

## A MIDDLE MIOCENE DOLPHIN FROM DOMAȘNEA (CARANSEBEȘ-MEHADIA MIOCENE BASIN)

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**ABSTRACT.** A small-sized dolphin humerus originating from a drill core sample collected from a borehole located at Domașnea (Middle Miocene Caransebeș-Mehadia Basin, South Carpatians) was found. This dolphin is assigned to Kentriodontidae family. The level the fossil originated from is Late Volhynian-Early Bessarabian (Sarmatian *s. str.*), probably located either to the top of Globu Craiovei Formation, or to the lowermost Petnic Formation succession. The bone is comparable with similar discoveries reported from Tășad and Cluj-Napoca, both located in the inner Carpathian area. This new Kentriodontidae locality proves the large geographic extension of these dolphins in the Sarmatian Paratethys.

**Keywords:** dolphins; Kentriodontidae; Caransebeș-Mehadia Middle Miocene Basin.

### INTRODUCTION

Marine mammals were rarely reported from the inner Carpathian area if compared to other regions of our country, where such discoveries are more frequent (e.g. the Moldavian Platform: Macarovici, 1944, Macarovici & Zaharia, 1968; Ionesi & Galan, 1988 etc. or the South Carpathians Foredeep and Orșova-Bahna Miocene Basin; Barbu, 1933), with several "species" mentioned from various localities. Unfortunately, the majority of these assignments had been done on vertebrae only. As it is well known, vertebrae are non-diagnostic for specific and even generic determinations in cetaceans. In these circumstances, the fossil cetacean "species" repertory of our country should be considerably shortened.

However, in the last years, some progress had been done either in the Transylvanian Basin (Codrea, 1996; Kazár et al., 2004) or in the western Middle Miocene basins of Apuseni M-ts (Kazár & Venczel, 2003), completing the older discoveries.

Such mentions are even more rare in the South or South Occidental Carpathians (e. g., the Badenian sea-cow mentioned by Florei, 1962 from the sandy clay from Pârâul Izvorului at Zorlențu Mare, near Reșița, or the already mentioned cetaceans described by Nicolaescu, 1933 from Bahna Depression), where several Middle Miocene sedimentary basins are known. One of these basins is corresponding to the actual Caransebeș-Mehadia Depression.

### GEOLOGICAL SETTING

The Miocene history of this area begun in the Late Badenian, with the so-called Calva and Belcovăț formations, followed in the Sarmatian *s. str.* by the Globu Craiovei and Petnic formations (Mărunțeanu et al., 1994; Marinescu et al., 1998). The both Sarmatian formations share the same clastic features, dominated by arenites.

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The Miocene from Caransebeș area was prospected in the last decades for coal, but the results did not confirm any economic interest. The prospecting was carried on through medium-deep boreholes, carried on by S.C. FORMIN S.A. Caransebeș. Other boreholes had hydrogeological targets. Core samples had been collected for some intervals. In such a core, some small bone fragments occurred and one of us (V.S.) collected these fossils.

The well FH 26 that yielded the drill core sample is located at Domașnea (Fig. 1). The bones originate from a gray marl level, 150 m in depth (Fig. 2). The microfaunal investigations carried on by S.C. PROSPECȚIUNI S.A. (geol. P. Panaitescu, Bulletin of analysis # 1269/01.10.2001) indicate that these rocks are Late Volhynian - Early Bessarabian. This age is suggesting that the core sample could originate either from the top of Globu Craiovei Formation, or to the lowermost section of Petnic Formation.

Fossils are curate at the Transylvanian Basin Collection, Museum of Paleontology-Stratigraphy of the Babeș-Bolyai University in Cluj-Napoca (abbreviated TBM), # V 411.

