

AMS RADIOCARBON DATES OF KURGANS LOCATED ON THE UST'-YURT PLATEAU, UZBEKISTAN

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ABSTRACT. Recent osteological analyses of archaeological human skeletal remains from the Ust'-Yurt Plateau, Uzbekistan, provided the opportunity to obtain samples for radiocarbon dating. The results of 18 accelerator mass spectrometry (AMS) dates are presented in this paper and provide the first absolute dates for late prehistoric and early historic archaeological sites in Uzbekistan. The AMS dates suggest that most sites are earlier than have been traditionally thought based on relative dating using artifact typologies.

INTRODUCTION

Russian scholarship in Central Asia has traditionally concentrated on the examination of archaeologically defined domestic areas and material culture as a means of interpreting whether remains belonged to nomadic or sedentary peoples (e.g. Belentisky 1968; Frumkin 1970). The evidence recovered from excavations of cemeteries has been used primarily to investigate religious beliefs and to ascertain social structures. Descriptions of modes of interment are also prominent in the literature, particularly early burials from northern Afghanistan, southern Tajikistan, and southern Uzbekistan. The majority of sites dating to the later prehistoric period in these countries are only relatively dated and have been placed at the end of the 2nd millennium BC (the Bronze Age) and the beginning of the 1st millennium BC (e.g. Abetekov and Yusupov 1994; Masson 1992). Little, however, is known about cemeteries in northwestern Uzbekistan, which are only relatively dated to the later so-called "Antique" period, which includes the Archaic period (7th–5th century BC), Kangiui period (4th century BC–1st century AD), and Kushan period (1st–3rd century AD) (Helms and Yagodin 1997). The recent formation of the Karakalpak-Australian Expedition¹ has provided the opportunity to address this gap in knowledge by making available material from a number of burial mounds (kurgans) from the Ust'-Yurt Plateau, northwestern Uzbekistan.

Our research project aims to use morphological and isotopic analyses of osteological remains from kurgans located on the Ust'-Yurt Plateau to investigate past population health and migration patterns in western Uzbekistan. In addition, scientific dating of the kurgans is being undertaken to augment the interpretation of the osteological findings. This paper presents the results of the dating program.

DESCRIPTIVE BACKGROUND

The Ust'-Yurt Plateau is located between the Aral Sea and an inlet of the Caspian Sea (58°15'E, 44°10'N) and spans the southern part of Kazakhstan, the northern part of the Karakalpak Republic (Uzbekistan), and Turkmenistan (Figure 1). The Ust'-Yurt Plateau covers an area of 160,600 km² and rises to 150–300 m above sea level (Anonymous 2002). The Plateau consists of a monotonous desert with large drainage basins and extensive sandy upland massifs. With the exception of sweet

¹The Karakalpak-Australian Expedition was formed under the auspices of the University of Sydney Central Asian Project (USCAP) by Dr Alison Betts and Dr Svend Helms (Department of Archaeology, University of Sydney) and Prof Vadim Yagodin (Director of the Institute of History, Archaeology and Ethnography [IHAE], Nukus, Uzbekistan).

