

# 内蒙古阿左旗乌兰塔塔尔 中渐新世的兔科化石

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**关键词** 内蒙古乌兰塔塔尔 中渐新世 兔科

## 内 容 提 要

本文记述了内蒙古阿左旗乌兰塔塔尔中渐新世地层中发现的兔形类材料中的一种兔科化石——德氏鄂尔多斯兔 [*Ordolagus teilhardi* (Burke), 1941]。在形态上对该属种做了较多的补充和订正,并对其系统关系进行了初步探讨。

古脊椎所野外队 1978 年在内蒙古阿左旗乌兰塔塔尔地区所采的兔形类标本约二百七十块,全部是带有不同数目颊齿的上、下颌骨,它们是乌兰塔塔尔动物群中包括啮齿类梳趾鼠科在内的全部化石中标本数量最多的一类。这些化石代表了兔科的一属一种,鼠兔科的两属四种。本文只研究兔科化石,有关鼠兔科的材料将另文发表。

德氏鄂尔多斯兔以往的标本仅有两块残破的下颌骨,而在乌兰塔塔尔,不仅发现了数量较多的下颌骨,而且还有好几块带不同部位颊齿的上颌骨,使我们能了解更多的这个属的上、下颊齿的特征和变异,提供了探讨德氏鄂尔多斯兔的系统关系的可能性。

笔者感谢张杰和陈璋同志为本文摄绘照片和插图,古脊椎所高等室的许多同志在研究过程中给予帮助。

## 一、标本记述

**兔形目** Lagomorpha Brandt, 1855

**兔科** Leporidae Gray, 1821

**鄂尔多斯兔属** *Ordolagus* Muizon, 1977

**属的修正特征** 下颌骨深而粗壮。颊齿高冠。上颊齿前后向压缩,横向窄长,齿冠弯曲度大,无次沟,嚼面上的构造可能仅出现在年幼的个体上。 $P^2$  宽大于长,具单一的前褶沟。 $P^3$  和  $P^4$  完全臼齿化。 $M^1$  前后径比其他颊齿稍大,是上颌中最大颊齿。 $M^3$  冠面成椭圆形,比  $P^2$  小得多。下颊齿的大小与形态相似于戈壁兔 (*Gobiolagus*)。所不同的是: $P_3$  的前外和前内褶沟没有或很不发育。中间下颊齿 ( $P_4-M_2$ ) 的三角座不成梨形,而具显著的后壁突起。 $M_3$  只具一条唇侧沟,生长位置与其他颊齿倾斜。

### 德氏鄂尔多斯兔 *Ordolagus teilhardi* (Burke), 1941

(图版 I, 图 A—I; 图 1—5)

**材料** 右下颌骨带颊齿  $P_3-M_2$  (V6268.1); 左下颌骨前部带颊齿  $P_3-M_1$  (V6268.2); 左下颌骨附颊齿  $M_1-M_2$  (V6268.3); 右下颌骨附颊齿  $P_4-M_3$  (V6268.4); 左下颌骨残段具颊齿  $M_1-M_2$  (V6268.5); 右下颌骨带颊齿  $P_3$  及  $P_4$  的三角座 (V6268.6); 左下颌骨附颊齿  $P_3-M_2$  (V6268.13); 右上颌骨带颊齿  $P^3-M^3$  (V6268.7); 右上颌骨带颊齿  $P^3-M^2$  (V6268.8); 左上颌骨带颊齿  $P^3-M^2$  (V6268.9); 左上颌骨碎块具颊齿  $P^3-P^4$  (V6268.10); 右上颌骨带颊齿  $P^3-M^3$  (V6268.11); 右上颌骨带颊齿  $P^2-M^2$  (V6268.12); 右  $P^4-M^1$  (V6268.14)。

**描述** 所有标本下颌骨均只保存了水平支部分, 骨体深而粗壮, 在 V6268.13 号标本中,  $M_2$  之下舌侧深 12.3 毫米, 唇侧深 11.2 毫米。咬肌窝浅, 咬肌脊不太清楚, 但在 V6268.2 号标本中明显可见咬肌脊前缘达  $M_1$  跟座, 咬肌窝也比在其他标本中深而显著。在此标本中, 后颊孔位于  $P_4$  前方颌骨体中部 (而其他标本比较接近底缘), 其周围有许多小而规则的滋养孔。前颊孔位于下门齿与  $P_3$  齿缺中间, 靠近颌骨体背侧。下颌角突向后方伸延, 和谷氏沙漠兔 (*Shamolagus grangeri*) 的相近。下门齿从保存的残段和某些标本中颌骨体内侧所保留下的齿槽看, 发育程度中等, 不象已描述过标本中的那样细小, 位于包括  $P_3$  在内的全部下颊齿的舌侧, 后端止于  $M_1$ 。

