

MORPHOMETRIC DATA FOR SUINES (*SUS SCROFA DOMESTICUS* AND *SUS SCROFA FERUS*) IDENTIFIED IN BRONZE AGE SETTLEMENTS ON ROMANIA'S TERRITORY

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Introduction

The regions of Romania that have yielded Bronze Age fauna for archaeozoological analyses are: Moldavia (12 samples), Transylvania (14 samples), Banat (3 samples), Wallachia (5 samples). Bronze Age in Romania is divided into: Early (3500-2200 BC), Middle (2200-1600/1500 BC) and Late Bronze Age (1600/1500-1100 BC).

The separation between domestic and wild forms is difficult due to their coexistence in samples. Our results reveal biometric data for suines remains and intend to characterize and distinguish interpopulational differences. We used relevant measurements recorded on different anatomical elements which were undergone statistical analysis.

Material and Method

This study is based on suine (*Sus scrofa domesticus*=pig and *Sus scrofa ferus*=wild boar) remains recovered in assemblages dating from bronze age from Romania. The measurements were taken with a calliper rule (in millimeters) for following anatomical elements: mandible, maxilla, humerus, scapula, radius, tibia, calcaneum and astragalus. Linear measurements were defined according to von den Driesch (1976). The bones with non fused epiphysis and porous surface were excluded from the study. Samples sizes were too small to test males and females separately.

The descriptive analysis were carried out separately for each analyzed variables. We described the variability using coefficient of variation (CV%), which is dimensionless and allows a comparisons of variability of large and small bones. To test the homogeneity of the populations, the Kolmogorov-Smirnov test was used on each variable assuming they had a continuous distribution. The measurements of variables are compared using one-way ANOVA test. For statistical analysis, the software PAST, version 2.08b and Excel were used (Haber *et al.* 2002; Hammer *et al.*, 2001).

Results and discussion

The archaeozoological samples include a total of 43991 mammal remains and 9071 of them belong to suines (Table 1).

The complete metapodials providing data on withers height are few, therefore the most often the withers height is established by means astragalus and calcaneus: we present the variability of the withers height of pigs from Neolithic period using astragalus in the Figure 2 and Table 1.

The observed distribution of data were insignificant different from normality for every variable ($p > 0.05$). The results of one way ANOVA indicated that there were no significant differences between the mean of variables from the samples ($p > 0.05$), excepting the size in the lower third molar in three assemblages: One Way ANOVA: $F=6.3$; $p < 0.05$; PostHoc test (Q / p): - Mandrisca-Bogdanesti: 5.13 / 0.0004; - Mandrisca - Cernavoda: 6.02 / 0.007; (Figures 3, 4).

The descriptive analysis is presented for every anatomical element in Table 2 and represents an overview of the size in populations investigated.