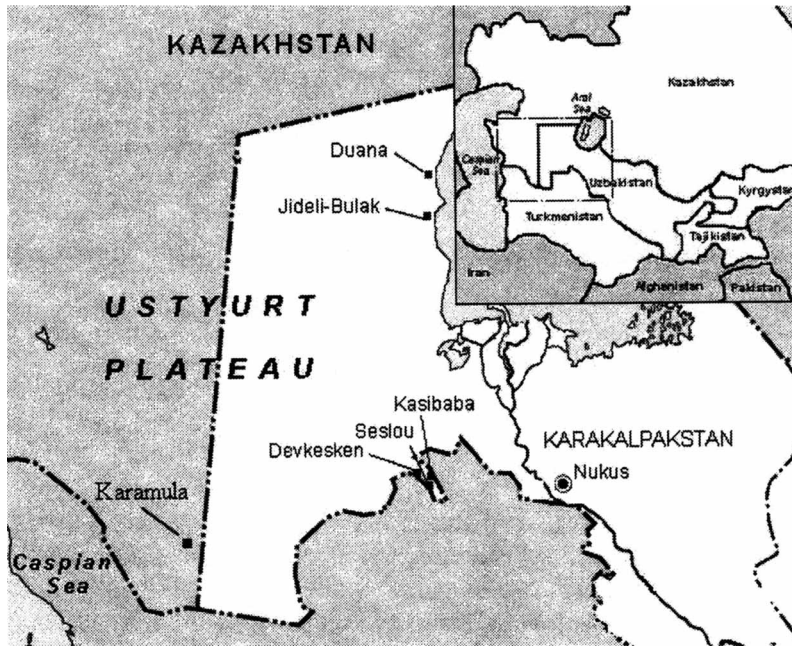


Figure 1 Location of the Ust'-Yurt Plateau

and salty water that is accessible from deep wells, there are few water resources and a lack of mature vegetation. The average annual rainfall ranges from 90 mm in the south to 120 mm in the north. The plateau has a continental climate with recorded summer temperatures reaching up to 47 °C and lows of -30 °C in the winter (Yagodin, forthcoming). The climatic conditions on the Ust'-Yurt are claimed to have changed little over the last 3000 yr (e.g. Olkhovskiy 2000:34), although further research in this field is required.

An extensive program of archaeological research on the Ust'-Yurt Plateau was undertaken between 1972 and 1985 under the direction of Professor Vadim Yagodin (IHAE), Karakalpak Branch of the Uzbek Academy of Science, Nukus. Large cemetery sites including Devkesken, Kazibaba, Duana, Sesiou, and Jideli Bulak were recorded (see Figure 1). Due to time restraints, within each site specific areas were selected for investigation (e.g. Devkesken 6, Kazibaba 4, Duana 5). Depending on the degree of preservation, at some sites samples of the better preserved kurgans were selected for excavation (e.g. 19 out of the 58 kurgans at Devkesken 6), while at other sites with improved preservation all kurgans were excavated (e.g. all 72 kurgans at Kazibaba 4). Kurgans from all sites were relatively dated based on associated artifacts (Table 1).

Table 1 Relative dates for Ust'-Yurt Plateau sites.

Site	Relative date
Kazibaba 3	6th/5th century BC
Kazibaba 5	6th/5th century BC
Kazibaba 6	6th/5th century BC
Kazibaba 2	4th/3rd century BC
Karamala 1	4th/3rd century BC
Kazibaba 4	3rd/4th century AD
Devkesken 6	3rd/4th century AD
Duana	3rd/4th century AD

Evidence from the excavations illustrates that the burial practices of the late prehistoric and early historic populations using the Ust'-Yurt Plateau involved placing one person, but sometimes up to 12 individuals, inside a subterranean pit. The pits ranged between 0.30 to 1.4 m in depth and were covered with stones to form a mound (kurgan). Craniometric and osteometric analyses of some of the human remains from sites on the plateau have been undertaken (Bagdasarova 1993) and preliminary results of the morphological skeletal analyses have revealed evidence of leprosy in Central Asia during the time period investigated (Blau and Yagodin 2005). The results of oxygen and strontium isotopic analyses are currently being interpreted.

METHODS

All archaeological skeletal remains recovered from the Ust'-Yurt Plateau are currently housed in the Karakalpak Museum, Nukus. Soren Blau visited the museum in 2003 and 2004 to undertake osteological analyses of the remains. Samples of complete permanent and deciduous human teeth were collected for radiocarbon dating from 18 individuals to enhance the interpretations of osteological and isotopic analyses. No other organic samples were dated due to the lack of preservation.

The dental samples come from 7 separate kurgans at 5 sites. A total of 4 dates were obtained from Kurgan 2, Kazibaba 3, which had a minimum of 16 individuals interred. One adult and 3 teenagers were sampled, i.e. a total of 4 individuals. Three kurgans from Kazibaba 4 were dated. A total of 2 adults were interred in both Kurgan 11 and Kurgan 24. Two tooth samples were obtained from 1 adult from Kurgan 11 and 1 sample from 1 adult from Kurgan 24. Only 1 individual (an adult) was buried in Kurgan 22 and 1 tooth sample was obtained from this individual.

Two kurgans from Kazibaba 6 were dated. Kurgan 2 had a total of 14 individuals (9 adults and 5 children) and Kurgan 5 contained 12 individuals (7 adults and 5 children). A total of 7 dates representing at least 2 adults were obtained from Kurgan 5, while 1 sample from 1 adult was obtained from Kurgan 2. Kurgan 3, Devkesken 6 and Kurgan 2, Karamula 1 both had 1 adult each interred in them. Due to funding procedures, samples were submitted to 3 separate dating laboratories: Oxford Radiocarbon Accelerator Unit, Beta Analytic Inc., and the Australian Nuclear Science and Technology Organisation (ANSTO).

