

# 湖北房县豕齿兽一新种

黄学诗

(中国科学院古脊椎动物与古人类研究所 北京 100044)

**摘要** 记述了在湖北省房县罗家沟始新世地层中新近发现的哺乳类,其中包括踝节目豕齿兽科豕齿兽属一新种——房县豕齿兽 (*Hyopsodus fangxianensis* sp. nov.)。依据该新种的进化水平,进一步确定产化石的油坪组的地质时代为早始新世,但就化石层本身来说,很可能是早始新世晚期。

**关键词** 湖北省房县,早始新世,踝节目,啮齿目

1993年初夏,笔者在湖北省房县进行古生物地层考察时,于该县罗家沟附近采得两件残破的下颌骨标本,经观察研究分属踝节目豕齿兽科豕齿兽属和啮齿目梳趾鼠超科。

罗家沟又名油坪,位于房县县城西北十余公里处,这里出露一套紫红色、棕红色蒜瓣状砂质泥岩、泥岩,夹灰绿色砂岩或砂质泥岩。砂质泥岩、泥岩风化后表面残留5—10cm大小的结核。地层倾向南南东,倾角 $15^{\circ}$ 左右,估计厚度超过200米。这套地层可能为湖北省区域地质志上所指的油坪组的一部分。

踝节目是一类重要的古有蹄类,它不仅在早第三纪地层中化石丰富,而且还包含了现生蹄类和偶蹄类的祖先。踝节目中的豕齿兽是北美早、中始新世地层中的常见分子。在中始新世勃力吉期 (Bridgerian) 地层表面采集的该属标本可占该层化石总标本数的39%。在本世纪60和70年代的十年中,耶鲁大学考察队在怀俄明大角盆地的早始新世地层中,采到豕齿兽带两个或两个以上牙齿的上、下颌骨竟高达400件(Gingerich,1974)。豕齿兽在北美不仅种类多,数量大,而且以往一直是北美专有的化石动物。直到近10多年,才在亚洲找到了它的踪迹,但种类不多,标本数量极少,且分布区域局限,除蒙古发现过1种外,其余2种均在中国,它们各仅以一残破的下颌骨为代表,其中一件标本上仅有一个牙齿。所以在亚洲每一块化石的发现都是十分珍贵的。豕齿兽是始新世时北美和亚洲大陆之间动物群有交往的重要证据。由于豕齿兽从未在古新世地层中发现过,而且在晚始新世开始前即绝灭,因此它是早、中始新世的标准化石。湖北省房县豕齿兽的发现,不仅再一次肯定了该属在亚洲的存在,丰富了属的内容,将分布区域向南扩大到我国长江流域,而且为确定含化石地层的时代提供了可靠的依据。

## 一、标本记述

踝节目 *Condylarthra* Cope, 1881

豕齿兽科 *Hyopsodontidae* Trouessart, 1879

豕齿兽属 *Hyopsodus* Leidy, 1870

房县豕齿兽(新种) *Hyopsodus fangxianensis* sp. nov.

(图版 I; 图 1)

**正型标本** 一右下颌骨断块带颊齿  $M_1-M_3$ , 臼齿前的水平支及上升支均未保存(古脊椎所 V12005)。

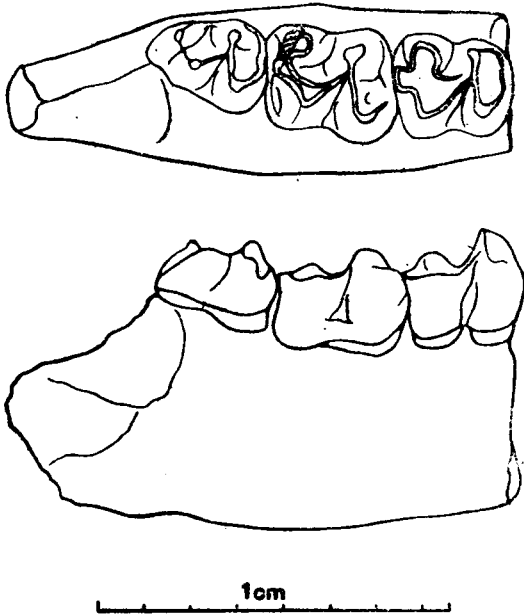


图 1 房县豕齿兽右下颌骨附  $M_1-M_3$ (V12005)

Fig. 1 The right lower jaw with  $M_1-M_3$  of *Hyopsodus fangxianensis* (V12005)

