

PHYTOPLANKTON COMMUNITY STRUCTURE, BIOMASS AND PRIMARY PRODUCTIVITY IN THE SOUTHERN OCEAN AND IN SOME FRESH WATER LAKES OF ANTARCTICA

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Phytoplankton species composition, distribution and abundance was studied at 35 stations in an expansive area between Lat. 70°S to 57°S. At stations close to the ice edge, diatoms were distinctly the most abundant forms and were largely represented by species of Chaetoceros, Eucampia and Rhizosolenia.

At all stations, water samples were drawn from discrete depths within the euphotic and the disphotic zones for measuring the rate and magnitude of primary and extracellular production. The nature of the end products of photosynthesis and extracellularly liberated dissolved organic compounds was also examined.

Biomass estimates were made on the basis of chlorophyll a adenosine triphosphate and Particulate oxidisable carbon measurements. The distribution of phytoplankton biomass in the euphotic zone was fairly uniform and ranged from 0.09 to 2.62 mg m⁻³. One striking observation was the presence of viable cells well below the euphotic column.

Ice samples examined showed that phytoplankton biomass was located almost entirely in the bottom 20 cm of the

platelates. Measurements of photosynthesis, nutrient uptake, growth and rate and generation time by sea bound algal communities were carried out under a varied range of salinity and light levels.

In the Schirmacher oasis eight freshwater lakes were examined for their biological characteristics. Photosynthesis, biomass estimates, primary and extracellular metabolites release were examined on a fortnightly basis between December 1987 and February 1987.

An underwater survey of Priyadarshini Lake (Maitree) revealed the presence of thick algal mats comprising mainly of unicellular Chlorophyceans.