PRE-SCYTHIAN DOG REMAINS FROM SALGÓTARJÁN-IPARI PARK II (NORTHERN HILL REGION, HUNGARY)

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Over 4500 animal bones have been recovered during preventive excavations at the Pre-Scythian settlement of Salgótarján-Ipari Park II, northern Hungary. The dog remains, including a well-preserved calvarium, show no evidence of dog meat consumption. It looks likely, that dogs were defined in the local culture on the basis of the functions they performed. They suggest that Iron Age dogs in the region formed largely free-breeding populations: no sign of conscious breeding could be detected. These dogs were not only of medium size, but the calvarium is also reminiscent of unimproved cranial types such as those of Skye terriers or traditional Hungarian sheep dogs. Such forms tend to occur in prehistoric dog populations probably in the absence of targeted human selection. Their features are similar to those of pariah dogs, evidently resulting from panmixis. Such dogs probably hung around human habitations as scavengers, subsisting on food refuse. Their territorial nature probably also made them useful as guards. Beyond these simple, instinctive activities, their roles in herding and hunting cannot be excluded, but cannot be proven either on the basis of osteological evidence alone. A carefully cut proximal end of a dog femur from Salgótarján-Ipari Park II, indicates that dogs were at least opportunistically used as a source of raw material in bone manufacturing.

Keywords: Iron Age Hungary, dog reconstruction, craniometry, withers height, dog breeds

Introduction

Over 4500 identifiable animal remains have been brought to light during the course of preventive excavations at Salgótarján-Ipari Park II (Nógrád County) in the Northern Hill Region in Hungary. Field work was carried out under the direction of Andrea Vaday, to whom this article is dedicated. While the detailed analysis of animal remains merits its own separate study, dog remains have been singled out for the purpose of this article. Dogs from this period are virtually unknown in Hungary which – in spite of the relatively small numbers of finds – lends special importance to their remains recovered from this site.

The Pre-Scythian settlement uncovered prior to the construction of an industrial lot at Salgótarján-Ipari Park II *(Fig. 1, right)* dates from approximately 650 to 450 BCE. This largely corresponds to the Scythian Period (i. e. the early phase of the Early Iron Age) in Hungary, but the location of the site at around 300 m above sea level in a valley between the mountains was at a distance from "proper" Scythian territories in the Great Hungarian Plain toward the south. Sporadic occurrences of Late Bronze Age Gáva and Kyjatice culture as well as Iron Age Hallstatt-style ceramics at the site illustrate this Prescythian position.[1] Originally, "Prescythian" was a contradictory term in itself, applied to a vaguely defined group of equestrian people,[2] who supposedly arrived from southeast into the

[1] Vaday 2003, 31–38.
[2] Gallus–Horváth 1939.

territories marked by the Late Bronze Age Gáva and Kyjatice ceramic styles in eastern Hungary. Lacking absolute dates, the typo-chronological dating of Scythian-period artefacts seems to span a broad time interval. Dog remains from this settlement include a well-preserved *calvarium*, a mandible, a complete *humerus* and a *femur* showing marks of manufacturing. All bones came to light in a disarticulated condition: neither entire nor partial skeletons were found in the refuse pits and no marks of butchering are indicative of dog meat consumption.

A reasonably large assemblage of almost 300 identifiable Scythian-period bones came from Balassagyarmat-Káposztások located 48 km west of Salgótarján-Ipari Park II in the Northern Hills Region *(Fig. 1, left)* in yet another valley at an altitude of only 130 m. Excavations at this site were directed by Gábor Bácsmegi. The assemblage of identifiable Scythian-period bones from Balassagyarmat-Káposztások was smaller by an entire order of magnitude than the number of bones available from Salgótarján-Ipari Park II. Only ten of the 258 identifiable bones originated from dogs. A mandible fragment, however, offered morphometric information comparable to the data gained from the heavily fragmented find material from Salgótarján-Ipari Park II.

