

Sector collapse event around 24,000 years before on Asama volcano, central Japan, restored from geomorphologic traits

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In order to understand the long-term geomorphic development of drainage basins that include some Quaternary stratovolcanoes, it is necessary to evaluate not only the usual river processes associated with glacial-interglacial alternations but also the influence of sediment supply by volcanic events such as the sector collapses of stratovolcanoes. From this point of view, we show the nature of the catastrophic sector collapse of Asama volcano, central Japan, occurred around 24 ka mainly based on geomorphological and geological interpretations of the deposit. The surrounding area of Asama volcano is a suitable field to examine the topographical impact of the sector collapse events in the time scale ranging from thousands of years to tens of thousands of years. The outline of this presentation is as follows.

Morphologically conspicuous features such as scattered mounds on the depositional surfaces and the internal structures of the deposit indicate that the mass movement triggered by the sector collapse event was regarded as not a kind of volcanic mud flow but a series of debris avalanche unsaturated with water all over the depositional area. The debris was probably transported as Bingham 'plug flow' because it contains lots of fragile debris avalanche blocks along with numerous captured clasts. The debris avalanche deposit is distributed more than 100 km distant from the source area, and the presumed distribution area amounts to 500 km². The total amount of the debris avalanche deposit was estimated to be 6 km³ or more based on its 3-dimensional distribution in depositional basins. This volume is approximately 1 km³ larger than the expected one by the expansion of removed part of volcanic edifice. The difference is mainly because the debris avalanche captured various materials including fluvial gravels during flowage from the source to the distal area. This event is categorized into the greatest one among the known with high precision.