論　説

火山　第 57 巻 (2012)
第 1 号　19–35 頁

富士火山西麓に分布する玄武岩質火砕流の成因

前 田 美 紀*,**・宮 地 直 道***

（2011 年 3 月 29 日受付，2012 年 1 月 30 日受理）

Origin of Basaltic Pyroclastic Flow Distributed on the Western Slope of Fuji Volcano, Central Japan

Miki MAEDA*,** and Naomichi MIYAJI***

Formation mechanism of basaltic pyroclastic flows has not been sufficiently clarified yet because basaltic pyroclastic flows do not occur as frequently as felsic ones. We studied the Osawa pyroclastic flow 3 deposit (OsPfl-3), which took place on the western flank of the Fuji volcano between 2.9 and 3.0 ka. OsPfl-3 has two flow units and one cooling unit, which have a combined volume of 6.2 × 10^6 m^3. The flow overlies another unit composed of two scoria fallout deposits (YokSfa-2a and 2b) which sandwich a pyroclastic flow deposit (OtPfl). OsPfl-3 mainly consists of welded blocks and dense blocks with composition and petrographical characteristics of basaltic andesite. Some of the dense blocks have cracks on their surfaces and look like “cauliflower-shaped bomb”. They have a flat surface on one side with concentration of vesicles near the surface. The matrix of OsPfl-3 has dense fragments that are thought to have originated from dense lava blocks and poorly vesiculated scoria. The emplacement temperature of the blocks is estimated to be higher than 580℃ from thermoremanent magnetization measurements. These observations indicate that the blocks in the OsPfl-3 originated from welded pyroclasts, lava flow or lava lake at the summit crater. The sequence of the eruptions that formed OsPfl-3 and underlying deposits are summarized as follows: Stage 1: Deposition of fallout tephras (YokSfa-2a and 2b) and an intercalated pyroclastic flow (OtPfl) which are composed of fairly vesiculated scoria; Stage 2: Formation of lava flow or lava lake at the summit crater, and deposition of pyroclastics on the lava; Stage 3: Occurrence of the pyroclastic flow (OsPfl-3) caused by collapse of lava and pyroclastics. OsPfl-3 is prominently distributed on the western flank. This observation implies that the westward flow from the source lava that filled the summit crater could cross the lower part of the crater rim.

Key words: Basalt, Fuji volcano, Thermoremanent magnetization, Pyroclastic flow

1. はじめに

玄武岩質噴火は珪長質噴火に比べ爆発的な噴火が少ないため，火砕流が発生する頻度は少ない．このような玄武岩質火砕流の発生メカニズムは珪長質火砕流の場合と必ずしも同一ではなく，そのメカニズムについて近年多数の研究が進みつつある (Alvarado and Soto, 2002; Behncke *et al.*, 2003; Cole *et al.*, 2005; Miyabuchi *et al.*, 2006)．例えばコスタリカの Arenal 火山では火口壁の重力崩壊に伴う溶岩湖決壊により火砕流が発生したとされている (Alvarado and Soto, 2002)．また，日本の阿蘇火山中岳の泉川火砕流も半固結した溶岩湖あるいは火道でのマグマ水蒸気爆発などが起こって火砕流が発生したとされ，その

* 〒156–8550 東京都世田谷区桜上水 3–25–40
日本大学大学院総合基礎科学研究科
Graduate School of Integrated Basic Sciences, Nihon University, 3–25–40 Sakurajosui, Setagaya-ku, Tokyo 156–8550, Japan
** 現在 〒220–8401 神奈川県横浜市西区みなとみらい 3–3–1 三菱重工横浜ビル 23 階
株式会社アイネット
I-NET Corp., 23F, MitsubishiJuko Yokohama Bldg., 3–3–1 minatomirai, Nishi-Ku, Yokohama 220–8401, Japan
*** 〒156–8550 東京都世田谷区桜上水 3–25–40
日本大学文理学部地球システム科学科
Department of Geosystem Sciences, Collage of Humanities and Sciences, Nihon University, 3–25–40 Sakurajosui, Setagaya-ku, Tokyo 156–8550, Japan

Corresponding author: Miki Maeda
e-mail: m.maeda.6109@gmail.com