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KSU RADIOCARBON DATES I

OSAMU YAMADA and AKIRA KOBASHIGAWA
Faculty of Science,
Kyoto Sangyo University, Kyoto 603, Japan

INTRODUCTION

It was T Higashimura of Kyoto University who did the first liquid scintillation measurement for ^{14}C in Japan. The External Standard Method (Higashimura *et al*, 1962) has been accepted the world over as an efficient method of measuring low-level radiation.

Yamada, Higashimura and Sidei (1966) used the methanol synthesis method of ^{14}C dating. Subsequently, a ^{14}C dating laboratory was established at Kyoto Sangyo University by O Yamada in 1969. An Aloka LSC-601 counter for 20ml vials was introduced in 1971 with an LSC-800 for 100ml vials in 1973. The appended list includes all samples measured with the LSC-800 counter from 1975 to 1984.

METHANOL SYNTHESIS

Each sample is converted to methanol by the Nystrom formula (Nystrom, Yanko & Brown, 1948)

$$4CO_2 + 3LiAlH_4 = LiAl(OCH_3)_4 + 2LiAlO_2$$
$$LiAl(OCH_3)_4 + 4ROH = 4CH_3OH + LiAl(OR)_4$$

where R is buthyl carbitol.

Each sample is heated and converted to charcoal in an airtight electric furnace at ca 800°C for 2 hours, then boiled in a 1% solution of HCl for one hour, washed well in distilled water, and thoroughly dried.

The samples are then placed in a quartz tube and subjected to a stream of heated N_2 gas for one hour at 500°C. O_2 is passed through the tube and CO_2 gas is made from the charcoal.

The CO_2 is then passed through a mixture of $LiAlH_4$ and diethyl carbitol for 2 or 3 hours until the reaction ends. Buthyl carbitol is added slowly and abundantly to the mixture and the methanol is separated from the mixture through distillation.

For shell samples, CO_2 is derived using diluted HCl and then transformed into methanol using $LiAlH_4$, as described above. Peat samples are first converted to CO_2 and then $CaCO_3$ and then into methanol.

Usually ca 2mol of carbon, 2mol of $LiAlH_4$, 1500ml of diethyl carbitol, and 1000ml of buthyl carbitol are used in the process. The approximate yield rate is ca 80%, falling to 60% after fine distillation. The purity of the final product according to gas chromatography is greater than 99.6%.

MEASUREMENT

The counting rate and counting efficiency has been measured for all samples to obtain a precise absolute decay rate.

The ^{14}C age is given by the formula

$$t = 8033 * \ln(N_0/N)$$

where N_0 is the concentration of modern ^{14}C, *ie*, 95% of the NBS oxalic acid value and N is unknown. Anthracite coal was used for the background dead carbon. One standard deviation was used for the error.

When the ^{14}C is measured in a 100cc teflon vial containing a mixture of 40g of methanol, 50cc of xylene, 0.5g of buthyl PBD and 0.05g of PBBO, the C-channel counting efficiency was ca 70% with a background count of 14 cpm.

When the recent ^{14}C of 40g of methanol is measured over 48 hours, the statistical error of one sigma is ca 20 years including the background error. The oldest age is ca 60,000 BP with 2σ criterion measured over a duration of a week.

Isotopic fractionation during the chemical reaction has been extremely small. Fractionation during distillation did occur to some extent but is negligibly smaller than the statistical error for ^{14}C dating by mass spectrography (Shimada & Yamada, 1977).

ACKNOWLEDGMENTS

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GEOLOGIC SAMPLES

Japan

Mount Fuji series

These samples date volcanic history of Mt Fuji. Coll 1960 to 1975 and subm 1975 by H Tsuya, Tokyo Univ and T Ogawa, Japan Volcano Speleo Soc. All lava flows and mud flows are described by Tsuya (1968).

KSU-21. Komakado **2560 ± 25**

Wood (chestnut) in mud flow erupted from Mt Fuji, Kisegawa River, Gotenba city, Shizuoka pref (35° 14′ 46″ N, 138° 55′ 17″ E) alt 345m.

KSU-22. Nishimarubi **2950 ± 25**

Charcoal in Nim lava flow erupted from young parasitic cinder cone, Fujinomiya city, Shizuoka pref (35° 22′ 3″ N, 138° 40′ 36″ E) alt 1495m.

KSU-23. Katsuragawa **19,190 ± 150**

Wood (hemlock spruce) in Katsuragawa Older Fuji mud flow, Tsuru city, Yamanashi pref (35° 33′ 28″ N, 138° 54′ 30″ E) alt 450m.

KSU-42. Kurozuka **1460 ± 25**

Charcoal in ash of Kurozuka parasitic volcano, Susono city, Shizuoka pref (35° 17′ 18″ N, 138° 46′ 55″ E).

KSU-44. Kansuyama **1290 ± 15**

Wood (Japanese cypress) in scoria under Kan lava flow, erupted from young parasitic cinder cone, Susono city (35° 17′ 17″ N, 138° 47′ 3″ E) alt 1230m.

KSU-43. Fudosawa **1550 ± 15**

Charcoal under Fud lava flow erupted from small fissure on flank of Mt Fuji, Fuji city, Shizuoka pref (35° 19′ 49″ N, 138° 44′ 48″ E) alt 1620m.

KSU-49. Shibanuta No. 1 **2350 ± 25**

Wood (Zelkova) in scoria from summit of Mt Fuji, Oyama town, Shizuoka pref (35° 21′ 00″ N, 138° 53′ 30″ E) alt 720m.

KSU-50. Shibanuta No. 2 **1760 ± 15**

Charcoal, upper of KSU-49.

KSU-57. Takizawa **1650 ± 15**

Charcoal in scoria, left bank of Mamabori swamp, Fujiyoshida city, Yamanashi pref (35° 25′ 3″ N, 138° 46′ 50″ E) alt 1215m.

KSU-62. Takamarubi **1790±15**

Charcoal in scoria, lower layer of Tam lava flow, Yamanakako village, Yamanashi pref (35° 26′ 57″ N, 138° 51′ 42″ E) alt 995m.

KSU-64. Nanamagari **1050 ± 15**

Charcoal in scoria under Fud lava flow, Omote-Fuji hiking road, Fujinomiya city (35° 19′ 50″ N, 138° 44′ 5″ E) alt 2000m.

KSU-73. Karuisaki **24,330 ± 110**

Wood (fir) in Older Fuji mud flow, Fujiyoshida city (35° 29′ 48″ N, 138° 48′ 15″ E) alt 450m.

