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A NEW LATE ORLEANIAN/EARLY ASTARACIAN MAMMALIAN FAUNA FROM KULTAK (MILAS-MUGLA), WESTERN TURKEY

TANJU KAYA, VAHDET TUNA & DENIS GERAADS

A new late Orleanian/early Astaracian mammalian fauna from Kultak (Milas-Mugla), western Turkey. Une nouvelle faune de Mammifères datant de la fin de l'Orléanien / début de l'Astaracien à Kultak (Milas-Mugla), Turquie occidentale.

ABSTRACT- In Western Anatolia, where the earliest known Mammalian fauna is of late Astaracian age, a new late Orleanian/early Astaracian mammalian fauna is recognised in Kultak (Milas-Mugla). The fauna occurs at the top of a marine to continental succession known to be as old as Aquitanian in age. The fauna includes Anchitherium aurelianense hippoides (LARTET 1851), Ancylotherium (Metaschizotherium) fraasi (KOENIGSWALD 1932), Tethytragus koehlerae AZANZA & MORALES 1994 and Gomphotherium sp. All these genera are known in Europe. Anchitherium and Tethytragus are common constituents of the Middle Miocene faunas of Turkey, but Ancylotherium (Metaschizotherium), previously known from central Europe, is described in Turkey for the first time.

KEYWORDS: Middle Miocene, Mammalian fauna, Turkey

RESUME-En Anatolie Orientale, où les plus anciennes faunes Mammaliennes connues dataient de la fin de l'Astaracien, nous avons reconnu une nouvelle faune datant de la fin de l'Orléanien / début de l'Astaracien à Kultak (Milas-Mugla). La faune provient de dépôts gréseux au sommet d'une série marine supposée être d'âge Aquitanien. Elle comprend Anchitherium aurelianense hippoides (LARTET, 1851), Ancylotherium (Metaschizotherium) fraasi (KOENIGSWALD, 1932), Tethytragus koehlerae AZANZA & MORALES, 1994 et Gomphotherium sp. Tous ces genres sont connus en Europe; Anchitherium et Tethytragus sont des constituants habituels des faunes du Miocène moyen de Turquie, mais Ancylotherium (Metaschizotherium), surtout connu en Europe centrale, est signalé pour la première fois en Turquie.

MOTS-CLES: Miocène moyen, faune de Mammifères, Turquie

INTRODUCTION

The known ages for the mammal faunas in the Mugla area range from Astaracian to Pliocene (Becker-Platen 1970; Atalay 1980). The oldest age produced by the Mugla-Sarıçay fauna of the “Turgut member” is the late Astaracian (late Middle Miocene) (13.5-11.1 Ma) (de Bruijn et al. 1992; Steininger et al. 1996; Steininger 1999). The fauna includes Pliospalax primitivus ÜNAY, Anomalomys gaudryi GILLARD, Keramidomys sp., Anomalomys sp. Anchitherium sp., Tethytragus koehlerae AZANZA & MORALES, Listriodon lockarti POMEL and Gomphotherium angustidens (KAUP) (Becker-Platen et al. 1975; Ünay 1978; Köhler 1987; Made 1995).

We describe here a still older mammalian fauna in the Mugla area, which includes Anchitherium aurelianense hippoides (LARTET, 1851), Ancylotherium (Metaschizotherium) fraasi (KOENIGSWALD, 1932), Tethytragus koehlerae AZANZA & MORALES, 1994 and Gomphotherium sp. The fossil locality lies to the north of the Gökova Gulf, east of Ören, 4 km east of Alatepe (Alakilise), and 1.5 km Northeast of Kultak (N 37° 02' 41.8''; E 28° 03' 14.6''), on the road cutting (Fig. 1).

Anchitherium and Tethytragus are commonly known in the Middle Miocene faunas in Turkey, such as in Bursa-Paşalar, Ankara-Çandır, İnönü-I and Mugla-Sarıçay (Becker-Platen et al. 1975; Atalay 1981; Köhler 1987; Forsten 1990; Fortelius 1990; Kaya 1989). There is no previous record of Ancylotherium (Metaschizotherium) in Turkey.

The terminology and systematics used herein for Anchitherium, Ancylotherium (Metaschizotherium) and Tethytragus follow those of Abusch-Siewert (1983), Butler (1965), Coombs (1978) and Köhler (1987), respectively. Measurements are given in mm. Material is stored in the Natural History Museum (Ege University- Izmir/Turkey). Abbreviations used in this study are: NHM, Natural History Museum-Izmir/Turkey; MMK, Mugla-Milas-Kultak.

