

An estimation and character of flood deposits found in Nishimuka Site along the Ota River in Shizuoka prefecture

*Suzuki Kaito¹, Kondo Masaru¹, Suzuki Daisuke¹, Tsutahara Keito¹, Ina Tomoya¹

1. Iwata Minami High School

1.Motive・Purpose

We discovered a rough sand layer similar to Tsunami Deposits that were found in a preceding study by Suzuki (first name) in 2012 at an outcrop in Nishimuka(fig,1) along the Ota River in Iwata City. But, there is a possibility that sand layer is a flood deposit because the outcrop was located near Ota River. Knowing the sand layer was a deposit we started the study to clarify whether it resulted from a Tsunami or a flood.

2. Means

We made a histogram(fig,2) at three points on the outcrop in Nishimuka and gathered samples of the deposit at 5 centimeters intervals. We painted fluid adhesive on the outcrop and after it dried stripped it off, to acquire a sample. Next, we conducted an analysis of particle size and mineral composition. For the analysis of particle size, we mixed the deposit with water, put it in an Emery tube, then measured the volume that accumulated in a certain period time. For the mineral composition, we dispersed particles using an ultrasonic washing machine, removed minute particles, chose deposits at random and judged the kind of particles present using a binocular stereoscopic microscope, with at least 200 particles analyzed per sample. We classified the minerals into five types, quartz, feldspar, lithic fragment, heavy mineral, and other. We then calculated the percentage of each mineral per sample.

3. Result

3-1 Depositional Composition

We discovered some depositional compositions such as ripple-marks and cross-lamination within the deposit. These depositional compositions are formed by the flow of water, so it is presumed that the deposit was formed by a tsunami or flood. We could not discover a mud drape or rip-up clast, which are particular to Tsunami deposits, within the deposit we analyzed.

3-2 Variation of layer thickness

Considering the histogram we used, the layer thickness of the deposit is 86 centimeters at point 1 on the east side of Ota River, 58cm at point 3 on the central side of the Ota River, and 10cm at point 2 on the west side of the Ota River. Judging from the results we can see that the sand layer becomes thinner from north to south and east to west.

3-3 Particle size composition

The average size of the particles found at point1, was 0.27mm, point3, 0.20mm, at point2, 0.17mm.From the location of each point, we found that sands become smaller from east to west. This corresponds with our result that layer becomes thinner as it goes to the west.

3-4 Mineral Composition

Comparing the mineral composition from the event deposit and the riverbed deposit in Ota River, the percentage of lithic fragment from the event deposit is 80% and 88% from the river deposit. They are similar. However, the percentage of lithic fragments from the coast at Enshu Sea is 67% and the percentage of quartz and feldspar is higher. According to this, the mineral composition of the event deposit is not different to the sand in the coast at Enshu Sea, but similar to sand in Ota River

3-5 Comparison of Tsunami deposit and Flood deposit

We could not discover a mud drape or rip-up clast, which is particular to Tsunami deposit, within the event deposit. This corresponds to the result that the layer become thinner and grain refining occurs as you go from east to west. Moreover, the event deposit has less quartz and feldspar unlike what is often seen at the coast of Enshu Sea. So, we can conclude that the event deposit is a flood deposit that was made from the flooding of Ota River.

4. Presuming the depositional age

We presumed the depositional age of this flood by quoting the histogram of TP III-16 which is the nearest place to the area that we collected the deposits from *maizoubunnkazai-tyousahoukokusho* research report “Nishimuka” (2011). The layer of sand in III-layer which altitude is about 2.00m correspond to this flood deposit, some earthen vessels were excavated from the X-layer under III-layer. The earthen vessels were shown to be from the late the 12th century. Also ceramics from the Edo era were excavated from the horizon of III-layer in another area. As a result, we presume that it was in the Edo era that this flood occurred.

5. Conclusion

The deposit we analyzed was not from the coast of Enshu Sea, but from the Ota River judging by particle size composition, mineral composition, depositional composition and the variation of layer thickness. Also, by analyzed previous studies, it can be presumed the flood occurred in the Edo era.

Work cited

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