

# Bloom timing explains succession of protistan functional effect trait community structure

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## Abstract

Given the important role of protists in trophodynamics and major biogeochemical cycles, identifying which factors influence the distribution of their biomass and species composition is a central tenet in oceanography. However, understanding the drivers of that distribution from a functional trait perspective would allow us to better link protistan biogeography to ecosystem function. Here we evaluated the distribution of protistan functional traits across the Labrador Sea during spring over three consecutive years. More variability in the biogeography of protistan functional traits was explained across water masses, and among years than taxonomic composition. Furthermore, patterns in trait variability were more apparent when site-specific timing of peak chlorophyll-*a* was considered. By recreating bloom phenology, we found that approximately 20 days prior to peak, mixotrophs were replaced by autotrophs of different size classes, supporting the critical role of bloom timing in structuring protistan community trait succession with consequences on modelling of ecosystem function.

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