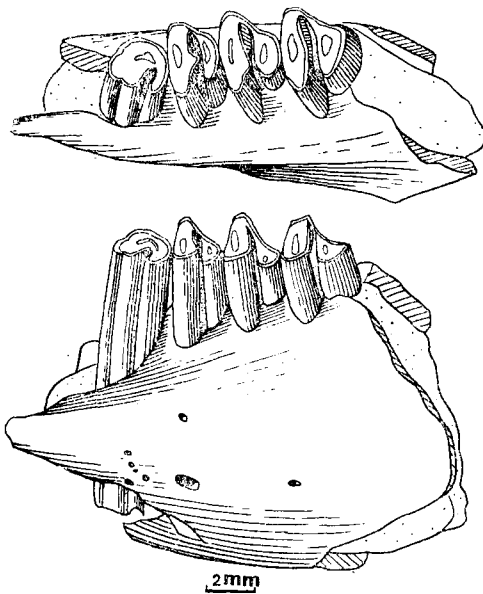


图 1 德氏鄂尔多斯兔的下颊齿,  $P_3-M_2$  (V6268.13)  
上, 冠面观; 下, 唇面观

Fig. 1 Lower cheek teeth ( $P_3-M_2$ ) of *Ordolagus teilhardi* (V6268.13)  
Upper, occlusal view; below, labial view

下颊齿的大小和形态在不同个体中略有变异。P<sub>3</sub> 相对较大, 由两叶组成, 三角座比跟座窄得多, 冠面成不规则的圆面, 跟座成横宽的长条形。由于在有些标本中有前内和前外褶沟的存在(在 V6268.13 号标本中, 前外褶沟强于前内褶沟; 在 V6268.1 号标本中, 则相反, 前外褶沟弱于前内褶沟, 而在 V6268.2 号标本中, 此两褶沟均不发育), 三角座隐约可分为两部分: 小而圆的前部和大而成椭圆形的后部。后外褶沟宽而长, 向后内方伸延超过牙齿宽度的三分之一, 沟内为白垩质所填充。三角座和跟座唇舌两面的珐琅质厚度没有明显差异, 两者齿柱在内侧相连超过齿宽之半。中间颊齿 P<sub>4</sub> 到 M<sub>2</sub>, 基本结构相互比较接近, 但大小由前向后递增, 这不是由于三角座在增大, 而是由于跟座加宽加长的结果, 因而 M<sub>2</sub> 是下颌骨中最大颊齿。经磨蚀三角座略成两边高中间低的漏斗状, 但内侧尖显著高于外侧尖。三角座和跟座的珐琅质和齿质仅在舌侧有部分连接, 两者之间由充填着白垩质的唇侧沟所分开。从 P<sub>4</sub> 到 M<sub>2</sub>, 由于跟座逐渐加长加宽, 故在三角座和跟座之间的舌侧凹陷也愈来愈显著。P<sub>4</sub> 三角座后壁的突起比后面臼齿的强得多, 跟座成叶状, 后内角和 M<sub>1</sub> 一样比较圆隆, 而与 M<sub>2</sub> 不同, 该牙的后内角向后内方突出成尖角状, 使跟座形态与前两牙齿的椭圆形不同, 成唇侧比较尖的三角形。M<sub>3</sub> 仅在 V6268.4 号标本中保存, 比较倾斜地附贴在 M<sub>2</sub> 跟座唇侧的后方, 很退化, 比前面的颊齿小得多, 但仍起咀嚼作用。其跟座小而圆, 位于三角座舌侧后方, 其间仅有一很窄的唇侧沟分开。这个牙齿比鄂尔多斯兔德氏种以前的标本相对显得小。

在某些磨蚀较轻的标本里(如 V6268.13), 三角座和跟座的中心部分各有一椭圆形珐琅质小坑, 在 P<sub>3</sub> 中长轴为前外后内向, 在中间颊齿里长轴基本上是横向。这些小坑, 未磨

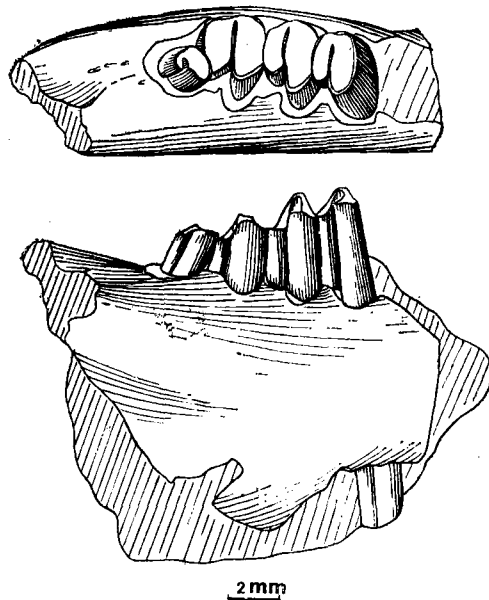


图 2 德氏鄂尔多斯兔的下颊齿, P<sub>4</sub>—M<sub>3</sub> (V6268.4)  
上, 冠面观; 下, 唇面观

Fig. 2 Lower cheek teeth (P<sub>4</sub>—M<sub>3</sub>) of *Ordolagus seilhardi* (V6268.4). Upper, occlusal View; below, labial View