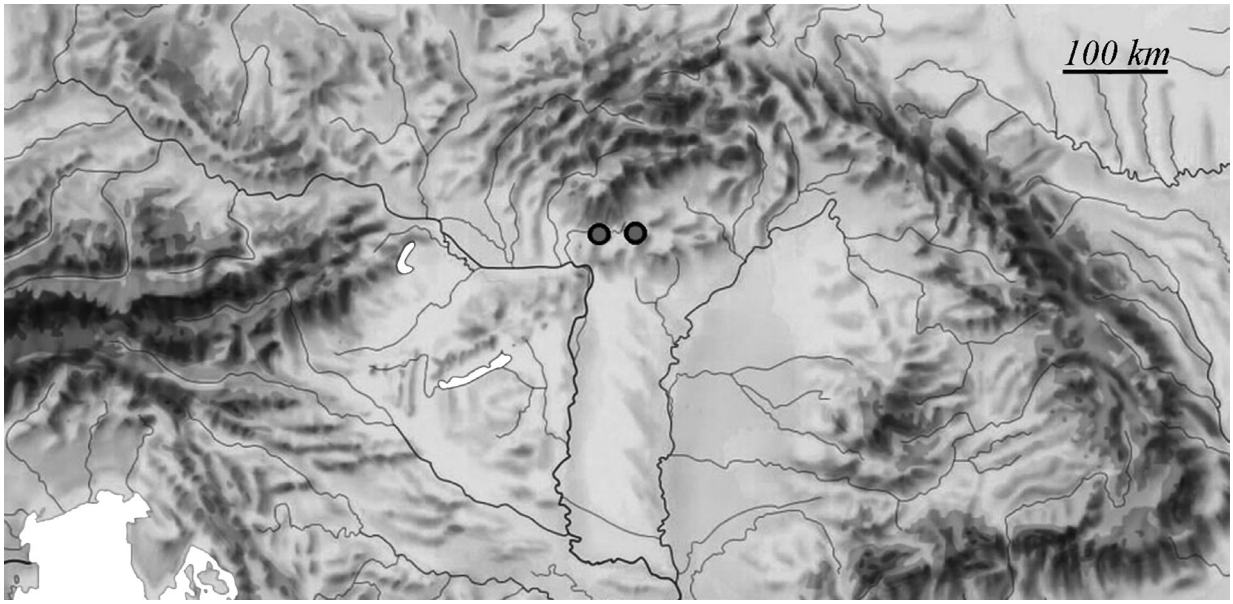

Fig. 1: The location of the two sites within the Carpathian Basin. Balassagyarmat-Káposztások (West) Salgótarján-Ipari Park II (East).

Material and method

While the detailed compositions of the two assemblages have been analysed within a micro-regional as well as county-level context elsewhere,[3] contributions by the most important domestic animal species are worth comparing *(Table 1)*. Although there is a major difference between the sizes of two assemblages, large stock was more important in meat provisioning at Salgótarján-Ipari Park II, while the few dog bones formed a greater percentage within the small sample from Balassagyarmat-Káposztások. These differences are significant in formal statistical terms ($Chi^2 = 19.186$, df = 4, P = 0.0007).

[3] Bartosiewicz–Gál 2010a, 118, Fig. 9. 1; Bartosiewicz–Gál 2010b, 337–352, 343, Table 2.

Table 1: Contributions by domestic animal remains to the assemblages studied (NISP = Number of Identifiable Specimens)

Species	Salgótarján-Ipari Park II		Balassagyarmat-Káposztások		Total
	NISP	*%*	*NISP*	*%*	NISP
Cattle (*Bos taurus* Linné, 1758)	1695	42.1	88	34.4	**1783**
Sheep/goat (*Caprinae* Gray, 1852)	1669	41.4	103	40.2	**1772**
Domestic pig (*Sus domesticus* Erxleben, 1777)	454	11.3	49	19.1	**503**
Horse (*Equus caballus* Linné, 1758)	119	3.0	6	2.3	**125**
Dog (*Canis familiaris* Linné, 1758)	92	2.3	10	3.9	**102**
Domestic total	**4029**		**256**		**4285**

One of the characteristics of the general archaeozoological material from Salgótarján-Ipari Park II is that its taxonomic composition is strikingly similar to that of Jászfelsőszentgyörgy-Turóczi-tanya, a far smaller, but archetypical Scythian-period settlement in the Great Hungarian Plain.[4] The relatively high proportions of sheep/goat and horse remains are notable at both of the latter two settlements.

The evidently small contribution of dog remains to animal bone assemblages from Iron Age sites in Hungary suggests that dogs were not eaten during this time period in the region. In comparison to the preceding Bronze Age, dog remains occur only sporadically in settlement materials. It should therefore be considered particularly fortunate that an almost intact dog *calvarium* was recovered at the Salgótarján-Ipari Park II settlement although no complete dog skeletons could be identified at the site.