**产地与层位** 湖北房县罗家沟, 早始新世油坪组。

**特征** 个体较大 ( $M_2$  长 4.5 毫米)。  $M_1$  和  $M_3$  长度近等。  $M_1$  和  $M_2$  比较短宽、粗状,  $M_3$  较窄长。似无下前尖, 下后附尖不存在, 下次小尖发育。

**种名来源** fangxian, 湖北省房县, 化石产地。

**描述** 从保存的残段看, 下颌骨比较粗壮、厚实, 唇舌面最大径为 5.5 毫米。水平支底缘微凸, 最凸处位于  $M_2$  跟座之下, 该处下颌骨体唇、舌面高分别为 6.5 和 6.8 毫米。

三个下臼齿紧密排列无齿隙, 其中  $M_2$  最大,  $M_3$  与  $M_1$  长度相等, 但窄得多。齿冠尤其是三角座均有不同程度的破损, 但其主要特征尚可辨认。

为锥脊形齿, 珐琅质层厚。  $M_1$  成长方形, 长稍大于宽, 跟座略长于和宽于三角座, 但比三角座稍低。三角座基本上由下原尖和下后尖组成, 近于垂直牙齿长轴, 内外壁均较浑圆。下原尖和下后尖均较粗壮, 后者略高于前者。似无下前尖 ( $M_2$  三角座保存较好, 从中可以看出无下前尖) 也无下后附尖。下前脊未保存, 如果存在估计也很低。下后脊比较粗壮, 几与下原尖和下后尖等高。下次尖和下内尖都很粗壮, 均有脊与下次小尖相连。从下次尖伸出的脊, 使下次尖成清楚的新月形状。下次小尖相当明显、大, 位置近中, 与下次尖和下内尖相连的脊短, 长度几乎相等, 且看不出有明显的凹缺。下次尖、下内尖与牙齿后壁之间、即在下次小尖的内、外侧均有深而明显的沟。无下内尖棱 (entocristid)。下斜脊比较长, 伸至三角座内三分之一处与下后尖相连, 相接处的位置较高。由于下斜脊与下后脊相接的位置靠内, 故下次褶 (hypoflexid) 深, 此褶中的外齿带成结节状。

$M_2$  的形状和特征与  $M_1$  的相似, 只是个体较大, 三角座和跟座的宽度与在  $M_1$  中的相反, 前者略宽于后者。

$M_3$  比  $M_2$  小得多, 跟座也比三角座窄得多。与前两下臼齿不同还在于; 下次褶中无结节状外齿带。下次小尖向后突出, 内、外侧尤其是内侧无沟。下次小尖与下次尖之间的脊低。下次小尖比较舌位, 靠近下内尖。下内尖比下次尖小得多。牙齿后壁较尖凸, 故外形成粗略的三角形。

表 1 房县豕齿兽的下臼齿测量 (单位: 毫米)

Table 1 Measurements of the lower molars of *Hyopsodus fangxianensis* (in mm)

	$M_1$	$M_2$	$M_3$	$M_1-M_3$	$M_1-M_2$	$M_2-M_3$
长 (length)	4.1	4.5	4.1	12.4	8.2	8.3
三角座宽 (width of trigonid)	3.1	3.8	3.1			
跟座宽 (width of talonid)	3.5	3.6	2.3			

**比较与讨论** 房县标本下臼齿呈锥脊形, 珐琅质层厚, 应属踝节类。它的尖相对较高。三角座基本上由下原尖和下后尖两个尖组成, 不完全垂直牙齿长轴。下次尖伸出的脊呈新月形。下斜脊与下后尖相连。由齿带升起的下次小尖明显, 清楚地位于下次尖和下内尖连线之后。 $M_3$  的跟座与前两下臼齿的有很大不同, 较窄长, 向后变尖, 有一大而向后突出的下次小尖。这些特点均表明房县标本应属于豕齿兽科的豕齿兽属。