时似乎与唇侧沟相通。这种构造有可能是牙齿适应增大强度的需要。

上颌骨在 V6268.7 和 V6268.11 号标本中颧突保存得比较好, 颧突前缘起于 P<sup>3</sup> 前方, 后缘在 M<sup>2</sup> 后方破损。颧突上缘虽残缺, 但仍可见成锐利的脊状。在 V6268.9 号标本中, P<sup>3</sup> 后内侧有一明显的孔, 可能是腭孔, 但颌骨、腭骨已难辨认。如果是这样, 则上颌骨明显短于现生兔类。

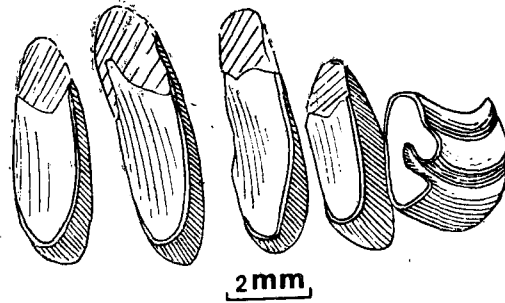


图 3 德氏鄂尔多斯兔的上颊齿, P<sup>2</sup>—M<sup>2</sup> (V6268.12)

Fig. 3 Upper cheek teeth (P<sup>2</sup>—M<sup>2</sup>) of *Ordolagus teilhardi*, occlusal view

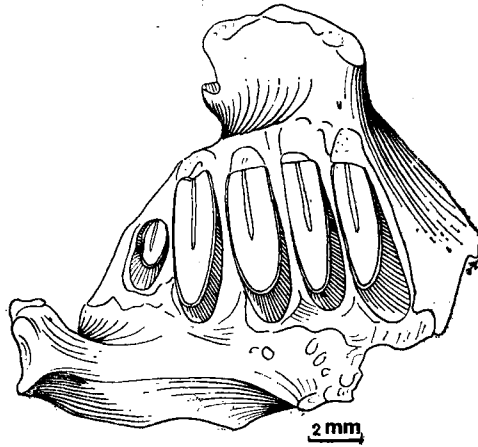
上颊齿除端齿外, 其余唇面均有不同程度的破损, 中间颊齿都非常短宽。

P<sup>2</sup> 宽也大于长, 单一的前褶沟靠近舌面, 向后伸达牙齿长度的三分之一, 分牙齿为外大内小两部分。外叶前外侧平或轻微凹陷, 可能表明是原始的唇侧前褶沟的残余。舌侧珐琅质层厚, 唇侧稍变薄。P<sup>3</sup> 和 P<sup>4</sup> 的形态与其后的臼齿一致, 表明已完全臼齿化。由于唇侧部分未保存, 因此各中间颊齿前后脊的长短无法判别。唇侧构造不明。在比较年轻 (如 V6268.12) 个体中, 冠面上隐约可见新月形谷的残余, 谷顶指向舌侧, 位于牙齿唇侧一半的中央。珐琅质在牙齿的前和舌侧较厚, 唇、后侧变薄。在所有的标本中, 均未见有次沟, 舌面比较平或稍圆隆。在冠面上也未见到次沟所留下的任何珐琅质坑的痕迹, 看来与磨蚀程度无关, 可能这类动物牙齿就不存在次沟。M<sup>3</sup> 特别退化, 比 P<sup>2</sup> 小得多, 但仍起咀嚼作用。冠面上成横宽的长圆形, 舌面略尖, 唇侧稍钝。

表 3 德氏鄂尔多斯兔 (*Ordolagus teilhardi*) 的上颊齿 (单位: 毫米)

标本	P <sup>2</sup>		P <sup>3</sup>		P <sup>4</sup>		M <sup>1</sup>		M <sup>2</sup>		M <sup>3</sup>	
	长	宽	长	宽	长	宽	长	宽	长	宽	长	宽
V6268.7			1.7	6.3	1.8	6.8	2.4	6.7	2.1	6.0	1.1	2.4
V6268.8			1.5	6.5	1.8	6.8	2.2	6.4	2.0	5.5		
V6268.9			1.4	5.0	1.7	5.5	2.1	5.7	1.8	5.0		
V6268.10			1.7	6.0	1.9	7.0						
V6268.11			1.7	6.6	1.8	7.0	2.3	7.0	2.1	5.3	1.1	2.2
V6268.12	1.7	3.1	1.6	5.0	1.7	6.8	2.0	6.7	1.8	6.0		

注: 表中宽度为冠面最大宽度, 但由于唇面破损, 中间颊齿宽度只是近似值。

图 4 德氏鄂尔多斯兔的上颊齿, P<sup>3</sup>—M<sup>3</sup> (V6268.11)Fig. 4 Upper cheek teeth (P<sup>3</sup>—M<sup>3</sup>) of *Ordolagus teilhardi*, occlusal view表 4 德氏鄂尔多斯兔 (*Ordolagus teilhardi*) 的上颊齿齿列长度(单位: 毫米)

