

Necessity to distinguish Neogene diatoms from living and dead assemblages at the Toberi river mouth area, Hokkaido, Japan: A strategy for the paleo-tsunami research

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In order to reveal the distribution of living diatom assemblages including *Pseudopodosira kosugii* and Neogene marine diatoms such as *Denticulopsis vulgaris* in the Toberi river mouth area, for paleo-environmental reconstruction such as paleo-sea level changes and paleo-tsunami researches, we conducted the ecological survey in 17 sites at the area and collected the one Taiki Formation sample (Neogene diatomaceous massive siltstone deposited in marine environment) distributed in around the area.

As a result of this study, we recognized the distribution of *Pseudopodosira kosugii* in a very small tidal-wetland with any other freshwater and freshwater-brackish pieces. This tidal-wetland was located and formed at the low tide to spring high tide level of Tokachi area. The pH show Neutrality-weak acid. Salinity of this area was lower than 1 ‰ and grain size of bottom sediments were sandy-mud to peaty-mud. We recognized the habitat segregation of freshwater, freshwater-brackish and brackish-marine diatoms in no vegetated, very low salinity environment formed upper MTL. *Pseudopodosira kosugii* distributed in sandy mud - mud sediment area formed around the high tide level. This results support to former study. This study area is formed with the influence of anthropogenic effects, however, the tendency of the distribution of *Pseudopodosira kosugii* is similar to reports of previous studies. Therefore, it was felt that this data would be important for paleo-environmental study including paleo-seismological and paleo-tsunami studies.

On the other hand, a few Neogene marine diatoms such as *Denticulopsis* spp. including *D. vulgaris* were recognized in all study sites. It is highly possible that these extinct diatoms were derived from Neogene marine deposits such as the Taiki Formation and Mudstone Member of Okawa Formation by the Toberi river flow. Taiki Formation is widely distributed in the area around the study site and consists of diatomaceous massive siltstones (with sandstone and tuff). In Hokkaido, the Neogene extinct species of the Holocene and late Pleistocene deposits have been found in the Holocene deposits. Therefore, when counting fossil marine diatoms for the purpose of inferring paleo-environments, the possible presence of reworked extinct diatoms needs to be considered. All marine diatoms should be classified as belonging to either a modern species or an extinct species before paleo-environments are reconstructed by diatom analysis.

Keywords: Modern diatom assemblage, Reworked Neogene diatoms, Toberi River mouth area, Hokkaido