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New Chalicotheriidae (Perissodactyla-Mammalia) Fossil From The Middle Miocene of Turkey (Bursa-Orhaneli)

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Summary: The *Chalicotheriidae* fossils described in this paper were found by a certain Mustafa Özyıldız during clay subsoil cleaning at the coal-mine Bursa-Orhaneli (Burmu) in Western Anatolia. The duplex bone (joint middle and proximal phalanx) belongs most probably to the second digit of the manus. The epiphyseal parts of vertebrae found among the fossils point to a young animal of the assumed *Ancylotherium* species. All bones – with the exception of duplex and metacarpal II – are too fragmented. However, the authors are strongly inclined to believe that they are either of *Metaschizotherium* or *Ancylotherium* origin. In particular duplex and metacarpal II are considered the most characteristic bones for such an attribution. The teeth among the fossil material are those of *Chalicotheriidae* which contributed to the conclusion that the remains are to be classified as those of *Metaschizotherium* species.

Key Words: Chalicotheriidae, bones, Bursa-Orhaneli, Western Anatolia.

Türkiye'de (Bursa-Orhaneli) Orta Miocene Dönemine Ait Yeni Chalicotheriidae (Perissodactyla-Mammalia) Fosili

Özet: Bu çalışmada, Batı Anadolu'da Bursa-Orhaneli kömür ocağındaki taban kili temizliği esnasında Mustafa Özyıldız adlı şahıs tarafından bulunan Chalicotheriidae fossilleri tanımlandı. Bulunan duplex kemiği (birleşmiş Phalanx proximalis ve media), büyük ihtimalle manus'un ikinci parmağına ait olduğu sonucuna varıldı. Bulunan fossiller içerinde vertebra'ların epifiz kısımlarının bulunması, Ancylotherium türü olduğu düşünülen bu hayvanın genç bir bireye ait olduğu kanısını uyandırmaktaydı. Bütün kemikler-duplex ve metacarpus II hariç- çok parçalıydı. Bununla birlikte fossil materyallerinin, metaschizoterium yada Ancyloterium'a ait olduklarına kuvvetle muhtemel olduğuna inanıyoruz. Özellikle duplex ve metacarpus II bunlar için en belirleyici kemikleri oluşturmaktadır. Fossil materyalleri arasında bulunan diş materyallerinin de chalicother dişlerine ait olmaları, yapılan Metaschizotherium türleri (Sp.) tespitindeki görüşlerimizin bu yönde olmasına katkı sağlamaktaydı.

Anahtar Kelimeler: Chalicotheriidae, kemikler, Bursa-Orhaneli, Batı Anadolu.

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Introduction

The Chalicotheriidae familia, one of the most unusual member of the Perissodactyl group, comprises two sub-familiae, the Chalicotheriinae and the Schizotheriinae. This familia, can be distinguished most easily by the presence of clawed ungual phalanges[5].

Palaeontology		
Class	Mammalia	
Order	Perissodactyla[10]	
Family	Chalicotheriidae[10]	
Subfamily	Chalicotheriinae	Schizotheriinae[11]
Genus		Ancylotherium[8]
		Ancylotherium hennigi
		Ancylotherium pentelicum

The Chalicotheriidae first appeared during the Eocene and their presence can be traced up to the Pleistocene[5], however, they were never a particularly diverse or numerous groups. Despite the fact that fossil records of the Chalicotheriidae familia are rather rare[9], remains have been found in a wide ecological distribution covering North America, Europe and Asia[1-5,7,12,13]. With rare exceptions, Chalicotheriidae fossil finds have been reported to be fragmented[5].

Chalicotheriidae remains were first discovered in Turkey at the location Seyitömer-Kütahya[12]. Among those fossil finds was Moropus elatus (Chaicotheriidae - Perissodatyla) which was dated end of the Middle Miocene. The fragment was identified as proximal part of the left metatarsal. In the following years, remains of Ancylotherium pentelicum of the Schizotheriinae sub-familia were found in two Turolian localities in central and western Turkey. They were dated to the Upper Miocene. The remains were identified as distal limb bones[14]. Further Chalicotheriidae fossils were discovered in Southwest Bulgaria which is geographically close to Turkey. They are reported to be the best preserved samples of the Late Miocene in Europe. Examination of the remains led to important findings about genera in the Chalicotheriinae and Schizotheriinae sub-familiae[9].

Materials and Method

The Chalicoteriidae fossils described in this paper were found by a certain Mustafa Özyıldız during clay subsoil cleaning at the coal-mine Bursa-Orhaneli (Burmu) in Western Anatolia. The plant is located 65 km to the south of the city of Bursa approximately 6 km from the exit Yürücekler on the Bursa-Orhaneli highway. Palaeographic studies date the region`s sediments to the Middle Miocene – 11.2-16.4 million years –[15].

