

MORE THAN JUST HORSE: DIETARY BREADTH AND SUBSISTENCE IN BRONZE AGE CENTRAL MONGOLIA

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ABSTRACT: *Our current state of knowledge of subsistence strategies and dietary breadth in Bronze Age Mongolia has been hampered by a monument focused research paradigm, which has largely ignored habitation sites. This approach has skewed our understanding by extrapolating the ordinary from the extraordinary. The Khanuy Valley Project has recently excavated Bronze Age transhumant habitation sites in central Mongolia and recovered the associated faunal remains. Analysis has revealed a complex subsistence strategy focused on the herding of several species of domestic animal, with dietary breadth increased through the minimal exploitation of wild resources.*

Introduction

Past assessments of subsistence economy in the prehistoric Eurasian Steppes have recently been the subject matter of many critiques (Rassamakin, 1999; Hanks, 2003; Morales-Muñiz and Antipina, 2003; Frachetti, 2004). The problems, they argue, are both methodological and theoretical. Methodologically, the problem apparently lies in the lack of appropriately recovered and analysed botanical and faunal data. Soviet and post-Soviet excavations, for example, have not systematically collected archaeobotanical data, and the lack of systematic sieving and an almost complete absence of flotation has resulted in an underrepresentation of plant remains, small mammals, birds and fish.

Theoretically, the problem lies in part with “the misuse of ethnographic observations for associating particular faunal assemblages with prescribed socio-economic strategies (i.e. pastoral nomadism, sedentary agro-pastoralism, etc.)” (Frachetti 2004:239). Michael Frachetti (2004:240) has also recently further underscored where the problem lies with most economic reconstructions of the subsistence economy proposed notably during the Soviet period, that is, that they have for the most part rested almost solely on faunal findings from excavated burials. Apparently, this problem has

specifically to do with the paucity of settlement data within the steppe zone (Hanks 2003:72), but recent collaborative studies (e.g. Chang et al., 2002; Hanks, 2003; Frachetti, 2004; Anthony et al., 2005; Houle, 2010) indicate that this paucity of data from habitation sites is not because of their actual absence, but because of the lack of appropriate techniques (or resolve) to uncover them.

This problem has also plagued the reconstruction of ancient subsistence economies in Mongolia. Indeed, at present, subsistence reconstructions for Bronze Age Mongolia still rest almost solely on animal remains found in burial and ritual contexts (e.g. Tsybiktarov, 1998, 2003) and we lack the more concrete evidence of subsistence practices that come from residential contexts. This, in part, has led some to suggest that Late Bronze Age groups associated with khirigsuurs were either necessarily horse herding pastoralists (of an uncertain nature) or, contrary to the general view, Epipaleolithic (Mesolithic) hunter-gatherers (Wright, 2006). To be fair, however, these last two authors (Tsybiktarov and Wright) call for the necessity of conducting archaeological research on domestic contexts. Nevertheless, for the moment, what is known of the actual subsistence economy of Late Bronze Age Mongolia is, not surprisingly, very little. But this is to be expected of a type of archaeology that has been mainly interested in burials, ritual sites and objects of fine craftsmanship. Botanical remains and animal bones have not been given the same attention—especially those from domestic contexts. As a result, interpretations regarding the nature of Late Bronze Age subsistence practices has to date remained speculative.

The Khanuy Valley Project (N48° 05'/E101° 03') was formulated in part to redress this balance by seeking to identify domestic habitation sites in close proximity to khirigsuurs and other monuments and integrating a variety of environmental archaeological approaches in the excavation and post-excavation phases.

Methods

The material discussed in this article was excavated during the 2010 field season of the Khanuy Valley project. This built upon the work carried out in previous field seasons by targeting excavations at two habitation sites (SP32E-MAB and SP26E-MAC), believed to represent respectively summer and winter use campsites by analogy with present day transhumant habitation patterns in the valley (Figure 1). Earlier phases of the project have identified campsites through artefact clusters discovered through extensive shovel-pit survey, and explored some of these sites through excavation of randomly and strategically positioned 2x2m test-pits (Houle, 2010). Five 6x6m trenches were opened up at each site, located according to the interpretation of the results from these test-pits.

