

# Investigation of the Kanedori site, Northern Honshu, Japan

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## Introduction



When did the humans arrive in the Japanese archipelago? This simple question is a large and difficult study subject in Japanese archeology. In 1946, Tadahiro AIZAWA found the Iwajuku Site and proved the existence of the Late Paleolithic in Japan. Prof. Chosuke SERIZAWA of Tohoku University tried to obtain evidence for the Early Paleolithic in the Japanese archipelago. It seemed that a few disciples of Prof. SERIZAWA proved the existence of Early Paleolithic remains by recovering lithic tools from a 40000 year-old layer of the Zazaragi site during the 3rd excavation in 1981. However, it was found in 2000 that the so-called evidence had been forged, and the study in the Early Paleolithic age had to start all over again. The Kanedori site was discovered by Yoshio TAKEDA in 1984 and the 1st excavation took place in 1985. In those days, Kanedori attracted attention as the northernmost Early Paleolithic site in Japan. After the 2000 Fujimura Scandal, with the deletion of forged Early Paleolithic sites, the Kanedori site came into the spotlight again as the oldest in Japan. Therefore, the 2nd and 3rd excavations were conducted in 2003 and 2004. In these excavations, different methods of age determination were employed, which revealed that the site contained materials dating to the Early Paleolithic period. This poster presents a summary of the results of all the excavations conducted at the Kanedori site.

## Location



The Kanedori site is located in Tono City, in Iwate Prefecture, in northern Honshu (Fig.1). The site is in the middle part of the Kitakami Highlands, to the west of the Kitakami River. There are many Paleolithic sites in the area (Fig.2). To the east of the Kitakami River is the Ou Mountain Range, which forms the backbone of Northern Honshu. There are several volcanos in the Ou Mountains that sent out numerous tephra falls during the Pleistocene. The tephra deposits are most useful for age estimation of the Paleolithic assemblages (Fig.3). The site is located in a remnant of the middle terrace of the Yuya River, in the southwestern part of the Kitakami Highlands. The High, Middle, and Low terraces along the Yuya and Tassobe Rivers can be correlated with riverine terraces of the Sarugaishi and Kitakami Rivers, in terms of the relative heights from the river beds and from the sea level (Fig.4). It should be noted that the Middle terrace of the Yuya River, on which the site is located, can clearly be correlated with the Murasakino · Isawa Terrace of the Kitakami River, with reference to the horizon marker tephra, the Yakeishi-Murasakino Pumice, Or “Yk-M.” The site is on the tongue-shaped terrace which extends from Hiryu-san Mt. on the west bank of the Yuya River. It is at 242m above sea level, and at about 20m from the river bed (Fig.5). The terrace remnant hill on which the site is located is separated from the Hiryu-san Mt. by the National Highway 396. The Highway runs through a shallow valley, which marks the boundary between different kinds of bedrock: serpentine on the west side of the Highway, and argillite on the east side.

## Research history and methods



The site was discovered in 1984 by Yoshio TAKEDA. It was investigated by the Kanedori Excavation Group, led by Kyoichi KIKUCHI. The first investigation which took place from July 26, 1985 to March 31, 1986, covered some 300 square meter of the site (Fig. 6, 7). It revealed that the site contained materials, dating to the Early Palaeolithic period. Because of the Fujimura Scandal of 2000, the municipal Board of Education conducted the second and the third investigations, for one month each, in 2003 and 2004. The investigations confirmed the Early Paleolithic status of the site.

The investigation was conducted by horizontal excavation of lamina unit in each layer. Artifacts were recorded 3-dimensionally, and fabric measurement was conducted. Of the scientific methods of investigation, the following were applied. Analyses of physico-chemical properties of tephra, with the view to identifying its source and the eruption date. Also we took Radiocarbon and OSL dating, Phytolith analyses, Geological research, and Lithological analyses of the lithic artifacts.

## Stratigraphy



The site stratigraphy is as follows: Stratum 1 is the present and old surface soils; Strata 2, 3a, 3b, and 3c are soft loam of volcanic origin; Stratum 3d is pumice; Strata 4a, 4b, and 4c are clay; and Stratum 5 is terrace gravel (Fig.8).

Of these, cultural remains were found in the following strata: the lower part of Stratum 1 contained Late Yayoi to Final Jomon remains, and the upper part of Stratum 2 contained Early Jomon materials. Early Paleolithic materials were found in Strata 3b, 3c, which we call Cultural Layer III, and Strata 4a and 4b, called Cultural Layer IV. Each stratum is separated by unconformity, and slight unconformity exists between sub-strata. Cracks are present in the lower part of Stratum 4a and the upper part of 4b.

