”ALEXANDRU IOAN CUZA” UNIVERSITY IAŞI.
FACULTY OF GEOGRAPHY AND GEOLOGY
DEPARTMENT OF GEOLOGY
DOCTORAL SCHOOL

GEOLOGICAL STUDY OF

HUSI – MURGENI – BÂRLAD –

VASLUI – MUNTENII DE SUS AREA

SUMMARY

-DOCTORATE THESIS-

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PhD student:

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IAŞI

2012

"ALEXANDRU IOAN CUZA" UNIVERSITY IAŞI
RECTORATE

Mr./Mrs. …….

On the 29th of September 2012, at 10 o'clock, in the amphitheater B6, at the Faculty of Geography and Geology, the Geology Department, Mr. **Bejan Daniel** will give a presentation, in open session, of his doctorate thesis entitled "GEOLOGICAL STUDY OF HU□I – MURGENI – BÂRLAD – VASLUI – MUNTENII DE SUS AREA" for obtaining the scientific title of doctor in Geology.

The doctorate committee is made up of:

President: Associate Professor, PhD Traian GAVRILOAIEI – deputy dean of the Faculty of Geography and Geology,"Al. I. Cuza" University, Iaşi.

Scientific coordinator: University Professor, PhD Mihai BRÂNZILĂ - the Faculty of Geography and Geology, Al. I. Cuza" University, Iaşi.

Reviewers:

- University Professor, PhD Vlad A. CODREA, Faculty of Biology and Geology, The Geology Department, "Babeş-Bolyai" University, Cluj-Napoca
- PhD Titus BRUSTUR, Scientific researcher 1st degree, The National Marine Geology and Geo-ecology Institute (GEOECOMAR), Bucharest.
- Associate Professor PhD Paul ȚIBULEAC, Faculty of Geography and Geology, The Geology Department, "Al. I. Cuza" University, Iaşi.

You are invited to attend the session for the presentation of the thesis.
The thesis can be read at the Library of the Faculty of Geography and Geology.

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INTRODUCTION

The purpose of this work is to deepen the geological awareness over the formations from the Chersonian – Pleistocene stratigraphic interval, from the Southern part of the Moldavian Platform and partially of the northern and central part of the Scythian Platform. Geographically, the researched area covers the central – eastern part of the Central Moldavian Plateau, the interfluves Vasluieț – Bârlad – Prut.

The drafting of the works, the professional context and the development of the entire research was made under the guidance of the scientific coordinator, university professor doctor Mihai Brânzilă, being the one who suggested this theme. Through this PhD thesis, I wish to thank my coordinator who accepted me as a PhD student, for the trust given and for including me in the research project PN-II-IDEI No. 975/2008.

This study was performed with the financial support from the Sectorial Operational Program for the Development of Human Resources 2007 – 2013, Contract POSDRU 88/1.5/S/47646 – „Doctoral studies: the gate to an excellent career in research and the society of knowledge.” I wish to thank the entire management team of the POSDRU scholarships who supported us logistically throughout this period.

Chapter I. OBJECTIVES OF THE THESIS

The objectives of this thesis were:

- the overall geological research of the sedimentary formations in the area;
- deciphering the sedimentary deposits in the research area;
- the taxonomic categorization of the fossil remains collected during the activity on the field at the main vertebrates sites in the studied area;
- the taphonomic interpretation of the fossil remains based on the morphologic characteristics;

Research materials and methods

In the case of the vertebrates' remains, the preparation of the material was performed by removing the sediment attached, through the traditional method with the chisel and hammer.

The preservation of as more details as possible was in view for a better identification, the processing being made very carefully due to the fragility of the material.

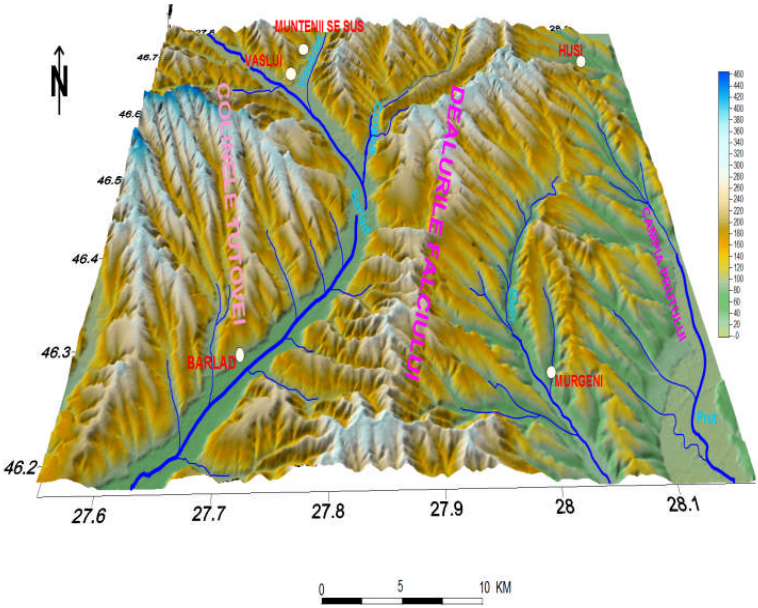
In order to prevent the destruction of the fossil remains, the material was reinforced by brushing with a solution of mowillit, rodopast diluted glue during the preparation.