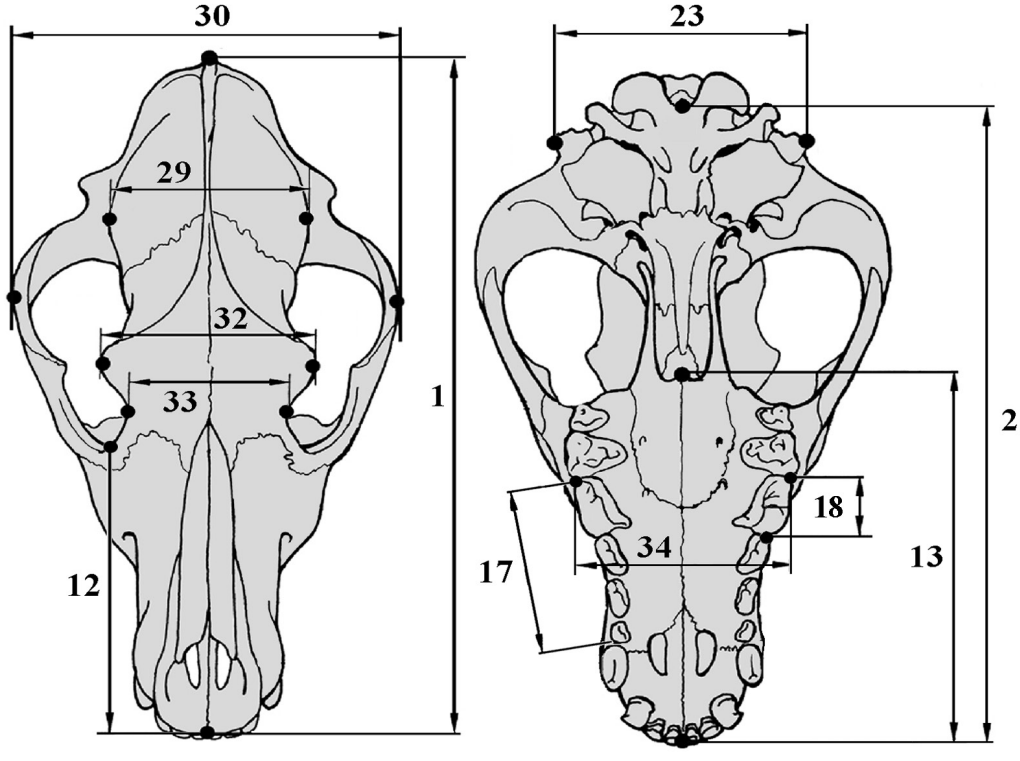

Fig. 2: Measurements of the calvarium used in this study (von den Driesch 1976). Left: *norma frontalis*, right: *norma basilaris*. The breadth of upper carnassial (P4, *Table 2*) is not shown on the sketch.

[4] Bökönyi 1974, 371.

No butchering marks could be identified, that would have helped functionally interpreting the dispersed state of skeletal elements from dogs. Most of these bones were strongly fragmented at both sites, chiefly due to multiple re-deposition. However, the few measurable specimens offer valuable information on the little-known dogs of this time period at least at the two sites available for study.

Morphometric methods used in the description and analysis of dog remains relied on a variety of sources. All measurements were taken following the animal osteometry standard developed by Angela von den Driesch.[5] The set of cranial dimensions selected for study is summarized in *Fig. 2*. The measurements are summarized in *Table 2*.

Table 2: *Calvarium* measurements from Salgótarján-Ipari Park II. See *Fig. 2* for the position of measurements listed. Asterisks indicate estimates based on half measurements taken on the preserved side of the *calvarium*.

Code	Name	Abbreviation	Mm
1	Total length	A–P	187.2
3	Basal length	B–P	167.5
12	Snout length	oral edge of orbits–P	95.5
13	Median palatal length	St–P	93.2
17	Buccal length of the premolar row		52.5
18	Length of the upper carnassial (P4)	L	12.5
18a	Breadth of the upper carnassial (P4)	B (not shown in *Fig. 2*)	13.0
23	Greatest mastoid breadth	Ot–Ot	60.0*
29	Greatest neurocranium breadth	Eu–Eu	39.9
30	Zygomatic breadth	Zy–Zy	94.0*
32	Frontal breadth	Ect–Ect	52.1
33	Least breadth between the orbits	Ent–Ent	37.0
34	Greatest palatal breadth	between the buccal sides of alveoli	67.0

Body size reconstructions for dogs were carried out following a number of methods. Direct estimations of withers heights from the greatest length of a single complete *humerus* from Salgótarján-Ipari Park II were calculated using the 3.37 coefficient developed for canids (using skeletons of 13 dogs of known modern breeds, two wolves, two foxes and a striped hyena) by Koudelka[6] and Harcourt's linear regression equation[7] in which WH equals withers height and TL is the total (greatest) length of the *humerus*:

$$WH = 3.43*TL-26.54$$

Another withers height estimate from the proximal fragment of a *femur* was attempted using the method published recently by Anna Biller[8] based on a considerable body of Roman-period dog remains identified from the Pannonian provincial town of Gorsium (Tác) in Hungary.[9]

Dozens of cranial measurements have been gathered on 59 skulls of present-day known breeds and wolves kept in the Hungarian Agricultural Museum were collected,[10] to serve as a body of comparative data, against the backdrop of which the specimen recovered at Salgótarján-Ipari Park II could be studied. The archaeological find was related to these modern specimens performing a cluster analysis. Groups were created on the basis of single linkage calculated from Euclidean

5 von den Driesch 1976, Figure 14. a–c.
6 Koudelka 1884, 127–153.
7 Harcourt 1974, 151–175.
8 Biller 2014, 139–141, 140, Figure 8. 3.
9 Bökönyi 1984, 69–71.
10 Daróczi-Szabó 2006, 85–95.