The following tephra have been identified: the tephra named Iw-Od dated 35000 to 50000 years ago in Stratum 3b; Yk-M (68000 to 78000 years ago) in Stratum 3d, and, from the lower part of Stratum 4a, were extracted Hj-Kth (84000 years ago) , Aso-4 (85000 to 90000 years ago) , Nr-N (90000 years ago) , and Toya (112000 to 115000 years ago) .



Fig.1 Earlier Paleolithic sites and late Quaternary widespread tephra in Japanese Archipelago (after Machida, Arai 2003)

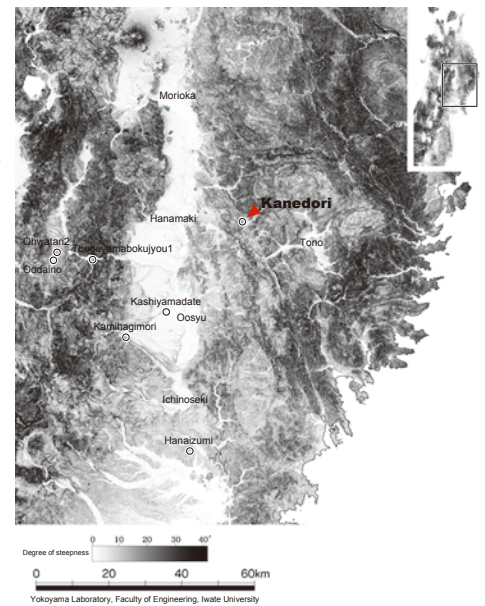


Fig.2 Map of referred Paleolithic sites in Iwate. Yokoyama Laboratory, Faculty of Engineering, Iwate University

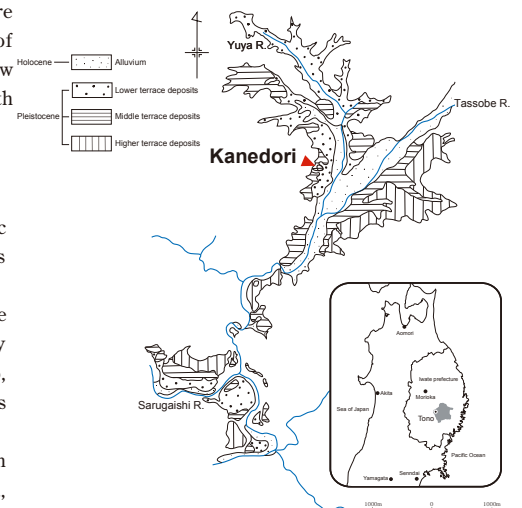


Fig.4 Geomorphological map in around Kanedori

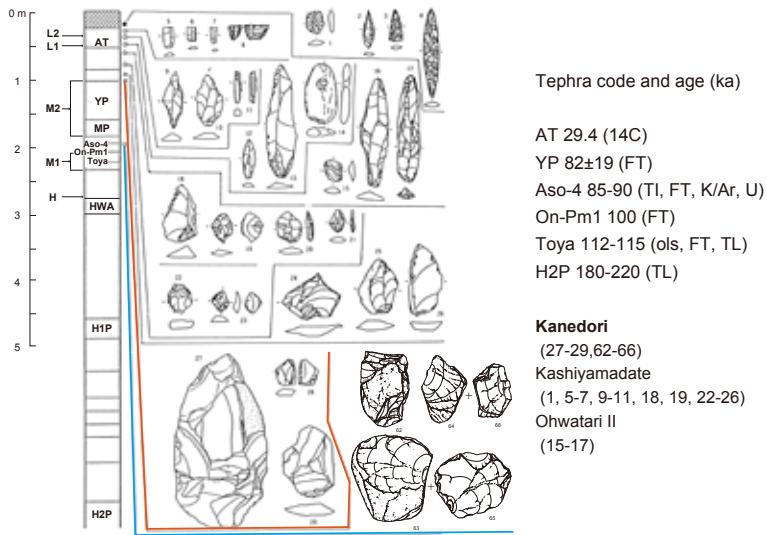


Fig.3 Tephra and Stratification of Paleolithic sites in around Kitakami River (after Kikuchi 1996)



Fig.5 Distant view of the site (after Digital Globe 2015)