STRATIGRAPHY

The generalised stratigraphic succession is modified after Görür et al. (1995) (Fig. 2). The “Çambeleni formation” is made up of interbedded limestone and shale, and rests unconformably on the basement. The limestones are rich in marine molluscan fragments. The composite stratigraphic succession of the “Akkaya formation” consists, in ascending order, of limy shale, coaly mudstone, Turritella-mudrocks, thinly bedded lithic sandstone, limy Ostrea-biostrome, mudrocks, poorly bioclastic limestone, in places limy, texturally submature lithic sandstone, and poorly to moderately indurated, lithic conglomerate-sandstone which yielded the mammalian fauna. The mammal-bearing horizon is separated by a covered interval from the underlying sandstone horizon. The lithic conglomerates and sandstones are light brown grey, poorly to moderately indurated, medium to thick-bedded and texturally submature, and interfinger laterally.

The succession of the Çambeleni and Akkaya formations is Aquitanian and Burdigalian in age, on the basis of marine microfaunal elements (Nebert 1957; Görür et al. 1995). The mammalian fauna recovered from the conglomerate-sandstone horizon of the Akkaya formation indicates an Orleanian/Astaracian boundary age, an approximate Burdigalian/Langhian boundary age in terms of marine chronological classification, for the top of the unit. This horizon may represent the last fluvial ingression in the primarily marine environment of the Akkaya formation.

The “Eskihisar Formation” (Görür et al., 1995) consists uniformly of poorly to moderately indurated, medium to massively bedded, medium brown gray lithic conglomerates and yellowish gray sandstones. It is separated from the Akkaya formation by exposed extensional faults, and rests unconformably on the basement rocks. Clasts of marine limestones and limy sandstones of the Çambeleni formation occur sporadically in the Eskihisar Formation. The unconformable setting on the basement, and diagenetic difference between the marine limestone clasts and the matrix of the conglomerates signifies an unconformity between the Eskihisar and Akkaya formations.

MIOCENE	E	LATE	European Land Mammal		Mammalian locality
			Mega- Zones	MN-Zones	

		11.1 Ma	Vallesian	9	
	MIDDLE	15.0 Ma	Astaracian	7+8	Yeni Eskihsar Çatakbağyaka Sarıçay Eskihsar Berdik Mesevle
				6	Çakıralan Kultak(this study)
	EARLY	20.5 Ma	Orleanian	5	
				4	
				3	

TABLE 1. Mammalian fauna in the surroundings of Mugla and their age significance. Time units are based on continental chronological correlations of the European Land Mammal Mega-Zones and MN-Zones (after Becker-Platen et al. 1975; Steininger et al.1996; Steininger 1999).

Faunes de Mammifères des environs de Mugla, et leurs ages. Les ages sont basés sur les corrélations chronologiques des super-zones mammaliennes et des zones MN (d'après Becker-Platen et al. 1975; Steininger et al.1996; Steininger 1999).

SYSTEMATIC PALEONTOLOGY

Order PERISSODACTYLA Owen, 1848

Family EQUIDAE Gray, 1821

Subfamily ANCHITHERIINAE Leidy, 1869

Genus Anchitherium H.V.MEYER, 1844

ANCHITHERIUM AURELIANENSE HIPPOIDES (LARTET, 1851)

Figure 3.1-2

1983 Anchitherium aurelianense hippoides (LARTET, 1851), Abusch-Siewert, P.156

1990 Anchitherium aurelianense hippoides (LARTET, 1851), Forsten, p. 476

Material- Right lower jaw, with m1-m3 in situ (1999-MMK/2)

Description- The teeth are medium-sized and little worn (Table 2). The m1 is larger than the other molars. The m3 is considerably tall and narrow. The protoconid is larger than the hypoconid. Both occur as V-shaped buccal cusps separated by a deep and vertical valley. The paralophid curves posteriorly. The metaconid and metastylid are separated. Their tips are distinct on m1. The metastylid is lower in m2 and m3. The lingual groove between the metaconid and metastylid is not distinct. The metaflexid is a shallow valley, and does not reach the base. The entoflexid is v-shaped, forms a deep valley, and lacks enamel fold. The anterior cingulum is strong, and surrounds the anterior side. The labial cingulum is well developed and continuous in m1 and discontinuous between cusps in m2. It is weak in m3. A small crest is located between the hypolophid and hypoconulid. There is no lingual cingulum. The heel of m3 is low and vertical.