	P <sup>2</sup> -M <sup>2</sup>	P <sup>2</sup> -M <sup>1</sup>	P <sup>2</sup> -P <sup>4</sup>	P <sup>2</sup> -P <sup>3</sup>	P <sup>3</sup> -M <sup>3</sup>	P <sup>3</sup> -M <sup>2</sup>	P <sup>3</sup> -M <sup>1</sup>	P <sup>3</sup> -P <sup>4</sup>	P <sup>4</sup> -M <sup>3</sup>	P <sup>4</sup> -M <sup>2</sup>	P <sup>4</sup> -M <sup>1</sup>	M <sup>1</sup> -M <sup>3</sup>	M <sup>1</sup> -M <sup>2</sup>	M <sup>2</sup> -M <sup>3</sup>
V6268.7					11.1	9.2	6.6	4.0	8.7	6.8	4.5	6.0	4.6	3.6
V6268.8						8.2	5.8	3.5		6.6	4.3			
V6268.9						7.8	6.0	3.7		5.7	4.1			
V6268.10								3.8						
V6268.11					10.0	8.4	6.2	3.8	7.8	6.4	4.2	5.8	4.5	3.4
V6268.12	11.3	8.4	5.7	3.6		9.2	6.5	3.7		7.2	4.5			

## 二、比较和讨论

贝克 (Burke, 1941) 在研究蒙古和我国内蒙古发现的兔科化石时, 建立了戈壁兔属 (*Gobiolagus*), 材料全部是下颌骨和下颊齿, 包括晚始新世一个种——托氏戈壁兔 (*G. solmachovi*), 早渐新世两个种——安氏戈壁兔 (*G. andrewsi*) 和大戈壁兔 (*G. ? major*), 中渐新世一个种——德氏戈壁兔 (*G. ? teilhardi*)。其中这后一个种的标本是一带 P<sub>3</sub>-M<sub>1</sub> (P<sub>3</sub> 齿根已破碎) 的下颌骨, 贝克是经过和德日进 (Teilhard, 1926) 的“不确定的双门齿类”标本对比后建立的。贝克本人也怀疑过这两块标本所代表的德氏戈壁兔可能是个新属: “在代表这个种比较好的标本被发现以前, 德氏戈壁兔的分类位置仍存在问题, 当这样的材料被发现时, 这个种很可能被证明属于不同的属”。(Burke, 1941, p. 13)。1968年, Janvier 将德日进研究过的那块标本重新进行修理, 暴露出一些新的特征。米荣 (Muizon, 1977) 根据这些特征, 并与贝克所建戈壁兔中的几个种详细进行比较, 认为贝克所建德氏戈壁兔的两块标本, 与以托氏种和安氏种为代表的戈壁兔是不同的, 指出了几点主要差别, 并建

立了一新属——鄂尔多斯兔,只包括一属型种——德氏鄂尔多斯兔。

1978年我所野外队在内蒙古阿左旗乌兰塔塔尔地区发现了大量的兔形类标本,其中有几块带有不同数目颊齿的下颌骨与戈壁兔的下颊齿很相近,如从 $P_4$ 到 $M_2$ 尺寸逐渐增大, $P_4$ 跟座成叶状附贴在三角座后方, $M_2$ 是下颌骨中最大颊齿。从 $P_4$ 到 $M_2$ ,主要是跟座在逐渐扩大,且与三角座渐趋分离。中间下颊齿的三角座和跟座的珐琅质和齿质在舌侧均有部分连接。因此我们曾试图将这些标本放到戈壁兔属。但米荣在建立新属鄂尔多斯兔时,指出新属的臼齿高冠,下颌骨相应地也较高,而戈壁兔的臼齿齿冠相对较低,基本上是半高冠齿(或贝克所称单面高冠),下颊齿的齿沟从不伸入到相对较低的下颌骨中。在鄂尔多斯兔里, $M_3$ 相对比较倾斜生长,只有一个唇侧沟,而在戈壁兔中 $M_3$ 相对齿槽比较垂直,沟有两条(唇、舌侧各一)。在鄂尔多斯兔中, $P_4$ 到 $M_2$ 三角座后壁有不同程度的突起,此特征在托氏种和安氏种这两戈壁兔典型种中是不存在的,而在大戈壁兔中稍有发育。前者 $M_1$ 到 $M_2$ 舌侧的凹度相对比后者深,下颊齿与齿列长轴比后者近于垂直。我们的标本在这些方面与戈壁兔不同,而与鄂尔多斯兔基本一致,可视为同属同种。但在乌兰塔塔尔,有些标本的 $P_3$ 除具后外褶沟外,还具有发育程度不同的前外和前内褶沟,致使三角座似成双叶,整个 $P_3$ 有点象葫芦形;而在另一些标本中,和德氏种原标本一样,由于只具后外褶沟, $P_3$ 冠面形态成逗点形。 $P_4$ 三角座后壁突起及 $M_2$ 跟座后内角突出的程度在不同的标本里也是不同的。这些差异或与磨蚀程度有关,或为种内的个体变异。

