

## Most ancient elephants from the south of Russia

V.V. Titov

R.-Luxembourg, 38, 20, Rostov reg., Taganrog, Russia

vvtitov@euro.ru

**SUMMARY:** The most ancient representative of the mammoth lineage in East Europe belongs to the species *Archidiskodon meridionalis* which is common on the Khapry fluviatile site near the Azov Sea. Biostratigraphy characteristics of the large vertebrates association and palaeomagnetic data of the Khapry layers testify that the chronological range of Khapry Faunal Unit is 2,6 - 2,2 Ma. Comparison between nominative subspecies of *Archidiskodon meridionalis* and *Archidiskodon meridionalis gromovi* (Garutt et Alexejeva) was done. Most of localities with the remains of these subspecies on the south of Eastern Europe are listed.

Very numerous remains of ancient representatives of the mammoth lineage on the East Europe territory belong to *Archidiskodon meridionalis gromovi* (Garutt et Alexejeva). The most part of their fossils is known from the Upper Pliocene Khapry fluviatile site of the Sea of Azov region. Biostratigraphic characteristics of the large vertebrates association and palaeomagnetic data of the Khapry layers testify that the chronological range of Khapry Faunal Unit is 2.6 - 2.2 Ma. That is, it corresponded to the time interval of the Middle Villafranchian and the most part of the zone MN 17. The faunal analysis permits a correspondance with the level of the typical middle Villafranchian Saint-Vallier Faunal Unit in West Europe. That fact is confirmed by small mammals complex, which is associated with the most part of megafauna remains. Taking into account the relative simultaneity of the Khapry megafauna remains, we suggest the presence of one species of *Archidiskodon* elephant in the collection from the typical localities Khapry and Liventsovka (Gromov 1948; Garutt & Alexejeva 1964; Dubrovo, Bajgusheva 1964; Bajgusheva 1971). But the period of the accumulation of the Khapry fluviatile suite was very long (approximately some hundred thousands years), this why we can propose the presence of slightly different popula-

tions (in the range of late Pliocene) in the elephant sample.

*A. m. gromovi* differs from *A. m. meridionalis* and other representatives of the genus by a more elongated skull in sagittal direction (ratio of the skull length to height - 86%), narrow forehead and the position of the nape regarding to the occlusion surface of upper teeth by an angle of nearly 90°, and by a more convex parietal part.

Figures of the abrasion on the occlusion surface are of unsteady, "meridionaloid" type, as a rule consisting of three ovals. Molars are low and wide (the crown wide is 80-85% of the height, hypsodonty index: 1,03-(1,29)-1,44). From teeth of typical *A. m. meridionalis* Nesti from Upper Valdarno (Italy), Senezé, Chagny (France) and several middle and late Villafranchian localities of Central, West and South Europe (Azzaroli 1977; Maglio 1973; Lister 1996) fossils from Khapry and Liventsovka differed, on an average, by a smaller plate number ( $M^2$ : 11-(13)-15,  $M_3$ : 12-(13,7)-15 together with talon) and more little lamellar frequency (Figs. 1, 2). Whereas some different time of Upper Valdarno localities, it is difficult to speak about the absolute reliability of the sample of this meridionaloid elephants. Numerous elephant teeth collections from one locality in West Europe are not frequent, and

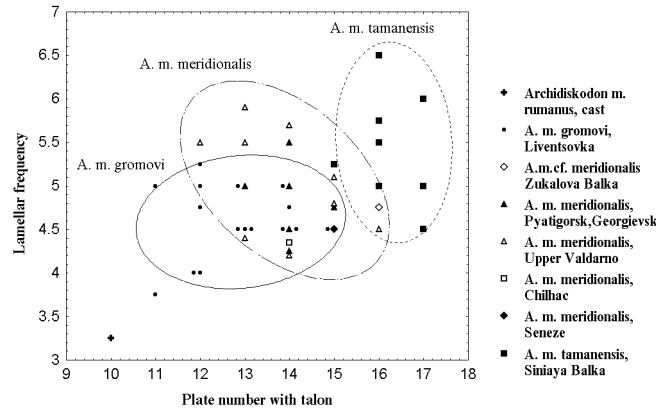


Fig.1 - Ratio of plate number and lamellar frequency of upper M<sup>3</sup> of some *Archidiskodon* representatives.