Chapter II. ANALYSIS OF THE PHYSICAL – GEOGRAPHICAL NATURAL ENVIRONMENT

The studied region overlays geomorphologically the Hills of Falciu, the Depression of Elan and the Lohan Coast. Morphologically, this region is at the contact between the Central Moldavian Plateau and the Hills of Falciu from the Plateau of Barlad and the Hilly Plain of Falciu (Ionesi et al. 2005), both being divisions of the Moldavian Plateau from the North-East of Romania.

The eastern and western limit of the researched region is given by the rivers Prut and respectively Bârlad. The northern part stretches up to a line which connects the locality Muntenii de Sus with the town Huşi. The southern part stretches between Bârlad and Murgeni.

The hills of Fălciu (Picture 1) are situated between the Valleys of Barlad and Elan, from the Cuestas of Lohan and Draslavat in the north and up to the Cuestas of Jeravat and Horinca, in the south. The maximum altitude does not exceed 350 m, being characteristic of the tops with the direction NE-SW. In our research area, the high tops are represented by Dobrina Hill, Popii Hill and Recea Hill (307.2 m alt.).



Picture 1. The physical map of the study area modified from the Global Mapper 11 into Surfer 8.0

This geographic subunit is characterized by a erosive – accumulative relief, whose sculptural origin is due first of all to the direct tributaries of Prut, Sarata and Elan, but also to the existence of more friable deposits dominated by the presence of clays and sands alternating with sandstones.

The present relief derives from the sculpture of a Maeotian – Pliocene dry land, epigenetically erected , fragmented and turned into a region of plateaus, hillocks and hills whose average altitudes vary around 150-300 m. Thus, the relief forms, the plateaus, hillocks and hills, are present on the Bârlad - Vasluieţ – Prut interfluves, they have a main orientation and a slight inclination from the north-west towards the south –east, according to the monocline structure of the plateau.

Chapter III. BACKGROUND OF THE GEOLOGIC RESEARCH IN THE AREA

The results of the scientific studies over the geologic deposits on the Vasluieț – Bârlad – Prut interfluves are found in a small number of works. However, concerning the geology of the studied region some analogies can be made with the neighboring areas which have been studied in more detail.

Stefănescu in 1897, in his doctorate thesis, describes the non-fossil deposits in the proximity of Barlad town (which he attributes to the Sarmatian, which actually belong to the Maeotian) in the profile from Câlcea Hill, where oolitic limestone appears.

Simionescu establishes in 1904 the paleontological material from Zorleni, considered to be of Pontian age. The mastodon teeth discovered near Barlad could have the same age. In 1920, 1932, he studies the tortoises from Malusteni.

Detailed researches in the studied area were performed by Macarovici (1938, 1955, 1960, 1965). The contributions of the author are stratigraphic and paleontological, both concerning the fossil fauna of invertebrates and the vertebrates' one.

Jeanrenaud's research (1961, 1965, 1966, 1971, 1995) includes almost our entire study area, except for the south –eastern part. The author delimitates the Chersonian in brackish and deltaic facies, he separates the lower and upper limits of the Maeotian, and the thickness in different sectors, he determines the cineritic deposits for which he suggests the name of Nuțasca-Ruseni "horizon"; he separates in this unit three andesitic cineritic "banks" and considers it a landmark which can be identified and

followed from south of Iasi throughout the entire surface between the Vasluieț – Bârlad – Prut interfluves.

As of 1993, Codrea has a constant paleontological research activity in the area of the Vasluieț – Bârlad – Prut interfluves, which continues Radulescu's and Samson's concerns related to the vertebrates fossil fauna from Malusteni, but which extends the explored area to other points as well such as Draxeni, Pogana, Roşieşti, Zorleni and Movileni.

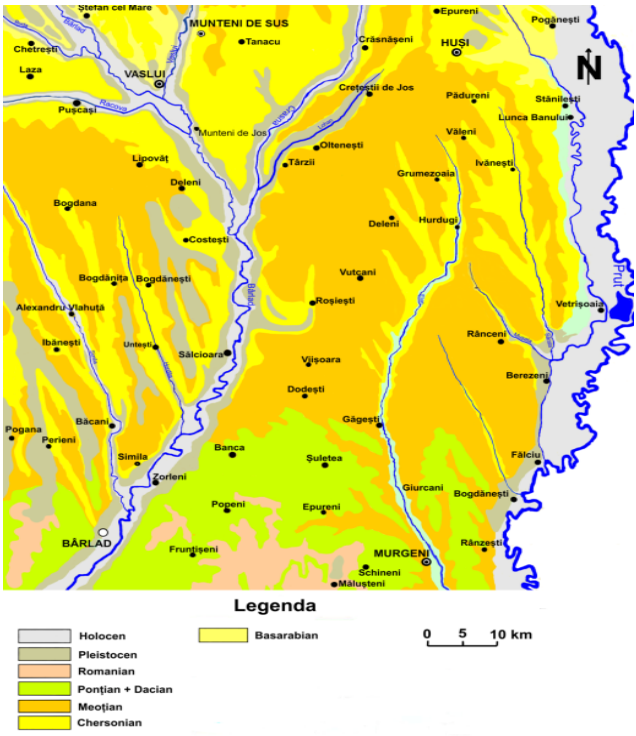
Grasu et al. (2002) analyze the Sarmatian from the Moldavian Platform in the context of the geological evolution of the contact areas between the orogene and the foreland.