Fig.7 First investigation of Kanedori site in 1985



Fig.6 Detailed plan of the excavation area

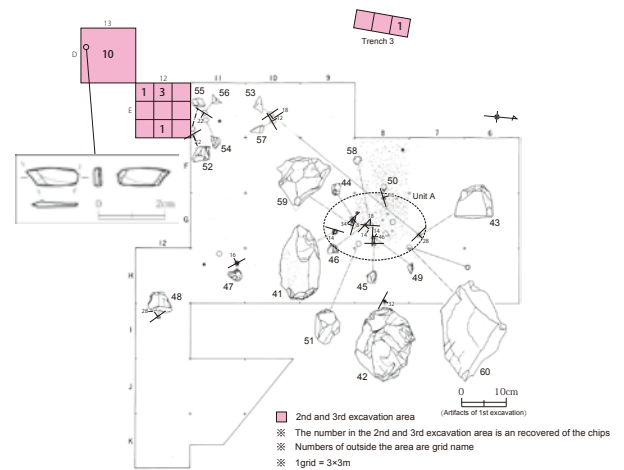


Fig.9 Distribution map of Artifacts In Cultural Layer III (after Kikuchi 1986)

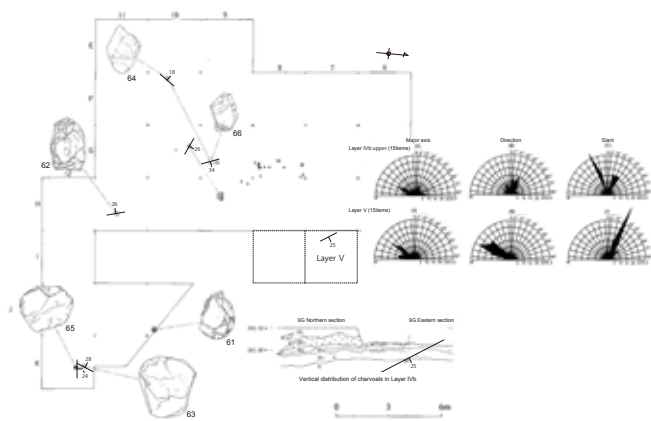


Fig.10 Distribution map of Artifacts In Cultural Layer IV and Rose diagram of Cultural Layer IV and Natural Layer V (after Kikuchi and Nakamura2004)

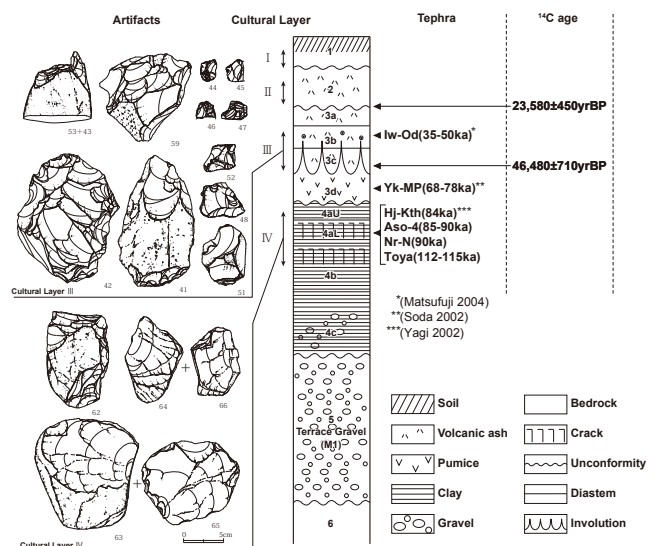
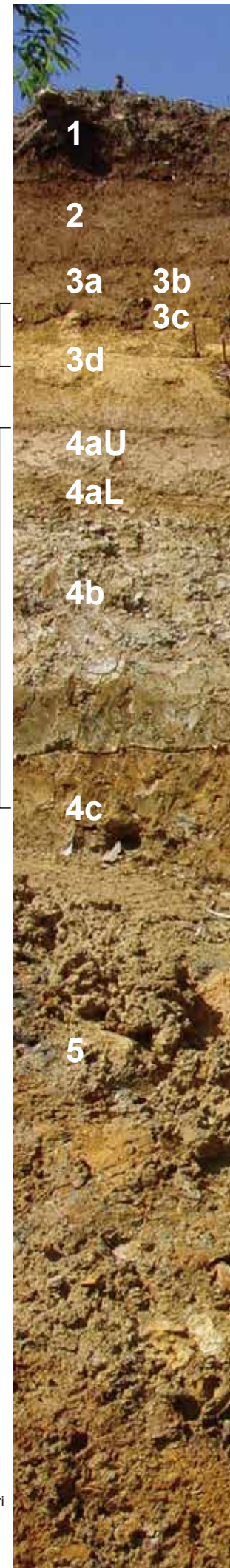