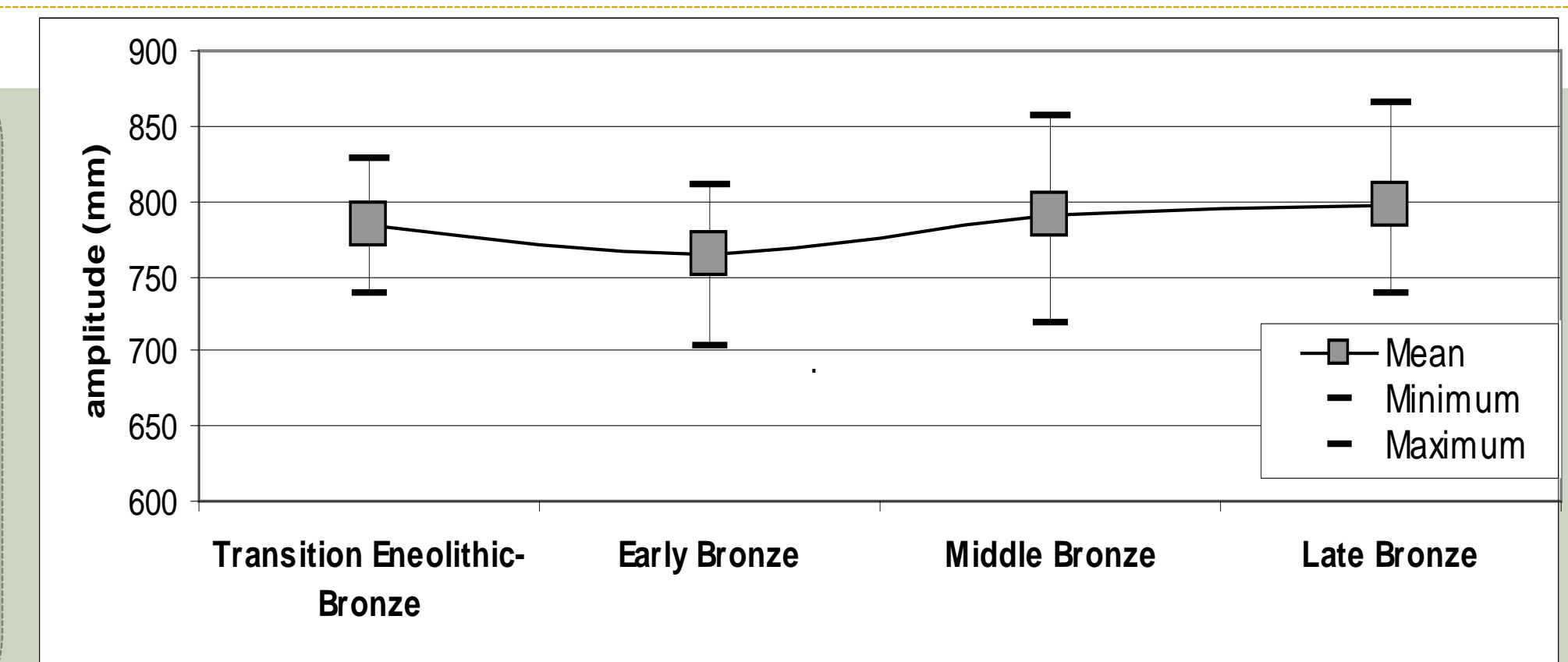


Figure 2. Variation in withers heights of pig in Bronze Age in Romania.

