Late Pleistocene–Holocene tephra ejecta in the trench log at the southern apron of Esan volcanic complex, Japan

*Daisuke MIURA[1], Ryuta FURUKAWA[2], Kenichi Arai[3]

1. Graduate School of Science, Osaka Prefecture University, 2. Institute of Earthquake and Volcano Geology, GSJ/AIST, 3. Asia Air Survey

In the Esan volcanic complex (EVC), northern Japan, large number of phreatic ejecta are found at around the volcanic aprons, and could be threaten to the local residences due to the close proximity. Our trench excavation study has been performed at two digging sites, and 11 samples of the black paleo soils and the charcoal for ^{14}C dating have been measured there. A source explosion crater is inferred at 2.6 and 2.2 km far from the site A and B, respectively. This close proximity between the crater and trench sites indicates that the most of deposit exposed in the trench logs are the proximal facies. At least eleven and twelve units of volcaniclastic deposits are identified at the sites A and B. The first phreatic deposit in Holocene is newly identified just prior to the EsMP episode, and it had erupted in ca. 11 ka (Es-0). Holocene phreatic episodes of Es-1 and 3 can be divided into three and five subunits. The pyroclastic surge deposit in Es-1 and 3 was confirmed, suggesting that the phreatic surge also could be threaten to the local residences. The sequence of Holocene eruptions at the EVC comprises at least 13 phreatic tephra events in 10 thousand years, implying that the cyclic phreatic eruption could manifest in every thousand years. With regards to the characteristics of phreatic explosions, it is expected that grain size plot for the phreatic deposit becomes scattering. Grain size analysis in comparison with the magmatic ejecta may not be better way to discriminate the phreatic depositional process. It is also pointed out that the deposited area of phreatic ejecta is largely constrained by a regional topography. Parts of this work was financially supported by MEXT “Integrated Program for Next Generation Volcano Research and Human Resource Development.

Keywords: Esan volcanic complex, phreatic explosion, trench excavation