KSU-74. Jumangoku-Road No. 1 **2570 ± 15**

Charcoal in scoria under Nim lava flow, Fujinomiya city (35° 22′ 1″ N, 138° 40′ 26″ E) alt 1490m.

KSU-76. Jumangoku-Road No. 2 **2520 ± 15**

Charcoal in scoria under Yam lava flow, Fujinomiya city (35° 22′ 16″ N, 138° 40′ 23″ E) alt 1495m.

KSU-79. Jumangoku-Road No. 3 **2700 ± 20**

Charcoal in scoria under NW 6 lava flow, Fujinomiya city (35° 21′ 34″ N, 138° 40′ 36″ E) alt 1490m.

KSU-75. Myogadake **1430 ± 15**

Charcoal in scoria under SSW 17 lava flow erupted from summit of Mt Fuji, Fujinomiya city (35° 19′ 10″ N, 138° 40′ 26″ E) alt 1530m.

KSU-77. Futatsu-tsuka **310 ± 15**

Charcoal in scoria erupted from Houei crater of Mt Fuji in AD 1707, Gotenba city (35° 19′ 45″ N, 138° 46′ 50″ E) alt 1804m.

KSU-78. Inno-Tainai **1650 ± 15**

Charcoal from tree mold in Inm lava flow, Gotenba city (35° 17′ 44″ N, 138° 51′ 55″ E) alt 675m.

KSU-80. Nissawa **2500 ± 35**

Charcoal from ancient bonfire, Fujinomiya city (35° 18′ 46″ N, 138° 44′ 12″ E) alt 1590m. *Comment:* suggests human activity.

KSU-81. Taisekiji **24,520 ± 90**

Charcoal in Older Fuji mud flow, Fujinomiya city (35° 16′ 50″ N, 138° 35′ 15″ E) alt 350m.

KSU-83. Komitake **1110 ± 15**

Charcoal in scoria from Ken 2 lava flow, Narusawa village, Yamanashi pref (35° 23′ 28″ N, 138° 44′ 1″ E) alt 2300m.

KSU-84. Omote-Fuji **1150 ± 20**

Charcoal in scoria under Fud lava flow, hair-pin curve of Omote-Fuji Road, Fujinomiya city (35° 19′ 52″ N, 138° 44′ 7″ E) alt 2220m.

KSU-85. Okuniwa **1350 ± 15**

Charcoal under Oniwa 1 lava flow, erupted Oniwa 1 parasitic fissure, Narusawa village (35° 23′ 24″ N, 138° 41′ 43″ E) alt 2250m.

KSU-86. Kenmarubi **1120 ± 15**

Charcoal in scoria under Ken 1 lava flow, Fujiyoshida city (35° 28′ 56″ N, 138° 47′ 6″ E) alt 835m.

KSU-88. Yamanaka Lake No. 1 **1480 ± 10**

Wood (larch), mostly outer tree rings, standing at 10m depth in lake, Yamanakako village (35° 24′ 50″ N, 138° 53′ 0″ E) alt 970m. *Comment:* dates fm of Yamanaka Lake dammed by lava flow from Mt Fuji.

KSU-89. Yamanaka Lake No. 2 **1660 ± 15**

Center tree rings of same sample as KSU-88, with 180 tree rings.

KSU-91. Daifuji golf links **980 ± 15**

Charcoal in lava tree mold at Obu lava flow, Fuji city (35° 12′ 15″ N, 138° 43′ 15″ E) alt 310m.

KSU-26. Niijima **1130 ± 20**

Charcoal from lava flow erupted in AD 886, Niijima I. (34° 23′ N, 139° 16′ E) alt 120m. Coll and subm by T Sameshima, Shizuoka Univ.

KSU-60. Kurofuji **41,900 ± 860**

Charcoal in loam strata from Kurofuji, Yamanashi pref (35° 45′ N, 138° 32′ E). Coll and subm by H Shinohara, Tsuru Coll and T Ogawa. *Comment* (TO): datum shows same age as Older Fuji, Yatsugatake, Kayagatake and new Hakone, situated in region usually called southern fossa magna.

KSU-72. Fukara **1530 ± 15**

Wood (*Cryptomeria*) in landslide sand from Hakone volcano, Susono city (35° 10′ 40″ N, 138° 55′ 45″ E). Coll and subm by Y Watanabe, Susono city office.

KSU-87. Kobuta-sawa **7250 ± 40**

Wood in landslide sand from Hakone volcano, Tertiary strata, Oshino village, Shizuoka pref (35° 24′ 50″ N, 138° 53′ 0″ E) alt 970m. Coll and subm by H Tsuya and T Ogawa.

Ohtaki Cave series

Stalactite from Ohtaki, Gifu pref (35° 43′ 27″ N, 136° 59′ 44″ E). Coll and subm by H Wada, Shizuoka Univ.

KSU-112. Surface No. 1 **3760 ± 50**

KSU-114. Surface No. 2 **3370 ± 40**

KSU-131. Coldest temperature part **>34,000**

KSU-128. Yogo Lake **3010 ± 30**

Tree root from bottom of Yogo Lake, Shiga pref (35° 30′ 40″ N, 136° 11′ 40″ E). Coll and subm by Yogo Educ Bd.

KSU-225. Hyonosen **3650 ± 80**

Peat, 90cm depth, from Yabu dist, Hyogo pref (35° 21′ N, 134° 1′ E), alt 1470m. Coll and subm 1978 by M Takeoka, Kyoto Pref Univ.

Amou series

Samples from Amou marshland, Ono dist, Gifu pref (36° 16′ N, 137° 1′ E). Coll and subm 1978 by M Yagi, Gifu Univ.

KSU-231. Amou No. 1 **8210 ± 280**

Peat, 220cm depth.

KSU-366. Amou No. 2 **13,320 ± 190**

Peat, 380 to 400cm depth.

KSU-244. Karasuma-Gojo **36,290 ± 800**

Wood, 12.5m depth, Kyoto city (34° 59′ 36″ N, 135° 45′ 44″ E). Coll and subm by S Ishida, Kyoto Univ.

KSU-275. Aratozaka **2900 ± 35**

Wood (chestnut) from bottom of rice field, Obanazawa city, Yamagata pref (38° 34′ N, 140° 30′ E). Coll and subm 1979 by M Takeoka, Kyoto Pref Univ.

KSU-289. Hatchodaira **6980 ± 200**

Peat, 70 to 80cm depth, from Kuta, Kyoto city (35° 14′ N, 135° 50′ E), alt 810m. Coll and subm 1979 by M Takeoka.

KSU-290. Ukishima **2540 ± 90**

Peat, 400 to 410cm depth, from Shinguu city, Wakayama pref (33° 43′ N, 135° 59′ E). Coll and subm 1979 by M Takeoka.