Ionesi et al. (2005) make up an ample monograph, which treats the Middle and Upper Sarmatian from the Moldavian Platform. It presents a litho- and bio-stratigraphic paleontological aspect, of the paleo-geographic, paleo-ecologic and sedimentary evolution of the Moldavian and Scythian (of Barlad) Platforms.

Țabără (2008) through the palynological data obtained shaped the image of the characteristics of the vegetation from the Middle and Upper Sarmatian on the Moldavian Platform.

Chapter IV. GEOLOGY OF THE REGION

The geological study of the Huşi – Murgeni – Bârlad – Vaslui – Muntenii de Sus area tries to bring new information, regarded geologically, over the formation which outcrop (Picture 2). The region which is bordered by the imaginary quadrangle which connects the above mentioned localities stretches on two structural units, namely the Moldavian Platform and the Scythian Platform (of Barlad). The oldest outcrops are Bessarabian.



Picture 2 The geological map of the studied area
(modified and updated, according to Jeanrenaud, 1961)

IV.1 Geological aspects of the foreland basins of the Oriental Carpathians

The sedimentation of the Sarmatian was performed in the marine conditions specific to the last evolution stage of the foreland basin of the Oriental Carpathians; the tectonic being the main factor which controlled the sedimentation during the Sarmatian through the west-east subsidence, induced by the load of the drifting layers and by the subsidence of Vrancea area (the Focşani-Odobeşti Depression) which polarized the sedimentation north – south.

IV.2 Stratigraphy

The region studied by us belongs to the Southern part of the Moldavian platform and partially to the north- west of the Scythian Platform (of Barlad). The two platform units are situated outside the Oriental Carpathians, their foundations being covered with layers which can reach a thickness of several thousand meters. Only the deposits of the layers made up of deposits from the Chersonian – Pleistocene interval outcrop.

IV.2.1. The sedimentary layer

The last sedimentation megacycles from the Moldavian Platform and from the Scythian Platform (of Barlad) of the deposits which outcrop in the studied area belong stratigraphically to the Upper Miocene – Upper Pliocene time interval. For the Moldavian Platform the end of the last megacycle is during the Maeotian, for the Scythian Platform the last sedimentation megacycle ends in the Romanian. In this work, I have approached the Chersonian – Quaternary stratigraphic interval, the reason being the fact that

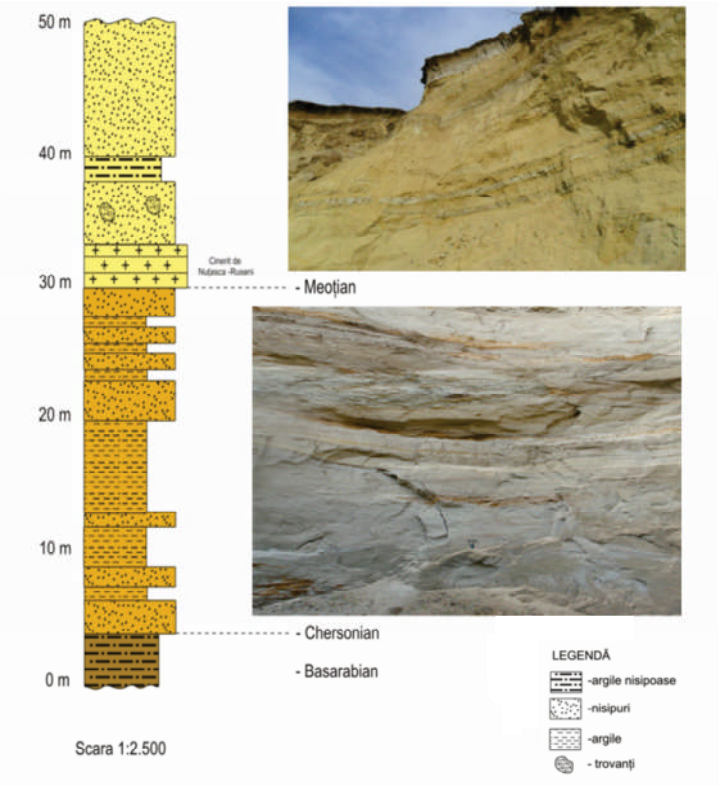
the oldest deposits outcropping in the studied area are Chersonian and the latest are Quaternary.

IV.2.1.1. The Chersonian

Openings where the Chersonian are well seen are found on the slopes of the hills between Prut Valley and Crasna Valley (Pădureni, Crăsnăşeni), between Vaslui Valley and Bârlad Valley (Tanacu). The thickness of the Chersonian is of 70 m, with a slight increase in the southern- western part of the Moldavian Platform. In the Scythian Platform, at the Chersonian level, a brackish marine litofacies with sands, clays, and sandy clays is distinguished east of Barlad, and between Siret and Barlad, a deltaic lithofacies with sands, sandy clays and clays (Jeanrenaud, 1961, 1963, 1965, 1968, 1971).

