

High precision radiocarbon dating of marshland sediments using peat samples

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Peat deposits developed in marshland are easy to measure radiocarbon dating. However, peat samples have uncertainty in estimating age that the source of carbon supply is secondary because the organic matter used for analysis is not the body of the living being but the substance decomposed and transformed of the biological bodies. In anaerobic environments where peat is deposited, biological disturbance hardly occurs, and the deposition rate often does not change much. Also, even if the deposition rate changes, according to the law of superposition, so that it is possible to obtain a sample with sufficiently shorter chronological intervals than the fluctuation cycle of radiocarbon concentration.

In this study, we examined the highly accurate radiocarbon dating of marshy sediments using peat samples, using samples in drill cores collected at the Saruto River Marshland in the northern part of Hokkaido. In addition to the bulk peat sample, plants and aquatic plants were used for dating samples. The AMS ¹⁴C age was measured by the single stage accelerator mass spectrometer owned by the Analytical Center for Environmental Study, Atmosphere and Ocean Research Institute, The University of Tokyo.

In the age analysis of algae, it is presumed that the research area was the brackish water area, so the old salinity concentration (Sagayama et al. 2018) restored by the diatom analysis from the core sample obtained from the same wetland. By using the brackish water environment to estimate the contribution rate of the reservoir effect of sea water and atmosphere, we confirmed the possibility that the calendar age can be estimated accurately.

In this presentation, we will discuss the possibility of high precision radiocarbon dating of marshy sediments using peat samples, taking samples in boring core taken at Sarutake River Marsh as examples.

Keywords: AMS, Radiocarbon dating, Peat deposits