

Characteristics of tsunami origin sediments sampled from Hirota and Toni bay around the Sanriku coast, Japan.

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The recent 2011 Tohoku tsunami strongly affected the coastal area of the Pacific coast of Tohoku. Tokai University with JAMSTEC investigated the Tohoku coastal area as a part of Tohoku Ecosystem-Associated Marine Sciences (TEAMS). We got the columnar core samples for give an account of bottom sediment environment and got the character of tsunami origin sediment.

Hirota bay is typical rias coast characterized by narrowing of bay size from bay entrance (6 km) to closed-off section of bay (3 km) and axial angle is northwest to southeast. Toni bay size is comparatively small (east to west angle 6 km and bay entrance 4 km).

The high-resolution sub-bottom profiling shows wide variety of sedimentary facies layer by each bay. These layers are distinguished clearly from basement (underlying) layers.

We got the columnar core using vibration bottom sampler at Hirota (6 station, max length approximately 2 m) and Toni bay (6 station, max length approximately 1 m).

By the result of Hirota columnar core sample, it was seen grading (fine to medium) sand sediment contain the woodchip and shell piece at the surface zone (0-10 cm). Underlying layer (10-50 cm) was seen coarse to medium grained sediment with woodchip and shell piece, and lower part of this layer eroded out the underlying silt layer. We supposed the surface-grading layer with medium to fine sand (0-50 cm) was tsunami origin sediment. The longest (2 m) core was seen coarse to gravel sediment contain woodchip and shell piece (0-20 cm), and it was scraping underlying massive silt to fine sand layer. From 130 cm underlying layer was seen middle to coarse sand sediment again. So, we think that underlying layer sediment (from 130 cm underlying layer) of 2m core has possibility of past tsunami origin sediment.

Characteristic of columnar core at Toni have lamina with woodchip (0-16 cm), grading (fine to coarse) sand sediment with shell piece (16-65 cm). Sand sediment of underlying layer is reddish brown clay, and has erosion between sand sediment (16-65 cm) and this layer.

We were able to estimate that the surface layer with grading structure (fine sand at the surface and coarse sand with gravel from lower part) of columnar core was the sediment gravity flow caused by the tsunami activity.

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