

**BÂLTA (DOLJ COUNTY), AN EXCEPTIONAL FOSSILIPHEROUS ROMANIAN SITE****ENACHE Constantin, POPESCU Aurelian**

**Abstract.** Bâlta fossiliferous site, of Romanian age, is a particular one due to the fact that within a 30 m high stack of sands, the Unionids valves are chaotically scattered and some valves of the same individual are lying vertically, unlike other fossiliferous sites where valves are piled, forming lumachelle. The great thickness of the sands that the Unionids valves are found in and the fact that sands do not have an oblique or crossover stratification testifies that they are lake deposits and not deposits of fluvial bars as some researchers claim, since, in Oltenia at least, there were nowhere found deposits of older interfluves to interrupt the Romanian fossiliferous deposits.

**Keywords:** Bâlta, Oltenia, fossiliferous site, Romanian, Dacian Basin.

**Rezumat. Bâlta (jud. Dolj), un punct fosilifer romanian excepțional.** Locul fosilifer Bâlta, de vârstă romaniană, este deosebit deoarece într-o stivă de nisipuri de 30 m înălțime, valvele de Unionide sunt răspândite haotic, iar unele valve ale aceluiași individ sunt situate în poziție verticală, spre deosebire de alte locuri fosilifere, unde valvele sunt îngrămadite, formând lumașele. Grosimea mare a nisipurilor în care sunt răspândite valvele de Unionide, și faptul că nisipurile nu prezintă stratificație oblică sau încrucișată, demonstrează că acestea sunt depozite lacustre. Ele nu constituie depozite de bare fluviale, cum susțin unii cercetători, deoarece între depozitele fosilifere romaniene, cel puțin din Oltenia, nu s-au întâlnit încăieri depozite de interfluvii, care să întrerupă depozitele ritmice cu ligniți între care se găsesc aceste nisipuri fosilifere.

**Cuvinte cheie:** Bâlta, Oltenia, punct fosilifer, Romanian, Bazinul Dacic.

**INTRODUCTION**

IONESCU-ARGETOAI (1918) mentioned for the first time the Romanian deposits from Bâlta, noting that their presence within the ravines stretching from Braloștita to the north, up to Bâlta village, with three layers:

- the upper marl layer, with *Unio bielzi*, *U. sturdze*, *U. slavonicus*, *U. porumbarui*, *U. herjeui*, *U. wilhemi*, *U. iconomianus*, *U. muniari*, *Viviparus* sp., etc.
- the intermediate sandy layer, with *Unio procumbens*, *U. davilai*, *U. doljensis*, *U. herjeui*, *U. porumbarui*, *U. rudis*, *Pisidium amnicum*, *Vivipara craiovensis*, *V. turgida*, *Neritina* sp., *Melanopsis* sp., etc.
- the base layer of bluish marls, with *Unio slavonicus*, *U. maximus*, *U. clivosus* var. *acutus*, etc.

During the summer of 2008, while searching on the right bank of the Jiu River between Braloștita and Bâlta the ravines described by Ionescu-Argetoia in order to collect some fossil molluscs for Oltenia Museum, the locals pointed to us a spot on the Bâlta valley, which has a right tributary (the Cornet valley), where ‘the spring with shells’ is located; thus, we came across a sandy ravine of about 30 m, where valves of Romanian unionids can be found from top to bottom, many of them in vertical position (Figs. 1, 2, 3). PĂTRUȚOIU (2000) also described this outcrop.

