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新疆准噶尔盆地北缘 Pliopithecus 的发现[1)]

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摘要 1997 和 1998 年的野外工作期间,在新疆准噶尔盆地北缘铁尔斯哈巴合中中新世哈拉玛盖组的底部第二砂层中发现了 4 枚上猿牙齿。两枚显然是属于同一个体的左 m2 和 m3 发现于 98017 地点,地理坐标为 46°39.997′N,88°30.412′E。另一枚左下第一门齿和左上第四前臼齿产自该地点附近的同一砂层中。这是在中国境内、也是亚洲的第二个上猿化石地点。

该 4 枚牙齿中,下门齿可能与 m2、m3 属同一个种。m2 刚开始经受磨蚀,m3 则刚萌出齿槽。它们不同于所有已知种(*P. zhanxiangi*、*P. vindobonensis*、*P. antiquus*、*P. platyodon* 和 *P. priensis*)的最明显的特征是在唇侧有一个很深的、间于下原尖和下次尖的漏斗状小坑。该坑由前次脊(prehypocristid)、下次尖前方的斜脊的唇侧分支和沿下原尖唇侧壁向下延伸的一条脊所围成。此外,m3 稍短于 m2。在其他形态特征方面,新疆的种又以 m2 和 m3 尺寸较小、齿尖较低、齿脊较锐、近中凹和远中凹发育、釉面褶皱和唇侧齿带很发育而不同于我国宁夏同心的 *Pliopithecus zhanxiangi*;以 m2 和 m3 的冠面较短宽且有很发育的上猿三角与 *P. vindobonensis* 区分;其 m2 和 m3 的尺寸明显大于 *P. antiquus*。但在尺寸和其他形态上与 *P. platyodon* 很相似。铁尔斯哈巴合的 m2、m3 和下门齿应代表上猿属内的一个新种,被命名为毕氏上猿(*Pliopithecus bii* sp. nov.)。至于 P4,它以尺寸小、相对长而窄的齿冠和具有两条横脊等特征组合而不同于所有的已知种。由于 P4 相对于 m2 和 m3 的尺寸显得太小而被归入未知种 *Pliopithecus* sp.。

Pliopithecus bii sp. nov. 和 *Pliopithecus* sp. 与江苏泗洪早中新世的双沟醉猿 *Dionysopithecus shuangouensis* 形态上很相似,这为 Harrison 和顾玉珉(1999)提出的上猿起源于亚洲的假说进一步提供了依据。

与新种共生的哈拉玛盖动物群的时代与宁夏同心动物群大致相当,为中中新世早期,与欧洲新近纪陆生哺乳动物分期 MN6 相当。

关键词 新疆准噶尔盆地北缘,中中新世,哈拉玛盖组,上猿

中图法分类号 Q915.879

THE DISCOVERY OF PLIOPITHECUS FROM NORTHERN JUNGGAR BASIN, XINJIANG

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Abstract A new species of *Pliopithecus* - *P. bii* sp. nov., is erected on dental morphology of

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m2～m3 and a central lower incisor, which were collected from the early Middle Miocene Halamagai Formation of Tieersihabahe in the northern Junggar Basin of Xinjiang Uygur Autonomous Region, China. The new species is especially characterized by a deep buccal funnel, which is enclosed by the cristid obliqua, the crest descending along the buccal slope of protoconid, and the buccal branch of prehypocristid. One P4 collected from near the same locality is assigned to *Pliopithecus* sp. because of its smaller size in relation to the m2 and m3. The associated mammal fauna of *P. bii* is approximately comparable to Tongxin fauna. Consequently *P. bii* is of early Middle Miocene in age, equivalent to the European Neogene land mammal age MN6. The high similarity between *Dionysopithecus shuangouensis* and *Pliopithecus* especially *P. bii* supports the inference made by Harrison and Gu (1999) that pliopithecini (*Pliopithecus*) was derived from an Asian rather than an African source.

