



INQUA-SEQS  
Subcommission on European Quaternary Stratigraphy  
First Circular

**The Quaternary of southern Spain:  
a bridge between Africa and the Alpine  
domain**

**September 28<sup>th</sup>-October 3<sup>rd</sup>, 2009  
Orce and Lucena, Spain**

**2009 annual meeting SEQS**

**ABSTRACT VOLUME  
and  
FIELDTRIPS GUIDE**

**Edited by:  
Bienvenido Martínez-Navarro  
Isidro Toro Moyano  
Paul Palmqvist  
Jordi Agustí**

LARGE DEER FROM THE VILLAFRANCHIAN OF EASTERN EUROPE (SEA OF AZOV REGION): EVOLUTION AND PALEOECOLOGY

V. BAIGUSHEVA, Azov museum-reserve, Azov, Russia, Email: paleorostov@yandex.ru

V. TITOV, Southern Scientific Centre RAS, Rostov-on-Don, Email: vvtitov@yandex.ru

Deer as well as others herbivorous mammals, are index forms for Villafranchian terrestrial deposits of Eastern Europe. Deer react to landscapes' changes more precisely than elephants and horses, because they are attached to more narrow ecological niche, as they are browsing animals, mainly.. Finds of remains of large deer of two lineages - *Eucladoceros-Praemegaceros* and *Arvernoceros* are more usual in Villafranchian layers of the Eastern Europe. They are typical for communities of Khapry (Middle Villafranchian), Psekups (Late Villafranchian) and Taman (Epivillafranchian) Faunistic complexes.

**Khapry Faunistic complex (KFC)** is characterized by the presence of *Pliocrocota perrieri*, *Homotherium crenatidens*, *Archidiskodon meridionalis gromovi*, *Anancus arvernensis alexeevae*, *Equus (Allohippus) livenzovens*, *Elasmotherium chaprovicum*, and *Paracamelus alutensis* (Baigusheva, 1971; Titov, 2008). The most part of animal's bones occurs from the bottom of alluvial cross sections of Khapry and Liventsovka sand pits. Remains of small mammals from these layers allow to date KFC as Late Villanyian and zone MN 17 (Tesakov, 2004). There are rather numerous remains of *Eucladoceros* cf. *dicranios* and *Arvernoceros* sp. beside small deer *Cervus (Rusa) philisi* (Baigusheva, 1994).. *Eucladoceros* from KFC with large massive antlers looks like to *E. dicranios* by dichotomy bifurcation of the first branch. It differs by the absence of a significant caudal curving of the distal ramifications and by more significant flattening of the whole antler. *Arvernoceros* sp. is another form of the deer of KFC (Baigusheva, 1994; Croitor, Kostopoulos, 2004). It has of some incomplete skulls, antlers, lower jaws and postcranial bones. *Arvernoceros* were initially known from some Early Villafranchian localities of zone MN 16 - Les Etouaires, Vialett (France), Villaroya (Spain), and Kvabebi (Georgia) (Heintz, 1970; Vislobokova, 1990).. The antler is known from the site Kushkuna (Azerbaijan) together with the remains of rodents, and mollusks of Middle Akchagylian. Paleomagnetic and biostratigraphic data of the layers allow to carry them to the second half of Middle Pliocene, Early Villanyian, and zone MN 16b (Tesakov, 2004). However, nowadays a whole series of *Arvernoceros* finds from Late Pliocene – Early Pleistocene sites of Europe is known (Croitor, 2005). *A. verestchagini* was described from Salcia sand pit (Moldova). Its complete antler was found jointly with remains of Late Pliocene - Early Pleistocene animals (David, 1992). The analysis of the Late Pliocene association allows to speak about the presence on the south of Eastern Europe of warm and relatively dry climate with hot summer and slight snowy winter with weak cold weather, warmer and drier, than the modern ones. The absence of forms adapted to droughty habitats, and the abundance of species, that are typical for open and semi-open landscapes were characteristic for the Complex.

