New specimens of the multituberculate mammal Uzbekbaatar from the Late Cretaceous of Uzbekistan

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Uzbekbaatar Kielan−Jaworowska and Nessov, 1992 is among the rarest mammals and the only multituberculate in the diverse, eutherian dominated Bissekty (Turonian) and Aitym (?Coniacian) local faunas, Kyzylkum Desert, Uzbekistan. New material from the Bissekty local fauna, suggests that only one multituberculate species, Uzbekbaatar kizylkumensis Kielan−Jaworowska and Nessov, 1992 is present in the Bissekty fauna. A newly collected p4 is better preserved than the holotype and demonstrates presence of the posterolabial cusp in the p4 of Uzbekbaatar. New material of Uzbekbaatar is consistent with placement of this taxon within the basal cimolodontan “Paracimexomys group.”

Introduction

The multituberculate mammal Uzbekbaatar kizylkumensis Kielan−Jaworowska and Nessov, 1992 is one of the rarest mammals in the rich and diverse Bissekty local fauna from the Late Cretaceous (Turonian) of the central Kyzylkum Desert, Uzbekistan (Archibald and Averianov 2005). It is represented by only twelve of 1134 (1.06%) catalogued mammal specimens from this local fauna collected between 1977 and 2004. A similar, somewhat larger species Uzbekbaatar wardi Averianov, 1999 perhaps was more abundant in the slightly younger (Turonian–?Coniacian) and more poorly known Aitym local fauna at Dzharakuduk (Averianov 1999; Averianov and Archibald 2003; Archibald and Averianov 2005).

Uzbekbaatar documents a poorly sampled early–middle Late Cretaceous interval of multituberculate evolution (Kielan−Jaworowska and Nessov 1992; Kielan−Jaworowska et al. 2004). It is the only Turonian multituberculate known from Asia. Otherwise, Turonian multituberculates have been reported only from the Smoky Hollow Member of the Straight Cliffs Formation, southern Utah, USA (Eaton 1995). In this brief report we describe some previously unpublished specimens of U. kizylkumensis from the Bissekty local fauna collected by URBCAC expeditions between 1998 and 2004 that permit us to supplement the morphological characteristic of the species, and further clarify its phylogenetic position.

Institutional abbreviations.—CCMGE, Chernyshev’s Central Museum of Geological Exploration, Saint Petersburg, Russia; URBCAC, Uzbek / Russian / British / American / Canadian Paleontological expedition specimens currently held at San Diego State University, San Diego, USA; ZIN, Zoological Institute, Russian Academy of Sciences, Saint Petersburg, Russia.

Systematic paleontology

Multituberculata Cope, 1884
Cimolodonta McKenna, 1975
Cimolodonta incertae sedis “Paracimexomys group” (although not formal, used sensu, Eaton and Cifelli, 2001)
Uzbekbaatar Kielan−Jaworowska and Nessov, 1992
Uzbekbaatar kizylkumensis Kielan−Jaworowska and Nessov, 1992

Fig. 1.
1992 Uzbekbaatar kizylkumensis; Kielan−Jaworowska and Nessov 1992: 14, figs. 1, 3C.
1992 Multituberculata indet.: Kielan−Jaworowska and Nessov 1992: fig. 4D–F.
1993 Uzbekbaatar kizylkumensis; Nessov 1993: figs. 1, 2.
2000 Uzbekbaatar kizylkumensis [sic]; Averianov 2000: fig. 30.6A−D.
2004 Uzbekbaatar kizylkumensis; Kielan−Jaworowska et al. 2004: 332, fig. 8.42C.

Holotype: CCMGE 100/12455, right p4 (CBI−14, 1987).

Type locality and horizon: Dzharakuduk, Central Kyzylkum Desert, Uzbekistan; Bissekty Formation, middle−upper Turonian, Upper Cretaceous.

Material.—URBAC 98−11, left maxilla fragment with alveoli for P1−4 (CBI−14, CCMGE 102/12455, right(?) lower incisor (CBI−14, 1989); URBAC 04−105, left p4 (CBI−14); CCMGE 101/12455, right dentary fragment with alveoli for i, p3−4, m1−2 (CBI−14, 1991); URBAC 03−175, right dentary fragment with alveoli for i, p3−4, m1−2 (CBI−14, 1989); ZIN 89005, right dentary fragment with alveoli for i, p4, m1−2 (CBI−14, 1987); ZIN 89004, left dentary fragment with alveoli for i, p4, m1−2 (CBI−14, 1989); URBAC 04−46, left dentary fragment with alveoli for p4, m1−2 (CBI−17); CCMGE 103/12455, proximal part of right humerus (CBI−14, 1987); CCMGE 104/12455, proximal part of left femur (CBI−14, 1987); CCMGE 104a/12455, proximal part of right femur (CBI−14, 1989).