Key words Xinjiang, northern Junggar Basin, early Middle Miocene, *Pliopithecus*

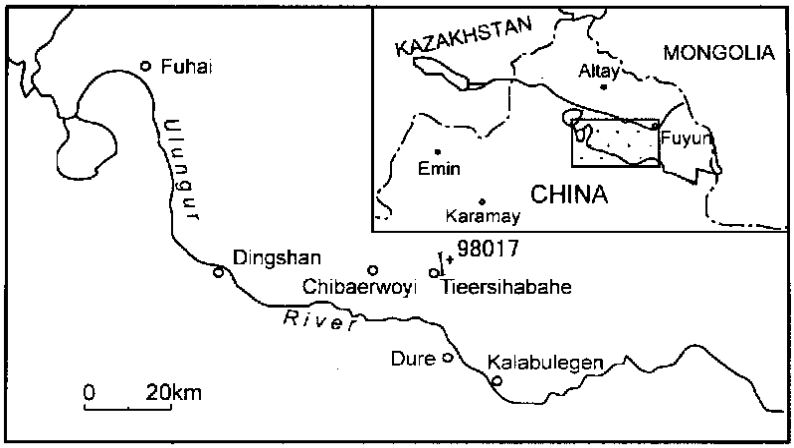

Fig. 1　Sketch map of Ulungur River Region of the northern Junggar Basin indicating *Pliopithecus* locality 98017

During the 1997 and 1998 field seasons four *Pliopithecus* teeth were found in the second sands at the bottom of Halamagai Formation of Tieersihabahe, northern Junggar Basin (Fig. 1 and Fig. 2). The m2 and m3 were found at site 98017 (46°39.997′N, 88°30.412′E), and the il and P4 were collected near this site. Site 98017 is located east to the 00TEe section (Ye et al. 2001a). The sediment is much thinner at locality 98017 than at section 00TEe. Site 98017 is the second *Pliopithecus* locality in China in addition to Tongxin of Ningxia. It is therefore necessary to make it known to the public, though the material is limited. Morphologically the il is typical of the pliopithecines, the three cheek teeth are also of pliopithecine but different from those of all known *Pliopithecus* species. The classification and nomenclature here adopted are after Harrison and Gu (1999).

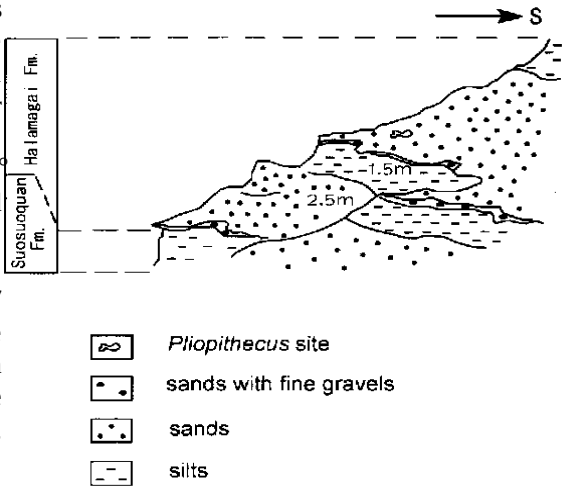

Fig. 2　Sketch geological section at *Pliopithecus* locality 98017

Order Primates Linnaeus, 1758
Infraorder Catarrhini Geoffroy, 1812
Superfamily Pliopithecoidea Zapfe, 1961
Family Pliopithecidae Zapfe, 1961
Subfamily Pliopithecinae Zapfe, 1961
Genus Pliopithecus **Gervais, 1849**

Pliopithecus bii **sp. nov.**

(Fig. 3, 2a~c, 3a~c; Fig. 4)

Holotype Left m2 and m3 from one individual, V 13323. 1 - 2.

Type locality, horizon and age Site 98017 at Tieersihabahe in northern Junggar Basin of China, 46°39. 997′N, 88°30. 412′E. The second sands from the bottom of Halamagai Formation, early Middle Miocene.

Etymology In honor of Mr Bi Shundong who found the Holotype.

Diagnosis *Pliopithecus* characterized by, and differing from all other known species of *Pliopithecus* in m2 and m3 having a deep buccal funnel, which is enclosed by the cristid obliqua, the crest descending along the buccal slope of the protoconid and the buccal branch of the prehypocristid. Besides it is characterized by m2 and m3 having slender and low cusps and sharp crests, deve-loped enamel wrinkles and distinct pliopithecine triangle, by m3 being slightly shorter and smaller in area than m2.

Referred specimen A right il (V 13324) found from nearby the type locality in the level where the holotype was collected.

Measurements (in mm)

il 3. 02 ×1. 58 (Length ×breadth of occlusal surface), 2. 30 ×3. 38 (at base of crown), remained crown height 3. 6mm, remained root height 11. 82mm

m2 7. 70 ×6. 80 (Length ×breadth), Breadth-length index 88. 3

m3 7. 36 ×6. 40 (Length ×breadth), Breadth-length index 86. 95

m2 : m3 size differential in area is 100 : 89. 95

Description The m2 and m3 are obviously from a single immature individual because m2 is only slightly worn and m3 is partially erupted so that its occlusal surface is completely fresh with the enamel being incompletely developed at the crown base. The m3 is slightly shorter and narrower, and smaller in area than the m2. The cusps are slender and not highly elevated. The enamel surface is wrinkled with secondary crestlets.

