

Elephants from the delta of paleo-Don river

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SUMMARY: Two skeletons of the steppe mammoth *Mammuthus trogontherii* are discussed in this paper. The skeletons were excavated in 1964 and 1999 in the Azov region (Russia) and are of Middle Pleistocene age. Comparisons are made with *Archidiskodon tamanensis* from Siniaya Balka and *Mammuthus trogontherii* from Mosbach and Süssenborn.

The delta of Don inherits the valley of an ancestor river and its banks are rich with well-known locations of elephants remains and other Plio-Pleistocene vertebrates. The excavations of two skeletons of steppe elephant on the left delta bank near Azov city (1964 and 1999) became quite an event for palaeontologists. The first skeleton (Tr-1) was assembled and exhibited in the Azov Local Museum. The digging-out of the second skeleton (Tr-2) was performed by collaborators of Azov Museum with the participation of geologists P. Haesaerts and A.E. Dodonov. Micromammals were collected by V.V. Titov and identified by A.S. Tesakov. The author is very grateful to the scientists mentioned above.

The arrangement of bones indicates that the animals were buried in the sites of their death (Fig. 1). Entire M³ were found in the skulls. This enabled us to study all the parameters of the crowns and compare them with serial teeth collections from Siniaya Balka, Mosbach III and Süssenborn according to A. Lister (1996, fig. 19,4) and W. Guenther (1969, abb. 4). The mean thickness of enamel of M³ of Azov elephant is 3,2 and 2,93 mm and lamellar frequency is 5,5 and 6 which is most similar to the mean parameters M³ of *Archidiskodon tamanensis*. The hypsodonty indexes (1,8 and 1,83 for Tr-1; 1,8, 1,7, 1,73 for Tr-2) were similar to indexes of 10 teeth of *Mammuthus trogontherii* from Mosbach III. This suggests a relationship with *Mammuthus trogontherii* from Azov and

Archidiskodon tamanensis and similarity with the steppe elephant from Germany. The other figure shows the correlation between the length and plate number for M³ of the elephant from Süssenborn. The teeth of Tr-1 and Tr-2 correspond to extremely high values and even exceed the levels of the elephant from Germany. Figure 2 shows the concurrence of the parameters mentioned above for the elephant from Azov with those for *M. trogontherii* from Tiraspol (Dubrovo, 1971), which was described by M. Pavlow (1910) as "*Elephas wusti*". This may be considered as the evidence of subspecies status of the elephant from Azov.

Deposits with *M. trogontherii* are underlined by strata with an early Tiraspol rodent association (*Lagurus transiens*, *Microtus gregaloides*). Similar rests were noted near Semibalki I village (Rekovets 1994) and also identified as *Microtus-Lagurus* association indicating temperature decrease and the presence of a mesophyl steppe. Mollusc fauna from Kagalnik sandpit with Tr-2 (identification by A.L. Chepalyga) helps to correlate these layers with early Tiraspol, which is confirmed by the normal polarity of rocks and their attitude to the Brunhes zone (identification by V.M. Trubikhin).

The skull of Tr-2 was partly destroyed after death before burying. There were taken 21 measurements from it. The condylobasale length of the skull Tr-2 was smaller (115.0 cm) than the same of Tr - 1 (144.0 cm).

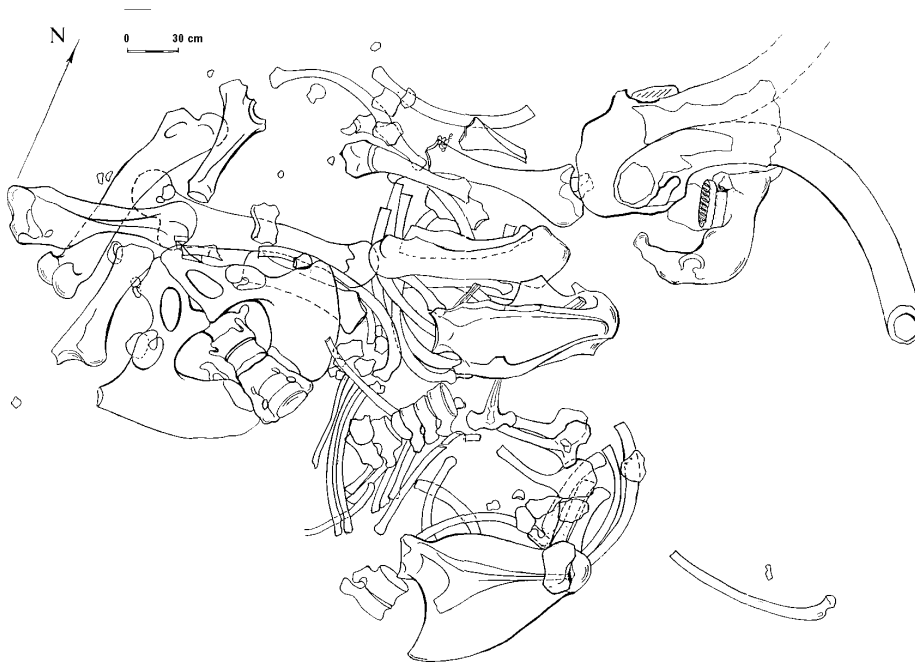


Fig.1 - The position of *Mammuthus trogontherii* (Tr-2) skeleton during the 1999 excavations.

