

Original article

Early Miocene cricetids (Rodentia) from the Junggar basin (Xinjiang, China) and their biochronological implications[☆]

Les cricetidés (Rodentia) miocènes inférieurs du bassin du Junggar (Xinjiang, Chine) et leurs implications biochronologiques

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Abstract

Among the 14 small mammal species from the early Miocene locality of the northern area of the Junggar basin (northern Xinjiang, China), four species are cricetids (Rodentia): unnamed species of *Cricetodon* and *Eumyarion*, and two new species, *Karydomys debruijni* nov. sp. and *Megacricetodon beijiangensis* nov. sp. Some aspects of the morphology of *Cricetodon* sp. are shared by *Eucricetodon* from the late Oligocene, suggesting that these specimens could be of intermediate form between *Eucricetodon* and *Cricetodon*. One tooth of *Eumyarion* sp. was found, making its determination uncertain, but its morphology is clearly differentiated from the one of *Cricetodon* sp. The species *K. debruijni* nov. sp. is established based on its primitive features compared to the species known in Europe and Anatolia, and its specific association of characters compared to *Karydomys dzerzhinskii*. *M. beijiangensis* nov. sp. shows many plesiomorphic features compared to the species already described in the middle Miocene of China. Based on both the whole assemblage of rodents and the species of cricetids, the biochronologic position and the age of the locality are discussed. The locality appears to be biochronologically very close to the fauna from the Chul'adyr Formation in Aktau Mountains, but we propose an age slightly older than the one proposed for this fauna, probably equivalent to the MN3 biozone in Europe.

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Keywords: Biochronology; Cricetidae; Early Miocene; Rodentia; Central Asia

Résumé

Parmi les 14 espèces de mammifères provenant d'une localité miocène inférieure de la région nord du bassin du Junggar (Nord du Xinjiang, Chine), quatre espèces de cricetidés ont été trouvées : deux espèces indéterminées des genres *Cricetodon* et *Eumyarion*, et deux nouvelles espèces, *Karydomys debruijni* nov. sp. et *Megacricetodon beijiangensis* nov. sp. Certains aspects de la morphologie de *Cricetodon* sp. sont communs avec les formes de *Eucricetodon* de l'Oligocène supérieur, suggérant que les spécimens décrits pourraient constituer une forme intermédiaire entre *Eucricetodon* et *Cricetodon*. Une seule dent de *Eumyarion* sp. a été trouvée, rendant sa détermination incertaine ; toutefois sa morphologie se différencie clairement de celle de *Cricetodon* sp. L'espèce *K. debruijni* nov. sp. est établie en raison de ses caractéristiques primitives en comparaison des espèces connues en Europe et en Anatolie, et en raison d'une association spécifique de caractères qui la différencie de *Karydomys dzerzhinskii*. *M. beijiangensis* nov. sp. montre de nombreux caractères plésiomorphes en comparaison des espèces déjà connues dans le Miocène moyen de Chine. La position biochronologique et l'âge de la localité sont discutés sur la base de l'association de rongeurs et des espèces de cricetidés. La localité semble être biochronologiquement très proche de la faune provenant de la Formation Chul'adyr dans les montagnes Aktau, mais nous proposons un âge légèrement plus vieux que celui proposé pour cette faune, probablement contemporain de la biozone MN3 en Europe.

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Mots clés : Biochronologie ; Cricetidae ; Miocène inférieur ; Rodentia ; Asie Centrale

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1. Introduction

The geology of the Xinjiang province has been extensively studied over the last 50 years, because of its largely exposed continental Mesozoic and Cenozoic sediments. Since the 1980s many survey expeditions have been organized by the Institute of Vertebrate Paleontology and Paleoanthropology to investigate the Cenozoic deposits of northern Xinjiang and their fossil record, focusing especially on the northern part of the Junggar basin. From a geographical point of view, this area is indeed of considerable interest for understanding the dispersion and diversification of faunas during the Cenozoic due to its central position in Asia (Fig. 1(A)). The material studied here comes from one locality, XJ 200114, discovered in 2001 in the northern part of the Junggar basin (Fig. 1(B)), Fuhai County, Xingjiang Uygur Autonomous Region of China ($46^{\circ} 18' 21.48'' \text{N} - 88^{\circ} 0' 59.58'' \text{E}$). This new locality is located about 30 km south of the Ulungur River (Fig. 1(C)), where numerous other Cenozoic localities have been previously discovered (e.g., Wu, 1988; Ye, 1989; Ye et al., 1999; Bi, 1999, 2000; Meng et al., 1999, 2006; Wu et al., 2000, 2003). The sediments have been recognized as belonging to the Suosuoquan Formation, probably the middle or upper part of the formation. Because this locality is distant from the more complete Tiersihabahe section (Meng et al., 2006), there is no certainty about its precise correlation with the Suosuoquan Formation in the Tiersihabahe section. However, the fossils from the locality do provide us a biostratigraphic correlation with those biozones in the Tiersihabahe section.