The **m2** is rounded rectangle in shape with a slight buccal constriction (waisting) midway along its length. The crown is slightly broader in its mesial moiety than in its distal moiety. The five main cusps are subequal in size. A mesostylid is present, which is at the distal end of the cingulum high up on the lingual wall of the metaconid.

Four sharp crests originate from the protoconid apex. 1) The preprotocristid is sharp and terminates mesially at the margin of the crown. 2) The hypoprotocristid extends lingually to meet the hypometacristid, forming the distal trigonid crest parallel to the mesial margin of the tooth. 3) The postprotocristid extends mesio-distally and is in alignment with the preprotocristid, and meets the prehypocristid posteriorly, forming the cristid obliqua, which is slightly obliquely oriented in relation to the longitudinal tooth axis. A V-shaped notch between the postprotocristid and the prehypocristid can be seen from buccal view. A lingual branch of the postprotocristid runs distolingually and terminates in the talonid basin, forming the mesial arm of pliopithecine triangle. 4) The fourth crest descends distobuccally along the buccal slope of the protoconid and terminates at the buccal cingulum.

The metaconid is located slightly distal to the protoconid. From the metaconid descend three sharp crests: 1) The premetacristid runs mesially and ends at the margin of the crown. 2) The postmetacristid extends distally and meets the preentocristid. Between the two cristids is a V-shaped notch. 3) The third crest is the hypometacristid, which extends labially to meet the hypoprotocristid.

High around the lingual wall of the metaconid is a developed cingulum.

From the hypoconid apex originate three sharp crests: 1) The prehypocristid, which is only slightly obliquely oriented. A buccal crest branches out halfway along the prehypocristid, which runs buccomesially till the buccal cingulum, and encloses a deep funnel together with the cristid obliqua and the crest on the buccal slope of the protoconid. 2) The distal arm of pliopithecine triangle extends mesiolingually, and terminates and bifurcates in the center of the talonid. 3) The posthypocristid extends distolingually and meets the prehypoconulid cristid.

