

## 九州尾鈴山火山深成複合岩体のカルデラ内岩屑なだれ堆積物

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Intracaldera Debris Avalanche Deposit Associated with Osuzuyama  
Volcano-plutonic Complex in Kyushu, Southwest Japan

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Miocene Osuzuyama volcano-plutonic complex 30 km across in diameter around 15 Ma reveals intracaldera debris, newly named Kanaiso debris avalanche deposit. The solidified deposit involves irregular blocks reaching 50 m across as a megablock and displays sedimentary characteristics clearly instead of the lost topography, such as blocks showing peculiar plastic deformation, disjunction and displacement along the joints as well as jigsaw-puzzle cracks and patchwork texture with the matrix. Imbrication and flame-shaped tail of the blocks develop near the boundary with the basement, indicating the flow direction of avalanche not from the inner caldera. Also, a concentration in orientation of the long axis develops.

The avalanche deposit consists of debris derived from the basement Shimanto supergroup of Cretaceous to Early Miocene, Iorigawa conglomerate and Welded tuff 1 of rhyolite in the lower units of the complex. But no debris derived from Welded tuff 2 of dacite in the upper unit of the complex appears in the deposit, except a few obsidian blocks in the same chemical composition of the Welded tuff 2. Neither pumice nor volcanic ash exists in the deposit obviously.

The avalanche deposit occupies two horizons in detail. The lower one overlies the basement and the solidified Welded tuff 1 and is overlain by the Welded tuff 2. Another one intercalates in the lower part of the Welded tuff 2.

These facts suggest that the Kanaiso debris avalanche deposit derived from the unstable caldera wall most probably soon after the caldera collapse of the complex. No debris avalanche appeared during the first pumice eruption to issue the Welded tuff 1. But putting a cooling lag after the first pumice eruption, avalanches occurred before the main phase in the second pumice eruption producing the Welded tuff 2.

**Key words:** intracaldera debris avalanche deposit, plastic deformation, imbrication, orientation of blocks, Miocene Osuzuyama volcano-plutonic complex.

## 1. はじめに

近年、カルデラ形成時に岩屑なだれ堆積物が伴われることが明らかになってきている。古くは始新世 50 Ma のカナダ Bennett lake cauldron subsidence complex (Lambert, 1974) や、金属鉱床が豊富な中新世 27 Ma (Lanphere, 2000) の北米 San Juan Mountain, Creede caldera (Steven and

Ratté, 1965) などで知られる。同じく San Juan caldera cluster (Lipman, 2000) で caldera-collapse landslide deposit, landslide breccia または caldera-collapse breccia あるいは megabreccia など (Lipman, 1976) と呼ぶ堆積物も、この種の岩屑なだれ堆積物を含んでいる可能性がある。

日本では、西南日本白亜紀有馬層群のカルデラ火山で

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