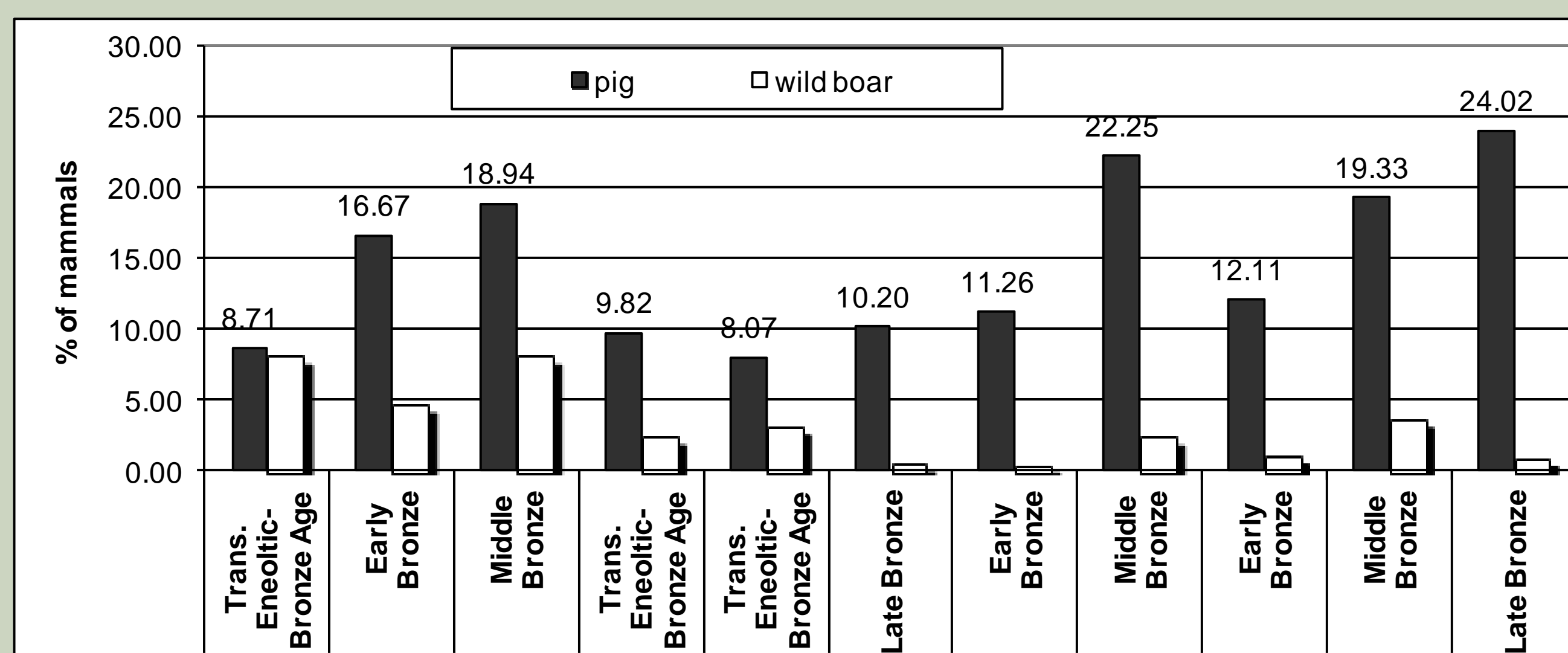


Figure 1. Swine proportions (%NISP calculated from the mammals) in studied samples.

Table 1. Variation in withers heights of pig in Bronze Age in Romania (in mm).

Variable	Transition Eneolithic-Bronze	Early Bronze	Middle Bronze	Late Bronze
Mean	783.75	764.06	791.3	798.07
Minimum	739	703.2	717.16	739
Maximum	828.5	810.6	855.35	864.3

Table 2. Univariate analysis of suine remains.

Abbreviations: n - number of bones examined; SD - standard deviation; CV - coefficient of variation in %, Conf. Level - confidence level (a mean of population); GL / GB - greatest length / breadth; Bp / Bd - breadth of the proximal / distal part; BFP / BFD - breadth of the facies articularis proximal / distal; SD - Smallest breadth of diaphysis; LM3/m3 Length of the 3 rd molar M-upper molar, m- lower molar; P2, 4 - upper premolars 2, 4; LG - Length of the glenoid cavity (scapula) BG - Breadth of the glenoid cavity.

Anatomical element	Variable	n	Mean	Median	SD	Minimum	Maximum	Conf. Level	CV%	
maxilla	pig	GL P2-P4	5	38.10	35	5.05	34	45	6.28	13.27
		GL M1-M3	27	69.13	70	3.70	61.5	75.5	1.46	5.35
		GL M3	38	33.83	34.5	3.13	27	43	1.03	9.26
		GL M3	9	42.53	43	2.32	40	47	1.78	5.45
mandible	pig	GL m1-m3	16	71.09	72	4.32	64	77	2.30	6.08
		GL m3	92	35.33	35.75	3.64	22.5	41	0.75	10.31
mandible	wild boar	GL m3	10	44.26	44.5	2.33	40.6	49	1.67	5.27
		GLP	22	36.55	36.25	5.09	28	49	2.26	13.92
		SLC	31	24.98	23.5	4.53	20	39	1.66	18.12
		GL	19	31.82	32	5.37	24	42	2.59	16.88
scapula	pig	BG	22	23.94	24	3.40	17	30	1.51	14.21
		GLP	3	45.50	-	-	44.5	46.5	-	-
scapula	wild boar	SLC	3	54.67	-	-	46.5	62	-	-
		GL	3	45.50	-	-	41.5	49.5	-	-
humerus	pig	BT	14	32.48	32.6	2.46	28.5	36.2	1.42	7.56
		Bd	40	39.66	41.5	4.24	26	45	1.35	10.68
		Dd	15	35.21	39.5	9.06	18	45	5.01	25.72
		SD	5	18.84	18	5.28	11.8	25	6.55	28.02
humerus	wild boar	BT	3	45.93	45.8	1.50	44.5	47.5	3.74	3.28
		Bd	10	54.08	53.75	2.72	51	58	1.94	5.03
radius	pig	Bp	42	30.44	30	1.86	27	36	0.58	6.12
		Dp	37	21.73	21	2.78	17.5	32	0.93	12.80
radius	wild boar	Bd	40	31.05	31.5	2.11	26	35.5	0.68	6.81
		BFD	1	26.40	26.4	-	26.4	26.4	-	-
tibia	pig	Dd	37	27.20	27	4.61	9	38	1.54	16.96
		Bd	11	42.15	42	1.83	39	45	1.23	4.34
tibia	wild boar	GL	5	63.90	74	31.51	80	83.5	39.13	4
		GB	5	28.60	31	4.22	24	32	5.24	14.75
calcaneus	pig	GL	6	97.50	99.5	9.97	85	108	10.47	10.23
		GB	6	38.33	39.25	3.25	32	41	3.41	8.48
astragalus	wild boar	GL	17	43.09	43	3.02	38	47	1.55	7.00
		GB	7	25.61	26	1.29	24	27.5	1.20	5.05