KSU-291. Sugawara marshland **5530 ± 80**

Peat, 363 to 373cm depth, from Touhaku dist, Tottri pref (35° 25′ N, 133° 59′ E) alt 680m. Coll and subm 1978 by M Takeoka.

Hananoego series

Peat from Yaku I., Kumage dist, Kagoshima pref (30° 18′ 40″ N, 130° 30′ 40″ E) alt 1600m. Coll and subm 1977 by M Takeoka.

KSU-292. Hananoego No. 1 **2450 ± 80**

Peat, 50 to 60cm depth.

KSU-293. Hananoego No. 2 **3280 ± 100**

Peat, 80 to 90cm depth.

Byakushiike series

Peat from Nishimorogata dist, Miyazaki pref (31° 57′ N, 130° 50′ E) alt 1349m. Coll and subm 1979 by M Takeoka.

KSU-309. Byakushiike No. 1 **0 ± 50**

Peat, 150 to 160cm depth.

KSU-310. Byakushiike No. 2 **5530 ± 130**

Peat, 285 to 295cm depth.

KSU-311. Imuta **4200 ± 190**

Peat, 390 to 400cm depth, from Satsuma dist, Kagoshima pref (31° 49′ N, 130° 28′ E) alt 295m. Coll and subm 1979 by M Takeoka.

KSU-314. Okameike **3890 ± 100**

Peat, 220 to 230cm depth, from Uda dist, Nara pref (34° 30′ 54″ N, 136° 10′ 1″ E) alt 710m. Coll and subm 1979 by M Takeoka.

Joyo series

Samples from Joyo city, Kyoto pref (34° 52′ 6″ N, 135° 46′ 0″ E). Coll by J Fukutomi, subm by Educ Bd, Joyo city.

KSU-340. Joyo No. 1 **3710 ± 30**

Wood, 13.5m depth.

KSU-341. Joyo No. 2 **3300 ± 35**

Wood, 7m depth.

KSU-364. Hirugano **3790 ± 100**

Peat, 90 to 100cm depth, from Gujo dist, Gifu pref (35° 59′ N, 136° 54′ E). Coll and subm 1980 by M Takeoka.

Hashio series

Wood from Kouryo, Nara pref (34° 34′ 0″ N, 135° 45′ 20″ E). Coll and subm by H Okuda.

KSU-431. Hashio No. 1 **3500 ± 40**

Wood, 4m depth, Late Jomon age.

KSU-424. Hashio No. 2 **38,500 ± 390**

Wood, 5.5m depth, upper portion of volcanic tuff layer.

KSU-436. Hashio No. 3 **40,100 ± 610**

Wood, 6m depth, right upper portion of same tuff layer.

KSU-390. Dainaka Lake **24,610 ±2750**

Wood, 14.8m depth, Shiga pref (35° 11′ N, 136° 7′ E). Coll and subm by S Sasajima, Kyoto Univ, underlying ash of Aira volcano.

KSU-437. Tominaga-Seisakusho **24,050 ± 190**

Peat, Nijo-nibo, Kyoto city (35° 0′ 37″ N, 135° 44′ 2″ E). Coll and subm by S Sasajima.

KSU-438. Seibo Women's College **19,810 ± 150**

Peat, Fujinomori, Kyoto city (35° 57′ 19″ N, 135° 46′ 37″ E). Coll and subm by S Sasajima.

KSU-450. Kigo **8980 ± 70**

Peat, 180 to 200cm depth, from Tango peninsula, Kyoto pref (35° 38′ N, 135° 11′ E). Coll and subm 1981 by M Takeoka, Kyoto Pref Univ.

KSU-542. Nawagaike **480 ± 180**

Peat, 70 to 80cm depth, from Higashitonami dist, Toyama pref (36° 28′ 30″ N, 136° 56′ 0″ E). Coll and subm 1982 by M Takeoka.

KSU-543. Midagahara **1070 ± 25**

Peat, 44 to 54cm depth, from Tateyama, Nakashinkawa dist, Toyama pref (36° 34′ 0″ N, 137° 33′ 15″ E). Coll and subm 1982 by M Takeoka.

KSU-546. Shirakimine **2820 ± 70**

Peat, 68 to 78cm depth, from Yao, Nei dist, Toyama pref (36° 25′ 0″ N, 137° 7′ 15″ E). Coll and subm 1982 by M Takeoka.

Mikata Lake series

Peat from Mikata dist, Fukui pref (35° 56′ N, 135° 54′ E). Coll and subm 1978 by Y Yasuda, Hiroshima Univ.

KSU-640. Mikata No. 1 **2040 ± 80**

Peat, 190 to 200cm depth.

KSU-641. Mikata No. 2 **5670 ± 100**

Peat, 355 to 375cm depth.

KSU-642. Mikata No. 3 **8590 ± 140**

Peat, 475 to 495cm depth.

KSU-465. Mikata No. 4 **15,500 ± 150**

Peat, 579 to 600cm depth.

KSU-467. Mikata No. 5 **18,100 ± 140**

Peat, 936 to 956cm depth.

KSU-650. Mikata No. 6 **20,600 ± 800**

Peat, 1270 to 1315cm depth.

KSU-651. Mikata No. 7 **32,700 $^{+6200}_{-3500}$**

Peat, 2560 to 2584cm depth.

Azuchi series

Samples from Azuchi, Gamou dist, Shiga pref. Coll and subm 1982 by Y Tsutsumi, Azuchi town office.

KSU-558. Azuchi No. 1 **2660 ± 40**

Soil, 56 to 69cm depth, from Dainaka (35° 9′ 57″ N, 136° 7′ 26″ E).

KSU-567. Azuchi No. 2 **4160 ± 80**

Soil, 70 to 90cm depth, from Dainaka.

KSU-557. Azuchi No. 3 **3210 ± 40**

Wood from bottom of Dainaka Lake.

KSU-562. Azuchi No. 4 **4200 ± 110**

Soil from Jionji (35° 8′ 7″ N, 136° 7′ 56″ E).

KSU-563. Azuchi No. 5 **3770 ± 100**

Soil from Jionji.

KSU-564. Azuchi No. 6 **1580 ± 60**

Soil, 14 to 25cm depth, from Higashioiso (35° 7′ 40″ N, 136° 9′ 50″ E).

KSU-565. Azuchi No. 7 **3350 ± 70**

Soil, 38 to 46cm depth, from Higashioiso.

KSU-566. Azuchi No. 8 **3790 ± 80**

Soil, 56 to 69cm depth, from Higashioiso.

