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CHRONOLOGY OF THE GOLDEN HORDE IN KAZAKHSTAN: ¹⁴C DATING OF JOCHI KHAN MAUSOLEUM

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ABSTRACT. We present accelerator mass spectrometry radiocarbon (AMS ¹⁴C) dating results of the “Jochi Khan Mausoleum”—the proposed burial place of the oldest son of Gengghis Khan in Ulytau, Kazakhstan. The Ulytau region retains 34 burial complexes of Islamic tradition associated with the Golden Horde history (1221–1438 CE). However, there is no calendar-dated chronology of the medieval mausoleums in this region, which complicates their historical interpretation. Three ¹⁴C dates from construction timbers and burial of the Jochi Khan mausoleum are calibrated to 1220–1400 CE interval (95.4% range) with the mid-point at 1245 CE for the coffin, 1330 CE for the entry door, and 1350 CE for a masonry wall. The ¹⁴C-calibration suggests that the mausoleum was built about 100 years after the death of Jochi (1225 CE) and renovated at least once in the middle of the 14th century. Apparently, the wood for the coffin was harvested sometime in the interval 1220–1270 CE. The calendar ages of the coffin and the mausoleum are ca. 75 years apart. It is possible that the old coffin was placed into a newly constructed mausoleum. However, there is no historical evidence confirming this important re-burial of Jochi. The dating results challenge the attribution of the mausoleum to Jochi Khan. This study demonstrates that the age of the Islamic mausoleums in Ulytau can be successfully dated with ¹⁴C. While requiring further data assembly, this first ¹⁴C dataset can form the basis of the calendar chronology of the Golden Horde in Kazakhstan. Historical attribution of the mausoleums must be collaborated with the calendar chronology.

KEYWORDS: carbon-14 dating, Genghis Khan Dynasty, Medieval Central Asia, Ulytau.

INTRODUCTION

The historiography of the Golden Horde (1221–1438 CE), the successor of the Mongol World Empire ruled by Chinggisids, is not well defined and bears many contradictories and misinterpretations, partly due to the scarcity of Mongol written chronicles about the internal affairs of the Gengghis Khan’s family (Halperin 1985; Uskenbay 2013). Traditionally, the history of Ulus Jochi integrates much lore, legend, and oral genealogy, as well as written narratives from Buddhist cosmology, and Latin, Chinese, Russian, Arab, and Persian chronicles that originated in the conquered states or outside of the nomadic empire (Suleimenov 1969; Masanov et al. 2007; Yurcheko 2008; Usmanova et al. 2021). The history of the later states in Central Asia representing a direct continuation of the parent Golden Horde (Uskenbay 2003) consists mostly of oral tradition. Medieval archaeology of Kazakhstan has been effectively rationalized to the material culture of the Golden Horde (Margulan 1948; Usmanova et al. 2018), yet the framework and legitimacy of Chinggis’s dynastic history is constrained by a lack of chronological evidence.

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Recent archaeological surveys throughout central Kazakhstan describe a considerable amount of preserved historical architecture attributed to the Golden Horde (Khorosh 2010, 2011). However, the age of the medieval structures is mainly approximated from architectural elements or oral tradition (Gerasimov 1957; Margulan 1974; Yegenbayuly 2001; Khorosh 2011). The lack of adequate calendar-defined evidence is a challenge to the authenticity and origin of the historical unions (Masanov et al. 2007; Yerofeeva 2016). Clustering of large mausoleums that have been well-kept and worshipped for 500–700 years could be not coincidental and certainly conveys a special historical memory of Mongol and Turks tribes of Central Asia preserved in architecture. We propose to define the age of these masonry structures with radiocarbon dating which will help outlining an improved calendar-based chronology of the Golden Horde archaeology in Kazakhstan.

