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Short communication

## Tunnug 1 (Arzhan 0) – an early Scythian kurgan in Tuva Republic, Russia

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## ABSTRACT

The burial mound Tunnug 1 (Arzhan 0) lies in a swamp of the Uyuk River Valley, Tuva Republic, Russia. The construction of this princely Scythian tomb is similar to the earliest identified Scythian kurgan Arzhan 1. Preserved wood from the burial mound was dated through AMS to the 9th century BCE. This confirms that Tunnug 1 (Arzhan 0) belongs to the oldest Scythian cultural horizon and potentially predates Arzhan 1. Due to its peculiar topographic location Tunnug 1 (Arzhan 0) appears to be a frozen tomb.

## 1. The earliest Scythian horizon in southern Siberia

Research on the earliest burial mounds of the so-called “Scythian” material culture began in the early 1970s with the excavation of Arzhan 1 led by M. Gryaznov and M. Mannay-ool (Gryaznov, 1980, 1984; Parzinger, 2006). Dated through *wiggle matching* to the 9th/8th century BCE (Zaitseva et al., 2007) Arzhan 1 constitutes the earliest known elite Scythian burial to date. With its singular internal structure of radially arranged wooden chambers and the good state of preservation including all elements of the Scythian triad (weapons, horse harness objects, and animal style), the discovery of Arzhan 1 defined the earliest Scythian horizon in Southern Siberia in particular and in the Eurasian steppe in general (Simpson and Pankova, 2017). The princely tomb of Arzhan 1 in some aspects was closer to the burials of the late Bronze Age (Mongun-Taiga culture, ca. 15th–9th century BCE) than to the hitherto early Scythian material culture in the area (Aldy-Bel culture, ca. 7th–6th century BCE).

However, in the Uyuk Valley there are other large princely tombs which belong into the context of the early Scythian period in Southern Siberia. On a regional level there are no other monuments of similar size and importance from this period and it can be assumed that the power of the rulers buried in the princely tombs of the Siberian “Valley of the Kings” radiated far beyond the borders of the Uyuk Valley.

Arzhan 1 lies in line with three other princely tombs of similar size (Fig. 1). From the outside Arzhan 1 to 4 all looked similar, consisting of a relatively flat stone platform. Arzhan 2 had a diameter of 80 m, Arzhan 3 measured roughly 90 m, Arzhan 4 had a diameter of > 100 m

(Chugunov et al., 2010).

From 2001 to 2004 K. Chugunov, H. Parzinger and A. Nagler excavated the burial mound Arzhan 2, the easternmost burial in the chain of princely tombs. The main burial was unlooted due to its off-centre position and yielded one of the richest assemblages of the Eurasian steppe belt ever discovered (Chugunov et al., 2010; Menghin et al., 2007). Arzhan 2 was dated to the 7th century BCE and stylistically associated with the Aldy-Bel culture.

Since 2008, the Central Asian expedition of the State Hermitage Museum is excavating the Chinge-Tei 1 burial mound (Chugunov, 2011). Chinge-Tei is the westernmost early princely tomb of the Uyuk Valley. It is surrounded by a deep moat with a diameter of 106 m at the outer boundary. Up until now seven accompanying burials have been excavated at the fringe of the mound. The objects discovered in the burials can also be associated with the Aldy-Bel period.

In 2014 I. Rukavishnikova started excavating the early Scythian burial mound Arzhan 5. Its first finds are stylistically close to Arzhan 1. With 55 m the burial is smaller than the largest early Scythian tombs in the Uyuk Valley, but preserved wood within the monument shows that a similar radial structure like in Arzhan 1 was erected before the mound was covered with stones (Rukavishnikova and Gladchenkov, 2016).

The Tunnug 1 (Arzhan 0) burial mound was first marked by M. Gryaznov (Gryaznov, 1980) on a map but remained unstudied up until 2013. The burial mound is very low and its location in the swamps of the river Uyuk makes it difficult to find and access. In 2013 D. Rukavishnikov conducted a geophysical survey and first aerial photographs were taken (Rukavishnikova et al., 2015). It was concluded that organic

