

Volcanic activity history of Ito Island in Ogasawara Archipelago estimated by the terrace chronology and crustal deformation observation

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Ito Island in Ogasawara archipelago (hereafter referred as "Ito Island") is a volcanic island located at 141°17'14" E longitude and 24°45'29" N latitude, where uplift and volcanic activity are currently ongoing. Ito Island consists of Motoyama volcano making the main body of the island, Suribachi Yama lateral volcano, Kangoku Iwa rock (which is caldera rim off the northwestern coast of the island) and so on. A few detailed studies about geoscience phenomena in this island were kept. We have conducted survey of topography and geology and observation of crustal deformation using GPS in order to interpretate a detailed uplift activity history, volcanic chronology and recent crustal deformation. This work was supported by MEXT KAKENHI (21510193). Primary results of this study were reported on Ooi and Yurai (2007) and Imakiire et al. (2010). In this presentation, we report the result of radioactive dating and component analysis about the samples extracted in Ito Island, and volcanic evolution history in Ito Island reached by making use of those results is suggested.

The volcanic activity history for 3,000 years past in Ito Island estimated by these results and existing results is as follows: (1) a great volume of lava and pyroclastic material (Motoyama tuff) spewed out about 2,700 years ago, and old Ito island covered thickly with it, (2) a submarine volcano erupted around Kangoku Iwa rock about 1,600-2,000 years ago, and the peperite was generated, (3) a large scale eruption of the volcano occurred around Suribachi Yama lateral volcano about 1,400 years ago, and pumice drifted in Okinawa Islands, (4) Suribachi Yama lateral volcano erupted with a uplifting rapidly Motoyama volcano about 500 years ago, and Suribachi Yama volcano was connected with Motoyama volcano by a large amount of pumice, (5) a small scale eruption occurred in Suribachi Yama lateral volcano about 200-400 years ago, and the scoria hill was formed on southern edge of the crater of this volcano, (6) a small eruption and phreatic explosion occurred at the northeast coast of the island and along Asodai fault, where lie down the western part of island, during the past 100 years, and an eruption with magma occurred at the sea bed off the southern coast of Motoyama volcano after the second World War.

It was confirmed that the uplift velocity past of Ito Island (Motoyama volcano) was intermittent and fastest in about 500 years ago by terrace chronology. On the other hand, the average uplift velocity during the past 100 years by a reference point and GPS observation is 15cm/yr (Hiraoka et al., 2009), and maximum uplift velocity was recorded in the 1950s-1960s and from late 2006 to 2010, about 56cm/yr (Tsuji et al., 1969) and about 50cm/yr (GSI, 2012) respectively. These recent uplift velocity is comparable to it in about 500 years ago, when Suribachi Yama lateral volcano erupted with a uplifting rapidly Motoyama volcano.