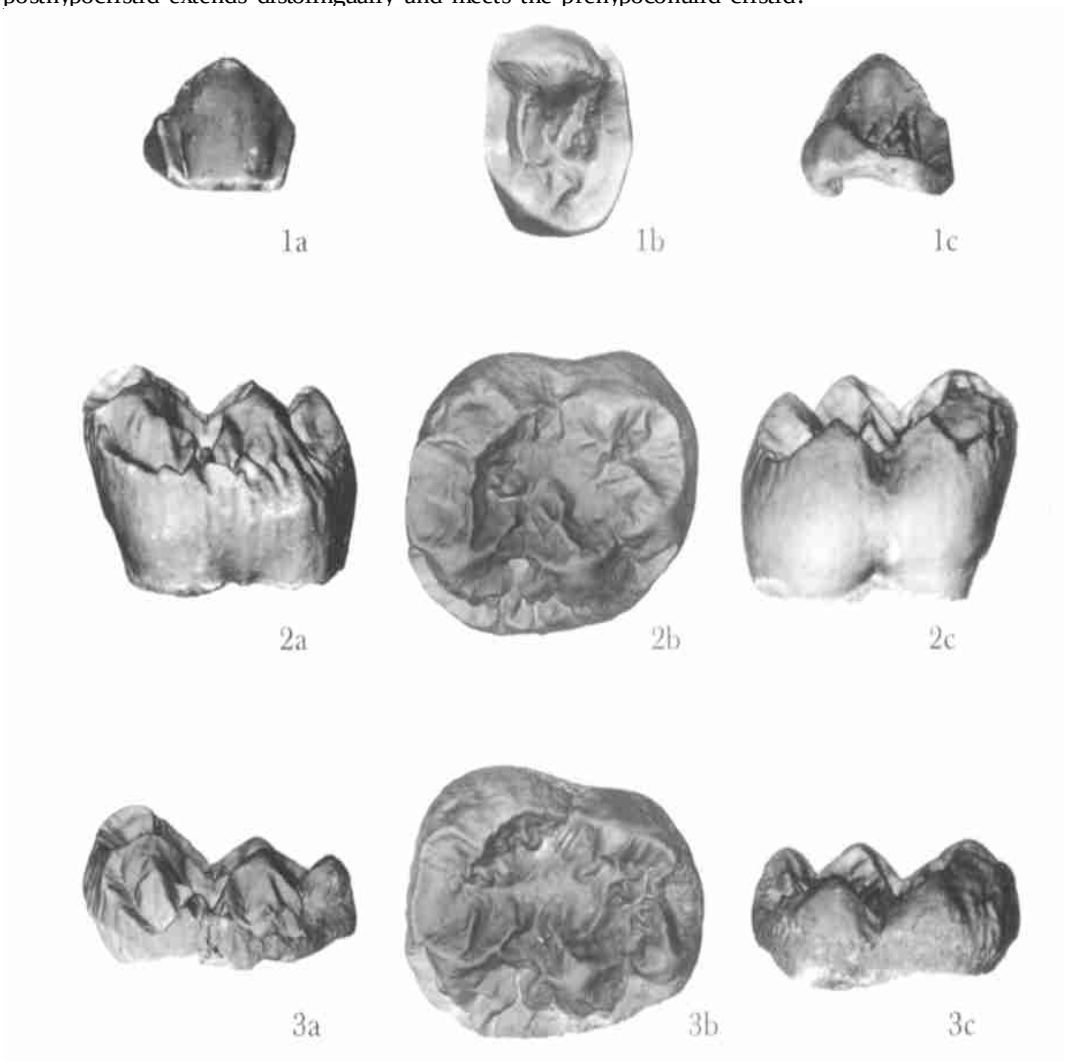

Fig. 3 Cheek teeth of *Pliopithecus* from Middle Miocene Halamagai Formation of Loc. 98017 in northern Junggar Basin, Xinjiang, X6

1. Left P4 of *Pliopithecus* sp., V 13325, 1a. buccal view; 1b. occlusal view; 1c. lingual view
2. Left m2 of *Pliopithecus bii* sp. nov., V 13323. 1, holotype, 2a. buccal view; 2b. occlusal view; 2c. lingual view
3. Left m3 of *Pliopithecus bii* sp. nov., V 13323. 2, holotype (from the same individual as m2), 3a. buccal view; 3b. occlusal view; 3c. lingual view

The hypoconulid is located distolingually to the hypoconid and slightly buccal to the longitudinal axis of the tooth. Four crests originate from the hypoconulid apex: 1) The prehypoconulid cristid descends mesiobuccally and meets the posthypocristid mesially. 2) The postcristid runs

mesiolingually , terminates and bifurcates in the talonid basin. 3) The posthypoconulid cristid extends along the distal margin of the tooth. 4) The fourth crest passes along the steep buccal slope of the hypoconulid and meets the buccal cingulum below.

Three crests originate from the apex of the entoconid :1) The preentocristid extends mesially and nearly meets the postmetacristid with a notch in between ,forming the mesial boundary of the distal fovea. 2) The postentocristid extends distally ,then turns buccally along the distal margin ,defining the distal fovea posteriorly. 3) The hypoentocristid descends along the buccal slope of the entoconid , terminates in the talonid basin ,and almost meets the postcristid with a notch in between ,forming the mesial boundary of the distal fovea.

The trigonid basin (mesial fovea) is transversely extended and very slightly obliquely oriented. It is narrower and higher than the talonid basin. A paraconid is indistinct.

The buccal cingulum is well developed and beaded , extends from the mesial side of the protoconid to the distobuccal side of the hypoconulid and weakens below the hypoconid.

The m3 is quite similar to the m2 in morphology with the following differences :1) The tooth is distinctly narrowed distally. 2) The hypoconulid is located more buccally and nearly in alignment with the protoconid and hypoconid. 3) The postcristid does not meet the hypoentocristid but the postentocristid. 4) The hypoentocristid bifurcates whose mesial branch is short and ends in the talonid basin , while the distal branch extends mesiobuccally until to the lingual slope of the hypoconid ,so that the distal fovea is differently defined on m3 from that on m2. 5) The distal crest arches forward probably because of incompletely developed enamel. 6) The hypoprotocristid extends against the hypometacristid but is not connected with the latter ,the trigonid basin is therefore confluent with the talonid basin. 7) The mesostylid and the lingual cingulum on the metaconid are less developed.

The right i1 is chisel-like ,and mesiodistally waisted towards the base of the crown. It is rather worn but seems high-crowned judging from the remained crown height. From lingual view the mesial margin is slightly more oblique than the distal margin. The buccal surface is vertical and flat while the lingual surface slopes down lingually. The lingual surface is smooth with an indistinct vertically extended ridge near the distal margin. The root is rather long(about 12mm) ,slightly curved distally and very slightly damaged at the tip.