In the Ulytau Mountains of central Kazakhstan, there are several dozen medieval monuments, including mausoleums, necropolises, and ancient settlements built of burnt bricks from the time of the Golden Horde (13th–15th centuries). A total of 34 mausoleums have been documented there, four of which have preserved architecture and 30 others have only structural footings remained (Khorosh 2009; QORYQ 2021). The most significant of them is the mausoleum of Jochi Khan (or Zhoshy-khan in Kazakh language). Jochi (ca. 1182–1225) was the oldest son of Gengghis Khan, an accomplished military commander and the founder of the Golden Horde also called the Ulus of Jochi. According to legend, he died while hunting, falling from a horse, and his funeral was carried out according the Chinggis protocol for sacred burial. The mausoleum of Jochi Khan is a medieval burial structure in a shape of a single-chamber domed portal (Figure 1). It was erected according to Islam tradition and presently surrounded by nine other smaller mausoleums. In Medieval Central Asia, a mausoleum was the most popular type of building and site after the mosque (Barthold and Rogers 1970; Hillenbrand 1999). The structure includes many key elements of medieval tomb architecture: a massive domed square tower built of burnt bricks, a portal with a rectangular frame around an arched opening, geometrical drum carrying the double dome (inner and outer), gallery, stucco vaults, and decorations with blue glazed tile (Gerasimov 1957; Khorosh 2009).

The mausoleum building has been known under this name since the 16th century from the description by Hafeez Tanysh (court historian) of the emir of Bukhara, Abdullah Khan, who visited Ulytau during his military campaign in the spring of 1582 (Suleimenov 1969). Folk stories, historical maps, and travelers' narratives commonly described the Mausoleum throughout the 19th and 20th centuries (Barthold and Rogers 1970; Yegenbayuly 2001; Khorosh 2009). The first scientific documentation and mapping of the Mausoleum architecture occurred in 1946–47 (Gerasimov 1957). Also in 1946, the excavation of the mausoleum's two burials has found a human skeleton with missing bones of one hand, animal bones, a camel skull, fragments of leather and fabrics, and a female skeleton in another crypt (Margulan 1948). Two decades later A.Kh. Margulan (1978) suggested that the skeleton in the first coffin (sometimes also referred as a wooden box) belonged to Jochi Khan "who was buried one year later after his death in a new mausoleum built in 1228" (Margulan 1978). This statement began the official recognition of the mausoleum as the burial place of Jochi Khan.

This hypothetic affiliation had been doubted by many researchers, primarily because Jochi as all Genghis's family had practiced Tengrism, while the mausoleum is designed following the Islamic burial tradition. It is well known from historical evidence that Tengrism kept elite