Comparison- The taxon resembles morphologically Anchitherium aurelianense hippoides from Sansan and La Grive in France described by Abusch-Siewert (1983; Pl.15, fig. 2; Pl.7, fig. 4) and from Paşalar described by Forsten (1990). They share the continuous labial cingulum and the separated metaconid and metastylid. However, the teeth from Paşalar are small, and the labial cingulum is generally continuous (Forsten 1990). The labial cingulum at Sansan is stronger than at Kultak. The teeth from La Grive are somewhat slightly smaller, with the continuous and strongly developed labial cingulum, and the weak lingual cingulum (Abusch-Siewert 1983). The lower teeth from Kultak also resemble those from Çandır. However, there are some differences. In the material from

Çandır, the labial cingulum is strongly developed, and the teeth are slightly larger. That of İnönü-1 is clearly smaller, and the heel of m3 is absent in one specimen (Geraads & Güleç, in press).

The teeth from Kultak differ from those of A. aurelianense aurelianense from Sandelzhausen (Abusch-Siewert 1983, Pl. 2, fig.1). The Sandelzhausen material is smaller, and has a stronger labial cingulum, a lingual groove between the metaconid and metastylid and a higher heel of m3. The lower teeth from Kultak are also different from A. a. aurelianense from Winterhof-West (Abusch-Siewert 1983, Pl. 8 fig.a) which are of smaller size, and have a higher and two-pointed heel of m3.

The material from Kultak is smaller than Anchitherium sp. from Çanakkale-Nebisuyu (Kaya 1989) and Eşme-Akçaköy (Ozansoy 1969; Sondaar and Staesche 1975) (Table 1). In the lower teeth from Eşme-Akçaköy, the m3 is longer than other molars, the labial cingulum is well developed, and the heel forms a wide angle with the hypoconulid. The Kultak material is also different from A. gobiense COLBERT from Tung-Gur in Mongolia (Colbert 1939, fig. 2), and A. karpinskii (BORISSIAK) from Belometchetskaya in Caucasus (Borissak 1937; Pickford et al., 2000). A. gobiense is somewhat larger (the length of m1-m3 is 67.5 mm), and is characterised by a longer m3 (24.5 mm) and a strongly developed basal cingulum. A. karpinskii is a large form, and the teeth are different in morphology.

	MMK-2			Paşalar 1)		Çandır 2)	
	m1	m2	m3	m1-2	m3	m1	m2
L	21.5	20.3	22.2	19.1	21.0	19.0	18.6
MB	15.3	13.2	11.1	13.8	11.9	14.0	13.5
DB	13.8	12.2	10.5	13.0	10.7	13.2	12.1
Me H	9.7	10.2	9.8	10.8	9.7		
Prd H		11.4	11.0	12.1	8.6	8.2	
L m1-m3	60.3						

	Eşme-Akçaköy 3)			Inönü-1 4)		
	m1	m2	m3	m1	m2	m3
L	27.2	25.5	29.5	17.5	17.0	17.2
MB	18.5	17.8	15.2	12.7	12.7	11.2
DB	16.5	16.7	14.0	12.5	11.4	10.5
Me H	14.0	13.1	11.8	-	-	-
Prd H	10.8	12.2	12.4	-	-	-
L m1-m3	81.0			52.1		

TABLE 2. Measurements of lower teeth of Anchitherium. 1) Forsten 1990, 2) NHM-Izmir AC/8, 3) NHM-Izmir EA/9, 4) NHM-Ankara 3/12. L: length, MB: mesial breadth, DB: distal breadth, Me H: metacone height, Prd H: protoconid height.

Dimensions de la denture inférieure d' Anchitherium. L: longueur; MB: largeur antérieure; CB: largeur postérieure; Me H: hauteur du métacône; Prd H: hauteur du protoconide.

