

Planktonic foraminifera as indicators of water masses north and south of the Azores Front/Current: Evidence from abundance and stable isotopes data

Andreia Rebotim

Unidade de Geologia Marinha,
LNEG
Estrada da Portela, Zambujal;
Amadora
2610-143
Portugal

andreia.rebotim@lneg.pt

Antje Voelker

Unidade de Geologia Marinha,
LNEG
Estrada da Portela, Zambujal;
Amadora
2610-143
Portugal

antje.voelker@lneg.pt

Joanna Waniek

Leibniz Institute for Baltic Sea
Research
Warnemünde; Seestrassse 15;
Rostock
D-18119
Germany

joanna.waniek@io-warnemuende.de

Palavras-Chave / Palabras-clave / Keywords

Planktonic foraminifera; Pteropods; Azores Front; Stable isotopes

Resumo / Resumen / Abstract

The study of the dynamic interaction between pteropods and planktonic foraminifera and the abiotic and biotic components of the marine environment is of extreme importance in understanding their ecology and consequently the ecosystems where they live(d). Here we present data from plankton tows collected from the upper 2000 m along two transects (22°W; 20°W) across the Azores Front between 38°N and 31°N in different seasons (April 2007; December 2008). The abundance of pteropods and planktonic foraminifera was determined, as well as, percentages of planktonic foraminifera species. Furthermore, stable isotope measurements were done in several foraminifera species: *Globorotalia scitula*, *Globigerinoides ruber*, *Globorotalia hirsuta*, *Globigerinella siphonifera*, *Globorotalia inflata*, *Hastigerina pelagica*, *Globorotalia truncatulinoides*, and *Orbulina universa*.

In April 2007, the differences in pteropod and planktonic foraminifera abundances and in the prevailing foraminifera species north and south of the Azores Front, seem to be related to the spring bloom. According to the fluorescence data, pteropods were present mostly above the fluorescence maximum (100 m) while planktonic foraminifera occurred mostly below this depth. Although the hydrographic conditions were similar in both transects, the abundances were higher in the 22°W transect. Comparing the data from April 2007 and December 2008 at the same coordinates, seasonal differences are evident with pteropods and planktonic foraminifera being more abundant in spring. Also the faunal composition seems to be more diverse in April 2007.

Alive *G. ruber*, *O. universa* and *G. siphonifera* occurred in the upper 200 m. *H. pelagica*, *G. inflata* and *G. truncatulinoides* (dextral) were mainly found in the upper 400 m and *G. truncatulinoides* (sinistral), *G. scitula* and *G. hirsuta* down to 1200 m. The more abundant species were *G. scitula* and *G. hirsuta*. From the north of the Front to the south, abundance of *G. scitula* starts to decrease and of *G. hirsuta* to increase.

Stable isotope values of living specimens of planktonic foraminifera generally reflect the environmental parameters of the waters in which the carbonate shell was calcified. Surface to thermocline dwelling species like *G. ruber*, *G. siphonifera* and *O. universa* seem to reflect conditions of the upper ocean, without significant differences in the north and south of the Azores Front values. Deep-dwelling species *G. truncatulinoides*, *G. scitula* and *G. hirsuta* seem to be good indicators for the water masses in which they occur, especially the Azores Front.