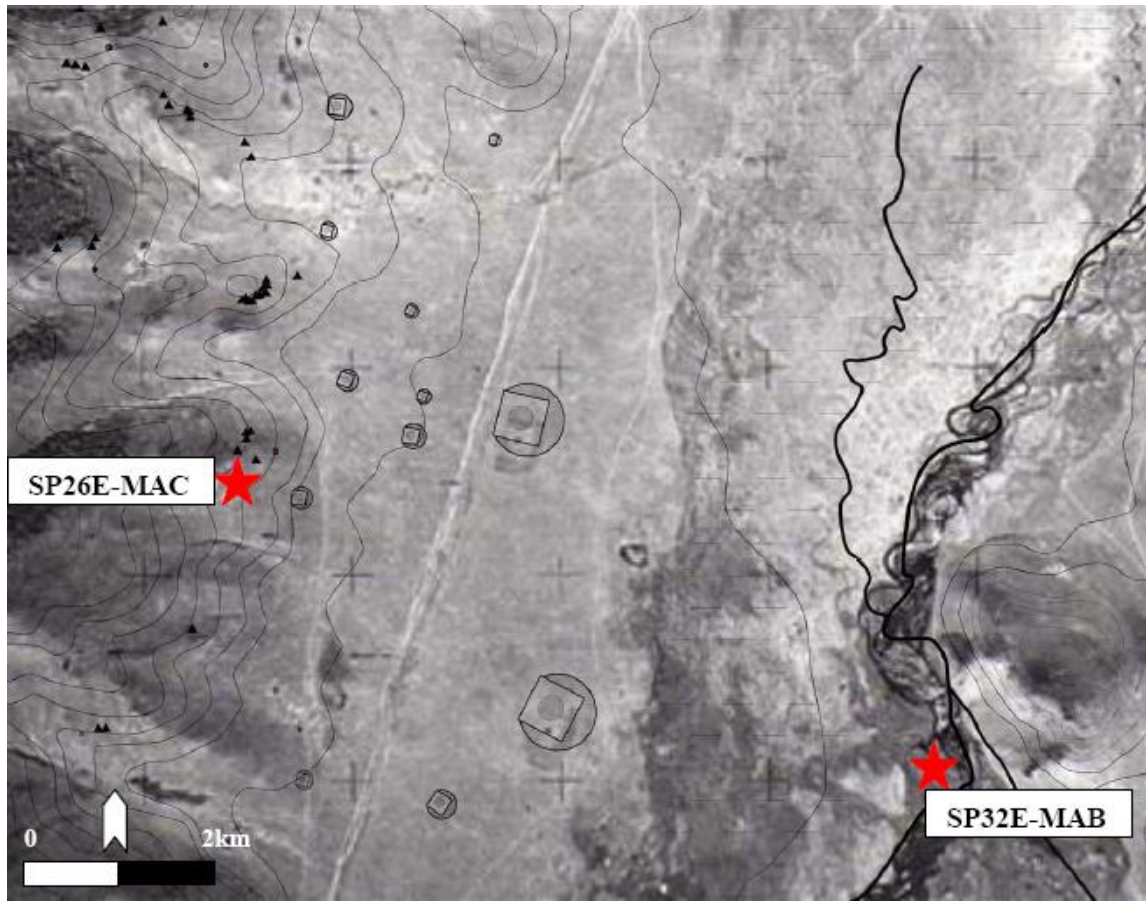


Figure 1: Location of sites mentioned in text (Khanuy Valley, central Mongolia).

Each of these 6x6m trenches was further subdivided into 2x2m units, comparable with the earlier test-pits and facilitating some form of spatial patterning analysis within the site and each trench. These units were excavated in 5cm spits and all spoil was sieved using a 6mm gauge mesh in order to both maximise and standardise recovery of small artefacts.

All faunal remains recovered from the excavation were identified in the field, using the project's own comparative reference collection, and recorded using a modified version of the procedure outlined by Davis (1992). This protocol was designed to balance the dual necessities of maximising the dataset acquired from a highly fragmented assemblage and ensuring ease of use (and therefore reliable comparison) between specialists of varying degrees of experience. Full details of this system are provided in Broderick (2011). Due to the relatively small amount of material recovered of sufficient preservation to be identifiable, NISP (Number of Identified Specimens) is the standard quantitative unit used throughout this paper.

Results

The specimens identified from the Bronze Age layers at the site of SP32E-MAB (in the summer campsite zone) provide a total NISP of 53 (Table 1). This figure can be neatly divided into small, medium and large mammals, birds and fish (Table 1) in which the medium and large sized mammals are represented by domesticated, or relatives of domesticated, species and the small mammals are represented by wild species – with the exception of *Capreolus pygargus* (Siberian roe deer) as a wild medium mammal. The domestic mammals account for 83% of the total Bronze Age assemblage from SP32E-MAB.

