

# 云南禄丰晚中新世古猿地点的 仓鼠类化石

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**摘要** 记述了采自云南禄丰晚中新世石灰坝组的仓鼠类化石一新种——*Kowalskia hanae* sp. nov.。后脊 II 和三齿根在 M1 中所占的比例、第一臼齿前边尖的宽度以及第三臼齿的退化程度表明,新种的演化水平与欧洲瓦里士晚期或土洛里早、中期的 *K. schaubi*, *K. fahlbuschi* 和 *K. skofleki* 接近,它是我国现知科氏仓鼠属中构造最原始的一种。

**关键词** 云南禄丰, 晚中新世, 仓鼠科

下面记述的仓鼠类化石材料系 1983 年冬从云南禄丰县石灰坝村附近的 D 剖面第 I—VI 层采集到的。关于这一晚中新世古猿地点所产的小哺乳动物化石及含化石的地层概况早有初步报道(邱铸鼎等, 1985; 祁国琴, 1985), 其后又先后对小哺乳动物群中的竹鼠科、兔科、树鼯科、猪尾鼠科、鼠科和食虫目作了较详细的系统研究 (Flynn & Qi, 1982; 祁国琴, 1986; 邱铸鼎, 1986, 1989; Qiu & Storch, 1990; Storch & Qiu, 1991)。仓鼠类是禄丰石灰坝古猿动物群中常见的一类啮齿类动物, 但仅有以下一属一种。

## 化石记述

仓鼠科 *Cricetidae* Rochebrune, 1883

仓鼠亚科 *Cricetinae* Murray, 1866

科氏仓鼠属 *Kowalskia* Fahlbusch, 1969

韩氏科氏仓鼠(新种) *Kowalskia hanae* sp. nov.

(图 1—3; 图版 1)

- 1985 *Kowalskia* sp., 邱铸鼎等, 禄丰古猿化石地点的小哺乳动物化石。人类学学报, 4(1): 第 20 页。  
 1985 cf. *Kowalskia* sp., 邱铸鼎等, 禄丰古猿化石地点的小哺乳动物化石。人类学学报, 4(1): 第 20 页。  
 1988 *Kowalskia* sp. 1, 2, Qiu Zhuding, Neogene micromammals of China. P837.

**名称由来** 献给韩德芬女士, 对她在领导禄丰古猿地点的发掘和对该哺乳动物群的研究所作出的重大贡献表示敬意。

**特征** 个体中等大小; M1 前脊外刺伸达牙齿边缘者达 50% 以上; 约 80% 的 M1 和

M2 具后脊 II; 近半数的 M1 保留三齿根; m1 下前边尖在三分之一的标本中为单尖; m3 的长度比 m2 的稍大或近等。

**正型标本** 左 M1 (V10843, 第 V 层, 2.00 × 1.35mm)。

**归入标本** I: 6 M1, 7 M2, 2 M3, 12 m1, 12 m2, 6 m3 (V10844.1—45);

II: 3 M1, 2 M2, 2 M3, 9 m1, 13 m2, 3 m3 (V10844.46—77);

III: 一具 m1—3 的左下颌骨 (V10844.78);

IV: 一具 m1—3 的残破右下颌骨 (V10844.79);

V: 15 M1, 14 M2, 8 M3, 16 m1, 12 m2, 9 m3 (V10844.80—153);

VI: 一破碎的右上颌骨, 具 M1—3, 一左下颌骨, 具 m1—3, 5 M1, 3 M2, 1 M3, 6 m1, 8 m2, 6 m3 (V10844.154—184);

混合层: 4 M1, 2 M2, 1 M3, 2 m1, 4 m2, 1 m3 (V10844.185—198)。

**测量 (mm):**

牙齿 (tooth)	长度 (length)		宽度 (width)		
	平均值 (mean)	范围 (range)	平均值 (mean)	范围 (range)	数量 (N)
M1	1.96	1.75—2.10	1.29	1.15—1.50	34
M2	1.49	1.40—1.60	1.28	1.20—1.40	29
M3	1.27	1.15—1.40	1.19	1.10—1.40	15
m1	1.87	1.65—2.05	1.15	1.05—1.35	47
m2	1.52	1.45—1.65	1.26	1.15—1.50	52
m3	1.50	1.35—1.65	1.18	1.05—1.30	28