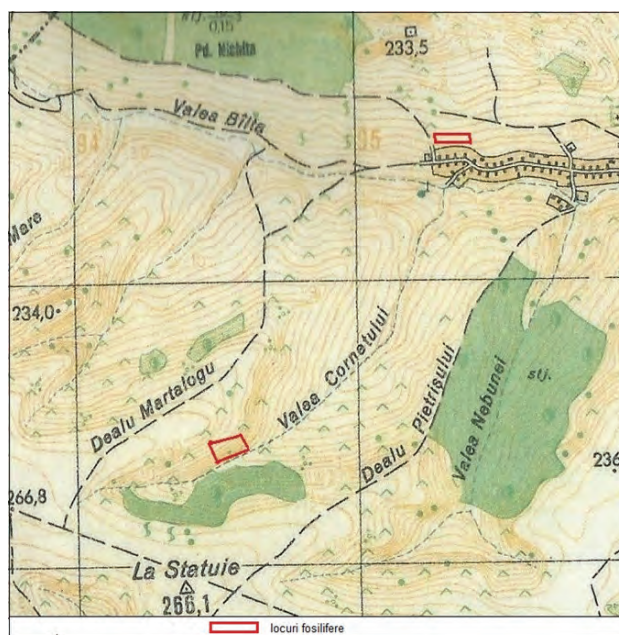


Figure 1. Natural outcrops within Cornet and Bâlta (map of Romania, sc. 1: 25,000).

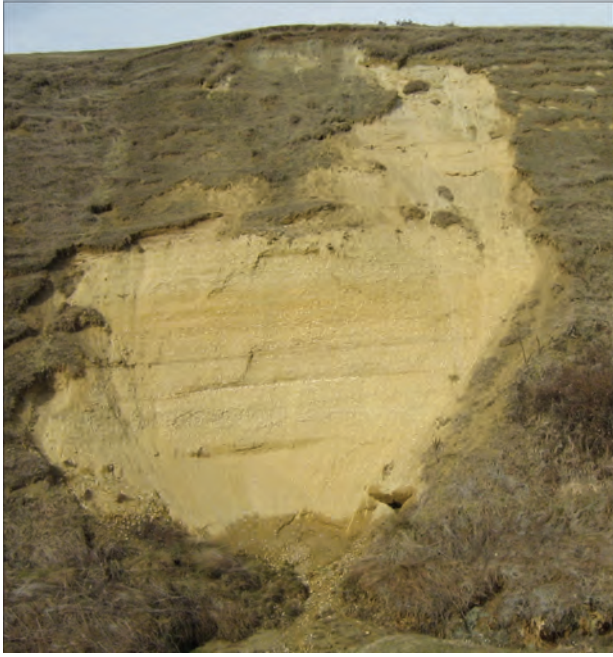


Figure 2. Natural outcrop within the left bank of the Cornet valley in Martalogu Hill (photo Aurelian Popescu).



Figure 3. Outcrop detail within the the Cornet valley in Martalogu Hill (photo Constantin Enache).

For the current study, we went again to Bâlta, to find out this time that there appeared a new outcrop following the excavations in the left bank of the Bâlta valley to build a house; here, valves are displayed in a similar manner to those on the Cornet valley in Martalogu hill (Figs. 1, 4, 5).



Figure 4. Excavation within the left bank of the Bâlta valley (photo Aurelian Popescu).



Figure 5. Excavation detail from the Bâlta valley (photo Aurelian Popescu).

## MATERIAL AND METHODS

As it is out purpose to clarify the particular situation of the fauna from Bâlta which does not form falunes transformed into lumachelles, but it is scattered chaotically into a 30 m stack of sands, we analysed both the fauna material, as well as the ecologic and sedimentation conditions. For this particular aim, we identified the mollusc species that we collected, establishing their living environment (fluvial, lake or paludous regime) through analogy with present species and the facies and sediment analysis of the deposits. Following comparisons with other fossiliferous sites from the same Romanian stratigraphical level, we established the particular character of this fossiliferous site.

## RESULTS AND DISCUSSIONS

From the mollusc fauna, there were identified and described the following species and their frequency was estimated.

As it is showed in Figs. 3 and 5 and the Table 1, within this fossiliferous site, there predominates *Pristinunio*, followed by *Viviparus rudis* in the lower part.

