

CONTRIBUTIONS TO THE ESTABLISHMENT OF THE AGE
OF "CRYPTOMACTRA CLAYS" OF THE MOLDAVIAN PLATFORM

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Abstract: The clays with *Cryptomactra* represent a lithostratigraphical unit (320 m thick) which is specific for the eastern part of the Moldavian Platform (the neritic-pelitic lithofacies, with *Cryptomactra*).

Although Cobălcescu (1883) and Simionescu (1903) mentioned the existence of the lithofacies with *Cryptomactra*, the merit of its recording goes to Văscăuțeanu (1929), who discovered the fauna at Ungheni. After that date, other contributions mentioned some new fossiliferous points (D. M. Preda, Emilia Saulea-Bocec, 1948; N. Macarovici et al., 1957; Natalia Paghida-Trelea, 1969; P. Jeanrenaud, 1971; L. Ionesi, Bica Ionesi, 1992).

In the summer of 1996 I discovered at the Vlădiceni quarry an assemblage similar to that at Ungheni. The identified fauna consists in bivalves, gastropods, foraminifers and vertebrate remains. This assemblage corresponds to the biozone with *Plicatiforma fittoni*, *Mactra fabreana* and *Cryptomactra pesansensis*, typical of the Upper Bessarabian.

Key words: Moldavian Platform, Sarmatian, Biostratigraphy

From the numerous Sarmatian deposits of the Moldavian Platform, a great part of them (about 500 m) belongs to the Bessarabian. These Bessarabian deposits, which are located in the eastern part of the Platform, possess a varied lithological composition from clays and siltites to sandstones and limestones, but most of them are clays.

The "*Cryptomactra* clays" constitutes a representative lithostratigraphic sequence for the Sarmatian of the Moldavian Platform. During their accumulation, within the fauna assemblage, the taxon *Cryptomactra pesansensis* May, developed and became characteristic. The lithology of this unit comprises clays and grey-bluish siltites, with some thin interbeds of argillaceous and silty sands.

Kolesnikov (1935) introduced the name of "*Cryptomactra* clays", but Andrussov described them in 1903 for the first time, in the Taman peninsula.

On the Moldavian Platform the research of these clays was initiated by Cobălcescu, who described the profile of the Vămășoia River (Repedeia hill) in 1862 and 1863. This profile was made up of "bluish clay" at the base and which were classified as "basic clays". As for their location in time, Cobălcescu considered them to belong to the Sarmatian.

In 1903, Simionescu formulated another opinion on these clays, considering that "basic clays" can be divided into two parts, of which the lower one is assigned to the "Miocene marine" (Badenian), and the upper part, that is the clays situated under the oolitic sandstone and limestones, is assigned to the Sarmatian. Simionescu considered that these "basic clays" had been massed inside a basin, which underwent a plunging process with the axle of the maximum depth at the front of the line crossing Moldavia from N to S, somewhere between the Siret and the Prut Rivers. The author put forward that, at the same time, the "*Lithothamnium* limestones" and "*Pecten* siltstones" (Badenian) were accumulating near the boundaries of the Russian Platform.

David (1914, 1922) agreed with Simionescu on the "basic clays" division into Sarmatic and sub-Sarmatic, but he underlined that "the sandy clays and gritty-siltstones which are overlain by lower Sarmatian levels", are "Buglowo levels" representing the last vestiges of the Vindobonian on the Moldavian Platform.

Also, in 1927, Simionescu used for "the basic clays" the name of sub-Sarmatic clays, considering that they reach some 500 m in thickness.

The year 1929 represents the moment of an important elucidation in the geology of the Moldavian Platform, by Văscăuțeanu's discovery inside the bank of the Prut, at Ungheni, of a rich and varied fauna assemblage (foraminifers, bryozoans, bivalves, gastropods, ostracods, vertebrate fauna). In the examined clays, known than as "basic clays", the taxon *Cryptomactra pesansensis* May was found for the first time, together with *Plicatiforma fittoni* d'Orb., *Mactra fabreana* d'Orb., *Obsoletiforma obsoleta* Eichw., *O. barbotti* Hoern., *O. michailovi* Toulou, *Tapes naviculatus* (Hoern.) etc. This assemblage enabled Văscăuțeanu to state the idea, quite revolutionary at that time, that those clays belong to the Bessarabian, the new found fauna being extremely similar to the one of the calcareous Bessarabian deposits.

After Văscăuțeanu's new indications and explanation (1929) of "basic clays", which contained the taxon *Cryptomactra pesansensis* May, only a few explanations as to the developing area and its thickness (Preda, Saulea-Bocec, 1948) as well as assessments as to their age, being considered to belong to the lower Bessarabian were added. More and more, frequently the name of "*Cryptomactra* clays" is used.