RESULTS AND DISCUSSION

Kurgans on the Ust'-Yurt Plateau have traditionally been dated using relative dates based on artifact typology (e.g. Jagodin 1987). The AMS dates presented in this paper are the first absolute dates for archaeological sites on the Ust'-Yurt Plateau (Table 2). Four dates from Kurgan 2, Kazibaba 2 were obtained which suggest the site was in use between the 9/8th to the 6/5th centuries BC. These results are significantly earlier than the relative dates (see Table 1).

Three kurgans from Kazibaba 4 were dated. The 2 dates from Kurgan 11 and 1 date from Kurgan 24 suggest the site dates between the 2nd century BC and the 1st century AD. These results are slightly earlier than the relative dates (see Table 1). The 2 dates from Kurgan 11 were obtained from 1 individual and their close correspondence highlights the reliability of AMS as a dating method. The 1 date from Kurgan 22 suggests this kurgan was used between the 6th–5th century BC. While it is possible that this date is an anomaly, given there are other kurgans at Kazibaba that were in use as early as the 10th century BC (see below), an early use of Kurgan 22 is probable.

Two kurgans from Kazibaba 6 were dated. A total of 7 dates were obtained from Kurgan 5 which suggest this kurgan was in use between the 10th–9th and the 8th–5th centuries BC. Although only 1 date was obtained for Kurgan 2, the result is consistent with the site being in use between the 8th and

Table 2 AMS date results of human teeth samples.

Lab code	Site/Kurgan/ Sample ref.	¹⁴ C age (BP)	95.4% cal age ranges (2 σ)	Relative area under distribution ^a	¹³ C (‰)
Beta-190243	Kazibaba 3 Kurgan 2 Sample T15	2450 \pm 40	cal BC 761–679	0.275	–13.8
			670–610	0.147	
			596–407	0.579	
Beta-190244	Kazibaba 3 Kurgan 2 Sample T16	2630 \pm 40	cal BC 896–871	0.052	–15.4
			864–847	0.020	
			844–762	0.921	
			677–673	0.006	
Beta-190245	Kazibaba 3 Kurgan 2 Sample T17	2560 \pm 40	cal BC 814–755	0.423	–14.4
			722–539	0.573	
			528–523	0.004	
ANSTO- 0ZH093	Kazibaba 3 Kurgan 2 Sample T27	2520 \pm 50	cal BC 799–502	0.943	–14.2
			490–484	0.008	
			465–449	0.020	
			440–427	0.018	
			423–413	0.011	
Beta-190246	Kazibaba 4 Kurgan 11 Sample T39	2000 \pm 40	cal BC 105–102	0.002	–19.9
			95–cal AD 84	0.984	
			cal AD 104–118	0.014	
Beta-190247	Kazibaba 4 Kurgan 11 Sample T80	2050 \pm 40	cal BC 169–cal AD 27	0.986	–20.9
			cal AD 42–49	0.014	
OxA-11822	Kazibaba 4 Kurgan 22 Nr 198 Sample 14	2425 \pm 30	cal BC 760–681	0.246	–17.4
			666–637	0.041	
			590–579	0.012	
			548–401	0.701	
OxA-11793	Kazibaba 4 Kurgan 24 Sample 12	2096 \pm 24	cal BC 196–193	0.004	–20.6
			174–46	0.996	
ANSTO- 0ZH095	Kazibaba 6 Kurgan 2 Sample T57	2490 \pm 50	cal BC 787–482	0.901	–13.8
			467–448	0.039	
			442–412	0.060	
Beta-190248	Kazibaba 6 Kurgan 5 Sample T62	2760 \pm 40	cal BC 997–985	0.032	–16.9
			983–828	0.968	
Beta-190249	Kazibaba 6 Kurgan 5 Sample T72	2490 \pm 40	cal BC 786–498	0.909	–14.3
			493–483	0.014	
			465–449	0.030	
			441–413	0.047	
Beta-190250	Kazibaba 6 Kurgan 5 Sample T73	2620 \pm 40	cal BC 896–872	0.031	–17.6
			863–848	0.011	
			844–760	0.924	
			681–667	0.021	
			610–594	0.013	
Beta-190251	Kazibaba 6 Kurgan 5 Sample T74	2730 \pm 40	cal BC 971–958	0.036	–16.8
			937–805	0.964	

Table 2 AMS date results of human teeth samples. (Continued)

