

Geochemical record in the northern East China Sea during the Late Pleistocene

H. KAWAHATA^{1,2}, M. NOHARA¹, K. AOKI¹ AND H. SHIMIZU³

¹AIST, Tsukuba-higashi 1-1, Ibaraki 305-8567 Japan (h.kawahata@aist.go.jp)

²Graduate school of Tohoku University, Aoba, Sendai 980-8578 Japan

³Hokkaido University, N10W8, Sapporo 060-0810 Japan

In order to understand fluctuations in terrestrial and marine environments influenced by the East Asian Monsoon during the last 42 kyr, we investigated contents and MARs of 19 inorganic elements with carbonate, organic carbon and total nitrogen contents in core MD982195 collected from the northern East China Sea (ECS), one of the largest marginal seas in the world. Based upon correlation between each element in content and MAR, these elements were classified into four groups: 1) biogenic organic matter (OC, N), 2) biogenic calcareous material (Ca, Sr), 3) lithogenics more associated with ash (Ti, Al, Na, K, Y), 4) lithogenics less associated with ash (Fe, Mg, Be, Co, Cr, Cu, Ni, Zn), and 5) the other elements (Mn, P, Ba, Cd, Li, Y). Contents of biogenic calcareous material were closely correlated with sea surface temperature (SST) in this area. On the other hand, lithogenics less associated with ash showed relatively high values in Pollen zones MD2195-2 (40.5-17 ka) and -3 (17-14 ka), which generally corresponded to low SST period. This was consistent with pollen data previously reported by Kawahata and Ohshima (2003), showing that high abundance of nonarboreal pollen in Pollen zones MD2195-2 and -3 was attributed to reduced distance, exposed continental shelf and ocean current system. Climate could begin to warm up in Pollen zone MD2195-3, when the contents of biogenic calcareous material increased. Organic carbon and nitrogen were more abundant in Pollen zones MD2195-4 (14-8 ka), which was characterized by sharp decrease in abundance of nonarboreal pollen due to rapid transgression.

References

Kawahata, H. and Ohshima, H. (2003) Global and Planetary Change, in press.

The primary cause for recent increase in iron concentration of Bandaiko hot spring, Gunma, Japan

SATOSHI KAWAI*, YOSHIKAZU KIKAWADA AND TAKAO OI

Faculty of Science and Technology, Sophia University, Tokyo, Japan (*sa-kawai@sophia.ac.jp)

Introduction

Bandaiko hot spring, the Mt. Kusatsu-shirane area, Gunma, Japan, started its operation in 1970. Its water is highly acidic and the iron concentration is characteristically low compared with those of other acidic hot spring waters in the area. Recently, however, a remarkable increase in iron concentration has been observed. This investigation aims to clarify the cause for this recent increase in iron concentration of the Bandaiko water.

Since the bed of iron sulfides like pyrite exists near Bandaiko hot spring, the most plausible cause for the iron concentration increase seemed the oxidative dissolution of iron sulfides. We measured the arsenic concentration of the Bandaiko hot spring waters by the neutron activation analysis to obtain a supporting evidence for our speculation, since arsenic usually accompanies iron sulfides.

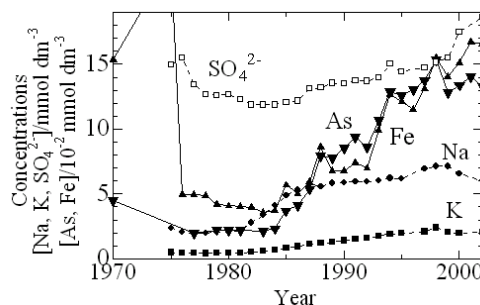


Fig. 1 Secular changes in concentrations of dissolved components in Bandaiko hot spring water since 1970.

Results and discussion

The secular change in arsenic concentration of the Bandaiko hot spring water since 1970, together with those of other selected components, is shown in Fig. 1. As can be seen in the figure and has been expected, the secular change pattern of the arsenic concentration is similar to that of the iron concentration and evidently different from those of sodium and potassium concentrations. Although the concentration of the sulfate ion should increase upon the oxidative dissolution of iron sulfides, it is not very clear compared with those of iron and arsenic. This is because the majority of sulfate ion is considered to be supplied by the volcanic activity of Mt. Kusatsu-shirane.

Conclusion

The primary cause for the recent increase in iron concentration of Bandaiko hot spring water is most probably the oxidative dissolution of iron sulfide minerals.