

Outline of the Sukumo core and event deposit related with Kikai Akahoya volcanic ash, southwest coast of Shikoku, Japan

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Recently, coarse event deposits under the volcanic deposits erupted from 7.3 ka Kikai Akahoya (K-Ah) caldera-forming eruption have been reported around southern Kyushu, which have been suggested as tsunami deposit related with K-Ah eruption (Nanayama et al., 2017). Sukumo plane on southwest Shikoku Island is an alluvial plane mainly formed by Matsuda River, which flows into the Sukumo bay facing Pacific Ocean. We drilled 38.5 m-long all-core boring (Sukumo core) from the polder at Nishiki area, Sukumo city near the river mouth of Nishiki-nishitani River, to study the evidence of event deposit accompanied with K-Ah at the coast of southwest Shikoku. As the boring site located at the river mouth of the small valley which has distance as far as 700 m from Matsuda River, the deposits transported by tsunami should not be affected by a large scale erosion by the river and are likely to be preserved. Then, we report the outline of Sukumo core and the event deposit related with K-Ah.

Based on lithofacies, the assemblages of molluscs, corals and ostracodes, with AMS ¹⁴C radiocarbon dating of wood materials, we identified six sedimentary facies as mentioned below in ascending order.

Braided channel deposits (altitude: -36.46 ~ 32.90 m): non-marine deposit consists of angular gravel and silty sand with gravel layers, covering basement rock. The lower part includes cobbles and is poorly sorted. 10,160-9,780 cal BP ages were obtained from the upper part.

River/estuary deposits (-32.90 ~ -26.25 m): mainly consists of alternated beds of sand and gravel layers, including the fragments of wood and charcoal, with radiocarbon ages of 9,500-9,400 cal BP. The gravel layers mainly consist of pebbles and the upper part is rich in mud which includes the shell fragments.

Transgressive inner bay muddy sediment (-26.25 ~ -19.07 m): mainly consists of mud and are rich in the fragments of shell and humus, with radiocarbon ages of 9,000-7,700 cal BP. The upward fining from the underlying sand and gravel layers via humic mud layer to mud disturbed by trace fossils, suggesting that this sediment was deposited in an inner bay related with rising sea level.

K-Ah and its related event deposit (-19.07 ~ -12.56 m): consist of a lower 40 cm-thick angular gravel layer and an overlying reworked ash layer of K-Ah. The gravel layer indicates sharp basement and includes a large amount of angular gravel, the fragments of molluscs, with bubble-wall and pumice type volcanic glass shards in matrix. The rock-reef shell and coral species such as *Chama* sp. and *Cyphastrea* sp., with the ostracode assemblage living in a rock reef under the open sea were found. The reworked K-Ah is mainly composed of volcanic glass shards characterized by planar laminae.

Deltaic inner bay muddy sediment (-12.56 ~ -1.16 m): mainly consists of silt to vfs and disturbed by trace fossils. The lower portion contains molluscan and ostracode subfossils that were reported from inner bay and the upper portion contains brackish water molluscs. 6,800-2,700 cal BP ages were obtained from the lower and upper part.

Tidal flat deposit (-1.16 ~ -0.36 m): consists of a lower pebble layer, with concentration layers of shell fragments and of plant fragments, with radiocarbon age of 430-290 cal BP and an overlying muddy sand and granule layer disturbed by trace fossils.

The gravel layer under the K-Ah is interpreted as an event deposit which has been formed by high energy current that eroded and transported the creatures living in rock-reef and open sea and then deposited them suddenly on the inner bay bottom. The layer is suggested to be deposited after the fallout of K-Ah and before a large scale reworking of K-Ah. Considering the reports of the event deposits under the K-Ah around southern Kyushu and at Oita plain which have been suggested as tsunami deposit (Fujiwara et al., 2010; Nanayama et al., 2017), the event layer under K-Ah in Sukumo core should be generated by tsunami.

Keywords: Kikai-Akahoya ash, event deposit, caldera-forming eruption, tsunami, Sukumo Plane, southwest Shikoku

