

Landslides in Aoki Village, Nagano Pref., Japan : Their distribution and geological-geomorphological characteristics

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Many landslides are present in the Aoki Village of Nagano Prefecture where the Neogene sedimentary rocks and rugged mountains are dominant. Nevertheless, little attention has been paid to the distribution, topographies, and ages of landslides in this village. We investigated the landslide geology and geomorphology of the village on the basis of airphoto interpretation, field mapping of geology, and tephrochronology of landslides as well as GIS-aided geomorphic analysis.

A sum of 109 landslides was identified. A total area of those landslides attains 12.3 km², occupying 21.5% to the total area of the village. Six landslide complexes comprising an assemblage of landslide bodies were also distinguished. Landslide distribution generally coincides with lithology of bedrocks. In particular, cleavable the Bessho Formation of shale seems to be prone to landslide occurrence. A cap rock structure and dip-slope strata are also thought to be crucial factors. These suggest that rock control is effective to generate landslides in the study area.

We found faulted and folded tephra layers with high content of hornblende, quartz, and biotite covering the Irinaramoto Landslide Complex (INM) that is a widest and most typical landslide in the village. Stratigraphic position and mineralogical properties of these tephra beds suggest that these tephra layers can be correlated with the Omachi APm during 350-300 ka. This fact shows that the primary or secondary landsliding of the INM would occur after the middle Pleistocene despite their triggers are uncertain.

Keywords: Neogene system, Tephrochronology, Omachi APm tephra group, Cap rock, Rock control, Dip slope landslide