Ichijoji series

Soil from Kyoto city (35° 2′ 22″ N, 135° 47′ 43″ E). Coll and subm 1983 by S Ishida, Kyoto Univ.

KSU-644. Ichijoji No. 1 **8580 ± 170**

Soil from 2nd black layer.

KSU-645. Ichijoji No. 2 **7790 ± 100**

Soil from same as No. 1.

KSU-664. Tadachi **6620 ± 100**

Peat, 32 to 42cm depth, from Minamikiso, Nagano pref (35° 39′ N, 137° 33′ E). Coll and subm 1983 by M Takeoka, Kyoto Pref Univ.

KSU-665. Kuroauchi **4520 ± 80**

Peat, 90 to 100cm depth, from Hase, Kamiina dist, Nagano pref (35° 53′ N, 138° 10′ E). Coll and subm 1983 by M Takeoka.

KSU-666. Karahanami **7420 ± 70**

Peat, 90 to 100cm depth, from Yasaka, Kitaazumi dist, Nagano pref (36° 29′ N, 137° 54′ E). Coll and subm 1983 by M Takeoka.

KSU-647. Kurauchi **2430 ± 30**

Wood (*Cryptmeria*) from Tango, Takeno dist, Kyoto pref (35° 4′ 37″ N, 135° 10′ 0″ E). Coll and subm 1983 by M Takeoka.

KSU-862. Yakumogahara **3300 ± 50**

Peat, 92 to 102cm depth, from Shiga, Shiga dist, Shiga pref (35° 37′ N, 135° 55′ E). Coll and subm 1984 by M Takeoka.

KSU-863. Fukashimizu **750 ± 60**

Peat, 150 to 160cm depth, from Imazu, Takashima dist, Shiga pref (35° 37′ N, 136° 0′ E). Coll and subm 1984 by M Takeoka.

KSU-864. Fukakusa **$31{,}600\ ^{+\ 2600}_{-\ 1900}$**

Wood from Fukakusa-kuragadani Kyoto city (34° 57′ N, 135° 46′ E). Coll 1984 by S Ishidaka and H Okamoto, Kyoto Sci Center for Youth and subm by M Takeoka.

GG series

Samples were subm 1983 by H Ohmori, Geog Inst, Tokyo Univ.

KSU-738. GG-1 **$50{,}600\ ^{+\ 8900}_{-\ 4100}$**

Wood, 150cm depth, from Kurioka, Oshamanbe, Hokkaido (42° 32′ 15″ N, 140° 21′ 31″ E). Coll by A Okumura.

KSU-739. GG-2 **> 55,100**

Wood, 550cm depth, from Horoiwa, Saroma, Hokkaido (44° 5′ 41″ N, 143° 53′ 27″ E). Coll by M Watanabe.

KSU-740. GG-3 **5340 ± 60**

Coral from Kamikatetsu, Kikai, Kagoshima pref (28° 16′ 30″ N, 129° 56′ 30″ E). Coll by S Kayane.

KSU-741. GG-4 **5530 ± 40**

Coral, same as GG-3.

KSU-742. GG-5 **1610 ± 90**

Peat, 240 to 250cm depth, from Hara, Numazu city, Shizuoka pref (35° 8′ N, 138° 47′ E). Coll by A Matsubara.

KSU-743. GG-6 **7020 ± 50**

Peat, 500cm depth, from Shinden, Maruyama, Chiba pref (35° 1′ 10″ N, 139° 57′ 30″ E). Coll by K Kashima.

KSU-744. GG-7 **6980 ± 460**

Shell, 180cm depth, from Amaya, Maruyama, Chiba pref (35° 0′ 40″ N, 139° 58′ 30″ E). Coll by K Kashima.

KSU-745. GG-8 **4910 ± 45**

Coral, same as GG-3.

KSU-746. GG-9 **2540 ± 60**

Peat, 220 to 225cm depth, Higashishihiji, Numazu city, Shizuoka pref (35° 7′ N, 138° 51′ E). Coll by A Matsubara.

HISTORIC SAMPLES

Japan

Yamanaka Castle series

Yamanaka Castle, Mishima city, Shizuoka pref (35° 9′ N, 138° 59′ E), was built in 1559, and added on to in 1979. Coll and subm by H Saitoh, Educ Bd, Mishima city.

KSU-28. Mumei-Kuruwa F9 No. 1 **340 ± 7**

Wood, sample was 11.89g carbon mass; measurement time was 20,200 min.

KSU-104. Mumei-Kuruwa No. 2 **350 ± 30**

Wood, same sample as KSU-28.

KSU-29. Nishi-Yagura **320 ± 5**

Wood from W tr; 13.36g carbon and 34,100 min.

KSU-184. Konrenji **810 ± 20**

Wood from Konrenji temple, Kira cho, Aichi pref (34° 49′ N, 137° 6′ E). Coll and subm by T Kondo, Kyoto Sangyo Univ. Temple was built in early stage of Kamakura Age (AD 1192 to 1332).

Sueki Kama series

Charcoal, Senboku New Town, Osaka pref (34° 28′ 34″ N, 135° 31′ 35″ E), from AD 8th century. Coll and subm by H Nakamura, Ohtani Women's Coll.

KSU-185. TK59 No. 1 **1190 ± 20**

KSU-189. TK59 No. 2 **1200 ± 15**

KSU-193. TK59 No. 3 **1220 ± 30**

Makishima series

Samples were in Uji River, Kyoto city (34° 54′ 11″ N, 135° 47′ 38″ E). Coll and subm by Y Murata. Bank of Uji R was constructed by Taiko Hideyoshi in Azuchi-Momoyama Age (AD 1574 to 1602), and occasionally repaired afterwards.

KSU-279. Makishima No. 1 **230 ± 10**

Wood, stake in Taiko-Bank.

KSU-280. Makishima No. 2 **230 ± 15**

Wood, another stake in same place as KSU-279.

KSU-281. Makishima No. 3 **370 ± 90**

Wood, twig from river sand, 10cm depth.

Hizume series

Samples from iron furnaces from Heian Age (AD 794 to 1191), Shimogamo, Minami-Izu cyo, Shizuoka pref (34° 38′ 10″ N, 138° 52′ 0″ E). Coll and subm by T Satoh.

KSU-307. Hizume No. 1 **920 ± 25**

Charcoal, B2, middle of Layer 2.

KSU-308. Hizume No. 2 **1050 ± 20**

Charcoal, C3, underlying Layer 3.

ARCHAEOLOGIC SAMPLES

Japan

Uryudo series

Uryudo Nishi-iwata site is ancient village of Yayoi Age in Higashiosaka city (34° 39′ 24″ N, 135° 36′ 0″ E). Coll and subm 1973 by Y Nakanishi. *Comment* (YN): dates cultivation time of waterfield rice in Osaka plain. Results as expected.