Infraorder ANCYLOPODA Cope, 1889

Family CHALICOTHERIIDAE Gill, 1872

Subfamily SCHIZOTHERIINAE Holland and Peterson, 1914

Genus Ancylotherium GAUDRY, 1862

ANCYLOTHERIUM (METASCHIZOTHERIUM) FRAASI (KOENIGSWALD, 1932)

Figure 3.3-4

1932 Metaschizotherium fraasi KOENIGSWALD, p.5

1974 Ancylotherium (Metaschizotherium) fraasi, COOMBS, p.274

Material- Left proximal phalanx of digit IV (1999/MMK-1)

Description- The proximal part of the phalanx is much broader than the distal part (Table 3). The proximal border forms two lobes of which the ulnar (lateral) lobe is more prominent. There is a pronounced notch between the lobes. The proximal facet is heart-shaped, and strongly concave. It faces proximo-dorsally, and occupies less than half the

dorsal surface of the phalanx. The distal part consists of the trochlea with median groove and lateral keels. The keels are parallel in the distal part. On the palmar side there is a longitudinal concavity between the keels. The median groove is deep and straight in the volar side. The lateral surfaces of the phalanx are roughened for ligaments. The intermediate volar tubercle is weak.

Comparison- The size and morphology, the material from Kultak is similar to Ancylotherium (Metaschizotherium) fraasi from Steinheim A. Albuch in Germany (Koenigswald 1932). Both have a heart-shaped proximal facet which faces proximo-cranially, and a large proximal part compared to the distal part.

The Kultak material resembles Ancylotherium pentelicum from Pikermi (Gaudry 1862; Schaub 1943) with respect to the proximo-cranial orientation of the proximal facet. The difference comes from the larger-sized, and narrower proximal part in A. pentelicum. The material from Kultak is also close to Moropus elatus MARSH from Nebraska described by Holland & Peterson (1914, fig. 93, 96) and Coombs (1978, p. 43) in having the dorsal orientation of the proximal facet, a slightly asymmetrical distal facet, and a narrowing distal part.

A. (M.) fraasi is distinguished from "Chalicotherium" grande BLAINVILLE from Devinska Nova Ves (Slovakia) described by Zapfe (1979). In "C. grande" the proximal facet is flat, almost parallel to the long axis of the bone, and occupies more than half the dorsal surface. A. (M.) fraasi differs from C. rusingense BUTLER (Butleria rusingensis: Bonis et al., 1995) from Rusinga (Kenya) (Butler 1965, fig. 16 C). The latter is a small-sized form, which possesses a proximal facet less oblique to the long axis of the bone and has a narrower and smaller proximal facet.

	MMK-2
Length	72.4
Length of metapodial articulation	25.0
Proximal width	48.4
Distal width	28.5
Index I = $\text{prox. width} \times 100 : \text{length}$	68
index II = $\text{distal width} \times 100 : \text{prox. width}$	58

TABLE 3. Measurements of proximal phalanx of A. (M.) fraasi
 Dimensions de la phalange proximale de A. (M.) fraasi

Order ARTIODACTYLA Owen, 1848

Family BOVIDAE Gray, 1821

Genus Tethytragus AZANZA & MORALES, 1994

TETHYTRAGUS KOEHLERAE AZANZA & MORALES 1994

Figure 3. 5-6

1987 Caprotragoides potwaricus PILGRIM, Köhler, p. 160-168, text-fig. 34-39, Pl. 2,3

1990 Caprotragoides stehlini THENIUS, Gentry, p. 540-542, fig. 4, b-c and 5 a-c

1994 Tethytragus koehlerae AZANZA & MORALES , p.20

1995 Tethytragus koehlerae AZANZA & MORALES, Geraads, Güleç & Saraç, p. 470

Material- Right m1/2 (1999/MMK-4), left horn-core (1999/MMK-3)

Description- The tooth is mesodont and its enamel is fairly rugose. The basal pillar is strongly developed (despite being broken). The inner lobes of the tooth between the stylids are slightly rounded. The outer lobes of the tooth are angular. The parastylid, metastylid and entostylid are developed. In terms of Köhler's (1993) classification, Tethytragus (Caprotragoides) teeth are of the "squasher type".

The tip of the horn core, which is inserted above the orbit, is broken. The present length of the horn core is 8.5 cm. It is curved slightly and regularly backwards. The surface of the horn core is irregularly ridged and grooved. The lateral surface is slightly flattened while the medium surface is more convex. The front of the pedicle is higher than the back. The cross-section of the horn core is oval. The supraorbital canal is short. The supraorbital foramina is small and anterointernal to the base of the pedicle. The orbital fossa is fairly deep. According to Köhler's (1993) classification, Tethytragus (Caprotragoides) horn represents the "pusher type" .