Proving in 1992 the impossibility of the prolongation west of this lithostratigraphic unit, which Pătruț also had attempted to demonstrate in 1990, and especially the location over the *Cryptomactra* clays of some deposits with an obvious Volhynian fauna, L. Ionesi and B. Ionesi assigns them to the first part of the Upper Bessarabian (Fig. 1).

Our concerns about this lithostratigraphic unit aimed to elucidate the finding of the limits of the deposits beneath (Volhynian) with those of the upper levels and especially the fauna assemblage.




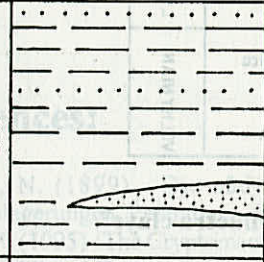
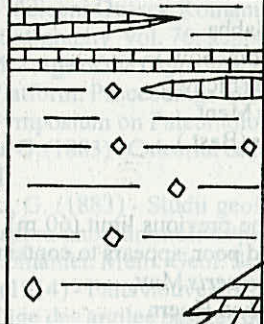
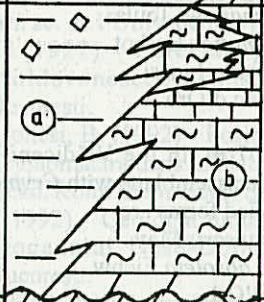
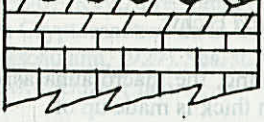
m	Lithologic column	Lithologic units	Fauna	Age	
5		Scheia sands and sandstone Repedea limestone	<i>Plicatiforma fittoni</i> <i>Macra fabreana</i>	B A S A R A B I A N	A
20		Bârnova sands	<i>Macra macarovici</i> <i>Macra naviculata</i> <i>Macra supernaviculata</i> <i>Macra tapesoides</i> <i>Porosonion</i> sp.		
~250		Vladiceni clays and sands		B A S A R A B I A N	A
320		Clays with <i>Cryptomacra</i>	<i>Cryptomacra pesanseri</i> <i>Obsoletiforma barboti</i> <i>Obsoletiforma mihailovi</i> <i>Plicatiforma fittoni</i> <i>Macra vitaliana</i> <i>Macra podolica</i> <i>Dogielina sarmatica</i> <i>Quinqueloculina voloshinovae</i>		
50 - 90		Zlătunoaia limestone Darabani-Mitoc clays	<i>Macra eichwaldi</i> <i>Ervilia dissita</i> <i>Ervilia podolica</i> <i>Inaequicostata pia</i> <i>Inaequicostata gleichenbergense</i> <i>Quinqueloculina reussi</i> <i>Articulina sarmatica</i> <i>Elphidium rugosum</i>	V O L H I N I A N	A
~50		a. Darabani Mitoc clays b. Marls and biohermic limestones	<i>Inaequicostata inopinata</i> <i>Obsoletiforma ruthenica</i> <i>Möhrensternia inflata</i> <i>Cibicides badenensis</i> <i>Quinqueloculina fluviata</i> <i>Quinqueloculina karrerii ovata</i>		
		Marls Limestones	<i>Chlamys elegans</i> <i>Dentalium vitreum</i> <i>Bulimina elongata</i> <i>Bolivina dilatata</i> <i>Textularia tarchanensis</i>	K O S S O V I A N	B A D E N I A N

Fig. 1 - Lithostratigraphy of the Sarmatian of the eastern Moldavian Platform

The following of the outcrops is very difficult, because of the continuity in sedimentation. In the specific context of the central part of the Moldavian Platform the existence of a neritic lithofacies in a large area allowed the development of the taxon *Cryptomacra pesanseris* May, and whose appearance in assemblages, after the most recent biozonations is considered to be at the beginning of the

Bessarabian.

The lower limit of the *Cryptomacra* clays could be followed north of Santa Mare (altitude 60 m) inside the bank of the Prut, then at Rânghileși-Deal (altitude 90 m) at Prisăcani and Nicolae Bălcescu (altitude 150 m) in the Miletin valley.

Alt. m	Depth in drilling m	Lithologic column	Lithologic units	Fauna	Age	
+3,5	95		marls	Articulina problema Obsoletiforma michailowi Obsoletiforma barboti Tapes naviculatus Tapes gregarius Cryptomacra pesanseris	LOWER Bessarabian	
0	100					bluish-grey clays
-1,5	105					
-11,5	110	marls	bluish-grey clays	Articulina sarmatica Tapes vitalianus Ervilia podolica Inaequicostata pia	VOLHYNIAN	
	115					
	120					
-26,5	125					

Fig. 2. Șipote drilling. The lower limit of the "Cryptomacra clays"

During a series of drillings at Șipote, Bivolari, Nicolina-Iași, the lower limit of *Cryptomacra* clays could be determined and placed at the disappearance of taxa in the assemblages: *Ervilia podolica* Eichw., *Inaequicostata pia* Zhizh. (Volhynian) and the settlement of the *Cryptomacra pesanseris* May, *Obsoletiforma barboti* Hoern, *O. michailowi* Toula, etc (Fig. 2).