Fig.13 Cultural Layers, tephra and <sup>14</sup>C age of Kanedori Site



Fig.11 Artifacts from Kanedori Site



## Artifacts

### (1) Excavation state

In the first investigation, we recovered 40 items of stone tools from Cultural Layer III (Fig.9). We noted an area of artifact-concentration, named Unit A, where we found large tools (axe-shaped tool etc.) in hornfels and smaller tools (scraper etc.) made of siliceous shale, as well as many carbonized remains. There is also a more loosely-defined cluster of smaller artifacts in the southwest. In Cultural Layer IV, 8 items are including an axe-shaped tool, chopper or chopping tools made by hornfels (Fig.10). There is no artifact concentration area. By the way, the axe-shaped tool (No. 41) was what led to the site discovery by Yoshio Takeda and the core (No.42), axe-shaped tool (No. 61) was collected by the landowner and its imprint on the ground was subsequently confirmed. In the second investigation, we excavated the outside of the center in site. 6 items (axe-shaped tool etc.) were found it from Cultural Layer IV or Cultural Layer III equivalency slope sedimentation of the Trench 1 that is facing south of low slope. After publication of the investigation report, we found these artifacts as a result of having reexamined cobble specimens that excavated in the site. In addition, we found two items from the surface collection of during the first investigation. Beyond that, there is the stone tool which did surface collection by one item each in the site in 2002 and 2006. The stone tool which Takeda collected in 2002 in particular is an important tool resembling an axe-shaped tool of the Cultural Layer III exhumation (No.9). They are made of a kind of hornfels that contains andalusite and garnet. This kind of hornfels is not included in Terrace Gravel but it can be gathered in a riverbed of the Tassobe River.



### (2) Characteristic types of tools

**Axe-shaped tool:** Nos. 6, 9, 41, 61 are unifacially modified base as axe-like which was worked on a cobbles or flakes of hornfels. These specimens seem to be shaped point which was flaked at its apex. Three Axe-shaped tools (Nos. 6, 9, 41) retain some cortex on the surface and the side.

**Handaxe-shaped tool:** No.8 is a unifacially modified point which was worked on a quartz-hornfels cobble. This artifact described as "pick-like" with a round shaped point which was further flaked at its apex.

**Plane-shaped tool:** No.12. This raw material is hornfels of sub-corner cobble. This has horsehoof shaped edge by flaking from the back side. In addition, the notch-shaped processing is accepted in the right side.

## Age of the site



Volcanic glass of Iw-Od tephra, dated 35000 to 50000 years ago, was found in the upper part of Cultural Layer III, and the Yk-M tephra, dated 68000 to 78000 years ago, is deposited in the lower part of Cultural Layer III. Thus, the age of Culture Layer III would be between 35000 and 68000 years ago. This is consistent with the radiocarbon date of 46,480 ±710 BP obtained on a sample from the lower part of Culture Layer III. The age of Culture Layer IV is estimated to be between 68000 years ago and 85000 years ago, because of the presence of the Yk-M tephra deposits just above the Culture Layer IV, and because volcanic glass from Aso-4, dated 85000 years ago, and other tephra have been found in the Culture Layer itself.

## Conclusions



Culture Layer III is estimated to date between 35000 and 68000 years ago, on the basis of tephrochronology and the radiocarbon method. Forty artifacts and numerous carbonized material were recovered from this Layer. The age of Culture Layer IV is estimated to be between 68000 and 84000 years ago, on the basis of the tephra analyses. Eight artifacts and carbonized material were recovered from this Layer (Fig.12).

The Culture Layer III assemblage consists of large tools made of hornfels and small artifacts in siliceous shale. Absence of the handaxe and the pick, which are often found in early assemblages of China and the Korean Peninsula, seems to suggest unique composition of Palaeolithic assemblages in the Japanese Archipelago.

The Kanedori site, which can be firmly dated by means of tephrochronology and geochronology, is a rare example of Early Palaeolithic site in Japan.

Fig.8 Stratigraphy of Kanedori

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