Comparison- Morphologically the tooth from Kultak is close to T. koehlerae from Paşalar (Köhler, 1987) and Çandır (Geraads, in press). The material from Çandır is the smallest form compared to T. koehlerae in Paşalar, Sarıçay and Kultak (Table 4). The tooth of T. koehlerae from Kultak is similar to that of T. langai AZANZA & MORALES from Arroyo de Val-Barranca (Spain) and Sarıçay (Made 1993). Both are characterised by the presence of the strong basal pillar. However, in T. langai, the mesostylid and the entostylid are weak, the anterior lobes are slightly angular, and the cingulum is well developed.

T. koehlerae has been described in Çandır (Geraads, in press) and İnönü (Geraads, Güleç & Saraç, 1995). The names of Caprotragoides potwaricus and C. stehlini are used, respectively in Sarıçay (Köhler 1987) and Paşalar (Gentry 1990, 1995). The size and morphology of the material from Kultak are close to those of Çandır and Paşalar (Table 4).

T. koehlerae differs from T. langai from Arroyo de Val. IV, Barranca and Paracuellos -3 in Spain (Azanza and Morales 1994). The horn core of T. koehlerae is large, with homonym(e) torsion and long pedicel. The frontal sinuses are weak or absent. The cross-sections vary from round to oval (Köhler 1987; Gentry 1990). In T. langai the horn cores are small and narrow, the torsion is heteronym, the pedicle is very short, the frontal sinuses are strong and begin at the base of the pedicle, the ornamentation is continuous, and the cross-section of the horn core is oval. With respect to general shape, Tethytragus ? stehlini (THENIUS) differs from T. koehlerae by having strong frontal sinuses without torsion, and the presence of strong ornamentation (Thenius, 1951).

Morphologically the horn-cores of Tethytragus are similar to those of Gentrytragus, from the Middle Miocene of Africa and Arabia, but some differences are recognisable. G. gentryi (THOMAS) from Ngorora (Kenya) remains poorly known, but G. thomasi AZANZA & MORALES from Fort Ternan (Kenya) has horn-cores with upwards increasing divergence. In Gentrytragus there are no frontal sinuses, and the torsion and ornamentation are strong. T. koehlerae is also different from "Caprotragoides" potwaricus from Potwar-Nagri and Ramnagar (Pakistan).

Horn-core		Pedicel	
DAP (base)	DT (base)	DAP	DT

<u>T. koehlerae</u>				
Kultak MMK-3	37,0	28,3	33.4	24.2
Paşalar 1)	36,4	27,5	-	-
Çandır 2)	28,3-37,1	21,4-31,0	29.9-32.0	21.7-25.4
Sarıçay 2)	34,6	26,0		
Paşalar 3)	35.5	28.0		
Inönü-1 4)	30.0-34.2	22.0-29.0		
<u>T. langai</u>				
Arroyo del				
Val-Barranca 3)	24.3-39.5	18.7-26.3	25.3-30.3	19.2-21.8
Paracuellos-3 3)	26.1-28.9	21.9-25.2	23.6-27.3	20.4-22.4
TABLE 4. Measurements of horn-cores of <u>Tethytragus</u> species.1) Gentry 1990; 2) Köhler 1987; 3) Azanza and Morales 1994; 4) Geraads et al., 1995. Dimensions des chevilles osseuses de <u>Tethytragus</u> .				

Paleoecology- The small number of fossils does not permit for a reliable paleoenvironmental reconstruction, but they provide some indications. Anchitherium has low-crowned teeth, and represents a forest biotope. The lophodont teeth of A. (Metaschizotherium), with the deeply split ungual phalanx and the elongated arms, indicate the presence of leafy trees, but Ancylotherium was certainly less restricted to forest environments than the Chalicotheriinae. According to Köhler (1993), Tethytragus (=Caprotragoides) is a very ubiquitous bovid. The morphological characteristics (high teeth, orbits, foot type, horn cores) of this species indicate an open country.

CHRONOLOGY AND CONCLUSIONS

The Anchitherium findings of Turkey are recorded in early Astaracian (Paşalar, Çandır, Inönü-1, Izmir-Tire), late Astaracian (Sarıçay, Çatakbağyaka, Kütahya-Sofça, Ankara-Tüney, and Çanakkale-Nebisuyu) and early Vallesian (Eşme-Akçaköy) faunas (Becker-Platen et al. 1975; Sondaar and Staesche 1975; Gürbüz 1981; Atalay 1981; Kaya 1987, 1989; Forsten 1990; Steininger et al. 1996). Anchitherium aurelianense hippoides (LARTET) is a medium-sized form and known from early Astaracian Sansan and late

Astaracian La Grive St.-Alban. Its chronological range is Astaracian (Abusch-Siewert, 1983).