豕齿兽属的系统发育是在种一级水平上哺乳动物进化的第一个详细记录(Gingerich, 1974)。豕齿兽的研究已有很长的历史, 从一百多年前莱迪 (Leidy, 1880) 首次描述这属化石起, 先后建过几十个种。直到本世纪六十年代, 盖辛 (Gazin, 1968) 才对前人记述过的豕齿兽做了较为详细的总结。他认为原先所建的 31 个种中, 有 6 个不是这个属的成员, 其余的 25 个种, 有不少是同物异名, 实际上只有 12 个有效。它们包括早始新世华沙溪期 (Wasatchian) 5 个种——*Hyopsodus miticulus*, *H. powellianus*, *H. wortmani*, *H. walcotianus* 和 *H. loomisi*; 中始新世勃力吉期 (Bridgerian) 5 个种——*H. paulus*, *H. minusculus*, *H. marshi*, *H. despiciens* 和 *H. lepidus*; 中始新世尤因他期<sup>1)</sup> (Uintan C) 2 个种——*H. uintensis* 和 *H. fastigatus*。但后人仍有使用废止种名的, 如金格里奇 (Gingerich, 1974) 仍使用了被盖辛作为 *Hyopsodus wortmani* 的 *H. minor* 种和作为 *H. miticulus* 的 *H. simplex* 种等。此外, 还有人将原先盖辛归并的种再归并和重新再定种, 如克里斯托卡 (Krishtalka, 1979) 将美国和加拿大的 *H. fastigatus* 并入美国的 *H. uintensis* 种, 还新建了一个大种——*H. sholemi*。近 10 多年来, 在亚洲始新世地层中先后报道过 3 种豕齿兽——东方豕齿兽 (*H. orientalis* Dashzeveg, 1977)、吐鲁番豕齿兽 (*H. turpanensis* Zhai, 1978) 和化石沟豕齿兽 (*H. huashigouensis* Tong, 1989)。所有这些说明, 豕齿兽在始新世时很繁盛, 不仅数量大, 而且有许多种或支系。

1) 尤因他期以往认为是晚始新世, 目前根据地层对比, 不仅尤因他期, 就连杜契乃期 (Duchesnean)、甚至部分卡特隆期 (Chadronian) 也为中始新世 (Stucky, 1992)。

豕齿兽是一类小而保守的动物,从早始新世开始一直到中始新世个体始终都很小,形态变化不大。虽然前人在区分始新世早和中期豕齿兽的牙齿特征上做了些工作 (Gazin, 1968; Krishtalka, 1979; West, 1979), 但各种之间的界限仍不十分清楚。尽管如此,房县豕齿兽还是可以与它们区分的。从现有的三个下臼齿看,虽然与北美早始新世华沙溪期的种类在主要特征上基本一致,但它们的脊形化相对较强,无下前尖,下次小尖发育等方面不同于该时期北美豕齿兽。房县标本的下臼齿在无下前尖,下内尖明显,下次小尖发育,脊形化程度较强,下臼齿三角座比较垂直牙齿长轴等方面相似于北美中始新世勃力吉期的豕齿兽。但它们之间也有明显的不同。房县种的下臼齿的下次小尖与下内尖之间有较强的脊相连,而北美种在两尖之间一般有一凹缺。West (1979) 曾指出北美勃力吉期豕齿兽的下臼齿具有发育程度不同的小的下后附尖,而在房县标本上无此特征。房县豕齿兽与北美中始新世尤因他期的种类差别较大,它的个体虽接近 *H. uinensis*, 但比 *H. fastigatus* 和 *H. sholemi* 均小。它的下臼齿无下后附尖,下次小尖发育,三角座不太歪斜等方面均不同于尤因他期豕齿兽。

在亚洲,产自蒙古奈玛格特盆地挪兰布拉克组的东方豕齿兽,以其个体特别小、具有下前尖而区别于房县标本。产自新疆吐鲁番盆地的吐鲁番豕齿兽,最早是翟人杰(1978)记述的,为豕齿兽未定种 (*Hyopsodus* sp.)。1989年童永生在研究新疆另一地点准噶尔盆地三个泉地区化石时,认为吐鲁番盆地十三间房标本的性质尚清楚,将未定种补以吐鲁番豕齿兽种名。与房县标本相比,在下臼齿无下前尖和下后附尖、 $M_1$  和  $M_2$  相对短宽等特点上相似,但它的个体小 ( $M_2$  仅长 3.5 毫米),下次小尖不很发育、舌位、接近下内尖,  $M_3$  相当窄长等方面与房县标本相差较大。房县标本与新疆另一种——化石沟豕齿兽的大小接近,无下前尖和下后附尖,下内尖和下次小尖发育、两者之间有脊相连,下次小尖不那么舌位等方面均相近。化石沟种的标本仅是一连在残破下颌骨上的  $M_2$ , 但就这一个牙齿,房县标本也能和它明显区分开来。两者的  $M_2$  长度虽接近,但房县标本无论是三角座还是跟座都显得宽,连同下颌骨一起给人以宽厚、钝实之感。而化石沟种  $M_2$  的三角座宽仅 3 毫米,跟座更窄,只 2.5 毫米(笔者补测),连同一段残破的下颌骨,给人以结构轻巧之印象。此外,在牙齿脊形化程度上,后者强于前者。

