

The modes of occurrence and petrographic features of the obsidian from the Takahara Volcano

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The Takahara volcano is a Quaternary volcano in the northern Kanto district, Japan, and is located on the active volcanic front of northeast Honshu arc. Obsidian artifacts and implements of the late Paleolithic-Jomon age are excavated from many ruins in the Kanto district and some of those are made of the Takahara obsidian. Therefore archaeologists have regarded one of the major suppliers for the obsidian in the rough during the late Paleolithic-Jomon age is the Takahara volcanic area. However, there have been no documents about the Takahara obsidian by geological or petrological researches, such as Ikejima and Aoki (1962), Inoue et al. (1994), and others.

The purpose of the present study is to clarify the distribution of the Takara obsidian and the geologic succession of the obsidian formation, with concerning about the volcanic history of the Takahara volcano. Also we present the preliminary considerations on the emplacing process and the genesis of the Takahara obsidian magma.

As the result of the present field survey, we found there are two separate occurrences of obsidian formations; one is the Kengamine ridge and the neighboring area and the other is Amayuzawa valley area. Both obsidians have the very similar field-occurrences of volcanoclastic products, and these show various appearances of textures or fabric in microscopic to field-outcrop size. These obsidians commonly include spherulites and/or vesiculations of the various degrees of the content and the size, and those are observed to have devitrificated features. The phenocrystic minerals are commonly of plagioclases, pyroxenes, and iron-ore minerals.

The bulk chemical compositions determined from the glasses of the various obsidians show the similar values, which suggest the Takahara obsidians are derived genetically from a single magma through a simple magmatic process. It erupted by the activity of rhyolitic magma and formed lava flows or dome lavas, although the original obsidian lavas were fractured to volcanoclastic products thorough some volcanic activity.