Oceanic cephalopods from western Canary Islands collected during CETOBAPH mesopelagic survey: distribution and biodiversity.

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INTRODUCTION
Oceanic cephalopods, especially squids, are one of the main animals in oceanic ecosystems and constitute a key group in marine food webs. Despite of their importance a small number of research cruises targeting on this group have been conducted in the Canary Islands. We report herein on the micronektonic component of the pelagic assemblage in the Canary region.

MATERIAL AND METHODS
During April 2012, the R/V “Corrida de Saavedra” carried out thirty trawl with a commercial midwater trawl. Sampling was directed to Deep Scattering Layer (DSL) during diurnal and nocturnal and migrant Surface Scattering Layer (SSL) during nocturnal period, in three Canary Islands (El Hierro, La Palma and Tenerife), at range depths of 50 to 900 m. All trawls were fixed to a one hour of duration. Acoustic backscatter was measured with a Simrad EK60 echo-sounder at 18 kHz (Figure 1).

Diversity was assessed based on the species richness observed, Shannon-Weaver and Simpson diversity indices. Differences in cephalopods assemblage structure between DSL, SSL and the three islands was analysed through hierarchical agglomerative and unweighted pair group method with arithmetic average (UPGMA) clustering by calculating Euclidean distance matrix between hauls after Log (n) transformation of the raw data. Analysis of similarities (ANOSIM) routine was used to test for differences in a priori selected groups (DSL, SSL and islands)(Figure 2).

RESULTS AND DISCUSSION
• A total of 3717 specimens belonging to seventeen families including two octopods, one sepioïd, one spirulid and thirty four squids species were caught. Four dominant species were found in all sampled layers. These were represented by actively diel vertical migratory species (DVM) as P. morgarti(fera, A. moriisii, O. banksii and P. giardi) that comprised the 91% of the total number of cephalopods caught (Table 1). The diversity index were similar for the tree islands sampled (Table 2).

• The dendrogram obtained shown three cephalopods assemblages. The ANOSIM routine showed that the only significant differences (R: 0.77 Sig.: 0.0009) were due to the differences in the depth of acoustic backscatter layer sampled (DSL/SSL).

• The presence of both, no migrant and semi-migrant species and its low number, characterized the trawls performed over the DSL. On the contrary, the SSL was characterized by the high dominance of DVM species.

• This study provide a good description of the micronektonic cephalopods community assemblage of the Canary Islands. However, the importance of large pelagic species could be infraestimated by the sampling methodology used. In this sense more deep studies are necessary.

Table 1: Cephalopod species caught during the CETOBAPH survey .

<table>
<thead>
<tr>
<th>Island</th>
<th>Shannon-Weaver index</th>
<th>Simpson index</th>
<th>Richness</th>
</tr>
</thead>
<tbody>
<tr>
<td>El Hierro</td>
<td>1,34</td>
<td>0,653</td>
<td>32</td>
</tr>
<tr>
<td>La Palma</td>
<td>1,77</td>
<td>0,747</td>
<td>30</td>
</tr>
<tr>
<td>Tenerife</td>
<td>1,61</td>
<td>0,645</td>
<td>31</td>
</tr>
</tbody>
</table>

Table 2: Diversity index and species richness.

Figure 1: Sampled areas (red box) and example of echogram and sampling design over SSL and DSL. Chlorophyll, oxygen and temperature vertical profiles. Box-plot represent hauls depths and duration.

Figure 2: Cluster dendrogram showing similarities based on the composition and abundance of cephalopods species.