德氏鄂尔多斯兔以往的标本仅有两块残破的下颌骨,一是发现在我国内蒙古三盛公,带完整颊齿齿列;另一是蒙古三达河的,仅带 $P_3$ — $M_1$ ,这次在乌兰塔塔尔不仅找到了几个带不同数目颊齿的下颌骨,而且还发现了几块大小与下颌骨基本吻合、可以断定为德氏鄂尔多斯兔的上颌骨。它们的颊齿前后向压缩,非常短宽, $P^2$ 仅具一条前褶沟,分牙齿为内小外大两叶, $P^3$ 和 $P^4$ 已完全臼齿化, $M^3$ 很退化,中间颊齿在中等磨蚀程度下,不存在次沟,冠面上其他原始构造也不发育,牙齿弯曲度大,很短宽。兔科的上颊齿,除个别的早期几个属如卢氏兔(*Lushilagus*)和沙漠兔等外,其余的属包括齿冠低、个体小、比较原始的渐新世类型如古兔(*Palaeolagus*)在内,全在内缘有次沟发育。李传夔(1965, p. 27)描述的?戈壁兔(?*Gobiolagus* sp.)一块具 $M^1$ 和 $M^2$ 的残破左上颌骨,它的个体大小与中间沙漠兔(*Shamolagus medius*)接近,也具次沟,牙齿相对窄长,均与本文记述的标本有很大差别。鉴于鄂尔多斯兔的下颊齿与戈壁兔的很相近,因此这块以往唯一代表戈壁兔上颊齿的标本,仍然是很可疑的。卢氏兔和沙漠兔的上颊齿虽无次沟,与鄂尔多斯兔一致,但前两类兔在许多特征上表现原始,个体小、齿冠低,沙漠兔的 $P^3$ 未臼齿化,卢氏兔不仅 $P^3$ 而且 $P^4$ 也未臼齿化。它们的唇面谷比较发育,上颊齿前后特别窄长与相当横宽的鄂尔多斯兔的上颊齿在许多方面差别甚大。

鄂尔多斯兔个体比较大,上臼齿三个, $P^3$ 已臼齿化,三角座和跟座在舌侧连接,这些特征与鼠兔科不同,说明它是兔科的成员。关于兔科的分类尽管各家持不同的看法,但由达斯(Dice, 1929)提出经过道森(Dawson, 1958)等人修正的三个亚科:Palaeolaginae, Archaeolaginae和Leporinae已被较多的人所接受。鄂尔多斯兔的 $P_3$ 无后内褶沟,应该归入Archaeolaginae,但该亚科的化石主要发现在北美,我国早第三纪尚无此亚科记录。不管怎样,鄂尔多斯兔和戈壁兔一样,均是亚洲早第三纪的古兔类。

德氏鄂尔多斯兔的  $P_3$  有的具前内和前外褶沟以及前面提到过的相似性, 提供了与戈壁兔有相近关系的可能性, 但与该属的托氏种和安氏种差别仍很大, 而与大戈壁兔似乎更近的亲缘关系, 这表现在两者下颌骨均粗壮, 三角座后壁都有不同程度的突起,  $M_3$  均有退化, 且相对齿槽缘比较倾斜。然而大戈壁兔的下颊齿半高冠, 三角座后壁突起不如鄂尔多斯兔明显, 前后向不太压缩, 牙齿相对比较窄长, 三角座与跟座舌侧愈合也不太明显,  $M_3$  具浅的舌侧沟等不同点均反映了大戈壁兔比鄂尔多斯兔原始。因此, 正如米荣所指出的那样, 鄂尔多斯兔与戈壁兔之间存在着亲缘关系, 可能前者是由后者发展而来。

鄂尔多斯兔的上颊齿弯曲度大, 其原因正如托宾 (Tobien, 1978, p. 171) 所指出的, 是由于颊齿向高冠方向发展的结果。鄂尔多斯兔是高冠齿, 下颌骨虽然深而粗壮, 但仍不能满足牙齿增高的需要, 只有加大颊齿的弯曲度来达到完全高冠。

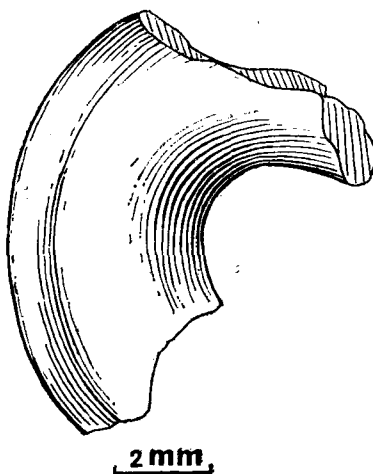


图 5 德氏鄂尔多斯兔的  $P^4$  (前面观), 以示颊齿的弯曲 (V6268.10)

Fig. 5  $P^4$  of *Ordolagus teilhardi* (V6268.10), posterior view. Showing the bend of the upper cheek teeth

从目前资料看, 德氏鄂尔多斯兔的标本都发现在中渐新世地层里。

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## FOSSIL LEPORIDS FROM THE MIDDLE OLIGOCENE OF ULANTATAL, NEI MONGOL

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**Key words** Ulantatal, Nei Mongol; Middle Oligocene; Leporidae

### Summary

The fossil Leporidae described in the present paper were collected from Middle Oligocene deposits at Ulantatal in Western Nei Mongol by an IVPP field team in 1978. The small collection consists of over ten specimens including upper and lower jaws, representing one species, *Ordolagus teilhardi*.