Comparison Because of the limited material available from Xinjiang ,the comparison and discussion are restricted to the i1 and m2~m3.

The Xinjiang form possesses rather high-crowned central incisor. Its m2 and m3 have distinct pliopithecine triangle , well-defined mesial and distal foveae , slightly obliquely oriented mesial margin , mesial fovea and cristid obliqua , and a much developed buccal cingulum. The m2 hypoconulid is located distolingually to the hypoconid and slightly buccal to the longitudinal axis of the tooth , and the m3 hypoconulid is located more buccally and nearly in alignment with the protoconid and hypoconid. Besides ,the m2 and m3 possess a distinct cingulum high around the lingual wall of the meta-conid and a mesostylid at the distal end of the cingulum. All these features are identical to those of *Pliopithecus*. Therefore the Xinjiang form should be assigned to the genus *Pliopithecus* , although its m3 is slightly smaller in area than m2.

Compared with all known *Pliopithecus* species the Xinjiang *Pliopithecus* is characterized particularly by a deep buccal funnel that is enclosed by the cristid obliqua ,the crest on the protoconid buccal slope , and the buccal branch crest of the prehypocristid. This feature distinguishes the Xinjiang species from other known species of the genus. In addition ,the Xinjiang species differs from other species respectively in the following characters on m2 and m3.

It differs from *P. zhanxiangi* (Harrison et al. 1991 ,Qiu and Guan ,1986) of the early Middle Miocene from Tongxin ,Ningxia in having 1) smaller size ;2) less elevated and less voluminous cuspids and crests ; 3) a greater degree of enamel wrinkling ; 4) more distinct or developed pliopithecine triangle ;5) much more developed and beaded buccal cingulum ;6) larger and well-defined mesial and distal foveae ;7) much more developed cingulum on lingual wall of the metaconid ;8) m3 being slightly

Fig. 4　Right i1 of *Pliopithecus bii* sp. nov. ,V 13324 , ×6 ,a. buccal view ;b. lingual view ;c. view from distal side

shorter and smaller in area than m2.

It differs from European Miocene (MN5~8) *P. antiquus* (Roger ,1898 ; Stromer ,1928 ; Hürzeler , 1954 ;Bergounioux and Crouzel , 1965 ; Heissig and Fiest , 1987 ; Ginsburg , 1990 ; Andrews et al. , 1996 ; Köhler et al. 1999 ; Mörs et al. , 2000) in having much larger size , much more wrinkled enamel ,much more developed and beaded buccal cingulum , and in m3 being slightly shorter and smaller in area than m2. We noticed that the m3 of *P. antiquus* from Manthelan of France (Hürzeler , 1954 ; Bergounioux and Crouzel , 1965) is also shorter than m2 , which Andrews et al. (1996) considered as intraspecific variation.

Its size falls within the size-range of *P. platyodon* from Miocene (MN5~6) of Göriach of Austria and Elgg of Switzerland (Hofmann , 1893 ; Hürzeler , 1954) . It differs from *P. platyodon* in having better-developed buccal cingulum ,and m3 being slightly shorter and smaller than m2. In contrast ,the lower molars of *P. platyodon* increase posteriorly in size. Otherwise ,the Xinjiang species is quite similar to *P. platyodon*.

It differs from latest Early Miocene *P. vindobonensis* of Slovakia (Zapfe and Hürzeler , 1957 ; Zapfe ,1960) in having more developed and distinct pliopithecine triangle , in the breadth/ length ratios of m2 and m3 of the Xinjiang form being higher than those of *P. vindobonensis* (Harrison et al. ,1991 : Table 2 ;Bergounioux and Crouzel , 1965 : Table on p. 61) . Finally , its m3 being slightly

shorter and smaller than m2 ,while the lower molar size of *P. vindobonensis* is greatly increased from m1 to m3.

P. priensis from earliest Late Miocene (MN9) of France (Welcomme et al. , 1991) was established on only a right mandible with m1~2. It is similar to *P. zhanxiangi* in size and with small size differences between m1 and m2 (Andrews et al. ,1996) . It is undoubted that the Xinjiang form is a separate species from *P. priensis*.

Discussion The above comparisons demonstrate that the Xinjiang form is different from all known *Pliopithecus* species. We therefore name a new species , *Pliopithecus bii*.