The specimens identified from the Bronze Age layers at the site of SP26E-MAC (in the winter campsite zone) provide a total NISP of 18 (

Table 2). Dividing this figure in the same way as before, it can be seen that domestic mammals account for 100% of the total Bronze Age assemblage from SP26E-MAC, of which large mammals dominate.

Table 1: Species representation, by NISP, for Bronze Age layers from SP32E-MAB.

Bos sp.	cf. Bos sp.	Equus sp.		Large Mammal
6	3	4		5
cf. Canis familiaris	Caprine	cf. Caprine	Capreolus pygargus	Medium Mammal
1	22	4	1	3
Ochotona sp.	Small Rodent		Fish	cf. Pica pica
4	2		2	1

Table 2: Species representation, by NISP, for Bronze Age layers from SP26E-MAC.

Bos sp.		Equus sp.	cf. Equus sp.	Large Mammal
4		6	1	1
	Caprine			
	6			

Of the eighteen large mammal specimens identified in the assemblage from the present day summer campsite area, six were *Bos sp.* and a further three were *cf. Bos sp.*, four were *Equus sp.* (horse or ass), (Table 1). It was not possible to speciate a further five specimens, which were recorded simply as “Large Mammal”. These unspciated bones

came from a single deposit of 5 ribs which were noted as having been broken when fresh. It was also noted that they were associated with a *Bos* sp. tooth, at the time of excavation. A *Bos* sp. humerus, from an adjacent unit, was broken into three pieces and had an FFI (Fracture Freshness Index (Outram, 2001, 2002) of one (on a scale of 0=low to 6=high). It was also possible to record an FFI for two further specimens of *Bos* sp.: a metatarsal (FFI = 3) and a cf. *Bos* sp. metapodial both from another (but the same other) trench.

A cf. *Bos* sp. 2nd phalanx was recorded which, though heavily abraded, showed signs of a burden/traction related pathology (lipping). *Equus* sp. remains comprised only teeth, of which it was not possible to determine any ageing information. It was possible to record a wear stage of 'g' from a *Bos* sp. M¹/M² – the same tooth mentioned above as being found in association with the ribs – representing an age at death of 2-5 years.

Of the 30 specimens identified as medium mammals in the assemblage, 22 were caprines and a further 4 were cf. caprine. In addition to three further specimens identified as non-specific "Medium Mammals" (one of which had a helical fracture observed (FFI=0), a 1st phalanx was recognised as being *Capreolus pygargus*. cf. *Canis familiaris* (dog) was also identified, when a highly worn maxillary first molar was recovered.

A second molar, of a caprine, was recovered which was at wear stage 9A, which would translate to an age at death of 2-7 years. A caprine humerus was also recovered which showed an FFI of 3 and exhibited signs of carnivore gnawing.

Of the wild resources recovered, one of the fish bones (Figure 2) was later identified to the family Salmonidae (salmonid) with the aid of a laboratory reference collection and photographs. The single bird specimen, cf. *Pica pica* (magpie), was a phalanx which had clearly been burnt. Among the small mammal remains, a cranium and right mandible of *Ochotona* sp. (pika) were recovered and a right mandible of a small rodent, all of which were intact so permitting measurements of the tooth row; these were 8.1, 7.7 and 4.7mm, respectively.



Figure 2: *Salmonidae* vertebra from SP26E-MAC, Khanuy Valley Project 2010.

Of the unidentified specimens recovered from this period, a helical fracture was observed on a further specimen and two possible worked bones were recovered.

Bos sp. was identified at the site of SP26E-MAC (in the winter campsite area) through one maxillary and two mandibular teeth, both too heavily abraded to provide a wear stage, and a 3rd phalanx. Caprines likewise were identified through three molars: one maxillary and two mandibular, also too heavily abraded to provide ageing information although it was noted that the M³ was only just in wear. A mandibular ramus, a second

phalanx and a metatarsal were also recovered; the latter exhibiting two axial cut-marks near the proximal end. The single most common species found at the site though was *Equus* sp., this was represented through a metatarsal, a humerus, a pelvis, a carpal and two phalanges (1st & 3rd).

