Detection of zooplankton predator-prey interactions in Alboran Sea by combining acoustic backscatter data and different sampling systems.

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MEDIAS
MEDiterranean International Acoustic Survey

Introduction

Zooplankton is one of the main links in the **pelagic food web**.

Zooplanktonic organisms can be observed by means of **acoustic** methods, although some non-acoustic evidence, such as **net samples**, are required to determine the echo traces **species composition**.

Fig 1: Pelagic food web

Objective

Determinate the **zooplankton composition & trophic relationships** in the epipelagic scattering layer of Alborán Sea in summer using different samplers.

Material & Methods

Acoustic data EK60 scientific echosounder
5 frequencies: 18, 38, 70, 120 & 200 kHz

Biological samples:
Bongo 40: 250 & 333 µm
Bongo 90: 500 µm
Deep sensor (Fig.3)

Fig 2: Acoustic and biological sampling scheme

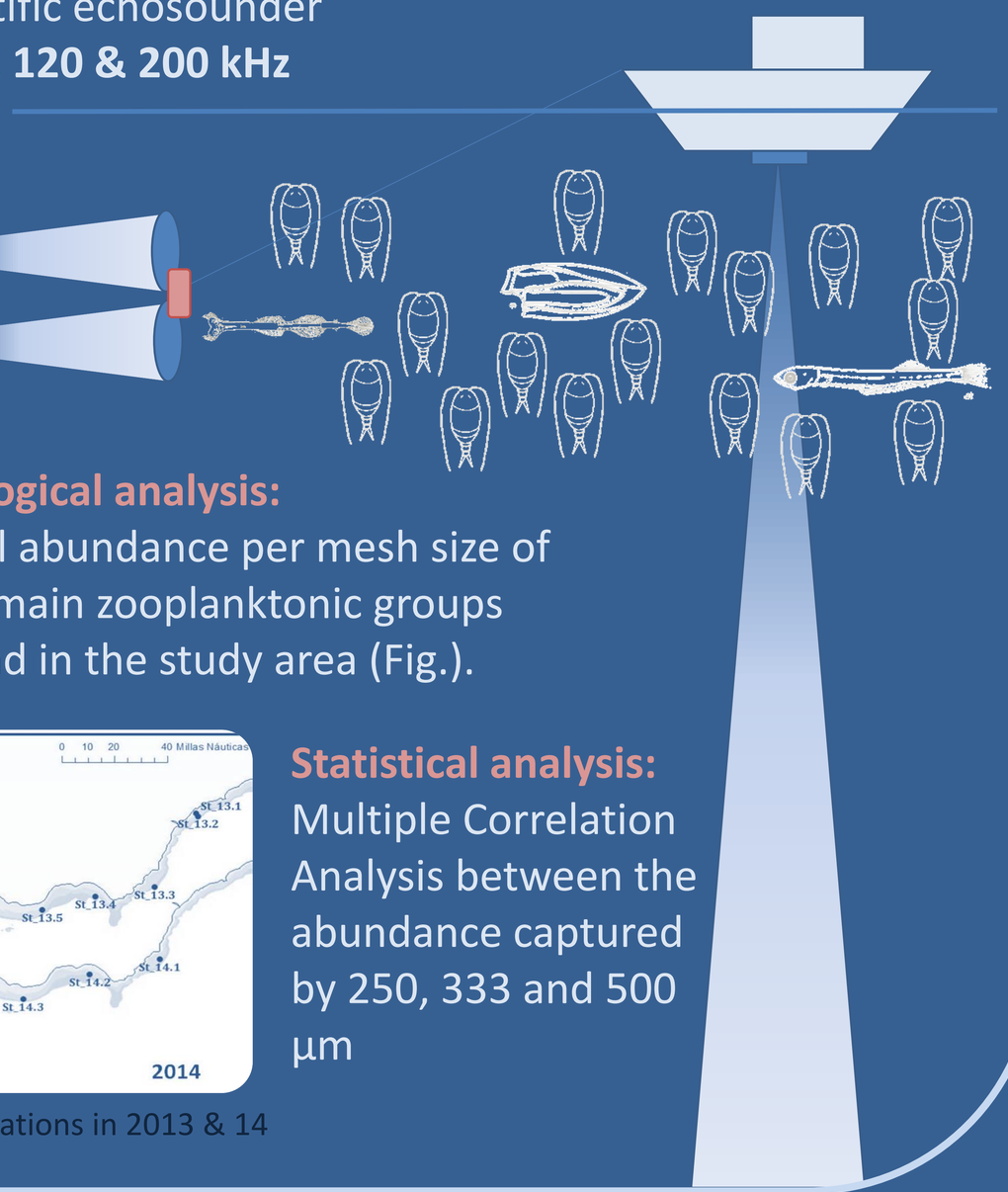


Fig 3:Deep sensor

Biological analysis:
Total abundance per mesh size of the main zooplanktonic groups found in the study area (Fig.).

