Seasonal dynamic of zooplankton abundance and biodiversity in the Southern Bay of Biscay - Micropolit program - Preliminary results (summer 2017- spring 2018)

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Introduction

The MICROPOLIT Research Program (*) aims at studying the distribution and the quantitative evolution of micropollutants on the entire marine food web of the southern Aquitaine littoral region. Especially, the zooplankton compartment, an essential part of the marine food web allows the transfer and accumulation of all micropollutants introduced into the pelagic environment by human activities. The preliminary results presented here focus on ecological data (abundance and biodiversity) of zooplankton during the period from July 2017 to April 2018.

Fig. 1: Location of the the two zooplankton sampling stations.

Material & Methods

14 samples of zooplankton were collected monthly in the southern sector of the Bay of Biscay at two points, one off the Adour estuary (depth=-30 m) and another near the Capbreton canyon (depth=-150 m) (Fig. 1). Samples were collected using a plankton net (200 µm mesh vacuum) according vertical profiles over the entire water column from the bottom to the surface. After each plankton sampling, the use of a Niskin bottle (depth: - 10 m) and a multiparameter probe allowed the acquisition of additional chemical and hydrological data (Fig. 2 and 3).

Fig. 2: Release of the Plankton Net, Niskin Bottle and Multiparameter Probe during a sampling campaign at sea.

Results

About 70 taxonomic units were identified on the whole zooplankton, including a more in-depth census of 41 copepod species, the dominant group of plankton throughout the year (Fig. 4). The highest abundance values reached about 87 000 individuals/10 m^3 during July 2017 (Fig 5A). Then they decreased during the whole winter period 2017-2018 to minimum values ten times lower about 9 000 indivduals/10m^3. A strong spring rise in abundance is recorded in 2018. During the whole period, the zooplankton abundances on the Adour Station are 20-60% much higher than those of the Canyon Station. About forty taxonomic units were identified in each sample, half of which were copepods (Fig. 5B and C). Unlike abundances, this copepodian diversity is systematically higher in the Capbreton Canyon station.

Conclusion and perspectives

Our data indicated higher abundance on the station Adour and higher taxonomic diversity on the Capbreton station. In a next step we will cross these biological data with the chemical and hydrological parameters collected *in situ* in the water column, in order to evaluate the impacts of micropollutants on the dynamics of planktonic populations.

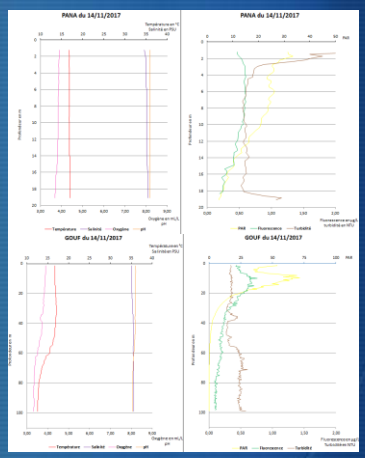

Fig. 3: Exemple of bathymetric profils of temperature (T°C), salinity (PSU), disssolved oxygen (mL/L), pH, PAR, fluorescence and turbidity (NTU) on the two stations on 2017/11/14.

	Copepoda	Others zooplankton taxa
1	*Acartia clausi*	Amphioxus larvae
2	*Aetideus armatus*	Amphipoda
3	*Bradyidius armatus*	Annelida larvae
4	*Calanidae indét.*	Appendicularia Fritillaria sp.
5	*Calanoides carinatus*	Appendicularia Oikopleura sp.
6	*Calanus helgolandicus*	Bivalvia veligera
7	*Calocalanus ovalis*	Bryozoa cyphonautа
8	*Calocalanus sp.*	Chaetognatha
9	*Calocalanus styliremis*	Cirripedia cypris
10	*Calocalanus tenuis*	Cirripedia nauplii
11	*Candacia armata*	Cladocera Bosmina longirostris
12	*Centropages bradyi*	Cladocera Evadne nordmanni
13	*Centropages chierchiae*	Cladocera Evadne spinifera
14	*Centropages hamatus*	Cladocera Penilia avirostris
15	*Centropages typicus*	Cladocera Pleopis polyphemoides
16	*Clausocalanus sp.*	Cladocera Podon intermedius
17	*Clytemnestra sp.*	Cladocera Pseudovadne tergestina
18	*Copepoda Copepodite*	Decapoda larvae
19	*Copepoda Nauplii*	Doliolidae
20	*Ctenocalanus vanus*	Echinodermata larvae
21	*Cyclopina littoralis*	Enteropneusta tornaria
22	*Diaxis hibernica*	Euphausiacea larvae
23	*Ditrichocorycaeus anglicus*	Fish eggs
24	*Eucheata sp.*	Fish larvae
25	*Euterpina acutifrons*	Gastropoda veligera
26	*Harpacticoida indét.*	Hydromedusa
27	*Heterorhabdus papilliger*	Isopoda microniscus larvae
28	*Labidocera wellastori*	Mysidacea
29	*Mesocalanus tenuicornis*	Ostracoda
30	*Metridia lucens*	Pisciphaea sivado
31	*Microsetella rosea*	Protista Acantharia
32	*Oithona nana*	Protista Globigerinida
33	*Oithona plumifera*	Protista Sticolonche zanclea
34	*Oithona similis*	Siphonophora Calycophorae
35	*Oncaea sp.*	
36	*Paracalanus parvus*	
37	*Pleurommamma sp.*	
38	*Pseudocalanus elongatus*	
39	*Temora longicornis*	
40	*Temora stylifera*	
41	*Xanthocalanus minor*	

Fig. 4: List of zooplankton taxonomic units identified during the whole sampling period from July 2018 to April 2018 on the 2 stations.

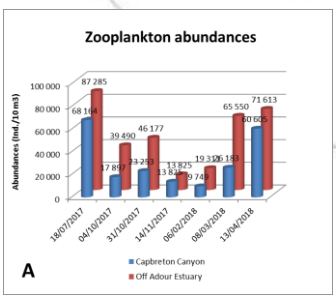

Fig. 5: Zooplankton abundance and diversity at the 2 stations during sampling period July 2017-April 2018.