The particle flux and the POC export flux using ^{234}Th in the equatorial Pacific during the cold phase of the ENSO event in 2003

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Introduction

The ENSO event shifts the boundary of the warm pool and the upwelling area in the equatorial Pacific. The transfer of boundary causes the change of the nutrient concentrations and the biomass compositions, and also affects the carbon cycling in the surface ocean. It is important to clarify the carbon export flux in order to understand the carbon cycling mechanism in the upper ocean. ^{234}Th ($t_{1/2}$= 24.1 day) was used as a tracer to investigate the scavenging and export fluxes of particle transport processes. Seawater and settling particle samples were taken from the surface to the depth of 200m during five cruises aboard the R.V. Mirai of JAMSTEC. And the particle fluxes and the POC export fluxes using ^{234}Th have been surveyed in the western and central equatorial Pacific since 1999.

Results and Discussion

High particle fluxes and high POC export fluxes using ^{234}Th were observed in the central equatorial Pacific (160W) during the cold phase of the ENSO event in 2003. The boundary in the warm pool in the western Pacific and the upwelling area in the equatorial Pacific was recognized near 160E. The total mass flux and POC/ Th-234 ratios in the settling particles were shown 1580 mg/m^2/day and 0.0067 mmol /dpm in the depth of 200 m. This total mass flux was 3-4 times higher than that in another station during this survey. The ratios of POC in the settling particles and thorium could not recognize the large difference in this area. The C/N ratios in the settling particles were higher than those in the suspended particles in the station that the high particle flux was observed. It is thought that the change in the C/N ratio is the higher abundance of fecal pellets and detritus presenting higher C/N ratios(R. Anadon et al., 2002). Although the estimated export fluxes of POC from 1999 to 2002 ranged from 1.0 to 10 mmolC/m^2/day in this area, this flux was shown about 30 mmolC/m^2/day on January 2003. It is considered that the different of the POC export fluxes are attributed to cause by the compositions of particle matter and the plankton species.

References

R. Anadon, F. Alvarez-Marques, E. Fernandez, M. Varela, M. Zapata, J.M. Gasol, D. Vaque., (2002). Deep-Sea Res. II, **49**, 883-901.

Amino acid chronology of molluscan shell fossils in raised beach deposits along the east coast of Lützow Holm Bay, Antarctica.

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The timing of variation of topography at the coastal area along the Lützow Holm Bay, Antarctica is recorded in molluscan shell fossils. Molluscan shell samples were collected in Lake Zakuro of Langhovde and in Kainohama of East Ongul Island, in raised beach deposits along Lützow Holm Bay (Fig.1).

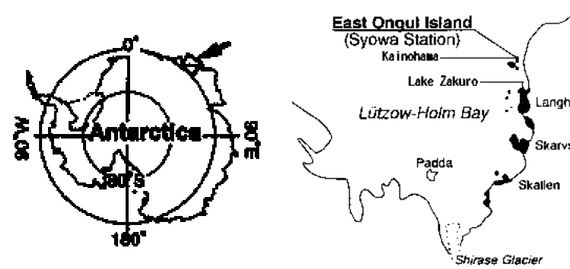

Fig.1 sampling location of molluscan shell fossils

^{14}C ages of molluscan shell fossils indicated that divided into 2 groups (<10 kyrBP, >30 kyrBP). Amino acid chronology is based on the racemization reaction that follows a first-order kinetic or parabolic models at a constant rate with time, given that the sorrounding temperature is constant. Aspartic acid (Asp) is one of the most useful amino acids to estimate the geological ages beyond the range of ^{14}C method (>50 kyrBP). The D/L ratio of Asp were compared with the ^{14}C ages (Table 1). The oldest ^{14}C age of molluscan shell, 42,840 ± 930 kyrBP is almost estimation limit for ^{14}C chronology, and the real deposit age of this molluscan shell estimated by Asp chronology might be older. In the presentation, we will show the Asp age by using an Ahrenius plot obtained by a heat experiment of molluscan shell.

Table.1 D/L ratio of Asp and ^{14}C age of molluscan shell fossils.

Sample code	Locality	C^{14} age Error	Species	D/L of Asp
951224-1-a	Lake Zakuro	3,480 ± 70	*L. elliptica*	0.0442
960206-1-c	Kainohama	35,320 ± 520	*L. elliptica*	0.397
960206-1-d	Kainohama	32,320 ± 220	*Worm tube*	0.348
960206-1-g	Kainohama	35,200 ± 330	*L. elliptica*	0.336
960206-1-i	Kainohama	37,740 ± 490	*L. elliptica*	0.371
960206-1-k	Kainohama	35,160 ± 350	*L. elliptica*	0.328
960206-1-r	Kainohama	42,840 ± 930	*L. elliptica*	0.547