Lab code	Site/Kurgan/ Sample ref.	¹⁴ C age (BP)	95.4% cal age ranges (2 σ)	Relative area under distribution ^a	¹³ C (‰)
ANSTO- 0ZH096	Kazibaba 6 Kurgan 5 Sample T75	2510 \pm 50	cal BC 796–499	0.925	–15.3
			492–483	0.012	
			465–449	0.026	
			441–426	0.021	
			424–413	0.016	
ANSTO- 0ZH097	Kazibaba 6 Kurgan 5 Sample T76	2400 \pm 50	cal BC 761–679	0.224	–13.1
			669–626	0.064	
			621–614	0.007	
			593–572	0.027	
			564–390	0.677	
ANSTO- 0ZH098	Kazibaba 6 Kurgan 5 Sample T77	2500 \pm 50	cal BC 791–483	0.922	–16.2
			466–449	0.030	
			441–413	0.047	
ANSTO- 0ZH094	Karamula 1 Kurgan 2 Sample T28	2120 \pm 50	cal BC 355–288	0.138	–16.0
			257–247	0.010	
			233–37	0.826	
			31–20	0.012	
			11–cal AD 0	0.014	
OxA-11792	Devkesken 6 Kurgan 3 Sample 5	1854 \pm 26	cal AD 83–105 116–237	0.092 0.908	–13.6
Beta-190243	Kazibaba 3 Kurgan 2 Sample T15	2450 \pm 40	cal BC 761–679	0.275	–13.8
			670–610	0.147	
			596–407	0.579	
Beta-190244	Kazibaba 3 Kurgan 2 Sample T16	2630 \pm 40	cal BC 896–871	0.052	–15.4
			864–847	0.020	
			844–762	0.921	
			677–673	0.006	
Beta-190245	Kazibaba 3 Kurgan 2 Sample T17	2560 \pm 40	cal BC 814–755	0.423	–14.4
			722–539	0.573	
			528–523	0.004	
ANSTO- 0ZH093	Kazibaba 3 Kurgan 2 Sample T27	2520 \pm 50	cal BC 799–502	0.943	–14.2
			490–484	0.008	
			465–449	0.020	
			440–427	0.018	
			423–413	0.011	

^aCalibration data: Stuiver et al. (1998).

5th centuries BC. The AMS results suggest the site had multiple periods of use: some overlap with the relative dates (see Table 1), whereas others are significantly earlier.

The majority of human remains from Devkesken 6 were treated with a chemical preservative to consolidate the bones at the time of recovery. Consequently, it was only possible to obtain 1 untreated sample from Kurgan 3. The results suggest the site was used between the 1st–3rd centuries AD, that is, during the Kushan period (Helms and Yagodin 1997:47). This is slightly earlier than the relative dates, which placed the site between the 3rd/4th centuries AD (e.g. Jagodin 1987). Similarly, 1 sam-

ple from Kurgan 2 at Karamula 1 dated to the 3rd century BC. This is consistent with the age suggested by relative dating.

There are many kurgan complexes throughout Central Asia which have been dated to the 1st millennium BC, the so-called "Iron Age." The majority have, however, only been relatively dated on stylistic assessments of associated material culture: examples include kurgans in the North Black Sea region (Yablonsky 2000), the Transurals of western Siberia (Dyachenko et al. 2000; Hanks 2000; Kroll 2000; Davis-Kimball and Yablonsky 1996:7–8), and from southern Siberia (Murphy 2000). Therefore, the results presented in this paper add to the pool of scientifically dated kurgans in the region, including Pokrovka, southern Russia (Hall et al. 1998:546), and kurgans in the southern part of the Altai Mountains (Slusarenko et al. 2001).

CONCLUSION

Samples of human tooth were collected from skeletal assemblages stored in the Karakalpak Museum, Nukus, originating from burial sites on the Ust'-Yurt Plateau, Uzbekistan. A total of 18 AMS dates were obtained, providing the first absolute dates for late prehistoric and early historic archaeological sites in Uzbekistan. In most cases, the AMS analysis results indicate that the antiquity of the kurgans is earlier than traditionally thought based on relative dates.

AMS dates for individuals interred within single kurgans and for kurgans within single sites indicate multiple periods of use. Previous interpretations had considered an individual kurgan to represent a single event of use, and sites to represent a single period of use. These findings are significant as they alter the present understanding of the chronology of individual burial structures, as well as the sites of which they are a part. In addition, the results highlight the need for more absolute dating in the region to better calibrate the relative chronology.

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