Changes of the watermass condition in the innermost part of the Kagoshima Bay for the past 11000 yrs.

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Bulk samples (a cube of one-side 25 cm) of fossil shells were collected from the Moeshima Shell Bed at three locations in order to discuss statistical data and the community structure. Consequently, the most dominant species in this community is Neopycnodonte musashiana and it represents 80 percent or more of the whole community, and it has very simple community structure characteristic to the inner bay.

The both previous knowledge,most species is pelagic and their living depth are deeper than 100 m were recognized again. Size frequency distribution, living position of shells, and articulation ratio were examined. The result indicates that this shell bed was autochthonically formed at about 4,700 yr BP.

In order to investigate the conditions of the watermasses, oxygen and carbon stable isotope analyses of the shells selected from three horizons were carried out: the Moeshima Shell Bed (about 5,700, 4,700, and 2,000 yr BP), the Moeshima Silt Bed (about 11,000 yr BP), and the Holocene. Results of the oxygen stable isotope ratios can be used as a geologic thermometer (Urey, 1947, etc.). In this study, the paleo water temperatures were calculated based on the oxygen isotope ratios, and the paleo water depth was determined from the comparison between the calculated value and vertical distribution of the water temperature in the innermost part of the present Kagoshima Bay. Consequently, the palep water depth three main species in the Moeshima Shell Bed was determined to do about from 100 to 150 m, and it is well conformoble with the results whose species composition indicating their living depth are deeper than 100 m.

The carbon stable isotope strongly suggested the influence of pelagic seawater to the Moeshima Shell Bed (during about 6,000-2,000 yr BP).

The isotope ratio of the shell in the Moeshima Silt Bed was lower than one of the Moeshima Shell Bed. This result suggested that the influence of pelagic watermass at about 11,000 years ago was very weak, but became very strong during about 6,000-2,000 yr BP, and became weak towards the present again.

These results indicate the following geological history and environmental changes. At least about 11,000 yr BP, the seawater penetrated to the Aira Caldera. Since this was a transgression period, the sea area of the innermost part of the bay was very narrow, and the influence of the pelagic watermass was small. However, at about 6,000-2,000 yr BP, which became the age of sea level high stand, pelagic watermass (a Kuroshio Current branch) flew into the innermost part of the Kagoshima Bay, and a large quantity of the pelagic watermass provided new nitches for the pelagic community. Then, at about 2,000 yr BP, the influence of pelagic watermass was faded, and the pelagic species disappeared from the Kagoshima Bay. The enlargement of Sakurajima may also have promoted this. The influence of the pelagic watermass is still small now. This result shows good an agreement with the opinion by Matsushima (1989) who argued the strength of the Kuroshio Current was the maximum about 6,000-2,000 yr BP.