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Detection of invisible microtephra traces for Lake Ichi-no-Megata sediments using high-resolution major element analysis

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The volcanic ashes layer records correct time when a volcano erupted. Therefore it is very important that we detect tephra. Our purpose is to detect the tephra which we were able to detect with neither observation by the naked eye and magnetic susceptibility from the profile of the Na/Al ratio in core sediment from lake. In comparison with lake sediments, there is very much content of the sodium of volcanic glasses included in tephra. We can detect tephra from the profile of Na2O/Al2O3 ratio. The analysis of inorganic chemical composition using ICP-AES and magnetic susceptibility performed on specimens of bulk sediments from a drilled core taken from lake Ichi-no-Megata in Akita prefecture. As a result, we clarified that there was To-a tephra from the profile of Na2O/Al2O3 ratio. In this core, To-a tephra was invisible to the naked eye, and cannot detect using magnetic susceptibility. A value of the means of the Na/Al ratio in lake Ichi-no-Megata drilled core samples is 0.074?0.024(2sigma), and a value of the Na/Al ratio in volcanic glass included in To-a tephra is 0.31. If volcanic glass included in To-a tephra in this drilled core samples is included more than 9% on the basis of density, we can detect To-a tephra. The value of the Na/Al ratio of lake Ichi-no-Megata drilled core samples and the value of Na/Al ratio of North American shale composite (NASC) and Post-Archean Australian average Shale (PAAS) known for average composition of continental crust show a very near value.

Therefore we can adapt ourselves to the area except Japan if we have the value of the Na2O/Al2O3 ratio at the same level as Japanese tephra.

Keywords: microtephra, Lake Ichi-no-Megata