The long bones of Tr-2 are more thin - ratio of diaphysis width to humerus length is 11.72; for ulna is 11.27; for femur is 12.4; for tibia is 14.1. The measurements of pelvis were performed using the method of A. Lister (1996). Ratio between pelvic aperture height and ilium shaft width (measurements 2:5) is 3.28, and ratio between pelvic aperture width and ilium shaft width (measurements 3:5) is 2.65 and 2.78. This indicates that the Tr-2 skeleton is likely to be a female one. The height of Tr-1 is 4.5 m, Tr-2 is nearly 4 m that is rather significant and similar to that of the skeleton from Nogaïsk (4.1 m) and Georgievsk (4 m). The rests of Tr-2 are located in the funds of the Azov Museum and must be restored.

Both Azov elephants have serial structure of the carpals. Proportions between the weight of os lunatum and the weight of os magnum is 78.3 grams for Tr-1 and 89.78 for Tr-2; the proportions of the difference of that bones to the weight of os lunatum are 21.7 and 10.21 accordingly. This is typical for serial type of *Archidiskodon* carpal bones and differs from the aserial type of *Mammuthus* (Dubrovo & Jakubowski 1989). Very likely *M. trogontherii*

from Azov retained the serial type of carpals as in another ancient elephants from Nogaïsk and Stavropol.

A decreased form of *M. trogontherii* was found in the delta of the Don river near Taganrog. This is a fragment of a skull with M²M³ sin and dex (EI-234). The teeth resemble those from Süssenborn. The crown length is 240.0 mm, the width is 84.0 mm, and the height of the entire lamina is 180.0 mm, lamellar frequency is 6.25 and 6.0, mean thickness of enamel is 2.08 and 2.02. The plate number (t14) corresponds to that of M³ of the skeleton from Edersleben (Germany). We supposed it to be a decreased form of *M. trogontherii* also.

An interesting collection of *A. tamanensis* from Port-Katon village and Semibalki 3 (layers 4-5) is represented in Azov museum. Geologists and palaeontologists studied both locations in detail. Micro- and macromammals of Taman faunal Unit were found here (Bajgusheva 2000).

The collection of the elephant *A. gromovi* remains from the right bank of the Don delta (Liventsovka, Khapry and others) is well known.

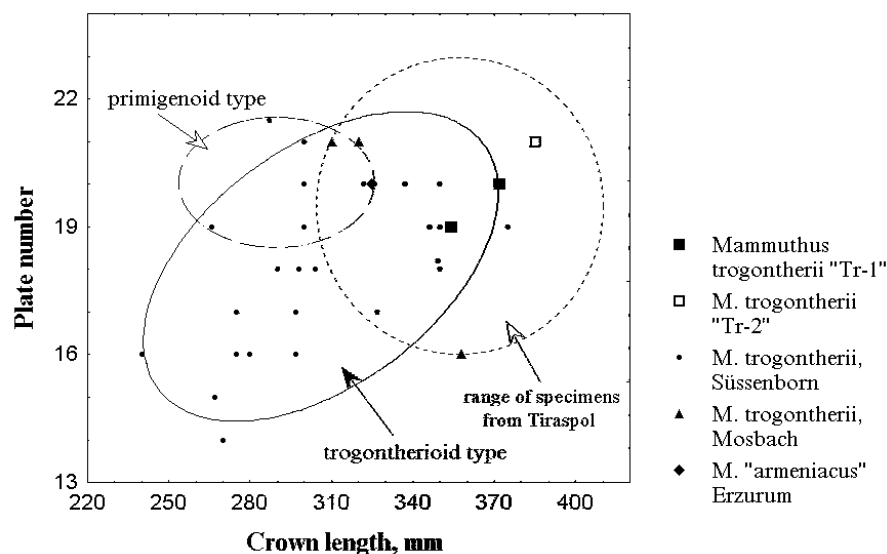


Fig.2 - Ratio between crown length and plate number in upper M3 of some *M. trogontherii*: Tr-1 - *M. trogontherii* from Azov, 1964; Tr-2 - *M. trogontherii* from Azov, 1999; *M. trogontherii* from Süssenborn by W. Guenther 1969; the data of *M. trogontherii* from Tiraspol by Dubrovo, 1971 (upper and lower M3 together); the data of *M. "armeniacus"* by Adam 1988. "Primigenoid and trogontherioid types" by W. Guenther 1969.

Some elephant teeth were found in the bay near Taganrog city. Two of them M^3 (EI-59) and M_3 (EI-112) are significantly abraded. The lamellar frequency is 8.5 and 7.5; the thickness of enamel is 1.8 and 2.03. We consider them to be a Post-Khazar *M. primigenius* similar to the elephant from Kamensk (Bajgusheva 1980, 1999). Last ones lived during the formation of Roslavl-Moscow horizon of Pleistocene, according to I.V. Foronova and A.N. Zudin (1995). Three other teeth M^3 (EI-5, EI-10) and M_3 (EI-7) have antiquoid figure of abrasion. The functional density of plates on M^3 is 4.7 and 5.5; relative hypsodonty is 3.2 and 3.0. This allows to determinate those findings as *Palaeoloxodon cf. antiquus*. It differs from *P. antiquus* (Aguire 1969) by a longer crown of M^3 (350 and 300 mm); M_3 (345 mm); the plate number - 17 and 18 (excluding talons); the ratio between crown height and M^3 length - 91.42 and 96.7. This may be connected with more severe environment of the south of Eastern Europe. Probably

these three teeth belong to a new subspecies of the forest elephant.

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