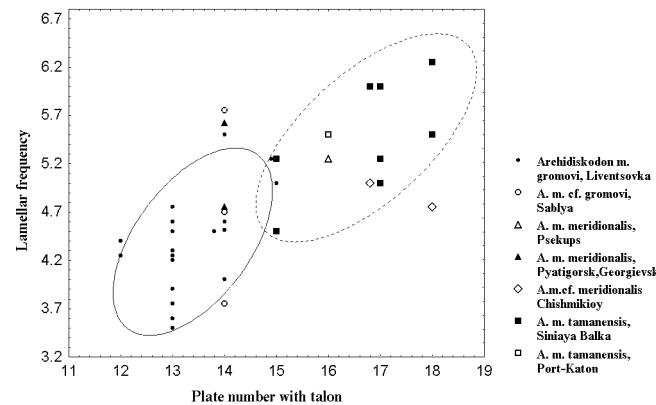


Fig.2 - Ratio of plate number and lamellar frequency of lower M<sub>3</sub> of some *Archidiskodon* representatives.

available data about teeth parameters of *A. m. meridionalis* (Maglio 1973) include data from different sites, as a rule. Molars of *A. m. gromovi* differ from those of other genus representatives by lower (height of unobliterated M<sup>3</sup>: 105-(126.7)-147 mm, M<sub>3</sub>: 108-(123.7)-134 mm) and relatively wide crowns (M<sup>3</sup>: 88.2-(102.7)-121, M<sub>3</sub>: 77-(96.4)-107). The elephant from Khapry layers has a higher plate number in comparison with more archaic *A. m. rumanus* Stefanescu from Romania (Fig. 1).

Molars of the Khapry elephants have similar lamellar frequency and enamel thickness as teeth of “primitive” type of meridionaloid elephants from Norwich Crag - England (Falconer, Cautley 1868), Montopoli, Laiatico,

San Regolo, San Miniato, Incisa Belbo - Italy (Azzaroli 1977), Aszod - Hungary, Tulucheshty - Romania, Farladany - Moldavia (Pavlov 1910), Podpusk - Western Siberia, Kuruksay - Tadjikistan.

W. Maglio (1973) attributed remains of *Archidiskodon* elephants from early and middle Villafranchian sites of West, Central and South Europe to *A. meridionalis* “Laiatico stage”. But this fragmental material does not allow to compare it with the teeth collection of the Khapry association elephant.

Remains of *A. m. cf. gromovi* in situ are known from the Upper Pliocene marine deposits of Upper Akchagyl in the Kushkuna locality (Northern Caucasus) (Lebedeva 1972).

The M3 of the elephant from the village Sablya have the same parameter (Stavropol region) (Fig. 1).

There are known remains of elephants similar to typical *A. m. meridionalis* from the Psekups locality (Bakinskaya and Saratovskaya villages, Krasnodar region), included in Psekups Faunal Unit (terminal Pliocene - early Pleistocene) (Gromov, 1948). M<sup>3</sup> of *A. m. cf. meridionalis* were discovered on the northern bank of the Sea of Azov (Berdiansk town, Zukalova Balka), too (Bajgusheva 1984). Few M3 of *A. m. meridionalis* were taken from the Georgievsk and Piatyorsk localities. Several teeth of *A. cf. meridionalis* from the neighbourhood of Grozny city (Northern Caucasus) were found in the Lower Pleistocene Apsheron deposits. The incomplete skeleton, which was described as *A. m. taribanensis* Gabunia et Vekua, 1963 (= *A. m. meridionalis* by V.E. Garutt) was excavated in transitional Upper Pliocene - Lower Pleistocene layers of Georgia (Taribana site). In the same deposits of Azerbaidjan (Duzdag locality), remains of *A. m. cf. meridionalis* were found.

The next evolutionary stage of *A. meridionalis* of East Europe is the Pleistocene southern *A. m. tamanensis*. The comparison of large

series of M3 of *A. m. gromovi* with the same of *A. m. tamanensis* from Siniaya Balka (Taman peninsula) shows the overlapping of some absolute and relative data (length of the crown, lamellar frequency) of M<sup>3</sup> and M<sub>3</sub> of that form (especially in the upper teeth). They differ by plate number, lamellar frequency and height of crown (Tamanian elephant have higher index values). Some remains from Lower Pleistocene deposits near Samarskoe village, Port-Katon village (Rostov region), Obitochnoe village (Zaporozhiye region, Ukraine) are attributed to that form of *Archidiskodon* elephant (Bajgusheva 1984).

