Consideration of the formation process of Mt.Hoei, Fuji volcano

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It is important to review the sequence of each eruption in the past in order to mitigate volcanic hazard in the future. Especially the Hoei eruption is regarded to be important because it represents large scale explosive eruption that is rare in the eruptive history of Fuji volcano, but may cause extensive disaster in the metropolitan area. Mt.Hoei has been considered to be protuberance formed during the Hoei eruption and to be composed of Old Fuji formation (Tsuya, 1955). The protuberance has been considered as a kind of bulge accompanied by lateral intrusion of degassed magma (Miyaji et al., 2011). Koyama (2018) suggested the bulge by intrusion of magma could cause sector collapse and the evacuation plan for such sector collapse should be made. In this presentation, we will discuss the genesis and the formation process of Mt.Hoei based on new data obtained from geological survey, geochemical analysis and palaeomagnetic measurements of the constituents of Mt. Hoei and the ultraproximal deposits of Hoei eruption.

Mt.Hoei located at the northeast of Hoei craters, consists of pyroclastic rocks including mainly dense blackish-grey scoriaceous lapilli, spatters, volcanic bombs capturing gabbro and gabbroic fragments. From these observations, microscopy, whole rock chemical composition analysis, palaeomagnetic measurements and XRD analysis results, Mt.Hoei (Akaiwa) is presumed that ultraproximal fall and surge deposits by phreatomagmatic eruptions, compared with Ho-Ⅲ(Stage 2) of Miyaji et al.,(2011) from petrography and chemical composition. In addition, 2nd and 3rd crater ridge, the wall of the erosion valley of Gotenniwa consists of fallout deposits of Hoei eruption, corresponding to Ho-Ⅰ to Ⅲ(Stage 1) of Miyaji et al.,(2011). Although the white and banded pumice layer cannot be confirmed at the base of the erosion valley of Gotenniwa at the present moment, the deposits show a gradual compositional change from andesite to the basalt (SiO_2 = 62.8 to 52.2 wt%) upward. The paleomagnetic directions obtained from the spatter cone in the 1st crater of Hoei, the deposit around the summit of Mt.Hoei and the fallout deposit at erosion valley of Gotenniwa coincides with 1707 A.D.of the paleomagnetic secular variation curve (JRFM 2K.1).

We estimated the formation process of Mt.Hoei based on these new findings, isopach maps of Hoei eruption(Miyaji et al., 2011), the model of magmatic development of Hoei eruption (Fujii, 2007 ; Yasuda et al.,2015), and historical records and drawings (Koyama, 2009). Mt.Hoei is not a bulge caused by the magmatic intrusion, but a pyroclastic cone of Hoei eruption formed in only 9 days.

1. The basaltic magmas contacted and mixed with the dacitic magma, white-banded pumice squirted from the vicinity of the 1st crater and was swept in the east direction by the westerlies (December 16th around 10 to 17 o'clock, Unit A, B of Miyaji et al.,(2011)).
2. As the crater expanded, the side of the mountain of the first crater was also scraped off, and abundant accessory materials were ejected in the east-south direction together with the essentials, and deposited near crater to form Mt.Hoei (December 17th before daylight, Unit C ~ F of Miyaji et al, (2011)).
3. The vent transitioned to the 2nd crater due to the landslide at the 1st crater edge or expansion of the vent. (December 17 to 19 th, Unit G ~ I of Miyaji et al, (2011))
4. The vent transitioned to the 1st crater due to the accessory materials of landslide were gradually ejected, Mt.Hoei (Akaiwa) was formed by intermittent phreatomagmatic eruptions (December 19-25 th, Unit J ~ M of Miyaji et al, (2011)).

5. As crater is restricted to the 1st crater, inflow of accessory materials stopped and Plinian eruption of basaltic magma continued for 6 days and ended (December 25 - 30 th, Unit N ~ Q of Miyaji et al, (2011)).

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