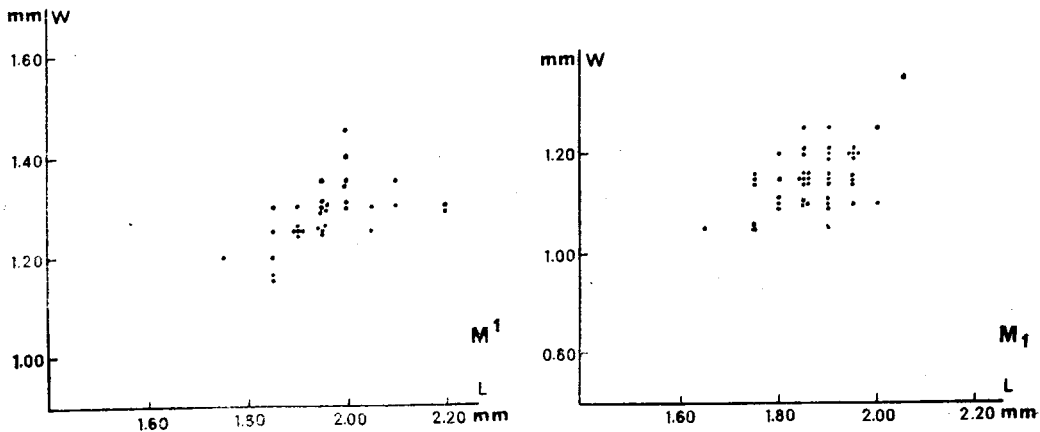


图1 禄丰韩氏科氏仓鼠第一臼齿测量图解

Fig. 1 Length/width diagrams for the first molars of *Kowalskia hanae* from Lufeng, Yunnan

**描述** 上颌骨极破碎, 三件下颌骨保存尚好。下颌骨齿虚长在两件标本中分别为 5.00mm 和 5.2mm; 骨体于 m1 外侧的深度在 4.7—4.8mm 间; 从角突底部至冠状突顶部在一件标本中高约 9.0mm。下咬肌脊比上咬肌脊稍显著, 但都不很粗壮。咬肌窝宽阔,

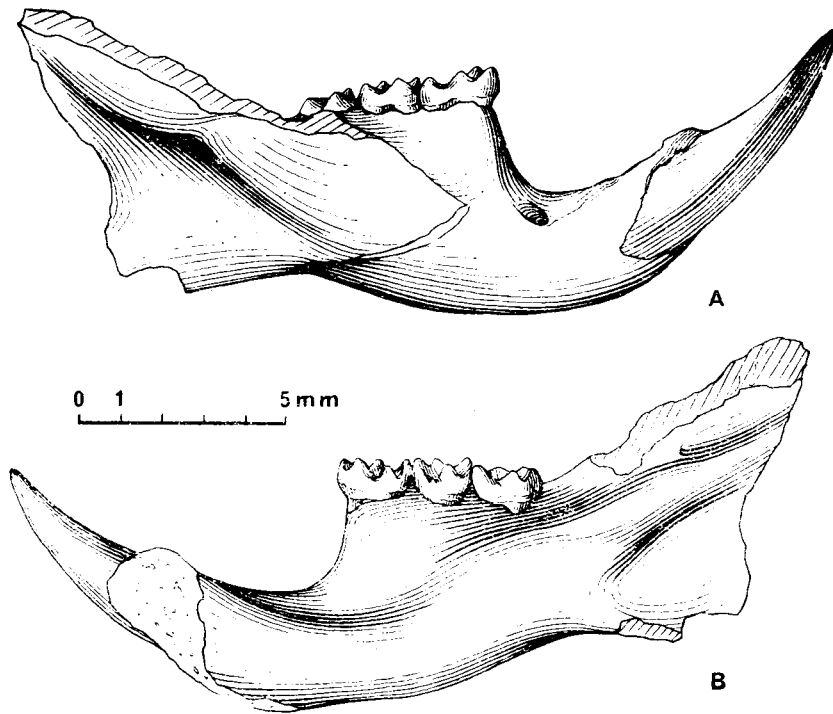


图2 禄丰韩氏科氏仓鼠下颌骨 A唇侧视, B舌侧视

Fig. 2 Lower mandible of *Kowalskia hanae* from Lufeng, Yunnan

相对平坦。颞孔卵圆形, 位于齿虚下弯之唇侧。齿列与颌骨间的夹角不大。唇侧视 m3 被上升枝遮掩。

M1: 前边尖宽, 通常被一较深的后中沟和一较浅的前中沟分成唇侧尖和舌侧尖(一枚牙齿例外, 见下), 两尖近等或唇侧的稍大; 前边尖的前缘常有凹陷。舌侧前边尖与原尖前臂间总有一颇为强壮的前脊 (Anteroloph); 唇侧前边尖在三分之二的标本中孤立, 其余也有一与前脊外刺连接的脊。前脊外刺 (Labial Spur of Anteroloph) 低, 靠近唇侧前边尖; 伸达或几乎伸达牙齿外缘的有 19 件(占 56%), 没有或不清楚的只有 5 件(15%), 其余成连接唇侧前边尖与前脊间的脊; 在前脊外刺唇侧端, 常有一小尖。除三枚牙齿外都有原脊 I, 较显著者占其中的半数; 原脊 II 较发育, 且见于所有标本。后脊 I 发育弱, 只见于 12 枚牙齿, 其中半数较显著; 在 25 件可以观察到后脊 II 的标本中, 该脊见于 20 件(占 80%)。所有的标本都有中脊, 其中伸达或几乎伸达牙齿外缘者占 42%(15/35), 外伸不足长度之半者仅有 2 枚; 中脊靠后尖, 在部分标本中与后尖连接。个别牙齿有一小的中附尖。近半数标本的内谷 (Sinus) 具清楚的舌侧齿带。在 24 枚保存齿根的牙齿中, 11 枚三根(占 46%), 其中 8 枚的舌侧根具一沟。

