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Development of a method to extract and date of carbonised material in pottery: Research aimed at overcoming the issues of marine reservoir effects in Hokkaido, Japan

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The purpose of this study is to establish a method for extracting charcoal from inside pottery and measuring its radiocarbon date. We proposed a new method that uses X-ray equipment to search for carbonised grains embedded within earthenware and directly date these grains in relation to grain cultivation in the Japanese archipelago [1]. This method allows us to obtain data on the introduction of crops without contamination, even from archaeological sites where flotation was not conducted or carbonised grains have not been detected. It is also possible to clarify the relationship between grains and associated pottery types.

In this presentation, we report an analysis of Kouren-4 site (Early Jomon period in Hokkaido, Japan) using this method. The dates of charred residues on pottery in Hokkaido can be compared with charcoal, providing data that is several hundred years older. Estimated age difference were caused by marine foods which might reflect the upwelling of old sea water for western part of North Pacific. We present the radiocarbon dates for the carbonised materials in the pottery (insects, seeds, twigs, etc.) to approximately 4700-4900 BP. These dates were several hundred years newer than the charred residues on the pottery. This new attempt is expected to overcome the issues of marine reservoir effects.

References

[1] Obata, H. and Kunikita, D. 2022 A new archaeological method to reveal the arrival of cereal farming: Development of a new method to extract and date of carbonised material in pottery and its application to the Japanese archaeological context. *Journal of Archaeological Science* 143, 105594.

Student Submission

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