

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



MEDIAS  
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ACOUSTIC SURVEY

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## 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.

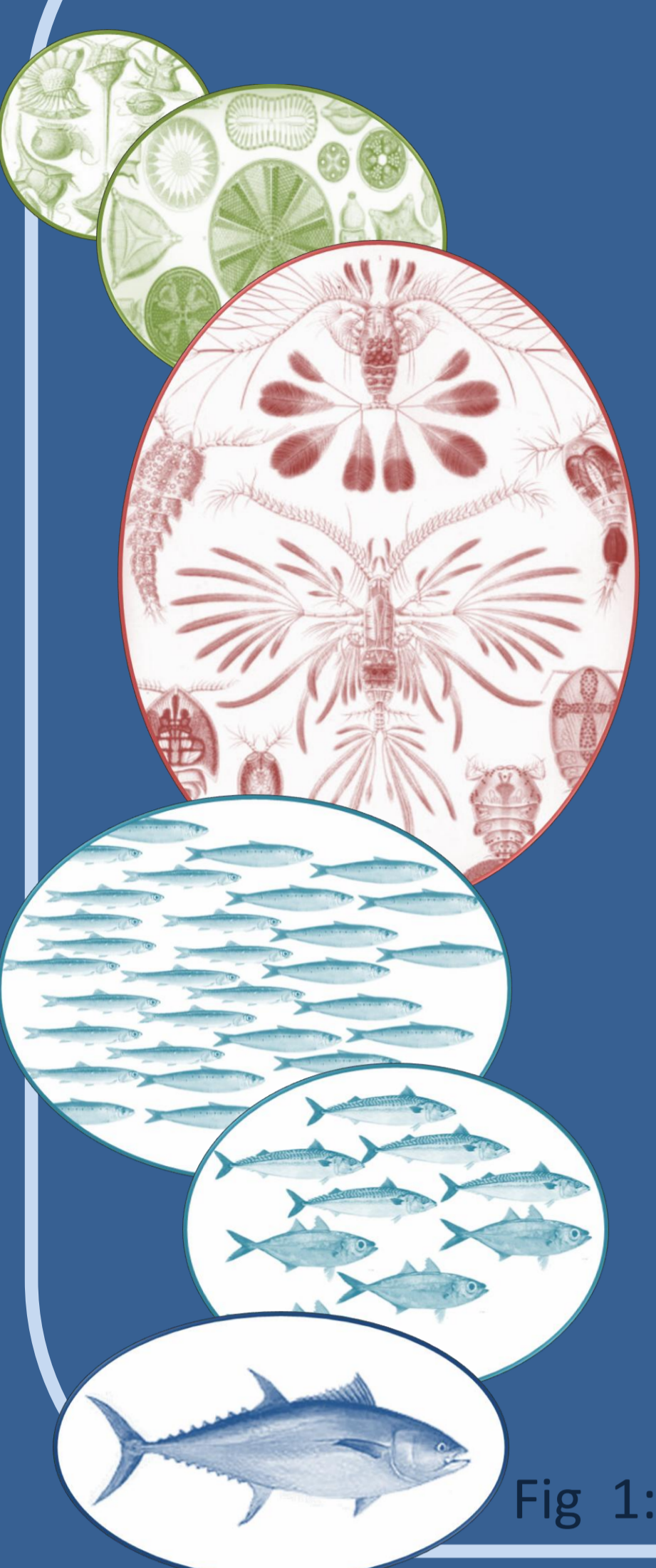


Fig 1: Pelagic food web

## Objective

Determine 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  $\mu\text{m}$   
Bongo 90: 500  $\mu\text{m}$   
Deep sensor (Fig.3)