Pliopithecus bii is the second *Pliopithecus* species found in China. The first Chinese *Pliopithecus* species is *P. zhanxiangi* (Harrison et al. ,1991 ;Qiu and Guan ,1986) from Tongxin of Ningxia ,which is about 1700km apart from Tieersihabahe. We have enumerated the morphological differences between these two species. As a whole *Pliopithecus bii* is smaller and slender than *P. zhanxiangi* , which possesses voluminous and rounded cusps and crests. Among all *Pliopithecus* species *P. bii* is more similar to the European species than to *P. zhanxiangi* in slenderness , in larger mesial and distal foveae , and more developed enamel wrinkles. The dental morphological differences imply ,as we consider ,that *P. bii* has closer affinities with European species than with *P. zhanxiangi* , or they might reflect different ecological adaptations and different diet. However confirmation of this inference needs adequate material and further study of these fossil animals.

When studied the enlarged sample of *Dionysopithecus shuangouensis* and *Platodontopithecus jianghuaiensis* from Sihong ,Jiangsu ,and based on analysis of characters in dental ,cranial as well as postcranial morphology , Harrison and Gu (1999) established for these two genera a new subfamily Dionysopithecinae under the family Pliopithecidae. Pliopithecinae was considered as the sister subfamily of Dionysopithecinae , and was subdivided into two tribes : Crouzeliini and Pliopithecini. *Pliopithecus* is the only genus of tribe Pliopithecini. According to Harrison and Gu (1999) ,these two subfamilies share several derived features on lower incisors and lower molars besides those on p3 and upper central incisors , including : 1) lower incisors mesiodistally waisted towards the base of the crown ;2) presence of a distinct pliopithcine triangle on lower molars (at least on m2~3) ; 3) a relatively long trigonid that is narrower than the talonid ,at least on m1 ;4) the mesial crest linking the metaconid and protoconid is obliquely oriented ; and 5) the cristid obliqua is obliquely aligned relative to the long-axis of the crown. According to Harrison and Gu (1999 : Table 10 ,Node 5) ,the lower molars of Dionysopithecinae are distinguished from those of Pliopithecinae by the high incidence of a well-developed mesostylid and m3 being smaller in area than m2.

We found that *Dionysopithecus shuangouensis* is very similar to *Pliopithecus* although they are assigned to different subfamilies. The *D. shuangouensis* is much more similar to *Pliopithecus bii* than to *Platodontopithecus jianghuaiensis* in dental morphology. In addition to the above-mentioned features shared by these two subfamilies ,the m2 and m3 of *D. shuangouensis* and of *Pliopithecus bii* are further similar with each other in having developed pliopithecine triangle , in having distinct , sharp occlusal crests (contrary to what Harrison and Gu (1999 , p. 232) mentioned that the upper and lower molars of Dionysopithecinae possess "low , rounded cusps and crests") , well-defined mesial and distal foveae , moderately developed mesostylid , m3 being smaller than m2 , similar enamel wrinkles , and the distinct cingulum up on the lingual wall of the metaconid and the crest descending from the protoconid which is downwards along the protoconid buccal slope till to meet the buccal cingulum. We consider these common features as their synapomorphic characters. Of course , *D. shuangouensis* is different from *Pliopithecus bii* in a few features. Its m2 and m3 differ from those of *P. bii* in being much smaller in size , in having much longer and narrower tooth crown , in having slightly higher cusps and greater occlusal relief , in having more elevated and more obliquely directed trigonid basin (mesial fovea) , more obliquely oriented cristid obliqua , smaller and more lingually situated hypoconulid as well as the less developed buccal cingulum. These differences indicate that *D. shuangouensis* is more primitive than the Xinjiang form.

We noticed that the m2 and m3 of *Platodontopithecus jianghuaiensis* have "low, rounded cusps and crests" (Harrison and Gu, 1999: p. 232) and the relevant ill-defined mesial and distal foveae, less developed buccal cingulum, much more developed and seeming isolated mesostylid, and absence of a cingulum on the lingual wall of metaconid. *Pliopithecus bii* can be easily distinguished from it mainly by smaller size, much more distinct crests, well-defined mesial and distal foveae, a much more developed buccal cingulum, less developed mesostylid and more distinct cingulum on the lingual wall of metaconid. These features also differenciate *D. shuangouensis* from *Platodontopithecus jianghuaiensis*.

