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History of multi segment earthquake along the Nankai Trough, deduced from tsunami boulders and emerged sessile assemblag

Masanobu Shishikura[1*], Hideaki Maemoku[2], Tomoo Echigo[3], Yuichi Namegaya[1], Asaka Nagai[4]

[1]Active Fault Earthq. Res. Ctr., AIST/GSJ, [2]Hiroshima University, [3]Geo-Reseach Institute, [4]Tatsumi Junior High School

To evaluate the history of interplate earthquake caused from the Nankai Trough, we investigated the distribution and ages of tsunami boulders and uplifted sessile assemblages along the southern coast of the Kii Peninsula.

Near the Cape Shionomisaki, the tip of peninsula, drifted boulders are distributed in scattered pattern on wave-cut-bench at Hashigui-iwa which is known as a scenic site. We considered that the most of boulders have been transported by tsunami because they were not moved by storm in recent 30 years. Littoral organisms such as oyster or barnacle attached on some boulders are a good indicator to reconstruct the history of transportation by measuring radiocarbon date. The ages of them show two concentrated periods of 12th-14th century and after AD 1650. The latter transportation event would be correlated to the tsunami associated with the 1707 Hoei earthquake. Although the former event cannot be specified to historical earthquake, recurrence interval of large tsunami event is inferred to be 400-500 years.

We also observed the evidence of repeated uplift events recorded in emerged sessile assemblage around the Cape Shionomisaki. Some well-developed assemblages are characterized by layered structure composed of several vertical layers. Based on radiocarbon dating result, it can be interpreted that each of the layers has been formed by a usual seismo-tectonic cycle with interval of 100-150 years. A whole of assemblage which was developed during 400-600 years was eventually emerged by unusual large uplift associated with multi-segment earthquake such as the 1707 Hoei earthquake. The recurrence interval is consistent with that of large tsunami event deduced from drifted boulders.

Keywords: earthquake, tsunami, crustal deformation, Nankai Trough, Cape Shionomisaki