KSU-12. Uryudo 12 **1880 ± 30**

Wood from UU3PY1, blue-gray layer.

KSU-17. Uryudo 17 **2030 ± 20**

Wood from UU3PY15, black sand layer.

KSU-18. Uryudo 18 **2460 ± 30**

Wood from UU5CH24, brown clay layer.

KSU-41. Uryudo 20 **2170 ± 30**

Wood from UU3PY15, Pit 2.

KSU-51. Uryudo 19 **2140 ± 15**

Wood from UU5CH24, brown clay layer.

Toro site series

Toro, Shizuoka city (34° 57′ 3″ N, 138° 24′ 33″ E), is typical site of Yayoi Age in Japan. Coll and subm by T Mochizuki, Toro Mus. *Comment* (TM): expected age: 1800 BP.

KSU-31. Toro No. 1 **2050 ± 10**

Wood, stake from rice field, 0.5km S of Toro.

KSU-61. Toro No. 2 **2020 ± 15**

Wood, board from same field.

KSU-66. Toro No. 3 **1880 ± 15**

Wood, stake from same field.

Shigasato site series

Shigasato site is W side of Lake Biwa, Shiga pref (35° 1′ N, 135° 52′ E). Coll and subm by S Tanabe. *Comment* (ST): results of Late and Final Jomon Age as expected, but results of Yayoi Age older.

KSU-13. Shigasato D **2320 ± 50**
Wood, assoc with first style of Yayoi pottery.

KSU-14. Shigasato A **2470 ± 20**
Wood, same as KSU-13.

KSU-15. Shigasato C **2170 ± 15**
Wood, same as KSU-13.

KSU-16. Shigasato wooden tool **2940 ± 10**
Wooden tool, between Late and Final Jomon age.

KSU-40. Shigasato shell **2730 ± 20**
Shell, Final Jomon Age.

Hamane site series

Samples from salt-making cottages, Hamane, Ohi, Fukui pref (35° 32′ N, 135° 30′ E). Coll and subm by M Morikawa, Wakasa Mus. *Comment* (MM): results seem to be older.

KSU-125. Hamane No. 1 **1710 ± 15**
Wood, assoc with Hamane-shiki pottery.

KSU-207. Hamane No. 2 **1860 ± 40**
Wood, same pottery as KSU-125.

Yotsuike site series

This site includes many artifacts from Jomon to Kofun Age, Sakai city (34° 32′ 34″ N, 135° 27′ 52″ E). Coll and subm by Y Higuchi, Educ Bd, Sakai city. *Comment* (YH): results as expected except Middle Kofun Age. Results of Middle Kofun Age seem to be older.

KSU-181. Yotsuike No. 1 **1580 ± 15**
Wood from sand layer in old river, assoc with pot of ca 5th century.

KSU-183. Yotsuike No. 2 **2120 ± 15**
Wood from black gray layer at Dist 34, Yayoi Age.

KSU-191. Yotsuike No. 3 **2040 ± 50**
Wood from gray sand layer at Dist 35, Yayoi Age.

KSU-223. Yotsuike No. 4 **1280 ± 35**
Charcoal from dark-gray layer in river, Late Kofun Age.

KSU-238. Yotsuike No. 5 **1620 ± 30**
Wood from black clay layer, Middle Kofun Age.

KSU-239. Yotsuike No. 6 **1670 ± 15**

Wood, Dist 32, Middle Kofun Age.

KSU-240. Yotsuike No. 7 **1580 ± 40**

Wood from AO gray-brown sand layer, Tr 1 at Dist 32, Middle Kofun Age.

KSU-457. Yotsuike No. 8 **3660 ± 60**

Charcoal from third phase of Jomon Age at Dist 17, Late Jomon Age.

Ninomiya site series

Samples from Tsuyama city, Okayama pref (35° 2′ N, 134° 0′ E). Coll and subm by T Takahata, Educ Bd, Okayama pref. *Comment* (TT): KSU-208 as expected. KSU-182 seems to be older.

KSU-182. Okanotawa **1960 ± 20**

Charcoal, Late Yayoi Age.

KSU-208. Koujinmoto **930 ± 25**

Wood, between Late Heian and Kamakura Age.

Torihama site series

Torihama is important site from Incipient to Late Jomon Age, Mikata-cho Fukui pref (35° 32′ 56″ N, 135° 52′ 42″ E). Coll and subm 1975 to 1984 by M Morikawa, Wakasa Mus. *Comment* (MM): many Jomon ceramics and Oki volcanic ash are dated. Torihama site may be standard of Jomon Age.

KSU-94. TR7501 **5800 ± 20**

Shell from shell layer, E wall, Sec 1.

KSU-95. TR7502 **5760 ± 100**

Wood from shell layer, E wall, Sec 1.

KSU-118. TR7503 **5670 ± 30**

Shell from shell layer, E wall, Sec 1.

KSU-134. TR7504 **5450 ± 20**

Wood from shell layer, E wall, Sec 1.

KSU-141. TR7505 **5520 ± 20**

Walnuts from shell layer, E wall, Sec 1.

KSU-154. TR7506 **5810 ± 25**

Shell from shell layer, E wall Sec 1.

KSU-101. TR7507 **5510 ± 20**

Wood from Layer 3, S wall, Sec 2.

KSU-123. TR7508 **5490 ± 70**
Wood from Layer 5, S wall, Sec 2.

KSU-102. TR7509 **5460 ± 30**
Wood from Layer 6, S wall, Sec 2.

KSU-93. TR7510 **6170 ± 20**
Wood from Layer 7, S wall, Sec 2.

KSU-98. TR7511 **6140 ± 20**
Wood from Layer 7, S wall, Sec 2.

KSU-92. TR7512 **8340 ± 20**
Wood from Layer 10, S wall, Sec 2.

KSU-427. TR80R01 **5130 ± 100**
Wood, 90cm depth, from Layer 14, E wall, Sec 3, with Hajima-kasou 2-shiki pottery.

KSU-405. TR80R02 **5440 ± 40**
Wood, 135cm depth, from Layer 27, E wall, Sec 3, with same pottery as KSU-427.

KSU-399. TR80R03 **5500 ± 45**
Wood, 140cm depth, from Layer 27, E wall, Sec 3, with same pottery as KSU-427.

KSU-361. TR80R04 **9780 ± 60**
Wood, 160cm depth, from Layer 31, Sec 2 to 3, with Tajomon pottery.