Description.—The maxilla fragment URBAC 98−11 (Fig. 1A) preserves alveoli for P1−4. There is no maxillary−premaxillary suture preserved. Judging from the alveoli, P1 was larger than P2.
Fig. 1. Uzbekbaatar kizylkumensis. Dzharakuduk, Kyzylkum Desert, Uzbekistan; Bissekty Formation, Upper Cretaceous (Turonian). A. URBAC 98−11, left maxilla fragment with alveoli for P1−4, in occlusal (A1, stereopair), lateral (A2), and medial (A3) views. B. URBAC 03−175, right dentary fragment with alveoli for lower incisor, p3−4, m1−2, in occlusal (B1), labial (B2), and lingual (B3) views. C. URBAC 04−105, left p4, in labial (C1), lingual (C2), and occlusal (C3) views.
trally from the eighth serration borders the posterolateral cusp and the crown of p4 completely overhangs p3 and thus is not equal to the length of its alveoli. The length of the root at the alveolar border in the holotype is 2.6 mm (2.5 mm in URBAC 04-105), while our measurements of the p4 alveoli is 2.5 mm for CCMGE 101/12455 and 2.5 mm for URBAC 03-175. In other dentary fragments, alveoli for p4 are not complete, but they have virtually the same size. Two only known multibullcute teeth from the Bissekty local fauna at Dzharakuduk, p4's CCMGE 100/12455 and URBAC 04-105, are almost identical in size and morphology. According to measurements of Kielan-Jaworowska and Nessov (1992), = 8–10; as “Multituberculata indet. sp. A”, see discussion). Additional dentary specimens from Dzharakuduk fully agree with this description. The maxillary fragment URBAC 98-11 cannot be directly compared with dentaries but likely also matches them in size (Fig. 1). A better preserved p4, URBAC 04-105, confirms for Uzbekbaatar kizylkumensis the lack of a triangular plate with crenulated margins for reception of p3 on the anterior surface (incomplete on the holotype), characteristic for plagioulacid multibullcute teeth. The new specimen confirms the presence of a posterooral cusp that was presumed absent in the damaged holotype. Presence of a posterooral cusp further supports the attribution of Uzbekbaatar to the basal cimolodontan “Paracimexomys group,” first proposed after study of isolated teeth of U. wardi from the Aitym local fauna at Dzharakuduk (Averianov and Archibald 2003). The posterooral cusp in Uzbekbaatar is almost identical in structure to that in a de-

Discussion

Kielan-Jaworowska and Nessov (1992) established Uzbekbaatar kizylkumensis based on the single specimen, isolated p4, while an edentulous dentary fragment, a lower incisor, and humeral and femoral fragments were referred to Multituberculata indet. Although it was found that all specimens “roughly fit each other in size” (Kielan-Jaworowska and Nessov 1992: 13), the dentary was not considered conspecific with the premolar because “the length of isolated p4 is 3.1 mm, while the estimated length of p4 in the edentulous dentary is 2.8 mm” (p. 13, or 2.7 mm on p. 10). In Uzbekbaatar, as in many other cimolodontans, however, the crown is overhanging the root anteriorly and posteriorly (perhaps the crown of p4 completely overhangs p3) and thus is not equal to the length of its alveoli. The length of the roots at the alveolar border in the holotype is 2.6 mm (2.5 mm in URBAC 04-105), while our measurements of the p4 alveoli is 2.5 mm for CCMGE 101/12455 and 2.5 mm for URBAC 03-175. In other dentary fragments, alveoli for p4 are not complete, but they have virtually the same size. Two only known multibullcute teeth from the Bis-

Measurements.—The p4 (CCMGE 100/12455, holotype, after Kielan-Jaworowska and Nessov 1992, and URBAC 04-105, respectively, in mm): crown length 3.1 [tooth is not complete anteriorly], 3.3; crown width across the middle of the anterior triangular lobe 1.2, 1.3; crown height along the middle of anterior triangular lobe 2.4, 2.4; crown height above the interradicular crest on labial side 1.5, 1.5; maximum crown height on lingual side 1.6, 1.6.
rived plagiaulacoid *Eobaatar magnus* Kielan-Jaworowska, Dashzevge, and Trofimov, 1987 from the Early Cretaceous of Mongolia (Kielan-Jaworowska et al. 1987: fig. 1A, B, pl. 1: 1a, 3a), or in some pitlodontids from the Late Cretaceous of North America (e.g., Clemens 1963: fig. 13; Archibald 1982: fig. 11a, c). *Uzbekbaatar* is similar to *Eobaatar* in having nine serrations on p4, but clearly differs in having a more arcuate, rather than having parallel anterior and posterior sides of the crown of p4, and in having only two lower premolars with a reduced, single-rooted p3. *Uzbekbaatar* differs from North American genera of the “Paracimexomys group” (Paracimexomys Archibald, 1982, Bryceomys Eaton, 1995; Cedaromys Eaton and Cifelli, 2001, and Dakotamys Eaton, 1995, see Eaton 1995; Eaton and Cifelli 2001; Kielan-Jaworowska et al. 2004) in having a lower, arcuate p4 crown, compared to most other North American genera that have an arcuate, but taller p4 crown.

Eaton and Cifelli (2001: 459, fig. 3A, B) noted a similarity “in overall outline” of an isolated p4 of an indeterminate plagiaulacoid from the mid-Cretaceous Cedar Mountain Formation in Utah, USA with the p4 in *Uzbekbaatar*. The tooth from Utah, however, is clearly a plagiaulacoid, parallel-sided p4, while in *Uzbekbaatar* the p4 crown is more arcuate with a crown overhanging the anterior and posterior roots, which is typical for Cimolodonta.

Averianov and Archibald (2003) suggested that *Uzbekbaatar* was probably derived from an American immigrant, because basal cimolodontan multituberculates of the “Paracimexomys group” are known only from the Cretaceous of North America. Inasmuch as taxa of “Paracimexomys group” were derived from the Asiatic Eobaataridae (Eaton and Cifelli 2001), persistence of this lineage in Asia until the Turonian cannot be excluded. Nevertheless, an immigration of *Uzbekbaatar* ancestor from North America seems more likely at the current state of our knowledge, because of extensive intercontinental exchange occurred at this time, involving, in particular, dispersal of spalacotheriid “symmetrodont” *Shalbaatar* Nesov, 1997 from North America to Asia and eutherian *Paranyctoides* Fox, 1979 and possible zhelestids from Asia to North America (Archibald and Averianov 2001; Averianov and Archibald 2003).

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References


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