Acoustic identification of krill (*Nyctiphanes couchii & Nematoscelis megalops*) in the Spanish Mediterranean Sea

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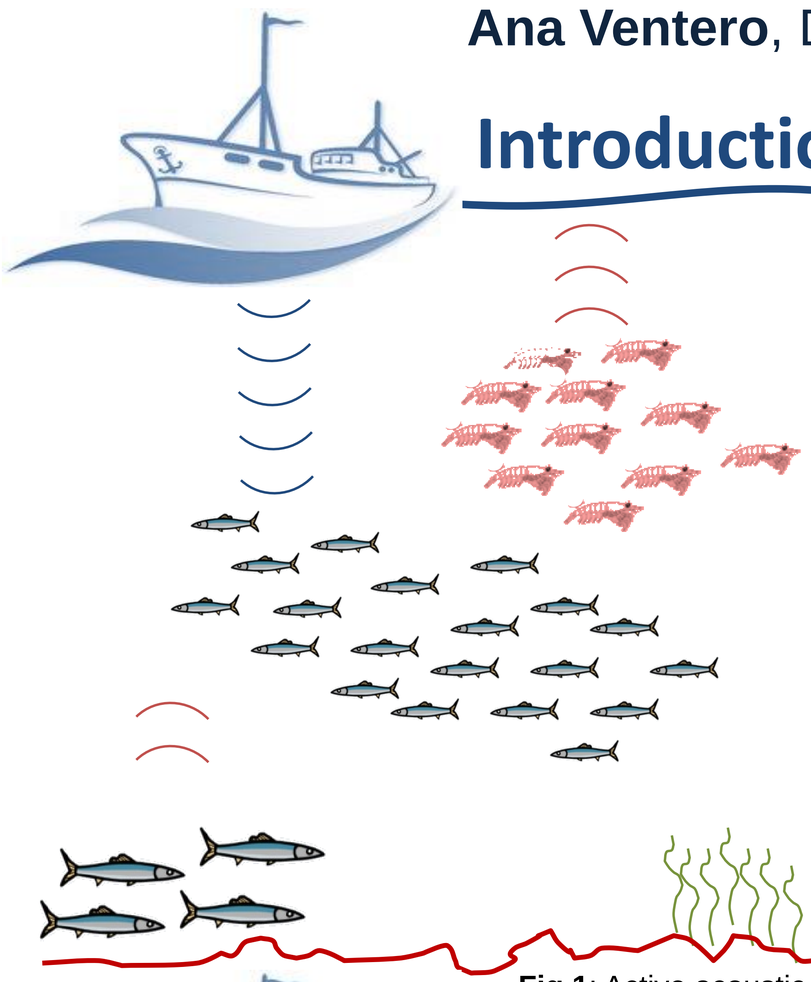
MEDIAS
MEDiterranean International Acoustic Survey

Introduction



Active acoustic techniques, involve producing sound and receiving signals from organisms, provide a synoptic view of the water column and constitute an **effective tool** for the **integrated study of the pelagic ecosystem** (Fig 1)**.**

Krill resonance occurs at high frequencies, around 120 or 200 kHz.

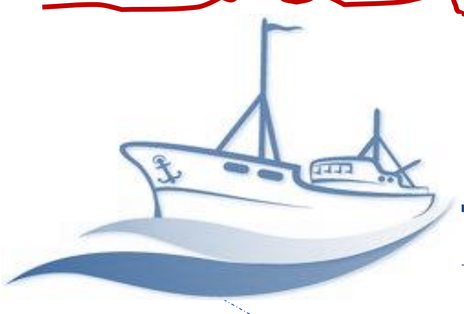
Acoustic multifrequency classification exploits differences in the acoustic frequency response of aquatic organisms to deduce their identity.

Fig.1: Active acoustic techniques

Objective

Acoustic identification of *krill swarms* in the Spanish Mediterranean Sea (Fig 3)