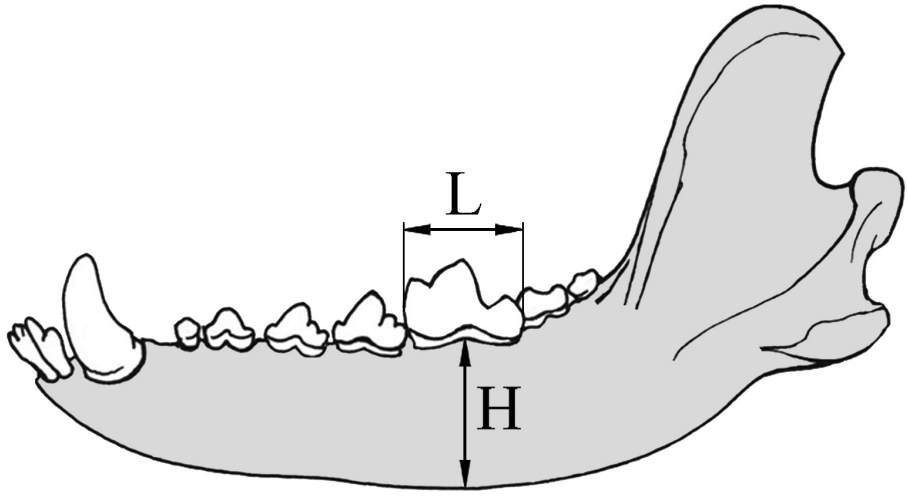

Fig. 3: Measurements on the lower carnassial (M1) and *corpus mandibulae* on the jaw of dogs (the breadth of lower carnassial is not shown on the sketch).

distances between each individual. The result was presented in the form of an agglomerative dendrogram using the Ward method.[11]

Finally, mandibular measurements were used in two ways. The lengths and breadths of lower carnassial (M1) teeth[12] from Salgótarján-Ipari Park II were compared to those of modern breeds and wolves whose skulls are kept in the Hungarian Agricultural Museum. The height of *corpus mandibulae*, measured at the mid-point of the lower carnassial *(Fig. 3)* was used in estimating the live weights of dogs from Salgótarján-Ipari Park II and Balassagyarmat-Káposztások using the coefficient developed by Nancy L. Hamblin for dogs used for sacrifice and other rituals.[13]

Results

The medium-size *calvarium* from Salgótarján-Ipari Park II shows a narrow snout and a moderately steep profile line *(Fig. 4)*. This is a definitely "dog" shape in comparison with, for example, foxes or even wolves. It is far, however, from the sometimes strongly neotenic cranial conformation of some present-day breeds of similar size. The cluster analysis performed feeding *calvarium* proportions into the Ward algorithm supports this visual impression. The three major groups of canids defined on the basis of cranial measurements *(Fig. 5)* include most of the modern-day wolves (usually large males; linkage distance = 30), "ordinary" breeds (linkage distance = 20)[14] and a group of smaller terriers (linkage distance = 25) within which the Pre-Scythian dog fits. Outliers in this dendrogram are represented by dwarf breeds and boxers of extreme inherited cranial formations, especially maxillary *brachygnathia*.[15]

[11] Everitt 1974, 26.
[12] von den Driesch 1976, Figure 23. a–b.
[13] Hamblin 1984, 116–117.
[14] This major group can be further refined into two groups: dogs having elongated skulls as various lurchers and setters, and regular large/medium size breeds such as Alsatians, Great Danes and she-wolves.
[15] Bartosiewicz 2013, 192, Fig. 165.

Fig. 4: From top to bottom: frontal, left lateral and basilar aspects of the dog calvarium from Salgótarján-Ipari Park II. Photo: Erika Gál

It must be emphasized here that archaeological dogs, especially from prehistoric periods, should never be directly equated with modern day breeds whose dynamic development and change beats even the most accurate chronological resolution in archaeology. Reference to some breeds, however, makes it easier to imagine the size and shape of dogs that once lived in the immediate environment of prehistoric peoples.

The clustering of this Pre-Scythian dog *calvarium* with those of Puli, Skye terrier, Fox terrier, and even Dachshund in *Fig. 5* reconfirms the visual impression that this medium-size animal had an elongated skull with a moderate profile line as is seen in the most similar modern breeds.