KSU-397. TR80R05 **10,080 ± 60**
Wood, 170cm depth, from Layer 31, E wall, Sec 3, with same pottery as KSU-361.

KSU-404. TR80R06 **10,320 ± 60**
Wood, 190cm depth, from Layer 33, Sec 3, with same pottery as KSU-361.

KSU-419. TR80L01 **4790 ± 25**
Wood, 60cm depth, Layer 5, Sec 3.

KSU-396. TR80L02 **5780 ± 20**
Wood, 70cm depth, from Layer 7, 5H, Sec 2, upper Akahoya volcanic ash.

KSU-395. TR80L03 **7010 ± 30**

Charcoal, 80cm depth, from Layer 8, 5I, Sec 2, under Akahoya volcanic ash.

KSU-409. TR80L04 **8130 ± 30**

Wood, 185cm depth, from Layer 22 to 23, 15C, Sec 3, with Oshigatamon pottery.

KSU-389. TR80L05 **8190 ± 300**

Wood, 205cm depth, from Layer 24, Sec 4, upper Oki volcanic ash, with same pottery as KSU-409.

KSU-382. TR80L06 **8970 ± 120**

Soil, 208cm depth, from bottom of Oki volcanic ash, with same pottery as KSU-409.

KSU-388. TR80L07 **9170 ± 50**

Wood, 210cm depth, from Layer 26, under Oki volcanic ash, Sec 4, with same pottery as KSU-409.

KSU-485. TR80L08 **11,850 ± 100**

Wood, 280cm depth, from Layer 32, Tr E, Sec 3.

KSU-478. TR80L09 **11,900 ± 110**

Wood, 280cm depth, from Layer 32, Tr E, Sec 3.

KSU-400. TR80L10 **11,470 ± 70**

Wood, 305cm depth, from Layer 37, Sec 3.

KSU-484. TR80L11 **11,500 ± 100**

Wood, 305cm depth, from Layer 37, Sec 3.

KSU-471. TR80L12 **12,100 ± 100**

Wood, 305cm depth, from Layer 37, Sec 3.

KSU-477. TR80L13 **12,100 ± 130**

Wood, 305cm depth, from Layer 37, Sec 3.

KSU-571. TR8201 **3780 ± 50**

Wood, piece of canoe, from Layer 3, Sec 2 to 3.

KSU-572. TR8202 **3680 ± 35**

Wood, stick from canoe, from Layer 3, Sec 2.

KSU-1012. TR8301 **5220 ± 35**

Wood, 95cm depth, from Layer 13, 23B 21D, Sec 1, with Kitashirakawa-kasou 2-c-shiki pottery.

KSU-1019. TR8401 **5170 ± 30**

Wood, 80cm depth, from Layer 37, Sec 2, with Kitashirakawa-kasou 2-b-shiki pottery.

KSU-1013. TR8302 **5330 ± 30**

Wood, 170cm depth, from Layer 31 to 34, 22E, Sec 1, with same pottery as KSU-1019.

KSU-1014. TR8303 **5910 ± 30**

Wood, 95cm depth, from under Layer 73, 33B, Sec 3, with Hajima-kasou 2-shiki pottery.

KSU-1020. TR8402 **5500 ± 40**

Wood, 110cm depth, from Layer 39, 23H 25I 25K, Sec 2, with same pottery as KSU-1014.

KSU-1021. TR8403 **5200 ± 40**

Wood, 120cm depth, from Layer 41, 21L, Sec 2, with same pottery as KSU-1014.

KSU-1022. TR8404 **7250 ± 60**

Peat, 30cm depth, from Layer 49a, 29M, Sec 2, with Initial Jomon pottery.

KSU-1023. TR8405 **8330 ± 45**

Peat, 40cm depth, from Layer 49b, 29M, Sec 2, with Oshigata-mon pottery.

KSU-1024. TR8406 **9120 ± 80**

Peat, 60cm depth, from Layer 51, 29M, Sec 2, with same pottery as KSU-1023.

KSU-1015. TR8304 **10,070 ± 60**

Wood, 130cm depth, from Layer 80, 39B, Sec 3, with Tajomon pottery.

KSU-1016. TR8305 **10,070 ± 45**

Wood, 150cm depth, from Layer 82, 38D 39B 37B, Sec 3, with same pottery as KSU-1015.

KSU-1025. TR8407 **10,270 ± 45**

Wood, 105cm depth, from Layer 60, 29M, Sec 2, with same pottery as KSU-1015.

KSU-1026. TR8408 **10,130 ± 45**

Peat, 105cm depth, from Layer 60, 29M, Sec 2, with same pottery as KSU-1015.

KSU-1017. TR8306 **10,290 ± 45**

Wood, 180cm depth, from Layer 85, 36E 38C 34D, Sec 3, with Tsume-gata-mon pottery.

KSU-1027. TR8409 **10,770 ± 160**

Wood, 165cm depth, from Layer 62, 22M, Sec 2, with same pottery as KSU-1017.

KSU-1028. TR8410 **11,830 ± 60**

Wood, 185cm depth, from Layer 66, 29M, Sec 2, with Ryusenmon pottery.

KSU-1029. TR8411 **11,800 ± 60**

Wood, 180cm depth, from Layer 66, Sec 3, with same pottery as KSU-1028.

KSU-1030. TR8412 **11,700 ± 60**

Wood, 200cm depth, from Layer 67, 22M, Sec 2.

KSU-1018. TR8307 **11,730 ± 50**

Wood, 270cm depth, from Layer 90, Tr A, Sec 2.

KSU-1031. TR8413 **11,870 ± 50**

Wood, 225cm depth, from Layer 68, 22M, Sec 2.

Yoshidaminami site series

Samples from Tarumi-ku, Kobe city (34° 40′ N, 134° 49′ E). Coll and subm by S Tanabe, Nara Univ. *Comment* (ST): expected age: Kofun to Nara Age. Results of Nara Age as expected, but results of Kofun Age older.

KSU-194. Yoshidaminami No. 1 **1890 ± 30**

Wooden stake, 3YM, Kofun Age.

KSU-229. Yoshidaminami No. 2 **1760 ± 50**

Wood, 3YM-SB26.

KSU-235. Yoshidaminami No. 3 **1380 ± 70**

Wood, SE1.

KSU-227. Yoshidaminami No. 4 **1290 ± 40**

Wood, 1YMSE2, Nara Age.

KSU-220. Yoshidaminami No. 5 **1260 ± 70**

Wood, 2YM.

KSU-213. Yoshigo site **2380 ± 20**

Shell from Tahara, Aichi pref (34° 40′ 41″ N, 137° 17′ 4″ E). Coll and subm by S Sumida, Nagoya Univ. *Comment* (SS): assoc with Final Jomon pottery. Result as expected.

