

Paleoenvironmental history during the last 2,000 years in Lake Hamana, Shizuoka prefecture, central Japan

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Lake Hamana, located at the western end of Shizuoka prefecture, is a coastal lagoon lake with a area of 64 km². In Lake Hamana, seawater inflows from the channel of about 200 m wide at the Imakiriguchi on the south side, and freshwater inflows from a river such as the Miyakoda River. The sandbar of Lake Hamana was damaged by tsunami in Meiou Earthquake in AD1498 and the storm of the following year, and the Imakiriguchi channel is formed (Ikeya et al., 1990 ; Minami et al., 1990). The purpose of this study is to collect cores at Lake Hamana, and to discuss the paleoenvironmental history of Lake Hamana during the last 2,000 years.

In this study, 16Hm-1C, 2C cores in the deepest site (water depth:11.6m) of of the northern lake basin of Lake Hamana and 17Hm-3C, 4C cores in the site (water depth:6.5m) of Inasa- hosoe of Lake Hamana were collected.

In 16Hm-1C, 2C and 17Hm-3C, 4C cores, the upper part of the cores were composed of mud with lamination, and the lower part is mud with bioturbation. As a result of CNS element analysis, Total organic carbon (TOC) content of 17Hm-3C, 4C cores varied between 0.9 and 4.5% and total nitrogen (TN) content varied between 0.1 and 0.5%. The variation of TOC contents show almost synchronous change with 16Hm-1C, 2C core, however values was lower by 1 to 2% in the upper part. This is due to the fact that the site of Inasa-hosoe is strongly influenced by rivers compared with the northern lake basin of Lake Hamana.

Total sulfur (TS) contents show the cyclic change between 1 and 5% in 16Hm-1C, 2C cores, and between 0.1 and 3.2%.

AMS ¹⁴C dating was performed in the 8 hrizons of 16Hm-1C, 2C cores. The 17Hm-3, 4 C core seems to indicate a similar age with 16Hm-1C, 2C cores from lithology and synchronism of analysis results. Judging from the TS contents, the paleoenvironment of Lake Hamana show the freshwater-like lake from AD 200 to AD 400 years, and after that it is a brackish lake. During this time, the TS contents in the 16Hm-1C core shows the more than 0.7%, indicating a value that is not fresh water. In contrast, the 17Hm-3C core shows the less than 0.2%, indicating a value that is fresh water condition. It seems to be a oligohaline water lake showing the stratified structure due to the difference of water condition by different depth. After this time, the water column in Lake Hamana have a thick bottom water showing polyhaline water. However, the condition of surface water was suggested freshwater from diatom fossils until Meiou Earthquake in AD1498 (Sato et al, 2016). In the Meiou Earthquake, the surface water dramatically changed, but the bottom water did not change significantly.

Keywords: Lake Hamana, paleoenvironmental analysis, Total Sulfer contents