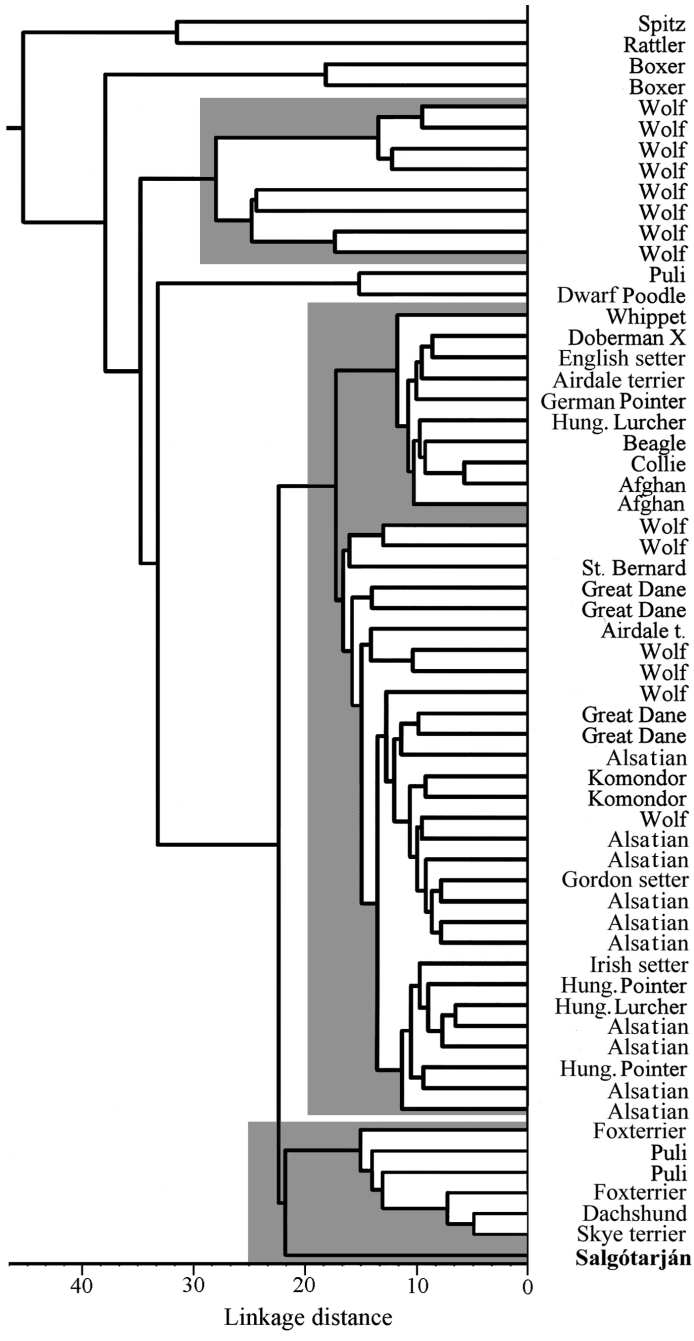

Fig. 5: The numerical classification (Ward method) of the Salgótarján-Ipari Park II calvarium in relation to wolves and modern dog breeds (Tassi 2002) based on the measurements shown in *Fig. 3*

The elongated palatal shape further supports this observation. In *Fig. 6,* the specimen from Salgótarján-Ipari Park II falls way below the regression line calculated on the basis of wolves indicating a snout shape that is far narrower than that of the wild ancestor *(Fig. 6)*. Two boxers are shown as an extreme in this graph and the photograph of is breed is also included for comparison with the basilar view of the Pre-Scythian dog at the bottom of *Fig. 4.*

On the basis of cranial proportions, it is impossible to determine the overall shape of the dog. The relatively primitive forms of two breeds whose name came up in the cluster analysis due to their great similarity to the Pre-Scythian specimen from Salgótarján-Ipari Park II are presented in *Fig. 7.*

