

# 山西垣曲中始新世中期仓鼠化石<sup>1)</sup>

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**摘要:** 记述了在垣曲盆地郭家村火石坡地点发现的仓鼠类一新种和一个相似种——垣曲古亚鼠 (*Palasiomys yuanquensis* sp. nov.) 和垣曲古亚鼠相似种 (*Palasiomys* cf. *P. yuanquensis*)。新种以上臼齿前小尖不明显、m1 下前边尖与下原尖相连、个体大等特点区别于属型种锥齿古亚鼠 (*P. conulus*)。古亚鼠化石在火石坡的发现为垣曲盆地可能存在中始新世伊尔丁曼哈期地层提供了又一证据。

**关键词:** 山西垣曲, 中始新世, 仓鼠科

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山西省垣曲县王茅镇郭家村火石坡是垣曲盆地近年来发现的新化石点, 产有丰富的哺乳动物化石, 部分门类已做了报道(黄学诗等, 1999; Zhang et al., 2001; 刘丽萍、黄学诗, 2002; 黄学诗、王景文, 2002; 黄学诗, 2002)。本文研究的是其中的啮齿类仓鼠科化石, 是中美联合考察队 1997 年和中科院古脊椎动物与古人类研究所野外队 1998 年两次在该地点筛洗获得的, 虽种类和标本数量不多, 但它们在增加垣曲盆地始新世动物群成员和确定地层时代上均有一定的意义, 故予以简单记述。

## 1 标本记述

**啮齿目 Rodentia Bowdich, 1821**

**仓鼠科 Cricetidae Rochebrune, 1883**

**古亚鼠属 Palasiomys Tong, 1997**

**垣曲古亚鼠(新种) Palasiomys yuanquensis sp. nov.**

(图 1)

2001 仓鼠科属种未定 Cricetidae gen. et sp. indet. Huang et al., p. 91

**正型标本** 一枚右 M1 (V 13734)。

**归入标本** 7 枚 M1 (V 13734. 1 ~ 7); 4 枚 M2 (V 13734. 8 ~ 11); 7 枚 M3 (V 13734. 12 ~ 18); 9 枚 m1 (V 13734. 19 ~ 27); 9 枚 m2 (V 13734. 28 ~ 36); 3 枚 m3 (V 13734. 37 ~ 39)。

**产地与层位** 山西省垣曲县王茅镇郭家村火石坡, 中始新世河堤组峪里段。

**特征** 上臼齿前小尖不明显、m1 下前边尖与下原尖相连、牙齿尺寸比属型种大的一种古亚鼠。

**词义** 种名表示化石产地山西省垣曲盆地。

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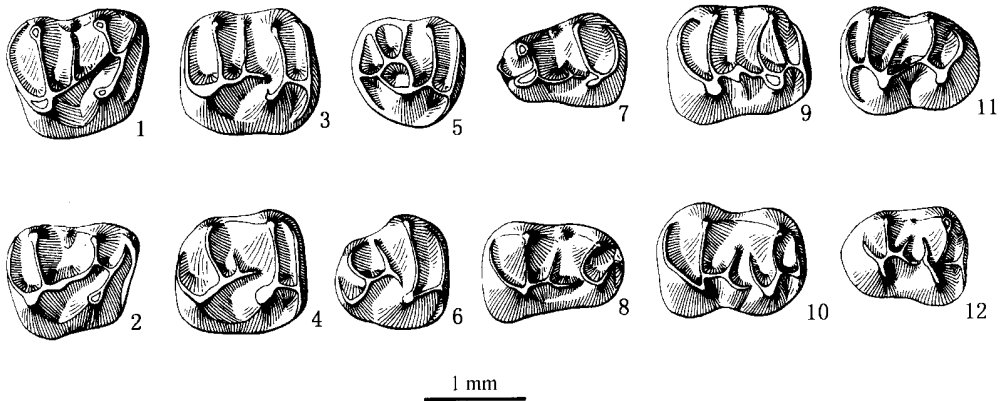


图1 垣曲古亚鼠(新种)的颊齿冠面素描

Fig. 1 Occlusal view of the cheek teeth of *Palasiomys yuanquensis* sp. nov.

