

Luminescence dating of last Pleistocene marine terrace

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The marine terrace formed during sea-level highstand is important to understand the tectonics in the coastal area, Japan. To estimate the formed age of marine terrace is a key to reconstruct the uplift rate which is one of the most important tectonic information. In previous works, there were some uncertainties depending on indirectly age determination based on tephrochronology of terrestrial sediment, distribution of marine terraces in that area and so on. To determine the age of marine terrace directly, Post-infrared infrared stimulated luminescence (pIRIR) dating which can be used for sand samples from Late Pleistocene to present, was applied to the marine terrace. On the other hand, pIRIR signal was also applied to modern beach sands to know the difference of signal stabilities between difference areas and residual dose which was one of the most important factors in pIRIR dating. In seven outcrops of marine terraces of MIS5e, 7, 9 and 11 at Kamikita coastal plain, pIRIR ages were determined by using K-rich feldspar from subtidal sediments. Each age had no age difference between each subtidal facies of same outcrops because of measurement precision. However, considering error range, the average ages of samples from all subtidal facies of same outcrops were relatively concordant with expected ages of marine terrace which were based on Koike and Machida (2001). On the other hand, the luminescence characteristics of pIRIR signal such as signal stability were difference between each sampling area in Japan. This difference influenced the suitable choice of pIRIR protocols which had several differences between measurement temperatures. As a result, it suggested that we could apply pIRIR protocols to other marine terraces in Japan too, considering the signal stability depending on sampling area.

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Koike K. and Machida H., 2001. Atlas of Quaternary Marine Terraces in the Japanese Islands. University of Tokyo Press, ISBN 4130607359 (in Japanese).

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