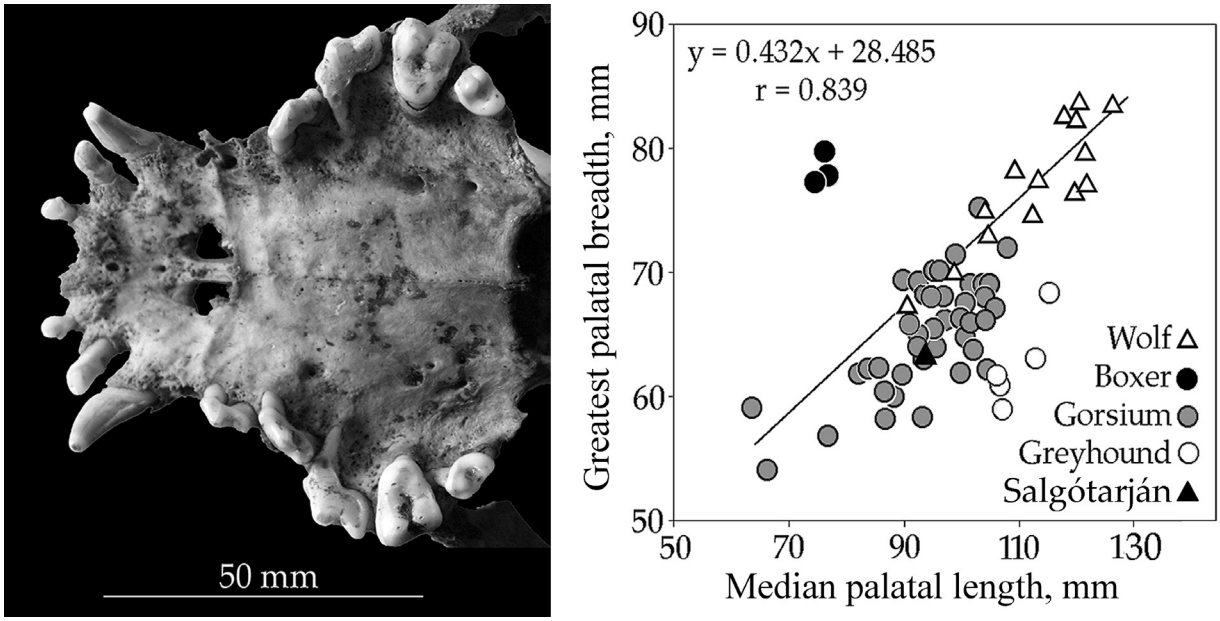

Fig. 6: Palatal proportions of the Salgótarján-Ipari Park II calvarium in comparison of wolves, Roman dogs from Gorsium and extreme present-day breeds: Greyhounds and Boxers. Palatal aspect of the latter is shown on the left side (compare to *Fig. 4*, bottom). Photo: Erika Gál

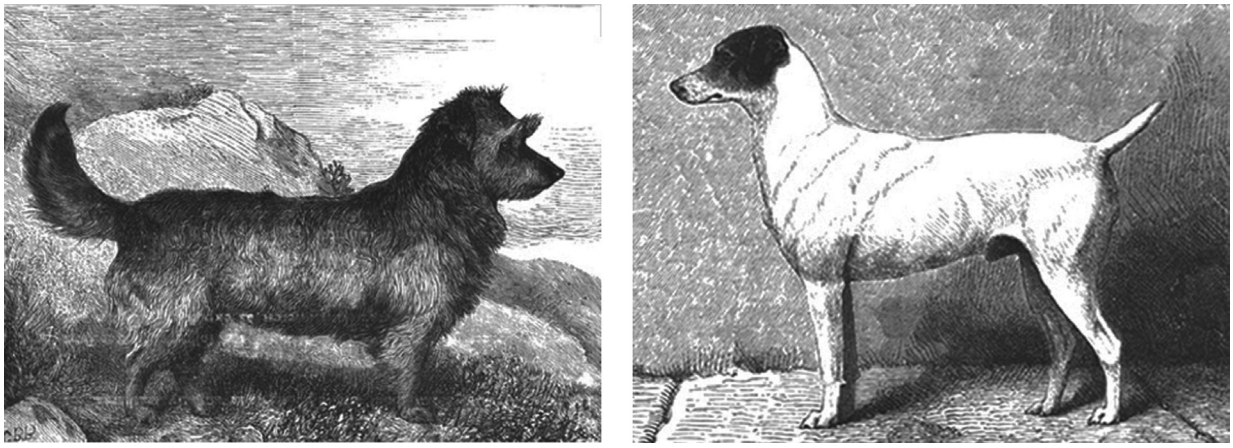

Fig. 7: Early forms of Skye terrier (left) and Foxterrier, two possible cranial analogies of the Pre-Scythian dog from Salgótarján-Ipari Park II (Shaw 1881)

A stout-legged late 19th-century Skye terrier and a small/medium size, straight-legged Fox terrier from the same epoch[16] represent these cranial analogies.

It is at this point that mandibular measurements and the sizes of lower carnassial teeth are worth considering. Calculated from the height of the *corpus mandibulae* (as illustrated in *Fig. 3*), the estimated weight of this dog was 16.08 kg using Hamblin's formula. This value is slightly above the maximum weight (15 kg) specified in the modern-day breed standard for the Hungarian Puli,

[16] Shaw 1881, 273, 302.

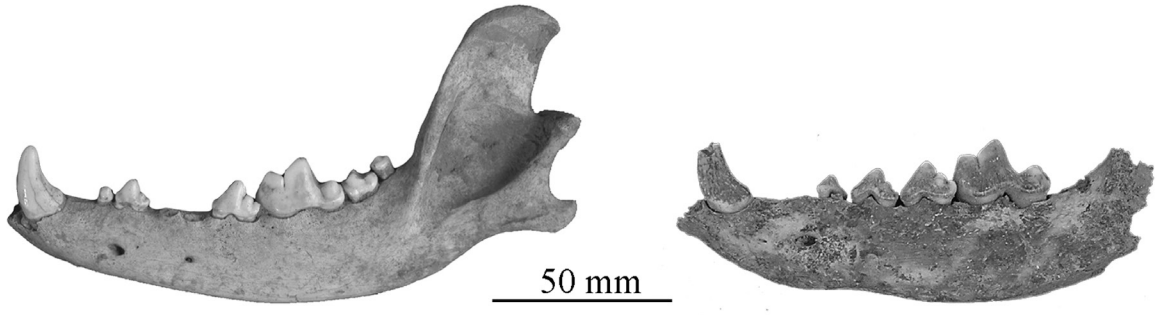

Fig. 8: Lateral aspects of the left mandibles from Salgótarján-Ipari Park II (left) and Balassagyarmat-Káposztások (right). Photo: Erika Gál