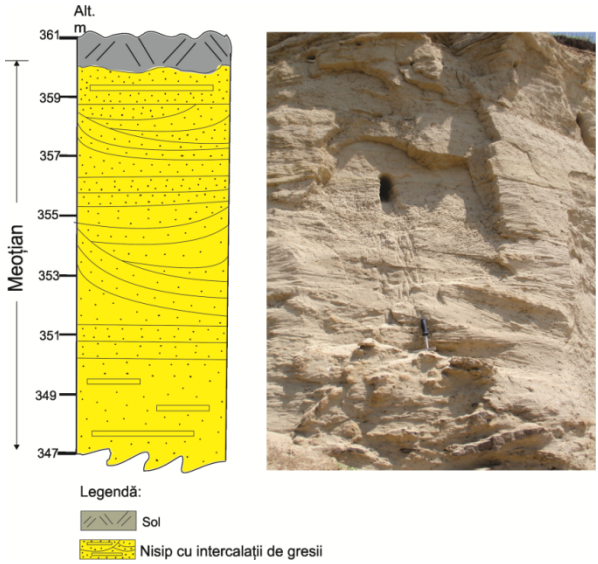
IV.2.1.2. The Maeotian

Starting with the southern part of Husi locality (Picture 3) up to approximately the latitude of Falciu locality, Maeotian deposits outcrop from the thalweg of the deepest valleys up to the interfluves of the highest hills. The thickness of the Maeotian vary from west to east (the thickness increases towards Siret Valley). On the Prut, the thickness of the Maeotian deposits is of 100 – 120 m, and on the Siret it can reach 250 m.



Picture 3 The synthetic lithological column for Chersonian and Maeotian formations in the area Pădureni - Huşi.

Stratigraphically, the Maeotian begins with the Nuțasca-Ruseni cineritic complex, made up of three cineritic banks separated between them through sands and clays deposits. In the studied perimeter this horizon is 10-20 m thick. The cineritic horizon can be observed on the slopes of the hills from the Lohan lower course and from Barlad Valley, up to Pădureni. The cineritic deposits can be encountered at Târzii, Olteneşti, Dobrina Forest, and then at Idriciului Valley north of Codreni village, Bogdana (Picture 4).



Picture 4 The lithostratigraphic column and Bogdana outcrop

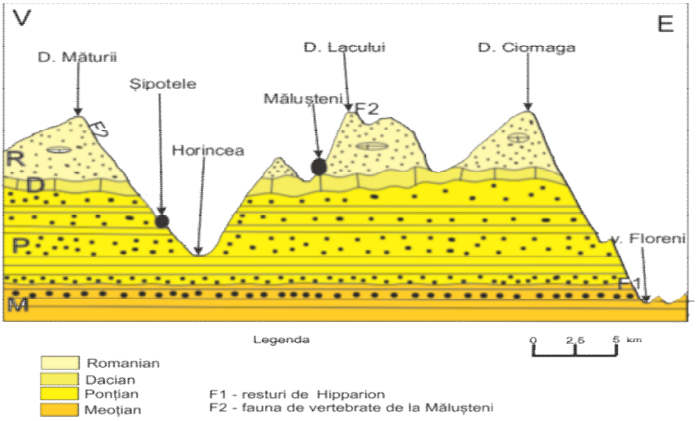
IV.2.1.3. The Pontian

The Pontian deposits are characterized by a strong marine regression, which probably ended during the Dacian when the entire studied territory permanently resurfaced.

IV.2.1.4. The Dacian

The Dacian deposits are made up of a complex of sands and clays and they couldn't be separated from the Pontian. Macarovici (1960) determines some clayey sands as being Dacian, approximately 30 m thick, which appear in Corbita profile, but which do not contain fossils.

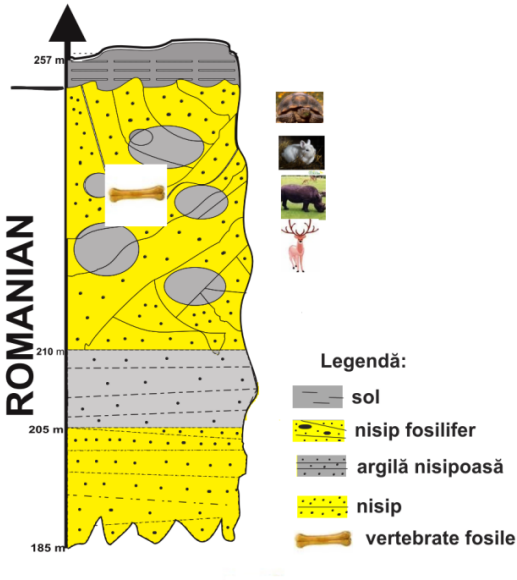
The Pontian – Dacian take over the top of the hills from the southern third of the area between Bârlad and Prut, being approximately 150 m thick. Ghenea (1968) separates three horizons (Picture 5):



Picture 5 Geologic section between Măturii Hill and Floreni Forest (according to Ghenea, 1968)

IV.2.1.5. The Romanian

The Romanian deposits are developed by white – yellowish fine sands or gravel, sometimes with sandy and calcareous concretions in their mass which by cementation give the sands a conglomeratic aspect. The deposit with fine sands or gravel has a torrential structure. They cover the high southern tops of the studied area, reaching a thickness of 70 m. In this formation, the rich mammals' fauna from Măluşteni, Mânăstirea and Obârşeni (Picture 6) can be found.