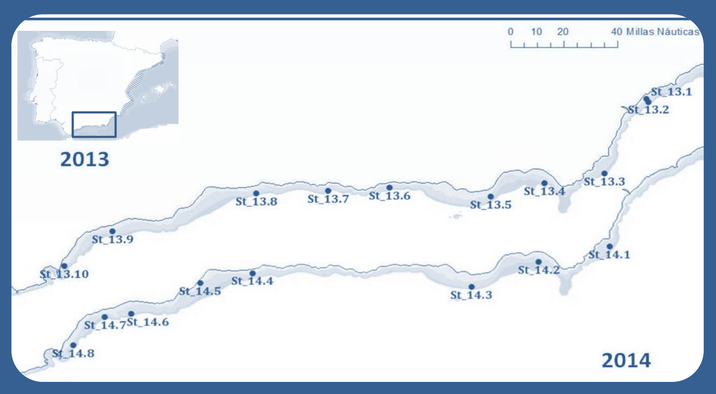


Fig 4:Study area and bongo stations in 2013 & 14

Statistical analysis:
Multiple Correlation Analysis between the abundance captured by 250, 333 and 500 µm

Results & Conclusions

The epipelagic scattering layer (Fig. 4) was composed of a **complex and heterogeneous zooplankton community**

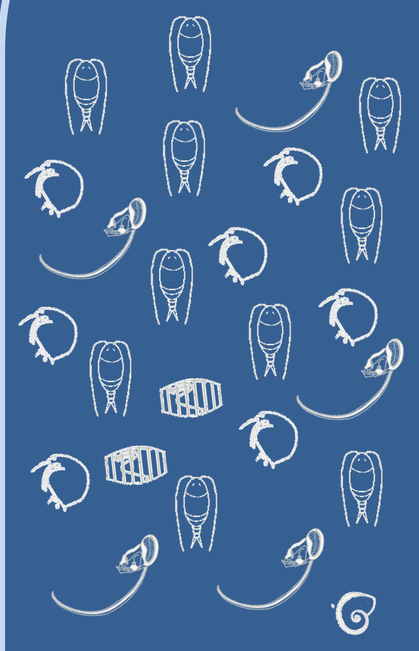


Fig 5: Bongo 40

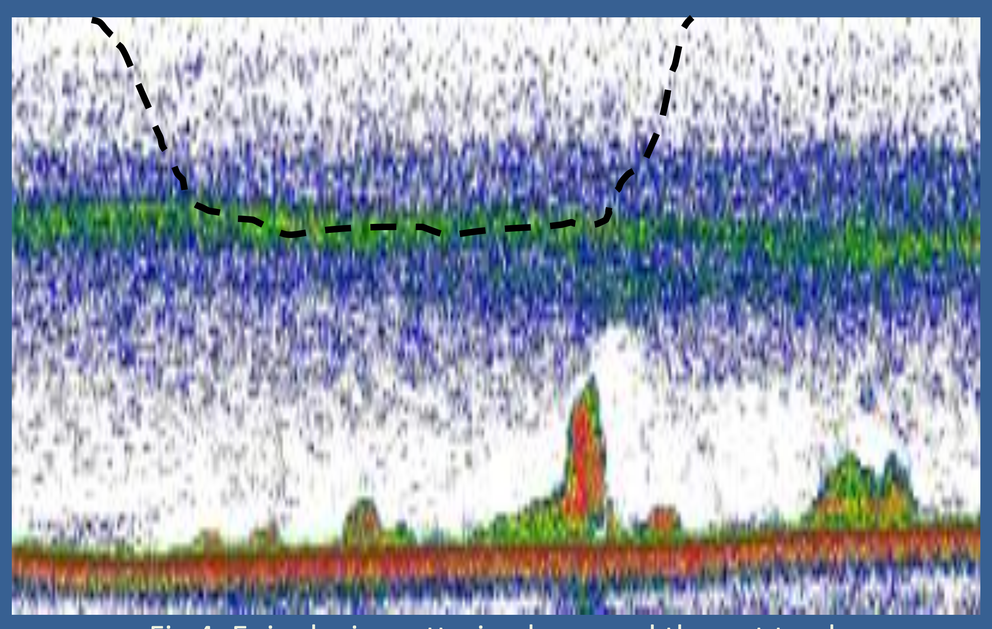
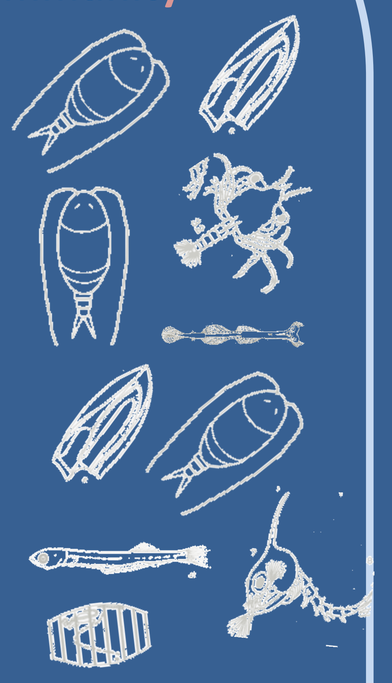


