Human-Dog Companionship: Body size and Potential Expression of Sentimentalism

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GOBI-STEPPE NEOLITHIC PROJECT

Introduction

- Beneath the ground of Tamsagbulag, east of the Gobi-Steppe, lies evidence of prehistoric human settlement. Traces of hearth, dwelling, artefacts, and various faunal remains were found.
- Combinations of dog's cranials, and postcranial skeletons are recovered. An astonishing preserved of full dog skeleton is depicted in the image on the left. The radiocarbon date of this buried specimen indicate Middle Neolithic origin.
- This research aims to provide the preliminary results for the understanding of animal use and the potential of sentimental value toward dogs during the Neolithic period, Mongolia.
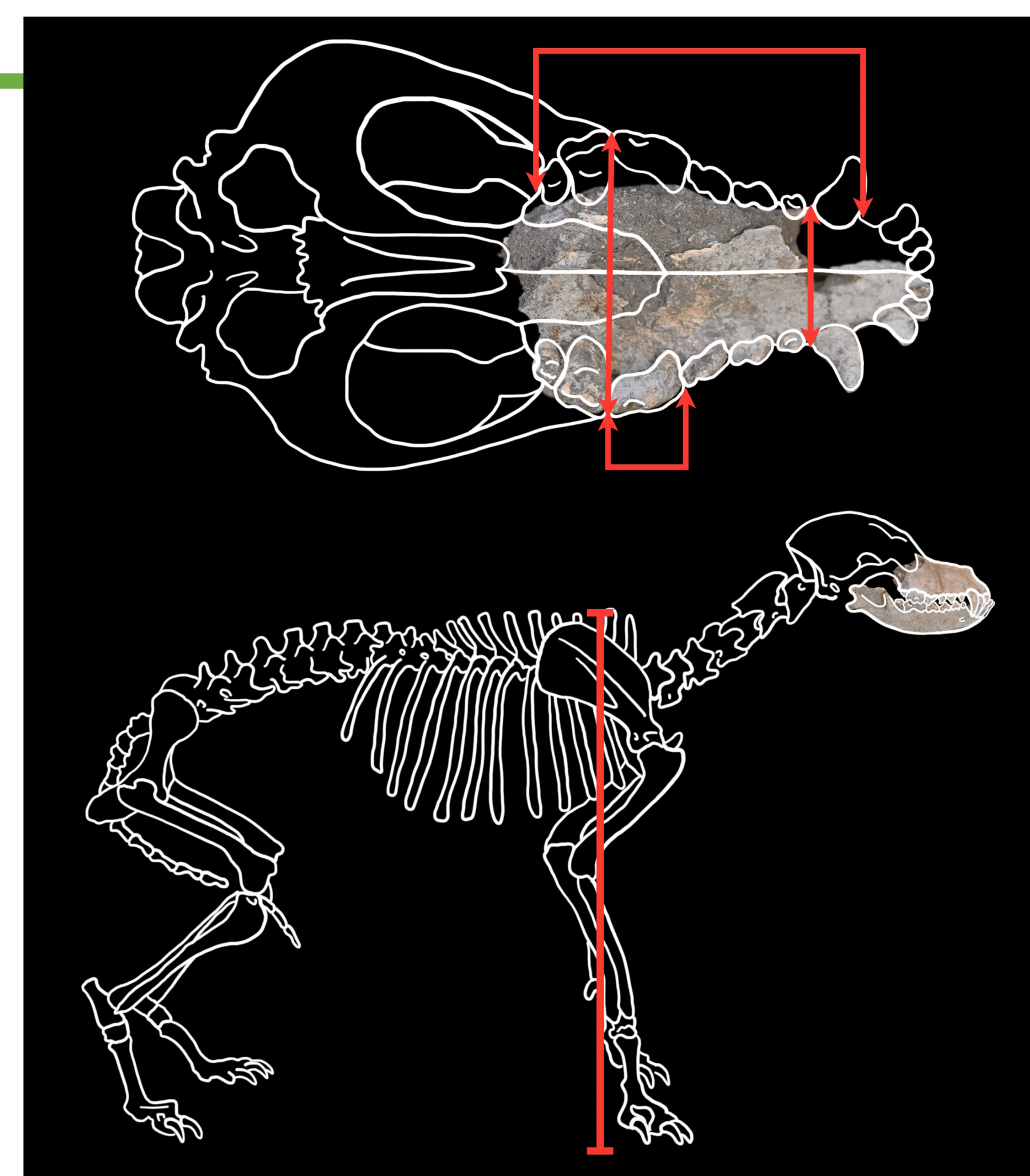
Method