It should be emphasized that the mesostylid on the lower molars of *Platodontopithecus jianghuaiensis* is significantly different from that of *Pliopithecus bii* and *Dionysopithecus shuangouensis*. The mesostylid on the m2 and m3 of the former is large and isolated, and the mesostylid of the latter two species is small and is the end part of the cingulum on the lingual wall of the metaconid, as in other *Pliopithecus* species (at least *P. platyodon*, *P. antiquus*, *P. zhanxiangi*, *P. vindobonensis*). This indicates that the mesostylid and the cingulum on the lingual wall of the metaconid of *Pliopithecus* and *Dionysopithecus shuangouensis* is very probably homogenous character. However the mesostylid in *Platodontopithecus jianghuaiensis* is probably non-homologous with that in *Pliopithecus* and *Dionysopithecus shuangouensis*. Harrison and Gu (1999, p. 265, Table 10, Node 4) indicated that *Dionysopithecus* and *platodontopithecus* share the feature in lower molars "with a high incidence of a wall developed mesostylid". Because the mesostylid in *Pliopithecus bii* and *Dionysopithecus shuangouensis* and the mesostylid in *Platodontopithecus jianghuaiensis* are non-homogenous we may not compare the incidence of the different types of mesostylids in these forms. Further, we have noticed that the frequency of mesostylid is not very low in *Pliopithecus*, at least it can be recognized in most observed specimens. In consideration of the foregoing analysis the classification of Pliopithecoidea might be reevaluated after detailed study and more material being available.

Another feature shared by *Dionysopithecus shuangouensis* and *Pliopithecus bii* is that the m3 is shorter and smaller than m2. Because there is only a single m2 and single m3 from one individual of *Pliopithecus bii* from Tieersihabahe we may not assert whether it is the character of the species or it is simply individual variation.

Taking account of the high similarity between *Dionysopithecus shuangouensis* and *Pliopithecus* we suspect that *Dionysopithecus shuangouensis* is more closely related to *Pliopithecus*, at least *Pliopithecus bii*, than to *platodontopithecus jianghuaiensis*. *Pliopithecus bii* could be derived from *Dionysopithecus shuangouensis*-like ancestor or its close relative.

Pliopithecus **sp.**
(Fig. 3, 1a~c)

Material　A left P4 (V 13325).

Locality, horizon and age　Near locality 98017 at Tieersihabahe in north Jungar Basin of China, 46°39.997′N, 88°30.412′E. Second sands from the bottom of Halamagai Formation, early Middle Miocene.

Measurement (in mm)　Length ×breadth of occlusal surface: 3.91 ×4.69.

Description　The tooth is unworn with the crown much higher labially than lingually. It seems not fully developed. It is oval in occlusal outline with parallel mesial and distal margins. Three main cusps are present: paracone, protocone and hypocone.

The paracone is high and bucco-lingually compressed. It is positioned almost midway mesiodistally. The preparacrista and postparacrista are sharp and in alignment mesiodistally. The preparacrista descends mesially and terminates at the parastyle. The postparacrista descends distally and ends at a style on the marginal ridge. Both styles are pillar-like that project buccally and slightly converge towards the crown base.

The protocone is low and located slightly mesial to the paracone. It is ridge-like but quite

bulged and the lingual wall is vertically positioned. the preprotocrista curves mesio-buccally and is continuous with the mesial margin ridge , while the postprotocrista descends distolingually to the hypocone.

The hypocone is even lower than the protocone and also ridge-like but slightly thickened. A crest extends from the hypocone distobuccally and continues with the distal margin ridge.

Mesiolingually at the base of the paracone originates a crest (hypoparacrista) that extends parallel to the mesial margin and terminates at the protocone on halfway of the protocone height and slightly mesial to the apex of the protocone. Together with the mesial margin crest ,preparacrista and preprotocrista , it delimites the mesial fovea. Distolingually at the base of the paracone originates another crest that runs mesio-lingually and terminates midway and bifurcates in the basin. Opposite to this crest , slightly distal to the apex of the protocone , extends a short crest from the base of the protocone , the distal fovea is thus confluent mesially with the central basin. Both mesial and distal foveae are much lower than the central basin.

No lingual and buccal basal cingula are present. However we may not conclude whether they are present or not because the tooth crown is not fully developed ,it is extremely fresh and lacks roots.

