



## Release of dissolved organic matter by coastal diatoms

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**ABSTRACT:** Dissolved organic matter (DOM) production was examined in axenic batch cultures of five coastal diatom species. For *Chaetoceros decipiens*, dissolved organic carbon (DOC) accumulated beginning in late exponential growth as a result of increased cell density. For *Cylindrotheca closterium*, DOC actually decreased in late exponential growth and reached zero by the end of the experiment. This coincided with continued particulate organic carbon (POC) production and a threefold increase in the per-cell concentration of transparent exopolymer particles after nutrients were depleted. DOC release rates varied between species but were significantly higher for all five species in exponential or transition growth than during stationary growth. On average, 5% of the total fixed C was released as DOC for four of the diatoms, whereas *C. decipiens* released ~21% of its fixed C as DOC. The percentage of fixed C released as DOC varied little with nutrient availability or diatom growth stage. The DOM produced by some diatom species adheres to filters and is measured in the particulate organic matter (POM) fraction when cells are separated from the medium by filtration. This may be an important problem when diatom species with known benthic life histories are prevalent. In contrast, for species like *Chaetoceros* that have no benthic life history, DOM release rates estimated by bulk measurements or <sup>14</sup>C appear to be accurate. Overall, these results indicate that the species composition of phytoplankton blooms has the potential to influence the relative importance of POM and DOM production and can complicate interpretation of those measurements.

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