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Radiocarbon AMS dating of the ancient sites with earliest pottery from the Russian Far East

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Abstract

Recently obtained radiocarbon accelerator mass spectrometry dates from the Gasya and Khummi sites (lower Amur River basin, the Russian Far East), on charcoal associated with pottery, fall within the interval 10345 ± 110 to 13260 ± 100 radiocarbon yr BP. Now both Russian Far East and southern Japanese Islands present evidence of the earliest pottery-making technology in the world starting about 13000 BP.

We have studied the archaeology and radiocarbon chronology of one of the key regions in continental North-east Asia, the lower Amur River basin. The Osipovka culture of this region presents the earliest evidence of pottery-making. Initially, the excavations near Khabarovsk City in 1926–1927 [1] and in the early 1960s [2] did not reveal ceramics, and the culture was associated with Mesolithic, 9th–8th Millennia BC [2]. New archaeological and radiocarbon accelerator mass spectrometry (^{14}C AMS) data were obtained from the excavations in 1970–1994.

The Neolithic sites cluster around the modern villages Malyshevo and Sikachi-Alan, about 50 km northeast from Khabarovsk City, and were intensively excavated during 1970–1990. On the Gasya site ($48^{\circ}45'$ N, $135^{\circ}40'$ E), charcoal collected from the hearth is associated with pottery (depth 2.1–2.4 m below surface) that was dated using conventional decay counting 12960 ± 120 BP [3]. This date corresponds to the Osipovka culture of the Incipient Neolithic [4]. Another charcoal sample (depth 1.4–1.6 m below surface) was collected during excavations in 1987 [5]. We report a new AMS date on this site, 10875 ± 90 BP, which is in agreement with the stratigraphic position of the earlier date.

The excavations of another key site, Khummi ($50^{\circ}34'$ N, $137^{\circ}06'$ E), located near Komsomolsk-on-Amur City, were conducted between 1990 and 1994. A conventional

^{14}C date associated with the upper level of Osipovka stratum is 7760 ± 120 BP (GIN-6945) [6]. Three small charcoal samples from the lower level were obtained during fieldwork in 1992 and dated using AMS. Charcoal collected from a depth of 93 cm, located 1 m away and without close association with any artifacts, was dated at 42800 ± 1900 BP (AA-13394). This date most probably does not correspond to human occupation of the Khummi site, and the charcoal originated from a pre-human forest fire. Two other samples were collected in primary association with pottery. The first date of 10345 ± 110 BP (AA-13391) corresponds to the upper part of the lower level, at a depth of 55–60 cm. The second date on charcoal from a hearth at a depth of 75–85 cm gave an age of 13260 ± 100 BP (AA-13392) and most closely relates to the earliest site occupation by the Osipovka culture.

The recently obtained data suggest the appearance of pottery in the Incipient Neolithic of the lower Amur River basin could be as early as 13000–13200 BP. Both the Gasya and Khummi sites have ^{14}C dates comparable to the Fukui and Kamikuroiwa sites in southern Japan [8]. The oldest dates from the Russian sites are 12960 and 13260 yr BP, which can be compared to the Fukui date of 12700 yr BP (Table 1).

The earliest ^{14}C dates associated with pottery from the area beyond the lower Amur River basin and southern Japanese Islands were obtained from the Zeng-pi-yan and Ba-zi-tou sites in southern continental East Asia (Fig. 1) [9], and the oldest values determined were 10735 to

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Table 1
Radiocarbon dates associated with the earliest pottery from Eastern Asia

Site, layer	Radiocarbon date, BP	Lab. no.	Material dated
Russian Far East			
Gasya, lower layer	10875 ± 90	AA-13393	charcoal
Gasya, lower layer	12960 ± 120	LE-1781	charcoal
Khummi, lower layer	10345 ± 110	AA-13391	charcoal
Khummi, lower layer	13260 ± 100	AA-13392	charcoal
Japanese Islands			
Fukui, layer II	12400 ± 350	GaK-949	charcoal
Fukui, layer III	12700 ± 500	GaK-950	charred wood
Kamikuroiwa, layer VI	10085 ± 320	I-943	charcoal
Kamikuroiwa, layer IX	12165 ± 600	I-944	charcoal
Southern China			
Zeng-pi-yan, layer 3	11310 ± 180	ZK-279-1	shell
Ba-zi-tou	10735 ± 200	ZK-842	shell

11310 BP (Table 1). As the material dated at these sites was freshwater mollusc shells, we take these ages as a maxima because of the hard-water reservoir effect [7]. Thus, the first evidence of pottery-making technology in southern East Asia are dated at least 2000 years later than in Northeast Asia.

The first ^{14}C AMS dates obtained on the Osipovka

culture sites show that there is evidence that pottery appeared in the Incipient Neolithic in continental Northeast Asia at a similar time to that in southern Japanese Islands. We can propose either two independent centers of the pottery emergence in East Asia, both lower Amur River basin and Kyushu and Shikoku Islands, or considerable communication between these areas, ca. 13000 BP.

In terms of future ^{14}C AMS dating of the earliest pottery from the Russian Far East sites, we plan to date the organic temper (carbonized blades of grass) which remain in the pottery after firing. The comparison of two data sets made on charcoal and carbon temper in the pottery will give us the opportunity to evaluate the degree of association between hearths and pottery assemblages.

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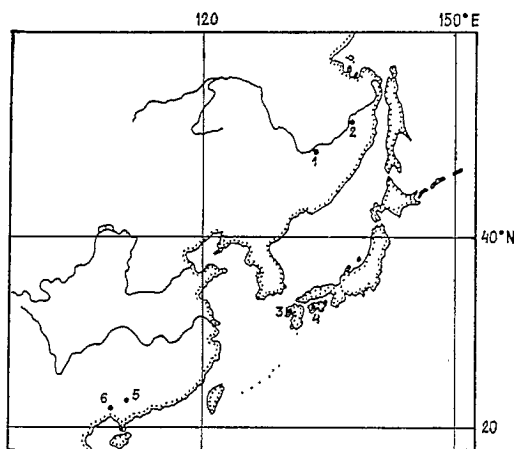


Fig. 1. The location of sites with the earliest pottery mentioned in the text 1 – Gasya; 2 – Khummi; 3 – Fukui; 4 – Kamikuroiwa; 5 – Zeng-pi-yan; 6 – Ba-zi-tou.