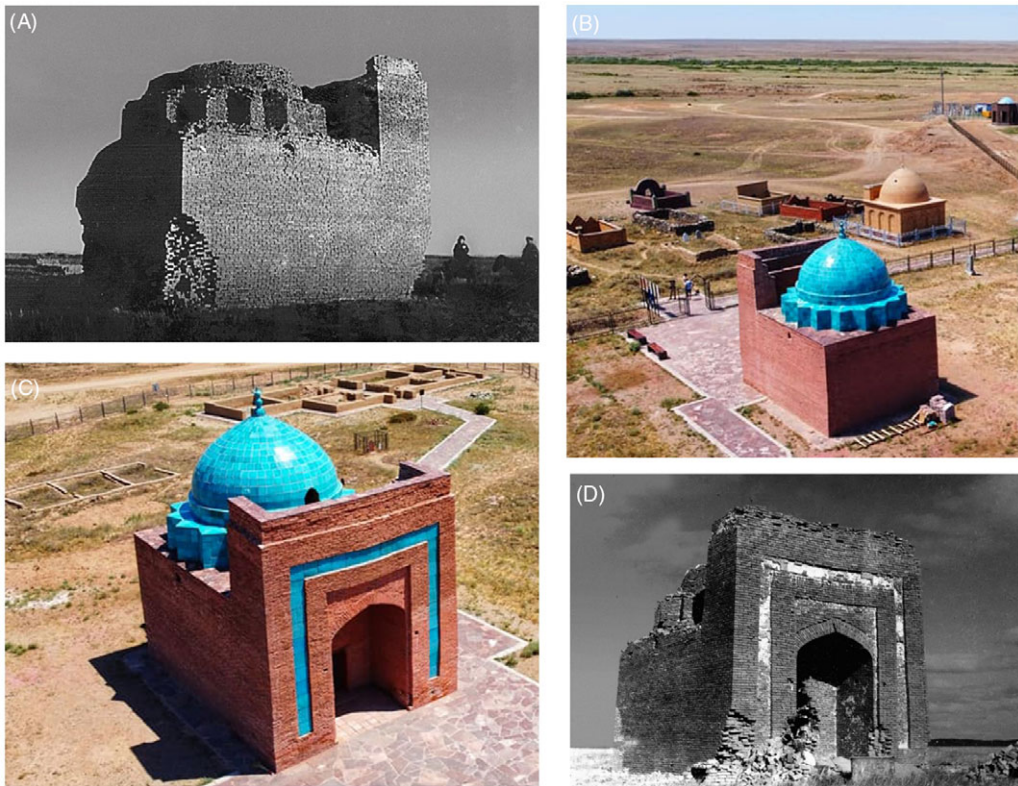


Figure 1 Jochi Khan Mausoleum in Ulytau, central Kazakhstan as seen in ca. 1946 and now. Black and white photos (A, D) by architect G.G. Gerasimov circa 1946 are from the archive of KazRestovratsia, (Almaty, Kazakhstan) edited by M.A. Antonov. Color photos (B, C) by V. Shuptar (Karaganda) are the most recent view of the mausoleum after the latest restoration (2018–2020). A–B is northeast direction with the dome view. C–D is the portal facing the Qibla direction (southwest) toward the Kaaba in Mecca. (Please see electronic version for color figures.)

burial places in inaccessible, secret and sacred place under the protection of the ancestors (Barthold and Rogers 1970; Rykin 2010), since looting of burials (often practice in the past) was believed to weaken the clan's power (Yurchenko 2008; Usmanova et al. 2021). Barthold and Rogers (1970) explicitly stated that the burial rites of a Khan remained exactly the same throughout the Mongol Empire, and the royal cemetery was forbidden ground and the grave was not indicated in any way. Interestingly, the name of “Ulytau” is a derivative from the word “Ulug” which is translated from Kazakh and many other Turk languages as a “Grand Place” in the sense of veneration (Sembli 2014). Moreover, Islam only became an official religion of the Golden Horde in the beginning of the 14th century (1313 CE, Halperin 1985; DeWeese 1994). Recently, the year of Jochi Khan's death was corrected from 1227 CE to 1225 CE with new analysis of written historical documents (Uskenbay 2003).

In this study, we aim to establish the calendar age of the coffin and the building of the mausoleum in order to test the hypothesis that Jochi's remains could have been reburied shortly after his death since the Chinggis funeral tradition excluded the Islamic mausoleum. The human bones from the Margulan's excavations are currently inaccessible. This predicament limits our approach to the datable materials that are available. Nevertheless, ^{14}C dating can potentially link the historical evidence and calendar dates of the mausoleum.

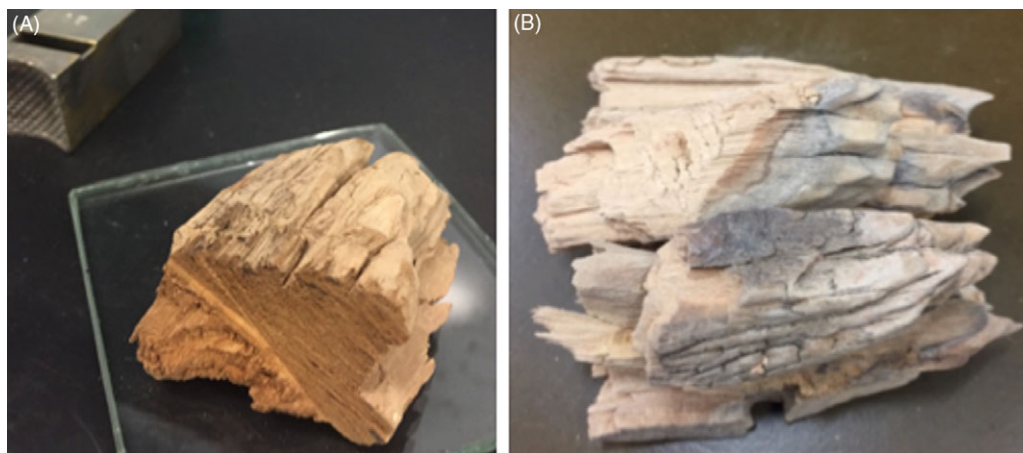


Figure 2 Samples of the timbers used in ^{14}C dating. A is the piece from the coffin; B is the weathered end of scaffolding beam from the facade.

