Underwater geoarchaeological research at the coastal area of Kochi prefecture to reveal the traditional tale of "Kurodagori"

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Historical records and oral traditions mention submerged villages and buildings due to great natural disasters along the coast in Japan. For instance, 1498 Meio Tokai Earthquake induced the submergence of local villages at southern area of Lake Hamanako, 1585 earthquake caused a subsidence of villages at West Nagahama, and 1888 volcanic eruption of Mt. Bandai submerged a local village into a lake. A traditional tale about a village named Kuroda-gori, which was probably submerged during the Hakuho Nankai earthquake of 684 CE has been passed down orally. To reveal the tales of Kurodagori, academic and private researches had been carried out at multiple sites along the coast of Kochi Prefecture. However, the previous research did not record the results and data clearly, therefore it is difficult to understand what they discovered about Kurodagori.

Therefore, Kochi University and JAMSTEC launched the new project to reveal the mystery of Kurodagori from 2013. The project performed underwater survey at 6 sites along the coast of Kochi Prefecture (Tochi, Nomi-bay, Urano-uchi bay, Okitsu, Tsumajiro, and Kashiwajima). Unfortunately, we did not find any evidence of Kurodagori at all 6 sites until now. On the other hand, the project treats underwater artifacts as potential records of natural disasters, therefore this project may contribute on the understanding of historical natural disasters at Kochi prefecture. A summary of the project and detail of the preliminary results at three sites (Nimi-bay, Tsumajiro, and Kashiwajima) are introduced in this presentation.

Heshima remains (Yayoi period: 300 BC to 300 AD) are found at Heshima Island located at southern parts of Nomi bay, and there are many local witnesses of a drinking well at the seafloor near Heshima Island. Therefore, Nomi-bay has been thought as the most promising candidate site of Kurodagori. Our research discovered the very flat abrasion platform that has 200 m width. Therefore, we may estimate the history of co-seismic subsidence at this area by dating of the platform.

Nearly 30 stone pillars, that appear artifacts, were observed on seafloor at Tsumajiro beach, Tosashimizu city. Our study discovered that the pillars were used as stone works (stone step and building stone foundation) at local village nearby the coast. Moreover, historical earthquake tsunami wave and water flood by high tides contributed on the transport of the pillars from inland to seabed.

A 200 m long stone wall, that is composed of boulders and matrix and appears as a stone bank, are observed at the northern coastal site of Kashiwajima at Hata county. The underwater wall is located along the coastal line that is parallel to the old stone bank in Kashiwajima village (constructed by the director Kenzan Nonaka), therefore, local citizen considered the wall as the submerged stone bank. However, dating and mineral composition data of the stone wall suggest that the wall is probably beachrock. Beachrock is an intertidal deposit forming in the zone where carbonate saturated meteoric and marine water mix, therefore, the history of the submergence by earthquakes at this site can be approximated based on the dating of beachrock.

This project introduces new idea to evaluate the record of the historical natural disasters based on the underwater structures and artifacts.

Reference

A review on estimation of subsidence records of Nankai earthquakes from the tradition of the submerged village "Kuroda-gori", Rekishi Jishin, 31, 17-26