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SPATIAL AND TEMPORAL VARIATIONS OF DIMETHYLSULFIDE AND DIMETHYLSULFONIOPROPIONATE DISTRIBUTIONS IN THE INDIAN SECTOR OF THE SOUTHERN OCEAN

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Seven cruises were conducted during 2002 – 2006 to understand the spatial and temporal variations of biogeochemical cycles of dimethylsulfide (DMS) and dimethylsulfoniopropionate (DMSP) in the Indian sector of the Southern Ocean (20°E – 140°E). One of the cruises was the first campaign to determine the distributions of DMS(P) in seawater off Lützow-Holm Bay (68°S – 70°S, 35°E – 40°E). Lützow-Holm Bay lies far from the usual oceanic Polar Front area. Additionally, the distance from the coast to the maximum extent of sea ice is longer at 40 °E than at 140°E. In the seasonal ice zone, at surface off Lützow-Holm Bay, DMS concentrations varied from 0.6 to 10.9 nmol·L^{-1}. Particulate DMSP ($DMSP_p$) concentrations were linearly related to chl. *a* concentrations, and $DMSP_p$: Chl. *a* ratio was calculated to be 36 (nmol·μg^{-1}) off Lützow-Holm Bay. It was reported that well mixed phytoplankton populations had ratios of $DMSP_p$: Chl. *a* in the range 11-60 nmol·μg^{-1}. On the other hand, the smaller ratios (*ca*. 5 nmol·μg^{-1}) were found at the coast of Dumont d'Urville (DDU) (140°E) with high DMS concentrations (49 nmol·L^{-1}) and high Chl. *a* concentrations. These different ratios suggest that the phytoplankton assemblages were well mixed in Lützow-Holm Bay and were different from the coast of DDU. It was suggested that the difference in DMS concentrations between off Lützow-Holm Bay and in the coast of DDU was due to the difference in phytoplankton assemblages and hence due to the differences in the following zooplankton and microbial assemblages. During seven cruises, in the open ocean area, DMS concentrations at surface seawater were high near the coast of Antarctica, Polar Front and Subtropical Front with high chl. *a* concentrations. It would appeared that physical parameters, such as temperature, sea ice and water masses affect biological distributions and hence DMS(P) distributions.