Reconstruction of Holocene environmental changes by diatom analysis in the Nobi plain, central Japan

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To predict the impact of sea level rising on coastal lowlands, it is important to clarify the past changes of coast environments during the sea level rising period. This study analyzed diatom assemblages obtained from four sediment cores drilled in the Nobi plain to reconstruct the post glacial sea level changes for the last 10000 years with high resolution time.

The Kiso, Ibi, and Nagara rivers flow southward in the Nobi plain. These rivers supply much amount of sediments to the plain which has subsided at the rate of around 1 m/ka during the Quaternary. Because of the high sedimentation rate, it is highly possible that the sediments store without wash away in the basin. This study used four sedimentary cores named YM-1, KZN, NK-1 and SB whose distance from the sea are 5km,18km,18km,and 22km,respectively. Detailed sedimentation curves for these cores have been studied based on many ^{14}C calibrated ages (Ogami et al., 2006).

Silt and clay beds of the four cores were sampled at about 2 m interval of core depth. Prepared slides were made from these samples by smear slide method. Number of sample is 7 for YM-1, 21for KZN, 11 for SB, and 8 for NK-1 cores. About 200 diatom frustules were identified and were divided into 4 groups of Fresh, Fresh-Brackish, Blackish-Marine, and Marine for each individual samples.

From the beginning of Holocene to about 8000 cal yrs BP, the change that Brackish-Marine species dominated Fresh species was observed in four cores at the same time. This change means rising salinity probably due to marine transgression controlled by glacial eustasy. During the 6500-6000cal yrs BP at SB and NK-1, 2500-2000cal yrs BP at KZN, Fresh species dominated Blackish-marine. These changes mean marine regression by delta propagation. Although these changes happened at different timing depending on location, these changes have similar processes. At YM-1, Fresh, Fresh- Brackish species increase from 2000 to1200cal yrs BP, at 1100cal yrs BP, Marine species increased. There are rhythmic changes of marine abundance ratio at KZN from 9000 cal yrs BP to 2500cal yrs BP. These changes may record past seismic subsidence event or eustatic sea level. Fresh species ratio is below 5% at KZN and NK-1 , while no less than 10% almost all the time at YM-1 and SB. This suggests marine influence become weaker due to the fresh water discharge of the Kiso, Ibi, and Nagara rivers as move to inland areas even when the marine transgression was the maximum.