M2: 前边脊连续伸达牙齿的内、外齿缘; 唇侧高, 舌侧低。原尖前臂及原脊 I 联合交于前边脊中部偏唇侧处。前脊不清楚。原脊 I 和原脊 II 见于所有标本, 并分别与原尖的前、后臂对称连接。29 枚牙齿中, 10 枚具发育程度不同的后脊 I; 在 27 枚可以观察到

后脊 II 的牙齿中,该脊见于 22 枚。中脊伸达牙齿外缘者占 45%,极短的占 7%(2/9),其余达半长左右。部分标本亦有一小的中附尖。四齿根。

M3: 牙齿前部齿尖和齿脊的形状、排列与 M2 的很相似,明显不同的是,在 13 枚牙齿中,有 8 枚的中部偏唇侧具一连接原脊 I 和原脊 II 的弱脊。次尖和后尖相当退化,后尖几乎退化成脊状,并与次尖后臂构成牙齿后外缘上的一齿脊。中脊尚显著,近半数伸达牙齿边缘。

m1: 下前边尖在 45 枚牙齿中,17 枚单尖,28 枚由一较深的后中沟及一极浅的前中沟分成双尖;一般这两个齿尖分得不很开,其中一个牙齿的唇侧下前边尖有再分的趋势。下前脊的发育程度变异大,数量也不一:在 42 枚牙齿中,一脊者 30 枚,二脊者 9 枚,三脊者 3 枚;下前脊的后端与下原尖前臂及极短的下后脊 I 连接,前端在具单一下前脊的牙齿中总伸向前外,与下前边尖的唇侧连接,在具二或三下前脊的牙齿中总有其中一脊伸达下前边尖的唇侧。除一件标本外,都有一与下外脊连接、指向前外的下次脊。所有牙齿都具一长达牙齿内缘的下中脊,该脊末端在多数标本中具一小的下中附尖。12 枚牙齿具一粗细不一的下外中脊;该脊从下次尖前臂或其基部伸出,并几乎都达牙齿的外缘,且末端常膨胀成小的下外中附尖。下外脊虽低,但显著且连续。下后边脊强大,从下次尖后臂伸达下内尖后外基部。

m2: 唇侧前边脊发育,从外向后伸达下原尖的基部;舌侧前边脊弱,无一伸达牙齿内缘,甚至在部分标本中完全消失。下原尖的前臂和下后脊交于下前边脊中部。下前脊不清楚。下次脊或多或少指向前外,与下外脊连接。下中脊伸达牙齿内缘,下中附尖通常发育。57 枚牙齿中,7 枚具下外中脊。外谷入口处常具发育的外齿带。

m3: 在三件下颌骨中,m3 的长度等于或稍大于 m2 的长度。下次尖稍退化。下内尖仍显著。舌侧前边脊很弱,在三分之一多的标本中,该脊几乎或甚至完全缺失。下次脊发育,通常指向前外,个别近横向。下中脊除一例标本与下后尖后基部连接外,其余标本的都伸达牙齿舌侧,末端也常发育成下中附尖。28 枚牙齿中,3 枚具清楚的下外中脊。后边脊强大,从下次尖后臂伸向下内尖,把后内谷封闭。

材料中有三枚牙齿(V10844.185, 186, 192)比较特殊:它们的尺寸都较大,其中一 M1 的前边尖分开深,而且唇侧前边尖再二分,并具三条显著的前脊(图版 I,3)。但它们除尺寸较大及 M1 的前边尖较异常外,无论齿冠高度还是形态构造都落入其它牙齿的变异范围。

**比较与讨论** 上述牙齿的大小和形态变异显著,但又难以进一步把它们分为不同的种;另外,在不同层中发现的牙齿的形态变化也不明显,因此,这里暂时把它们都归入 *Kowalskia* 属的同一种。这些牙齿的形态特征与法尔布施(V. Fahlbusch)赋予科氏仓鼠属(*Kowalskia*)的完全一致:下颌骨 cricetine 型;臼齿低冠;M1 的前边尖从后裂成双尖,M1 和 M2 的前尖常有双脊(protoloph I and II)与原尖连接;m1 下前边尖宽,m3 具明显的下内尖。

在记述新第三纪晚期仓鼠类的一些文献中,有时可见 *Neocricetodon* 一属名。其实,*Neocricetodon* 和 *Kowalskia* 的牙齿构造特征完全相同,不同的是学者对属名的有效性和优先权的认识有异。一方面似乎归因于法氏在 1969 年创建 *Kowalskia* 时未注意

