

Occurrence of Huge Mountain Collapse and its Sediments Developing in Niigata - Nagano Prefecture border, Central Japan ; Pleistocene Epoch Events

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1.Introduction

I review the huge collapse in non-volcano regions similar to "mountain collapse - rockslide avalanche occurrence" occurred in many volcanoes. The survey area is the northeastern part of the Sekita Mountains located in the Niigata - Nagano prefecture border, and the northern side of the ridgeline has a maximum height of 400 m and a steep cliff extending over about 6 km extension. The huge collapse formed the small undulation flat surface such as the Shoubu Plateau, the upper stream area of the Shibumi River, the Daigonji Plateau, and so on. At present, traces of huge collapse are confirmed in 5 places. According to Takeuchi et al.(2000), the Uonuma Formation of the late Pliocene to Late Pleistocene is distributed around these areas.

2.Huge collapsed terrain

In this paper, I call the huge collapse that formed the Shoubu Plateau and so on as Nonomi collapse, call the collapse that formed a small undulation flat surface in the upper stream area of the Shibumi River as Tensui collapse, and call the huge collapse that formed the Daigonji Plateau as Daigonji collapse, and discuss these collapse cases. The Nonomi collapse has a sliding cliff of 150 m in height and a sliding width of 950 m in width as a cliff top. The horizontal flow distance of sediment is estimated to be 2,700 m and the layer thickness is estimated to be 50 m at the maximum and 15 to 20 m on average. The Tensui collapse has a sliding cliff with a maximum relative height of 400 m and a sliding width reaching 3,000 m. The horizontal flow distance of the sediment is estimated to be 4,500 m, the layer thickness is estimated to be 15 to 30 m on average, and 3 sites of hummocky mass can be confirmed. The Daigonji collapse is estimated as the top of the cliff in the vicinity of Tensuiyama Mountain. The horizontal flow distance of the sediment is estimated to be 3,300 m and the layer thickness is estimated to be 10 to 35 m on average.

3.Properties and composition of collapsed deposits

Collapsed sediments consist of sedimentary layer(sis) consisting of siltstones and sedimentary layer(tfb) mainly composed of andesitic volcanic rocks. Both strata are consolidated to such a degree that they can't easily penetrate with a hammer. The sedimentary layer composed of siltstone is densely packed in angular clast with a diameter of about several cm, and it may include andesite angular clast. Features of the sedimentary layer composed mainly of andesitic volcanic rocks are 1)clast-supported ~ matrix-supported sediment containing a large number of angular to subangular clast (ϕ - 3 m, mostly ϕ 10 - 50 cm) of andesite, 2)sedimentary structure with water during deposition can't be seen, 3)besides andesite, siltstone, sandstone, tuff, etc. are present in the clast, and it contains Kusare clast, 4)matrix part is tuffaceous sand mixed silty and fresh part is blueish gray to blue-greenish gray. The sedimentary layer due to Nonomi and Tensui collapse was formed from basement strata, tfb-1(maximum layer thickness 20 m), sis-1(same 5 m), sis-2(15 m), tfb-2(10 m), tfb-3(20 m), topsoil. Paleosol ·organic matter of several cm thickness is sandwiched between sis-1 - sis-2 and sis-2 - tfb-2. On the other hand, the sedimentary layer due to the Daigonji collapse is layered from the base to the upper tfb (maximum layer thickness 20 m), sis(15 m), tfb(10 m), topsoil.

4.Origin of collapse and collapse sediment

Sediments generated by the huge collapse originate from the Uonuma Formation. With reference to

Takeuchi et al. (2000), the collapsed strata are mainly of the Uonuma Formation, andesite tuff breccia, volcanic tuff and marine silt sand phase. Stratigraphically, the former is higher and the latter is lower. This huge collapse shows a cycle in which the lower stratum is repeatedly collapsed while the gap is sandwiched by the extent of formation of old soil after stratigraphically upper strata collapse and then the upper strata collapse again. A relatively large time gap occurred at least twice.

5. Discussion

The huge collapse is presumed to have at least 5 events from the sedimentary layer distribution. However, from the Lidar data, the occurrence of more events is estimated, and correspondence with the sedimentary layer, the identification of the time and the contrast of the collapsed sedimentary layer are future tasks.

References

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