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A NEW OCCURRENCE OF LATE CRETACEOUS EUTHERIAN
MAMMAL *ZALAMBDALESTES*

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Nearly complete left lower jaw of *Zalambdalestes lechei* is described, from Toogreeg beds, locality of Toogreeg on the Gobi Desert. An occurrence of *Z. lechei*, (known so far only from the Djadokhta Fm.) in Toogreeg beds, gives support to an opinion that Toogreeg beds are a stratigraphic equivalent of the Djadokhta Fm., which is of ?late Santonian and/or ?early Campanian age.

Key words: Mesozoic mammals, *Zalambdalestes*, Late Cretaceous, Gobi Desert.

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The specialized Late Cretaceous eutherian mammal *Zalambdalestes*, represented by a single species *Z. lechei* was known so far only from the locality of Bayn Dzak (formerly Shabarkh Usu) in the Gobi Desert, Mongolia (Gregory and Simpson 1926, Simpson 1928, Kielan-Jaworowska 1969, 1975, Szalay and McKenna 1971). The age of the Djadokhta Formation, which crops out at Bayn Dzak and yields *Z. lechei* has been estimated as ?late Santonian and/or ?early Campanian (Gradziński *et al.* 1977).

Ca. 30 km WNW of Bayn Dzak is the locality of Toogreeg, (Toogreegeen Shireh). The yellowish-gray sandstone, known as the Toogreeg beds, which crops out at Toogreeg and yields the same dinosaur species (*Veliciraptor mongoliensis* and *Protoceratops andrewsi*) as the sandstone of the Djadokhta Formation has been tentatively regarded as a stratigraphic equivalent of the Djadokhta Fm. (Gradziński *et al.*, 1977). So far only one mammalian species, has been described from the Toogreeg beds: an eucosmodontid multituberculate *Tugrigbaatar saichanensis* (Kielan-Jaworowska and Dashzeveg 1978).

During the 1978 Soviet-Mongolian Palaeontological Expedition to the Gobi Desert, Mongolian technician Mr. Namsray, working under Dr. R. Barsbold, found a lower jaw of a eutherian mammal in Toogreeg: this is

housed in the Palaeontological Institute of the USSR Academy of Sciences in Moscow. This specimen has been identified by the present writers as *Zalambdalestes lechei*. As it is the most complete lower jaw of *Z. lechei* ever found, it was thought desirable to describe it in the present paper.

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Abbreviations used:

AMNH American Museum of Natural History, New York.

PIN Palaeontological Institute of the USSR Academy of Sciences, Moscow.

ZPAL Paleobiological Institute of the Polish Academy of Sciences, Warsaw.

Order **Proteutheria** Romer 1966

Family **Zalambdalestidae** Gregory and Simpson, 1926

Genus *Zalambdalestes* Gregory and Simpson, 1926

Zalambdalestes lechei Gregory and Simpson, 1926

(pls.1 and 2)

Material. — PIN 3143-501, nearly complete left lower jaw of an adult individual, with roots of I_1 , I_2 , broken off I_3 , C, roots of P_1 and P_2 , and P_3 — M_3 , from Toogreeg beds, Toogreeg, Gobi Desert, Mongolia.

Description. — The body somewhat tapers anteriorly, being deepest below P_4 — M_1 , where it measures (outer view) ca. 5.3 mm. The alveolar border is nearly straight and slightly convex upwards between C — M_1 . The lower margin is convex opposite the alveolar border and concave below the masseteric fossa. The coronoid process slopes upwards at an angle of ca. 49° in adult individuals and ca. 42° in young ones. The masseteric crest is wide and prominent at the base and becomes faint and very narrow above. The coronoid fossa is sharply limited by the masseteric crest. The masseteric fossa is divided into a deeper upper part, the lower boundary of which is formed by a ridge which extends from the condyle anteroventrally, and a much shallower lower part. The angular process is broken off but preserved part indicates that it has been inflected medially. The posterior margin forms two concavities separated by the condyle, the upper more incurved than the lower. There are two mental foramina, one situated below the anterior root of P_1 and a posterior larger one, situated below the middle of P_3 . The symphysis forms a large, roughly crescent-shaped area which reaches back as far as P_2 . The symphyseal surface is markedly rugose and is bounded from above in the middle part by a ridge. Behind the symphysis the surface of the mandibular ramus is slightly swollen below P_3 and anterior root of M_1 . On the lower part of the ascending ramus of the coronoid process there is a distinct, oval, rugose swelling, 1.8 mm long and 1.2 mm wide, possibly a remnant of the coronoid bone, fused with the dentary. Behind and below this swelling there is a ridge (medial flange of Kermack *et al.*, 1973), which extends posteriorly and reaches the condyle. The mandibular foramen is large, situated ca. 5.2 mm behind the last molar. Extending posteriorly from the mandibular foramen there is a very distinct tear-drop-shaped fossa, pointed backwards and upwards. The fossa is delimited from above by a medial flange. At the anterior part of the fossa there is a faint groove which extends posteriorly, parallel to the medial flange and disappears in the middle of the length of the fossa.

