# Coccolithophore distribution in the western Black Sea during early summer 2016


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The Black Sea is the largest semi-enclosed marginal sea and receives drainage from almost one-third of continental Europe. Intensive coccolithophore blooms (*Emiliania huxleyi*, primarily) are typical events for the Black Sea. According to satellite observations, on a temporal scale the most extended bloom occurs in May-June, although differences in intensity and area of coverage have been recorded (e.g., Cokacar *et al*., 2004; Kopelevitch *et al*., 2014; Triantaphyllou *et al*., 2014; Mikaelyan *et al*., 2015). These blooms can be detected by ocean color sensors as a result of light being scattering by the coccolith plates that are detached from cells. The optical signature of coccolithophore blooms on satellite true color images is a very bright patch of water with a milky turquoise color. The Black Sea is an ideal site in which to study the effect of biogeochemical properties on coccolithophore blooms. The main aim of this study was to determine the spatial and vertical distribution patterns of living coccolithophores from the oxic surface zone in the western part of the Black Sea in June 2016. A total of 90 plankton samples from 32 stations were taken from discrete water samples (1 to 50m depths) that were collected from coastal and open sea zones. Coccolithophores showed excessively high cell densities ($\sim 4 \times 10^6$ cells $l^{-1}$) with an impressive almost monospecific assemblage of *Emiliania huxleyi* lightly calcified morphotypes. In general, cell numbers were usually higher in the surface layer (0–20m), and tended to decrease in abundance below ~20m water depth. In the lower part of the surface zone (~50m water depth), *E. huxleyi* gradually decreased, while *Algirosphaera robusta* occurred in high abundances ($\sim 0.2 \times 10^5$ cells $l^{-1}$), indicating low light availability below the thermocline. Differences in abundances between coastal and open-sea environments were observed that are primarily associated with major river discharges. However, these differences were less pronounced in chlorophyll-*a* concentrations between coastal and offshore stations. This observation indicates that other groups than coccolithophores (e.g., diatoms) also play an important role. Further examination will elucidate the phytoplankton community structure.

Samples were collected during the BIO-OPT-2016 EUROFLEETS cruise, onboard the R/V *Akademik*.

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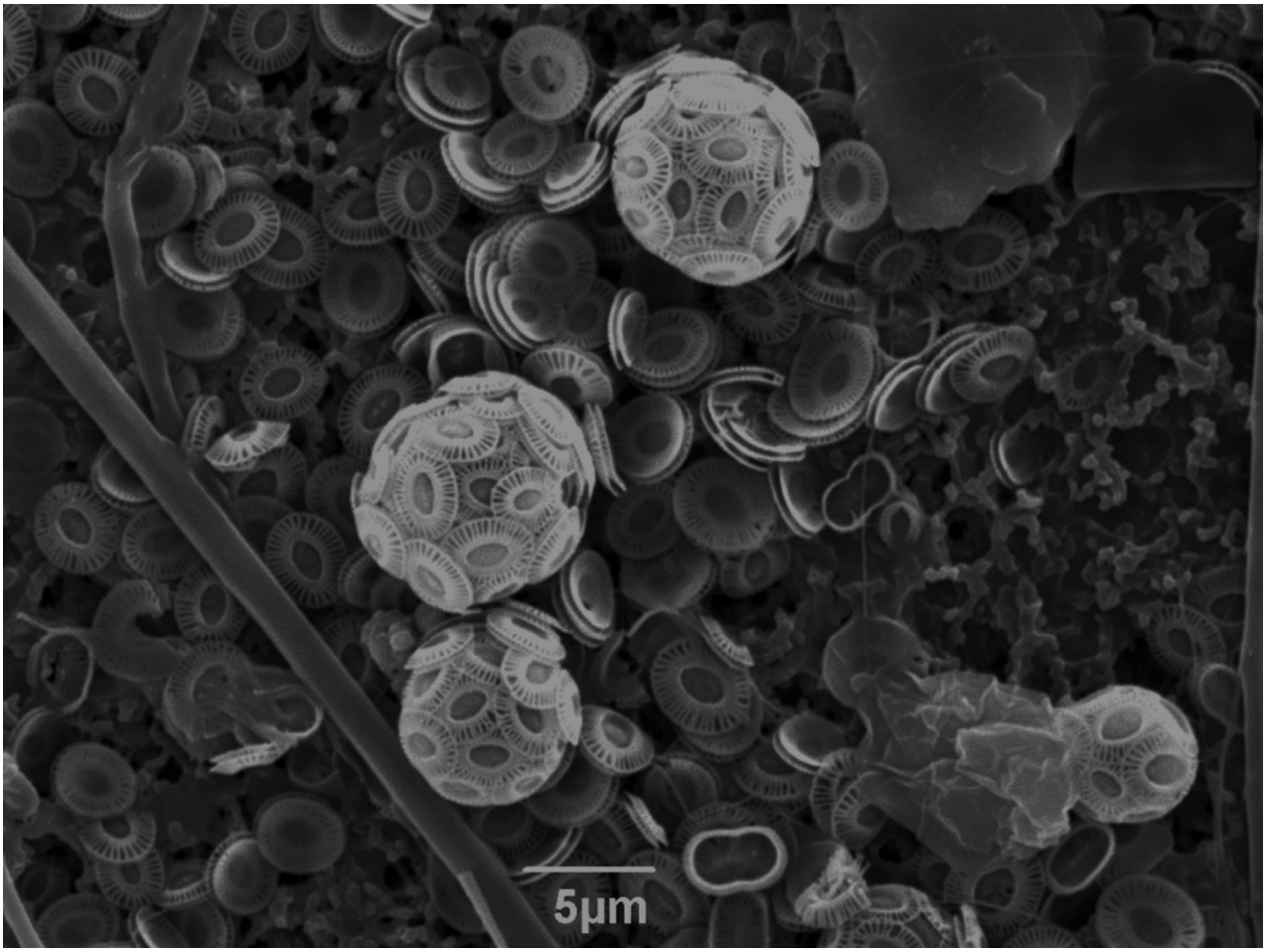


**Figure 1**: Black Sea waters coccolithophore assemblage