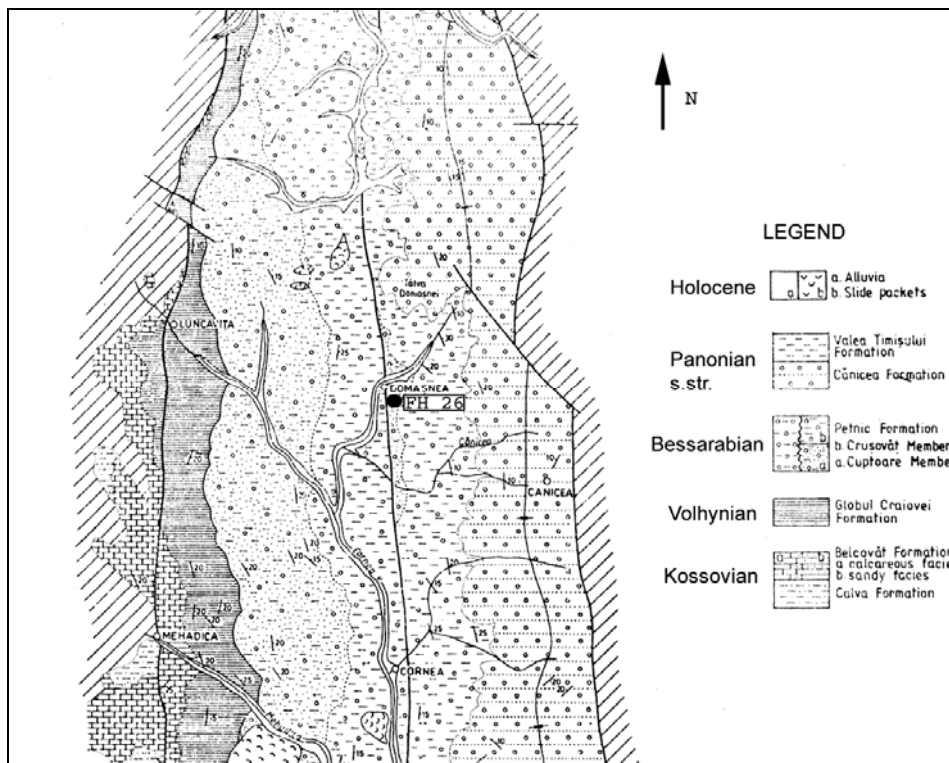


Fig. 1. Geological map of Domașnea area, indicating the FH 26 location (accordingly to Măruțeanu et al., 1994)

### SYSTEMATIC PALEONTOLOGY

Order Cetacea BRISSON, 1762  
 Suborder Odontoceti FLOWER, 1869  
 Infraorder Delphinida de MUIZON, 1984  
 Superfamily Delphinoidea GRAY, 1821  
 Family Kentriodontidae SLIJPER, 1936

Kentriodontidae indet.

### DESCRIPTION

The only bones recovered from the drill core concern a small rib fragment and a nearly complete left humerus belonging to an immature animal: the proximal epiphysis is not fused to the shaft.

The humerus is very small and robust. The posterior condyle side, as well as the posterior part of the distal epiphysis is damaged, due to the core drill cut. The bone is also damaged on lateral side, but this damage had probably a pre-burial origin.

The *trochin* forms a plateau higher than the humerus condyle, with a rounded parallelogram outline. Like in the Tășad and Cluj-Napoca Sarmatian dolphins (Kazár & Venczel, 2003; Kazár et al., 2004), the *trochiter* forms a distinct rim clearly visible on the anterior epiphysis side. The humerus neck represents the narrowest part of the bone, in lateral, anterior or posterior views.

Like in *Atocetus iquensis* DE MUIZON 1988, the delto-pectoral tuberosity is non-projecting and do not reach the distal epiphysis (de Muizon, 1988). It begins on the anterior bone edge, at a level located just beneath the lowest termination of *fovea infraspinati*, in a centro-distal position (Pl. I, fig. 1 a). *Fovea infraspinati* is distinct, moderately deep, located just bellow the condyle, in an anterior position related to the bone longitudinal axis. It has an oval outline and it is better expressed if compared to the Cluj-Napoca dolphin humerus (TBM 14943), described by Kazár et al. (2004) (Pl. II, figs. 1b, 2 b). In spite of the damaged status of the distal epiphysis, it is obvious clear that it represented the broadest anteroposterior bone section, with an anteroposteriorly longer articular facet for the radius, if compared with the one of the ulna (Pl. I, fig. 1 b).

