

CHARACTERISTICS OF ORGANIC PARTICLES COLLECTED BY SEDIMENT TRAP IN THE ANTARCTIC OCEAN (ABSTRACT)

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Organic particles collected by sediment trap in the Antarctic ocean are examined. The sediment traps were set at a station located at 61°33'S, 150°27'E where the water depth was 3580m. Five traps were placed at 690, 930, 1330, 2330 and 3130m depth during the BIOMASS SIBEX cruise of the R. V. HAKUHO MARU, Ocean Research Institute, University of Tokyo to the Antarctic ocean. The particles collected were examined at once on board for chlorophyll pigments and degraded phaeopigments of phytoplankton. After detection of phytoplankton pigments the particles were fixed in 5% formalin sea water. Counting and measurement of the size of fecal pellets of zooplankton and foraminifera were carried out using Luzex 500 image analyzing system.

Among organic particles trapped in this experiment, diatom shells were dominant resulting in a high content of opal in the chemical composition of the trapped materials (TSUNOGAI, personal communication). Fecal pellets and fragments of crustacea including copepods and euphausiids were also common in samples, amongst which small elliptical and rod type fecal pellets were dominant. The organisms which excrete these elliptical fecal pellets are still unknown, but the rod type fecal pellets are considered to be those of euphausiids. The shells of foraminifera also formed a large component of the materials trapped. Less than 10% of foraminifera in all traps at different depths were living and there was no particular trend in variation in size of the shells. More than 90% of the shells of foraminifera were sinistral, which is typical of species inhabiting waters colder than 7°C in surface temperature.

Using a fluorescence microscope technique, fresh and degraded phytoplankton pigments were detected in particles trapped at all depths from the surface down to the deep of the Antarctic ocean. This clearly shows that rapid transportation of the particles from the surface to depth is occurring. There was a general trend that more amorphous or deformed particles containing degraded phytoplankton pigments were detected in the lower sediment traps.

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