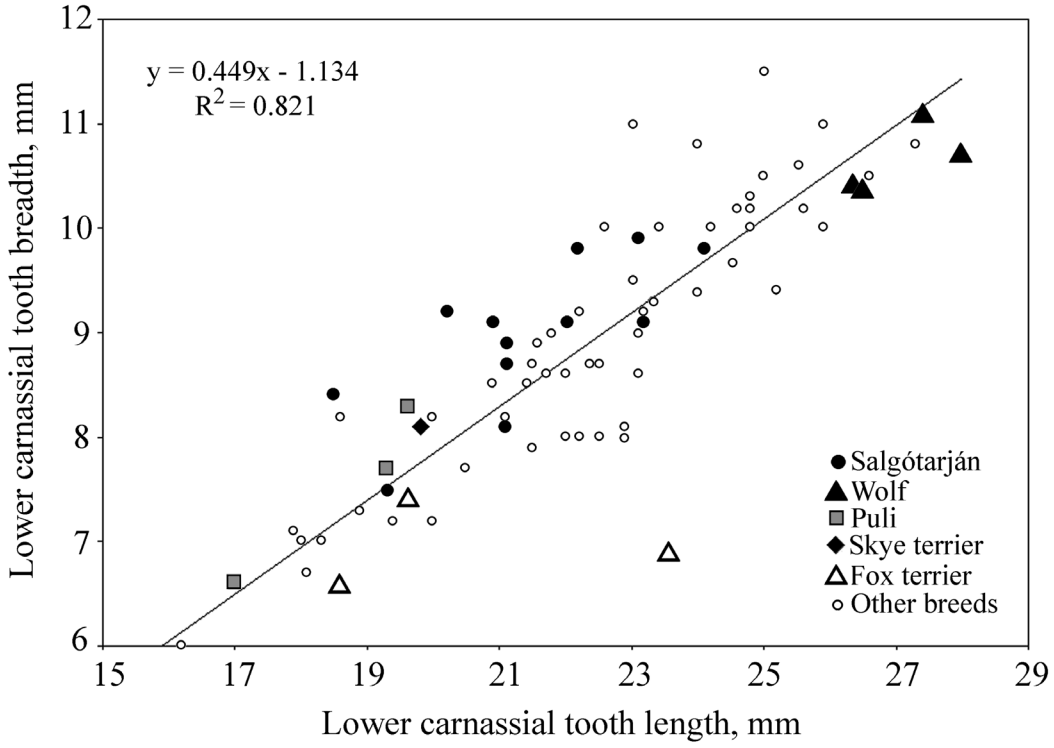

Fig. 9: The distribution of lower carnassial (M1) dimensions of dogs from Salgótarján-Ipari Park II in comparison with present-day dogs and wolves. The regression line is based on the sample of present-day breeds

a medium-size, terrier-like herding dog[17] whose name also came up in cranial comparisons *(Fig. 5)*. The same calculation carried out on the mandible fragment from Balassagyarmat-Káposztások resulted in an estimated live weight of 12.44 kg, slightly below the minimum (13 kg) for a modern Hungarian Puli. The two mandibles used in these estimations are shown in *Fig. 8.*

Individual teeth tend to be better represented even in fragmented archaeozoological assemblages. The distribution of a dozen lower carnassial teeth plotted by its length and width along with a number of similar teeth from present-day breeds indicates that larger dogs were also present at the Pre-Scythian

[17] Sárkány–Ócsag 1977, 41.