Additionally, this will confirm the prospect on developing a calendar chronology of the Golden Horde in Kazakhstan with radiocarbon dating of the medieval architecture.

METHODS AND DATA

We analyze the age of three wood samples collected at the Jochi Khan mausoleum under different restoration projects in 1997, 2001, and 2021. The mausoleum is located on the left bank of Kara-Kengir River (48°09'N, 67°49'E). A small piece of a wooden coffin (AA106632) from the burial inside the domed chamber was sampled in 1998 during the burial re-excavation (Yegenbayuly 2001). Another wood sample (DeA-19262) was cut from a scaffolding attached inside the brick wall at 1/3 height from the ground at the main façade. A third wood sample (DeA-30740) was the end of door- saddle threshold that was subsampled at the archive of National Historical, Cultural and Natural Reserve-Museum “Ulytau” (QORYQ 2021) in Zhezkazgan, Karaganda Oblast. The original wood of the doorway was archived after the latest restoration of the mausoleum. All samples are small pieces of wood with few of visible rings that are not suitable for tree-ring cross-dating that requires >50 rings (Figure 2). The coffin plank is made of a conifer species (probably pine) and two other samples are construction timbers from deciduous trees cottonwood/poplar species which are presently grown in the vicinity of the mausoleum. The curvature of the rings indicates that the wood was harvested from relatively young trees of 20–30 years of age.

Wood samples were cleaned and checked for possible contamination then grounded to 20 μm -mesh. The ^{14}C -dating was performed at two AMS facilities: the *NSF*-Arizona AMS facility, University of Arizona, USA (Arizona) and the Isotope Climatology and Environmental Research Centre, Debrecen, Hungary (ICER). Each powdered sample was converted to α -cellulose using pretreatment by sodium chlorite bleaching at pH 3 (Leavitt and Danzer 1993; Molnar et al. 2013a). The cellulose samples were combusted to CO_2 and converted to graphite, and ^{14}C dating was performed using the 3MV Pelletron AMS (National Electrostatics Corporation) operated at 2.5 MV in Tucson, Arizona, and a 200kV MICADAS (ETHZ, Zürich, CH) in Debrecen, Hungary using standard facility protocols (Jull et al. 2008; Molnar et al. 2013b; Rinyu et al. 2013; Janovics et al. 2018). Carbon-14 calculation and

Table 1 Summary of wood samples and ^{14}C dates from the Jochi Khan Mausoleum. DeA-ICER in Debrecen and AA-Arizona in Tucson.

^{14}C lab ID	^{14}C age (yr BP) & error ($\pm 1 \sigma$)	95.4% calibrated interval (CE)	Mid-point of calibrated interval (CE)	Sampled object	Year of sampling
AA106632	811 \pm 18	1218–1268	1245	Coffin plank	1998
DeA-19262	622 \pm 26	1298–1398	1350	Facade scaffolding	2001
DeA-30740	693 \pm 18	1276–1380	1330	Door saddle threshold	2021

error data reduction were done using the standard BATS software (Wacker et al. 2010). The fraction of modern carbon, F is defined as the $^{14}\text{C}/^{12}\text{C}$ ratio relative to 1950AD (Stuiver and Polach 1977; Donahue et al. 1990) and this can be converted to an uncalibrated radiocarbon age using the standard formula,

$$^{14}\text{C age} = \left(-\frac{1}{\lambda}\right) \ln F$$

Where λ is 1.245×10^{-4} , the decay constant based on the Libby half-life of 5568 yr. The calendar age range can be determined from the uncalibrated age using the OxCal v4.4 program (<https://c14.arch.ox.ac.uk>) and the IntCal20 calibration curve (Reimer et al. 2020).