*Ordolagus teilhardi* was previously known by only two broken lower jaws recovered from Middle Oligocene deposits of Shanshengong, Nei Mongol and from the deposits of same age at Hsanda Gol, Mongolia. Newly discovered upper cheek teeth show greater range of morphological diversity than was previously known for this species.

**Lagomorpha Brandt, 1855**

**Leporidae Gray, 1821**

***Ordolagus* Muizon, 1977**

**Revised diagnosis** Lower jaw deep and robust. Cheek teeth hypsodont. Upper cheek teeth anteroposteriorly compressed with strongly curved crowns. There is no evidence of a hypostria, and the primitive structure on the surface may exist only in very young individuals. P<sup>2</sup> width greater than length, with a single anterior reentrant that crosses one-third of the occlusal surface. P<sup>3</sup> and P<sup>4</sup> fully molariform. M<sup>1</sup> is the largest upper cheek tooth. Lower cheek teeth are similar to those of *Gobiolagus* both in size and in morphology, differ from the latter in no or much reduced anterointernal and anteroexternal reentrants on P<sub>3</sub>, nonpear-shaped trigonids with pronounced posterior projections on P<sub>4</sub>-M<sub>2</sub>. Obliquely setting M<sub>3</sub> with only one lateral groove.

***Ordolagus teilhardi* (Burke) 1941**

**Material** Right P<sub>3</sub>-M<sub>2</sub> (V6268.1); left P<sub>3</sub>-M<sub>1</sub> (V6268.2); left M<sub>1</sub>-M<sub>2</sub> (V6268.3); right P<sub>4</sub>-M<sub>3</sub> (V6268.4); left M<sub>1</sub>-M<sub>2</sub> (V6268.5); right P<sub>3</sub> and trigonid of P<sub>4</sub> (V6268.6); left P<sub>3</sub>-M<sub>2</sub> (V6268.13); right P<sup>3</sup>-M<sup>3</sup> (V6268.7); right P<sup>3</sup>-M<sup>2</sup> (V6268.8); left P<sup>3</sup>-M<sup>2</sup> (V6268.9); left P<sup>3</sup>-P<sup>4</sup> (V6268.10); right P<sup>3</sup>-M<sup>3</sup> (V6268.11); right P<sup>2</sup>-M<sup>2</sup> (V6268.12); right P<sup>4</sup>-M<sup>1</sup>.

**Description** Horizontal ramus deep and robust, measuring 12.3 mm and 11.2 mm labially below  $M_2$  in V6268.13. The masseteric fossa is shallow, terminating anteriorly below  $M_1$ . One mental foramen is situated below the diastema and a second lies in front of and below  $P_4$  in most specimens.

The lower incisor in all specimens extends posteriorly along the ventrolingual side of the jaw, and terminates below  $M_1$ . Size and morphology of lower cheek teeth slightly varies among specimens.  $P_3$  consists of two lobes: the trigonid is narrower than the talonid, and a main posteroexternal reentrant between the trigonid and talonid spans more than one-third of the tooth. The dentine of the lobes is lingually confluent. In some specimens the trigonid appears to be divided into two sections due to the presence of less developed anterointernal and anteroexternal reentrants. In general,  $P_4$ ,  $M_1$  and  $M_2$  are similar. Each consists of a trigonid and a narrower talonid that are united lingually by a bridge of enamel and dentine. Tooth size increases from  $P_4$  to  $M_2$ . The talonid of  $P_4$  is leaf-like, while in  $M_2$  is nearly triangular. The posterior projection on the trigonid of  $P_4$  is the largest of the three teeth.  $M_3$  is preserved only in V6268.4, obliquely set posterior to the talonid of  $M_2$ .  $M_3$  is smaller than any other cheek teeth in this species. Two columns are indicated by a narrow labial groove. The talonid on  $M_3$  is small and circular, situated lingually behind the trigonid. This tooth is also relatively smaller than  $M_3$  found in previously studied specimens. Cement is present between the columns on  $P_4$  to  $M_2$  and fills the external reentrants on  $P_3$  and  $M_3$ .

The anterior root of the zygomatic arch extends to the anterior surface of  $P^3$ .

The upper cheek teeth are broken labially, except for  $P^3$  and  $M^3$ .  $P^3$ - $M^3$  are very wide.  $P^3$  is wider than long with a single anterior reentrant that crosses about one-third of the occlusal surface. The anterior portion of the tooth is divided by the reentrant into a big external (buccal) lobe and a smaller internal (lingual) one. The  $P^3$  enamel is well developed lingually, but it is thin buccally.  $P^3$ ,  $P^4$ ,  $M^1$  and  $M^3$  are similar in overall pattern, demonstrating that the last two premolars are fully molariform. There is no evidence of a hypostria on  $P^3$ - $M^3$ , and a small remnant of a crescent is present only in younger individuals (e.g., V6268.12). The enamel is well developed anteriorly and lingually, but it is thinner or reduced posteriorly and buccally.  $M^3$  is much smaller than  $P^3$ , and has an elliptical occlusal surface.

