

Tephra stratigraphy and a slope failure of about 4,000 years ago on the slope of the Late Pleistocene Janoo Volcano in the northwestern of Aso Caldera

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In the west part of Aso Caldera, the 2016 Kumamoto Earthquake caused surface earthquake faults along the Futagawa and Hinagu fault zone, triggering numerous landslides and some lateral spreads on tephra. Janoo Volcano is located on the line that extrapolates from the end of the earthquake fault zone to the northeast in the disaster area. We carried out an excavation and boring exploration at the south slope of Janoo Volcano and measured chemical compositions of lava and radiocarbon ages of volcanic soil. The results elucidated the succession of volcanic products after the formation of Janoo Scoria Cone and showed a slope failure about 4,000 years ago. The eruption ages of key beds were estimated with calibrated method as follows: Janoo Scoria (>15.5 ka), ACP1: Aso Central Pumice 1 (~4.0 ka), Kishimadake Lava and Kishimadake Scoria (~3.7 ka), Ojodake Scoria (3.5±0.1 ka), and Kometsuka Lava (3.0±0.1 ka). Fine sandy ashes deeper than 8 m and the surface part of Janoo Scoria weathered to become yellowish and included small dislocations that are the normal sense and parallel to the surface of Janoo Scoria. The volcanic soil layer on the sandy ash was separated as 1-meter-tall blocks, and they were arranged into an imbricated form of overturned strata. This deposit was covered with a 2 m thick of soft volcanic soil moved from the upper slope. All the above tephra layers were consistently covered with ACP1. Consequently, these deformation and sedimentary structures suggest that the tephra on Janoo Scoria silted down successively from the slope toe toward the top just before the eruption of ACP1. This ancient slope failure seems to be triggered by earthquake because its depth and material are similar to those of landslides by the 2016 Kumamoto Earthquake.

Keywords: Aso Caldera, eruptive history, landslide, non-tectonic faulting, trench survey