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PATTERNS OF VARIATION IN THE DENTITION OF THE SUINES FROM STANCESTI SETTLEMENT (BOTOSANI COUNTY, ROMANIA)

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Suines represented an important economical resource for human communities, but it is difficult to determine whether this food source of these communities come from wild boar or pigs taking in account that the bone remains found in studied samples are quite fragmented. For this reason, in order to identify variations in dentition of the swine and new criteria to separate the two forms, the second and third molar from the mandible and maxillary of suines were subjected.

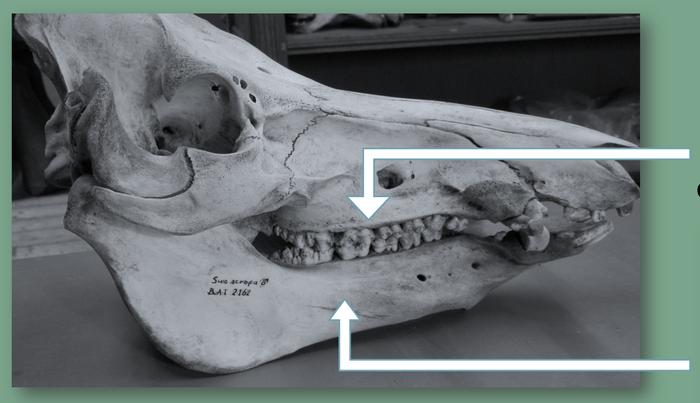
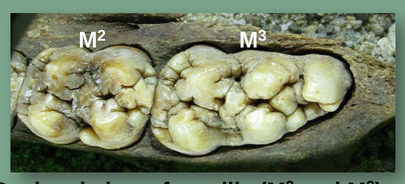


Figure 2. Pig skull showing the studied molars



Occlusal view of maxilla (M^2 and M^3)

Occlusal view of mandible (M_2)

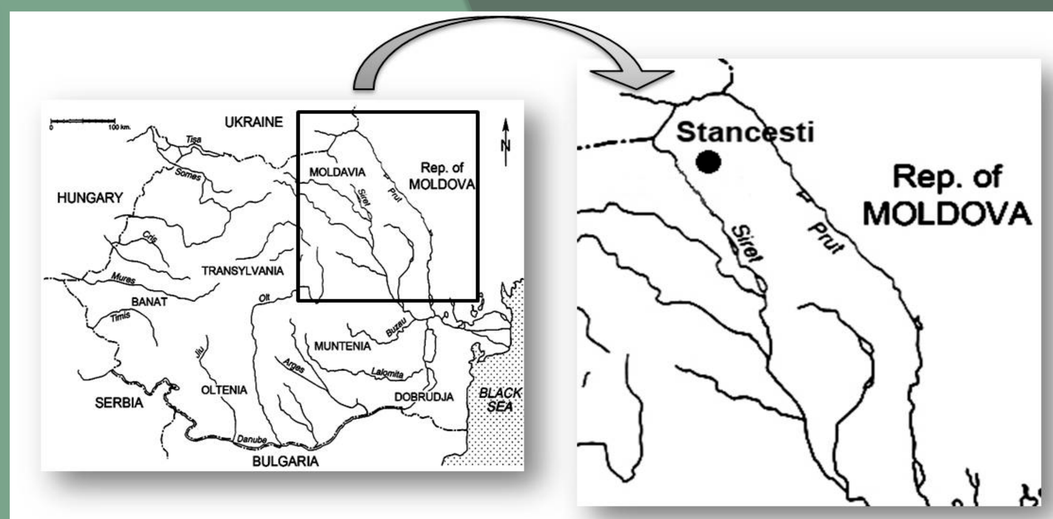


Figure 1. Location of the archaeological site

Material and method

The second and third molar of maxilla and mandible in suines (domestic and wild forms) were used in analysis (Figure 2). The material came from the settlement of Stancesti (Botosani County, Romania), dating from the 6th–3rd centuries BC (Haimovici, 1974).
The classic and geometric morphometric analyses were applied.
For classic analysis the length and breadth of molars were used and linear measurements were defined according to von den Driesch (1976). Univariate and bivariate analysis were apllied.
The shape variation were studied using geometric morphometric approaches. This analysis was applied in the lower second molar of pig and wild boar.
The advantages of geometric morphometric consist in possibility of using the mathematical data in multivariate statistics. The geometry of the shape is preserved, and the results can be visualized not only as statistical scatter plots but also as configuration of landmarks points (Zeldith et al., 2004). 7 landmarks situated on the intersection of longitudinal and transverse grooves and fissures which separate the six cusps of the lower second molar were pointed (Cucchi at al., 2001).

