[EJ] Evening Poster | S (Solid Earth Sciences) | S-SS Seismology

[S-SS08]Active faults and paleoseismology

convener:Mamoru Koarai(Earth Science course, College of Science, Ibaraki University), Hisao Kondo(Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology), Ryosuke Doke(神奈川県温泉地学研究所, 共同), Nobuhisa Matsuta(Okayama University Graduate School of Education)

Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Geologic and historic information on seismic cycles and on the magnitude and source faults of past earthquakes is essential information to understand future large earthquakes. The study of past faulting and seismicity is an important issue for an interdisciplinary community of seismologists, geologists, geomorphologists, archaeologists, and historians.

[SSS08-P11]Review on ca. 3 ka Event of Kozu-Matsuda Fault Zone inferred from CNS elemental and Pollen analyses in southern Ashigara Plain, central Japan

*Yoshiki Sato[1], Yuki Ota[2,1], Kiyohide Mizuno[1], Tatsuya Ishiyama[3] (1.Geological Survey of Japan, Advanced Industrial Science and Technology, 2.Department of Earth and Planetary Science, the University of Tokyo, 3.Earthquake Research Institute, the University of Tokyo)

Keywords:Kozu-Matsuda Fault Zone, Ashigara Plain, CNS elemental analysis, pollen analysis, Off-fault paleoseismology, Holocene

Kozu-Matsuda Fault Zone, located between the Ashigara Plain and Oiso Hills, is a reverse fault lifting the Oiso Hills. Paleoseismic history of this fault zone have been revealed based on geological survey such as trench survey in Ashigara Plain (Yamazaki and Mizuno 1999; Kanagawa Prefecture 2004). These suggest that the last seismic event occurred between AD1100-1350, and recurrent interval is 800-1300 yrs (HERP 2015).

This study focuses on the ca. 3 ka paleoseismic event of the Kozu-Matsuda Fault Zone (Yamazaki and Mizuno 1999). This event was suggested by drastically increasing of a brackish water diatom species around 3 ka. Nevertheless, it is necessary to review about this paleoenvironmental change, because diatom fossil assemblage in this event layer includes abundant freshwater species. Therefore, we conducted CNS elemental and pollen fossil analyses on two core samples (TJ11-1, and GS-ASG-5) taken in the southern Ashigara Plain for reviewing the ca. 3 ka event.

TJ11-1 core, 15.2 m long, was drilled by ERI of the University of Tokyo in 2011 (ERI, 2012). A radiocarbon age from 5.28 m depth was measured to be 2,346-2,677 cal BP. In addition, a total of two tephra layers were found; Fuji-Zunasawa tephra (F-Zn, 2.5-2.8 ka, Machida and Arai 2004) in 5.89-5.91 m depth, and Amagi-Kawagodaira tephra (KgP, 3,126-3,145 cal BP, Machida and Arai 2004) in 6.71-6.74 m depth. Pollen fossil assemblage shows that *Gramineae* and *Cyperaceae* increased drastically with some emergent plant pollens such as *Typha* and *Alisma* in 6.0 to 6.2 m depth, between F-Zn and KgP tephra layers. This indicates that wetland area expanded around coring site in ca. 3 ka.

GS-ASG-5 core, 15.0 m long, was obtained by GSJ of AIST in 2016 (Sato et al. 2017). A total of three tephra layers were found in this core sample; Gotenba-mud flow (Gmf, 2.5 ka, Machida 1964) in 4.00-4.12 m depth, F-Zn in 4.48-4.52 m depth, and KgP in 5.3 m depth relatively. A radiocarbon age from 4.73-

4.74 m depth was measured to be 2,355-2,700 cal BP. Result of CNS elemental analysis shows that higher TS value and lower C/N ratio value occurred in 4.7 to 5.0 m depth, between F-Zn and KgP tephra layers. This suggest that sea water inundation around coring site occurred around 3 ka.

TJ11-1 and GS-ASG-5 cores shows synchronous paleoenvironmental change around 3 ka, between F-Zn and KgP tephra layers, despite ~2 km away. This environmental change suggests coseismic subsidence occurred in ca. 3 ka rather than riverine erosion and eustatic sea-level rise. Based on tephrochronological evidences, this coseismic event is corresponding to the ca. 3ka event of Yamazaki and Mizuno (1999). Therefore, we concluded that Kozu-Matsuda Fault Zone probably slipped around 3 ka, between F-Zn and KgP eruption.

References

Kanagawa Prefecture (2004) 2004 Annual report of paleoseismological survey about Kozu-Matsu Fault Zone*. 76p.
HERP (2015) Long-term evaluation of Shiozawa Fault Zone, Hirayama-Matsuda Kita Fault Zone, and Kozu-Matsuda Fault Zone (Kannawa Kozu-Matsuda Fault Zone) (Second edition)*. 55p.
Machida, H. (1964) Tephrochronological Study of Volcano Fuji and Adjacent Areas -no.2-. Journal of Geography (Chigaku Zasshi), 73, 337-350.
Machida, H., and Arai, F. (2003) Atlas of tephra in and around Japan: revised edition. University of Tokyo Press. 336p.
Sato, Y., Mizuno, K., Kubo, S., Hosoya, T., Morita, S., and Kaga, T. (2017) Preliminary reports on coring survey in Ashigara and Lower Sagami-gawa Plains, central Japan. GSJ Interim Report No. 74, Annual Report of Investigations on Geology and Active Faults in the Coastal Zone of Japan, 97-110.
ERI (2012) Progress report of focused survey and observation on Kannawa Kozu-Matsuda Fault Zone (2009-2011)*. 233p.
Yamazaki, H., and Mizuno, K. (1999) The Kozu-Matsuda Fault: Its recent behavior and tectonic significance in a Plate Convergent Region. Quaternary Research (Daiyonki-Kenkyu), 38, 447-460.
*English translation from the original written in Japanese.