

THE PONTIAN BIOSTRATIGRAPHY IN THE CISLAU AREA (THE BUZAU VALLEY BASIN)

Rodica MACALEȚ

National Institute of Hydrology and Water Management, 97 Bucuresti-Ploiesti Sos., Bucharest

Abstract. In the Cislau area the Pontian deposits have a complete development and from the lithological point of view there is an alternation of clays, sandy clays, and sands. On the Titu Valley one complete succession of the Pontian deposits is observed. The Lower Pontian (Odessian) overlies, concordantly, on the last lumachellic levels from the Upper Meotian (Moldavian) and is constituted from clays with *Paradacna abichi*. At this level, from the lithological and faunistic point of view, there are differences between the Titu and Nămoalele valleys. The Middle Pontian (Portaferrian) are developed in the classical facies of the "Congeria rhomboidea beds" and are constituted from the clays with alternations of sands. The Upper Pontian (Bosphorian) is constituted from an alternance of calys, sandy clays and sands. The Bosphorian faunas has yielded a species large variety of the following genera: *Pontalmyra*, *Prosodacna*, *Dreissena* and *Viviparus*. The last deposits on the Titu Valley, after mollusc fauna, are attributed to Lower Dacian (Getian).

Keywords: Dacic Basin, Pontian, Biostratigraphy, Mollusc

INTRODUCTION

The studied area is situated south of the Buzău Valley, namely in the western part of the Cislău village (Fig. 1).

The most interesting results were obtained in the profiles from the Tițu Brook (right tributary of the Bâsca Chiojdului Valley) and from the Nămoalele Valley (left tributary of the Aninoasa Valley).

The aim of our investigations was the biostratigraphy of the Pontian in this area through by proving the existence of different substages of the Pontian (Odessian, Portaferrian, Bosphorian) and of its lower and upper boundaries.

References to this zone belong to Nicolescu Mauriciu (1964). In the frame of the Pontian, this author separates three levels: lower, with *Congeria rumana* SABBA and *Paradacna abichi* (R. HOERNES); middle, with *Congeria rhomboidea* M. HÖRNES; upper, with *Philocardium planum planum* (DESHAYES). Some studies about the Upper Neogene (mainly of Meotian, Pontian, Dacian) from the Subcarpathians zone belong to: Andreescu (1972, 1973), Filipescu & Hanganu (1966), Hanganu (1966), Hanganu & Papaianopol (1982, 1984), Macarovici (1961), Macarovici *et al.* (1965), Marinescu (1964, 1967, 1978), Motaș (1960), Motaș & Papaianopol (1972), Nicolaescu *et al.* (1980), Pană (1966, 1971), Papaianopol (1974, 1976), Papaianopol & Motaș (1978), Papaianopol & Olteanu (1979), Pauliuc (1975), Pavnotescu *et al.* (1980), Teisseyre (1909), Wenz (1942).

THE PONTIAN BIOSTRATIGRAPHY

In the Dacic Basin, the Pontian deposits covered considerable surfaces. They are very important both through the lithofacies diversity, and rich and diverse paleontological content.

In the above mentioned area, the Pontian stage is completely developed, the Odessian, Portaferrian and Bosphorian substages being separated.

The Pontian deposits concordantly overlap the upper part of the Upper Meotian (Moldavian) which is represented by lumachellic clays with *Congeria (Andrusoviconcha) novorossica navicula* SINZOW (a situation found on the Tițu Brook).

The Lower Pontian (Odessian)

This substage is developed in the argillaceous facies of the "Paradacna abichi Beds". This facies is vastly spreaded in the whole Muntenia area between the Buzău and Ialomița Valley.

On the Tițu Brook, over the last lumachellic level with *Congeria ex.gr. novorossica* which belongs to the Upper Meotian there are disposed massive slightly sandy clays with *Prosodacnomya rostrata* (SINZOW), *Pseudo-prosodacna* sp., followed by clays with *Paradacna*. In the former clays decimetric levels of sands with *Pseudoprosodacna semisulcatoides* (EBERSIN) and stratified clays with very numerous species of *Paradacna* were noticed. The macrofauna includes: *Paradacna abichi*, *P. abichi abichiformis* (GORJANOVIĆ-KRAMBERGER), *P. minor* EBERSIN, *P. okrugici* (BRUSINA), *Congeria (Rhombocongeria) rumana*, *Limnocardium zagabiense* BRUSINA. The Odessian thickness on this brook is about 40 m.