Picture 6 The lithostratigraphic column and the outcrop from Mânăstirea

IV.2.1.6. The Pleistocene

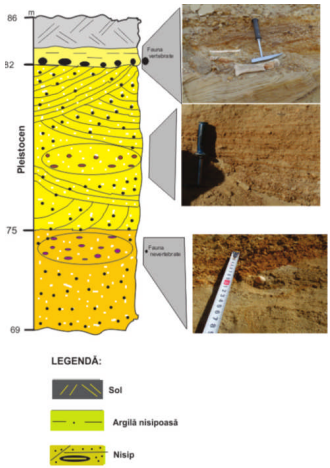
The Pleistocene continues the sedimentation over the deposits of the Pleistocene, but in regression conditions of the waters to the south. The lower Pleistocene ends the evolution as a sedimentation basin of the Scythian Platform, through grits, clays and sands alternations, sometimes with torrential aspect.

After this, especially in the southern part, the terraces system is formed in fluvial – lacustrine of the Middle and Upper Pleistocene and of the lower Holocene and of the alluvial plains of the hydrographic arteries from the upper Holocene. The structure of the terraces and alluvial plains system consists of alluvial deposits, gravels and sands, sometimes fossiliferous, such

as Simila (Picture 7), Sălcioara, Zorleni, Giurcani, Găgeşti, Deleni and Fălciu.

The fossil soils were signaled on the right –sided tributaries of the Elan at Vutcani, Văleni (Valea lui Darie), Epureni, Mihoanea etc. and of Bârlad river, being interleaved both in lassoed deposits (Bejan et al., 2012) and in quaternary psamo – pelitic formations, appearing in 1 to 3 fossil levels.

The hydrographic network was formed at the same time, along which the terraces systems formed. The deposits which make up the terraces systems and the alluvial plains of the rivers which drain the studied area add to this.



Picture 7 Simila lithostratigraphic column

The geologic structure mentioned above has a major influence on the present morphometric and morphographic aspect of the relief in the hilly area stretching between Bârlad – Vasluieţ – Prut interfluves.

IV.3. TECTONICS

The northern limit of the Scythian Platform is tectonic, its nature being given by the Falciu – Plopana major fault or by Bistrita fault. In the south, the Scythian Platform is limited by the Trotus fault having a NWW – SEE orientation, which continues with the Sf. Gheorghe fault which separates it from the North – Dobrogean Orogene (Săndulescu and Visarion, 1988).

We can say that the tectonics of the deposits which outcrop in the studied area can be deciphered with the help of a landmark deposit which outcrops almost throughout the entire studied area. This is the Nuţasca-Ruseni cinerite deposit. According to this landmark deposit we have measured, for the studied area, the tilt on the NE – SW direction, from Pădureni to Sălcioara, it being of 5 m/km.

Chapter V. PALEONTOLOGY

Taxonomically the parts collected after the monitoring of the sites from the Bârlad – Vasluieţ - Prut interfluves area are categorized, followed by short discussions.

Kingdom Chordata BATESON 1885

Class Reptilia LAURENTI 1768

Subclass Anapsida WILLISTON 1917

Order Testudines BATSCH 1788

Family Testudinidae GRAY 1825

Genus *Testudo* LINNAEUS 1758

Testudo sp.

Material: two neural hexagonal shell plates, a central and a marginal shell plate, a right femoral plastron and a plastron fragment.

Discussions: The fossil material which belongs to the *Testudo* species was found in the openings at Mânăstirea, Obârşeni, Fălciu and Simila. The first researches performed over the tortoise shell remains from Măluşteni were attributed to three genera: *Testudo*, *Clemmys* and *Trionyx* (Simionescu, 1922, 1930).

Picture 8 *Testudo* sp. Plastron from Obârseni.

Besides the tortoises' fauna from Măluşteni and Bereşti, fossil remains were also found in the Moldovian Republic at Cioburciu and Tighina (Macarovici, 1930). The shell remains from Măluşteni were examined in detail by Macarovici and Vancea, 1959.

Class Mammalia LINNAEUS 1758

Order Lagomorpha BRANDT 1855

Family Ochotonidae THOMAS 1897

SubFamily Ochotoninae THOMAS 1897

Genus *Ochotona*

Ochotona ursui SIMIONESCU, 1930

Material: left mandibula, with full dental composition.

Picture 9 *Ochotona ursui*, from Mânăstirea

Discussions: during the Pliocene and the lower Pleistocene, the *Ochotona* genus diversifies and it spreads widely in Europe and Asia. The *Ochotona* genus was represented at that time by taxa both large and middle and small. The large Pliocene specimens include *Ochotona ursui* SIMIONESCU, 1932 in Europe and *O. plicodenta* sp. nov. and *O. gromovi* in Asia. At the same time, the *Ochotona* large, medium and small specimens were abundant in Eurasia.

Order Carnivora BOWDICH 1821

Sub-Order Caniformia KRETZOI 1943

Family Canidae FISCHER DE WALDHEIM 1817

SubFamily Caninae FISCHER DE WALDHEIM 1817

Genus *Canis* LINNAEUS 1758

Canis lupus LINNAEUS 1758

Material: right mandible with two molars (M1, M2) and two premolars (p2, p3).

Picture 10 *Canis lupus*, from Zorleni

Discussions: The Pleistocene (*C.lupus*), seems to be fairly little known, as long as we have only limited data concerning these fossils. In Moldavia, *C. Lupus* is signaled by Necrasov et al. (1967), Necrasov and

Ştirbu (1975), Simionescu (1990) lists only four localities: Cucuteni (Iaşi), Târpeşti, Traian-Dealul Viei (Neamț), Drăgăneşti (Galați) for the spread of this species.

