

Diatom Assemblages in Lacustrine Sediments of Lake Tazawa, Akita Prefecture, Northern Japan

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Paleo-environmental histories at Lake Tazawa were presumed by diatom assemblages from two sediment cores at the center of the lake. Lake Tazawa (Tazawa-ko), Akita prefecture, northern Japan, is a caldera lake, and is the deepest lake in Japan (surface area: 25.8 m², surface elevation: 249 m, max depth: 423.4 m). It was an oligotrophic and neutral lake until 1940. But two water tunnels were constructed in 1940 and very acidic hot spring water from Tamagawa Hot Spring flew into the lake. Therefore, the lake had become acidic. The lake acidification caused extinction of *Oncorhynchus kawamurae* (Kunimasu), a species of salmon endemic to Lake Tazawa. The neutralization plant was constructed in 1991, however water quality criteria (pH=6) has not yet been achieved. This study focused on the water environmental changes since 7000 years ago and influence of the lake acidification.

In TZW15-1 core, *Cyclostephanos tazawaensis* and *Discostella* spp. were abundant in whole the core. These species are freshwater planktonic species and indicates the lake has been a freshwater lake in the past 7000 years. *Discostella* spp. increased in 500-4000 years ago, however the detail of the environmental change was not cleared. Changes of diatom assemblages was not found at the top of the core, implying that the top of core is missing.

Surface core includes water condition changes since 1940. Diatom assemblage at the bottom of the core was similar to TZW15-1 core, indicating water environments before the lake acidification. At 17 cm core depth, *Eunotia* spp., *Surirella* spp. and total sulfur (wt%) increased by inlet of acidic water in 1940. *Eunotia exigua* is abundant in Tamagawa River, so its occurrence in the surface core samples indicates that part of *Eunotia* spp. was carried through water tunnel. Decrease of total sulfur at 8 cm core depth should correspond to the construction of neutralization plant, however diatom assemblages of pre-acidification have not yet recovered.

Keywords: Lake Tazawa, Diatom assemblage, Acidification