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Infaunal macrobenthos in the Porcupine Bank (NE Atlantic)

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Introduction

The results of the infaunal communities distributions from the annual series surveys PORCUPINE are shown. Those surveys were realized during the months of September and October in the years 2006, 2008, 2009, 2010, 2011, 2012 and 2013 by the Instituto Español de Oceanografía (IEO) aboard the R/V *Vizconde de Eza* (Fig. 1C), within the research project ERDEM. This survey series has as main objective the obtainment of abundance indexes of the bentonic and demersal fauna from Porcupine Bank, west of Ireland, with special attention on the commercial species exploited by the Spanish fleet (hake, angler fish, megrim and norwegian lobster)

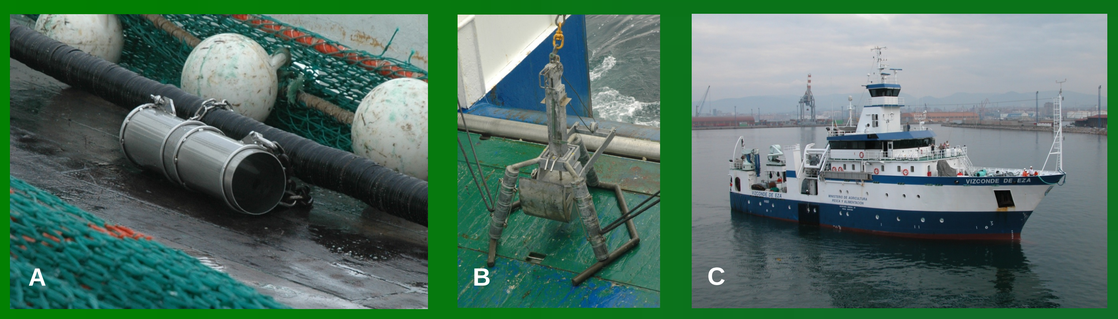

Fig. 1. Samplers used during Porcupine surveys (sediment net colecctor: A; *box corer*: B) and R/V *Vizconde de Eza* (MAGRAMA, SGMar; C)

Material and methods

For the study of the infaunal macrobenthos a total of 50 samples were analyzed from selected places of the Porcupine Bank, where the bottom characteristics, the climatology or the survey schedule allowed (Fig. 2). Samples were taken with an ULSNER box corer with 0.09 m² of sampling area (Fig. 1B). Samples for the faunal study were sieved aboard with a 0.5 mm mesh size sieve. The material collected in the sieve was preserved with 8 % formaldehyde neutralized with borax, and stained with Rose Bengal solution for the posterior sorting and identification of fauna. Additional samples were taken to estimate the organic content of the sediment and to perform the granulometric analyses. Complementary, in order to obtain a better coverage of the sedimentary types from the study area, more than 350 samples were collected with a net collector coupled to the trawling fishing gear (Baca-GAV 39/52; Fig. 1A).

