EVENT ABSTRACT

Back to Event

Contrasting molluscan fauna collected with beam trawl and otter trawl in circalittoral and bathyal soft bottoms of the northern Alboran Sea

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The Alboran Sea display complex oceanographic, geological, ecological and biological processes, promoting a high biodiversity and complexity (Robles, 2010). On the other hand, molluscs constitute one of the most diverse and best represented invertebrate groups in this area, representing an important component of soft bottom communities, as well as the second group in abundance and biomass in demersal fisheries, with species of ecological and commercial importance worldwide (Gofas et all., 2011). The study of the molluscan assemblages is important where trawling fishing fleets operate, in order to improve fisheries assessment and move forward to an ecosystem based approach, which takes into account other components of the fishery than the target species such as non-target and protected species and habitats (Pikitch et al., 2004). Information collected on fisheries assemblages may introduce a bias depending on the fraction of the assemblage (e.g. demersal, epifaunal, infaunal) at which the sampling method is targeted, particularly in a group such as molluscs with a high variability in life strategies. The aims of this study are 1) to increase the scarce knowledge on the composition and structure of molluscan assemblages of circalittoral and bathyal soft bottoms of the Alboran Sea; and 2) to compare the information obtained on these assemblages by using two different types of sampling gears, the beam trawl and the otter trawl.

During the MEDITS trawl surveys (springs 2014 and 2015) a beam trawl (BT) (horizontal opening 1.3 x vertical opening 1.2 m, mesh size 10 mm) and an otter trawl (OT)(GOC 73) (2.5 x 21.5 m , mesh size 20 mm) were used in 35 sampling stations at depths from 40 to 800 m in the Alboran Sea. Catches were sorted to species and their individuals counted and weighed. The molluscan assemblages and species were characterized according to their dominance (%Da) and frequency of occurrence (%F). Multivariate analyses using the Bray-Curtis index were performed with presence/absence species data and quantitative data obtained with each method were standardized to a similar sampling area. ANOSIM was used for testing the differences between groups of samples according to different factors (depth and sampling type) and SIMPER for the contribution of the different species to these factors using PRIMER v6. The characterization of the different types of sampling and assemblages was done with the species richness and statistical differences tested with Kruskal-Wallis using SPSS software.

A total of 170 spp. have been collected, with 69 species collected in OT samples, mostly cephalopods (26 spp., 37.68%), followed by gastropods (25 spp., 36.23%) and bivalves (18 species, 26.10% total species of OT), being the latter the most abundant group. The top-dominant species were the bivalve Neopycnodonte cochlear and the cephalopod Alloteuthis media, whereas the most frequent ones were the cephalopods Octopus vulgaris, Todarodes sagittatus and Illex coindetii (Fig. 1). In beam trawl samples, 135 spp. of 6 classes were found, being gastropods the most diverse and abundant one (69 spp., 51.11% total species of BT), followed by bivalves (49 spp., 36.3%) and cephalopods (15 spp., 11.11%). The top-dominant species were the gastropods Turritella communis and Nassarius ovoideus and the bivalves Nucula sulcata and Abra longicallus, and the most frequent ones included Nucula sulcata, Nassarius ovoideus and the gastropod Euspira fusca (Figure 1).
Contrasting both methods, only 20% (34 spp.) of the species were exclusively collected in OT samples (e.g. Alloteuthis spp., I. coindetii, Loligo spp., T. sagittatus) and 57% (97 spp.) in BT samples (e.g. N. ovoideus, Timoclea ovata, N. sulcata, Clelandella miliaris). Only 23% of the species (39 spp.) were collected with both methods (e.g. Venus nux, Turritella communis, N. cochlear).

Figure 1. Some common and dominant mollusc of beam trawl (A-C, E-G) and otter trawl samples (D, H-J) collected in circalittoral and bathyal soft bottoms of the northern Alboran Sea. A) Turritella communis; B) Abra longicallus; C) Nassarius ovoideus; D) Illex coindeitii; E) Clelandella miliaris; F) Timoclea ovata; G) Nucula sulcata; H) Venus nux; I) Octopus vulgaris; J) Neopycnodonte cochlear.

Multivariate analyses clearly separated two groups of samples, each one collected with a different sampling method, and in each grouping it revealed three main mollusks assemblages in relation to depth: I) Continental shelf (CS) (40-200 m), II) Upper slope (UCS) (201-400 m), and III) and Middle slope (MCS) (400-1800 m) (Fig. 2).

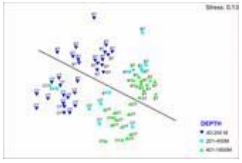
Figure 2. MDS applied to presence-absence data of molluscs assemblages obtained from beam trawl and otter trawl samples collected in the northern Alboran Sea. BT: Beam trawl; OT: Otter trawl ; CS: Continental Shelf; UCS: Upper Continental Slope; MCS: Middle Continental Slope.

The continental shelf assemblage in BT samples were characterized by T. ovata, N. cochlear, N. ovoideus and T. communis, whereas O. vulgaris, Eledone moschata and I. coindetii characterized the OT samples. For the upper and middle slope assemblages, E. fusca and A. longicallus characterized the BT samples, whereas T. sagittatus and Bathypolypus sponsalis characterized the OT samples. Mean values of species richness were significantly higher when using the BT.

This study showed that OT nor BT samples can provide complete information on the whole molluscan assemblage, giving each sampling method complimentary information. The demersal and epi-benthic fractions of the community were better sampled using the otter trawl and the beam trawl, respectively. The estimates of infauna were higher using the beam trawl, but this information should be contrasted with data obtained from dredges in order to assess whether the beam trawl yield acceptable estimates of the abundance of these molluscs.

Figure 1

Figure 2



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References

Gofas S., Moreno D. and Salas C. (2011) Moluscos marinos de Andalucía. Málaga: Servicio de Publicaciones e Intercambio Científico, Universidad de Málaga.

Robles, R. (2010). Conservación y desarrollo sostenible del mar de Alborán / Conservation et développement durable de la mer d'Alboran. Gland, Suiza y Málaga, España: UICN.

Pickitch E.K., Santora C., Babcock E.A., Bakun A., Bonfil R., Conover D.O., Dayton P., Doukakis P., Fluharty D., Heneman B., Houde E.D., Link J., Livingston P.A., Mangel M., McAllister M.K., Pope J., Sainsbury K.J. (2004). Ecosystem-based fishery management. Science 305: 346-347.

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