**Comparison and discussion** Burke (1941) created a new genus, *Gobiolagus*, including four species, *G. tolmachovi* (Late Eocene), *G. andrewsi* (Early Oligocene), *G. ? major* (early Oligocene), and *G. ? teilhardi* (Middle Oligocene). All of these taxa were based solely on lower jaws and cheek teeth from Nei Mongol and Mongolia. The last species, *G. ? teilhardi*, based on a broken lower jaw, was created by Burke, comparing with the specimen, which Teilhard designated as *Duplicidentis* indeterminate, from Shanshengong. Burke himself doubted that this material warranted a new genus: "The generic position of *Gobiolagus* (?) *teilhardi* must remain in some doubt until better material representing the species is available, when such material is studied, the species may prove to belong to a distinct genus." (Burke, 1941). In 1968 Teilhard's specimen was reprepared by Janvier, and some previously unknown features were revealed. Muizon (1977) recognized differences between Teilhard's specimen and the types of *Gobiolagus tolmachovi* and *G. andrewsi*. Subsequently, Muizon (1977) referred Teilhard's material (ie., *Gobiolagus ?teilhardi*) to a new genus, *Ordolagus teilhardi*.

The 1978 IVPP field team found a great many lagomorph specimens at Ulanatal localities in Nei Mongol. In that collection, several lower jaws and cheek teeth are similar to those of *Gobiolagus* in the increase in size from  $P_4$  to  $M_2$ , leaf-like  $P_4$  talonids placed close to the poste-

rior slope of the trigonid.  $M_3$  is the largest tooth in the lower molar series. The talonids and trigonids of  $P_4-M_2$  are united lingually by a bridge of enamel and dentine, as described above. These specimens were originally referred to *Gobiolagus*. Muizon (1977), however, pointed out some important differences between *Ordolagus* and *Gobiolagus*. In the former, the cheek teeth are hypsodont, the lower jaw is deep, and  $M_3$  is set obliquely to the tooth row with only one furrow on the labial side. The trigonids of  $P_4-M_2$  possess distinct posterior projections. In *Gobiolagus*, the cheek teeth are subhypsodont or unilaterally hypsodont, as Burke pointed out. Re-entrants or furrows on the lower cheek teeth of *Gobiolagus* never extend below the alveolar margin.  $M_3$  is placed nearly perpendicular to the alveolar margin and has two grooves on both lingual and labial sides. There are no posterior projections on the trigonids of the holotypes of *Gobiolagus tolmachovi* and *G. andrewsi*. Specimens found at Ulantatal resemble *Ordolagus* and not *Gobiolagus* in the above features. Nevertheless, on some specimens from Ulantatal there are various re-entrants on  $P_3$ , apart from the main posteroexternal ones. The posterior trigonid projection on  $P_4$  and posterointernal convex on  $M_2$  are better developed on the Ulantatal specimens than as noted for the holotypes. These differences may be due to different developmental stages being represented by various specimens. The Ulantatal specimens are, therefore, here referred to *Ordolagus teilhardi*.