Bones of the postcranial skeleton of *A. m. gromovi* have similar measurements and proportions as those of nother elephants of that genus. But it was smaller (Fig. 3), its height at the withers was nearly 3.1 - 3.3 m.

The species belonging to the elephant of Khapry Faunal Unit is the subject of discussion, yet. But, taking into account some of its differences from typical *A. m. meridionalis*, we suppose this form of elephant to be a separate taxonomic unit at a subspecies range. The presence of a more primitive "southern elephant" in Europe is marked by several investigators (Azzaroli 1977; Maglio 1973; Lister 1996).

The variability in skull structure of

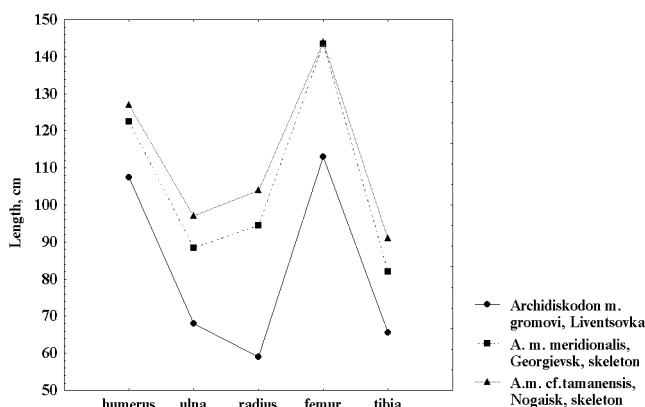


Fig.3 - Proportions of limb bones of some *Archidiskodon* from the south of Russia *Archidiskodon m. gromovi* from the collection of Rostov and Azov local museums; *A. m. meridionalis*, Georgievsk; *A. m. cf. tamanensis*, Nogaïsk (by Garutt, 1954).

*Archidiskodon* testifies about its significant variety and about slightly different specialisations. The taxonomic variety of *Mammuthus* (allied Proboscidian group) is the confirmation of that fact; there are several taxons of species and subspecies range in Pleistocene. All of them were characterised by features of teeth morphology and skull. Insufficient number of discovered skulls of *Archidiskodon* from one locality does not allow about the variability within of one taxon.

Teeth parameters of almost all *Archidiskodon* are overlapping significantly (Figs. 1, 2). Even the length of unobliterated tooth and plate number (most diagnostic features of elephant's dental system) overlap between close taxons because of their relatively slow evolutionary changes and the similarity of the food base. Differences of such features as enamel thickness, lamellar frequency, height of crown are considerable between evolutionary far away forms. This is why for the characteristic of teeth all parameters are necessarily complex. Observing distinctions between different *Archidiskodon* groups we interpret them as subspecies of *A. meridionalis*. Change in teeth characteristics were originated during a period of increasing aridity.

Taking into account landscape and climatic differences between various districts of *Archidiskodon* area in Eurasia, we can suppose the extension of some subspecies (or species) on that territory during different periods of the Plio-Pleistocene. It is possible that elephants from West and East Europe were representatives of various subspecies, which were geographically remote from each other. Very likely the level of *A. m. gromovi* corresponds with the group of *A. meridionalis* "Laiatico stage" from Montopoli, Laiatico, Le Serre, Incisa, San Regolo (Italy), (Maglio 1973; Azzaroli 1977). But these fossils are very fragmental and are not determined exactly (Dubrovo 1990). *A. m. meridionalis* from West, Central and South Europe display similarities with numerous but odd remains of *Archidiskodon* from early Pleistocene localities of the South Black Sea territory and Northern Caucasus. The latest form of *Archidiskodon* from the Azov Sea

region - *A. m. tamanensis* is biometrically close to *A. m. vestinus*.

The presence of constant last upper premolars is determined by species authors (Alexeeva, Garutt 1965) as the distinction of *A. gromovi*. It is regarded as the primitive index of that species. This premolar is on the incomplete skull from Khapry sandpit (GIN 300/122). This tooth is a reduced permanent premolar, which consists of some row of tubercles. On this skull "P<sup>4</sup>" and M<sup>1</sup> were functioned simultaneously, that is why V.I. Gromov (Gromov 1977) and V.E. Garutt (Garutt *et al.* 1977) supposed the vertical rotation of the first teeth generation for the elephant of the Khapry Faunal Unit. Another investigator considered this fact as atavism (Dubrovo 1989) or the breaching of dp<sup>2</sup> development (Maschenko 2000).