KSU-215. Hassaki site **6880 ± 35**

Shell from Ohbu city, Aichi pref (35° 0′ 39″ N, 137° 0′ 14″ E). Coll and subm by S Sumida. *Comment* (SS): assoc with Early Jomon pottery. Result as expected.

KSU-216. Asahi site **2600 ± 40**

Shell from Nagoya city (35° 12′ 50″ N, 136° 51′ 10″ E). Coll and subm by S Sumida. *Comment* (SS): assoc with Early Yayoi pottery. Result seems to be much older.

Tarumiminami site series

Samples from Suita city, Osaka pref (34° 45′ 37″ N, 135° 30′ 16″ E). Coll and subm by M Fujiwara, Educ Bd, Suita city. *Comment* (MF): assoc with Kofun pottery.

KSU-268. Tarumiminami No. 1 **1750 ± 10**

Wood.

KSU-269. Tarumiminami No. 2 **1750 ± 15**

Wood.

KSU-540. Tarumiminami No. 3 **1780 ± 20**

Wood.

Senpukuji site series

Samples from Sasebo city, Nagasaki pref (33° 11′ 54″ N, 129° 44′ 5″ E). Coll and subm by M Asou, Chiba Univ. *Comment* (MA): assoc with microlith and Jokon-mon pottery. Expected age: 8000–10,000 BP.

KSU-276. Senpukuji No. 1 **10,300 ± 200**

Soil from Layer 7b.

KSU-277. Senpukuji No. 2 **10,160 ± 150**

Soil from Layer 8.

Kyodai site series

Samples from Kyoto city (35° 1′ 44″ N, 135° 47′ 35″ E). Coll and subm by T Izumi, Kyoto Univ. *Comment* (TI): expected period: Final Jomon Age.

KSU-304. Kyodai No. 1 **2000 ± 10**

Wood from Layer 2.

KSU-286. Kyodai No. 2 **2340 ± 15**
Soil from Layer 2.

KSU-299. Kyodai No. 3 **2590 ± 15**
Wood from blue-gray layer.

KSU-283. Kyodai No. 4 **2780 ± 25**
Wood from blue-gray layer.

KSU-287. Kyodai No. 5 **2690 ± 50**
Soil from Layer 4.

KSU-282. Kyodai No. 6 **2740 ± 35**
Wood from Layer 4.

KSU-284. Kyodai No. 7 **2740 ± 30**
Wood from Layer 4.

KSU-288. Kyodai No. 8 **2760 ± 35**
Soil from Layer 4.

KSU-334. Teradani site **16,060 ± 980**
Charcoal from Late Stone Age site, Iwata city, Shizuoka pref (34° 46′ N, 137° 51′ E). Coll and subm by T Suzuki, Heian Mus. *Comment* (TS): assoc with backed blade. Result as expected.

Hegi Cave series

Samples from Honyamakei, Ohita pref (34° 29′ 20″ N, 131° 12′ 24″ E). Coll and subm 1979 to 1983 by M Kagawa, Beppu Univ. *Comment* (MK): assoc with many human bones from Initial to Late Jomon Age. Dates of shell in river ca 1200 yr older than plants. Results as expected.

KSU-337. Hegi No. 1 **6510 ± 45**
Shell from Layer 4a.

KSU-346. Hegi No. 2 **7310 ± 20**
Shell from Layer 4b.

KSU-347. Hegi No. 3 **5150 ± 40**
Soil from Layer 4a.

KSU-353. Hegi No. 4 **6400 ± 50**
Soil from Layer 4b.

KSU-354. Hegi No. 5 **7590 ± 50**
Shell from Layer 5b.

KSU-384. Hegi No. 6 **5850 ± 60**
Soil from Layer 5.

KSU-385. Hegi No. 7 **7510 ± 50**
Soil from Layer 5.

KSU-411. Hegi No. 8 **6470 ± 45**
Soil from Layer 4b.

KSU-412. Hegi No. 9 **3640 ± 40**
Soil from Layer 3a.

KSU-638. Hegi No. 10 **10,700 ± 900**
Charcoal from Layer 5a.

KSU-639. Hegi No. 11 **11,100 ± 800**
Charcoal from Layer 7c.

Hiruzen site series

Samples from Yatsuka, Maniwa dist, Okayama pref (35° 18′ N, 133° 42′ E). Coll and subm 1983 by Y Kamaki, Okayama Coll Sci. *Comment* (YK): assoc with backed blade. Results as expected.

KSU-568. Hiruzen No. 1 **18,400 ± 230**
Peat from Layer 6, upper Odori volcanic ash.

KSU-550. Hiruzen No. 2 **24,000 + 4000 − 3000**
Charcoal from Layer 10, underlying AT volcanic ash.

KSU-612. Hiruzen No. 3 **23,400 ± 500**
Same sample as No. 2.

Hironokita site series

Charcoal from Toyoda, Shizuoka pref (34° 44′ N, 137° 50′ E). Coll and subm 1983 by H Yamashita, Heian Mus. *Comment* (HY): assoc with backed blade, point and microblade. Results as expected.

KSU-671. Hironokita No. 1 **22,300 ± 800**
Charcoal from right upper AT volcanic ash.

KSU-672. Hironokita No. 2 **22,100 ± 800**
Charcoal from upper AT volcanic ash.

KSU-673. Hironokita No. 3 **25,300 + 3500 − 2000**
Charcoal underlying AT volcanic ash.

Kannami site series

Samples coll from rice field of Kannami-cho, Shizuoka pref (35° 5′ N, 138° 57′ E). Coll and subm by Y Nagano. *Comment* (YN): results as expected.

KSU-355. Kannami No. 1 **1870 ± 15**

Wooden stake from A8 grid, Late Yayoi Age.

KSU-356. Kannami No. 2 **1750 ± 20**

Wood from Z7 grid, between Late Yayoi and Early Kofun Age.

KSU-359. Kannami No. 3 **1620 ± 15**

Wood from Z4 grid, Kofun Age.

KSU-362. Kannami No. 4 **1850 ± 20**

Wood from Z4 grid, W-29 Layer 5, Late Yayoi Age.

KSU-414. Kurosaki site **3310 ± 30**

Shell from Kitakyusyu city, Fukuoka pref (33° 51′ 31″ N, 130° 45′ 55″ E). Coll and subm by M Tachibana, Beppu Univ. *Comment* (MT): assoc with Late Jomon pottery. Result as expected.

KSU-415. Kanegasaki site **3480 ± 25**

Shell from Genkai, Fukuoka pref (33° 52′ 10″ N, 130° 31′ 57″ E). Coll and subm by M Tachibana. *Comment* (MT): pottery type is older than KSU-414. Result as expected.