Results and Discussion

In classic analysis the distinction between domestic and wild forms of *Sus scrofa made worse due to* the coexistence of these two forms and it is possible that in archaeological samples occur hybrid forms. Our results reveal a summary statistic for osteological material taken in study. Only relevant results are putted in this presentation.
Remarks:
- **Univariate analysis in pig molars is shown in Table 1.**
- **A attempt to division between pigs and wild boar were revealed on data length and width of the lower third molar (Figure 5, 7, 8).**
- **The length of the upper third molar could be a relevant marker in distinguish between domestic and wild boar (Figures 4, 6)**

Table 1. Univariate analysis of pig molar (mm)

Molar	Variable m2	Mean	Median	Standard Deviation	Minimum	Maximum	Conf. Level(95.0 %)
The lower second molar	*GL*	2.53	2.57	0.23	2.07	2.93	0.14
	GB	1.72	1.69	0.22	1.45	2.33	0.14
The second upper molar	*GL*	3.73	3.71	0.33	3.16	4.31	0.14
	GB	2.18	2.13	0.21	1.9	2.56	0.09
The third upper molar	*GL*	4.82	4.73	0.33	4.34	5.69	0.16
	GB	2.09	2.1	0.11	1.9	2.3	0.05

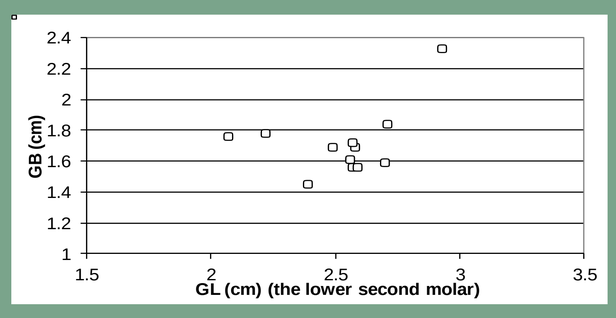


Figure 3. Diagram of correlation between length and breadth of the lower second molar

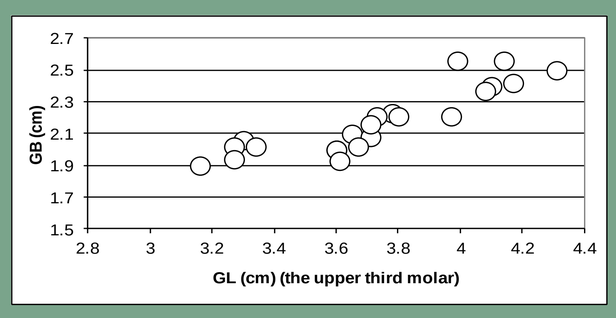


Figure 4. Diagram of correlation between length and breadth of the upper third molar

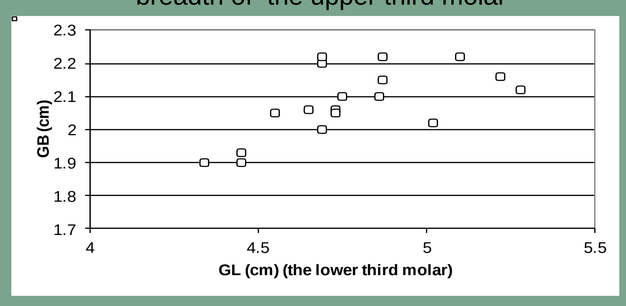


Figure 5. Diagram of correlation between length and breadth of the lower third molar

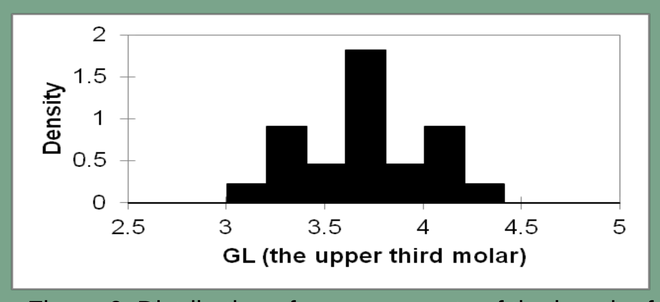


Figure 6. Distribution of measurements of the length of the upper third molar)

