

## Prehistorical volcanic stratigraphy of Shinmoedake in the Kirishima volcanic complex

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Eruption of the Shinmoedake volcano accompanied by pumice fall occurred in January 2011. We have little information regarding the prehistorical eruptions of this volcano. Inoue (1988) reported three pumice falls (Setao pumice: StP, Maeyama pumice: MyP, and Shinmoedake pumice: SmP or SmKP) from the Shinmoedake volcano. Imura and Kobayashi (1991) discussed about the two pumice falls that occurred after the SmKP. Tajima et al. (2011) reported about a prehistorical pumice fall (i.e., Shinyu tephra: SyT) that occurred between SmKP and K-Ah tephra eruptions in the region around Shinyu, in the western part of Shinmoedake volcano. The distribution axis of the SyT is to the north of the vent; we had not known about the north distribution pumice from the Shinmoedake volcano. As described by Inoue (1988), MyP was observed to the northeast of the vent. In this study, first, we considered both the pumice falls to belong to the same horizon because of lack of any other evidence. We attempted to measure the C14 age of the soil under the SyT pumice fall deposit to the north of the vent for determining the horizon of the unit. The age of the soil under the SyT was determined to be 4030 ± 20 yr BP. The result shows the different horizons that occurred in the SyT (4.5 cal ka BP) and the MyP, whose age has been determined as 5.6 cal ka BP by Okuno (2002). In addition, we measured the ages of two ash falls that overlies SyT and were attributed to eruptions from the Shinmoedake volcano. The age of the lower ash layer was determined to be 2635 ± 20 yr BP and that of the upper ash layer was 2305 ± 20 yr BP. Tajima et al. (2011) reported about the RyL-A and RyL-B lava flows above the SyT tephra. The age of RyL-A and RyL-B lava flows is presumed to be close to the age of the two ash falls.

Magmatic eruptions of the Shinmoedake volcano before the 2011 eruption were known to have occurred at 10.4 cal ka BP (StP), 5.6 cal ka BP (MyP), and AD 1716-1717 (SmKP). The results of this study show that the three magmatic eruptions occurred between the MyP and the SmKP eruptions. These results show that high-frequency magmatic eruptions have occurred at the Shinmoedake volcano. However, the eruption intervals were not same. We know that the crater had filled with lava (ScL) after the SmKP eruptions. This lava erupted before AD 1822 (Imura and Kobayashi, 1991). The repose time between the 2011 eruptions and SmKP or ScL is about 300 to 200 years. The repose time between SmKP and previous ash falls is over 2000 years. The Shinmoedake volcano has repeated active periods and quiet periods. These eruption intervals indicate that the recent age may be the active period. Tajima et al. (2008) determined the age of Eb-D (Eb-D) erupted in the western part (Ebinokogen) of the Kirishima volcanic complex. The age of SyT, erupted in the center part of the Kirishima volcanic complex, is the close as that of Ebino D tephra. Around 4.5 cal ka BP, Miike pumice (MiP) erupted in the eastern part of KVC. The MiP, SyT, and Eb-D eruptions occurred close time from each vents in the Kirishima volcanic complex.

I thank Paleo Labo Co. LTD for providing aid in C14 age measurements as well as for the information regarding geological records of disasters. We thank Profs T. Kobayashi of Kagoshima University.

Keywords: Shinmoedake, pumice fall, prehistorical eruptions, C14 age, Kirishima, long term activity