Fig 3: Deep sensor

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

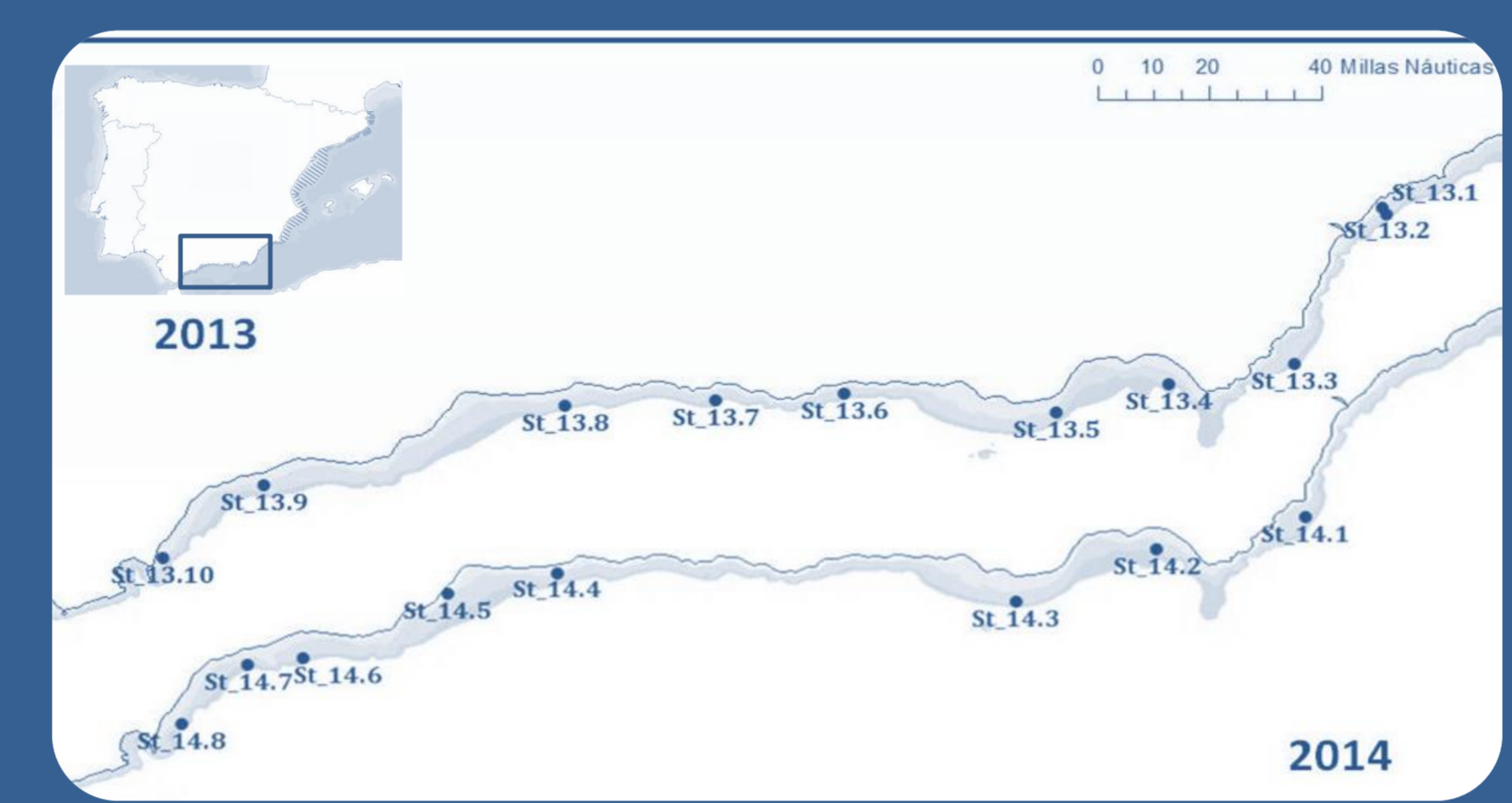


Fig 4: Study area and bongo stations in 2013 & 14

**Statistical analysis:**  
Multiple Correlation Analysis between the abundance captured by 250, 333 and 500  $\mu\text{m}$

