Tephrochronological relations of Middle-Pleistocene tephra derived from Myoko Volcanic Group and the pumice and scoria fall deposits found in Kosha Volcano, Central Japan

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Kosha Volcano, locating between liyama Basin and Nagano Basin, is a small stratovolcano erupted between 0.3 and 0.2 Ma (Kaneko et al. 1989). There are no geological studies about this volcano after Saito (1955) until Kaneko et al. (1989). Togashi and Akabane (1991) reported two tephra groups within Kosha Volcano. The lower is named Kosha Pumice flow and fall deposits (Kf/Kp), which consists of four pumice layers (A1-A4) with hornblende crystals. The upper consists of four pyroxene-rich scoria layers (A5-A8). They inferred A5- A8 are derived from another volcano locating in the west. They presumed that Kf/Kp originated in limori-yama Lava Dome (IM) which is the last product of Kosha Volcano because of presence of hornblende crystals. However, Kf/Kp does not include clinopyroxene crystals, which are common mineral in all of the Kosha products including IM. Hayatsu et al. (1994) and Suzuki (2001) reported several tephra layers distributed around Myoko Volcanic Group. In particular, Ojika Scoria Group (OS) derived from Kurohime volcano and Iz-KT tephra group derived from lizuna Volcano is possible to correlate to tephra layers at Kosha Volcano.

In order to clarify the origin of these tephra layers, we carried out mineralogical analysis (Takasugi et al. 2018, Fall meeting of the volcanological society of Japan). The results indicated that A5-A8 scoria groups are correlated to OS. Chemical compositions of orthopyroxene and hornblende of A3 and A4 tephra differed from those of Kosha products including IM, suggesting that A3 and A4 are not originated from Kosha volcano. Geological occurrences, mineral assemblages and chemical compositions of orthopyroxene and hornblende crystals of A3 and A4 tephra were very similar to those of KTa tephra, which composes the upper most layer of Iz-KT, suggesting that A3 and A4 tephra are correlated to Iz-KT tephra group. This time, we determined chemical compositions of Iz-KT layers to correlate tephra layers at Kosha Volcano.

Titanomagnetite crystals of three tephra layers of Iz-KT (KTa, KTb, KTc) showed distinct chemical compositions. Particularly, three tephra layers showed different Al contents, suggesting that KTa was correlated to A3 and A4, KTb was correlated to A2, and KTc was correlated to A1. Because A1-A8 tephras are covering the pyroclastic flow deposits and lavas of Kosha Volcano, this result suggests the age of the activities of Kosha Volcano is to be

guessed to be elder than the production of KTc, which considered to be supplied around 160 ka according to Suzuki (2001).

Keywords: Myoko Volcanic Chain, tephrochronology, SEM-EDS, orthopyroxene, titanomagnetite, Quaternary research