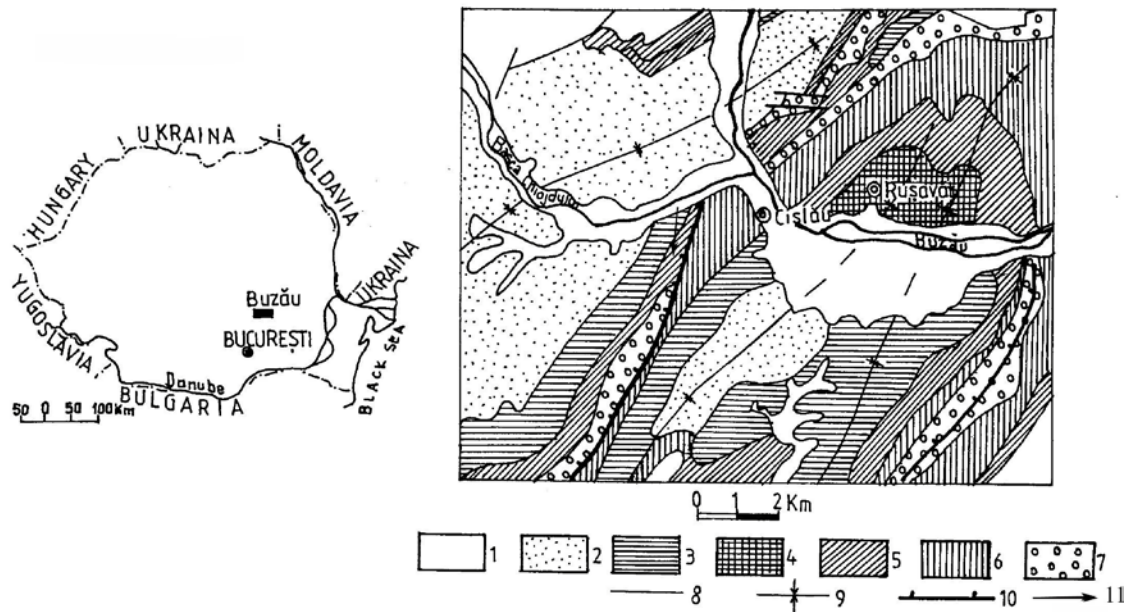


Fig. 1 Location and geological map of the Cislău area scale 1 : 200. 000) 1, Holocene-Middle Pleistocene deposits; 2, Lower Pleistocene-Romanian deposits; 3, Dacian+Pontian deposits ; 4, Pontian deposits ; 5, Meotian deposits ; 6, Sarmatian deposits ; 7, Lower Miocene deposits; 8, geological limit; 9, sincline axe ;10, reverse fault; 11, zona de interes.

On the Nămoalele Brook, the Odessian deposits are represented, from a lithological point of view, by gray clays with concoidal break. These deposits yielded a macrofauna with *Paradacna abichi*, *Valenciennius* sp., alternating with sheeting clays with *Paradacna abichiformis*, *Valenciennius* sp., *Dreissena* sp., and *Pseudocatillus* aff. *pseudocatillus* (BARBOT).

The alternation, on the Tițu Brook, of some fossiliferous levels abundant in *Prosodacnomya* and *Pseudoprosodacna* (3-4 levels) with others abundant in *Paradacna*, is to be emphasized. This alternation indicates salinity oscillations which have determined the deposition of some levels with different macrofaunas. In the “*Paradacna abichi* Beds” deposition time we consider that salinity had values of 7-8 ‰, being of mixed-mesohaline type; in the sedimentation time of the “*Pseudoprosodacna*” deposits the salinity had values of 1-4 ‰, being of mixed-oligohaline type.

The Middle Pontian (Portaferrian)

Biostratigraphically, the Middle Pontian can be defined as the stratigraphic interval characterized by the development of congerias pertaining to the *Rhombocongeria* subgenus.

Lithologically, there is a noticeable lithofacial diversification with direct implications on the macrofaunistic complexes which are either poorer or richer, more diversified or more uniform, depending on lithology.

