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Pre-historic activity of Shinmoedake in Kirishima volcanic complex

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Shinmoedake erupted on 19th January 2011; this eruption was followed by further explosive eruptions on the 26th and 27th of the same month. Since then, lava has been building up inside the Shinmoedake crater. We surveyed the volcanic geology at the flanks and crater rim of Shinmoedake in 2007. We found ash, pumice-fall deposits, and pyroclastic-flow deposits dating from A.D. 1716 to A.D. 1717, named Kyoho pumice (Sm-KP). This geological profile matches the historical records detailed by Imura and Kobayashi (1991). In addition, we found two lava flows above and one lava flow below the Maeyama pumice (MyP) fall deposits around the crater rim. It is known that MyP and Setao pumice volcanic deposits date to an event that occurred before the Sm-KP eruptions (Inoue, 1988; Okuno, 2002). We found typical outcrops of MyP on Shinyu forestry road, along the west flank of Shinmoedake. The thick pumice fall deposits within a pyroclastic flow deposit that covered the Sm-KP deposits and rode under the K-Ah tephra in this outcrop. We found the same depositional profile to the west of the crater rim. At the rim of the crater, the MyP comprises pyroclastic-fall deposits, thin pyroclastic-flow deposits, and 20-m-thick pyroclastic deposits. The MyP is distributed over the north-to-northwest part of the Shinmoedake volcano, and the tephra-fall volume in this region is calculated to be in the order of about 107 m³. In this study, we found two lava flows above MyP, named Ryobu lava flows (RyL-1, 2) originated mountain name of the historical records. RyL-1 is distributed on the southwest-to-south part of the crater rim and consists of Usagi-nomimi; the dikes of this lava flow can be observed on the south part of the crater, near the part of Usagi-nomimi. RyL-2 is distributed in the same area as RyL-1. Because the RyL-1 and RyL-2 lava flows covered the soil above the 2.2-ka Nakadake tephra, it can be concluded that the corresponding eruptions occurred at around the same time as the MyP eruptions. In addition, we observed another lava flow, named RyL-3, distributed from the southwest to southeast part of crater rim under the MyP. We found that the lava flow has covered the K-Ah tephra around the flank of the volcano. We thank the staff of the SABO Technical Center and Nippon Koei Co., Ltd.

Keywords: Shinmoedake, Kirishima volcanic complex, Maeyama pumice, lava flow, crater rim