Altogether about 3.5 tons of screenwashed matrix provided 14 species of mammals: Soricidae gen. and sp. indet. (Insectivora); Galericiini nov. gen. and sp. (Insectivora, Erinaceidae); unnamed species of *Sinologomys* Bohlin, 1937 (Lagomorpha, Ochotonidae); *Protalactaga shevyrevae* Zazhigin and Lopatin, 2000; new unnamed species of *Litodonomys* Loomis, 1914; *Heterosmintus mongoliensis* Zazhigin and Lopatin, 2000; new unnamed species of *Heterosminthus* Schaub, 1930 (Rodentia, Dipodidae); unnamed species of *Atlantoxerus* Forsyth Major, 1893 (Rodentia, Sciuridae); *Cricetodon* sp.; *Eumyarion* sp.; *Karydomys debruijni* nov. sp.; *Megacricetodon beijiangensis* nov. sp. (Rodentia, Cricetidae); *Aksharomys mallos* Shevyreva, 1994 (Rodentia, Ctenodactylidae); Mustelidae indet. (Carnivora, one damaged M2). The present study focuses on the specimens belonging to the family Cricetidae.

2. Material and methods

All specimens are deposited in the collections of the Institute of Vertebrate Paleontology and Paleoanthropology of Beijing, and all specimens are catalogued with the numbers: V16897.1–4 for *Cricetodon* sp.; V16898.1 for *Eumyarion* sp.; V16899.1–33 for *K. debruijni* nov. sp., and V16900.1–37 for *M. beijiangensis* nov. sp. Observation and measurement of the specimens were done with a binocular microscope Olympus SZX7 allowing precision to 0.01 mm; detailed measurements available on request. In the following, there are discrepancies in

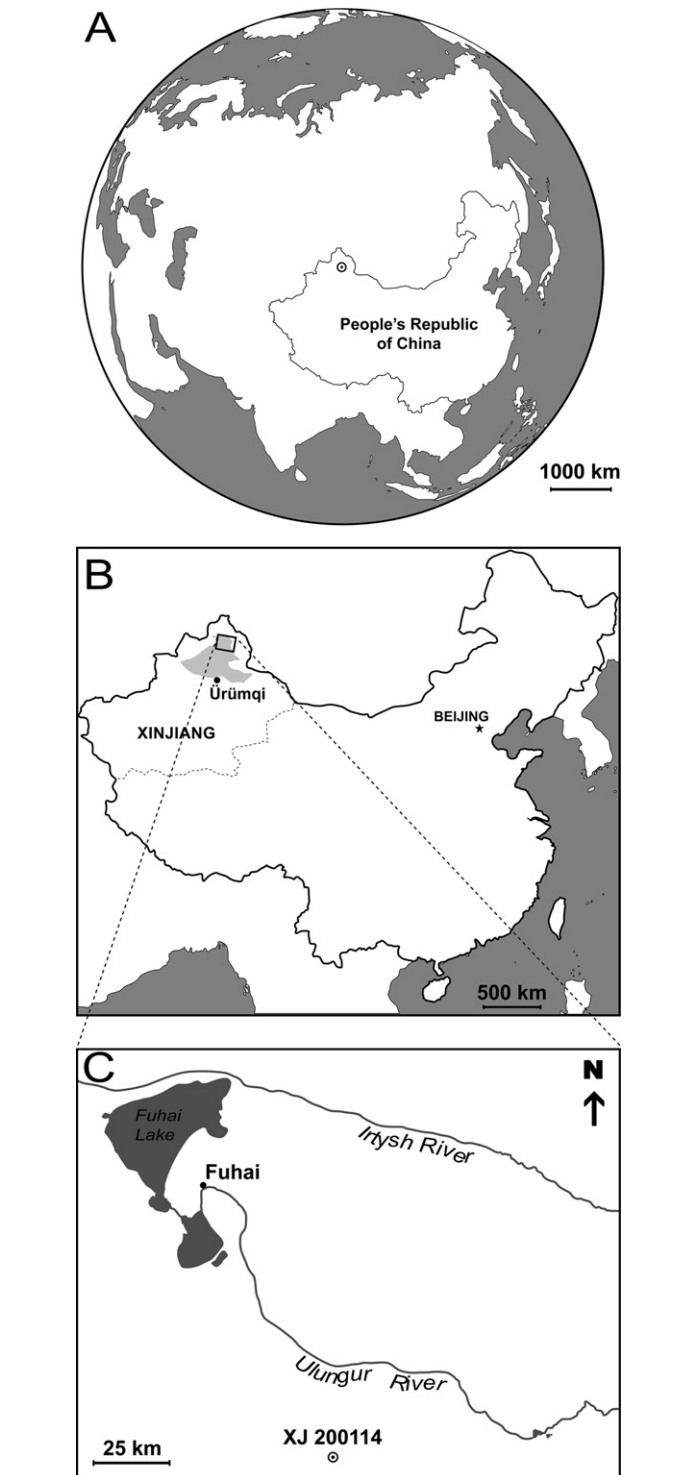


Fig. 1. Sketch map of the working area showing: A. Its central position in Asia at the continental scale. B. The location of the Fuhai County in the northern part of the Junggar Basin (in light grey). C. The location of the locality XJ 200114 south of the Ulungur River.

numbers of teeth for which features may be counted or measurements made. This difference is due to the fact that some teeth described cannot be measured or are partially broken, or some teeth that have been measured are too worn or badly preserved on their occlusal surface to be completely described.

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