Valves are chaotically scattered throughout the 30 m thickness, but many of them are still together two by two, transformed into lumachelles (Figs. 6a, b).

Table 1. Frequency of the mollusc species in the fossiliferous point Bâlta.

Species	Frequency
<i>Pristinunio pristinus</i> (Bielz)	abundant
<i>Pristinunio davilai</i> (Porumbaru)	abundant
<i>Rytia bielzi</i> (Czekelius)	rare
<i>Dreissena polymorpha</i> (Pallas)	rare
<i>Viviparus craiovensis</i> (Tourneur)	rare
<i>Viviparus rudis strossmayerianus</i> (Brusina)	frequent within the lower part
<i>Viviparus rudis rudis</i> (Neumayr)	frequent within the lower part
<i>Lithoglyphus acutus acutus</i> Cobălcescu	rare

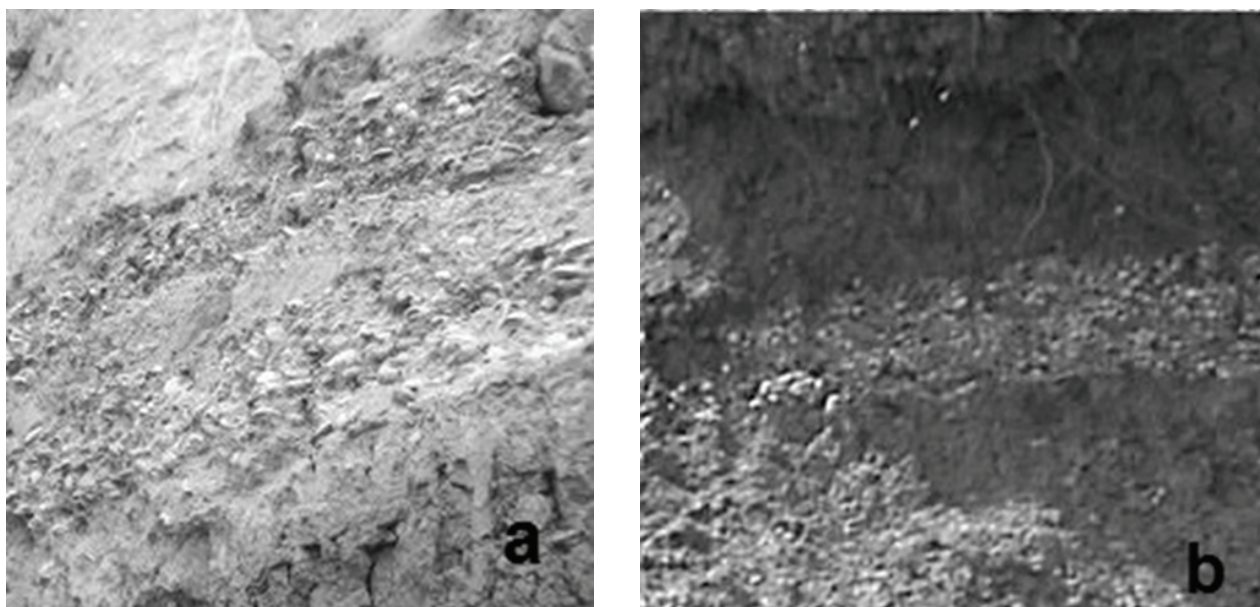


Figure 6. Lumachelles at Bucovăț (a) and Drănic (b) (photo Aurelian Popescu).

Only in other outcrop at Smadovita, 20 km westwards from Bâlta, the level also appears as a stack of sands with unionids scattered chaotically on approximately 10 m high sands eroded in the upper part (Fig. 7).

It is also worth mentioning the particular spreading of the two *Pristinunio* species: *pristinus* and *davilai* within the entire Dacian Basin.