1. right M1 (holotype, V 13734) ; 2. right M1 (V 13734. 1) ; 3. right M2 (V 13734. 8) ; 4. right M2 (V 13734. 9) ; 5. right M3 (V 13734. 12) ; 6. right M3 (V 13734. 13) ; 7. left m1 (V 13734. 19) ; 8. right m1 (V 13734. 20) ; 9. right m2 (V 13734. 28) ; 10. right m2 (V 13734. 29) ; 11. left m3 (V 13734. 37) ; 12. right m3 (V 13734. 38)

**记述** M1 呈不规则的长方形,长略大于宽,外壁稍长于内壁,后壁略宽于前壁。4个主尖大小相近,横向上看不出在位置上有前后。原尖前臂发育,长,向前外方斜伸至前外角并与前附尖相连。前尖锥状,与原尖前臂相接形成原脊,其上的前小尖(周明镇等, 1975,相当于童永生 1997年记述的原小尖)不发育。原脊在横向上不平直,中部微向前突。原尖后臂不发育。次尖似比原尖高大。次尖前臂发育,与内脊融合,向前外斜伸直达原脊中部,而不与原尖相连。在有些标本中,与内侧原尖间有深沟。后尖亦呈锥状,与次尖前臂相连形成后脊,因而后脊和原脊一样均为前连接。前附尖小,未形成明显的前叶。中尖不发育,中附尖较明显。中脊变异较大,大多不发育。多数标本具弱的前齿带,其中个别标本在舌侧有十分小的突起,可能是锥形的前边尖。

M2 近方形或长方形,长稍大于宽,大小与 M1 相近(表 1)。前尖与原尖前臂相接,因此原脊为前连接,并在中部微向前凸。原尖后臂较短,不与次尖前臂或内脊相接。次尖前臂向前外方伸,既不与原尖连接也不与原脊相连。后脊与次尖前臂相连,亦为前连接。中尖和中脊变异较大,有发育的,也有较弱的,但中附尖多数较清楚。前齿带发育,连续,并在舌侧形成前边尖。前边尖与原脊间有明显的平行牙齿长轴的脊相连(约位于原脊的内 1/3 处)。

M3 略成三角形或方圆形,长宽近等或长稍大于宽。次尖、后尖均明显退化。次尖位置仍在牙齿纵向中线舌侧。后尖几成牙齿后外角上的齿带突起。原脊与前两牙齿相似,仍很发育。后脊低细,明显向前突,多与后边脊(后齿带)围成封闭谷。中附尖、中脊和内脊也很发育,给牙齿冠面以复杂之结构。前齿带明显,在多数标本中具前边尖及此尖与原脊连接之纵脊。

颊齿测量见表 1。

表 1 垣曲古亚鼠(新种)的颊齿测量与比较

Table 1 Measurements and Comparison of the cheek teeth of *Palasiomys yuanquensis* sp. nov. (mm)

		<i>P. yuanquensis</i> sp. nov.					<i>P. conulus</i>
		N	OR	X	S	CV	OR
M1	L	8	1.25 ~ 1.45	1.36	0.075	5.221	0.95 ~ 1.10
	W	8	1.05 ~ 1.25	1.13	0.059	5.221	0.80 ~ 1.00
M2	L	4	1.35 ~ 1.40	1.36	0.025	1.838	0.95 ~ 1.15
	W	4	1.10 ~ 1.15	1.11	0.025	2.252	0.80 ~ 1.00
M3	L	7	1.05 ~ 1.15	1.10	0.034	3.090	0.70 ~ 0.95
	W	7	0.95 ~ 1.05	1.04	0.045	4.327	0.70 ~ 0.95
m1	L	9	1.25 ~ 1.45	1.34	0.058	4.328	0.90 ~ 1.15
	W	9	0.80 ~ 1.05	0.93	0.087	9.350	0.70 ~ 0.90
m2	L	9	1.25 ~ 1.45	1.34	0.065	4.850	0.95 ~ 1.20
	W	9	0.95 ~ 1.05	1.03	0.044	4.272	0.75 ~ 1.00
m3	L	3	1.20 ~ 1.35	1.28	0.076	5.938	0.90 ~ 1.10
	W	3	0.95 ~ 1.05	1.00	0.050	5.000	0.80 ~ 1.00