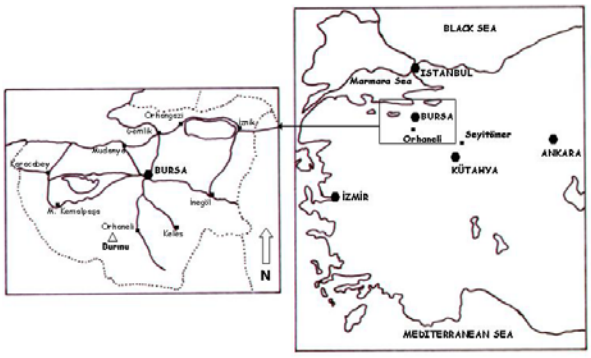

Figure 1.
Occurence of Chalicothriidae fossils in Anatolia

The fossils were taken to the Osteoarcheology Laboratory of the Istanbul University Veterinary Faculty Department of Anatomy for examination. The terminology employed is based on the publications[4,14].

Results

The remains consisted of the following materials:

Bone Name	Number
Duplex (complete)	1
Ungual phalanx fragment	1
Left metacarpal II (Proximal part)	1
Metacarpal III? (Proximal part, undefined side, embedded the coal)	1
Tooth (incisor and cheek teeth, fragment)	9
Skull fragments	numerous pieces
Occipital condyle (Right part)	1
Vertebrae fragments (Dorsal parts)	5
Vertebrae (epiphysis)	2
Left mandibular ramus (Fragment)	1
Right mandibular ramus (Fragment)	1
Undefined bone fragments	numerous pieces

A.Vertebrae fragments, B. Metacarpal III? (proximal part), C.Epiphysis of vertebrae, D. Left metacarpal II (Proximal part), E. Duplex (belongs

most probably to the second digit of the manus), F. Occipital condyle (rigth part), G. Epiphysis of vertebrae, H. Ungual phalanx (Fragment), I.Left ramus mandible (Fragment), J. Right ramus mandible (Fragment)

Figure 2.
Chalicotheriidae fossils found in the Orhaneli-Burmu coal mine

Table I. Measurements (mm) of duplex of digit II of the manus from Orhaneli-Burmu

	Orhaneli-Burmu
Maximum length	82,77
Proximal width	41,44
Proximal depth	32,98
Mid-shaft diameter	31,25
Distal width	32,92
Distal depth	32,97

Figure 3.
Metacarpal II (A), Duplex (B) and ungual phalanx (C)

Figure 4.
Fossil teeth found in the deposit

Discussion

The Bursa-Orhaneli fossils constitute the most important find of the Chalicotheriidae familia since they were first discovered and identified in Turkey[12].

The duplex bone (joint middle and proximal phalanx) belongs most probably to the second digit of the manus. This bone is characteristic for many Chalicotheriidae in the Schizotheriinae sub-familia such as Ancylotherium, Tylocephalonyx, Moropus and Phyllotillon[4-6,14].

The authors are of the opinion that the material discovered does not permit a definite generic reference. Because all bones – with the exception of duplex and metacarpal II – are too fragmented. However, the authors are strongly inclined to believe that they are either of Metaschizotherium or Ancylotherium origin. In particular duplex and metacarpal II are considered the most characteristic bones for such an attribution[4,5,14]. A number of properties, however, do not correspond to those found for the Ancylotherium pentelicum from the Turolian of Pikermi[13]. For example, the duplex is not as extended as in the Ancylotherium pentelicum, and the distal face has no protrusion on the ventral side (palmar). Also, the metacarpal II does not have the flat shaft which is typical for Ancylotherium pentelicum and Ancylotherium hennigi. In line with the evaluation of Coombs (Massachusetts University) the duplex and metacarpal II bones discovered may be considered to belong to Metaschizotherium species, however, the authors have come to the conclusion that their classification as Ancylotherium species does not constitute a grave mistake.

The epiphyseal parts of vertebrae found among the fossils point to a young animal of the assumed Ancylotherium species. Since no sign of closure of the vertebral epiphyseal cartilage could be detected it is highly unlikely that the animal was an adult. The teeth discovered in the deposit are those of Chalicotheriidae. Despite the high fragmentation of the dental material it permitted identification of the familia.

Fossils of Chalicotheriidae are reported to be both rare and usually fragmented or incomplete[5]. With the exception of the duplex and the proximal part of metacarpal II, the fossils of the find presented here are also highly fragmented. It was, however, attempted to attribute those fragments to particular bones. The teeth among the fossil material are those of Chalicotheriidae which contributed to the conclusion that the remains are to be classified as those of Metaschizotherium species. Taking palaeographic studies carried out in the region where the discovery was made into account[15] the fossils were dated to the Middle Miocene (11.2-16.4 million years).

The authors are convinced that the Bursa-Orhaneli fossils and their examination will contribute to a better understanding of the palaeoecology of members of the Chalicoteriidae familia in Anatolia.

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