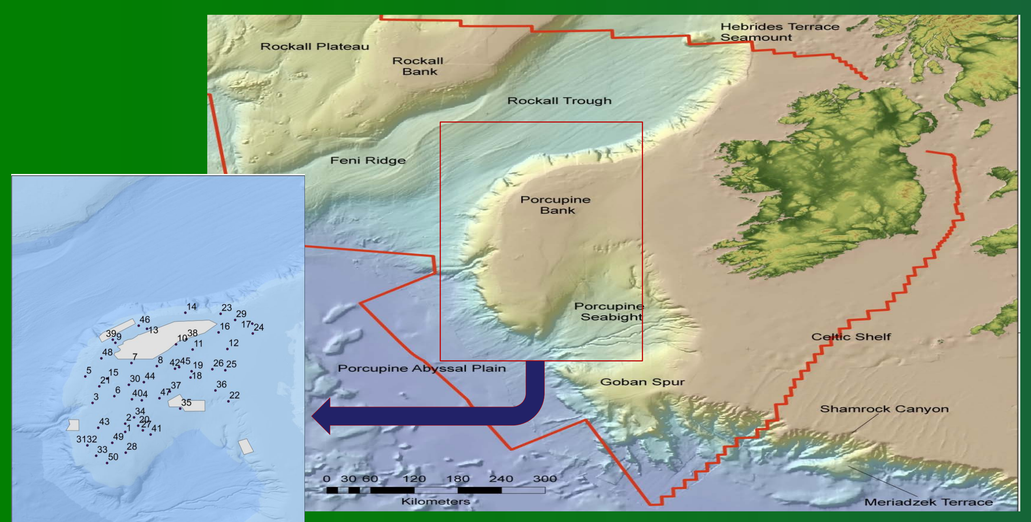

Fig. 2. Location of the sampling stations in Porcupine Bank, NE Atlantic ("Real Map of Ireland" by Geological Survey of Ireland and the Marine Institute)

Results

Globally, the sediments of the majority of the sampled stations are mainly formed by sand, between fine and very fine, except in deep areas of the southeast, where there are large muddy areas with elevated organic content and high selection coefficient. In the north, around the shallowest area, we found thicker sandy sediments, with lower organic content and moderate selection (Fig. 3).

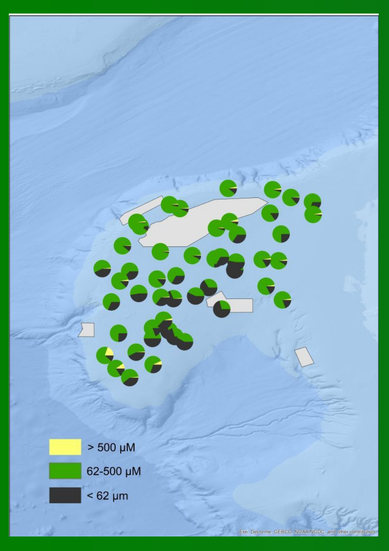

Fig. 3. Spatial distribution of sediment types (coarse sand > 500 µm; medium, fine and very fine sand 62-500 µm; muds< 62 µm) in Porcupine Bank

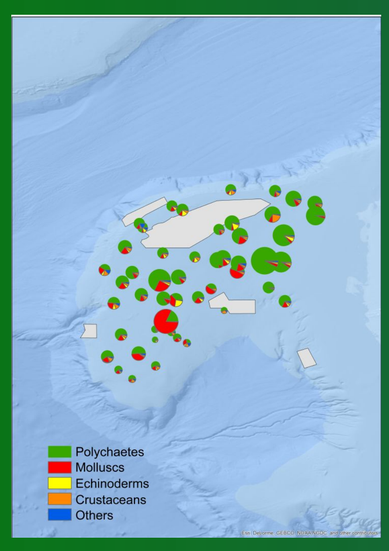

Fig. 4. Macroinfaunal total abundace by faunistic groups (%) in Porcupine Bank, NE Atlantic

The macroinfaunal communities from the Porcupine Bank are characterized by the dominance of the faunistic group of polychaetes (68.8 %), mainly represented by the families Owenidae, Spionidae, Paraonidae and Sabellidae (Fig. 4). The next in number are the group of molluscs (17.6 %), dominated by the family Kelliellidae, which reaches maximum abundances up to 7520 ind•m^{-2} (Fig. 5). The poorest groups represented are the crustaceans (5.0 %), echinoderms (4.3 %) and the "others" (sipunculids, nemertines, etc.), being the latter the least abundant (3.7 %)