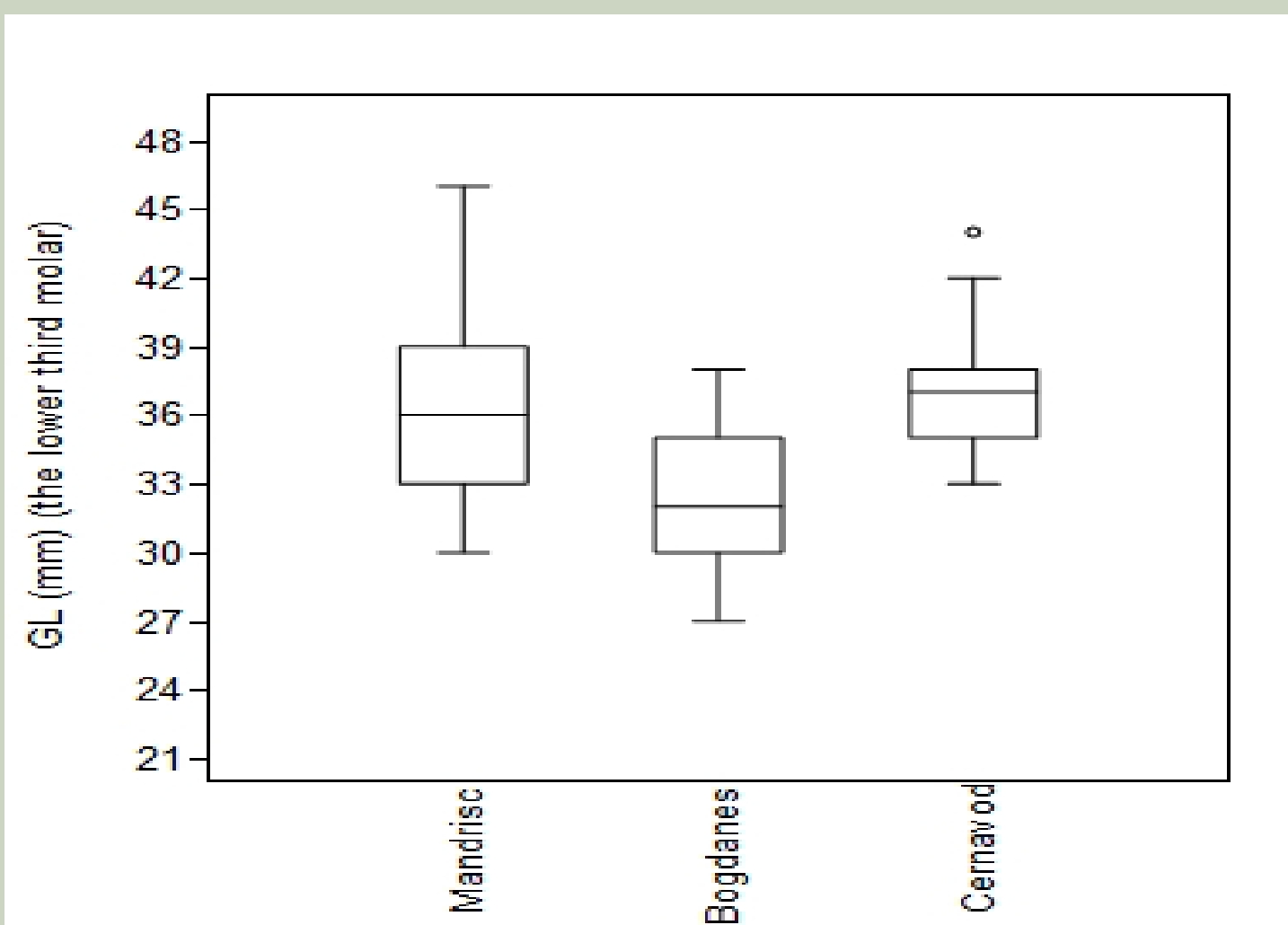


Figure 3. Comparativ analysis of the length (GL) of the lower third molar of pigs in Bronze Age (only assemblages with significant differences).