Fig 2: Acoustic and biological sampling scheme

## Results & Conclusions

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



Fig 5: Bongo 40

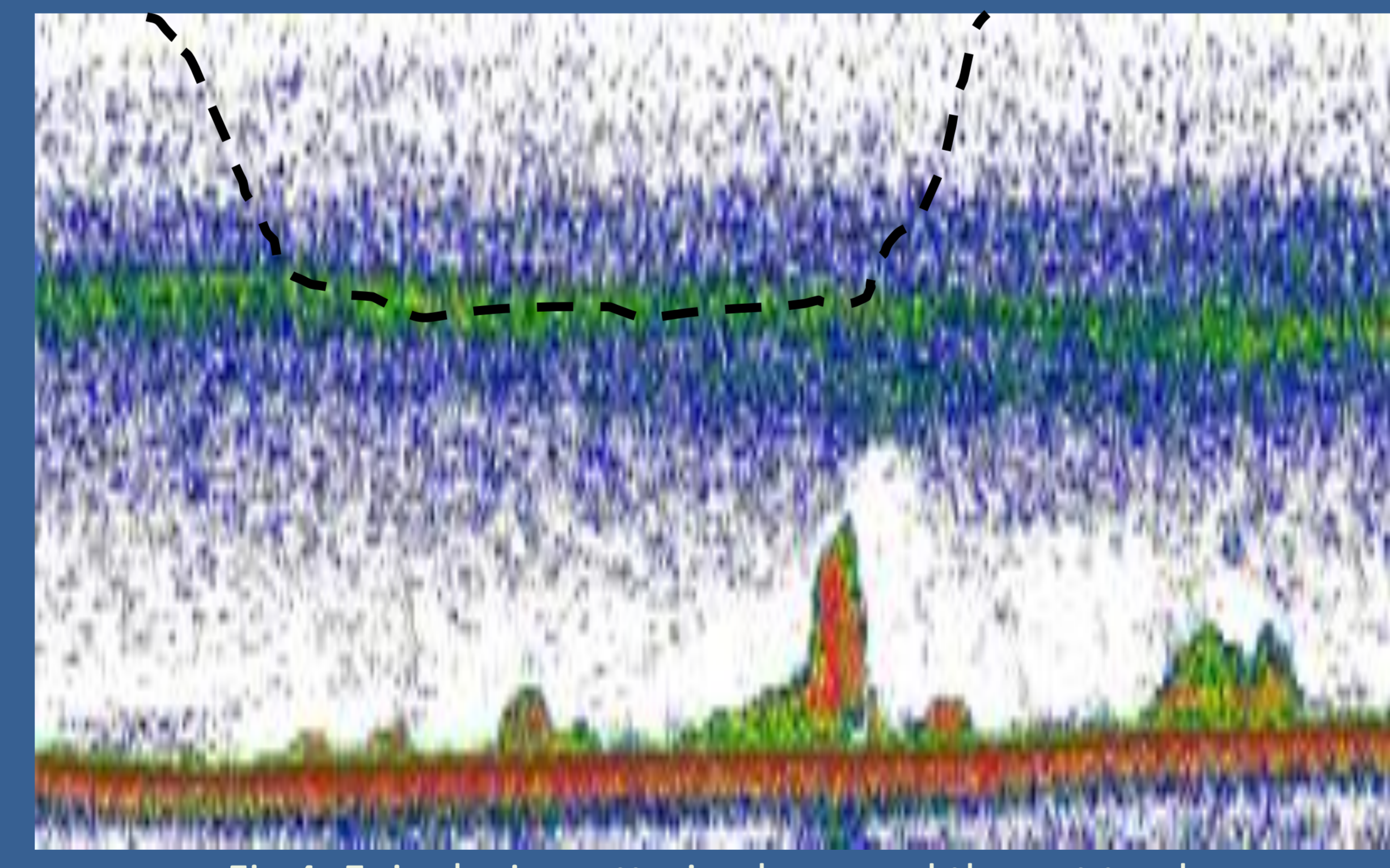
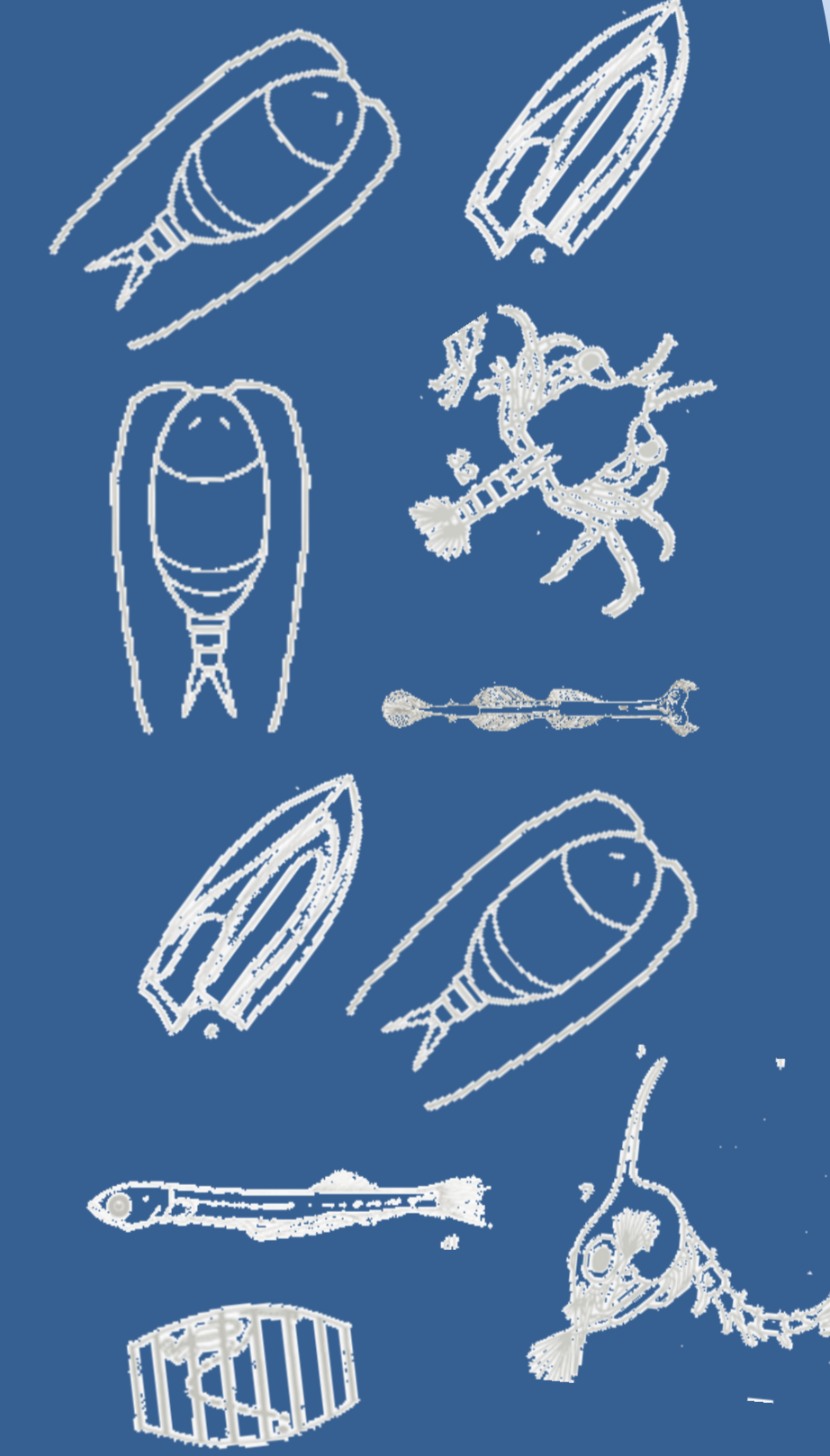