**For Psekups (Odessa) Faunistic Complex (PFC)** the presence of *Archidiskodon meridionalis meridionalis*, *Stephanorhinus* cf. *etruscus*, *Equus (A.)* cf. *major*, and *Pseudodama nestii* were typical. During this period *Anancus* and *Paracamelus alutensis* continue to exist, but become less numerous. For the first time *Bison* appeared. The

most representative fauna of this type occurs from Ciscaucasus (sites Saratovskaya and Bakinskaya) from the basis of Psekups River's coastal sections. Deposits with Psekups fauna belong to an early part of Matuyama epoch, and small mammal fauna concerns to the end of Villanyian, and early Upper Villafranchian, to the end of zone MN 17 (Tesakov, 2004).. The skull and the antler of *Eucladoceros "pliotarandoides"* have been found near village Bakinskaya (Gromov, 1948). The plan of the antler's structure with the distinctive dichotomy bifurcation and upper teeth allow to describe a new genus and a species "*Psekupsoceros*" *orientalis* (Samson, Radulesco, 1967). I.A. Vislobokova (1990) has attributed this deer to *E. orientalis*. There is another point of view on the genus definition of this specimen – *Megaceroides orientalis* (Azzaroli, Mazza, 1992).. R. Croitor (2006) has ascribed this antler to *Praemegaceros (Ortogonoceros) pliotarandoides* based on the similarity to an antler's fragment of "*Cervus*" *pliotarandoides* from Cortiglione Monferrato (Italy). Remains of *Arvernoceros* from PFC localities are not known. However such form of deer was characteristic for the given time interval of East Europe and adjacent territories. *Arvernoceros* sp. from Georgian site Dmanisi (Vekua, 1995), and from Romanian site Fantana lui Mitinan (Croitor, 2005) are pointed out.. There were no radical reorganizations in the structure of large mammal association in comparison with the previous stage. Probably, from this time a "savanna-type" Eurasian landscapes began to transform to recent steppe and forest-steppe as a result of an intensification of aridization..

**For Taman Faunistic Complex (TFC)** was characterized by *Canis tamanensis*, *C. (Xenocyon) lycaonoides*, *Ursus* sp. *Lutra simplicidens*, *Pachycrocuta brevirostris*, *Panthera* sp., *Homotherium latidens*, *Archidiskodon meridionalis tamanensis*, *Stephanorhinus* cf. *etruscus*, *Elasmotherium caucasicum*, *Equus (Allohippus) major*, *Sus* cf. *strozzi*, *Bison tamanensis*, *Pontoceros ambiguus*, *Tragelaphus* sp., and *Gazella* sp.. In unknown locality of Taman peninsula of the Sea of Azov Region the skull (afterwards destroyed) with antler of *Eucladoceros* cf. *orientalis* was found. This antler differs from Psekups one only by larger size. It keeps the same number and the size of two basal tines, dichotomy bifurcation of the unique branch and similar proportions of the beam. Croitor (2005) attributes this specimen to *P. (O.) pliotarandoides*. The morphology of the skull and its fossilisation are identical with those of the skull of *Eucladoceos* sp. from Tsimbal sand pit (Taman peninsula) whence remains of Taman fauna occur. Microtheriofauna of that site is referring to a late stage of TFC, Early Biharian and zone MQ 1. The similar antler were found out in other localities of TFC (sand pit on the right bank of Sredniy Egorlyk, on the coast of the Sea of Azov near the Semibalki village) (Baigusheva, 2000). From numerous localities of TFC from the Sea of Azov Region remains *Arvernoceros* were not determined. However these deer are known from other European sites of the same age: *Arvernoceros* sp. from Chishmikiioi (Moldova), *A. cf. verestchagini* from Apollonia-1 (Greece) (Croitor, Kostopoulos, 2004; Croitor, 2005). The staff of animals' complex specifies a variety of biotopes ascribing to steppe and forest-steppe landscapes, and the absence of psychrophilic elements. Dominating forms of large mammal in taphocoenosis of the TFC were inhabitants of semi-open and open habitats.

The transitional form from *Eucladoceros* to *Praemegaceros* is the specimen from the collection of Mariupol local museum (Ukraine). Unfortunately, the exact locality of this antler is not known. However one can suppose its Early Pleistocene age. The structure specifies the occurrence of features of similarity with *Praemegaceros*, such as the second basal tine considerably bents downwards, and the beam is considerably deflected

laterally. But the tuber of the first basal tine and dichotomy bifurcation are kept. This find was determined as *P. pliotarandoides* (Croitor, 2005). Croitor (2006) has attributed some other antler's finds from sites of PFC and TFC from territory of the East Europe to the same species.

In the Sea of Azov Region the change of large deer from *Eucladoceros* to *Praemegaceros* and also gradual disappearance of *Arvernoceros* are clearly found. *Eucladoceros* become larger, the size and flatness of a beam and basal tines of antlers changed with the preservation of dichotomy bifurcation. All these changes happened on a background of gradual intensification of the climate aridization and an expansion of steppe types vegetative communities.