

SEOUL NATIONAL UNIVERSITY ACCELERATOR MASS SPECTROMETRY (SNU-AMS) RADIOCARBON DATE LIST I

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INTRODUCTION

The accelerator mass spectrometry facility at Seoul National University (SNU-AMS) began functioning in December 1998 and was first reported at the Vienna AMS conference in October 1999 and at the 17th International Radiocarbon Conference in Israel in June 2000. At the Vienna conference, we reported our accelerator system (Kim et al. 2000) and details of the basic sample preparation system (Lee et al. 2000), such as the combustion line to produce CO₂; the catalytic reduction line for the graphitization of CO₂; and the pretreatment procedures for wood, charcoal, and peat samples. The recent progress of the AMS facility (Kim et al. 2001) and the extension of the sample pretreatment system to iron and bone samples were reported at the 17th International Radiocarbon Conference (Cheoun et al. 2001). In the meantime, extensive testing of accuracy and reproducibility has been carried out, and ~1000 unknown archaeological and geological samples have been measured every year. In this report, the archaeological, geological, and environmental data carried out in 1999 are presented in terms of yr BP.

ARCHAEOLOGICAL SAMPLES

Borusung Series

The Borusung site (37°33'48"N, 27°06'49"E), Acha Mountain, Seoul, is an old wall site, the remains of a typical ancient mountain fortress. The site was investigated in 1998 by Jongtaeg Choi and submitted in 1999 by Seonbok Lee at Seoul National University. Expected ages are about AD 500–550; samples are charcoals.

| | |
|---|------------------------------|
| SNU99-001. 98-1 | 1440 ± 60 |
| South part of an <i>ondol</i> (a traditional Korean floor heating system) in the trench S3W1. | |
| SNU99-002. 98-2 | 1545 ± 50 |
| Inside the earthenware found at the 5th ancient dwelling. | |
| SNU99-003. 98-3 | 1420 ± 50 / 1365 ± 53 |
| From a brazier in the 12th <i>ondol</i> . | |
| SNU99-004. 98-4 | 1490 ± 130 |
| From a brazier in the 7th <i>ondol</i> . | |
| SNU99-005-1. 98-5 | 1486 ± 70 |
| Inside the 5th ancient dwelling. | |
| SNU99-005-2. 98-5 | 1492 ± 40 |
| This is a repetition of the previous sample SNU99-005-1 in order to confirm the result. | |

Daehung Series

The Daehungri site (36°55'54"N, 127°08'49"E) is a known ancient dwelling in Cheonan, Chungnam. The site was investigated in 1997 and was submitted in 1998 by Seonbok Lee. Expected ages are 700–1000 BC; samples are charcoals.

| | |
|---|--------------------------------|
| SNU99-006-1. 97-1 | 2388 ± 37 |
| From the 1st ancient dwelling. | |
| SNU99-006-2. 97-1 | 2444 ± 77 |
| This is a repetition of the previous sample SNU99-006-1 in order to confirm the result. | |
| SNU99-007. 97-2 | 2450 ± 130 / 2402 ± 130 |
| From the 2nd ancient dwelling. The 2nd date listed is a repetition of the same sample in order to confirm the result. | |
| SNU99-008. 97-3 | 2250 ± 60 / 2171 ± 60 |
| Floor at the 2nd ancient dwelling. The 2nd date listed is a repetition of the same sample in order to confirm the result. | |
| SNU99-009. 97-4 | 2546 ± 100 |
| Floor at the 3rd ancient dwelling. | |
| SNU99-010. 97-5 | 1370 ± 100 |
| North part of the floor at the 4th ancient dwelling. | |
| SNU99-011. 97-6 | 2840 ± 310 |
| North part of the wall at the 4th ancient dwelling. | |
| SNU99-012. 97-7 | 1410 ± 150 |
| North part of the 5th ancient dwelling. | |

Anmyun Series

The Anmyun site, comprised of ancient shell mounds (36°25'06"N, 126°24'14"E) at Konamri on Anmyun Island, Taean, Chungnam, was investigated and submitted in 1999 by Sung Kim of Hanyang University. Samples are charcoals.

| | |
|------------------------------------|-------------------|
| SNU99-014. 98-DBO | 3140 ± 100 |
| Presumed Neolithic, 226 cm depth. | |
| SNU99-015. 98-KGF | 2630 ± 80 |
| Presumed Bronze Age, 284 cm depth. | |
| SNU99-016. 98-ABI | 3300 ± 130 |
| Presumed Neolithic, 168 cm depth. | |
| SNU99-017.98-ACC | 3990 ± 60 |
| Presumed Neolithic, 197 cm depth. | |

Sinuri Series

The Sinuri site is a group of ancient tombs (36°21'06"N, 127°05'E) at Sinuri, Inmyun, Kongju. Sinuri was investigated and submitted in 1999 by the museum of the Kongju University. Samples are charcoals with expected ages of about AD 500–550.