Hyakkengawa site series

Wood from Kanemoto, Okayama pref (34° 40′ N, 133° 57′ E). Coll and subm by T Takahata, Educ Bd, Okayama pref. *Comment* (TT): results seem to be older.

KSU-426. Hyakkengawa No. 1 **2180 ± 15**

Wood, Yayoi Age.

KSU-429. Hyakkengawa No. 2 **1900 ± 20**

Wood, Early Kofun Age.

Bibi site series

Samples coll 1980 by N Kimura, subm 1980 by R Asai, Center Archaeol Research Hokkaido, Chitose city, Hokkaido (42° 46′ N, 141° 39′ E). *Comment* (NK): results as expected except for KSU-374.

KSU-367. Bibi No. 1 **3970 ± 35**

Charcoal, Middle Jomon Age.

KSU-370. Bibi No. 2 **25,320 ± 1010**

Charcoal underlying Yop3 volcanic ash, Stone Age.

KSU-372. Bibi No. 3 **14,410 ± 2090**

Charcoal from upper Shikotsu volcanic ash, Stone Age.

KSU-374. Bibi No. 4 **5450 ± 450**

Charcoal, 0.315g carbon, Late Jomon Age.

Misawa site series

Samples coll 1980 by N Kimura, subm 1980 by R Asai, from Tomakomai, Hokkaido (42° 45′ N, 141° 39′ E). *Comment* (NK): results as expected.

KSU-358. Misawa No. 1 **5620 ± 25**

Shell, Early Jomon Age.

KSU-360. Misawa No. 2 **5480 ± 35**

Shell, Early Jomon Age.

KSU-375. Misawa No. 3 **3510 ± 100**

Wood, Late Jomon Age.

KSU-365. Suehiro site **1140 ± 25**

Charcoal from Chitose city, Hokkaido (42° 50′ N, 141° 39′ E), with Satsumon pottery. Coll and subm 1980 by T Ohtani Educ Bd, Chitose city. *Comment* (TO): result as expected.

Shadai site series

Samples from Shiraoi, Hokkaido (42° 32′ N, 141° 26′ E). Coll 1980 by Y Taneichi, subm 1980 by R Asai. *Comment* (YT): results as expected.

KSU-368. Shadai No. 1 **2910 ± 45**

Charcoal, Final Jomon Age.

KSU-369. Shadai No. 2 **190 ± 45**

Driftwood.

Kawakami B site series

Samples from Noboribetsu city, Hokkaido (42° 24′ N, 141° 11′ E). Subm 1980 and 1982 by R Asai. *Comment* (YN): expected age: 3000–7000 BP.

KSU-376. Kawakami No. 1 **5170 ± 90**

Charcoal, J-17-a, inside Jomon pottery. Coll 1980 by Y Nakamura.

KSU-584. Kawakami No. 2 **3250 ± 80**

Charcoal, L-93-376. Coll 1982 by H Hata.

KSU-585. Kawakami No. 3 **3200 ± 120**

Charcoal, J-92-d-570. Coll by H Hata.

KSU-586. Kawakami No. 4 **3530 ± 20**

Charcoal, L-93-a-152. Coll by H Hata.

Chitose site series

Samples from Noboribetsu city, Hokkaido (42° 24′ N, 141° 11′ E). Subm 1980 and 1982 by R Asai. *Comment* (YN and AO): results as expected.

KSU-377. Chitose 4 Site No. 1 **4060 ± 110**

Charcoal, K-16-a, Jomon Age. Coll 1980 by Y Nakamura.

KSU-378. Chitose 4 Site No. 2 **3600 ± 80**

Charcoal, J-16-b. Coll by Y Nakamura.

KSU-580. Chitose 5 Site No. 1 **3900 ± 120**

Charcoal, H-3, Layer 3, between Middle and Late Jomon Age. Coll 1982 by A Oniyanagi.

KSU-581. Chitose 5 Site No. 2 **3920 ± 180**

Charcoal, H-6. Coll by A Oniyanagi.

KSU-582. Chitose 5 Site No. 3 **3170 ± 260**

Charcoal, H-13. Coll by A Oniyanagi.

Kojohama site series

Samples from Shiraoi, Hokkaido (42° 28′ N, 141° 9′ E). Subm 1980 and 1982 by R Asai.

KSU-379. Kojohama 4 site **3860 ± 40**

Charcoal, Middle Jomon Age. Coll 1980 by Y Taneichi. *Comment* (YT): expected age: 4500 – 5000 BP.

KSU-380. Kojohama 3 Site No. 1 **3820 ± 60**

Charcoal. Coll by Y Taneichi. *Comment* (YT): expected age: 6000 BP.

KSU-559. Kojohama 3 Site No. 2 **3740 ± 40**

Charcoal. Coll 1982 by K Satoh. *Comment* (KS): expected period: Middle Jomon Age. Result as expected.

KSU-583. Kojohama 3 Site No. 3 **7450 ± 400**

Charcoal. Coll by K Satoh. *Comment* (KS): assoc with Initial Jomon pottery. Result as expected.

Kabukai site series

Samples from Rebun I., Hokkaido (45° 24′ N, 141° 0′ E), with Satsumon pottery. Coll and subm 1977 by H Ohi, Hokkaido Univ.

KSU-192. RKA 1 **1260 ± 40**

Charcoal. *Comment* (HO): younger than KSU-209.

KSU-209. RKA 2 **1270 ± 30**

Charcoal. *Comment* (HO): assoc with Satsumon 2-3 pottery. Expected age: 1200 BP.

KSU-210. RKA 3 **1400 ± 25**

Charcoal. *Comment* (HO): assoc with same pottery as KSU-209.

KSU-211. RKA 4 **2040 ± 60**

Charcoal. *Comment* (HO): expected age is older than KSU-209.

Komaba 7 site series

Samples from Shizunai, Hokkaido (42° 21′ N, 142° 21′ 30″ E). Coll 1980 and subm 1981 by T Kohara, Educ Bd, Shizunai-cho. *Comment* (TK): results as expected.

KSU-463. SP-No. 1 **7370 ± 200**

Charcoal, PH-7, with Akatsuki-shiki pottery.

KSU-454. SP-No. 2 **7310 ± 140**

Charcoal, PH-15.

KSU-464. SP-No. 3 **8840 ± 200**

Charcoal, PH-18.

KSU-472. SP-No. 4 **8730 ± 90**

Charcoal, PH-20.

KSU-462. SP-No. 5 **8730 ± 130**

Charcoal, PH-20.

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