

**CONTRIBUTION IN STUDY MEOTIEN FAUNAS OF THE CIOBURCIU SITE
FROM REPUBLIC OF MOLDOVA**

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Abstract

The studied region is located on the Moldovan Platform on the right bench of the river Nistru. Being located in the front of oriental Carpat Mountains the Moldovan Platform is the oldest platform in the region. The meotien deposits on this platform are represented by non stratified clays of continental genesis which by Hubca (1969) are attributed to *Strata of Balta* and by Rosca to *Strata of Cahul* (1967).

The Cioburciu site was studied by a number of researches: Pavlova (1914, 1915) Gabunea (1959), Macarovici (1940), Suhov (1945), Lungu (1990). As a result of these researches the lists of fauna were compiled and permanently revised. The last version is presented in this work which presupposes attribution of the Cioburciu site to the zone MN 11, Lungu (2004).

KEY WORDS: Superior Miocen, Meotien (Turolian); Hiparion fauna; Site Cioburciu; Republic of Moldova.

Introduction

In the south districts of the Republic of Moldova over the deposits of Superior Sarmatian a layer of clay rocks of continental genesis is located, which in turn is covered by the marine deposits of the Inferior Pontian.

These deposits are represented by clays of greenish and light bluish color, with brown not stratified spots. The thickness of this stratum varies growing from East to West up to the maximal thickness of 260 m Eberzin (1959) established the date of these deposits as Meotien which represents formations of an alluvial field. From these deposits the cockle shells of mollusks of sweet water are known (*Unio flabellatus* Goldf., *U. novorossicus* Sinz., *U. subpartshi* Sinz., *U. cainarensis* Iatzko, *Planorbis sp.*, *Lymnaea*) and terrestrial (*Helix sp.*, *Succinea sp.*), as well as residues of algae *Hariaceae*, and close to the localities Cioburciu, Tudora in district Stefan-Voda, Taraclia in district Causeni and city Cimislia

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sites of fossil rests of terrestrial vertebrates were found, known under the name of Hipparion fauna which was largely spread in regions of Eastern Parathetis.

Cioburciu Site

At the height of 30-40 m over the level of Nistru river bed on the right bank of the river between the localities Talmaza, Cioburciu and Rascaeti in natural sections the deposits of the superior Sarmatian are located which are represented by a stratum of clay and sand rocks (thickness 40-50m) and which contain cockle shells of *Mactra caspia* Eichv. Higher in afloriment there are clays without stratification of greenish – gray color which neighbor to the strata of argillaceous sand of gray color and argillites with carbon impregnation. These deposits are included by Hubca (1969) in strata of Balta, and Rosca (1967) included them in strata of Cahul. The thickness of these deposits varies from 30 to 45 meters. Fossil rests of Hipparion fauna were found in these deposits to the west from the village Cioburciu (Rapa Alba) and to the north from the village Tudora. The Hipparion fauna at Cioburciu was studied by Pavlova (1914, 1915), Macarovici (1940), Gabunea (1959), Lungu (1990). Until recently only rests of macrovertebral were known at this site. The paleontological collections at this site can be found at the paleontological museums of the Universities in Iasi, Odessa, and Moscow.

Bellow is the description of the section in Rapa Alba by Gabunea (1959):

1. Yellowish – greenish clays with sand, with poorly preserved cockle shells of *Mactra caspia* which are attributed to superior Sarmatian.
2. Greenish clays slightly sandy, not stratified with thickness of about 1 m.
3. White-yellowish sands with average and fine granules, which are rarely compacted with transition to sandstone. In the inferior part they have gravels with rare cockle shells of *Unio*. Thickness of sands is about 2.5 – 2.7 m. This sands have a big concentration of rests of well preserved mammals.
4. Sandy dark gray clays with a greenish shade, microgranulation and with slightly visible slanting intersection with thickness up to 3 m, they have small lenses of sandstone with rests of mammals, or with isolated fragments of bones. In some of this lenses there were cockle shells of *Cerithium cf. novorossicum* and *Unio* found. The fauna of mammals is preserved poorly, without whole exemplars. At the basis of the stratum there are erosions observed.
5. Gravel with parts of Carpathian rocks (Carpathian gravel) which pass higher in yellowish-brown sands. Rests of *Elephas meditionalis* were found in these sands (5-6 m thickness) in accordance with Macarovich (1940).
6. Grayish – greenish clays, more rare dark greenish clays which in the superior part pass in yellowish-gray sandy clays. Thickness is approximately 10 m.
7. Gray – greenish sandy clays sometimes with yellowish-greenish shade, compacted with thickness of approximately 7 m.