Fig 4: Epipelagic scattering layer and the net track



Fig 5: Bongo 90



The smaller mesh sizes (250 and 333  $\mu\text{m}$ ) captured mainly small crustaceans and apendicularias, which represented the primary consumers

The 500  $\mu\text{m}$  mesh captured the largest and less common organisms which could be understood as secondary consumers

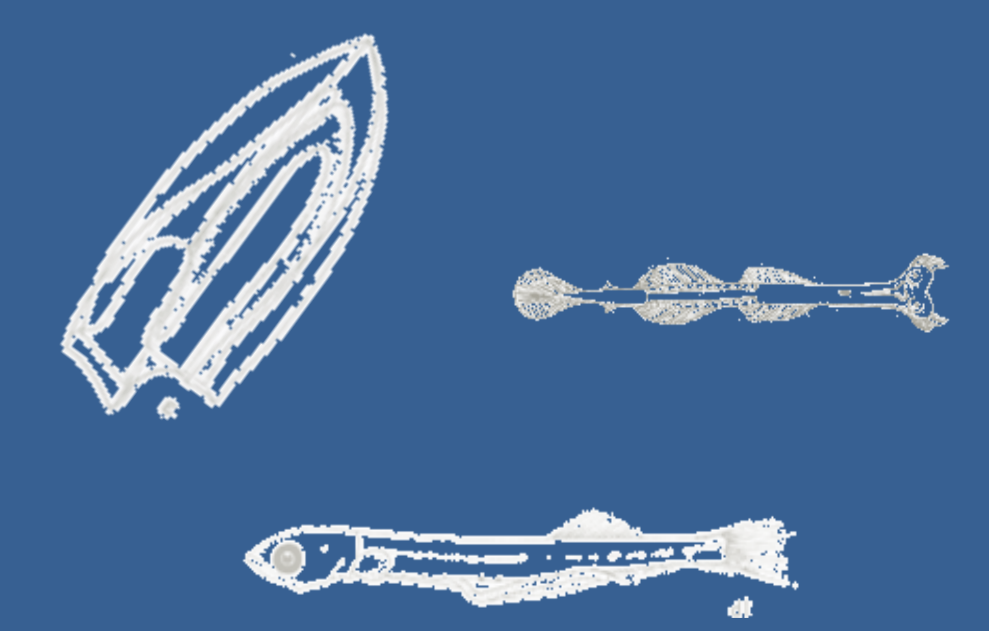
Multicorrelation analysis between the abundance captured by 250 and 500  $\mu\text{m}$  mesh sizes (table 1) reflected the existence of a predator-prey relationship in the zooplankton community, which agreed with the predators diet.

		Bongo-40, 250 $\mu\text{m}$								
		Ap	Bc	Sc	Do	He	Eg	La	Ch	Si
Bongo 90, 500 $\mu\text{m}$	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	<b>0.64</b>	-0.36	0.14	0.09	0.07	0.45	0.12
	Ch	-0.13	-0.08	<b>0.74</b>	-0.26	0.34	-0.13	0.42	0.86	0.29
	Si	0.02	-0.11	<b>0.67</b>	-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