Material & Methods



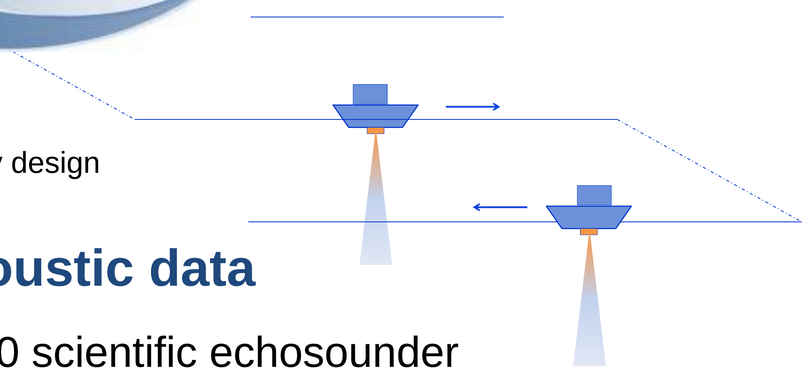


Fig.2:Survey design

Acoustic data

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

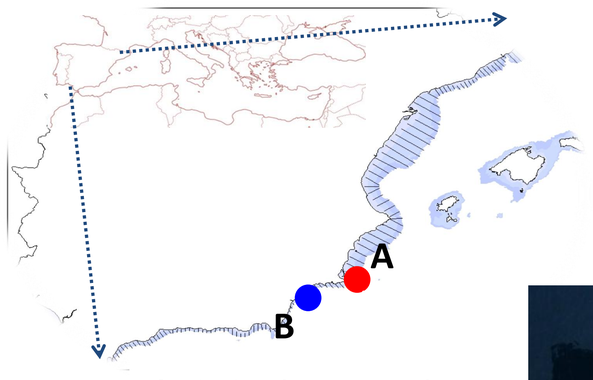


Fig.3: Study area and identification hauls

Biological identification

Plankton net **Bongo 90**
500 & 2000 µm mesh sizes (Fig. 4)

Deep sensor to monitoring the net track in real time (Fig 3)

Fig.4:Bongo net

Fig.5: ITI sensor

Results & Conclusions

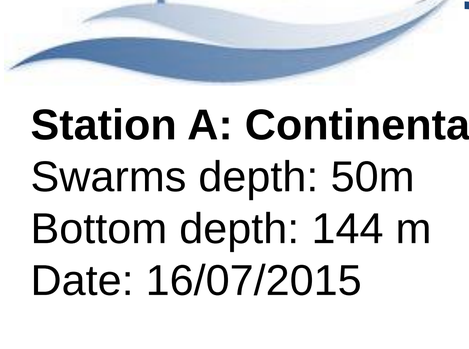
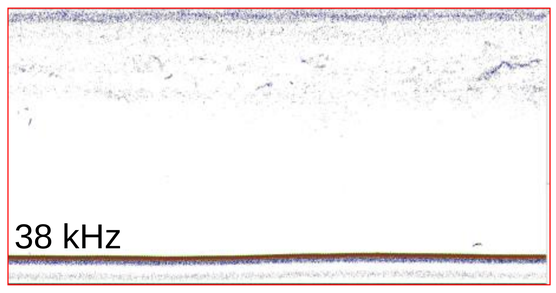
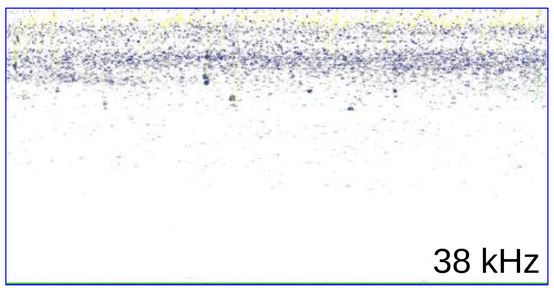
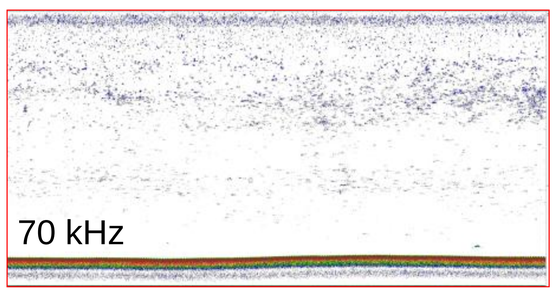


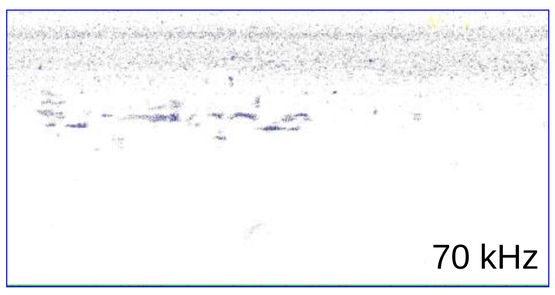
Fig.6: Krill echograms at 4 frequencies
In red: Station A. In blue: Station B.