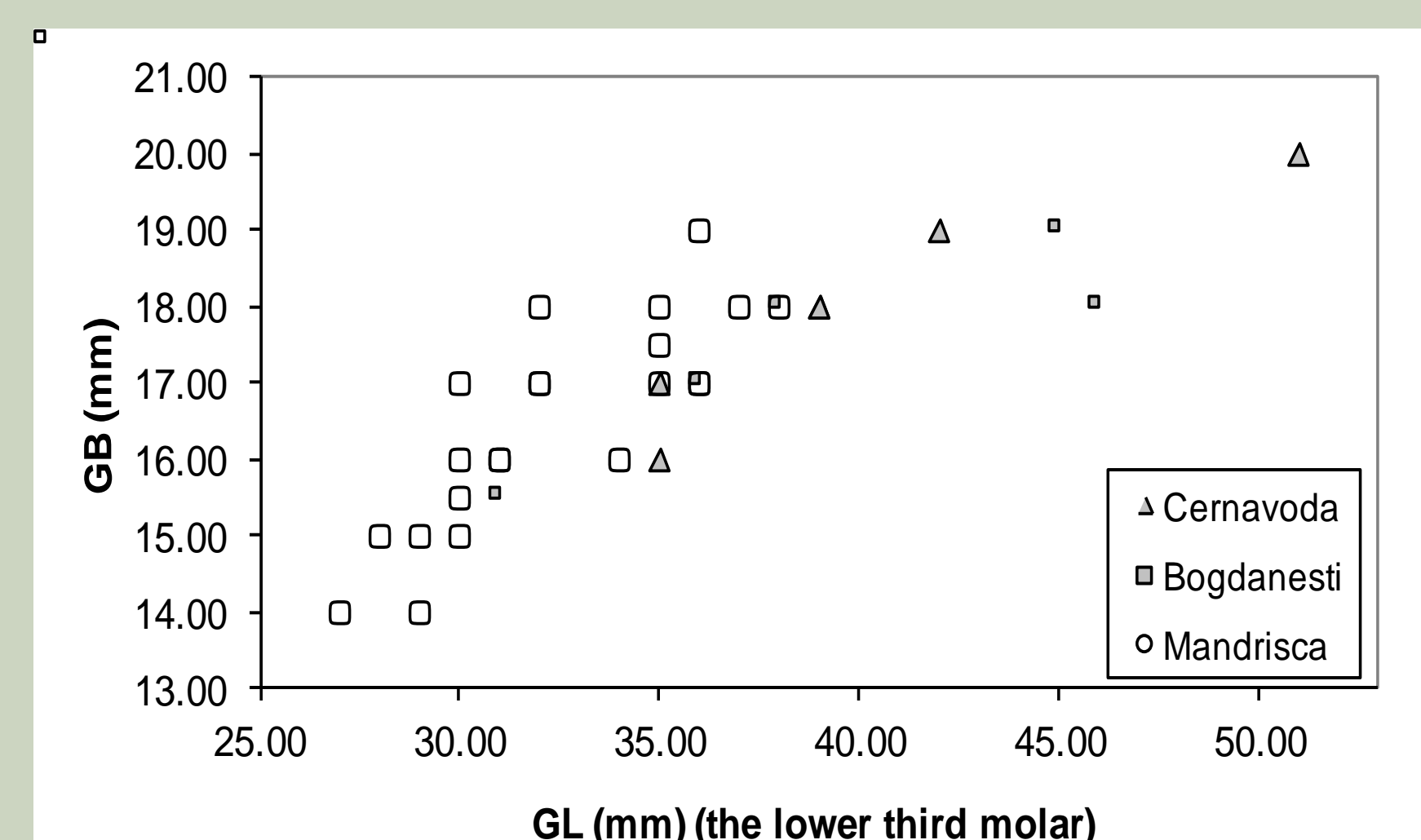


Figure 4. Diagram of correlation between length (GL) and breadth (GB) of the lower third molar in three assemblages in Bronze Age

Conclusions

A crossbreeding between the two forms is suggested by some variables that could not clear reveal the separation limits between the two forms.

Variation limits for the third inferior molar length are 22-40 mm for pig and 41-49 mm for wild boar.

Postcranial skeleton is better represented than cranial remains. The largest metric data series are given by humerus, radius, tibia and calcaneum. Variability limits for calcaneus length are between 80-83.5 mm (pig) and 85-108 mm (wild boar); in humerus a clear separation was obtained in Bd variable: 26-45 mm (pig) and 51-58 (wild boar)

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