综上所述,房县标本代表亚洲可能最靠南的一种豕齿兽,这里名之为房县豕齿兽。

## 啮齿目 Rodentia Bowdich, 1821

### 梳趾鼠超科 科、属、种未定 Ctenodactyloidea fam., gen. and sp. indet.

材料为一段左下颌骨附颊齿  $M_1$  和  $P_4$  的后半部 (V12006)。牙齿磨蚀很重,尖脊均难以辨认。但从保存的残部(尖和部分不清楚的脊)看,似梳趾鼠类。 $M_1$  的后部似有下次小尖脊,该牙齿前窄后宽,长 2.6 毫米,宽 2.1 毫米。

## 二、地层时代简析

本文记述的啮齿目梳趾鼠类标本保存极差,科、属、种不能确定,而这个超科动物从早始新世起一直到现在均有代表,所以它对确定地层时代无意义。豕齿兽是早、中始新世的

标准化石,房县豕齿兽虽为新种,但如前所述,它在进化水平上与北美早始新世华沙溪期和中始新世勃力吉期的种类相近,而与中始新世尤因他期豕齿兽相差甚远。因此,它似乎代表了早始新世到中始新世早期的产物。

含化石地层为油坪组,据湖北省区域地质志报道,在该组中曾发现有 *Rhombomylus* sp., *Asiocoryphodon lophodontus*, Mesonychidae 和 Ischiomyidae 化石。其中菱臼兽和脊齿亚洲冠齿兽均见于李官桥盆地玉皇顶组。由于这两种化石目前记录还未超出早始新世范畴,因此玉皇顶组和油坪组的时代被定为早始新世。从本文研究的豕齿兽看,产化石的油坪组的时代属早始新世是可能的。除上述分析房县豕齿兽的时代为早始新世到中始新世早期外,它的下臼齿的脊齿化程度不如产在相当于勃力吉期的依希白拉组 A 层中的化石沟豕齿兽的强,这种原始性或许意味着它所在的时代早于勃力吉期,而为早始新世。然而,房县豕齿兽比亚洲早始新世的东方豕齿兽和吐鲁番豕齿兽均稍显进步,不仅个体大,而且表现在下臼齿下次小尖非常发育等特征上。这表明油坪组或至少含房县豕齿兽的化石层的时代,虽为早始新世,但可能为早始新世晚期。

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### 参 考 文 献

- 童永生, 1989. 新疆准噶尔盆地三个泉地区几种始新世哺乳类, 古脊椎动物学报, 27(3): 182—196.
- 翟人杰, 1978. 十三间房组哺乳动物群及其地质时代. 中国科学院古脊椎动物与古人类研究所甲种专刊第十三号: 107—115.
- Dashzeveg D, 1977. On the first occurrence of *Hyopsodus* Leidy, 1870 (Mammalia, Condylarthra) in Mongolian People's Republic. *Joint Sov.-Mong. Paleont. Exp. Trans.*, 4: 7—13.
- Gazin C L, 1968. A study of the Eocene Condylarthra mammal *Hyopsodus*. *Smiths. Misc. Coll.*, 153(4): 1—90.
- Gingerich P D, 1974. Stratigraphic record of the early *Hyopsodus* and the geometry of mammalian phylogeny. *Nature*, 248: 107—109.
- Krishtalka L, 1979. Paleontology and geology of the Badwater Creek area, Central Wyoming. Part 18. Revision of Late Eocene *Hyopsodus*. *Ann. Carnegie Mus.*, 48(20): 377—389.
- Muizon C de, Marshall L G, 1991. Nouveaux condylarthres du Paleocene inferieur de Tiupampa (Bolivie). *Bull. Mus. natl. Hist. nat., Paris*, 4<sup>e</sup> Ser., 13, Sec. C, (3—4): 201—227.
- Stucky R K, 1992. Mammalian faunas in North America of Bridgerian to Early Arikareean "Ages" (Eocene and Oligocene). In: Prothero D R, Berggren W A eds. *Eocene-Oligocene Climatic and Biotic Evolution*. Princeton: Princeton Univ. Press. 464—493.
- West R M, 1979a. Paleontology and geology of the Bridger Formation, Southern Green River Basin, Southwest Wyoming. Part 3. Notes on *Hyopsodus*. *Milwaukee Pub. Mus. Contrib. Biol.*, 25: 1—52.
- West R M, 1979b. Apparent prolonged evolutionary stasis in the Middle Eocene hoofed mammal *Hyopsodus*. *Paleobiology*, 5: 252—260.
- West R M, 1982. Fossil mammals from the Lower Buck Hill Group, Eocene of Trans-Pecos Texas: Marsupialcarnivora, Primates, Taeniodonta, Condylarthra, Bunodont Artiodactyla, and Dinocerata. *Texas Mem. Mus.*, Pearce-Sellards Ser., 35: 1—20.