8. A series of brown sands and sandy clays follow, they containing small concretions of fragile limestone. Their thickness is about 5 m.

9. Thin stratum of soil with variable thickness of 10-30cm.

As a result of study and revision of fossil rests from the Cioburciu site by Lungu and Delinschi the list of faunal association was made more precise and this is represented by the following forms:

Reptila: *Testudo bessarabica Rjab.*

Mamalia: Edentata: *Orycteropus gaudryi F. Major*

Carnivora: *Ictitherium viverinum Roth. et Wagn.*

Adcrocuta exima Roth. et Wagn.

Mahairodus schloseri Weit

Machairodus cultridens Cuv.

Mustela palaeatica Weith.

Simocyon primigenius Roth. et Wagn.

Proboscidea: *Mastodont sp.*

Choerolophodon pentelici Gaud. et Lar.

Deinotherium giganteum Kaup

Perissodactila: *Hipparion verae Gab.*

Hipparion. gracile Kaup

Hipparion mediteranieum moldavicum Grom.

Acerorhinus simplex Krok.

Dicerorhinus schleiermacheri Kaup

Artiodactila: *Cervavitus varibilis Aleks.*

Palaeotragus roueny Gaud.

Helladotherium duvernoyi Gaud. et. Lart

Tragoportax amalthea

Tragoportax frolovi Pavlow.

Palaeoryx studzeri Sch.

Gazella deperdita Gerv.

Gabunea (1959) mentioned that the fossil rests collected from the continental deposits at Cioburciu come from different stratigraphical levels and belong to different units of meotien.

Lungu (1990) carried out researches with the purpose of studying of fossil site at Cioburciu. So 50m to south from *the Rapa Alba* he presented the following section (from bottom to top):

1. Clays of greenish-yellowish color with lenses of sand and cockles of *Maetra caspia*, thickness of 5m.

2. Sandy clays of greenish color, not stratified with thickness of 1 m.
3. White sands, with fine granules, in some places, with intersected stratification which contain concretions of sandstone, are succeeded by thin strata of gray-greenish clays, total thickness 24-25m.
4. Sandy clays of gray-greenish color, with intersected stratification, are altered by lenses of grey sand with fine granules. At the basis of the stratum in a lens of sand there were fossil rests of macro- and micro-mammals found (insectivore, rodents, ungulate). Thickness of stratum is 6m.
5. sands with Carpathian gravel, represent a terrace of Nistru river, thickness 3-4m.
6. Clays of gray-greenish color with horizontal stratification which gradually pass in sandy clays, 5m.
7. Lessoidals clays of yellowish color, thickness 5m.

Rests of terrestrial vertebrate were discovered in the stratum 4. The fossils are fragmented, very often polished.

From the lenses of sand there were about 1500 kg of rocks extracted, which were dried off, then sifted via sieves with different diameter. The obtained fractions were examined via microscope in laboratory. As a result of a comprehensive survey the rests of fish, amphibians, reptiles and small mammals were found, represented by the following kinds and species:

Amphibia: *Mioprotheus cf caucasicus*
Rana sp.

Reptila: *Testudo bessarabica Rjab.*

Chelidropsis sp.

Melanochelys sp.

Sakya sp.

Lacerta sp.

Ophizaurus sp.

Natrix sp.

Vipera sp.

Aves: *Struthio sp.*

Anas sp.

Insectivora: *Amphechinus sp.*

Shizogalerix cf. aticus Rumke

Desmana sp.

Crusafontina cf. kormosi (Bahm. et Wilson)

Paenelimnoecus cf. repenningi (Bahm. et Wilson)

Lagomorpha: *Prochotona sp. nov.*

Alilepus lascarevi (Chom.)

Rodentia: *Spermophilinus cf. bredai Meyer*

Vasseuromys theni Daxner-Höck

Hansdebruijnia neutrum (De Bruijn.)

Castromys sp.