到 1930 年 Kretzoi 提到的 *Neocricetodon*, 但主要是由于 Kretzoi 在 1930 年命名 *Neocricetodon* 时和在 1954 年再次报道这一属时, 都未对该属有过较详细的描述, 既没有属型种的图示, 也没有对标本的任何测量。尽管 *Neocricetodon* 的命名时代比 *Kowalskia* 早, 但基于这一原因它得不到优先律的维护。因此, 这里也把 *Neocricetodon* 当作裸记名称。绍伯 (Schaub, 1934) 把杨钟健 1927 年描述的 *Cricetulus grangeri* 订正为 *Neocricetodon*, 这里也把它视为 *Kowalskia* 属。

*Kowalskia* 为一多型属, 发现于欧亚大陆的上中新统至上上新统 (在欧洲陆相哺乳动物地层中相当于 MN10—15), 迄今所知至少有以下 14 种:

*K. moldavica* Lungu, 1981 (摩尔多瓦, Moldavia, 上中新统, 可能相当于 MN10);

*K. schaubi* (Kretzoi, 1954) (匈牙利, Csakvar, MN10);

*K. fahlbuschi* Bachmayer & Wilson, 1970 (奥地利, Kohfidisch, MN11);

*K. skofleki* (Kordos, 1987) (匈牙利, Tardosbanya, MN12);

*K. gansunica* Zheng & Li, 1982 (甘肃天祝, 上中新统, 可能相当于 MN12);

*K. lavocati* (Huguene & Mein, 1965) (法国, Lissieu, MN13);

*K. neimengensis* Wu, 1991 (内蒙古二登图、哈尔鄂博, 上中新统至下上新统, 可能相当于 MN13—14);

*K. similis* Wu, 1991 (内蒙古二登图、哈尔鄂博, 上中新统至下上新统, 可能相当于 MN13—14);

*K. browni* Daxner-Hock, 1992 (希腊, Maramena, MN13);

*K. nestori* Engesser, 1989, (意大利, Baccinello, MN13 或 14);

*K. polonica* Fahlbusch, 1969 (波兰, Podlesice, MN14);

*K. magna* Fahlbusch, 1969 (波兰, Podlesice, MN14);

*K. intermedia* Fejfar, 1970 (捷克, Ivanovce, MN15);

*K. yinanensis* Zheng, 1984 (山东沂南, 上新统, 可能相当于 MN15)。

目前所知 *Kowalskia* 属各种的材料多为牙齿, 这些牙齿的尺寸和形态在种内和种间的变异明显。各种的区分主要根据牙齿的尺寸大小和形态特征的统计分析。要把材料确定到种, 往往要求有一定数量的牙齿。

禄丰新种 *Kowalskia hanae* 属个体中等大小的一种, 它很容易以较大的尺寸区别于属型种 *K. polonica* 和我国的 *K. neimengensis*, 又以较小的个体不同于 *K. magna* 和 *K. yinanensis* (图 3)。

其实, 根据材料中具三根及后脊 II 的 M1 所占的比例、第一臼齿前边尖的分开及发达程度和第三臼齿的退化状况, 新种也不难与上述四种相区别 (Fahlbusch, 1969; Wu, 1991; 郑绍华, 1984)。

禄丰新种 *K. hanae* 牙齿的尺寸和 *K. moldavica* 接近一致, 但后者 M1 的前边尖和 m1 的下前边尖较窄, 双分不甚明显。

*K. schaubi* 的牙齿与 *K. hanae* 的大小接近, 形态也很相似, 不同似乎仅在于前者 M1 后外谷较宽, 后脊 II 较为横向 (即靠舌侧)。

