup>) and biomasses (g dw m<sup>-2</sup>) of the pooled sampled stations by the four main benthic group of shallow soft-bottom communities found off the Alt Empordà.