



## A new species of multituberculate mammal *Uzbekbaatar* from the Late Cretaceous of Uzbekistan

ALEXANDER AVERIANOV

Multituberculates were dominant mammals in the Late Cretaceous communities of Central Asia (present-day Mongolia), but very rare in the Late Cretaceous faunal assemblages from western Asia (Uzbekistan), where ungulate-like mammals dominated (Nessov *et al.* 1998). So far only one Late Cretaceous multituberculate taxon *Uzbekbaatar kizylkumensis* Kielan-Jaworowska & Nessov, 1992 was known from Uzbekistan. Here I describe the second Late Cretaceous multituberculate from the same area, *Uzbekbaatar wardi* sp. n., based upon an isolated p4 from the ?Santonian Aitym Formation at Dzharakuduk, Central Kizylkum Desert, Uzbekistan. It differs from the Coniacian *Uzbekbaatar kizylkumensis* by somewhat derived morphology (larger size, greater number of p4 ridges and serrations).

During field-work of the 1998 joint Uzbekian–Russian–British–American–Canadian (URBAC-98) project to study Late Cretaceous vertebrates of the Kizylkum Desert, Uzbekistan, a new mammal locality was found in the Dzharakuduk area. It is confined to the marine Aitym Formation, laying above the famous fluvially dominated Bissekty Formation that has produced a diverse and important fauna of late Turonian–Coniacian vertebrates (Nessov 1997; Archibald *et al.* 1998). The Aitym fauna consists of varied, mainly marine vertebrates (e.g., diverse and abundant chondrichthyans and more rare osteichthyans, infrequent plesiosaurs, sea(?) turtles), and of some marine invertebrates, including oysters, belemnites, and ammonites (*Placenticerus kizylkumense*). The remains of terrestrial vertebrates are extremely rare in this site. There are few bones of salamanders and lizards, teeth of crocodiles, shell fragments of possibly terrestrial turtles, and two mammalian remains. The first is the edentulous left dentary fragment with the alveolus for m3, belonging presumably to a ‘zhelestid’ of somewhat bigger size than the largest Coniacian ‘zhelestid’ *Eoungulatum kudukensis* from the Bissekty Formation (see Nessov *et al.* 1998). The second is a multituberculate p4 in which the enamel is slightly eroded from the ventral crown, but still preserves diagnostic characters. The Aitym p4 bears distinctive features that permit me to consider this multituberculate a distinct species of *Uzbekbaatar*. The specimen described herein is housed in the Zoological Institute, Russian Academy of Sciences, Saint Petersburg (abbreviated ZIN).

### *Multituberculata incertae sedis*

#### *Uzbekbaatar* Kielan-Jaworowska & Nessov, 1992

#### *Uzbekbaatar wardi* sp. n.

Figs 1, 2.

**Etymology:** in honor of David Ward, who found the ‘shark locality’ (CBI-117) in Uzbekistan, in 1997.

**Holotype:** ZIN 83673, left p4, the only specimen known. Found 10 September 1998.

**Type horizon and locality:** Locality CBI-117 (‘shark locality’) of the Aitym Formation (?Santonian) of Dzharakuduk, Central Kizylkum Desert, Uzbekistan (N 42°07'24'', E 062°39' 29'').

**Diagnosis.** — Differs from *U. kizylkumensis* Kielan-Jaworowska & Nessov, 1992, the type and previously only known species of the genus, by somewhat larger size, eleven instead of nine serrations on p4, and nine ridges instead of eight on both sides of p4.