In argillaceous facies the faunistic associations are characterized by the species presence of *Congeria*, *Paradacna* and *Valenciennius*. In sandy facies you will notice the lack of the rhombocongerias, paradacnas ex

gr. *abichi*, and *Valenciennius* genus. It proliferates the following genera: *Plagiodacna*, *Pontalmyra*, *Chartoconcha*, *Pseudocatillus*, *Melanopsis* and *Viviparus*.

The “*Paradacna abichi* Beds” continues in the Portaferrian too, but the appearance of the *Congeria* (*Rhombocongeria*) *rhomboidea* species points out the presence of the Middle Pontian.

On the Tițu Brook, in the stratified blackish clays - about 4 m thick - *Congeria* (*Rh.*) *rhomboidea*, *Congeria* (*Rhombocongeria*) *rumana*, *Caladacna steindachneri* (BRUSINA) and *Pontalmyra* sp. were identified.

The sedimentation follows with gray clays with more evident stratification in which there are *Paradacna abichi* and *P. abichi abichiformis*.

On about 300 m in length the brook is covered with slided deposits; after this portion appear blackish clays and slightly stratified clays (about 8-10 m) in which we identified the *Viviparus* sp.

On the Nămoalele Brook the Portaferrian sedimentation begins with nonfossiliferous gray sands, which are followed by stratified clays with *Zamphiridacna* sp., *Paradacna abichi*, nonfossiliferous blackish clays, sands and gray clays with irregular break, slightly stratified. These deposits yielded a faunal assemblage with: *Congeria* (*Rhombocongeria*) *rhomboidea*, *Zamphiridacna portaferrica* PAPAIANOPOL, *Valenciennius* sp., *Dreissena sermyca oresacensis* STEVANOVIĆ, *Pseudocatillus* sp., and *Pontalmyra* sp.

Compared to the Tițu Brook, on the Nămoalele Brook the sands are more abundant but still subordinate to the clays.

The Upper Pontian (Bosphorian)

In the Dacic Basin, the Upper Pontian (Bosphorian) is known under the name of “*Phyllocardium planum planum* Beds” due to the high frequency of this species, often making even lumachelles.

In the basis of Upper Pontian deposits the sedimentation of “*Paradacna abichi* Beds” continue.

On the Buzău valley and the Dâmbovița valley the Upper Pontian deposits develop under three main lithofacies (Papaianopol, 1974):

- lithofacies, mostly argillaceous which can or cannot have the basal part developed in the “*Paradacna abichi* Beds” facies;

- lithofacies, mostly prevailing sandy;

- lithofacies consisted of an argillaceous and sandy deposits alternance; in this case, the argillaceous deposits are more frequent in the basal part of the pile.

Lithologically, the Bosphorian is constituted of an alternance of clays, sandy clays and sands.

On the Tițu Brook the beginning of the Upper Pontian sedimentation is marked by an alternance of grey sands and clays (ca. 4-5 m). In the clays, the faunistic association is the following: *Pontalmyra* sp., *Pseudocatillus* sp., *Melanopsis decollata* STOLICZKA. It is followed by an alternance of sandy clays, sands and sandstones with *Paradacna retowski* ANDRUSOV, *Pontalmyra* sp., *Lithoglyphus* sp., grey clays with *Pontalmyra semisulcata*

(ROUSSEAU) and a sequence (ca. 4 m in thickness) of sands with fossiliferous detritus and sandstone levels. In sands, the fauna is represented by *Pontalmyra* ex.gr. *semisulcata* (ROUSSEAU), *Viviparus achatinoides* (DESHAYES), *Dreissena stefanescui* FONTANNES and *Prosodacna (Prosodacna) semisulcata* (ROUSSEAU).

The Bosphorian deposits succession finish with massive clays, having detritus zones.

On the Tițu valley, which offers a complete section of the Pontian deposits, one can also notice the Lower Dacian deposits 700-800 m thick pile.

A synthetic stratigraphic column is presented in Fig. 2.