Kowalskia lavocati (Hug. et. Mein)

Taphonomic observations

It should be mentioned that the fossil rests were collected from a single lens, but they are of different color and grade of fossilization. The same pieces have white, brown and very often dark black color.

Presence in lens of fossils with different grade of polishing tells us about the fact that the rests of terrestrial vertebrates were brought in the zone of sedimentation from different distances.

The rests of micro-vertebrates as well as big vertebrates are found in lenses which contain sand with gravel and are alternated with sands with fine granules without fossil rests. The deposits which contain fossil rests probably belong to lake facies, of river and delta, which in turn indicate that the region of sedimentation of terrestrial vertebrates could be a sector of delta of a river.

Analysis of Systematic Composition of Faunal Association

In the faunal association at Cioburciu there are representatives of different biocenozes. Such representatives like *Protestuda besarabica*, *Lacerta*, *Ophisaurus*, *Elaphe*, *Vipera*, from reptiles, *Struthio* from birds, *Hipparion*, *Palaeotragus*, *Tragoportax*, *Gazella*, *Palaeoryx*, *Dicerorhinus* from mammals used to populate the

open dry landscapes like actual savannah, with typical high herbs and grove of bushes. Probably in similar conditions lived some micro-mammals like *Alilepus Prochotona*, *Cowalskia* etc.

Forests from around the river *basins* were populated by such representatives of faunal association from Cioburciu like *Shizogalerix*, *Paenelimnoecus* from *insectivore*, *Hansdedebruijinia*, *Castromys*, *Vaseuromys* from rodents, and from big mammals by *Cervavitus*, *Deinotherium*, *Mastodont*.

In aquatic conditions and on marshlands such representatives like *Rana*, *Sakia*, *Natrix*, *Mioproteus* etc. lived.

The territory in the southern part between rivers Prut – Nistru during meotien represented an alluvial accumulative field, with savannah landscape, and basins of rivers were covered by forests formed of willows, poplars, etc.

Stratigraphic position and geological age of fauna of Hipparion from the Cioburciu site

Gabunea (1959) determined geological age of the fauna from the Cioburciu like Meotien. He mentioned that faunal associations from the inferior stratigraphic level for which *Hipparion verae* is characteristic should be attributed to the age of Inferior Meotien, and faunal association from the superior stratigraphic level, for which *Hipparion Mediteraneum Moldavicum* is characteristic should be attributed to the age of Medium Meotien. Korotkevich (1988) considers the age of *Hipparion* fauna from Cioburciu to be Superior Kersonian.

Roșca (1967) shows that the continental deposits from the neighborhood of Cioburciu and Tudora which contain *Hipparion* fauna are attributed to the strata of Cahul and their geological age is attributed to Meotien.

Faunal association from Cioburciu contains typical elements for *Hipparion* fauna of turolian type. It differs from the fauna of Superior Samatian by lack of such elements like *Percrocuta gigantea*, *Hipparion giganteum*, *Achtiaria* etc. In the faunal association from Cioburciu for the first time such forms like *Vasseuromys theni*, *Hansdebruijinia neutrum*, *Castromys*, *Kowalskia lavocati*, *Hipparion mediteraneum moldavicum*, *Acerorhinus simplex*, *Tragoportax amalthea* appear, they being characteristic to the fauna of Inferior Turolian, spread in the Eastern sectors of the Mediterranean region. Appearance of these elements allow us to determine the age of fauna from Cioburciu as Inferior Turolian and attributed to the zone MN11.

In the Western and Southern Europe the indicated above form appear also at the beginning of Turolian.

Hipparion fauna from Cioburciu is younger than the fauna from Tiraspol and Grebenikii, but older than fauna from Tudora, Taraclia and Cimislia.

Conclusions:

It may be mentioned that the teriofauna of continental regions which outlined Oriental Paratethis in the Superior Miocen is evolved in specific paleogeographic and paleoecologic conditions determined by the evolution of geographic environment. In the region of Moldovan Platform these details were determined by lifting of this platform and by the evolution of Carpathian Orogen which led to regression of Sarmatian Sea, drying of the climate and formation of landscapes of actual savannah type. Due to this reason during this period an intensification of migration of forms from the Southern Europe and Western Asia is observed, while in the Central and Western Europe conservation of the landscape and climacteric conditions contributed to preserving of relict forms from the Medium Miocen for a longer time.

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