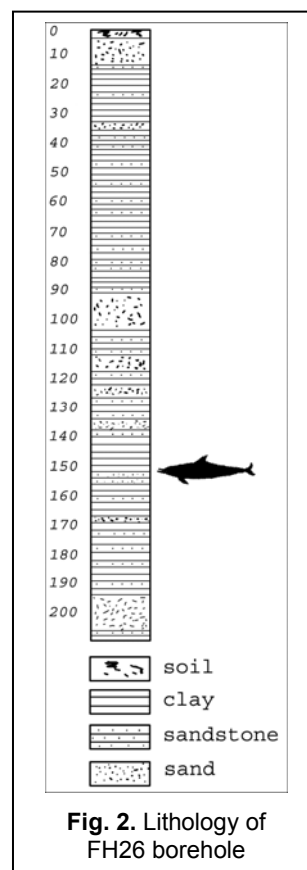


Fig. 2. Lithology of FH26 borehole

Table 1.

Measurements of the humerus; way of measuring, according to Kazár & Venczel (2003) measurement points.

1.	Length of the humerus	41.8
2.	Dorsoventral diameter of the head of the humerus	16.7
3.	Mediolateral width of proximal epiphysis	23.0
4.	Anteroposterior extension of the humerus neck	15.0
5.	Mediolateral extension of the humerus neck	10.0

## DISCUSSION

Codrea (1996) was the first to mention the Kentriodontidae in the inner Carpatian area. From the Volhynian clay mined at Cluj-Napoca at Iris quarry, he described tympanic and periotics assigned to Kentriodontidae indet. Recently, Kazár et al. (2004) described from the same site additional dolphin fossils represented by several post cranial bones, assigning it to *Atocetus(?) fuchsii* (BRANDT, 1873) (= "*Champsodelphis" fuchsi* BRANDT, 1873).

Other dolphin fossils originate from the Miocene Beiuș Basin, at Tășad. Compared to the Cluj dolphin, the Tășad one is considerably smaller, representing probably a distinct species (Kazár & Venczel, 2003).

As the Domașnea dolphin is an immature specimen, it is difficult to compare it to one or another discoveries, but the small size is however, obvious (Table 1). For instance, as the odontocete discoveries are not very numerous in our country one not dispose of a compelling view concerning the morphologic variability on different stages of ontogeny, as well on the intra-specific variations.

However, its affiliation to Kentriodontidae is evident, due to the humerus morphology. Kazár & Venczel (2003) pointed out recently these variations, so we do not reiterate them. The resemblances with *Atocetus iquensis* DE MUIZON 1988, *Atocetus(?) fuchsii* from Cluj, or the unnamed dolphin from Tășad, are obvious (for details, see Fig. 6 in Kazár & Venczel, 2003; Kazár et al., 2004).

## TAPHONOMY

A drill core always represents an extremely small geologic sample. As the Domașnea dolphin bones are originating from such a sample, consequently we dispose of limited data concerning the taphonomy.

The humerus has an isolated emplacement in sediment, without any anatomic connection. However, in its vicinity, a small rib fragment can be observed, probably belonging to the same animal. In these circumstances, one can presume that the dolphin carcass was scattered before burial, but on a limited area. The anatomical connections were lost, but the animal bones remained concentrated in the same place. This could indicate a low dynamic environment, without major waves or stream influences.

## CONCLUSION

In our country, Domașnea is a new locality with odontocete remains assigned to Kentriodontidae. It reveals the large extension of this group in the Middle Miocene Paratethys. Practically, one can expect to find this group of small dolphins everywhere the Sarmatian *s. str.* non-continental formations are exposed in the inner Carpatian area, with a predilect frequency in Volhynian.

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## PLATE CAPTIONS

**Plate I:** Comparison between the Kentriodontid left humerus from Domașnea (1) (TBM V 411) and *Atocetus(?) fuchsii* (BRANDT, 1873) humerus from Iris Quarry in Cluj-Napoca (2) (TBM 14943): 1a, 2a – anterior views; 1b, 2 b – medial views. Scale bar: 1 cm.

**Plate II:** Comparison between the Kentriodontid left humerus from Domașnea (1) (TBM V 411) and the *Atocetus(?) fuchsii* (BRANDT, 1873) humerus from Iris Quarry in Cluj-Napoca (2) (TBM 14943): 1a, 2a – posterior views; 1b, 2b, lateral views. Scale bar: 1 cm.