Order Perissodactyla OWEN, 1848

Family Rhinocerotidae GRAY, 1821

Genus *Chilotherium* RINGSTRÖM, 1924

Sub-Genus *Chilotherium* RINGSTRÖM, 1924

***Chilotherium* sp.**

Material: left upper molar (M2), right premolar (p4). The names and the model for the measurements are according to Guerin (1980).

Comparisons and discussions: The *Chilotherium* genus is represented very rarely in Romania.

Picture 12. *Chilotherium*sp., Pogana: 1 – left upper molar, M2; 2 – right lower premolar, p4; occlusal view

The Pogana specimen has bigger dimensions, compared to *C. sarmaticum* from Berislav or *Chilotherium (Eochilotherium) kiliasi* Geraads

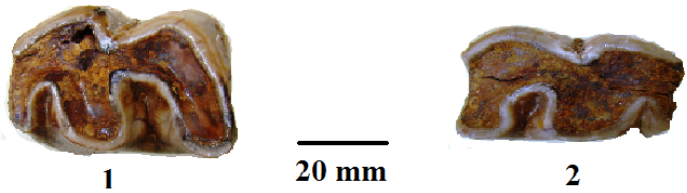
& Koufos. The difference between the mentioned species and the one from Pogana is the lack of cement on the teeth crown.

SubFamily Aceratheriinae DOLLO 1885

Tribe Aceratherini DOLLO 1975

Genus *Aceratherium* KAUP 1832

Material: right and left mandibular, a premolar and a molar; thoracic limb made of humerus, ulna, radius, metacarpus and calcaneus.



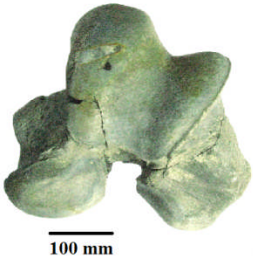
Picture 13 *Aceratherium*, Fălciu: 1 – left molar, M1;
2- left premolar p4; occlusal view

Family Rhinocerotidae GRAY 1821

Genus *Stephanorinus* KRETZOI 1942

Stephanorhinus megarhinus DE CHRISTOL 1832

Material: femoral head



Picture 14 *Stephanorhinus megarhinus* DE CHRISTOL,

Mânăstirea: femoral head

Discussions: *S. megarhinus* is typical for the MN 14 and MN 15 units, it is a large rhinoceros, it appears at Malusteni as well.

Family Equidae GRAY 1821

Genus *Hipparion* DE CHRISTOL 1832

Material: Upper tooth, phalange.

Picture 15 *Hipparion*, from Simila

Discussions In 1903, Simionescu describes two *Hipparion* premolars collected from the Maeotian green clays from Zorleni locality (situated 5 km away from Simila site) which were established as being

Hipparion gracile KAUP. Macarovici (1973) revizes the Zorleni fauna, conmsidering that those premolars belonged to the *Hipparion moldavicum* GROMOVA species. Simionescu (1930) describes in detail an upper molar belonging to the species *Hipparion gracile* KAUP found at Măluşteni, and in 1932 he points out the presence of the same *Hipparion* species at Bereşti.

Order Artiodactyla OWEN 1848

Sub-Order Ruminantia SCOPOLI 1777

Super-Family Bovoidea SIMPSON 1931

Family Bovidae GRAY 1821

Sub-Family Bovinae GILL 1945

Tribe Bovini SIMPSON 1945

Genus *Bison* SMITH 1827

Bison priscus BOJANUS 1827

Material: The upper part of the skull with the maxillary which contains the complete dental crown.

Picture 16 *Bison priscus*, from the Prut bank, in situ skull

Discussions: The forms which migrated from Asia to Eastern Europe (the Black Sea and Ukraine) during the Villafranchian are forms which have relatively short horns. The longer horns forms, such as our *Bison priscus* case, subsequently developed on large surfaces from Europe and Asia, during the Middle Pleistocene. At the end of the Würm ice age, a transition form between the *Bison priscus* and the *Bison bonasus* appeared.

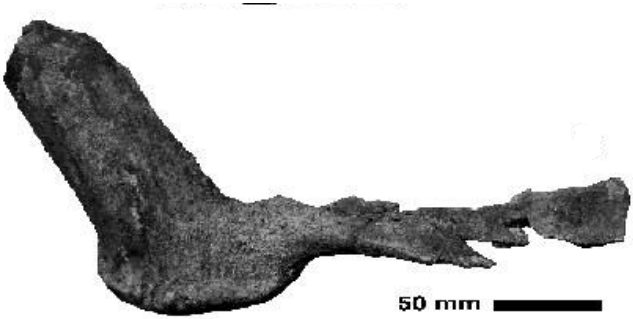
Such parts were discovered either in the terrace deposits of the rivers Siret, Prut, Moldova, Bistriţa, Hreasca, or in lassoed deposits.