SNU99-026 **1610 ± 60**
From an ancient tomb (#16).

SNU99-027 **1420 ± 50**
From an ancient tomb (#16).

Wondang Series

The Wondang site, ancient walls from the Goguryeo Dynasty at Yeoncheon, was investigated by Kwangju Sim and submitted in 1999 by Seonbok Lee. Expected ages are from the end of the AD 5th century to the beginning of the 6th century.

SNU99-029. 3-1 **1460 ± 50**
Charcoals from a deposit in a Goguryeo wall, Hodorusung (37°58'54"N, 126°43'06"E) at Wondang, Yeoncheon.

SNU99-031. 3-3 **1430 ± 60**
A burnt rice sample from a deposit in a Goguryeo wall, Borusung (38°06'30"N, 127°00'18"E), at Mudung, Yeoncheon.

Buyeo Series

The Buyeo site, an ancient capital, was investigated by Buyeo National Museum and submitted in 1998 by Seon Bok Lee. Samples are wood.

SNU99-041 **1360 ± 60**
From Ssangbukri (36°17'N, 126°55'42"E). Expected age is at the beginning of AD 600.

SNU99-043 **1720 ± 60**
From Neungsanri (36°16'30"N, 126°56'48"E). Expected age is about AD 660.

SNU99-045 **1470 ± 50**
From Kungnamji 3-1, Dongnamri (36°16'30"N, 126°54'21"E).

Imja Series

This site on Imja Island (35°06'48"N, 126°05'48"E), Shinan-gun, Jeonnam, was investigated and submitted in 1999 by Misun Kim. Samples are peat.

SNU99-091(P-5) **1100 ± 60**
From a deposit near seashore at 1 m depth.

SNU99-092(P-6) **2770 ± 60**
From a deposit near seashore at 1 m depth.

Migum Series

The Migum site (34°56'36"N, 128°07'E), Sacheon-si, Gyeongsangnam-do, was investigated by Jongkyu Choi, Archeological Institute, from the remains of an old temple assumed to be of Kaya age. Samples were collected and submitted in 1999 by M K Cheoun.

SNU99-112 (Charcoal) **3510 ± 280**

Oido Series

The Oido site (37°20'12"N, 126°42'06"E), located at Sihung-si, Gyeonggi-do, is a typical Korean shell-tomb presumed to be Bronze Age. The site was investigated by Hyojae Im, Seoul National University, and submitted by J C Kim.

SNU99-127 (Charcoal) **1950 ± 70**

Charcoal from a trench N1W1.

SNU99-128 (Peat) **4270 ± 60**

Peat from a trench N2W1.

Daepyung Series

The Daepyung site (35°13'48"N, 127°57'18"E), Jinju, Gyeongnam, is an ancient dwelling presumed to be Bronze Age, collected by the water flotation method from soils and submitted in 1999 by Kyunga Lee. Samples are burnt rice.

SNU99-125 (Old burnt rice) **2850 ± 60**

SNU99-126 (Old burnt rice) **2830 ± 60**

Mongolian Series

The site Tuv, Munsunmorit Khustiin bula Hun, Mongolian, was investigated and submitted in 1999 by Jingun Hong of the Korea National Museum.

SNU99-158. Sample 3 (Wood) **700 ± 40**

Wood from a tomb of Mongolian age from the Ikh dullan (48°08'48"N, 104°22'11"E) region.

SNU99-159-2. Sample 6 (Bone) **460 ± 100**

Human bone from the above tomb.

SNU99-160. Sample 9 (Charcoal) **1900 ± 80**

Charcoal from an ancient kiln for earthenware in Munsunmorit.