RESULTS

To determine the calendar age of the Jochi Khan mausoleum, we analyzed new and the only available, as of now, accelerator mass spectrometry radiocarbon (AMS ^{14}C) dataset from three wood samples measured at two AMS facilities: ICER and Arizona (Table 1). All ^{14}C measurements from both AMS facilities are high quality and show a coherent time sequence. The error of measurements is adjusted to 18–26 calendar years and the length of 68% range of calibrated dates are ~ 100 yr. The result of the ^{14}C ages calibration is shown in Figure 3. The 3-point sequence of the developed dates matches well the structure of IntCal20 calibration curve for the interval 1220–1400 CE (Figure 4). The calibrated sequence determines the chronology of the studied burial. From the midpoints of the calibrated intervals (95.4%) the coffin timber was harvested ca. 1243 CE (Figure 4). Since Jochi passed away in 1225 CE, the 95.4% confidence interval for the wood of 1218–1268 CE is consistent with this age, yet the mid-point indicates the age of the coffin wood about 20 years later. Masonry work on the mausoleum building continued throughout the 14th century. The bricks of the front facade were laid ca. 1350 CE according to the midpoint of carbon-14 date derived from the wall-top scaffolding. Meanwhile, the door to the burial chamber was installed, most likely, in 1280–90 (Figure 3).

The gap between these two dates from the building probably delineates the period of two construction phases established by the architectural analysis of the masonry earlier (Khorosh 2011). However, it would be useful to obtain more samples to better define the full period of construction. The mausoleum architecture suggests that the original part of structure had only the front portal with the central cupola (Figure 1). The decorative star-like drum of the cupola and the raised facade of the portal have appeared much later. Moreover, the installation of the decorative elements (e.g., blue glazed tile, gallery, stucco vaults and inner dome) was associated with the increasing importance of the tomb during the rule of the Timurids at the late 14th–15th centuries (Khorosh 2011). It is well-known

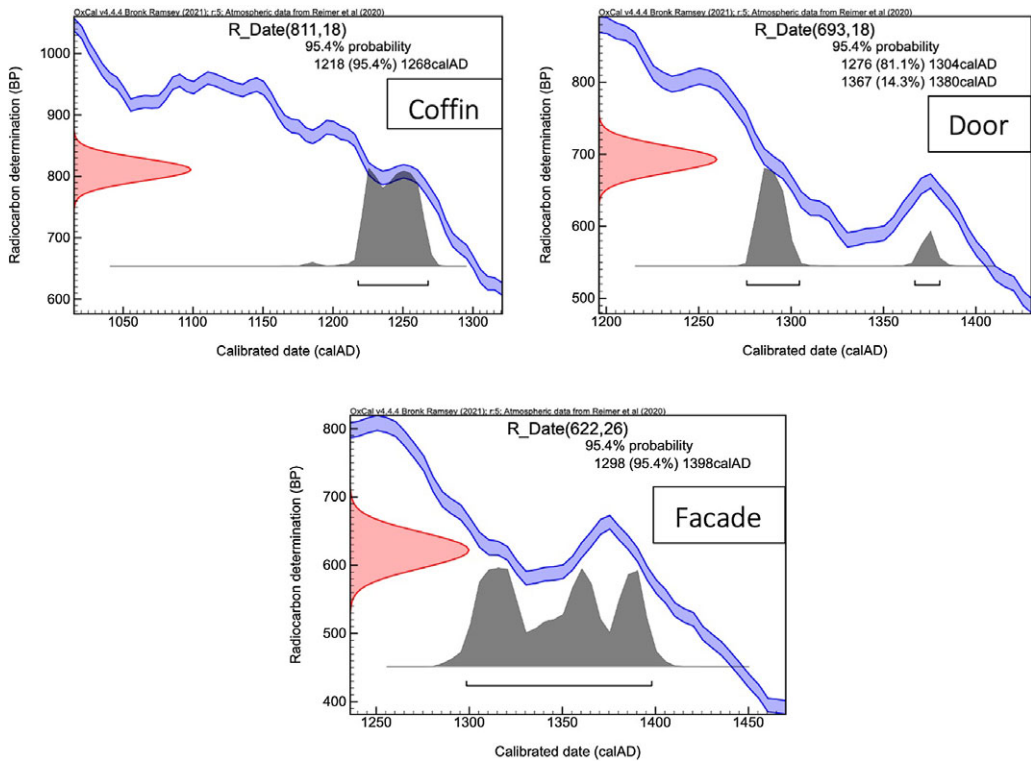


Figure 3 Calibration of three ^{14}C dates from the Jochi Khan Mausoleum. The probability distribution of ^{14}C calibrated dates at 95.4% range (gray) calculated in OxCal v.4.4 program is plotted against the IntCal20 curve (blue line). ^{14}C age with 68% range is shown in red. See Table 1 for the details of the ^{14}C dates.