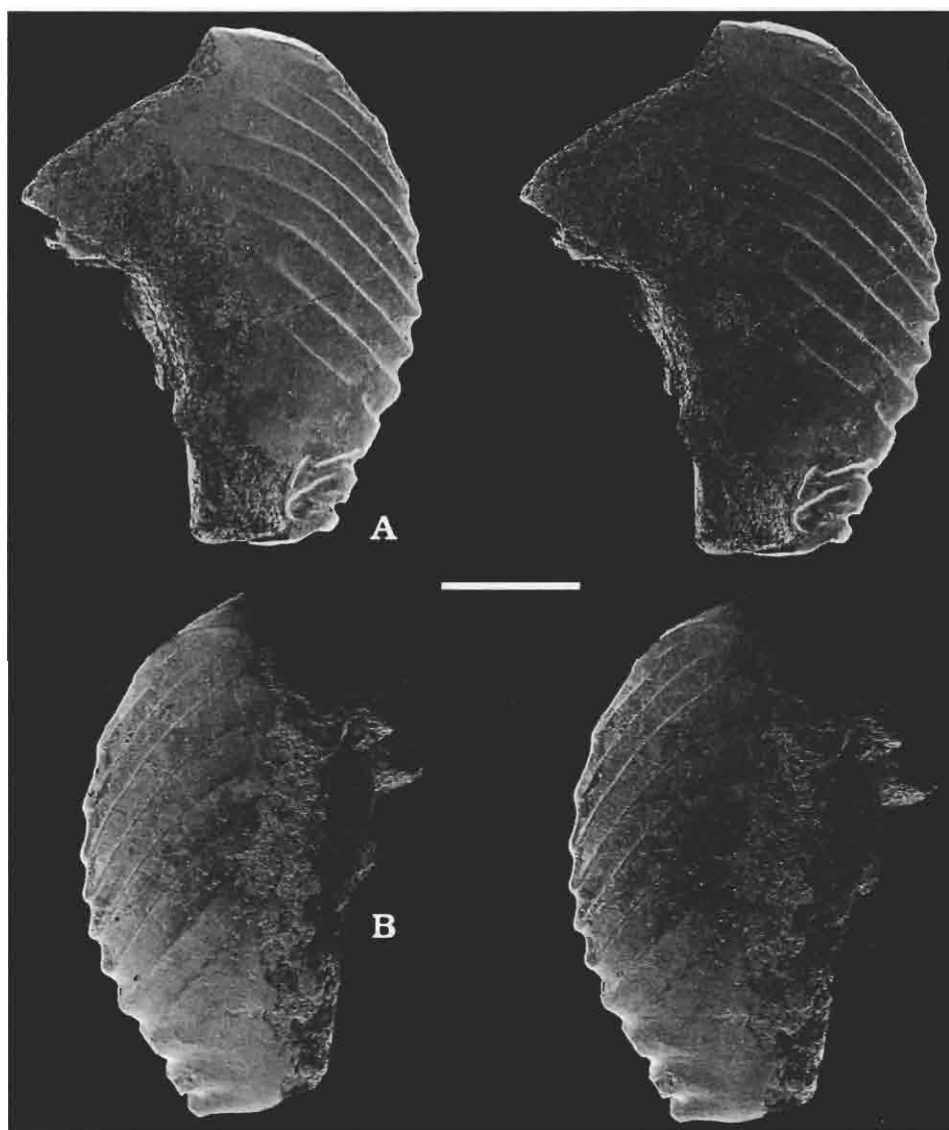


Fig. 1. *Uzbekbaatar wardi* sp. n. Holotype ZIN 83673, left p4. Locality CBI-117, Aitym Formation (?Santonian), Dzharakuduk, Kyzylkum Desert, Uzbekistan. A. Buccal view. B. Lingual view. All SEM stereo-micrographs. Scale bar is 1 mm.

**Description of the holotype (p4).** — The crown slightly overhangs the anterior and posterior roots. The enamel is eroded from the ventral border along the lingual and buccal sides. There are 11 serrations, first 9 of which bear ridges on both buccal and lingual sides. The distance between ridges increases gradually from first to last on lingual side. On the buccal side the first ridge is shortest, it is parallel to the anterior crown border. The remaining ridges are placed at an angle to the anterior crown border and parallel to each other. The 5th–7th ridges are longest, extending on to the exodaenodont lobe. The ridges are prominent on both the buccal and the lingual sides. The enamel on

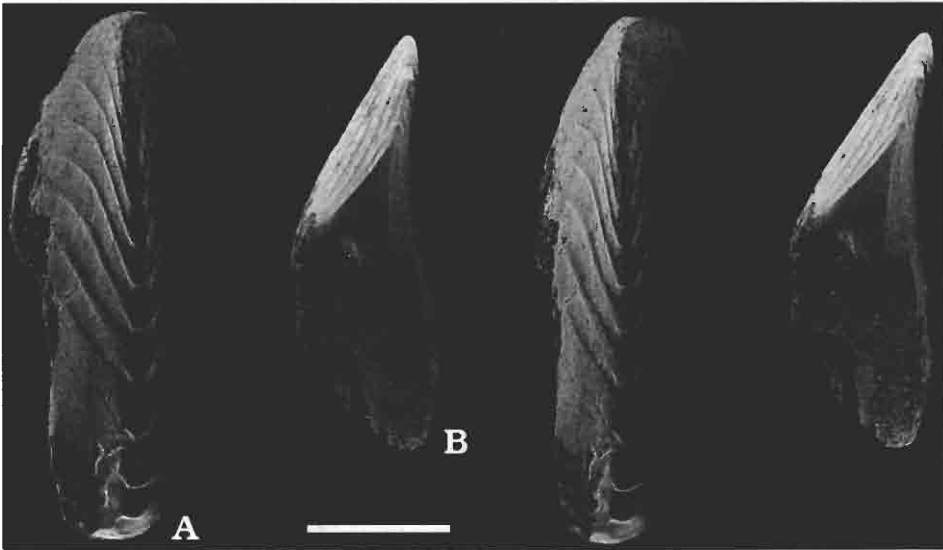


Fig. 2. *Uzbekbaatar wardi* sp. n. Holotype ZIN 83673, left p4. Locality CBI-117, Aitym Formation (?Santonian), Dzharakuduk, Kyzylkum Desert, Uzbekistan. A. Occlusal view. B. Anterior view. All SEM stereo-micrographs. Scale bar is 1 mm.

