

Volcanic Geology of eruption of Mukaiyama Volcano in A.D.866, Niijima, the Seven Izu islands

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Niijima is one of the Quaternary volcanic island belonging to the Seven Izu islands, and is located at about 160 km southwest of Tokyo. The island is made up of thirteen monogenetic rhyolitic volcanoes and one basaltic volcano. Recently, the end of June 2000, the island and adjacent volcanic islands (Shikinejima and Kouzusima) became active in seismicity accompanied by the volcanic eruption of Miyakejima volcano, about 30 km southeast of Niijima. So, study on the last activity of Niijima is important for mitigation of volcanic hazard.

Mukaiyama volcano, one of monogenetic volcano in southern part of Niijima, erupted in A.D.866. The eruption can be divided into four stages; 1st stage (abbreviation of the deposit: My1), 2nd stage (My2), 3rd stage (My3) and 4th stage (My4).

The first stage activity produced a low-lying and flat-topped hill made up of stratified deposits due to pyroclastic density currents. According to the upward variation of My1, it was concluded that the current speed and explosiveness decreased with time. Study of boring core by Isobe (2001) indicated that My1 distributed also under the sea level. My1 includes large pumice blocks characterized by radial cooling joint. These two evidences suggest that the first stage activity began in the sea.

The second stage activity produced a pyroclastic cone and My2 near the vent is characterized by well sorted pyroclastics. The second stage activity is due to pyroclastic fall, ballistics and crumble brecciation.

The third stage activity produced some lava domes. The lava domes are subdivided into four groups by gully; My3-a, -b, -c, -d. There are ridges on surface of the lava domes. According to the distribution of ridges, it is indicated that the eruption timing and the center location is different.

The fourth stage activity produced three thin pyroclastic deposits (My4-a, -b, -c) on the lava domes. Some My4 are characterized by oxidation. Similar deposit was observed in Kouzusima (Taniguchi, 1982) on Tenjousan lave dome. The deposit was concluded to be produced by secondary eruption. So, the fourth stage activity may be due to the secondary eruption.