

## **Ingestión herbívora de copépodos en el Océano Atlántico (Copepod grazing in the Atlantic Ocean).**

### **Huskin, I. PhD thesis**

The main objective of the thesis was to determine the importance of mesozooplankton grazing in different areas of the Atlantic Ocean, as well as the influence of mesoscale structures in mesozooplankton grazing and distribution in oligotrophic regions. The thesis is divided in two main sections. The first section describes the results obtained along three AMT cruises (UK-Falkland Islands), while the second sections is devoted to CANIGO cruises, carried out in the oligotrophic Subtropical Atlantic.

#### **AMT cruises**

Size fractionated copepod abundance and ingestion rates were investigated along a 50°S-50°N latitudinal transect, during the Atlantic Meridional Transect (AMT) 4, 5 & 6 cruises (boreal spring-autumn 1997, boreal spring-summer 1998). Copepod abundance was higher at high latitudes in spring, near Northwest Africa, in the equatorial and Benguela upwelling systems, and in the Subtropical Convergence, and lower in oligotrophic gyres. Gut contents were not related to phytoplankton biomass or production. Gut evacuation rate averaged  $0.03 \text{ min}^{-1}$ , and was not related to latitude or body size. Conservative estimates of copepod community total ingestion rates ranged between  $3.4$  and  $173 \text{ mg C m}^{-2} \text{ d}^{-1}$  for AMT4,  $1.6 - 252 \text{ mg C m}^{-2} \text{ d}^{-1}$  in AMT5 and  $10 - 160 \text{ mg C m}^{-2} \text{ d}^{-1}$  in AMT6. Maximum values were always in the upwelling regions, the subtropical convergence and high latitudes in the Northern Hemisphere during boreal spring. Calculated ingestion rates translates into average daily minimal consumption values of 2.07%, 1.89% and 2.6% of total chlorophyll stock, or 8.02%, 14.5% and 12.9% of total primary production ingested daily on AMT4, 5 and 6 respectively. Grazing impact increases considerably if we consider ingestion of phytoplankton larger than  $2 \mu\text{m}$ , especially under the influence of the Equatorial and North African upwelling, where copepod ingestion represents up to 30% of the biomass and  $>100\%$  of production by large cells.

#### **CANIGO cruises**

Mesozooplankton distribution and copepod grazing was investigated in the Subtropical Atlantic Ocean near the Azores Islands during the AZORES 1 (August) & 2 (April-May) cruises. Mesozooplankton biomass and abundance remained low in all the region, but significant increases were found related to the presence of the Azores Front. Azores Front also presented maximum values of copepod community ingestion, reaching  $250 \text{ mg C m}^{-2}$  ingested daily. This increase in ingestion was related to increases in copepod abundance, but not in copepod gut contents. No relationship was found between gut contents or ingestion and phytoplankton biomass or production. Daily cycles were found in copepod gut contents, higher during night, but not in copepod abundance. Cluster and ACP analysis revealed differences in copepod taxonomic composition between both sides of the front. Copepod Ingestion rates translates into high grazing impact on phytoplankton primary production, specially at the Azores Front, where copepods ingest daily 85% and 160% of total and large cells ( $>2 \mu\text{m}$ ) production. Impact on phytoplankton biomass is much lower, averaging 1.4% of integrated chlorophyll concentration. No clear influence of the cyclonic eddy LETICIA was found in mesozooplankton biomass or grazing. Significant effect of the Great Meteor Tablemount were found in copepod abundance and grazing, with higher values located downstream the mount.