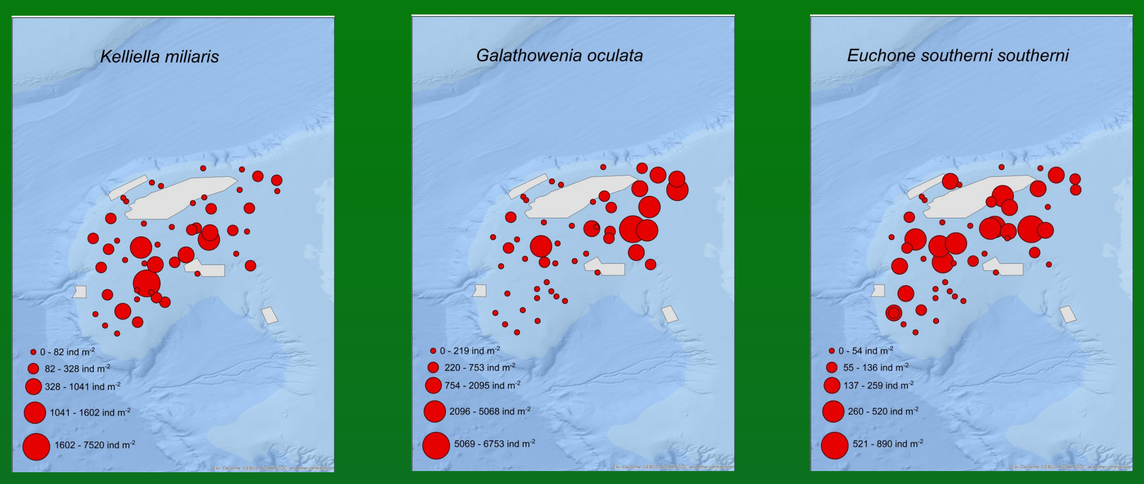

Fig. 5. Spatial distribution of the total abundance (ind·m^{-2}) of the bivalve *Kelliella miliaris*, and the polychaetes *Galathowenia oculata* and *Euchone southerni southerni* in Porcupine Bank, NE Atlantic

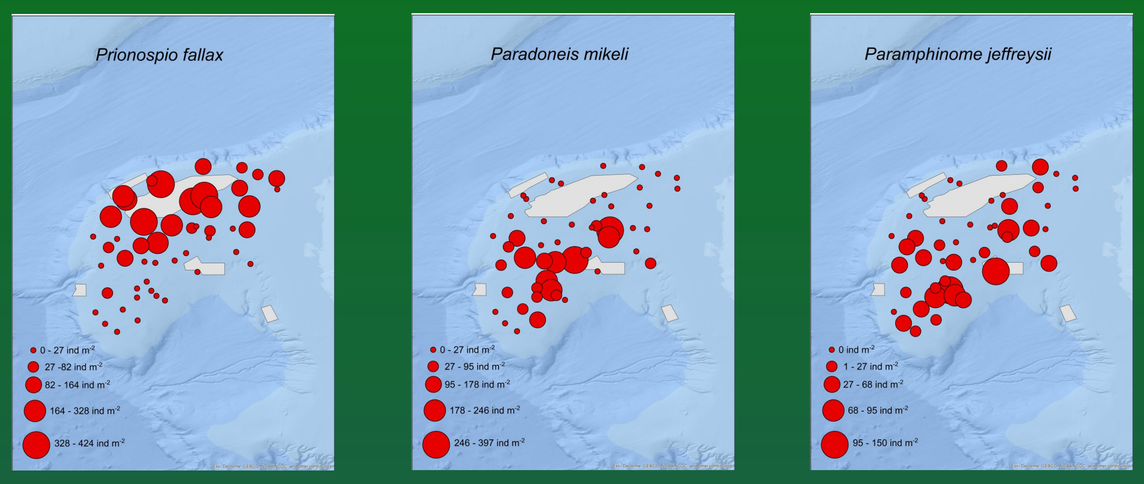

Fig. 6. Spatial distribution of the total abundance (ind·m^{-2}) of the polychaetes *Prionospio fallax*, *Paradoneis mikeli* and *Paramphinome jeffreysii* in Porcupine Bank, NE Atlantic

In relation with the spatial distribution four macroinfaunal groups were identified in the Porcupine Bank (Fig. 7-9):

• <u>Group 1</u>: located in intermediate depth areas, over sandy sediments with low organic content. The infaunal community is dominated by polychaetes from the Owenidae family, mainly represented by the specie *Galathowenia oculata*.
• <u>Group 2</u>: occupies the sandy and low organic content sediments from the shallowest area of the bank. Polychaetes are the most representative faunistic group, highlighting the dominance of the families Spionidae and Paraonidae. *Prionospio fallax* and *Aricidea wassi* are the most representative species of the group.