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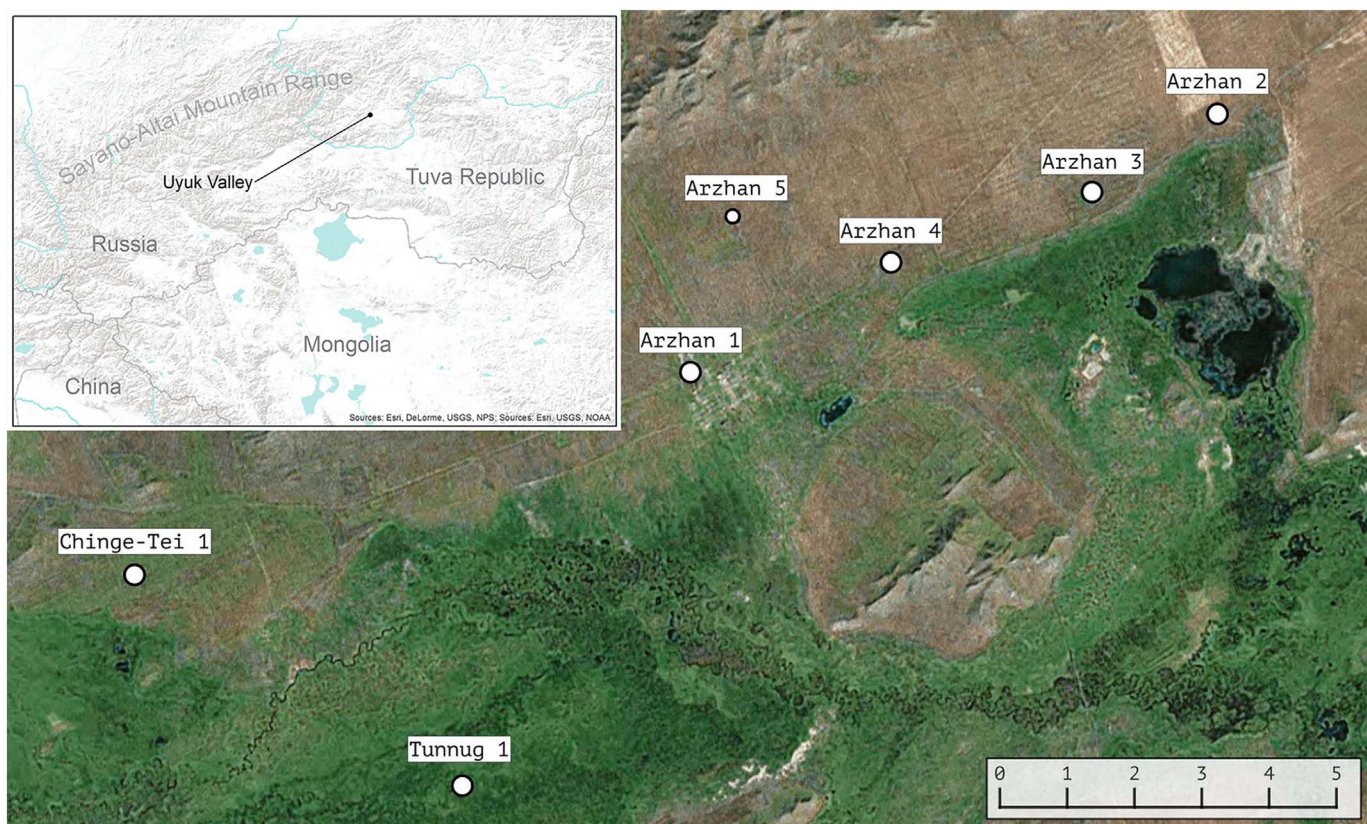


Fig. 1. Known early Scythian princely tombs in the Uyuk Valley, Tuva Republic, Russia.

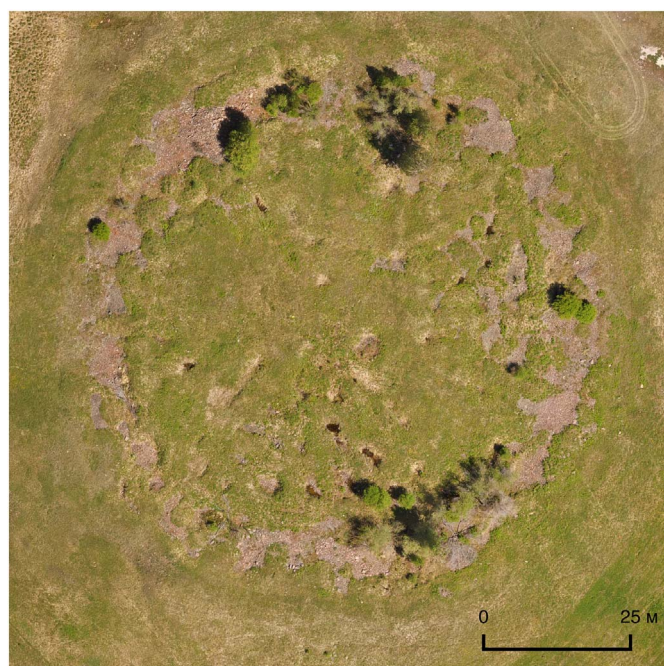


Fig. 2. High-resolution textured digital elevation model of the monument (ortho render, north-oriented, relative coordinates).

preservation was unlikely and the works were not continued due to the unfortunate sudden death of D. Rukavishnikov.

## 2. Survey preparation

First analyzed and identified through satellite imagery (WorldView-

2 data) the gigantic princely tomb Tunnug 1 in the swamp along the Uyuk River was the object of this expedition's interest. A Swiss-Russian scientific cooperation between the University of Bern, the Hermitage Museum and the Russian Academy of Sciences laid the foundation for the project. In order to gain a better understanding of the site and its surroundings as well as for planning of the logistics, high-resolution satellite imagery was ordered through a grant from the Digital Globe Foundation. Judging from the optical satellite data it appeared clear that there is a radial structure of wooden beams or logs underneath a thick package of stones. The parallels to the princely kurgans Arzhan 1 and Arzhan 5 were apparent, but it was unknown how old the monument is and why it was built in an area which is very untypical for early Scythian kurgans. Monuments of this period were usually erected on the river terraces. The unstable ground of the wetlands were unfavourable building grounds. Tunnug 1 lies in the middle of a swamp.

## 3. Mapping activities

A high-resolution 3D-model and ortho-photographs were generated through a structure from motion approach with the software *Agisoft*. The model has an accuracy of 4 cm and was used as the main decision making tool for the further steps of the project. Accurate mapping helped defining the best locations where we would be likely to answer our questions. The radial structure underlying the stone package is clearly visible in the rendered ortho-photograph (Fig. 2). Parts of the kurgan which show no vegetation are most likely collapsed wooden chambers which were covered with logs and a layer of stones. The logs broke and the stones fell into the chambers creating stone-filled pits. Plants are not growing on top of the pits because the stone package drains the water and no substrate is available.

The mound appears to be largely untouched apart from a somewhat disturbed periphery due to earlier attempts to source stones for a road through the swamp. It is possible that – because of its hidden position in

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