the postero-buccal crown corner is missing, but most probably the postero-buccal cusp was not present, as no dentine swelling is present. In occlusal view the crown is slightly asymmetrical because of the more lingual protrusion of the exodaenodont lobe. The enamel covering of the anterior tooth side seems to be relatively complete. There is a small triangular-shape concavity of the crown at its linguo-ventral border here, which most probably served for reception of the p3 crown (in the known p4 of *U. kizylkumensis* this crown area is missing). This triangular area has no crenulated margins as in Plagiaulacidae and Eobaataridae and is much smaller. The anterior surface of the root is somewhat eroded and bears no trace of a groove for reception of the p3 root, which may be a preservation artefact. The anterior root is about 1 mm long antero-posteriorly and the posterior root is about 1.2 mm long (measured on the buccal side). Between the roots there is a short, low, but distinct interradicular rest.

**Discussion.** — *U. wardi* is generally similar to *U. kizylkumensis* in having relatively low but arcuate crown, evident lacking of postero-buccal cusp, and presence of the interradicular crest. It differs in characters that may be considered as more derived in the former species: larger size and greater number of ridges and serrations. Both species may represent a single phyletic lineage (*U. kizylkumensis*–*U. wardi*), which is consistent with their close geographic occurrence and relative stratigraphic position. The localities are only a few kilometers from one another, and the more derived nature of *U. wardi* compared to the type species agrees with the younger age of the Aitym Formation compared to the underlying Bissekty Formation (upper Turonian–Coniacian). Although this is in line with the previous dating of Aitym Formation as Santonian (Nessov 1997; Archibald *et al.* 1998; Nessov *et al.* 1998), the endemic Uzbekian multituberculates offer no independent basis for age determinations.

In the Bissekty fauna, multituberculates compose about one percent of mammal remains (Kielan-Jaworowska & Nessov 1992). Although the Aitym mammal assemblage is very poorly known at present, the discovery of two mammals from the site with one being a multituberculate, suggests multituberculates might be more abundant here. The specimen described here is only the

third multituberculate tooth, known from the vast territory of the former Soviet Union (Kielan-Jaworowska & Nesson 1992; Averianov 1997).

**Measurements of the holotype (p4).** — The length of the crown is 3.54 mm. The crown height along the middle of the exodaenodont lobe is about 2.3 mm. The crown height above the interradicular crest is about 1.6 mm. The maximal width of the crown is about 1.3 mm.

**Acknowledgements.** — I am grateful to Prof. Zofia Kielan-Jaworowska for her hospitality during my stay in Warsaw in January 1999, to Dr. Cyprian Kulicki for taking SEM micrographs at the Institute of Paleobiology, Polish Academy of Sciences. I thank Prof. J. David Archibald, Drs. Jorn Hurum, and Guillermo Rougier for reading the manuscript and providing useful comments, all the participants of URBAC-98 for a wonderful 1998-field season, and the local Dzharakuduk Kazakh people for friendly assistance. The fieldwork of URBAC-98 was supported by the National Science Foundation (EAR-9804771) and by the National Geographic Society (6281-98).

### References

- Archibald, J.D., Sues, H.-D., Averianov, A.O., King, C., Ward, D.J., Tsaruk, O.I., Danilov, I.G., Rezvyi, A.S., Veretennikov, B.G., & Khodjaev, A. 1998. Précis of the paleontology, biostratigraphy, and sedimentology at Dzharakuduk (Turonian?–Santonian), Kyzylkum Desert, Uzbekistan. *In*: S.G. Lucas, J.J. Kirkland, & J.W. Estep (eds), Lower to Middle Cretaceous Terrestrial Ecosystems. — *Bulletin of the New Mexico Museum of Natural History & Science* **14**, 21–28.
- Averianov, A.O. 1997. New Late Cretaceous mammals of southern Kazakhstan. — *Acta Palaeontologica Polonica* **42**, 243–256.
- Kielan-Jaworowska, Z. & Nesson, L.A. 1992. Multituberculate mammals from the Cretaceous of Uzbekistan. — *Acta Palaeontologica Polonica* **37**, 1–17.
- Nesson, L.A. 1997. *Cretaceous Nonmarine Vertebrates of Northern Eurasia* [in Russian]. 218 pp. L.B. Golovneva & A.O. Averianov (eds). University of Sankt Petersburg, Institute of Earth Crust, Sankt Petersburg.
- Nesson, L.A., Archibald, J.D., & Kielan-Jaworowska, Z. 1998. Ungulate-like mammals from the Late Cretaceous of Uzbekistan and a phylogenetic analysis of Ungulatomorpha. *In*: C.K. Beard & M.R. Dawson (eds), Dawn of the Age of Mammals in Asia. — *Bulletin of Carnegie Museum of Natural History* **34**, 40–88.

Alexander Averianov [sasha@AA1923.spb.edu], Zoological Institute, Russian Academy of Sciences, Universitetskaya nab. 1, St. Petersburg 199034, Russia.