*K. hanae* 比 *K. fahlbuschi* 稍小, M1 的前脊外刺及中脊和 m1 的下中脊略长,

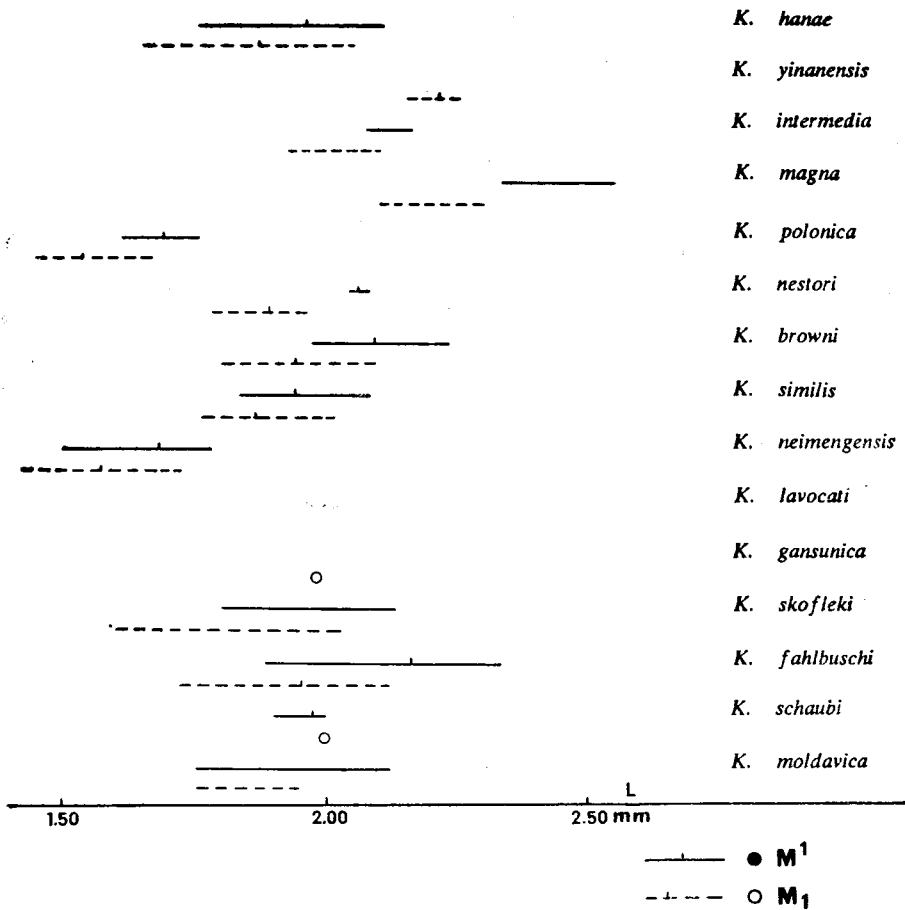


图3 科氏仓鼠已知种第一臼齿长度的变异范围及平均值

Fig. 3 Variable range and mean of the first molar length of *Kowalskia*

M1 舌侧根分开所占的比例较大,但后脊 II 出现的几率较低。

*K. skofleki* 不同于 *K. hanae* 在于其 M1 的前脊外刺、中脊和 m1 的下中脊更为显著。

*K. gansunica* 是该属在我国最先报道的一种,材料仅有一件带 m1—3 的下颌骨。恩格赛尔 (Engesser, 1989) 根据原描述的正型标本的插图,怀疑它是否应该归入 *Kowalskia* 属。他认为,该属下臼齿的舌侧尖(下后尖和下内尖)应该是相当圆的,而且 m1 不应该没有下后边脊。对原标本的重新观察表明,甘肃这一仓鼠类的下颌骨无疑具有 *Kowalskia* 属的特征,使恩氏产生误会的原因完全是由于绘图不准确所造成的。该种的标本仅有一件下颌骨,很难作更多的比较。但即使如此,它尚以 m3 相对于 m2 较短,齿尖相对于齿谷较弱, m1 和 m2 的下中脊未伸达牙齿外缘而不同于禄丰新种。

*K. lavocati* 的已知材料很少,迄今尚未发现第一臼齿,但它是该属唯一 M2 仅有三齿根的一种。目前欧洲多数古生物学者都还把它归入 *Kowalskia* 属。*K. hanae* 与 *K. lavocati* 的不同除在于 M2 具有四齿根外,还在于 M2 的后部,特别是后尖不那么

退化。

*K. hanae* 的牙齿尺寸与 *K. similis* 的接近,但其 M1 的前脊外刺和中脊较弱而短, M1—2 后脊 I 发育弱,后脊 II 则较常见, m1 的下前边尖单尖者较多。

*K. hanae* 比 *K. browni* 稍小,不同于后者还在于后脊 II 较常见,具四根的 M1 所占比例较高。此外,其第三臼齿可能不那么退化。

*K. nestori* 的 M1 具四齿根,中脊伸达齿缘,都有后脊 II, M3 较退化, m1 的下前边尖较分开。据此它易于与 *K. hanae* 分开。

*K. intermedia* 是明显较进步的一种, M1 和 m1 的前边尖宽、近圆锥形且相当强壮, M1 都具四齿根而无后脊 II。

至于曾记录于我国的 *Kowalskia grangeri*, 因唯一的一件标本保存于瑞典的伍普萨拉大学,记述中的图版、插图又不很清楚,难以进行比较。

*Kowalskia* 属显然具有不同的进化支系,这些支系的演化方式和速度也不尽相同。但从上述的比较似乎可以看到,该属从最早出现在相当于 MN 10 的 *K. moldavica* 和 *K. schaubi* 至残存于 MN 15 的 *K. intermedia* 和 *K. yinanensis*, 其牙齿似乎大体具有以下的进化趋势: M1 前边尖逐渐分开、增大,向接近 *Cricetus* 型的圆锥形前边尖的方向发展; M1 和 M2 后脊 II 与后边脊的连接从舌侧逐渐移向唇侧,最终使后外谷消失; M1 舌侧根趋向分开,使该牙齿的齿根从三根增至四根; m1 下前边尖逐渐增宽; M3 和 m3 趋向退化。