Mayet (1908) and Werhli (1938) suggested that the size of European Anchitherium increased from the Early Miocene to early Late Miocene. Abusch-Siewert (1983) noted that this occurred irregularly, and that differential trends existed in various parts of Europe. The Turkish Anchitherium material supports the idea of size increase from early Middle Miocene to early Late Miocene. However, Forsten (1990) remarked that the dental size could not be used for stratigraphic purpose.

Association of a large Anchitherium with Hipparion occurs in the Vallesian localities, e.g. Eşme-Akçaköy, Nombrevilla in Spain, Gaiselberg in Austria and Soblay in France (Becker-Platen et al. 1975; Sondaar 1971). The apparent absence of Hipparion in Kultak indicates that medium-sized Anchitherium may be confined to the Middle Miocene. The material resembles more the form from the Middle Miocene (Paşalar and Çandır) than that from the Upper Miocene (Eşme-Akçaköy).

A. (M.) fraasi is an European element, and a rare constituent of the Middle Miocene faunas. A. (M.) fraasi is known from Hader, Sandelzhausen, Steinheim, Viehhausen in Germany, La Grive St.-Alban in France, Krems and Kaisersteinbruch in Austria (Koenigswald 1932; Zapfe 1979; Coombs 1974, 1989). The chronological range of this species is Middle Miocene-early Vallesian ? (Coombs 1989). There is no earlier record of A. (M.) fraasi in Turkey.

Tethytragus is a mainly Middle Miocene bovid (Azanza and Morales 1994). It is known from Paşalar, Çandır, İnönü-1, and Sarıçay, but it has also been reported from the Late Miocene site of Kavakdere (Ankara) (Loc. 34), as “Caprotragoides“ stehlini (Kappelman et al., 1996). If this identification is correct, Tethytragus survived into the Late Miocene in Turkey, but the species Tethytragus koehlerae is only known in the Astaracian.

The chronological age of the above species and the stratigraphic succession of the study area indicate that the Kultak fauna is early Middle Miocene (late Orleanian/early Astaracian) in age.

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FIGURE 1- Location map. Carte de localisation.

Sorry but I do not know much about geology ! I am not sure about the translations into French. I do not know what is mudrock; is lime different from limestone ? is coal lignite ? what is lithic sandstone (I translated by lité, meaning bedded, but this is a guess !)?

FIGURE 2- Generalised stratigraphic section. 1, Basement rocks; 2, marine limestones; 3, mudrocks; 4, lime; 5, coal; 6, Turritella beds; 7, lithic sandstones; 8, Ostrea-biostrome; 9, lithic conglomerate and sandstone; 10, mammalian fossils.

Colonne stratigraphique synthétique. 1, socle; 2, calcaires marins; 3, argiles; 4, calcaire; 5, lignite; 6, niveau à Turritella; 7, grès lités; 8, niveau à Ostrea; 9, conglomérats et grès lités; 10, Mammifères fossiles

FIGURE 3 – 1-2, Anchitherium aurelianense hippoides (LARTET), 1. Right mandible with m1-m3 (1999/MMK-2), occlusal view. 2. Same specimen, labial view. 3-4. Ancylotherium (Metaschizotherium) fraasi (KOENIGSWALD), Proximal phalanx (1999/MMK-1), 3. anterior view. 4. Same specimen, posterior view. 5-6. Tethytragus koehlerae AZANZA & MORALES 5. Right m1-2 (1999/MMK-4), occlusal view, 6. left horn-core (1999/MMK-3), anterior view.

1-2, Anchitherium aurelianense hippoides (LARTET), 1. Série dentaire avec m1-m3, droite (1988-ÇY/4), vue occlusale. 2. idem, vue labiale. 3-4. Ancylotherium (Metaschizotherium) fraasi (KOENIGSWALD), phalange proximale (1999/MMK-1), 3. vue antérieure. 4. Idem, vue postérieure. 5-6. Tethytragus koehlerae AZANZA & MORALES, 5. m1/2 droite, (1999/MMK-4), vue occlusale, 6. cheville gauche (1999/MMK-5), vue antérieure.

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