

Lahar deposit originated from the Fuji 1707 tephra at the northern and middle part of Ashigara plain, central Japan

Shouta Nakamura[1]; Naomichi Miyaji[2]; Kazutaka Mannen[3]; Yoshio Seto[4]; Yoshio Owaki[5]; Masaki Takahashi[2]

[1] Former Nihon Univ.; [2] Geosystem Sci., Nihon Univ.; [3] HSRI, Kanagawa Pref.; [4] none; [5] JPS

Fuji volcano made Plinian eruption at Dec. 16 to 31, AD1707 and dispersed air fall tephra (Hoei scoria) of 1.7km³ to the South Kanto district. Hoei scoria deposited thickly at the eastern area of Fuji volcano and removed by the rain to the Sakawa river flowing in the Ashigara plain. Floods at the Sakawa river caused by the tephra happened frequently for more than 100 years after the Fuji 1707 eruption. The flood deposit, namely lahar deposit of the Hoei scoria, did not identified at the Ashigara plain in spite of the features of floods at this area are written or drawn in the many historical records. Then, we made geological survey and studied the borehole and historical records on the northern and middle part of Ashigara plain, and identified the Hoei lahar deposits. We found four debris flow deposits containing black scoria and white pumice, named layer A to D, from the lower to upper under few meters of the surface by the geological survey on the northern area of Ashigara plain along the eastern foot of Hakone somma. The layer A distribute wide area and is thick, layer B distribute rather wide area and is thick in the small valley, layers C and D distribute narrow area and is thin. These layers contact directly each other and erode the lower beds. Scoria and pumice grains of the very coarse to granule size in the debris flow deposits are correlated to the Hoei scoria by the lithofacies and whole rock chemistry of the grains. Layer A is composed mainly of the Hoei scoria grains with cross lamina structure at the lower half and rounded gravel in pebble size at the upper half. Layer B is composed mainly of the rounded gravel in boulder size with black gray sand containing the Hoei scoria. Layers C and D is composed mainly of the rounded gravel in cobble size with yellow brown sand containing the Hoei scoria. Containing ratio of the Hoei scoria in these debris flow deposits on the granule size is about 70 % in layer A, about 50 % in layer B, about 60% in layer C and about 50% in layer D. While, present Sakawa river deposit in this area contain about 10%. Main kinds of gravel for these deposits are granodiorite and green rocks from Tanzawa mountain, and basalt from Fuji volcano. Sand grain contain weathered scoria with the Hoei scoria. Ages of these deposits are supposed by the correlation of distribution of floods area from the historical records and distribution of these deposits, and the stratigraphical data as follows; layer A was formed at AD1708, layer B at AD1711, layer C at AD1734 and layer D at 1857. Sakawa river flooded repeatedly for 150 years after the 1707 eruption. Sentsu district at the northern part of Ashigara plain took long period to reconstruct the village from the destruction caused by some floods accompanying with brakes of banks. Layer C is covered by a paddy soil, and the soil is by artificial soil to build a house. Inhabitants in this district escaped to the hills after the 1707 eruption and reconstructed village until 1777 when the Sakawa river stabilized by the repair of Garase and Oguchi banks. Soil survey data in this time suggest the flood area was used as the paddy field before the reclamation of village. We identified one to three layers containing black sand under few meters depth at the northern and middle part of Ashigara plain from the borehole data. It is possible that these layers are correlate with the Hoei lahar deposits by the observation at the outcrop with the borehole data obtained near by the outcrop. Total thickness of these deposits at the southern part of Oguchi bank on the right bank in the northern area of Ashigara plain and at the Sohi, Kayama district on the right bank in the middle area is large. The former must be formed mainly by the flood at 1708, 1711 and 1734 and the latter mainly by the flood at 1802 and 1803 by the analysis of historical records.