The constant premolar is known reliably only for *Protelephas planifrons* Falkoner et Cautley. But the presence of the same feature was spotted on remains of *Elephas celebensis* Hoojer, *A. meridionalis*, *Mammuthus imperator* Seidi, *M. trogontherii* Pohlig "*Protelephas proplanifrons*" Osborn (Gromov 1977).

It is known that atavism and abnormal development are very rare in natural populations and that the probability of finding them in the geologic record is very small. The presence of constant teeth rotation of premolar on skull of *A. m. gromovi* suggests normality of this possibly rudimentary feature for the taxon.

The environment of *A. m. gromovi* was probably the same as modern African elephant. The structure of the Khapry fauna, which looks like that of the modern African savannah, speaks about this fact. Paleopalynological data testify the domination of steppe and forest-steppe landscapes on the territory of the Azov Sea region at the end of the Pliocene. The relatively small lamellar frequency and thick enamel on teeth of this elephant (in comparison with later forms) attests their more soft and less abrasive food - foliage, twigs and high grass. The more elongated humerus of *Archidiskodon* compared to the humerus of mammoth also indicates this. The proportions of "Gromovy elephant" skeleton look like those of skeletons of southern elephants. They had long limbs and

a short body. This suggest that he was living in half-opened landscapes (Garutt, 1954, 1998). It is possible that the forests were occupied by *Phanagoroloxodon mammothoides* Garutt (Garutt 1957) on the territory of the Sea of Azov at the end of Pliocene and at the beginning of the Pleistocene.

#### REFERENCES

- Alexeeva, L., Garutt, V. 1965. New data on the evolution of elephants genus *Archidiskodon*. *Bull. Com. Res. Quatern. Period* 30: 161-166.
- Azzaroli, A. 1977. Evolutionary Patterns of Villafranchion Elephants of Central Italy. *Mem. Acad. Naz. Lin. Serie 8.*, 14: 150-168.
- Baigusheva, V. 1971. Fossil theriofauna of Liventsovka (North-Eastern Azov Region). *Proc. Zool. Inst. Acad. Sci. USSR* 49: 5-29.
- Baigusheva, V. 1984. Late Neogene and Early Pleistocene faunas of proboscids and ungulates of Azov region and some of their correlation ties with Villafranchian faunas of Western Europe. *Anthropogene of Europe*: 168-175.
- Dubrovo, I. & Baigusheva, V. 1964. Elephants of Khapry faunistical complex. *Bull. Moscow Soc. Invest. Nat.* 39: 133-136.
- Garutt, V. 1954. South elephant *Archidiskodon meridionalis* (Nesti) from the Pliocene of the northern coast of Azov Sea. *Proc. Com. Res. Quatern. Period.* 10/2: 1-77.
- Garutt, V. 1957. New data about most ancient elephants. Genus *Protelephas* gen. nov. *Reports Acad. Sci. USSR* 114, 1: 189-191.
- Garutt, W.E. 1998. Is there a genus *Archidiskodon* Pohlig, 1885, on the family Elephantidae Gray, 1821? *Cranium* 15, 1: 15-20.
- Garutt, W.E. & Alexeeva, L.I. 1964. New data on the evolution of elephants of the genus *Archidiskodon*. *Novosibirsk*: 7-8.
- Garutt, W.E., Alexeeva L.I., Baigusheva, V.S. 1977. On the *Archidiskodon* Elephant from the antropogene of USSR. *Journal of the Paleontological Society of India* 20: 4-9.
- Gromov, V. 1948. Paleontological and archeological statement of stratigraphy of continental deposits of Quaternary Period on the territory of the USSR. *Proc. Geol. Inst.* 64: 1-521.
- Gromov, V. 1977. The skull of elephant from Khapry. *Pal. Strat. Anthropol.*: 83-94.
- Lebedeva, N. 1972. Geological position of the remains of terrestrial mammals of Khapry, Taman' and Tiraspol faunistical complexes in the cut of marine layers of Akchagyl and Apsheron of Eastern Transcaucasia. *Bull. Com. Res. Quat. Per.* 38: 99-117.
- Lister, A. 1996. Evolution and taxonomy of Eurasian mammoths. *The proboscidea: Evolution and paleontology of elephants and their relatives*: 202-213.
- Maglio, V.J. 1973. Origin and evolution Elephantoida. *Transaction of the American Philosophical Society* 63, 3: 3-149.
- Pavlow, M. 1910. Les Éléphants fossiles de la Russie. *Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou.* 17: 1-57.