SNU99-161. Sample10 (Charcoal) **1960 ± 40**

Charcoal from an ancient kiln for roof tiles in Munsunmorit.

SNU99-162. Sample 11 (Bone) **2640 ± 60**

Human tooth from a tomb of Mongolian age in the Uglugchingol B region (48°23'56"N, 110°17'52"E).

Yeoncheon Series

This site, located at Samguri (38°05'24"N, 127°02'E), Kunnammyun, Yeoncheon, Gyeonggi-do, was investigated by the Gyeonggi-do National Museum and collected and submitted in 1999 by J C Kim. Samples are charcoals.

SNU99-149 (Charcoal) **1730 ± 50**

4th ancient dwelling.

SNU99-150 (Charcoal) **2930 ± 50**

Earthenware at 5th dwelling.

| | |
|-----------------------------|------------------|
| SNU99-166 (Charcoal) | 2080 ± 40 |
| 1st archaeological site. | |
| SNU99-167 (Charcoal) | 2230 ± 40 |
| 1st ancient dwelling. | |

GEOLOGICAL SAMPLES*Ullung Series*

This is a Quaternary deposit in Ullung Basin (37°39'06"N, 131°51'12"E), Ullung Island, East Sea, ~2000 m below sea level. Samples were submitted by Jangju Bahk in CO₂ form obtained by combusting foraminifers in the cored sediment of the site.

| | |
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| SNU99-067. 96EPB 445-1 | 17,320 ± 560 |
| 2462 m depth. | |
| SNU99-068. 95PC1 | 10,100 ± 150 |
| (36°03'54"N, 130°59'24"E). 1634 m depth. | |
| SNU99-070. 94PC2 110-115 | 11,490 ± 350 |
| (37°50'48"N, 129°35'36"E). 861 m depth. | |
| SNU99-071. 96EPB6 | 14,480 ± 170 |
| (37°39'06"N, 131°51'12"E). 2462 m depth. The results above were published by Bahk et al. (2001). | |

Jungja Series

The Jungja site (36°12'12"N, 129°17'48"E), Yugaeri, Pohang-si, Gyeongbuk, at 110–135 m depth, was collected and submitted in 1999 by Sungku Lee. Samples are sediments, mainly organic soil and calcite.

| | |
|-------------------------------|---------------------|
| SNU99-073.S-S1-P2-C-R4 | 7882 ± 167 |
| SNU99-074.C-1 | 37,010 ± 550 |
| SNU99-075.C-2 | 31,850 ± 670 |

Hwajung (High Mountain) Moor Series I

The Hwajung site is located at Hwajung-dong, Ulsan, Gyeongbuk (35°30'27"N, 129°25'26"E), and was investigated in 1998 and submitted in 1999 by Kiryong Choi.

| | |
|--|-------------------|
| SNU99-084. BJ1 | 3780 ± 100 |
| Sediment (organic clay and organic silty clay), 20.85 m depth. | |
| SNU99-085 BJ2 | 4050 ± 60 |
| Sediment (organic clay and organic silty clay), 20.94 m depth. | |
| SNU99-086. BJ3 | 2280 ± 50 |
| Sediment (organic clay and organic silty clay), 22.08 m depth. | |

Hwajung (High Mountain) Moor Series II

This site is located at Hwajung-dong, Ulsan, Gyeongbuk (35°30'31"N, 129°25'20"E); the site was investigated in 1998 and submitted in 1999 by Kiryong Cjoi.

SNU99-087. BJ4 **3110 ± 60**
Sediment (organic clay and organic silty clay), 20.82 m depth.

SNU99-088. BJ5 **2830 ± 50**
Sediment (organic clay and organic silty clay), 21.71 m depth.

Pyunghae Series

Samples from the Pyunghae site, Uljin, Gyeongbuk (36°44'30"N, 129°26'30"E) were submitted in 1999 by Bongju Lee.

SNU99-090. OK-001 **36,450 ± 480**
Charcoal piece at 50 m depth.

Kyungju Series

Samples from the Kyungju site (35°50'N, 129°10'E), Gyeongbuk, Korea, were collected 1 m below the earth surface and submitted in 1999 by Jaebok Kyung. Samples are charcoals.

