

Seasonal shifts in microzooplankton grazing in the UK Shelf Sea

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Shelf seas are highly productive compared to the open ocean, a productivity that underpins more than 90% of global fisheries. Although comprising only about 5% of the global ocean surface area, they contribute 15-30% of total oceanic primary production. As part of the UK Shelf Sea Biogeochemistry programme, we investigated grazing and growth of microzooplankton in the Celtic Sea during April and July 2015. We carried out ten dilution experiments. Water was collected from two depths (20 m and below thermocline in April; 20 m and deep chlorophyll maximum in July). Dilutions were made up as 100%, 70%, 40% and 20% unfiltered water with the remainder being filtered water. 1.2-L glass bottles were filled in triplicates and incubated for 24 hours at in situ temperature and at the local photoperiod. Samples were taken for total Chlorophyll *a*, pico- and nanoplankton community structure and abundance, and microplankton. During April, total phytoplankton net growth ranged from -0.28 to 0.30 d⁻¹ above the thermocline and -0.13 to 0.03 d⁻¹ below the thermocline. During July, net growth rates were highest in the deep chlorophyll maximum, with marked differences in the community activity compared to the surface community. Microzooplankton grazing rates will be compared to mesozooplankton grazing rates, determined for the same day, station and water. Overall, we show that microzooplankton grazing dynamics shift with season and are an important regulator of phytoplankton growth in the UK Shelf Sea.

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