- Using a digital sliding caliper, the cranial and postcranial metric measurements were taken according to the Von den Driesch (1976) guidelines. The greatest length of postcranial elements were measured using astrometric board. All measurements were taken in millimeter and rounded to the nearest hundredths.
- The average estimated shoulder height from the long bones (i.e., humerus, radius, etc.) and the snout width index were calculated using the formulas from Harcourt (1974) and Mazzorin & Tagliacozzo (2000), respectively.
- The estimated snout width index, length of the carnassial were collected and compared with other Canis collections from Siberia.

Results

Specimen	Length of the carnassial (mm)		Snout width indices		Height (cm)	Estimated body size
	Maxilla	Mandible	Broadness	Length		
TB13.22.CO.L2C (dog burial)	21.11	-	60	93.73	54	Large dog
TB12.A3.L2B:10	21.11	-	56.65	109.92	-	Large dog*
TB13.CO.L2C:111-116	20.4	-	-	-	-	Large dog*
TB13.CO.L2C:111-116 (teal 23901)	20.1	-	-	-	-	Large dog*
TB12.A1.L2b no. 2	-	22.65	-	-	-	Large dog*
TB13.B1.L2B no.40 Sheet 12	-	17	-	-	-	Medium dog**
TB12.B3.L2B no.3 sheet 5	-	17.55	-	-	-	Medium dog**
TB13.B1.L2B no.76 sheet 13	-	16.9	-	-	-	Medium dog**
TB12.B1.L2 no.3	-	16.6	-	-	-	Medium dog**
TB13.22.Cprofile.L2C: 9-17	-	15.2	-	-	-	Small dog**

Footnote: *based on snout width indices, **based on carnassial length

- The collection consists of 10 dogs. Two were found in a separate burial with its position resembling flex posture. The recovered postcranial remains do no express any sign of wear or osteophytes which is indicative of old-age. The epiphyses are fully fused. The preserved dentitions represent a mature population. Cut mark or fracture induce by the butchering process are not observed. This confirms the alternative use of dogs, besides consumption or exchange goods.
- The most completed specimen is the individual from one of the burials (see image). The estimated shoulder height of 54 cm support that the specimen is a large dog (Harcourt, 1974).
- The relative length and width of the snout was estimated based on the calculation of snout width indices of two recovered maxillae. The result demonstrate resemblance with the Mesolithic and Neolithic large dogs from Cis-Baikal (Losey et al. 2013).
- The carnassial length of other individuals from the collection depicts a range of body sizes. In total, five dogs are categorized as a large dog, four as a medium dog, and one as a small dog (see table).

Discussion and conclusion

- Navigating through uncertain conditions and fluctuating climates through the Gobi desert-steppe can pose challenges to humans and other non-human species. Among many strategies to overcome the hardships, animal husbandry is one of the major leaps in mankind. Dogs do not only provide raw materials but also assistance in hunting and transportation (Kudinova 2023; Losey et al. 2018). Dogs have been playing a role as an economical commodity such as meat and fur trade since the Neolithic period (Kudinova 2023; Losey et al. 2018). The evidence of this practice is cut marks, the location of where the remains are recovered (i.e. waste pits), and dog fur goods (Kudinova 2023). On the other hand, dog remains found in a separate or inside of human burial with or without grave goods represent alternative use of the dog such as sacrifice for ritual (Losey et al. 2018) or expression of sentimentalism.
- The presence of over 10 dogs at the site is a representation of a co-adaptation of both humans and dogs. The estimated body size advised that large dogs were the most favourable trait (N=5), followed by medium (N=4) and small dog (N=1).

- Notably, the completeness and posture of a specimen from the burial among a scatter of faunal and pottery fragments depicts a potential expression of sentimentalism similar to contemporary values toward companion animals.
- To gain a better understanding of human-dog relationship and the use of animals among Neolithic communities in Mongolia, interpretation of the body size relative to the metabolic requirement, chemical analysis of the dentition or Canids gnawing marks on other specimens will allow us to gain more insight on the diet, living conditions, as well as the value of the relationship. Furthermore, a study of the genomic DNA and cross-comparison of a certain trait across temporal and spatial distribution could compliment the study of dog domestication.

Acknowledgment