

Sedimentary environment during 3000 years recorded in the piston core sediments of Beppu Bay, central Kyushu, Japan

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Beppu Bay is located at the northeast end of the region called the Beppu-Shimabara graben (Matsumoto, 1979) in the central Kyushu, Japan. According to Itoh et al. (1998), the formation process of Beppu Bay region is divided into two stages (Stage 1 and 2); especially pull apart basin started in Stage 2 after 1.5Ma and has been subsiding. Therefore continuous thick sediments of terrigenous, chemical/biogenic and cosmogenic/volcanogenic origin were deposited. The continuous analysis at the close interval is important to recognize a change of the sedimentary environment and the event sediment which affects the age depth model. We examined sedimentary environment of the bay using piston core (BP09-3) which were obtained in the southern part of head of the bay. In the southern part of the bay, high accumulation rate and high preservation potential are expected because here is the place the deepest part in the bay and is reductive sedimentary environment.

Piston core was about 9m length, and firstly soft X ray CT scanning, a magnetic susceptibility measurement and a color profile measurement were carried out. We cut piston core into pieces every 2cm and got 457 samples. The samples were fractionated by a mesh cloth. The particle composition was considered using the particle of very fine sand (3-4phi) under the polarization microscope. The particle was classified in heavy mineral, light mineral, volcanic glass, diatom, plant particle, rock fragment and others and were counted more than 200 particles. The age depth model used the model in Kuwae et al.(2012) which was decided using the multiple cores in the same point.

The core mainly consisted of mud, and accumulation rate was 230-300cm/ky. Marine diatom particles were observed in all samples and occupied more than 90% in some cases. The abundance ratio of diatom decreased and rate of particle excepted diatom increased at some horizons, and the composition changed abruptly. We call a series of samples with abrupt change of composition "event sediment". "Event sediment" was commonly revealed as increasing of abundance of coarse sediment, and some case without the change of a particle size. "Event sediments" has different grain composition.

Many diatom particles are included in the sediment, and diatom is main deposits in the very fine sand fraction in a common bay environment. It is considered that the decrease of abundance of diatom grains was diluted by "event sediment" because the abundance of diatom has a negative correlation with that of volcanic glass. Since the event sediment is detected from a sample without a remarkable particle size difference, not only the particle size but also the composition is important to examine the event sediment. The difference in the composition of each "event sediment" is related to source of particles, and also vertical change by particle type may be reflected the behavior of each particle type in transportation and sedimentary process. The frequency of the event sediment is different during 3,000 years. We need discuss on the type of "event sediment" from the viewpoint of type of event such as earthquake, flood, volcanic fall, turbidite and etc.

Keywords: Beppu Bay, sedimentary environment, event sediment, holocene, grain composition