

Archaeological research of Shikiryo site, Kagoshima prefecture, Japan, by introducing archaeological prospection and GIS

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Mt. Kaimondake is an active volcano and is located in Ibusuki city, Kagoshima Prefecture, Japan. It was recorded in historical documents that the mountain had erupted violently on the 25th of March in 874AD. A huge amount of volcanic product fell and covered over the whole area of Ibusuki city. Its deposition congealed and is now called 'Murasaki-Kora', whose meaning is 'purple-colored turtle shell', because it is purple-colored and very hard like a turtle shell. Archaeological sites and remains covered with Murasaki-Kora are in good preservation conditions and they can provide many kinds of information about ancient people's life. Shikiryo site is one of such sites. It is located to 12.5km northwest of Mt. Kaimondake. Its first excavation was carried out from 1995 to 1998 when two apartment houses were built. In these excavations, rice paddy fields were found, but a whole plan of ancient village could not be depicted.

As Shikiryo site is located near the city center, there are few large open spaces available for excavation and small open spaces are sparsely scattered. In such condition, geophysical techniques (archaeological prospection) are very effective to find underground sites and to decide excavation points because they are nondestructive and time-saving. GIS is also effective to integrate such sparse excavation and/or prospection results.

A new project to reveal Shikiryo site by combining archaeological prospection and GIS has been started since 2005.

In 2005, an area of 2,300m² to 30m south of the area excavated in 1996 was surveyed by GPR(Ground Penetrating Radar), and GPR time slice images drew a netted pattern like a giraffe skin. This pattern showed rice paddy fields expanding about 1m below the surface. Two parallel straight lines run south to north about 18m apart in the image. By integrating this image and the excavation result in 1996 on GIS, it was found that one of these line was connected to a path between rice fields in the excavated area and the path run over 100m straightly. A historian suggested that these paths had been constructed under the land subdivision system in the ancient period, 'Jori-sei'. This had become the first evidence of enforcement of Jori-sei in Satsuma province.

In 2006, an area of 2,800m² to about 170m north-northwest of 2005 surveyed one was surveyed by GPR and a newly developed resistivity survey system¹⁾. Murasaki-Kora layer had not been detected almost all in this area, and rice paddy fields and other archaeological remains were not detected.

In 2007, moving a little to the hillside, two small areas of 230m² and 190m² were surveyed by GPR. One is located to 30m west and the other is to 150m west of 2006 surveyed area. GPR survey had not given good results, but ridged dry fields were found by excavation in the latter area.

The cultivation area was revealed in past successive archaeological surveys, but the residential area had not been found. The residential area was intensively searched in 2008. At a small area of 216m² located to 150m south-west of the ridged dry field found in 2007, a rectangular shaped response of 6m by 4m was detected in a GPR time slice image. By excavation, it has been proved to be a well-preserved house.

It can be pointed by these successive researches that Shikiryo site extends at least over 20ha and that a village in the 9C AD will be well preserved under the ground. It is also suggested that Shikiryo site is much more important and of greater worth of conservation than the famous Hashimuregawa site which is located to about 2km south of Shikiryo site and was designated as a National Historical Site.

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Reference

1) Arai, H., Honda, M., Kamei, H. and Sekiguchi, T.(2005): Three-Dimensional Resistivity Survey System using Surface Potential, The 6th Int. Conf. on Archaeological Prospection, Rome, Italy, 191-194.