Fig 4: Epipelagic scattering layer and the net track

Fig 5: Bongo 90



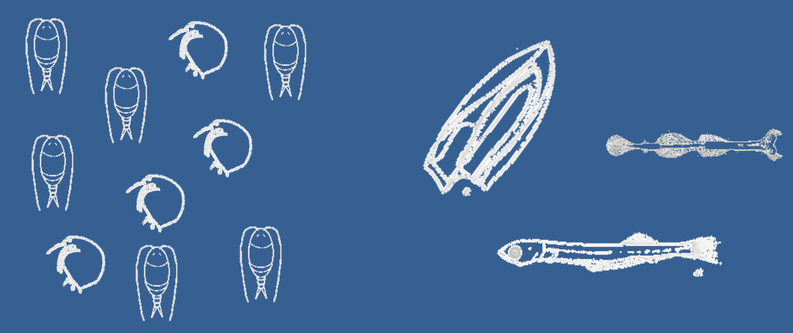
The smaller mesh sizes (**250 and 333 µm**) captured mainly small crustaceans and apendicularias, which represented the primary consumers

The **500 µm** mesh captured the largest and less common organisms which could be understood as secondary consumers

Multicorrelation analysis between the abundance captured by 250 and 500 µm mesh sizes (table 1) reflected the existence of a predator-prey relationship in the zooplankton community, which agreed with the predators diet.

Bongo 90, 500 µm \ Bongo 40, 250 µm	Ap	Bc	Sc	Do	He	Eg	La	Ch	Si
Ap	0.05	-0.05	-0.28	-0.35	0.14	0.04	-0.02	0.12	-0.07
Bc	0.32	0.90	0.52	-0.13	-0.40	0.64	-0.15	-0.11	0.20
Sc	0.06	0.18	-0.07	-0.11	-0.14	0.43	0.11	0.23	-0.12
Do	0.29	-0.21	-0.03	0.81	-0.33	0.03	0.23	-0.06	0.01
He	0.10	-0.23	0.35	-0.11	0.53	-0.36	0.63	0.74	0.34
Eg	0.19	-0.20	-0.18	0.76	-0.45	0.17	-0.02	-0.32	-0.11
La	0.42	0.24	**0.64**	-0.36	0.14	0.09	0.07	0.45	0.12
Ch	-0.13	-0.08	**0.74**	-0.26	0.34	-0.13	0.42	0.86	0.29
Si	0.02	-0.11	**0.67**	-0.16	0.25	-0.22	0.47	0.73	0.47

PREYS **PREDATORS**



Tab 1: Multiple correlation analysis **Ap**: Apendicularias, **Bc**: Big crustaceans, **Sc**: Small crustaceans, **Do**: Doliolids, **He**: Heteropods, **Eg**: Fish eggs, **La**: Fish larvae, **Ch**: Chaetognaths, **Si**: Siphonophores.

THANKS TO EVERYONE
WHO HAS MADE THIS WORK POSSIBLE