

Reconstruction of tsunami and paleoenvironment by diatom analysis in eastern Hokkaido

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Eastern Hokkaido is a severe Earthquakes and Tsunamis district occurred at Kuril trench in Pacific Ocean. The documents of them are only after 19th centuries because of settlement. However, some vestiges of the earthquakes bigger than records in the documents were found by sedimentological research in eastern Hokkaido. The intervals of the huge earthquakes are estimated about 4-500 years. The last event occurred in 17th century, so the next one will occur in near future.

There are many wetlands and marshes which have been protected and preserved in a natural state so their sediments record the paleoenvironmental history such as changes of vegetation, climate and some events. The wetlands and marshes were sometimes covered with a sand layer which is not a normal sediment, but a tsunami deposit. The analysis to the cores of these areas can reconstruct a paleoenvironmental history and tsunamis.

In order to analyze these sediments and reconstruct history, researchers often use diatom analysis. Diatoms are phytoplankton living in almost all aquatic areas and their species are different in each environment owing to their sensitivity to the quality of the water. Therefore, diatom analysis enables us to recognize tsunami deposits in lagoons and inland marshes when we find oceanic and brackish species mixing with freshwater species in the same layer (Soeta et al., 2004).

We analyzed the core sample from Lake Harutori-ko located in southeast of Kushiro city, eastern Hokkaido. The core bored at the deepest part of the lake and recorded an environmental history for 9500 years in the length 15.4 m. It contains 22 tsunami deposits and non-glacial varve. Conclusions are below.

1. Lake Environment was changed from inner bay to lagoon, inner bay, lagoon and brackish lake in order. Earthquakes, tsunamis and diastrophisms would have been related to these changes.
2. The result of analysis in tsunami deposit show that brackish species exceed to marine diatoms. In spite of abundant production of marine diatoms in the survey near beach (Soeta et al., 2004), the result of this study indicates that the diatom contents in tsunami deposit would have changed gradually by the distance from the sea.

References

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