Station A: Continental shelf
Swarms depth: 50m
Bottom depth: 144 m
Date: 16/07/2015



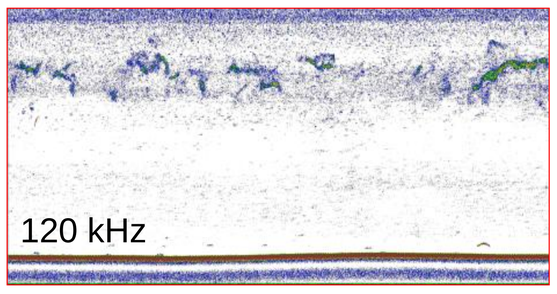


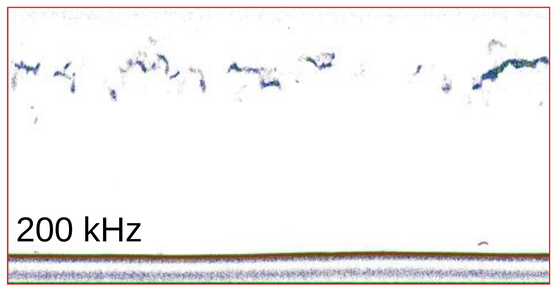


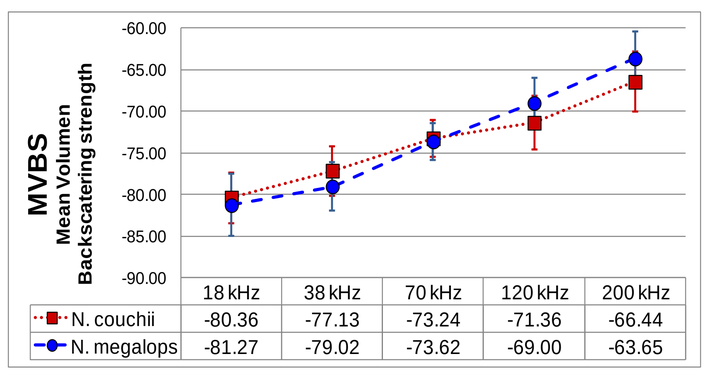


Station B: Shelf break
Swarms depth: 86 m
Bottom depth: 256m
Date:18/07/2015

Fig.7: **A**) ***Nyctiphanes couchii.***
B) Taxonomical detail .

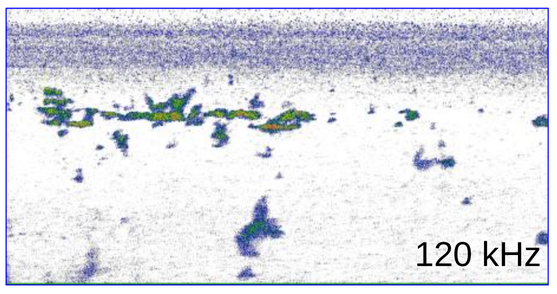


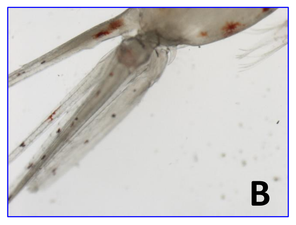


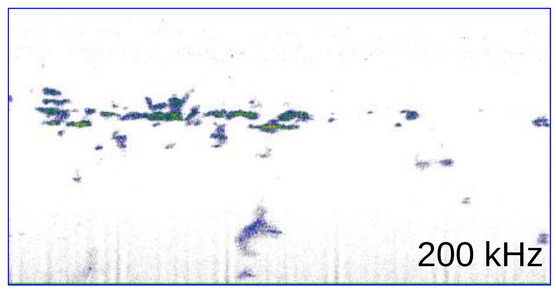


	18 kHz	38 kHz	70 kHz	120 kHz	200 kHz
N. couchii	-80.36	-77.13	-73.24	-71.36	-66.44
N. megalops	-81.27	-79.02	-73.62	-69.00	-63.65

Fig.9: Mean volume backscattering strength at different frequencies for the two species analyzed







Station B: Shelf break
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Date:18/07/2015

Fig.8: **A**) ***Nematoscelis megalops,***
B) Taxonomical detail .

Differences in the MVBS (Fig. 9) were exhibited between ***Nyctiphanes couchii*** (Fig.7). and ***Nematoscelis megalops*** (Fig 8)

Further research is needed to separate accurately this two species based on their frequency response in the study area.

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