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Last 10,000 years variation in phosphorus supply to a coastal region in a western Japan

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Some enclosed seas have a eutrophication issue, most of causes is due to anthropogenic supplies such as agriculture or human waste. But it is necessary to consider the background value or geological stock of nutrient in coastal regions. We aimed to confirm the geological stock and supply variation of the phosphorus in an alluvial plain for 10,000 years. Our research area is located on Okayama Alluvial Plain, western Japan. We drilled and collected the boring core of 6m to 19m at 4 sites. The each core was carried out the dating at the 2 depths, using ¹⁴C and volcanic ash. The core at the site of the mountain foot has sandy sediment, whereas another three cores at the coastal side has thick Holocene clay layer. The high phosphorus contents were found at the Holocene clay deposited in around 6,000 to 8,000 years ago under the sea level rising. These periods had rapid warming trend after the Last Glacial period, the increase of rainfall was also suggested. The increase of rainfall would cause the increase of sediment yield. The organic matters in soil are accumulated more in a headwater areas under the cooler climate because of the low decomposition rate, as compared with warmer climate. Based on the results and general present aspects, such high phosphorus content in the sediment is suggested that the organic matters including the phosphorus accumulated in the Last Glacial Period were eroded in headwaters and supplied to the coastal regions with the enclosed sea during the period from around 6,000 to 8,000 years ago with the warming and humid trend. After that, the organic phosphorus had been gradually decomposed, mineralized and released to the groundwater and sea. Such type of background phosphorus would also control the eutrophication and ecosystem environment in the enclosed sea.