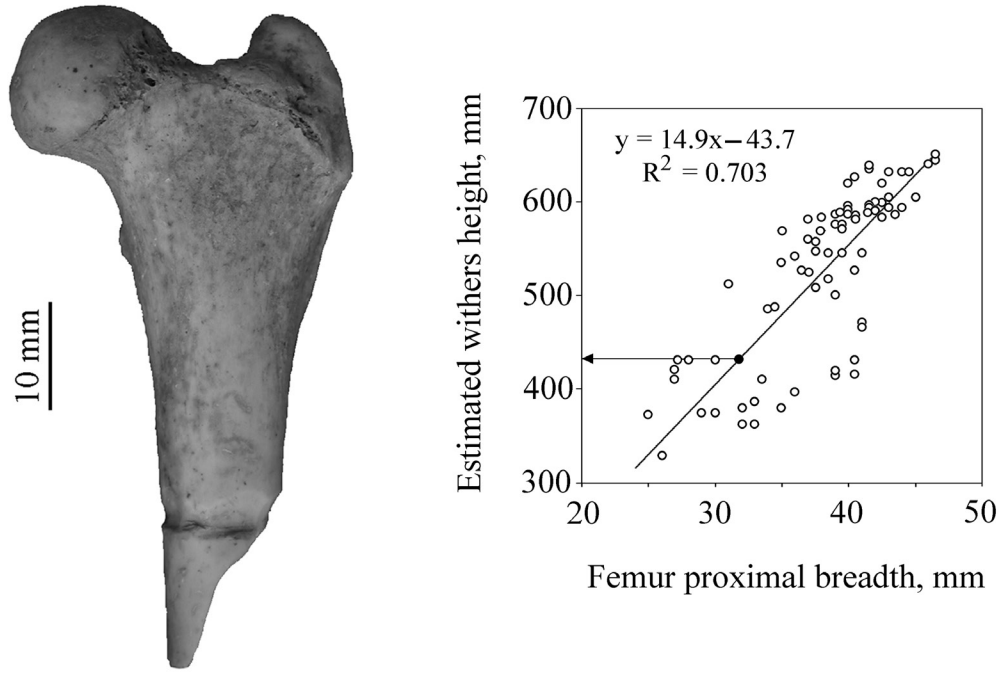

Fig. 10: Worked dog femur from Salgótarján-Ipari Park II and the estimation of withers height from the proximal breadth of this fragment. The regression line is based on complete femora from Roman Period Gorsium. Photo: Erika Gál

settlement of Salgótarján-Ipari Park II *(Fig. 9)*. Their carnassial teeth, on average, look even broader than it would be expected on the basis of their lengths in comparison with the proportion of lower carnassials in modern-day breeds. The dental dimensions of Pulis, Skye- and Fox terriers shown in the lower size range in this graph tend to be relatively small even in comparison with some of the Pre-Scythian loose teeth found in the material.

Withers height estimations are also indicative of slightly larger individuals than present-day terriers. The only long bone preserved in full length available here comes from the Salgótarján-Ipari Park II settlement. It is a 158 mm long *humerus* which probably originates from a male based on its relatively strong natural curvature that can be used in appraising secondary sexual dimorphism in this particular long bone.[18] Using the previously mentioned coefficient developed by Koudelka, the withers height of this individual was 532.46 mm. A parallel calculation based on Harcourt's equation yielded a slightly smaller, 525.6 mm value. These withers height estimates are indicative of a stature that corresponds to the size of a small female Hungarian pointer.[19]

While no evidence of dog meat consumption was found at either of the two sites, this proximal *femur* fragment from Salgótarján-Ipari Park II show cut marks indicative of conscious manufacturing.[20] Fortunately, the proximal epiphysis of the bone was fully preserved. While transversal long bone dimensions tend to grow throughout the animals' life and thus tend to be poor predictors of stature, this piece was compared to the aforementioned set of complete dog *femora* from Roman-period Gorsium.

[18] Ruscillo 2006, 62–37.
[19] Sárkány–Ócsag 1977, 43.
[20] Bartosiewicz–Gál 2010b, 123. This *femur* fragment was indented with a metal blade in a transversal direction and then snapped. It is possible that the round, tubular diaphysis of the bone was further carved and the find itself is manufacturing *débetage*.

The resulting withers height using Koudelka's coefficient was 433.11 mm *(Fig. 10)*. This corresponds to the stature of commonly occurring prehistoric dogs of usually gracile skeletal makeup known from a number of prehistoric sites across Central Europe.[21]

Conclusions

The dog remains, including a well-preserved *calvarium* fragment, brought to light at the Pre-Scythian settlement of Salgótarján-Ipari Park II and relevant contemporaneous evidence from the neighbouring site of Balassagyarmat-Káposztások suggest, that Iron Age dogs in the region formed largely free-breeding populations: no sign of conscious breeding could be detected. These Scythian-period dogs were not only of medium size, but a *calvarium* preserved at Salgótarján-Ipari Park II is reminiscent of unimproved cranial types of Skye terriers or Hungarian Pulis.[22] Such forms occur in prehistoric dog populations lacking conscious human selection for special breeds.[23] The mandibles from both sites belonged to 12–16 kg animals which is also consonant with this type of medium size dog. Altogether, the few features recognizable on these specimens are most reminiscent of no particular breed but a type of prehistoric pariah dogs, evidently resulting from panmixis in the human environment.

No evidence of dog meat consumption is available in the material studied. It looks likely, that dogs were defined in the local culture on the basis of the functions they performed. As a minimum possibility, they subsisted at the settlement as scavengers cleaning up refuse including food remains or even human faeces. Their territorial nature probably made them useful as guards when strangers approached the settlement. Beyond these simple, basically natural tasks, their roles in herding and hunting cannot be excluded. These, however, cannot be proven on the basis of osteological evidence alone.

Large-scale Prehistoric bone manufacturing tends to be based on food remains (sheep, goat and cattle bones) for raw material. However, as is shown by the carefully cut proximal section of a dog *femur* from Salgótarján-Ipari Park II, this species was also at least opportunistically used as a source of raw material in bone carving.

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[21] Bartosiewicz 2002, 77–89.
[22] Bartosiewicz 2006, 33–47.
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