Family Cervidae GOLDFUSS 1820

Genus *Megaloceros* BLUMENBACH 1799

Megaloceros giganteus BLUMENBACH 1799

Material: horn fragment



Picture 17 *Megaloceros giganteus*, from Zorleni

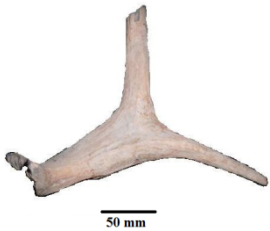
Discussions: "The giant stag", as well as his ancestors, were signaled from various locations on the territory of the country (Rădulescu & Samson, 1985; Păunescu, 1998, 2000, 2001). In Moldova, the fossils of this large

herbivorous appear either in the terraces of some rivers or in the lassoed accumulations. Among the significant localities, we can mention localities such as Ripiceni-Izvor (Simionescu, 1990), Iaşi, Aroneanu (Macarovici, 1975), Hulubăț (Macarovici, 1958, 1975), Băneasa (Trelea and Sficlea, 1984).

Genus *Alces* GRAY 1821

Alces alces LINNAEUS 1758

Material: Horn



Picture 18 *Alces alces*, from Zorleni

Discussions: As far as the fossil forms are concerned, *A. alces* is practically recorded throughout the entire Romanian territory (except for Dobrogea, where such remains have not been signaled yet), starting with the upper Pleistocene, after which the populations have probably become more consistent during the post ice age, as mentioned by Rădulescu and Hermann (1969).

Sub-Family Capreolinae BROOKES 1828

Gen *Capreolus* size

Material: right tibia

Picture 19 *Capreolus*, from Mânăstirea

Discussions: The dimensions are close to the specimen from Malusteni described by Simionescu (1930). Tibia of the capreolines is not a major element for the determination of the species; this is why our recordings stopped with the naming of the genus.

Order Proboscidae ILLIGER 1811

Family Mammutidae HAYS 1922

Genus *Mammut* BLUMENBACH 1799

Material: right V phalange.

Picture 11 *Mammut*, from Obârseni

Discussions: the mammals' fauna from the lower Pliocene is made up mainly of taxa common from the upper Miocene. Among the proboscidians, the elephants with long ivories, the *Anancus* and the mastodons kept their position as the largest mammals from the lower Pliocene forests from the South – Eastern Europe.

Family Elephantidae GRAY 1821

SubFamily Mammuthinae SIMPSON 1945

Genus *Mammuthus* BURNETT 1830

Material: pelvic belt bones

Picture 20 *Mammuthus*, from Fălciu;
Pelvic belt fragment

Discussions: the genus *Mammuthus* is widely spread in Muntenia and Moldova. Regularly, the more frequent fossils from these mammals are the dental crowns. Their frequency can be explained through the interesting

teeth structure in these proboscidians as well as their high sensitivity in being fossilized.

The invertebrates' fossil fauna collected and determined from contains various species. Thus *Mactra caspia caspia* EICHWALD, *M. bulgarica* TOULA, *M. caspia* EICHWALD, *Pirenella caspia* ANDRUSSOW, *Melanopsis subulata* SOWERBY, *Pseudamnicola sarmatica depresa* JEKELIUS, *Planorbis (Tropidiscus) semperviratus* Ziegler, *Unio sandbergeri* NEUMAYR are re-framed, belonging to the upper Sarmatian, while *Barbotella neumayri* COBĂLCESCU, *Dorsanum (Buccinum) pauli* COBĂLCESCU, *Plicatiforma fittoni* D'ORBIGNY belong to the middle Sarmatian. In such a mixture, the Chersonian and Bessarabian mollusks are considered to be re-framed in the Pleistocene.

The macroscopic observations point the fact that the fossil mollusks have gone through repetitive transport and rolling processes, being reframed from older deposits. The positions of the shells are chaotic. The bivalves are represented by the genera *Mactra* and *Unio*, and the gastropods are much more diversified systematically (Bejan et al., 2012).

The Simila site contains a numerous invertebrates and vertebrates fauna. Because the anthropic excavations carry on, there are real chances to discover from now on osteological material interesting from the paleontological point of view.

Chapter VI. TAPHONOMY

VI.1. Sedimentary context

Special attention was given to the bones which displayed high friability, thus susceptible to break very easily, such as for instance the ones in Falciu. These wet/ dry alternations caused a series of longitudinal and transversal cracks, making it difficult to extract the bone from the sediment without increased care and on site preservation measures.

VI.2. Quantitative and descriptive analysis

In the studied area, the fossils are found in two taphonomic means, each means having a different value as information source for the paleoecologic interpretation, namely:

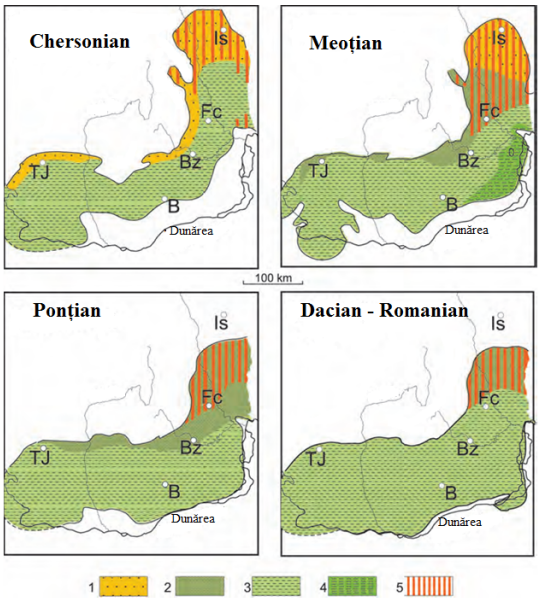
- isolated bones (predominant) at Pogana, Simila, Zorleni, Mânăstirea, Giurcani, Găgesti, Rosiesti and Sălcioara. They are either fallen on the under-layer or in the layer having a visible surface;
- accumulations under the shape of a lens with vertebrates at Fălciu.