一般来说,禄丰新种在属中具有较为原始的特征,这表现于:相当数量 M1 的前边尖分得不很开, m1 下前边尖单尖所占的比例大,大部分 M1 和 M2 具有后脊 II, 三齿根的 M1 近占 50%, m3 与 m2 等长甚至比后者稍长。在这些形态特征上,新种似乎与欧洲的 *K. schaubi*, *K. fahlbuschi* 和 *K. skofleki* 有较多相似之处。它显然比我国山东沂南上新世发现的 *K. yinanensis* 原始得多,甚至比内蒙古二登图及哈尔鄂博的 *K. neimengensis* 和 *K. similis* 也都要原始些 (M1 和 M2 中较高的后脊 II 比例, 四齿根的 M1 较常见, m3 不那么退化), 属于我国现知科氏仓鼠属中构造最原始的一种。

韩氏科氏仓鼠的形态特征与欧洲上述三种的相似,或许表明禄丰这一仓鼠与它们具有较接近的进化水平。同时,也似乎指示了禄丰动物群的时代要比一般认为与欧洲哺乳动物时代土洛里期 (Turolian) 晚期 (MN13) 相当的二登图动物群早,而大致与欧洲的土洛里早期 (MN11) 或中期 (MN12) 相当。这一结论与禄丰动物群其它种类,如兔形类和鼠类所指示的时代也大体吻合 (邱铸鼎等, 1985; Qiu & Storch, 1990)。

在禄丰小哺乳动物群中,除仓鼠类和河狸类外,其它成员主要是一些适应热带—亚热带森林—灌木丛的动物类型,如攀鼯类、毛猬类、竹鼠类等,充分显示了这一动物群与现代东洋界相似的特色。仓鼠科是现代古北界特有的一类啮齿类动物,分布于温带;在我国生活于长江以北。科氏仓鼠化石在我国也主要发现于华北的内蒙古、甘肃、山西和山东。该属在云南禄丰的出现,表明仓鼠科在中新世时的分布远远超越该科现生分布的界限,说明了当时华北和华南的动物分异,还没有现代那样明显。

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## A NEW CRICETID FROM THE LUFENG HOMINOID LOCALITY, LATE MIOCENE OF CHINA

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**Key Words** Lufeng, Yunnan, Late Miocene, Cricetidae

### Summary

The locality Shihuiba at Lufeng, Yunnan produced abundant fossils of small mammals as well as rich remains of hominoids. Preliminary reports on the micro-mammalian fauna and the producing levels have been presented (Qiu *et al.*, 1985; Qi, 1985), and detailed descriptions of selected taxa have been given in succession (Flynn & Qi, 1982; Qi, 1986; Qiu, 1986; Qiu, 1989; Qiu & Storch, 1990; Storch & Qiu, 1991). The present paper deals with the material of the rodent family Cricetidae collected in 1983 from layers I—VI of section D at the site. Cricetids are common rodents in this fauna, but represent only one genus and one species.

### Cricetidae Rochebrune, 1883

#### *Kowalskia* Fahlbusch, 1969

#### *Kowalskia hanae* sp. nov.

(Figs. 1—3; Pl. 1)

**Etymology** Named in honour to Prof. Han Defen who conducted the excavation at the site in 1983 and has made great contributions to the study of the hominoid fauna.

**Holotype** Left M1 (V10843; 2.00 × 1.35mm).

**Paratypes** Layer I: 6 M1, 7 M2, 2 M3, 12 m1, 12 m2, 6 m3 (V10844. 1—45);

II: 3 M1, 2 M2, 2 M3, 9 m1, 13 m2; 3 m3 (V10844. 46—77);

III: a mandible with m1—3 (V10844. 78);

IV: a damaged mandible with m1—3 (V10844. 79);

V: 15 M1, 14 M2, 8 M3, 16 m1, 12 m2, 9 m3 (V10844. 80—153);

VI: one damaged right upper jaw with M1—3, one left lower jaw with m1—3, 5 M1, 3 M2, 1 M3, 6 m1, 8 m2, 6 m3 (V10844. 154—184);

Mixed: 4 M1, 2 M2, 1 M3, 2 m1, 4 m2, 1 m3 (V10844. 185—198).

**Diagnosis** Medium-sized species of *Kowalskia*; M1 with labial spur of anteroloph extending to the margin in more than half of the specimens; metaloph II present in about 80% of M1 and M2; half of the M1 three-rooted; single anteroconid retained in one third of m1; m3 equal to or slightly longer than m2.

**Measurements** (see table and fig. 1 in the Chinese text).

**Description** The diastema is 5.0—5.2mm long. The mandible is 4.7—4.8mm high at the level of m1. The ascending ramus from angular process to coronoid process is 9.0mm high. The masseteric ridge is weak and the masseteric fossa is wide and flat. The mental foramen is elliptical and placed labially in the bend of the curved diastema. The m3 is hidden by the ascending ramus in labial view.