The Romanian deposits with 'carved unionids' are found within the entire Dacian basin and the high frequency of *Pristinunio* form with *pristinus* and *davilai* species testifies for the lacustrine character of these sediments that usually formed falunes at the shore of the ever expanding lake. They are not deposits of fluvial bars, as some researchers claim (ENACHE, 2004), because between the Romanian lumachelle deposits from Oltenia at least, there were not found anywhere interfluvial deposits that would intermingle and interrupt these fossiliferous deposits.



Figure 7. Stack of sand of ca. 10 m thickness with *Pristinunio* at Smadovița (photo Constantin Enache).

The discordant advancement on top of older and older Dacian deposits towards the western part of Oltenia (ENACHE, 2008) and the fact that the deposits are found again, from sands to clays, then to coal and again to sands (ENACHE, 1976) also support the hypothesis of the existence of plains that were rhythmically covered by waters, from swamps to deeper waters.

In order to establish the habitat of lamellibranchiates and gastropods, from this 30 m thick stack of sands from Bâlta, full of *Pristinunio* especially and almost lacking any 'carved' unionids such as *Rytia*, *Cuneopsidea*, *Rugunio*, we studied the habitats of the present unionid, dreissenid, lithoglyphid and viviparid species in Romania.

#### Habitat of present species of Unionidae in Romania

The present day unionids prefer the clear waters of the rivers, being numerous on the sandy bottom rivers, some of the species being found also in ponds and lakes (GROSSU, 1962).

*Unio tumidus* Philipson prefers the plain regions, living in large rivers or in lakes.

*Unio crassus* Philipson is found in rivers, ponds connected to rivers, clogged in mire or sand, sometimes in dense populations (ibid.).

*Unio pictorum* Linné lives in slightly running waters or in larger ponds within the floodplain, buried in sand or mire (ibid.).

#### Habitat of present day species of Dreissenidae in Romania

*Dreissena polymorpha* Pallas lives in lakes, slightly running water channels, periodically flooded ponds, rivers, on the reed stems (ibid.).

#### Habitat of present day Viviparidae species in Romania

*Viviparus (Viviparus) acerosus* (Bourguinat) lives in rivers as well as ponds, lakes and swamps (GROSSU, 1986).

*Viviparus (Viviparus) viviparus* (Linneus) is characteristic to eutrophic waters, in rivers and lakes (ibid.).

*Viviparus (Viviparus) conectus* (Millet) lives in pits, rivers, lakes and ponds (ibid.).

#### Habitat of present day Lithoglyphidae species in Romania

*Lithoglyphus naticoides* (Pfeifer) lives in running waters, channels and lakes, in the detritus found on their bottom (ibid.).

*Lithoglyphus apertus* (Küster) stays on the river beds, near the shores on the rocky or sandy bottom (ibid.). Consequently, the present day species from Romania are found both in large running waters (rivers), as well as in lakes, ponds or swamps.

It is nonetheless true that unionids can breed on a rather vast territory within the river network, by fixing glochidia on fish, growing as a parasite on them during a rather long period of time, but then they come off and fall on the river bed; thus, their transport on fresh water fish does not mean that unionids can only live in running waters as some researchers claim.

## CONCLUSIONS

Bâlta fossiliferous site with Romanian unionids and viviparidae stands apart from the other known fossiliferous sites (except for Smadovița), since it is not a lumachelle resulted out of a falune at the brink of the lacustrine area, but an inner area of the flooded plain. The fact that many of the two valves of an individual are bonded and stay in a vertical position indicate the fact that these individuals actually lived there (DAVITAȘVILI, 1956); the chaotic dispersion of the valves, which are not piled as in the case of the falunes, point to their death in a relatively quiet space within the lacustrine area by a progressive intake of sand generated by the uplift of the Southern Carpathians. The present day unionids, as well as viviparidae found in such an environment also testify for the lacustrine habitat from Bâlta.

As it can be seen in Figs. 2 and 4, the stack of sand points to a horizontal depositing process and does not present a cross-stratification as it is the case of river sediments (RUHIN, 1966).

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