Discussion

Bos sp. was the most numerous large mammal, by NISP, at the site of SP32E-MAB (in the summer campsite zone) in the Bronze Age (but see Broderick & Houle, Forthcoming for general regional trends regarding herd structure). The origins and nature of *Bos* sp. in Mongolia are still poorly understood, two species are present in the Khanuy Valley today – *Bos grunniens* and *Bos taurus* – but no method has yet been devised for distinguishing between their skeletal remains. The presence of a possible traction related pathology on a *Bos* sp. phalanx at Bronze Age SP32E-MAB is of real interest, since it would indicate a domestic type. Such pathologies are generally associated with ploughing (e.g. Groot, 2005; Telldahl, 2005; Isaakidou, 2006), but that seems unlikely given the context, and an attribution to old-age is considered more likely by the authors. Fracture patterns of the *Bos* sp. remains would also indicate that their marrow was sought after, a practice still common in the area today. *Equus* sp. was the only other large mammal identified among the remains recovered from either site and was the most common species identified at SP26E-MAC (in the winter campsite zone). Sadly there were no indications of specific use or other information associated with these finds, but it's worth noting that cattle and horses are both slaughtered shortly after moving to a winter campsite in the Khanuy valley today and so, based on this ethnographic model, it would be predicted that large mammals would account for a greater proportion of the assemblages from winter campsites than they would from summer campsites. This prediction is true here for both *Bos* sp. and *Equus* sp. separately as well as for large mammals as a category.

Caprines were the largest part of the assemblage overall and were the most common species found at the site of SP32E-MAB. Caprines are most commonly slaughtered at the summer campsites in the Khanuy Valley today (Broderick, 2012), and it's tempting to read the data in this way, given the summer campsite interpretation already applied to SP32E-MAB. The presence of caprine (and possibly other medium mammal) skeletal remains with low FFI scores indicates that the animals were consumed at the site, with its inhabitants making use of the bone marrow (Outram, 2001, 2002), a valuable source of essential vitamins and fatty acids in diets without a significant plant component (Mead et al., 1986; Erasmus, 1989). Axial cut marks identified on a caprine metatarsal from SP26E-MAC indicate that the animals were also butchered at that site; in light of the above comments on marrow use it is worth noting that the most commonly employed method used to extract marrow from bones in the Khanuy Valley today is to split them axially with a blade (Broderick, field notes).

The presence of *Canis familiaris* in the Bronze Age is significant, since although carnivore gnawing had been detected previously (Broderick, 2010), this is the first time that *Canis familiaris* has been found in an archaeological context in the region. Although hard to conclusively differentiate from *Canis lupus* (wolf), the high state of wear on the tooth (Figure 3), combined with signs of carnivore gnawing on a caprine humerus from



the same site, would argue in favour of the former. Today, *Canis familiaris* is often a tolerated guard rather than a pet or hunting or herding companion (Broderick, 2012). That some hunting occurred alongside herding in the Bronze Age period, however, can be demonstrated by the presence of *Capreolus pygargus* (roe deer) in the assemblage.

Figure 3: *Canis familiaris* tooth (M^1) from SP32E-MAB, Khanuy Valley Project 2010.

Related to hunting is fishing - the simplest explanation for the presence of fish on an archaeological site is always human agency, and there is nothing here which would suggest otherwise. Fish is today a taboo food in this part of Mongolia and it is not known when this first developed, with some attributing it to Buddhism (Blunden, 2008, 208) although a link to shamanic beliefs has also been suggested (Broderick, field notes). The evidence here would suggest that the taboo was not enforced in the Bronze Age Khanuy Valley.

Conclusion

The analysis of faunal remains excavated from domestic contexts in the Khanuy valley has shown that a complex subsistence system was already established in central Mongolia by the Bronze Age. This consisted of herding at least three and possibly up to five different species of animal (horse, cow and/or yak and sheep and/or goat), refuting notions of wild resource or single species dependence. It has also been suggested that utilisation of different components of the aggregate herd varied seasonally (i.e. caprines were a proportionally greater component of the diet in the summer and horses/cattle in the winter). This method of subsistence was leant greater dietary breadth and variety by making occasional use of seasonal wild resources – hunting and fishing. In addition, it has also been shown that dogs were present in Mongolia by at least the Bronze Age – a highly visible, though rarely commented upon, component of modern day lifestyles in the region.

As is common with much research, the data presented here raises as many new questions as it answers old ones. The role of dogs in ancient Mongolia, the consumption of fish and the ubiquity and composition of complex herding subsistence strategies in Bronze Age Mongolia are just some of these which, through continued excavation and

new techniques, the Khanuy Valley Project will seek to answer. It is to be hoped that others, too, will add to our knowledge of every-day life in this period.

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