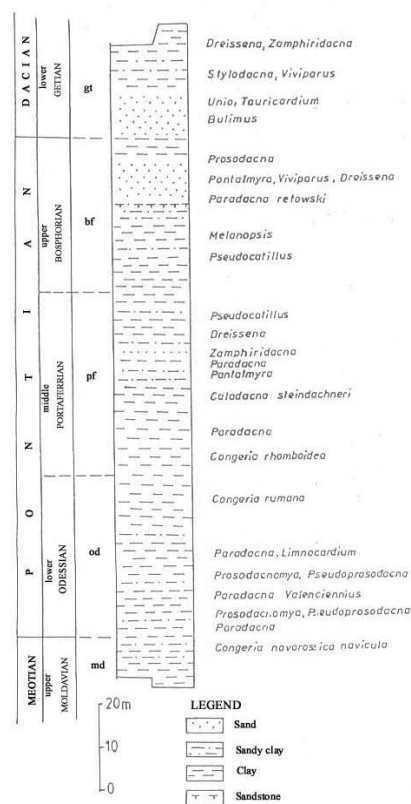


Fig. 2 Synthetic stratigraphic column of the Pontian from the Cislău area

The Lower Dacian (Getian)

Over the Upper Pontian deposits there are lumachellic sands (which marked the beginning of the Lower Dacian sedimentation) with *Dreissena rimestiensis* FONTANNES. It is followed by a sequence of 7 m thickness which contains the following faunistic association: *Unio (Rumanunio) rumanus* TOURNOUÉR, *Prosodacna longiuscula* GILLET & MARINESCU, *Pachydacna (Parapachydacna) cobalcescui* (FONTANNES), *Zamphiridacna orientalis* (SABBA), *Limnocardium (Tauricardium) olteniae* IONESCU-ARGETOAI, L. (T.) *petersi nasyrica* EBERSIN, and *Bulimus (Tylopoma) speciosus* COBALCESCU.

The sedimentation continues with clays containing *Stylodacna* sp. and *Viviparus* sp. and reddish and yellowish medium grainsize sands with: *Viviparus argesiensis* SABBA, *Dacicardium rumanum* (FONTANNES), *Stylodacna* sp., and big congerias such as: *Congeria (Mytilopsis) volatica* PAPAIAPOPOL and *C. (M.) aff. subcarinata* (DESHAYES).

In the sandy clays which are disposed over sands, the faunistic assemblage is very rich, being represented by: *Zamphiridacna orientalis*, *Viviparus dacianus* LUBENESCU, *Prosodacna (Psilodon) munieri* SABBA, *Dreissena rumana* SABBA, *D. rimestiensis* FONTANNES, *Stylodacna heberti* (COBALCESCU), *Bulimus (Tylopoma) sp.*

CONCLUSIONS

The Pontian succession, on the described profile, point out, from lithological point of view, the prevailing of the argillaceous deposits.

The sandy levels are more frequent only in the Upper Pontian (Bosphorian), whereas the Odessian and Portaferrian are almost exclusively argillaceous. This explains the presence of the "*Paradacna abichi* Beds" both in the Odessian and in the Portaferrian substages. The faunas of these two substages are similar enough and only the appearance of the *Rhombocongeria*, from the "*rhomboidea*" group, allows the establishment of the boundary between the Odessian and Portaferrian substages. This faunistic monotony is disturbed by some levels with *Prosodacnomya* and *Pseudoprosodacna*, identified only in the Odessian.

The Bosphorian fauna yielded a large variety of species, such as: *Pontalmyra*, *Prosodacna*, *Dreissena* and *Viviparus*.

The boundary with the Lower Dacian is pointed out by the appearance of the species of *Pachydacna*, in assemblage with new species of *Zamphiridacna*, *Tauricardium*, *Prosodacna* and *Viviparus*.

REFERENCES

ANDREESCU I., 1972, Contribuții la stratigrafia Dacianului și Romanianului din zona de curbură a Carpaților Orientali. D. S. Inst. Geol., **LVIII**, 4, București.
ANDREESCU I., 1973, Precizări asupra limitelor etajului Meotian. Stud. cerc. geol. geofiz. geogr., Seria Geologie, **2**, 18, București.

