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Holocene seismotectonic movement in the Uchibo coast of Boso Peninsula, central Japan, related to the Kitatake fault

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The 1703 Genroku Kanto earthquake (M8.1) and The 1923 Taisho Kanto Earthquake (M7.9) occurred along the Sagami Tough where Philippine Sea plate is subducting under the Eurasia plate, accompanying distinct coastal uplift in the Boso peninsula on the overriding plate. Referring to these crustal movements, Holocene paleoseismology has been deduced from emergent coastal topography analysis. These earthquakes are so-called Kanto earthquakes are thought to be major cause of northward tilting with uplift of the Boso Penisula. However, the coseismic movement was negative at the 1703 earthquake (Shishikura, 1999) and that lead us not to sufficiently understand the height of highest Holocene paleoshoreline (17m asl, Okada, 1995MS) only by the accumulation of coseismic uplift at 1923 type earthquake. We carefully made the recognition of Holocene highest paleoshoreline and radiocarbon-dated shell fossils sampled from emerged sea cave. Combining their results, 2m-DEM-based topographic analysis and fault modeling, we report the latest Holocene paleoseismological table and newly identified type of uplift in Uchibo coast generated by the Kitatake fault as an active fault.

(1)Around ten paleo-tidal levels are recognized in depositional and erosive emergent coastal topographies and their detailed correlation is difficult due to no continuation. Compiling radiocarbon data presented by previous study and this study, isochrones, 7 ka, 5ka and 3ka, were possibly traced.

(2)The pattern of the highest 7 ka paleoshoreline depicts the warping displacement, which is 25 m asl in Tateyama lowland, lowering to 15 m asl in Hota lowland and heightening 20 m asl in Uchibo coast again. Those of 5 ka and 3 ka paleoshorelines have the same tendency, suggesting the accumulation of displacement.

(3)The 2.2m asl abrasion bench just on the Taisho bench is recognizable only in Uchibo coast that shows the probable local tectonics which make the Uchibo coast uplift. Based on the continuity and seismic images, the Kiatake fault is causative for the local uplift.

(4)Calculating elastic dislocation putting the slip on the fault, the following parameters fit in the reconstruction of the last displacement of about 1m uplift along the coast by the movement of Kitatake fault.

Keywords: Holocene, seismotectonics, paleoseimology, Uhibo coast, Kitatake fault