

# 土砂供給源としてみた日本の第四紀火山における 巨大山体崩壊

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## Catastrophic Sector Collapses of Quaternary Volcanoes as Significant Sediment Sources in Japan

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### Abstract

The Japanese Islands are tectonically active and humid. Thus, erosion and deposition are the primary processes controlling geomorphic development. Catastrophic sector collapses at volcanoes should be considered significant in this context. This study examines the geomorphological role of volcanic sector collapses in Japan, introducing 58 cases with their respective occurrence ages and volumes ( $\geq 1 \times 10^8 \text{ m}^3$ ). We find that the frequency of sector collapses becomes exponentially higher as the collapse magnitude decreases. The total volume of the dissected volcanic edifice caused by catastrophic collapses amounts to *ca.*  $6.4 \text{ km}^3$  ( $640 \times 10^8 \text{ m}^3$ ) during the last 500 years. This value can be translated into an annual denudation rate of  $0.53 \text{ mm/y}$  per unit area of the Quaternary volcanoes (*ca.*  $24000 \text{ km}^2$ ), which is comparable to the contemporary denudation rate of non-volcanic mountains in Japan. Therefore, although volcanic sector collapses occur intermittently, we have to consider them as sediment sources that are indispensable to an understanding of geomorphology in Japan.

**Key words** : catastrophic sector collapse, frequency, magnitude, Quaternary volcano, Japan  
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