注:L=length(长);W=width(宽);N=specimen number(标本数);OR=observed range of variation(变异范围);X=mean of sample(平均数);S=standard variation(标准差);CV=coefficient of variation(变异系数);*P. conulus* 据童永生(1997)。

m1 窄长,跟座宽于三角座。牙齿齿尖高突,齿脊低弱。4个主尖大小相近,但内侧尖高于外侧尖,并在横向上比外侧尖略靠前。下后脊与下原尖后臂相接,并呈稍向后凸之弧形脊。下次脊横向,比较平直,与下次尖前臂相连。下中尖、下内中尖和下中脊因标本而异,有发育的,也有不明显的。下外脊在多数标本中比较发育,位置相当靠外。下前边尖明显,突出在牙齿的正前方,在绝大部分标本中与下原尖前臂相连,极少数的标本连接的脊弱或不连接,但并未发现与下后尖相连者。

m2 呈长方形,前后宽度大致相等或跟座稍宽于三角座。绝大部分标本下原尖前臂和后臂均与下后尖相连,形成封闭的三角凹,但少数标本下后脊不完全,即下原尖后臂不与下后尖相接。下次脊横向,与下次尖前臂相连。下中尖、下内中尖和下中脊有发育的,有不明显的,变异较大。下外脊较发育,与m1一样位置靠外。前齿带(或前边脊)和后齿带(或后边脊)都很发育。下前边尖明显,与下后脊以纵脊相连。

m3 比m2略小,后壁明显窄于前壁。下内尖明显小于下次尖。下后脊完全。下原尖后臂虽长但不与下后尖相接。下次脊也较发育,与下次尖前臂相接,比较横向。下中尖、下内中尖、下中脊以及下前边尖、前齿带和后齿带等发育状况基本上与前两牙齿同。

比较 前面记述的牙齿,M1和M2大小相近,M1前附尖小,前叶不发育,与垣曲盆地以往发现的祖仓鼠(*Pappocricetodon*)有很大区别(童永生,1992),而这些特点却与古亚鼠和罕仓鼠(*Ranricricetodon*)一致(童永生,1997)。但后者M1的原尖前臂不与前附尖相连,所以本文研究的标本应为古亚鼠。古亚鼠属为童永生(1997)所建,仅包括锥齿古仓鼠一个种,本文记述的标本与其相比,有以下区别:牙齿尺寸相对比锥齿种大些(表1)。M1的前附尖和前叶虽小,但相对比属型种还要大些和发达些。上臼齿前小尖不发育(锥齿种明显)。M2的舌侧前齿带仍相当发育(锥齿种不显著)。m1下前边尖与下原尖的连接脊明显,而锥齿种连接下后尖的内侧脊清楚。m2在有些标本中下原尖后臂短,不与下后尖相接,而

锥齿种正相反,有些下原尖前臂短。此外,从整体上看,上颊齿脊形化程度显得稍强些,齿尖不如锥齿种那样高凸。因此火石坡的标本应为一新种——垣曲古亚鼠(*Palasiomys yuanquensis* sp. nov.)。

### 垣曲古亚鼠(相似种) *Palasiomys* cf. *P. yuanquensis*

(图 2)

在火石坡地点发现的仓鼠标本中,尚有 3 枚 M1 (V 13735.1~3)。它们近方形或长方形,长稍大于宽,外壁略长于内壁。4 个主尖大小相近,在横向上看不出有前后位置之分。

