

【Grant-in-Aid for Transformative Research Areas (A)】

Section I



Title of Project : Excavating earthenware: Technology development-type research for construction of 22nd century archaeological study and social implementation

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【Purpose of the Research Project】

Modern society is a society based on agriculture. In the Old World, humans began growing wild plants about 10,000 to 8,000 years ago. In Japan as well, grains such as rice and foxtail millet were introduced in about 3,000 years ago from the Korea, and after thousands of years, the society shifted to a full-fledged agricultural society named Yayoi Culture. However, recent archaeological studies have revealed that plant cultivation was actually already carried out by the Jomon people about 7,000 years ago. This was clarified by the traces of seeds and insects remaining in the earthenware, and this investigation method is called the "impression method". The method has brought several discoveries that have significantly changed the existing view of history.

For further development of the study, this project uses the latest X-ray and AI technology to detect organisms and processed plant products in earthenware at the maximum that eloquently tell the accurate history of plant cultivation and agriculture that archaeologists have not noticed so far. In addition to exploring the accurate time of agricultural transmission, we will challenge the human proposition of "what did agriculturalization bring to humankind?"

【Content of the Research Project】

In this project, we "excavate" the earthenware discovered around Japan and detect new information using the latest scientific technologies. While deriving the answer to the proposition mentioned above, we will construct a new world-class archaeological material science "Earthenware Comprehensive Analysis" toward the 22nd century. To achieve the purpose, we prepared five interdisciplinary research groups. Each group conducts cutting-edge development research in each group and to obtain more

effective results. We systematized the research organization that is jointly analyzing the basic materials supplied by the A01 Group. The A01 Group plays a key part in the research project of digging out analytical samples using X-ray equipment and supplying them to each group. This group aims to develop more effective detection method and species identification method using AI. The A02 Group is a group that establishes new morphology, where experts in botany, entomology, pharmacy, and conchology gather. The A03 Group mainly focuses on identification of plant-based temper using X-ray CT device and phytolith analysis for temper. The B01 Group is a chemical analysis group that dates trace carbons and analyzes lipids. The B02 Group explores the more accurate relationship between the dates, the pottery type, and cultivated plants on the chronology.

【Expected Research Achievements and Scientific Significance】

We attempt to extract and analyze new information on the history of plant cultivation (agriculture and settlement) and its impact on humankind from earthenware. It is a new academic field named the "Earthenware Comprehensive Analysis". Answering the human historical proposition by the studies in this field will lead to a historical evaluation of modern human society based on agriculture. In terms of social needs, by providing a new analytical method to the archaeological society, which is shrinking now, new capital investment and employment will be created. Additionally, it may contribute to develop the academia of archaeology in Japan. Then, by showing the results as a concrete research model to other countries, the world scale demand can also be expected.

【Key Words】

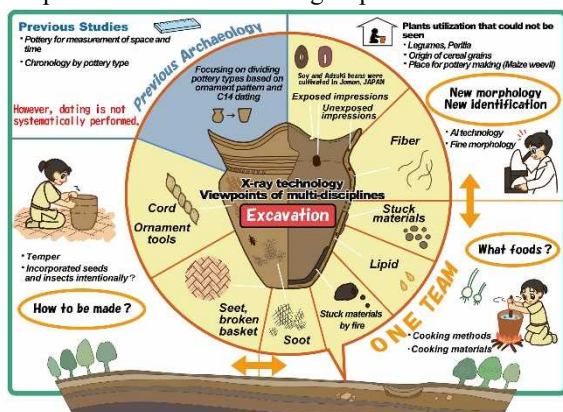
Earthenware Comprehensive Analysis: Analytical studies to extract the correct and new information from earthenware by collaboration of archaeology and advanced sciences and technologies

【Term of Project】 FY2020-2024

【Budget Allocation】 379,700 Thousand Yen

【Homepage Address and Other Contact Information】

<http://www.fhss.kumamoto-u.ac.jp/archaeology/earthenware/>



Conceptual view of the study and methods