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Location of "Augustus's Villa" at the northern foot of Vesuvius in relation to physical environments

Takashi Oguchi[1*], Zhou Lin[2], Kota Osawa[3], Goro Komatsu[4], Yuichi S. Hayakawa[1]

[1]CSIS, Univ. Tokyo, [2]Active Fault Res. Center, AIST, [3]Grad. Sch. Frontier Sci., Univ. Tokyo, [4]IRSPS, Univ. G.d'Annunzio, Italy

Through archaeological excavations in Somma Vesuviana at the northern foot of Vesuvius, Italy, a large, complex building was discovered. The building is called "Augustus's Villa", although it was probably built in the 2nd to 5th centuries, after the reign of Augustus. The building is characterized by artistic paintings, mosaics, and architectural decorations, indicating that it was built by wealthy people. Cisterns and large earthenware pots for wine production in the building indicate that water resources were highly important for activities there. We have discussed why the building was built in Somma Vesuviana, considering the physical environments of Vesuvius including landforms, geology and water availability.

Because the large eruption of Vesuvius in AD79 led to extensive disasters in the southern and western foot of the volcano including the city of Pompeii, these sectors may have been excluded during the site selection. Geomorphological analyses of 32 watersheds on Vesuvius using GIS and a DEM (Digital Elevation Model) have revealed that the watershed above Somma Vesuviana has the second steepest mean slope angle and the largest dissection depth among the watersheds. The deep dissection led to a wide exposure of relatively impermeable bedrock along major valleys. In addition, the uppermost part of the watershed is characterized by two wide and deep valleys that can collect water efficiently. These observations indicate that water supply from Vesuvius toward Somma Vesuviana has been more abundant than in the other piedmont areas of the volcano. Indeed, residential areas in the watershed above Somma Vesuviana have been located higher, compared to the other watersheds, at least since the late medieval period. Therefore, more abundant underground and surface water may be a major reason for the site selection of " Augustus's Villa".

It should be noted that such a steep watershed with high water availability tends to undergo frequent sediment transport and related disasters. Indeed, debris flows soon after the eruption of Vesuvius in AD472 caused widespread deposition in Somma Vesuviana, resulting in the complete burial of "Augustus's Villa".

Keywords: Roman ruin, Vesuvius, landforms, geology, water resources