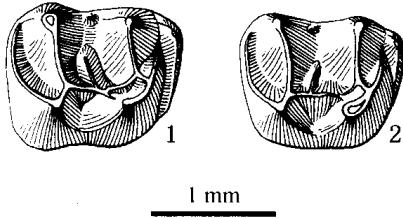


图 2 垣曲古亚鼠(相似种)的右上臼齿冠面素描

Fig. 2 Occlusal view of the upper molars of *Palasiomys* cf. *P. yuanquensis*

1. right M1 (V 13735.1); 2. right M1 (V 13735.2)

表 2 垣曲古亚鼠(相似种)的第一上臼齿测量

		Table 2 Measurements of M1 of <i>Palasiomys</i> cf. <i>P. yuanquensis</i> (mm)		
		V 13735.1	V 13735.2	V 13735.3
长	L	1.35	1.35	1.45
宽	W	1.10	1.05	1.25

原尖前臂不伸达前附尖,而终止在前尖前侧。前附尖不大但清楚,前叶很小不明显。前尖以细弱的脊与原尖前臂相接。后脊也和原脊一样,与次尖前臂相接,为典型的前连接。内脊短,中脊低但明显,中附尖发育,但中尖在有一块标本中不明显。很难看出牙齿前壁有与前面牙齿接触的痕迹。测量见表 2。

这 3 颗牙齿总的特征与前面描述的垣曲古亚鼠一致,所不同的是它的 M1 原尖前臂短,不与前附尖相连。童永生(1997)在建立新属古亚鼠和罕仓鼠以及祖仓鼠和罕仓鼠两个新亚科时明确指出,罕仓鼠亚科与祖仓鼠亚科的主要的区别在于,罕仓鼠的 M1 原尖前棱不是伸向前附尖,而是伸向前尖的前侧。照此分

类,这 3 颗牙齿就应该归入罕仓鼠属。但经过认真比较后发现,它们与罕仓鼠中的种区别很大。根据童永生(1997)的研究,这个属包括 4 个种(其中 3 个是有疑问的):中条罕仓鼠(*Ranricetodon zhongtiaensis*)、小罕仓鼠? (*R. ? minor*)、梯形罕仓鼠? (*R. ? trapezius*)和纤细罕仓鼠? (*R. ? leptaleos*)。但无论是哪个种,它们 M1 的原尖前臂向前外伸成为原脊的一部分,不管原脊弯曲与否,原尖前臂均不游离。而本文记述的 3 个牙齿,虽然原尖前臂不与前附尖相连,但明显地指向前附尖,在原脊前侧成游离状,因此它们与罕仓鼠不同。考虑到在这批仓鼠标本中,除 M1 与垣曲古亚鼠有较大区别外,无其他牙齿支持再立新属或新种,故本文暂以垣曲古亚鼠(相似种) (*Palasiomys* cf. *P. yuanquensis*) 处之,不排除它就是垣曲古亚鼠的可能性。

## 2 关于含垣曲古亚鼠地层的时代

垣曲盆地的始新世地层发育好出露全,并含有丰富的哺乳动物化石,一直是我国研究始新世哺乳动物和地层的重要地点。关于盆地内地层时代的进一步划分,以往认为是晚始新世到渐新世。周明镇等(1973)将其分为晚始新世河堤组的任村段和寨里段以及早渐新世的白水村组。童永生(1997)把盆地中的地层统称为中始新世到晚始新世的河堤组,

分为中始新世萨拉木伦期的峪里段和任村段、及中始新世到晚始新世那读期(董永生等, 1995)的寨里段。黄学诗等(2001)将垣曲盆地始新世地层分为?中始新世伊尔丁曼哈期河堤组峪里段、中始新世萨拉木伦期河堤组任村段、最晚中始新世那读期河堤组寨里段和晚始新世乌兰戈楚期南堡头动物群,首次提出在盆地内存在中始新世伊尔丁曼哈期地层的可能性,并指出需要更多有力的化石证明。随后的研究(Zhang et al., 2001; 刘丽萍、黄学诗, 2002; 黄学诗、王景文, 2002)表明,火石坡化石点的地层时代很可能为伊尔丁曼哈期。