that the interior walls of the mausoleum were covered with several layers of stucco before and after the decorative interior renovations (Gerasimov 1957; Khorosh 2009), which is the evidence of the continued maintenance of the building.

The dating results challenge the traditional attribution of the mausoleum to Jochi Khan. It is evident from the ^{14}C dating that an older coffin was interred in a later mausoleum structure. Although, there is no historical evidence for such an important reburial of Jochi, Barthold thought there could be a possibility that the mausoleum was erected in the vicinity of the actual burial of Jochi (Barthold and Rogers 1970). Ginsburg, who studied the anthropology of the skulls from the Margulan excavations, concluded that the bones most likely belong to the descendants of the Jochi clan (Ginsburg 1956). We think that the secret burial of Jochi could be located anywhere in the Ulus Jochi and its location remains unknown (Masanov et al. 2007; Yerofeeva 2016; Usmanova et al. 2021). The mausoleum most likely contains the remains of members of the Jochi clan. However, to confirm this hypothesis, it is necessary to look for new historical evidence.

CONCLUSIONS

Our first ^{14}C dating of Medieval construction timbers in Kazakhstan showed a great potential of this dating approach for developing the calendar chronology of the Golden Horde (Ulus

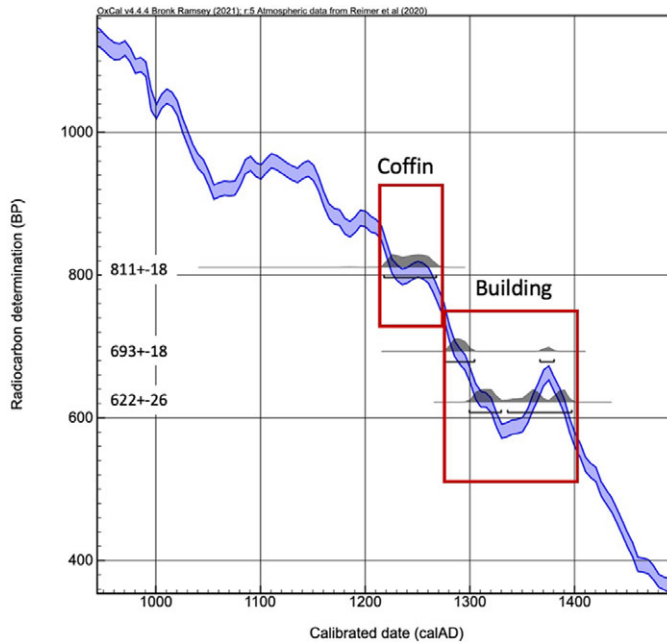


Figure 4 Sequence of three calibrated ^{14}C dates plotted on the IntCal20 calibration curve. Red frames show the intervals of calibrated ages for the coffin and the mausoleum building. See Table 1 for the sample details.

Jochi). The attribution of the Jochi Mausoleum as the burial place of the Jochi Khan does not correspond with the dating results. The mausoleum was built about 100 years after the death of Jochi (1225 CE) and, more importantly, soon after Islam became the official religion of the Golden Horde (1313 CE). The historical date of the Jochi Khan Mausoleum ca. 13th–15th centuries should be narrowed down to the 14th century. The architectural context of the dated timbers suggests two phases in the mausoleum construction during the 14th century, which points to the importance of the complex for the Golden Horde elite. The coffin date from the burial excavated in 1998 is consistent with near the time of Joshi's death or some decades later. The age of the coffin does not overlap with the age of the building materials. Perhaps the mausoleum complex was built for the descendants of Jochi Khan and named after Jochi to honor the great ancestor.

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