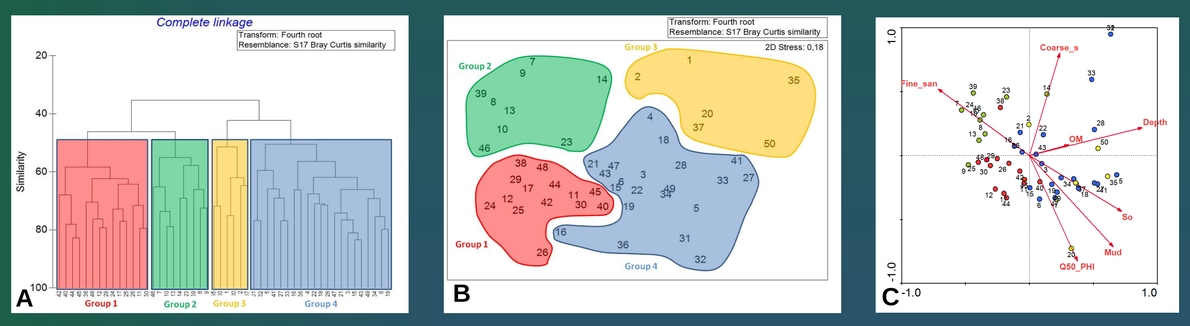

Fig. 7. Hierarchical cluster (Bray-Curtis; A), MDS of macroinfaunal samples (B) and RDA ordination plots of environmental variables and macroinfaunal samples (C).

• <u>Group 3</u>: situated in two deep areas in the south area of the bank with muddy and high organic matter content sediments. It has the lowest infaunal abundance of the study, being dominated by the bivalve molluscs from the family Kelliellidae and by the annelids polychaetes from the family Paraonidae.
• <u>Group 4</u>: Is the cluster that includes more stations in throughout the study. It is distributed spatially in the south area of the bank, in different bathymetries, with the most heterogeneous sediments and moderate organic content. The bivalve molluscs from the Kelliellidae family again become dominant, with *Kelliella miliaris* reaching abundance over 7500 ind•m^{-2}.

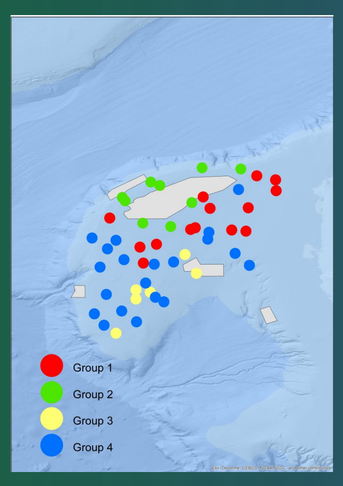

Fig. 8. Spatial distribution of the MDS macroinfaunal groups in Porcupine Bank, NE Atlantic

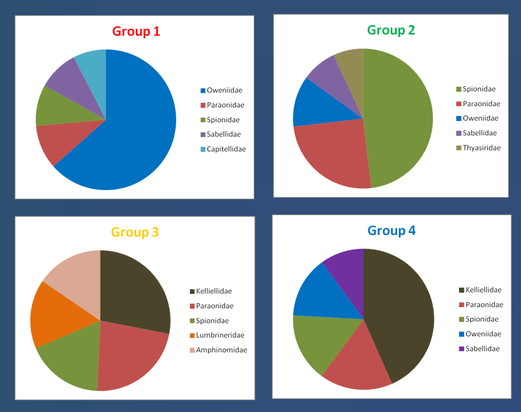

Fig. 9. Total family composition in MDS macroinfaunal groups in Porcupine Bank, NE Atlantic

Acknowledgements

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