

Size composition of particulate organic matter in the lagoon of Tikehau atoll (Tuamotu archipelago)

J. Blanchot¹, L. Charpy² and R. Le Borgne¹

¹ Centre ORSTOM, B.P. A5, Nouméa Cedex, New Caledonia

² Centre ORSTOM, B.P. 529, Papeete, Tahiti, French Polynesia

Abstract

Suspended particulate matter was comprehensively investigated from 6 to 17 April 1986 in the lagoon of Tikehau atoll (15°00'S; 148°10'W). Dry weight (DW), particulate organic carbon (POC), adenosine triphosphate (ATP), and chlorophyll a were measured for five size-classes (0.2 to 0.8 μm , 0.8 to 3 μm , 3 to 35 μm , 35 to 200 μm , and 200 to 2 000 μm). Taxa were identified and counted for the whole plankton (both autotrophic and heterotrophic). Particles < 3 μm accounted for 81% of the total POC (192 mg m⁻³), and detritus comprised 82% of the total POM. Phytoplankton (cyanobacteria plus algae) accounted for 35% of the living carbon, 75% of which consisted of heterotrophic bacteria and cyanobacteria. The zooplankton biomass was composed of 31% nano-, 26% micro-, and 43% mesoplankton.

of suspended particulate matter (detritus, phytoplankton and zooplankton) and of feeding by zooplankton.

In a coral atoll environment, the absence of terrigenous inputs means that the system is dependent on the surrounding open ocean for nutrient supply, and nutrient regeneration is therefore of primary importance.

Our study examines the different components of the organic seston, i.e., all particles > 0.2 μm suspended in the water, including both plankton made up of living organisms, and tripton composed of non-living particles. Particulate organic carbon (POC) was weighed and analysed in each size class. Living particulate organic matter (LPOM) was measured by conversion of ATP into living carbon, and phytoplankton by chlorophyll measurement. The floral and faunal composition, abundance (numbers and biomass), and size-class structure of the plankton from 0.2 to 2 000 μm were determined by microscopy.