

阿蘇火山中岳北東麓に分布する火砕流堆積物とその層序的意義

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A Pyroclastic Flow Deposit Occurring at the Northeastern Foot of Nakadake,
Aso Volcano (Japan) and its Stratigraphic Significance

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A basaltic pyroclastic flow deposit, the Izumikawa pyroclastic flow deposit, occurs at the northeastern foot of Nakadake Volcano, which is the only active central cone of Aso caldera, southwestern Japan. The pyroclastic flow deposit covers a fan-shaped area of about 0.9–1.9 km², and the bulk volume is estimated at 4.4–9.4 × 10⁶ m³. The deposit is poorly sorted, and consists of subangular faceted clasts and spherical cauliflower bombs set in a sandy non-cohesive matrix. The deposit forms two different facies: a black reversely graded lower unit and a reddish-gray reversely graded upper unit. The cauliflower bombs, which have slightly vesiculated crusts and denser interiors, are more abundant in the lower unit than in the upper unit. The presence of the cauliflower bombs suggests that the pyroclastic flow was generated by an explosion at the source lava lake or conduit, which was filled with mixture of solidified and molten lavas. The age of the deposit was estimated at ca. 19 cal ka, based on ¹⁴C ages obtained from charred wood fragments in the deposit. Recent tephrochronological studies reveal that Nakadake Volcano became active from ca. 22–21 cal ka and that violent scoria and ash eruptions of Nakadake were concentrated in two periods of ca. 22–21 cal ka and 18–16 cal ka. The age of the Izumikawa pyroclastic flow corresponds an intermediate period between the two violent eruption periods. A similar pyroclastic flow deposit and a basaltic lava flow were also identified. They cover immediately the Izumikawa pyroclastic flow deposit. These facts indicate that multiple violent eruptions producing pyroclastic flows and lava flows occurred in a short period at ca. 19 cal ka. Recent activity of Nakadake has been characterized by ash eruptions, strombolian eruptions and phreatomagmatic explosions. However, the presence of the Izumikawa pyroclastic flow deposit emphasizes the potential hazard induced by bomb-rich pyroclastic flows that may rush down the flanks of Nakadake Volcano.

Key words: Nakadake Volcano, pyroclastic flow deposit, cauliflower bomb, eruptive history

1. はじめに

阿蘇火山中央火口丘群の中で現在唯一活動を継続している中岳は、西暦553年以來の噴火記録があり(福岡管区気象台, 1990; 気象庁, 1996), わが国で最も活発な火山の一つである。この火山は約22~21 cal ka (以下, ¹⁴C年代の暦年較正結果を cal ka と表記する)に活動を開始したと考えられており(宮縁・他, 2004), 古期山体・新

期山体・最新期火砕丘という3つの山体を形成した(Fig. 1; 小野・渡辺, 1985)。中岳では、活動のごく初期にあたる22~21 cal ka と18~16 cal ka 頃に多量の降下テフラ(スコリアと火山灰)を放出する激しい噴火活動があり(宮縁・他, 2004), 前者には古期山体の溶岩(玄武岩質)が流出している(馬場, 1999)。また、完新世に入ってから新期山体の溶岩(玄武岩質安山岩)を噴出

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