**M1:** The anterocone is divided or incipiently divided into two nearly equal cusps by shallow anterior and deep posterior grooves. The lingual anterocone is connected with the anterior arm of the protocone by a rather strong anteroloph, while the labial anterocone is isolated in most of the specimens. The labial spur of anteroloph is low and present in 29 of 34 teeth, of which 19 extends labially and usually terminates with a cuspule at the margin of the tooth. The protoloph I exists in all but 3 teeth. The protoloph II is developed in all specimens. The metaloph I is weak and only present in 12 teeth. A metaloph II is seen in 20 of 25 observed specimens. The mesoloph is evident in all the teeth; it runs close to the metacone and extends to the labial margin in 42% of the teeth (15/35), fails to reach half way in 2. There is a tiny mesostyle in a few specimens. In 42% of observable teeth there are three roots; the others have four roots.

**M2:** The anterior cingulum is continuous, higher labially than lingually. The anterior arm of protocone joins the anterior cingulum labial to midline and the anteroloph is uncertain. The protoloph I and II are present in all the specimens and connected with the anterior and posterior arms of protocone, respectively. A variable metaloph I exists in 10 of 29 teeth, and the metaloph II is present in 22 of 27 observed specimens. The mesoloph is present in all the specimens, but variable in development: extending to the border in 45%, short in 7%. Four-rooted.

**M3:** In structure the anterior portion of the tooth is the same as in M2, except for existence of an extra longitudinal crest connecting protoloph I and II in 8 of 13 specimens. Hypocone and metacone are rather reduced. The mesoloph runs to the margin in about half of the teeth.

**m1:** The anteroconid is relatively narrow, single-lobed in 17 of 45 teeth, bifid or incipiently twinned in the others. The anterolophid is variable in development and number: single in 30 of 42, double in 9 and treble in 3. The mesolophid, present in all the specimens, extends to the margin and terminates mostly with a small mesostylid. An ectolophid running from the anterior arm or the base of hypoconid can be seen in 12 specimens; it extends mostly to the border of the tooth and ends with a small ectostylid.

**m2:** The anterolophid fails to reach the lingual border and its lingual branch is missing in some specimens. The anterior arm of the protoconid and the metaconid join the anterolophid. The hypolophid is more or less anterolabial directed and connected with the ectolophid. The mesolophid runs to the lingual margin of the tooth and terminates usually with a distinct mesostylid. An ectomesolophid is present in 7 of 57 teeth.

m3: In the three mandibles, this tooth is slightly longer than or equal to the m2. The hypoconid is somewhat reduced and the entoconid is still individual. The mesolophid extends to the border and ends with a visible mesostylid. An ectomesolophid can be seen in 3 of 28 specimens.

Three teeth in the material (V10844. 185, 186, 192) are a bit peculiar in their relatively larger size, and V10844. 185 has a more divided anterocone with the labial one bilobed, and has three anterolophs (Pl. I3). However, they fall within the range of variation exhibited by the other teeth either in structure or in height of crown.

**Remarks** The teeth described above are extremely variable in size and morphology, but can not be divided into separate groups with definite limits. Moreover, measurements and morphology for specimens from different layers display normal variation. Therefore, the whole sample is treated as representing a single species.

The new species *Kowalskia hanae* is larger than *K. polonica* Fahlbusch, 1969 and *K. neimengensis* Wu, 1991, and smaller than *K. magna* Fahlbusch, 1969 and *K. yinanensis* Zheng, 1984 (Fig. 3). It is easily distinguished from the four species by its frequency of three-rooted M1 and of metaloph II in M1 and M2, the development of the anterocone (id) in the first molars, and the reduction of the third molars.

*K. hanae* is close to *K. moldavica* Lungu, 1981 in size; anterocone (id) in *K. moldavica* is narrower and less separated than in *K. hanae*.

*K. hanae* is similar to *K. schaubi* (Kretzoi, 1954) in both size and morphology, but *K. schaubi* has a wider posteroectosinus with a more transverse metaloph II in M1.

*K. hanae* is smaller than *K. fahlbuschi* Bachmayer & Wilson, 1970, but differs from the latter in M1 having on average a longer labial spur of anteroloph and mesoloph, m1 having longer mesolophid, in higher frequency of three-rooted M1 and less frequent metaloph II in M1 and M2.

*K. hanae* resembles *K. skofleki* (Kordos, 1987) in morphology; labial spur of anteroloph and mesoloph on M1, and mesolophid on m1 in *K. hanae* are longer on average.

*K. gansunica* Zheng & Li, 1982, with only one lower jaw, was the first recognized species of the genus in China. According to the figure in the original description, Engesser (1989) doubted its assignment to the genus *Kowalskia* for its rather compressed metaconid and entoconid in the molars and lacking of posterolophid in m1. Redetermination of the original specimen shows that the teeth were not accurately figured: the lingual cusps should be more rounded than they were figured and the m1 does have a posterolophid. It can be distinguished from *K. hanae* by its short m3 relative to m2, weaker cuspids relative to sinusids, and short mesolophid in m1 and m2.

