A MIDDLE MIOCENE DOLPHIN FROM DOMAŞNEA (CARANSEBEŞ-MEHADIA MIOCENE BASIN)

VLAD CODREA¹, VASILE SEREŢAN²

ABSTRACT. A small-sized dolphin humerus originating from a drill core sample collected from a borehole located at Domaşnea (Middle Miocene Caransebeş-Mehadia Basin, South Carpathians) 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 Tâşad 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; Caransebeş-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 assignations 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 Zorlenuţa Mare, near Reşiţa, or the already mentioned cetaceans described by Nicolaeascu, 1933 from Bahna Depression), where several Middle Miocene sedimentary basins are known. One of these basins is corresponding to the actual Caransebeş-Mehadia Depression.

GEOLOGICAL SETTING

The Miocene history of this area begun in the Late Badenian, with the so-called Calva and Belcovăţ formations, followed in the Sarmatian s. str. by the Globu Craiovei and Petnic formations (Mărundeănul 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 Caransebeş 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. Caransebeş. 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 Domaşnea (Fig. 1). The bones originate from a gray marl level, 150 m in depth (Fig. 2). The microfaunal investigations carried on by S.C. PROSPECTIUNI 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 Globo Craiovei Formation, or to the lowermost section of Petnic Formation.

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

![Geological map of Domaşnea area, indicating the FH 26 location (accordingly to Mărunţeanu et al., 1994)](image-url)
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 Tâșad 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).

Table 1.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
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<tbody>
<tr>
<td>1. Length of the humerus</td>
<td>41.8</td>
</tr>
<tr>
<td>2. Dorsoventral diameter of the head of the humerus</td>
<td>16.7</td>
</tr>
<tr>
<td>3. Mediolateral width of proximal epiphysis</td>
<td>23.0</td>
</tr>
<tr>
<td>4. Anteroposterior extension of the humerus neck</td>
<td>15.0</td>
</tr>
<tr>
<td>5. Mediolateral extension of the humerus neck</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Fig. 2. Lithology of FH26 borehole
DISCUSSION
Codrea (1996) was the first to mention the Kentriodontidae in the inner Carpathian 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 Beiuş Basin, at Tâşad. Compared to the Cluj dolphin, the Tâşad one is considerably smaller, representing probably a distinct species (Kazár & Venczel, 2003).

As the Domaşnea 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 Tâşad, 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 Domaşnea 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, Domaşnea 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 Carpathian area, with a predilect frequency in Volhynian.

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REFERENCES


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.
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Plate II