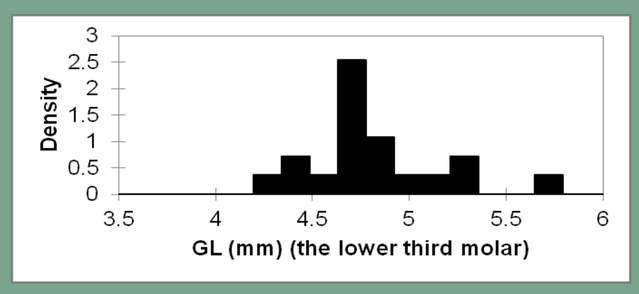


Figure 7. Distribution of measurements of the length of the lower third molar

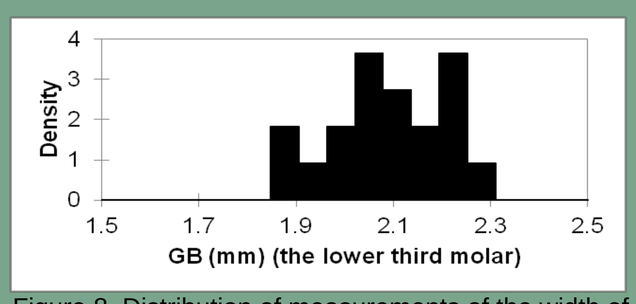


Figure 8. Distribution of measurements of the width of lower third molar

In geometric morphometric analysis a description of variation models is realized by a set of landmarks.
Remarks: Results revealed some aspect in size of shape in the lower second molar:
- **Molar size analysis: a significant differences between domestic pig and the wild boar: one-way ANOVA, F= 19.88; p=0.0002; Tukey's pairwise comparisons, Q=6.305; p=0.0003)**
- **Molar shape analysis: most similarities were observed between pigs and wild boar; the models of variation observed differed insignificantly (Discriminant Function: Mahalanobis distance: 2,9749; T-square: 42,2392, P-value (parametric): 0,9941.**

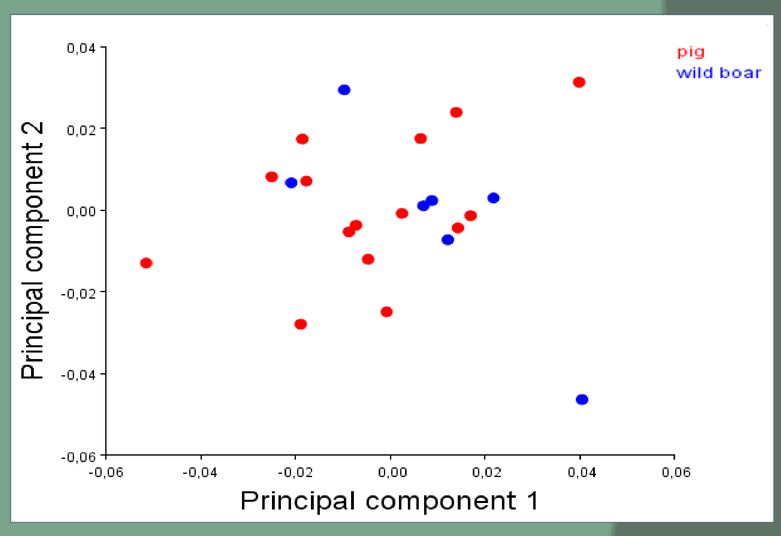


Figure 9: Principal components analysis: projection of the archaeological specimens on the first two principal components (PC1: 28.84 % and PC2: 18.43%)

- **Discriminant analysis: The M_2 variability targets the distal cusps: hypoconid, pentaconid and entoconid).**

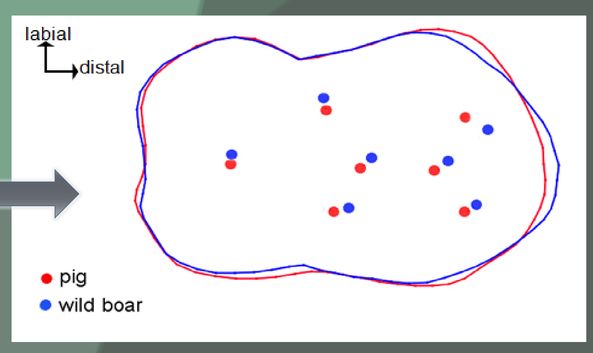


Figure 10. Discriminant analysis: Shape changes from pig to wild boar

References
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Zelditch ML, Swiderski DL, Sheets AD and Fink WL. 2004. *Geometric Morphometrics forBiologists. A Primer.* Elsevier: Berlin.
Haimovici S., 1974. Studiul resturilor faunistice descoperite în cetăţile traco-getice de la Stănceşti– Botoşani (sec. VI-III î.e.n.) şi importanţa lor pentru cunoaşterea vieţii locuitorilor din această aşezare. *Din trecutul judeţului Botoşani:* 55-62.

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