In the Șipote drilling, the lower limit of the "Cryptomacra clays" (the Volhynian-Bessarabian limit) is placed at the highest altitude - 16 m, at Bivolari +9 m and at Nicolina-Iași - 165 m.

At the upper part the "Cryptomacra clays" support the pelitic sandy deposits, with different biofacies characteristics (deposits with small macras). This upper limit could be followed very well in the Vlădeni-Tomești quarry at the altitude of 107 m, then on the Bârnova's bank (altitude 130 m).

In the Vlădiceni quarry at the altitude of 60 m one should mention a fine sandy interbed, abundant in fossils. The fauna discovered here is represented by:

- Plicatiforma fittoni* d'Orb.
- Plicatiforma plicatofittoni* Sinz.
- Obsoletiforma barboti* Hoern
- Obsoletiforma michailowi* Toula
- Obsoletiforma sarmatica* Barbot
- Maetra vitaliana* d'Orb.
- Maetra fabreana* d'Orb.
- Maetra podolica ovata* Ionesi
- Cryptomacra pesanseris* May
- Tapes gregarius gregarius* (Partsch.)
- Solen subfragilis* Eichw.
- Musculus sarmaticus* (Gat.)
- Modiolus incrasatus* d'Orb.

- Unio moldavicus* Sabba
- Potamides disjunctus* (Sow.)
- Hydrobia elongata* (Eichw.)
- Hydrobia ventrosa* Ment
- Hydrobia stagnalis* (Bast.)
- Phoca* sp.

Over 10 m from the previous limit (60 m), another assemblage, less varied and poor, appears to contain:

- Cryptomacra pesanseris* May
- Obsoletiforma barboti* Hoern
- Obsoletiforma michailowi* Toula
- Obsoletiforma sarmatica* Barbot
- Maetra podolica ovata* Ionesi
- Maetra aff. fabreana* d'Orb.

At the altitude 107 m, in the Vlădiceni-Tomești quarry, the last traces of the assemblage with *Cryptomacra* can be noticed. The identified forms are:

- Cryptomacra pesanseris* May
- Obsoletiforma aff. obsoleta* Eichw.
- Maetra vitaliana* d'Orb.
- Maetra aff. podolica* Eichw.

In the Șipote drilling, the macrofauna assemblage identified in a layer 115 m thick is made up of:

- Cryptomacra pesanseris* May
- Tapes gregarius gregarius* (Partsch.)
- Tapes gregarius aff. ponderosus* d'Orb.
- Tapes naviculatus* (Hoern.)
- Obsoletiforma barboti* Hoern.
- Obsoletiforma michailowi* Toula
- Obsoletiforma gatuevi* Kol
- Inaequicostata suessi* Barbot

Maetra andrussowi Kol.

Potamides disjunctus (Sow.)

Hydrobia uiratamense Kol.

In another zone of *Cryptomacra* clays increase, that is Santa Mare's outcrops beside the deposits found in the Bivolari drilling (62 m thick), I could identify:

Cryptomacra pesansensis May

Tapes gregarius gregarius (Partsch.)

Obsoletiforma sarmatica Barbot

Obsoletiforma barboti Hoern

Maetra podolica podolica Eichw.

Maetra podolica ovata Ionesi

Spirorbis heliciformis Eichw.

The taxon *Cryptomacra pesansensis* May was identified in the fauna assemblage of Vlădeni, Andrieșeni

(Jijia valley) Podu Iloaiei, Dumești (Bahlui valley) and at Ciurea, Voinești, Mădârjac.

Analysing the faunal assemblage of "*Cryptomacra* clays" of the Moldavian Platform, we notice the presence of the taxon *Cryptomacra pesansensis* May spread in the thickness of these deposits, besides which *Obsoletiforma barboti* Hoern. and *O. michailovi* Toulou persist. Another characteristic consists in the existence of taxa *Plicatiforma fittoni* d'Orb., *Maetra fabreana* d'Orb. and *M. naviculata* Bailly at the upper limit of these clays, beginning at the Ungheni boundary. This last assemblage belongs to the biozone *Plicatiforma fittoni*, *Maetra fabreana* and *Cryptomacra pesansensis* specific to the Upper Bessarabian. In conclusion, I may say that the "*Cryptomacra* clays" massed during the period Lower Bessarabian - first part of the Upper Bessarabian.

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