Distribution and diversity of coccolithophore communities living in the tropical and subtropical South Atlantic: Preliminary results from AMT28

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https://doi.org/10.58998/jnr3255

Coccolithophores, a group of unicellular nannophytoplankton chromists belonging to the Division Haptophyta, play a crucial role in oceanic ecosystems and global biogeochemical cycles. These communities are affected by changes in seawater temperature, nutrient availability, and sunlight conditions linked to the meridional variations of the mixed layer dynamics. Here, we present new data on coccolithophore communities living in the tropical and subtropical South Atlantic based on biological and hydrological data collected along a meridional transect (AMT28) of 16 stations extending from the equatorial region to the Tropic of Capricorn (0–30°S). The aim of this study is to gather information on how variations in environmental parameters influence the distribution and diversity of coccolithophores living in this heavily stratified region. This information is critical for understanding how these important primary producers are likely to respond to ongoing and future climate changes, and their associated impacts on the biogeochemical cycles that they influence.

Our preliminary results identified a total of 54 taxa, of which 42 contributed to >5% of the assemblage in at least one of the samples studied. Taxa contributing <5% of all studied samples on average were 1% of the studied coccolithophore community. The identified taxa were subsequently grouped into 19 taxonomic categories (by genus and/or ecological similarity) to facilitate exploration of the data and focus on the most abundant taxa. The region of highest coccolithophore abundance (coccospheres/liter) was the South Atlantic equatorial region (0–8˚S). To the south of the equatorial area, abundances became much lower in the upper photic zone, particularly in the region where the deep chlorophyll maximum (DCM) was deeper along the gyre, despite slightly increasing again around 24–27˚S. The Shannon-Wiener diversity index was higher to the south of the equatorial region but did not show a clear distribution pattern along the transect. Enhanced species diversity was noticed along the entire photic zone in the region where the DCM was deeper along the gyre, and slightly more bound to the DCM to the south (24–25˚S) and to the north (7–12˚S) of the gyre center.

Emiliania huxleyi was more abundant near the surface in the equatorial region (3–7˚S) but clearly bound to the DCM to the south of this area. *Umbellosphaera* spp. were clearly more abundant in the upper photic zone to the south of the equatorial region, whereas *Florisphaera profunda* was most abundant along and below the DCM across the transect, particularly along 2–25°S. Finally, *Oolithotus* spp. were clearly more abundant along the DCM in the northern part of the studied transect (2–12°S). The next step in this ongoing study will be to compare the newly obtained ecological data with environmental parameters measured along the photic zone during the cruise, and with previous coccolithophore studies from the Atlantic Ocean, including the North Atlantic region, which was also sampled during the same AMT28 cruise.