Comparison The P4 from Tieersihabahe is recognized as *Pliopithecus* for it is similar to those of *Pliopithecus* species in having two transverse lophs acrossing the tooth basin ,and in the presence of a parastyle and a distal style as in P4 of *P. vindobonensis* and *P. platyodon* ,though the P4 of *P. zhanxiangi* possesses only one transverse loph. The Tieersihabahe P4 is very narrow in relation to the length ,which differs from the P4 of all known *Pliopithecus* species in which P4 are usually wider than long. In addition it is particularly small in relation to the m2 and m3 of *Pliopithecus bii*. The ratio is much smaller than those in other species(see Table 1) . It will therefore be reasonable not to refer this P4 to the new species but to a nomenclatura aperta. We noticed that the Tieersihabahe P4 also resembles that of *Dionysopithecus shuangouensis* in possessing two transverse lophs in the tooth basin ,as well as the metastyle and distal style. However its protocone is located more mesially than in *D. shuangouensis* and it has an initial hypocone ,which is absent in the P4 of *D. shuangouensis*.

Table 1 Size differential of P4 to m2 and m3 of Pliopithecus **species** (mm)

Species	Size ratio of P4/ m2	Size ratio of P4/ m3
Xinjiang material	3.91 ×4.69/ 7.7 ×6.8 = 0.35	3.91 ×4.69/ 7.36 ×6.4 = 0.389
P. zhanxiangi *	40.3(n = 4) / 67.4(n = 3) = 0.60	40.3(n = 4) / 75.46(n = 1) = 0.53
P. vindobonensis **	29.4(n = 2) / 42.3(n = 3) = 0.695	29.4(n = 2) / 46.68(n = 3) = 0.63
P. platyodon ***	31.5/ 43.8 = 0.719	31.5/ 45 = 0.70

* The measurements used for calculation is after Harrison et al. ,1991.

* * The measurements used for calculation is after Zapfe ,1960 ,p. 17.

* * * The measurements used for calculation is after Hofmann ,1893 ,p. 15.

Age of *Pliopithecus bii* and *Pliopithecus* sp. and the origin of *Pliopithecus* : According to a preliminary identification the mammal fossils associated with the *Pliopithecus bii* and *Pliopithecus* sp. are as follows. Insectivora : *Schizogalerix duolebulejinensis* , *Mioechinus ?* aff. *M. gobiensis* ; Chiroptera gen. et sp. indet. ; Lagomorpha : *Plicalagus junggarensis* , *Sinolagomys* sp. , *Alloptox gobiensis;* Rodentia : *Sinomylagaulus halamagaiensis* , *Eutamias* sp. , *Atlantoxerus giganteus* , *A. junggarensis* , *Palaeosciurus* sp. , Petauristinae gen. et sp. indet. 1 et 2 , *Steneofiber depereti* , *Anchitheriomys tungurensis* , *Tachyoryctoides* sp. , *Cricetodon* sp. nov. , *Megacricetodon* sp. nov. ; Carnivora : *Nimravus ?* sp. , *Pseudaelurus cuspidatus* , *Protictitherium intermedium* , *P.* sp (small) , *Thalassictis chinjiensis* , *Simocyon* sp. (small) , *Gobicyon* sp. , *Oligobunis ?* sp. ; Proboscidea : *Zygolophodon ? junggarensis* , *Zygolophodon ?* sp. , *Gomphotherium* cf. *G. shensiensis* , *Gomphotherium* sp. ; Perissodactyla : *Chilotherium* sp. , *Aceratherium* sp. , *Anchitherium* cf. *A. aurelianense* ; Artiodactyla : *Lagomeryx* sp. , *Stephanocemas* aff. *S. thomasoni* , *Micromeryx* sp. , *Palaeomeryx* sp. , *Eotragus halamagaiensis* ,Bovidae gen. et sp. indet. The fauna is similar to the

Tongxin fauna in composition, and is considered as early Middle Miocene (Qiu et al., 1999; Ye et al., 2001a, b) in age, equivalent to the European Neogene land mammal age MN6. A better age determination of the fauna should be made after a detail study of the fauna.

The genus *Pliopithecus* has occurred in Miocene of Eurasia, including Spain (Harrison et al., 2002), France, Switzerland, Germany, Austria, Slovakia, Poland and China (Andrews et al., 1996; Köhler et al., 1999). Its earliest appearance is in MN5 of Europe (France, Germany and Switzerland). The new locality from Xinjiang is about 1700km far from Tongxin and nearly 3000km from Sihong. Poland is about 4860km away from Xinjiang locality. The occurrence of *Pliopithecus* in Xinjiang increases the density of its geographical distribution between Asia and Europe. The high similarity between *Dionysopithecus shuangouensis* and *Pliopithecus bii* supports the inference made by Harrison and Gu (1999) that pliopithecins were derived from an Asian rather than an African source. New finds of *Pliopithecus* of earlier age, at least MN5 equivalent, are expected in North China.

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