

Tephrostratigraphy and its eruption history of the Latest Activity in the Kozushima Volcano, the Izu Islands

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In this study, we defined the younger eruptive activity since the eruptive event of Chichibuyama A tephra (ca. 22–26 ka; Suga et al., 1992, 2003) composed of pyroclastic deposits from the southern part of Kozushima covering the whole island as "the Latest Activity". In order to establish the tephrostratigraphy during this period, we are aiming to construct more detailed eruption history of Kozushima Volcano. As a result of the topographical interpretation using DEM, we recognized Tenjo-san edifice (pyroclastic cone and lava domes), Kobeyama-Hanadateyama volcanic chain (lava domes) and Kushigamine (pyroclastic cone) as younger volcanic landforms presumably formed by the Latest Activity.

In addition, according to the geological survey, we recognized deposits associated with eight eruption events in minimum. At Loc. 16 in the north part of Nachi-san, northern Kozushima, we recognized pyroclastic surge deposit composed of alternate layers such as pumice, volcanic lapilli and coarse ash so on (no. 16-1; Tenjo-san Tephra (AD 838)), fall-out deposit including altered volcanic blocks and lapillus (no. 16-2), medium to fine fall-out ash deposit (ca. 10 cm in thickness) containing pumice clasts (no. 16-3), densely scattered zone composed of scoria clasts with diameter of several mm (no. 16-4) and densely scatter zone composed of coarse volcanic ash (no. 16-5) in descending order. On the other hand, at the Akabane-tunnel (Loc. 4) in southern Kozushima, Tenjo-san tephra (no. 4-1), densely scattered zone composed of coarse ash (no. 4-2), medium to fine volcanic ash deposit (ca. 3 cm in thickness) containing pumices (no. 4-3), densely scattered zone composed of scoria clasts with diameter of several mm (no. 4-4), fine volcanic ash deposit with a thickness of ca. 9 cm (no. 4-5) and pyroclastic surge deposit composed of alternated layers such as volcanic lapilli and coarse ash (no. 4-6) in descending order. Widespread tephra of K-Ah was detected between no. 4-2 and no. 4-3. Among these eruption deposits, it is suggested that the eruption of no. 16-2 occurred around central to northern part of Kozushima because these deposits distributed only these areas. In contrast, medium to fine air fall ash deposits (no. 16-3 and no. 4-3) containing pumices and fall-out fine ash deposit (no. 4-5) are very prominent layers, then, we are deeming these deposits as widespread tephtras originated by relatively larger eruptions. ¹⁴C datings for charcoal scattered in tephric loess or humus soil just below tephra layer were applied. ¹⁴C ages are 1300±20 yr BP under the fall-out ash deposit correlated with the no.16-2 (Loc. 15; 262 m lava dome), 5790±30 yr BP at top of the no. 4-2, 8850±30 yr BP and 9390±30 yr BP above and below the no. 4-3, respectively, and 12030±30 yr BP just under the no. 4-6. Considering the calendar years and tephrostratigraphic relation, the ages of tephtras during Latest Activity comprises five eruptions of ca. 1.1-1.2 ka (no. 16-2), ca. 7.5 ka (no.16-3 and no. 4-3), ca. 10 ka (no. 4-4) and ca.13.5 ka (no. 4-6).

Currently, we are further collecting data on mineral compositions, the refractive indexes and the major element compositions of volcanic glass shards for each tephra, and we are studying from the viewpoint of correlation with eruption deposits from Kobeyama-Hanadateyama volcanic chain, and Niijima Volcano origin tephra (Miyatsukayama, Shikinejima and Miyatsukayama South: Kobayashi et al., 2018). In the presentation on the day, we will report the eruption history of the Latest Activity of Kozushima Volcano based on the results of these studies.

Keywords: tephrostratigraphy, ^{14}C age, eruption history, Kozushima Volcano