本文研究的仓鼠化石,其 M1 前附尖小,前叶不明显, M1 和 M2 大小相近,它们的原尖和前尖间为前连接等,这些都是早期仓鼠的原始特征。虽然它们比发现在核桃园组中的锥齿古亚鼠个体稍大,牙齿脊形化程度略强些,前附尖和前叶也稍微明显些,似乎有点继承关系,也就是说垣曲古亚鼠可能比锥齿古亚鼠略显进步,但从总体上看它们应在同一进化水平上。因此产垣曲古亚鼠的地层时代应和产锥齿古亚鼠的核桃园组大体一致,为中始新世伊尔丁曼哈期。

致谢 杨明婉高级工程师帮助绘制插图,在此表示感谢。

## CRICETID (RODENTIA, MAMMALIA) REMAINS FROM THE MIDDLE EOCENE OF YUANQU, SHANXI

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**Key words** Yuanqu, Shanxi, Middle Eocene, Cricetidae

### Summary

The fossil cricetids described in the present paper were obtained from the Middle Eocene of Yuanqu Basin by screen-washing in two field seasons of 1997 and 1998. This discovery not only adds the member of the Eocene faunal list of the Basin but sheds light on the age of the fossil-bearing bed.

*Palasiomys yuanquensis* sp. nov.

(Fig. 1)

**Type** A right M1 (V 13734).

**Other material** 39 isolated upper and lower cheek teeth (V 13734. 1 ~ 39).

**Locality and horizon** Huoshipo of Guojiazhuang Village, Wangmao Town, Yuanqu County, Shanxi Province; Middle Eocene Yuli Member of Hedi Formation.

**Diagnosis** A species of *Palasiomys* with indistinct paraconule on upper molars, connection of anteroconid and protoconid on m1, and larger than *P. conulus* in size.

**Etymology** The species name shows the place, Yuanqu Basin, where the fossils were found.

**Remarks** M1 and M2 in Huoshipo are nearly equal in size. Both parastyle and anterolobe of M1 are small. The anterior arm of protocone of M1 extends directly to the anteroexternal corner of the tooth and links the parastyle. All above features are different greatly from those of *Pappocricetodon* found in Yuanqu Basin, and indicate the teeth studied should belong to *Palasiomys*. But the teeth in Huoshipo differ from those of *P. conulus*, the only species of the genus, in following

respects: 1) relatively larger in size; 2) the parastyle and anterolobe of M1 comparatively little bigger though they are actually small; 3) the paraconule is not very developed on upper molars whereas it is distinct in *P. conulus*; 4) there is crest between anteroconid and protoconid on m1 while in *P. conulus* the crest is between the anteroconid and metaconid. So the specimens under study may represent a new species, here named as *P. yuanquensis* sp. nov.

In Huoshipo cricetid collection there are three M1 (V 13735. 1~3), in which the anterior arm of protocone is free disconnecting the parastyle. These M1 may represent another taxon or still belong to the new species created, here treated as *Palasiomys* cf. *P. yuanquensis*. The systematic position of the specimens, however, remains open.

The discovery of the new form provides further evidence for the existence of Irдинmamhan strata in Yuanqu Basin. In *P. yuanquensis* sp. nov. M1 and M2 are equal in size. The parastyle and anterolobe on M1 are small and the protoloph and metaloph on M1 and M2 are anterior connection. All these demonstrate the new species is a very early and primitive cricetid. *P. yuanquensis* sp. nov. should be in about the same evolutionary level with *P. conulus* though the former is a little bit more progressive than the latter in some respects. So the age of *P. yuanquensis* sp. nov. -bearing bed seems to be equivalent to or a little younger than that of *P. conulus* -bearing bed —Middle Eocene Irдинmamhan Hetaoyuan Formation.

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