## A NEW *HYOPSODUS* FROM THE EARLY EOCENE OF FANGXIAN, HUBEI

Huang Xueshi

(Institute of Vertebrate Paleontology and Paleoanthropology,  
the Chinese Academy of Sciences Beijing 100044)

**Key words** Fangxian, Hubei, Early Eocene, Condylarthra, Rodentia

### Summary

*Hyopsodus fangxianensis* sp. nov. and Ctenodactyloidea fam., gen. and sp. indet. represented by fragmentary lower jaws are described in the present paper. The fossils were found near the village Luojiagou, 10 kilometers away northwest to Fangxian city, where exposes a series of reddish-brown and purplish-red mudstone and siltstone with greyish-green sandstone or siltstone intercalations.

*Hyopsodus* is the common animal in the Early and Middle Eocene of North America. Outside North America only in Asia it was found in the past decades (Dashzeveg, 1977; Zhai, 1978; Tong, 1989). Up to now only three species of *Hyopsodus* have been described from Asia, and all of them are represented by fragmentary unique specimens. So each specimen of this genus discovered in Asia is especially precious. The discovery of *Hyopsodus* in Fangxian not only further indicates the genus existing in Asia but also enriches the genus composition and extends the distribution south to the Yangtze River valley.

**Condylarthra** Cope, 1881

**Hyopsodontidae** Trouessart, 1879

***Hyopsodus*** Leidy, 1870

***Hyopsodus fangxianensis*** sp. nov.

**Type** A right mandibular fragment preserving m1—m3 (IVPP V12005).

**Locality and horizon** Luojiagou, Fangxian County, Hubei Province; Early Eocene Youping Formation.

**Diagnosis** m2 4.5mm long. The length of m1 and m2 nearly equal. m1 and m2 relatively wide and robust while m3 narrow and slender. No paraconid and metastylid on the molars. Hypoconulid more developed and situated near the middle of the tooth on the first two lower molars.

**Etymology** Trivial name refers to provenance of this species.

**Description** The mandible is robust, 5.5mm in biggest thickness labiallingually. Its height under m2 is 6.5mm labially and 6.8mm lingually, respectively.

All the molars arrange closely. Among them m2 is the largest and m3 the smallest. The molars are bunolophodont with thick enamel layer. m1 is rectangular in outline, somewhat longer than wide. The talonid is relatively bigger but lower than

the trigonid. The trigonid is not too obliquely oriented, with rounder external and internal walls. The protoconid is as robust as metaconid but a little lower than the latter. The paralophid is not preserved, probably low if exists. The metalophid is robust, as high as protoconid and metaconid. Both hypoconid and entoconid are developed and robust, having crests connected with hypoconulid respectively. The crests started from hypoconid made this cone becoming distinctly selenodont. The hypoconulid is large, situated nearly in the middle of the tooth. The length of crest between hypoconulid and hypoconid is nearly the same as that between hypoconulid and entoconid though both are very short. On the external and internal sides of the hypoconulid exist grooves. There is no entocristid. The oblique crest is long, linking with metaconid in the internal one third of the trigonid. Owing to more internal connection, the hypoflexid is deep. In the hypoflexid the external cingulid becomes tuber-like.

m2 resembles m1 both in shape and in characteristics, but bigger than the latter. In contrast with m1, the trigonid of this tooth somewhat wider than talonid.

m3 is much smaller than m2, with rather narrow talonid. It differs from the preceding molars also in: no tuber-like external cingulid in hypoflexid, hypoconulid projecting backward, no grooves on the external and internal sides of hypoconulid. The entoconid is much smaller than hypoconid and has short crest with hypoconulid which relatively lingually situated. The tooth is roughly triangular in shape because of posterior projecting.