*K. lavocati* (Hugueney & Mein, 1965) is the only species of *Kowalskia* with three-rooted M2. Besides, *K. hanae* can also be distinguished from the European species by M2 with strong metacone.

*K. hanae* is close to *K. similis* Wu, 1991 in size, but differs in its weaker and shorter labial spur of anteroloph and mesoloph in M1, higher frequency of metaloph

II and more frequent single anteroconid in m1.

*K. hanae* is slightly smaller, with more frequent metaloph II in M1 and M2, and lower frequency of four-rooted M1 than in *K. browni* Daxner-Hock, 1992. In addition, it has less reduced M3 and m3.

All the M1 in *K. nestori* Engesser, 1989 have four roots and metaloph II. Besides, m3 in the European species is rather reduced, and anteroconid in m1 is more separated. By these characters, it can easily be distinguished from the new Chinese species.

*K. intermedia* Fejfar, 1970 is characterized by its more advanced pattern of M1 and m1: four-rooted M1 without metaloph II; wide, strong and cone-shaped anteroconid of m1.

*Kowalskia* may include evolutionary lineages with different evolutionary rates. However, the genus seems to have undergone a similar evolutionary trend, which is characterized by an increase of root in M1 (from 3 roots to 4 roots), a gradual change of metaloph II in M1 and M2 (from transverse to backwarddirected and finally to disappear), a widening, splitting and strengthening of anterocone (id) in the first molars, and reduction of the third molars.

The Lufeng species seems to possess some relatively primitive characters. These are: (1) high percentage of incipiently twinned anterocone in M1 and of single-lobed anteroconid in m1; (2) having metaloph II in most M1 and M2; (3) relatively high frequency of three-rooted M1; and (4) rather long and less reduced m3. In size and generally morphology, *K. hanae* more closely resembles the European species, *K. schaubi* from Csakvar of Hungary (MN10), *K. fahlbuschi* from Kohfidisch of Austria (MN11), or *K. skofleki* from Tardosbanya of Hungary (MN12). It is certainly more primitive than *K. yinanensis* from the upper Pliocene of Shandong, and even than *K. neimengensis* and *K. similis* from the upper Miocene of Ertemte, Nei Mongol (more frequent metaloph II and four-rooted M1, and less reduced m3). The new form seems to represent the most primitive species of this genus known in China.

The nature of *K. hanae* appears to indicate that the age of Lufeng fauna is older than the Ertemte fauna. The similarities of *K. hanae* to the European species mentioned above may indicate they have a close evolutionary grade, with the age of the Lufeng fauna about equivalent to early or middle Turolian of Europe (MN11 or MN12).

The Lufeng micromammalian assemblage is mainly composed of elements adapted to a tropical or subtropical mesic forest or shrub like that of the present-day Oriental province, such as Tupaiidae, Echinisoricinae, Rhizomyidae, Platacanthomyidae etc. Cricetidae are considered as habitants of temperate steppic environment. In China they thrive north of the Yangtze River at the present day. The existence of *Kowalskia* at Lufeng seems to imply that provinciality and latitudinal ecological variation in faunal elements between North and South China was not so marked in the late Miocene as it is at present, or else this species was unusual in preferring moist habitat.

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### 图版 I 说明 (Explanations of plate I)

韩氏科氏仓鼠(新种) *Kowalskia hanae* sp. nov. 冠面视 (occlusal view)  $\times 20$   
 1. 左 M1, V10843, 正型标本 (type); 2. 左 M1, V10844.91; 3. 右 M1, V10844.185;  
 4. 右 M1, V10844.186; 5. 左 M2, V10844.163; 6. 右 M2, V10844.99; 7. 左 M3,  
 V10844.51; 8. 右 M3, V10844.109; 9. 左 m1, V10844.118; 10. 左 m1, V10844.54;  
 11. 右 m1, V10844.59; 12. 右 m1, V10844.193; 13. 左 m2, V10844.63; 14. 右 m2,  
 V10844.144; 15. 左 m3, V10844.76; 2. 右 m3, V10844.151



## 第六届中生代陆相生态系统国际讨论会将提前举行

因与将在北京召开的联合国第四届世界妇女大会有所冲突,原定于 1995 年 9 月 1 日至 4 日在北京举行的第六届中生代陆相生态系统国际讨论会,将不能如期举行。经组织委员会研究决定,将讨论会及与其相关的活动,如会前、会后的地质旅行等,提前一个月进行。

具体变更如下:

7月25日至 31 日 会前地质旅行;

7月 31 日 代表报到、注册;

8 月 1 日至 4 日 大会日程;

8 月 5 日至 11 日 会后地质旅行。

其他与会议有关的日程安排,如报名、提交论文摘要的截止日期等,将不作任何改动。

(MTE 会务组)