SNU99-096. CN-1 **1560 ± 60**

SNU99-097. CN-2 **11,600 ± 620**

SNU99-098. CN-3 **25,750 ± 240**

SNU99-099. CN-4 **13,760 ± 140**

SNU99-100. CN-5 **36,300 ± 140**

SNU99-101. CS-1 **14,010 ± 240**

SNU99-103. CS-3 **19,990 ± 410**

Yangsan Series

The Yangsan site is on a fault (36°05'N, 129°13'E) between Kyungju and Pohang, Gyeongbuk, Korea. Expected ages are Mesozoic. Samples are collected from the earth surface and submitted by Jaebok Kyung.

SNU99-115. DN2 (Sediment) **3060 ± 80**

SNU99-116. DN3 (Sediment) **2410 ± 90**

SNU99-118. YNN2 (Sediment) **25,900 ± 730**

SNU99-133. YNN3 (Charcoal) **36,600 ± 780**

SNU99-134. YNN4 (Sediment) **39,400 ± 570**

SNU99-135. YNN5 (Sediment) **9870 ± 340**

SNU99-136. YNN6 (Sediment) **6250 ± 150**

SNU99-137. YSN1 (Charcoal) **1550 ± 90**

SNU99-138. YSN2 (Sediment) **1930 ± 90**

SNU99-140. YSN4 (Charcoal) **1310 ± 40**

SNU99-141. BN1 (Sediment) **19,400 ± 500**

| | |
|-----------------------------------|---------------------|
| SNU99-142. BN2 (Sediment) | 12,600 ± 290 |
| SNU99-143. BN3 (Sediment) | 32,300 ± 830 |
| SNU99-146. YNN7 (Charcoal) | 580 ± 80 |

Mujeci Series

The site Mujeci High Mountain Moor II (35°27'22"N, 129°08'35"E), Ulsan, Gyeongnam, was investigated in 1998 and submitted in 1999 by Kiryong Choi. Samples are peat, including pollen.

| | |
|--|-------------------|
| SNU99-153. P-3 9–10 cm depth. | 2230 ± 50 |
| SNU99-154. P-8 34–35 cm depth. | 3210 ± 40 |
| SNU99-155. P-17 79–80 cm depth. | 5300 ± 100 |
| SNU99-156. P-24 99–100 cm depth. | 8050 ± 60 |
| SNU99-157.P-27 109–110 cm depth. | 7990 ± 100 |

Jecheon Series

The Jecheon site, Urim Lake (37°10'18"N, 128°12'49"E), Chungbuk, was investigated and submitted by Juyong Kim. Samples are lake sediments with plant fragments from the bottom of the lake at 7.5–9.5 m depth.

| | |
|------------------|-----------------|
| SNU99-163 | 600 ± 30 |
| SNU99-164 | 650 ± 40 |
| SNU99-165 | 800 ± 40 |

ENVIRONMENTAL SAMPLES*Cheon-An Series*

Cheon-An city, Gyeonggi-do, is a typical city of average size. Sample tree leaves (5 ginkgo leaves) were collected on 21 July 1999 to measure the impact of city traffic near Cheon An, and 1 reference sample (acorn leaf) was collected at Keryong Mountain for relative comparison. Both samples were submitted in 1999 by C B Moon.

| | |
|---|-------------------------|
| SNU99-119 (Ginkgo Leaf) Ginkgo leaf from Cheon-An city (36°78'87"N, 127°16'65"E). | 103.3 ± 2.64 pMC |
| SNU99-120 (Ginkgo Leaf) Ginkgo leaf from Cheon-An city (36°78'87"N, 127°16'65"E). | 103.1 ± 0.65 pMC |
| SNU99-121 (Ginkgo Leaf) Ginkgo leaf from Cheon-An city (36°81'59"N, 127°15'93"E). | 101.4 ± 3.15 pMC |

| | |
|---|-------------------------|
| SNU99-122 (Ginkgo Leaf) Ginkgo leaf from Cheon-An city (36°80'62"N, 127°14'99"E). | 98.0 ± 1.02 pMC |
| SNU99-123 (Ginkgo Leaf) Ginkgo leaf from Cheon-An city (36°80'11"N, 127°13'42"E). | 104.3 ± 0.75 pMC |
| SNU99-124 (Acorn Leaf) Acorn leaf from Keryong Mountain (36°35'N, 127°22'E). | 110.6 ± 1.02 pMC |

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