For the measurement see table 1.

**Comparison** The Fangxian lower molars are bunolophodont with thick enamel layer. The trigonid, essentially composed of protoconid and metaconid, is slightly oblique orientation. The crests started from hypoconid made this cone selenodont. The oblique crest links with metaconid. The hypoconulid is more developed, situated behind the line between hypoconid and entoconid. All above features indicate that Fangxian specimen belongs to *Hyopsodus* of Condylarthra.

*Hyopsodus* is a small and conservative animal. Its size is always small and morphology has no big change from Early to Middle Eocene. Much work have been done in distinguishing North American Early and Middle Eocene *Hyopsodus* by many paleontologists (Gazin, 1968; Krishtalka, 1979; West, 1979) though the boundary is still hard to tell among species. Fangxian specimen differs from that of North American Early Eocene Wasatchian *Hyopsodus* in having stronger lophodont crests, more developed hypoconulids and no paraconids. Fangxian lower molars, however, resemble those of North American Middle Eocene Bridgerian *Hyopsodus* in having distinct entoconid, more developed hypoconulid, stronger lophodont crests, and not too oblique oriented trigonids. But the differences between the two is still obvious. In Fangxian specimen there is strong crest between hypoconulid and entoconid, while there is always a pit on that crest in North American Middle Eocene *Hyopsodus*. In the former there is no metastylid while metastylid existed in the different degree in the latter. From the Middle Eocene Uintan *Hyopsodus* it differs in having no metastylid, more developed hypoconulid and the trigonid is not too oblique.

The Fangxian specimen differs from that of *Hyopsodus orientalis*, a species

from the uppermost part of the white beds of Naran Bulak Formation in Nemegt Basin of Mongolia, in having no paraconid and much bigger size. Fangxian specimen resembles that of *H. turpanensis*, original as *Hyopsodus* sp. from Shisanjianfang Formation of Turpan Basin, Xinjiang by Zhai in 1978, in having relatively short m1 and m2, no paraconid and metastylid on the lower molars. Whereas it differs from the latter by big size, more developed hypoconulid situated nearly in the middle of the teeth, and relatively short m3. The Fangxian specimen is similar to that of *H. huashigouensis*, another Asian species of *Hyopsodus*, both in size and in tooth structure, such as more distinct crests, no paraconid and metastylid, more developed entoconid and hypoconulid. But in Fangxian specimen m2, the only tooth *H. huashigouensis* has, is much wider (especially the talonid) than that of *H. huashigouensis*. Moreover, the teeth are more lophodont in the latter than in the former.

So Fangxian specimen may represent a new species — *H. fangxianensis*, which existed more south than other species of the genus in Asia.

### Rodentia Bowdich, 1821

#### *Ctenodactyloidea* fam., gen. and sp. indet.

It is represented only by a fragmentary lower jaw with m1 and a rear half of p4 (V12006). The teeth are so heavy worn that the most characters can not be seen. There seem to be hypoconulid crest on m1, which is 2.6mm long and 2.1mm wide.

**About the age of the fossil-bearing beds** Unidentified ctenodactyloid described in the present paper is meaningless for age because this superfamily rodents have a long history from Early Eocene to the present. *Hyopsodus* is represented in the Early to Middle Eocene both in North America and in Asia, but is not recognized in the preceding Paleocene and evidently became extinct before the beginning of the Late Eocene. As mentioned above, *Hyopsodus fangxianensis* resembles North American Early Eocene Wasatchian and Middle Eocene Bridgerian *Hyopsodus* and has bigger differences with Middle Eocene Uintan ones in evolutionary level though it is a new species. This may indicate the age of *H. fangxianensis* is of Early Eocene to early Middle Eocene. Considering *H. fangxianensis* is more similar to Early Eocene *H. turpanensis* in main tooth structure and less lophodont in lower molars than Middle Eocene (equivalent to Bridgerian) *H. huashigouensis*, the fossil-bearing beds is probably of late Early Eocene in age.

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#### 图版 I 说明 (Caption of plate 1)

房县豕齿兽 (*Hyopsodus fangxianensis* sp. nov.) 右下颌骨附臼齿 M<sub>1</sub>—M<sub>3</sub> (right lower jaw with M<sub>1</sub>—M<sub>3</sub>) (IVPP V12005) 1.唇面观 (Labial view); 2.冠面观 (Crown view); 3.舌面观 (Lingual view) 全部约×5.3 (All about 5.3 times of its natural size)



