

Investigation of tsunami disasters using lake kitagata sediments

*kotoaro kinugawa¹, Noriko Hasebe¹, Junko Kitagawa³, Kota Katsuki², Keisuke Fukushi¹

1. Kanazawa University, 2. Shimane University, 3. Fukui Prefectural Satoyama-Satoumi Research Institute

After tsunami disaster caused by the 2011 Tohoku-Pacific Ocean Earthquake vigilance awareness of tsunami has increased in Japan. Many large-scale tsunami disaster in Japan occurred in the Pacific Ocean side originated from earthquakes along the Japan trench or Nankai trough. According to the past history written in documents and existing geological records, large-scale tsunami occurred in the Sea of Japan side. Therefore, we reconstructed past tsunami records focusing on the coastal areas, especially in the Hokuriku region. Generally tsunami deposits have sedimentary structures such as lamina, coarse grain size, and rip up clast (Sawai 2012). However, because of the beach ridge and expected small scale of Tsunami in the Sea of Japan side, clear tsunami sedimentary structures can be found only at limited locations in Hokuriku. Therefore we tried to detect tsunami deposit by measurement of physical quantities and observation of diatom. This study analyzed the lake sediments from Lake Kitagata, Fukui Prefecture. The advantage of analyzing lake sediments is good age resolution due to higher sediment accumulation rate than ocean sediment.

We discovered two doubtful layers of tsunami deposit. The layer of depth 170 to 203 cm shows a decrease of water content, coarse mineral grain size ($\Phi < 7$), and increase in calcium carbonate. A lot of seawater species diatom is found in this layer. This layer was deposited around 1450AD, when no historical tsunami record in Hokuriku was reported in historical documents.

The layer of depth 344 to 352cm also shows increase in calcium carbonate, decrease in water content and coarsening of mineral particle size. Diatoms observation confirms seawater species of *Actinocyclus gallicus* in spite that the kitagata was freshwater lake at that time. Dating results indicates this layer corresponds to around 700AD, so that we considered this layer deposited by Taiho tsunami that have occurred 701 AD from historical document record.

Keywords: lake sediment, tsunami, diatom