The long (elongated) parts are the bones of the limbs which are predominantly tubular and the ribs.

A representative predominance of the remains with flat and long shapes is the lens in Simila and it includes mostly parts from the appendicular skeleton which preferentially orients itself according to the long axis. The compact shape of the parts is not very often met. The conic shapes are mostly represented by teeth.

Chapter VII. PALEO-GEOGRAPHIC CONSIDERATIONS

The northern area of the Dacian Basin is individualized by Saulea et al. (1969) by the extended deposits of fresh water (Picture 20).



Picture 21 The main deposits of fresh water from the Dacian Basin (modified according to Jipa, 2009).
1-litoral salt water deposits; 2- sandy deposits with brackish water; 3- clayey –sandy deposits with brackish water;
4- clayey-lute deposits with brackish water; 5-fresh water deposits.

During the Chersonian there were continental deposits with mammal remains. The Basin has a brackish character during the Pontian. Starting with the Dacian, the basin becomes continental through the withdrawal of the waters to the south. The conglomerate deposits are sandy in the proximity of the source Carpathian and Dobrogean areas and relatively finer (clayey - sandy) in the area between the source – areas.

CONCLUSIONS

The geological study of Huşi – Murgeni – Bârlad – Vaslui – Muntenii de Sus area led to a better knowledge of the sedimentary deposits in the Chersonian – upper Pleistocene.

The field research allowed the collection of a reach evidence material both for chronostratigraphic arguments and for the revealing of the existent sedimentary bio-lithofacies at the level of the upper Miocene - Pliocene deposits.

Besides the outcrops described in the specialty literature, we have identified new natural openings and we have erected lithostratigraphic columns. They are to be found in the proximity of Padureni locality at the places called ”Nisipărie”, ”Doi stejari”, ”Pădurea cu pini”, Pogana, Mânăstirea, Fălciu, Simila. Following the complex of the Nuțasca-Ruseni cinerites on the direction north – south at the locality Muntenii de Sus, we have identified outcrops at Bogdana, Deleni, Valea lui Darie, Barboşi and Sălcioara.

In the deposits at Pogana, we have identified osteological material which belonged to the *Chilotherium* sp species. The paleontological material is made up of teeth: a molar and a premolar, vertebra, ribs remains and other fragments which could not be determined. The species found at Pogana was less spread on the territory of Romania.

On the bank of Prut, at the locality Falciu, we have collected paleontological material from Maeotian deposits, which belonged to the genus *Aceratherium*. The paleontological material consists of two right sided

mandibles made up of premolar and molar; thoracic limb made up of humerus, ulna, radius and metacarpus; astragal.

The Romanian deposits were studied at the openings from Mânăstirea and Obârşeni. From the fossil material collected we have determined the following vertebrates' taxa: *Testudo* sp., *Ochotona ursui* SIMIONESCU, *Stephanorhinus megarhinus* DE CHRISTOL, *Capreolus* sp. (Mânăstirea) and *Testudo* sp., *Mammut* (Obârşeni).

The Pleistocene fauna at Zorleni is represented by the species: *Canis lupus* LINNE, *Megaloceros giganteus* BLUMENBACH, *Alces alces* LINNAEUS.

In the deposits which outcrop on the bank of Prut River, at Falciu locality, we have collected and determined a Pleistocene vertebrates' fauna having the following taxa: genus *Mammuthus* and the *Bison priscus* BOJANUS species.

At Simila taxa representative of the vertebrates were identified, including herbivores and carnivores, but also representatives of the invertebrates. The vertebrates bones are very rolled over and they did not allow their determination except at the genus level: *Testudo*, *Hipparion*, *Bos* and *Canis*.

The invertebrates' fossil fauna collected and determined contains numerous species. Thus *Mactra caspia caspia* EICHWALD, *M. bulgarica* TOULA, *M. caspia* EICHWALD, *Pirenella caspia* ANDRUSSOW, *Melanopsis subulata* SOWERBY, *Pseudamnicola sarmatica depresa* JEKELIUS, *Planorbis (Tropidiscus) semperviratus* ZIEGLER, *Unio sandbergeri* NEUMAYR are reframed, belonging to the upper Sarmatian, whereas *Barbotella neumayri* COBĂLCESCU, *Dorsanum (Buccinum) pauli*

COBĂLCESCU, *Plicatiforma fittoni* D'ORBIGNY belong to the Middle Sarmatian. In such a mixture, the Chersonian and the Bessarabian mollusks are considered to be reframed to the Pleistocene.

In the studied area, the fossils are found in two taphonomic means, each having a different value as information source for the paleoecologic interpretation, namely:

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- accumulations in the shape of a vertebrates lens at Falciu.

Tectonically, the deposits from the studied area have a quasi-horizontal layout, with a slight tilt appreciated at a 5 – 6 m/km average value, from NW to SE.

As far as we are concerned, we consider the paleogeographic model of the Dacian Basin suggested by Jipa (2006) to correspond with the deposits outcropping in the studied perimeter from the upper Miocene – upper Pliocene interval.

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