oceanic areas south and north of the Antarctic Convergence. High proportions of unsaturated fatty acids were characteristic of the south area of the Antarctic Convergence and the particulate matter from this area gave fatty acid composition almost identical to that of diatom. Unsaturated fatty acids, however, were found to be much less abundant in the particulate matter from the north area of the Antarctic Convergence and the particulate matter was very different from marine unicellular algae living in this oceanic area in terms of the fatty acid composition. Low nutrient concentration, high water temperature, or a combination of the two in this area was supposed to be the most important environmental factor producing the characteristic fatty acid composition observed in the present study. (p. 85–95)

## CHLORINATED HYDROCARBONS IN THE ANTARCTIC, WESTERN PACIFIC AND EASTERN INDIAN OCEANS

Shinsuke TANABE, Masahide KAWANO and Ryo TATSUKAWA

Polychlorinated biphenyls (PCBs) and chlorinated hydrocarbon pesticides such as DDT compounds and HCH isomers were measured in air and surface water samples taken from the Antarctic, western Pacific and eastern Indian Oceans.

All of chlorinated hydrocarbons were detected in every location surveyed. The most interesting finding was their presence in the Antarctic Ocean with measurable concentrations, which indicates their long-distance transport in the global extent.

Both in air and water samples, $\Sigma$HCH (sum of $\alpha$, $\beta$ and $\gamma$ isomers) concentrations were higher in the northern hemisphere rather than in the southern hemisphere. On the other hand, higher concentrations of $\Sigma$DDT (sum of *p, p'*-DDT, *p, p'*-DDE and *o, p'*-DDT) were found in the tropical regions and its levels between both hemispheres were not so different. These results appear to be the strong proof that the consuming areas of HCH are still concentrated in the northern hemisphere, especially in the Asian Continent, while those of DDT have been shifting from northward to southward for the last decade.

The significantly high concentrations of PCBs were observed in the coastal regions of the tropical and subtropical zones, and PCB components found in these regions were composed of higher chlorinated biphenyls both in air and water samples. In contrast, the lower chlorinated biphenyls were dominant in the oceans far from the terrestrial environment.

The data presented here will be useful for the estimation of persistent chlorinated hydrocarbon fluxes into the marine environment and for the construction of more sophisticated mathematical models of their global atmospheric transport. (p. 97–109)

## STANDING STOCK AND DISTRIBUTION OF PHYTOPLANKTON CHLOROPHYLL IN THE SOUTHERN OCEAN, SOUTH OF AUSTRALIA

Yukuya YAMAGUCHI and Yoshiaki SHIBATA

During BIOMASS Cruise of the T/S UMITAKA MARU III to the Southern Ocean, the standing stock and the distribution of phytoplankton chlorophyll were determined in the areas between Australia and Antarctica. Mean surface chlorophyll *a* concentrations in five different water masses, measured continuously by the *in vivo* fluorescence, ranged from 0.118 to 0.385 mg/m$^3$. Clear diurnal fluctuations of *in vivo* fluorescence, higher in the nighttime and low in the daytime, were observed. Except in the Subantarctic zone in early February, marked subsurface chlorophyll maxima were observed. The amounts of chlorophyll *a* in the subsurface maximum layers were 1.30 to 5.37 times greater than those observed in the surface waters. In the Antarctic zone, most of the subsurface chlorophyll maximum was found in the subsurface temperature minimum layer. The total amount of chlorophyll *a* within the upper 200 m of the water column varied from 12.48 to 50.96 mg/

$m^2$. The standing stock of nannoplankton (smaller than 10 $\mu$m), microplankton (10–60 $\mu$m) and netplankton (larger than 60 $\mu$m) was 15.73±1.78, 8.39±3.96 and 7.73±4.87 mg chl. $a/m^2$, respectively, and their mean percent contributions to the total chlorophyll *a* stocks were 52.6, 25.1 and 22.3%, respectively. The standing stock of nannoplankton chlorophyll *a* was almost constant in all water masses, while those of the micro- and netplankton showed large fluctuations. Thus, the cause of the regional variations of the standing stock of phytoplankton chlorophyll should mainly be attributed to the variations of micro- and netplankton standing stocks. (p. 111–128)

## PHYTOPLANKTON COLLECTED DURING THE FIBEX CRUISE OF THE UMITAKA MARU III, 1980–1981; A PRELIMINARY REPORT

Teru IORIYA and Mitsuo KATO

From November 1980 to March 1981, 145 phytoplankton taxa were identified in 30 samples collected at various stations on the FIBEX Cruise of the T/S UMITAKA MARU III of the Tokyo University of Fisheries. The classification of phytoplankton were: 65 taxa of Bacillariophyceae, 68 taxa of Dinophyceae, 2 taxa of Cyanophyceae, one taxon of Euglenophyceae, 8 taxa of Chrysophyceae and one taxon of Cryptophyceae. Tables of stations and species with preliminary notes on the distribution patterns of phytoplankton in the Antarctic, temperate and tropical waters are given. Brief taxonomic notes are also given for some of the predominant and rare phytoflagellates. (p. 129–144)

## PRELIMINARY REPORT ON THE BIOMASS OF MACROPLANKTON AND MICRONEKTON COLLECTED WITH A BONGO NET DURING THE UMITAKA MARU FIBEX CRUISE

Takashi MARUYAMA, Hiroshi TOYODA and Shigemi SUZUKI

Zooplankton biomass in the austral summer in the western Pacific sector of the Southern Ocean was estimated. The mean total biomass was 28.8–31.1 g/1000 $m^3$ in the richer regions and 14.1–20.1 g/1000 $m^3$ in the poorer ones. These values were similar to the previous estimates. However, the maximal values were extremely smaller than those of the previous ones. Copepods were most abundant, and chaetognaths, euphausiids and amphipods followed. There seemed to be at least two types of waters represented by different zooplankton assemblages. *Euphausia superba* occurred only at the southernmost station. (p. 145–153)

## CONTINUOUS COLLECTION OF MACROPLANKTON BY A FISH PUMP AT SURFACE LAYER IN THE ANTARCTIC OCEAN; A PRELIMINARY REPORT

Yoichi SASADA

Continuous samplings of macroplankton were conducted at two regions with a fish pump connected with the cod-end of the KMT-net by a hose from the surface layer of the Antarctic Ocean during the FIBEX Cruise of the T/S UMITAKA MARU III.

Occurrence of the species at the surface water closely related to the surface light intensity. Both the number of species and number of individuals increased with the decreasing of the light intensity. The reaction of the species to light intensity varied with