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TITLE: Global marine plankton functional type biomass distributions: *Phaeocystis* spp.

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ABSTRACT:

Abstract. The planktonic haptophyte *Phaeocystis* has been suggested to play a fundamental role in the global biogeochemical cycling of carbon and sulphur, but little is known about its global biomass distribution. We have collected global microscopy data of the genus *Phaeocystis* and converted abundance data to carbon biomass using species-specific carbon conversion factors. Microscopic counts of single-celled and colonial *Phaeocystis* were obtained both through the mining of online databases and by accepting direct submissions (both published and unpublished) from *Phaeocystis* specialists. We recorded abundance data from a total of 1595 depth-resolved stations sampled between 1955–2009. The quality-controlled dataset includes 5057 counts of individual *Phaeocystis* cells resolved to species level and information regarding life-stages from 3526 samples. 83% of stations were located in the Northern Hemisphere while 17% were located in the Southern Hemisphere. Most data were located in the latitude range of 50–70° N. While the seasonal distribution of Northern Hemisphere data was well-balanced, Southern Hemisphere data was biased towards summer months. Mean species- and form-specific cell diameters were determined from previously published studies. Cell diameters were used to calculate the cellular biovolume of *Phaeocystis* cells, assuming spherical geometry. Cell biomass was calculated using a carbon conversion factor for prymnesiophytes. For colonies, the number of cells per colony was derived from the colony volume. Cell numbers were then converted to carbon concentrations. An estimation of colonial mucus carbon was included a posteriori, assuming a mean colony size for each species. Carbon content per cell ranged from 9 pg C cell⁻¹ (single-celled *Phaeocystis antarctica*) to 29 pg C cell⁻¹ (colonial *Phaeocystis globosa*). Non-zero *Phaeocystis* cell biomasses (without mucus carbon) range from 2.9×10^5 to 5.4×10^3 ?g C l⁻¹, with a mean of 45.7 ?g C l⁻¹ and a median of 3.0 ?g C l⁻¹. The highest biomasses occur in the Southern Ocean below 70° S (up to 783.9 ?g C l⁻¹) and in the North Atlantic around 50° N (up to 5.4×10^3 ?g C l⁻¹). The original and gridded data can be downloaded from PANGAEA, doi:10.1594/PANGAEA.779101.

SOURCE: Earth system science data

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