

observed at about 100 m depth, and below this the ATP concentration decreased rapidly. The ATP/POC ratios were high (0.10–0.25%) in the euphotic layers, decreasing with depth. The maximum ratio observed in this study was 0.25%. The two sections of ATP/POC ratio most clearly suggest the counter-clockwise helical circulation between the Antarctic Divergence and the Convergence. The DOC concentration was characteristically low throughout the water column over the studied area with only a few exceptions. (p. 53–63)

HORIZONTAL AND VERTICAL DISTRIBUTIONS OF PARTICULATE ORGANIC MATTER IN THE PACIFIC SECTOR OF THE ANTARCTIC OCEAN

Eiichiro TANOUE, Nobuhiko HANDA and Mitsuo KATO

Particulate matter was collected from surface waters in the Pacific Ocean (64°57.8'S–27°36.0'N) and from various depths of 14 hydrographic stations in the Antarctic Ocean. The particulate matter was analyzed for organic carbon and nitrogen, amino acid, carbohydrate, lipid and chlorophyll *a* and *c*.

Particulate organic carbon (POC) in the surface waters was found to be higher in the areas to the south of 40°S than in the areas to the north of 40°S. However, POC in the former areas showed a great regional variability. Average concentrations of POC in the oceanic areas of the Antarctic Ocean were found in a range of 55.6–61.6 µgC/liter in the surface and subsurface water layers (0–100 m), and tended to decrease with depth to a range of 26.1–33.1 µgC/liter in the deep water layers (300–1500 m).

The ratios of amino acid, carbohydrate and lipid carbons to POC were determined. The ratio of amino acid carbon to POC was found in a range of 34.1–40.3% in the surface and subsurface water layers, and tended to decrease with depth to a range of 18.6–21.2% in the deep water layers at all of the hydrographic stations of the Antarctic Ocean. The ratio of carbohydrate carbon to POC was found in a range of 11.6–16.5% in all of the water layers at each of the stations. No significant trend in relation to the different watermasses and oceanic areas was found. The ratio of lipid carbon to POC was found in a range of 21.6–22.7% in the surface and subsurface water layers in the areas to the north of the Antarctic Divergence, while the values tended to increase with depth to a range of 25.5–28.4% in the deep water layers. Much higher values of the ratio (30.8–37.8%) were found in the areas to the south of the Antarctic Divergence in the surface through the deep water layers. Markedly high values of the ratio (larger than 40%) were found in the subsurface and intermediate water layers where the dichothermal water (below 0°C) was found to occur. (p. 65–83)

VERTICAL AND HORIZONTAL CHANGES IN FATTY ACID COMPOSITION OF PARTICULATE MATTER IN THE PACIFIC SECTOR OF THE SOUTHERN OCEAN

Eiichiro TANOUE and Nobuhiko HANDA

A vertical distribution of the fatty acid composition was examined in the particulate matter collected from a station (64°35.0'S:124°57.1'E) located near the pack-ice area. It was found that unsaturated fatty acids tended to decrease toward deep, while saturated and branched fatty acids increased with depth.

A horizontal distribution of the fatty acid composition of the particulate matter collected from the surface waters of various oceanic areas (7°N–64°S) was also examined. A remarkable change in the fatty acid composition was observed in the areas between the