FILIPESCU M.G., HANGANU E., 1966, Asupra vârstei și orizontării stratigrafice a depozitelor neogene postsarmatice din Subcarpați. Stud. cerc. geol. geofiz. ,geogr. (geologie), **11**,1, București.
HANGANU E., 1966, Studiul stratigrafic al Pliocenului dintre văile Teleajen și Prahova (reg.Ploiești). Stud. tehn. econ., **J**, **2**, București.
HANGANU E., PAPAIAPOPOL I., 1982, Sur les limites du étage Pontien dans le Bassin Dacique. Anal. Stiinț. Univ. "Al. I. Cuza" Iași (serie nouă), sect. II, b, Geologie-Geografie, **XXVIII**, 63-67, Iași.
HANGANU E., PAPAIAPOPOL I., 1984, Sur la biostratigraphie du Pontien entre la vallée du Buzău et vallée d'Olt (Dépression Subcarpatique, Munténie). 75 years of the Laboratory of Paleontology. Spec. vol., 247-260, București.
MACAROVICI N., 1961, Observații stratigrafice pe structura Berca-Arbănași (cu privire specială asupra limitelor Dacianului). Acad. R.P.R., Stud. cerc. geol., **VI**, 3, București.
MACAROVICI N., MARINESCU FL., MOTAS I., 1965, Asupra Neogenului superior și a Pontianului s.str. din Bazinul Dacic. Stud. cerc. geol. geofiz. geogr. (geologie), **10**, 2, București.
MARINESCU FL., 1964, Propuneri cu privire la orizontarea Pontianului din partea occidentală a Bazinului Dacic. Stud. cerc. geol. geofiz. geogr., seria geologie, **9**, 1, București.
MARINESCU FL., 1967, Precizuni asupra stratigrafiei Portaferrianului din vestul Bazinului Dacic. D. S. Inst. Geol. **LII**, 2, București.
MOTAS I.C., 1960, Pontianul din bazinul Râului Alb-Valea Dâmboviței. Bul. Inst. Petrol, Gaze, Geol., **VI**, București.
MOTAS I.C., PAPAIAPOPOL I., 1972, Biostratigrafia succesiunii Meotian-Pleistocen dintre Călugăreni și Vadu Săpat (jud. Prahova). D. S. Inst. Geol., **LVIII**, 4, București.
NICOLAESCU V., LUBENESCU V., IAVORSKI M., IONESCU ST., DAMIAN R., 1980, Contribuții la cunoașterea biostratigrafiei depozitelor Neogenului superior din regiunea valea Ialomiței și valea Cricovul Dulce. D. S. Inst. geol. geofiz., **LXV**, 4, 133-146, București
NCOLESCU ST. MAURICIU, 1964, Studiul Miocenului și Pliocenului din regiunea Cislău-Salcia-Lapoș. An. Com. Geol., **XXXIII**, București.
PANA I., 1966, Studiul depozitelor pliocene din regiunea cuprinsă între valea Buzăului și valea Bălăneasa. Com. Stat. Geol., St. tehn. econ., **J**, **1**, București.
PANA I., 1971, Lithofaciés et faciés paléontologiques dans la région de la courbure des Carpates Orientaux. Föld. Közl. Bul. Soc. Géol. Hongrie, Colloquium on the Neogene Budapest, **101**, 2-3, 254-264, Budapest.
PAPAIAPOPOL I., 1974, Faciesurile și posibilitățile de corelare ale Pontianului superior (Bosphorian) dintre valea Cricovul Sărat și valea Tohăneasa (jud. Prahova). D. S. Inst. Geol., **LX**, 5, București.
PAPAIAPOPOL I., 1976, Faciesurile și limitele portaferrianului din zona cutelor diapire experme dintre valea Cricovul Sărat și valea Unghiului (jud. Prahova). D. S. Inst. geol. geofiz., **LXII**, 4, București.
PAPAIAPOPOL I., MOTAS I.C., 1978, Marquers biostratigraphiques pour les dépôts post-chersoniens du Bassin Dacique. D. S. Inst. geol. geofiz., **LXIV**, 4, București.
PAPAIAPOPOL I., OLTEANU R., 1979, Contribution a l'étude du Pontien supérieur (Bosphorien) dans la partie orientale du Bassin Dacique. Rev. rom. géol. géophys. géogr. (géologie), **23**, 2, 231-247, București.
PAULIUC M., 1975, Variații de facies ale depozitelor sarmatopliocene dezvoltate între valea Teleajenului și valea Cricovul Sărat. Anal. Univ. București, Stiințele naturii, **XXIV**, 97-102, București.
PAVNOTESCU V., ILIESCU O., PARASCHIVESCU C., 1980, Observații biostratigrafice asupra depozitelor neogen superioare de la Boteni (jud. Argeș). D. S. Inst. Geol. Geof., **LXV**, 4, 147-155, București.

WENZ W., 1942, Die Mollusken des Pliozäns der rumänischen Erdölgebiete. *Senckenbergiana*, **24**, 293 p., 71 pl., Frankfurt am Main.