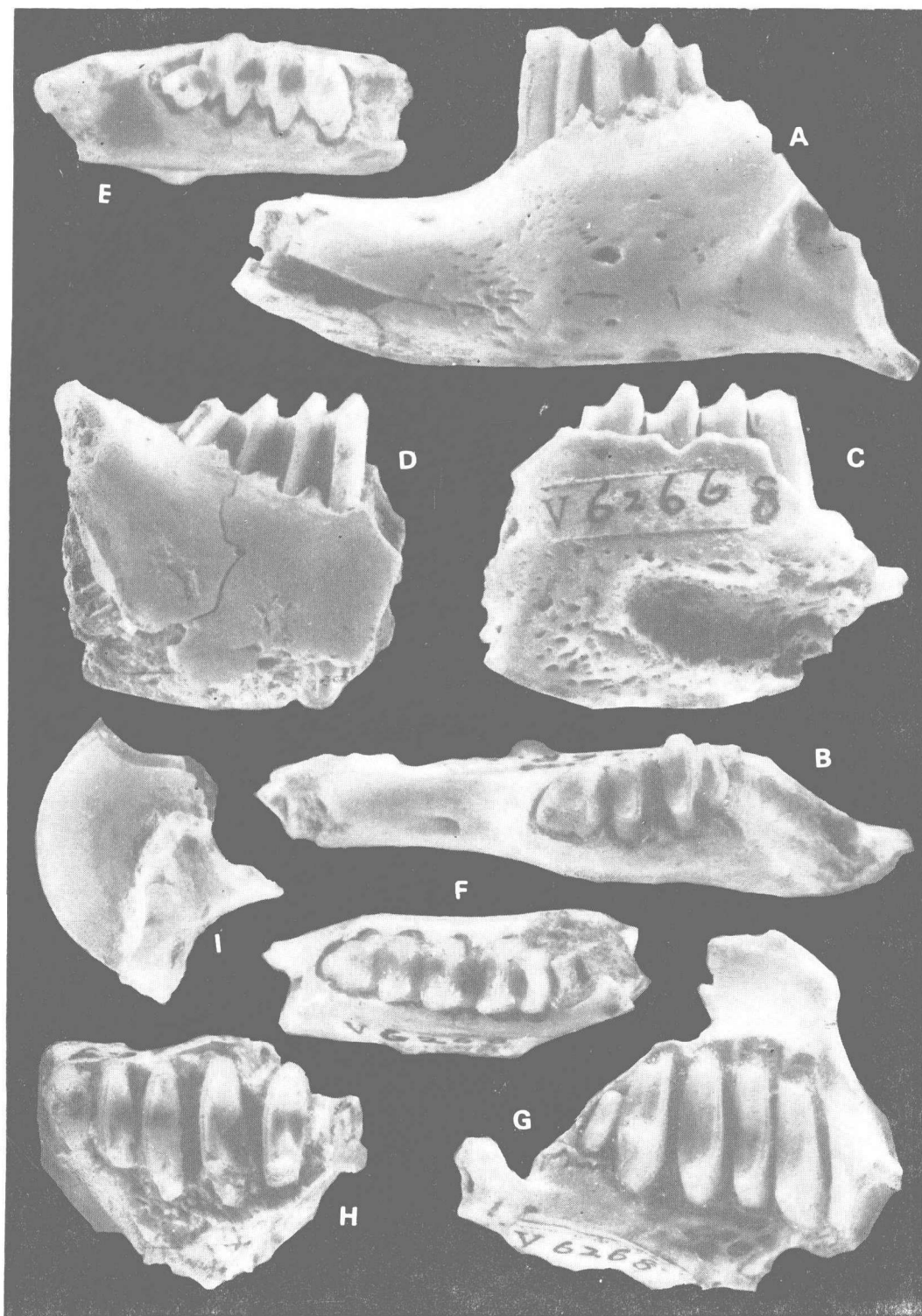
*Ordolagus teilhardi* has large size and three upper molars.  $P^3$  is fully molariform and there are bridges of enamel and dentine between the  $P_4-M_2$  trigonids and talonids. All of these features indicate that *O. teilhardi* is a leporid.

Specimens of *Ordolagus* can be distinguished from those of other leporid genera by their possession of completely molariform  $P^3$ s and greater transverse width of the upper cheek teeth. There is no evidence of a hypostria on the upper cheek teeth of *Ordolagus*, like *Lushilagus* and *Shamolagus*. However, *Lushilagus* and *Shamolagus* differ from *Ordolagus teilhardi* in their possession of several primitive features, such as smaller size, lower crowns, nonmolariform  $P^3$ , and relatively longer upper cheek teeth than seen in *Ordolagus*.

There are no known upper cheek teeth of *Gobiolagus*. Li (1965, p. 27) described a broken maxilla with  $M^{1-3}$  as ? *Gobiolagus* sp.. It is comparable to *Shamolagus medius* in size, possession of hypostria and greater anteroposterior width of upper cheek teeth. These features also distinguish Li's specimen from *Gobiolagus*. Considering the above noted similarities of lower cheek teeth between *Ordolagus* and *Gobiolagus*, it is not likely that Li's specimen belongs to either genus.

Some specimens of *Ordolagus teilhardi* possess anteroexternal and anterointernal furrows on  $P_3$  and other similar features of the lower cheek teeth. The common possession of these characteristics by *Ordolagus* sp. and *Gobiolagus* sp. demonstrating the close affinity of the two genera. In addition, both *O. teilhardi* and *G. ? major* the mandible is deep, trigonids possess posterior projections and  $M_3$  is reduced in size and placed obliquely with respect to the alveolar margin. But, in general, *G. ? major* possesses a more primitive suite of characters than *O. teilhardi*, including subhypsodont, relatively longer lower cheek teeth, trigonid posterior projections less developed,  $M_3$  with a shallow lingual groove in addition to the buccal one. It is possible that *G. ? major* represents an earlier branch of leporids which give rise to that of *Ordolagus teilhardi*. The upper cheek teeth are strongly curved in *O. teilhardi* due to the progressive hypsodonty in this species, as Tobien (1978, p. 171) noted.

All known specimens of *Ordolagus teilhardi* were recovered from Middle Oligocene deposits. For that reason, the "typical" fossil leporid is considered to be of that age.



德氏鄂尔多斯兔 *Ordolagus teilhardi* (Burke), 1941

- A—B, 左下颌骨前部附颊齿  $P_3-M_1$  (V6268.2), A. 外侧面观; B. 冠面观;  
C, 左下颌骨附颊齿  $P_3-M_2$  (V6268.13), 内侧面观;  
D—E, 右下颌骨附颊齿  $P_4-M_3$  (V6268.4), D, 外侧面观; E, 冠面观;  
F, 右下颌骨附颊齿  $P_3-M_2$  (V6268.1), 冠面观;  
G, 右上颌骨附颊齿  $P^3-M^3$  (V6268.11), 冠面观;  
H, 右上颌骨附颊齿  $P^2-M^2$  (V6268.12), 冠面观;  
I, 右  $P^4$  (V6268.14), 前面观 全部标本放大 3.5 倍