Dentition.—The dentition of *Z. lechei* (as well as of *Z. grangeri*, which is a junior synonym of *Z. lechei*) has been described by Gregory and Simpson (1926), Simpson (1928) and Kielan-Jaworowska (1969), on the basis of specimens from the Djadokhta Fm., housed in AMNH and ZPAL collections. As the dentition of PIN 3143-501 does not differ from those of the Djadokhta Fm., it does not merit description.

Comparisons.—PIN 3143-501 belongs to an adult individual and differs from the specimens from the Djadokhta Fm. in ZPAL collection in its greater dimensions. The depth of the body (outer view) below M_1 is 5.4 mm in PIN 3143-501 compared with 3.6 mm in ZPAL MgM-I/16 and 4.2 mm in ZPAL MgM-I/51. The length of the ramus (between the end of M_3 and the end of the condyle) is 14 mm in PIN 3143-501, and the depth ca. 15.1 mm, whereas in ZPAL MgM-I/51 they are respectively 10.2 mm and 10.8 mm (see pl. 2). In the oldest specimen in ZPAL collection, no. MgM-I/13, in which the dentition is very strongly worn, both lower jaws are damaged and comparable measurements cannot be given. The described specimen from Toogreeg falls within the range of variability of the dimensions of AMNH specimens nos. 21704, 21707, and 21708, which belong to old individuals. (It should be also explained that AMNH 21708, figured by Gregory and Simpson 1926, text-fig. 14, is enlarged 1.5 times and not 2 times as stated in the paper, and in fig. 13 it is enlarged slightly less than 2 times and not 2 times as stated).

In ZPAL MgM-I/14, which belongs to a very young individual, P_4 is provided with anterior and posterior basal cusps (see Kielan-Jaworowska 1969, pl. 28, figs. 1d-f and text-fig. 4), whereas in all other specimens in ZPAL collection and AMNH specimens and in PIN specimen, the anterior basal cusp is lacking. The conclusion is that in ZPAL MgM-I/14 the deciduous P_4 has been preserved.

The above description and comparison show that PIN 3143-501 is conspecific with the specimens of *Z. lechei* from the Djadokhta Fm. The occurrence of another common species in the Djadokhta Fm. and Toogreeg beds gives a further support for the opinion (Gradziński *et al.* 1977) that the Toogreeg beds are a stratigraphic equivalent of the Djadokhta Formation.

REFERENCES

- GRADZINSKI, R., KIELAN-JAWOROWSKA, Z. and MARYANSKA, T. 1977. Upper Cretaceous Djadokhta, Barun Goyot and Nemegt Formation of Mongolia, including remarks on previous subdivisions. — *Acta Geol. Polonica*, 27, 3, 281—318.
- GREGORY, W. K. and SIMPSON, G. G. 1926. Cretaceous mammal skulls from Mongolia. — *Amer. Mus. Novit.*, 225, 20 pp.
- KERMACK, K. A., MUSSET, F. and RIGNEY, H. W. 1973. The lower jaw of Morganucodon. — *J. Linn. Soc. Zool.* 53, 87—175.

- KIELAN-JAWOROWSKA, Z. 1969. Preliminary data on the Upper Cretaceous eutherian mammals from Bajn Dzak, Gobi Desert. In: Z. Kielan-Jaworowska (ed.), Results Pol.—Mong. Pal. Exped. I.—*Palaeont. Polonica*, **19**, 171—191.
- 1975. Preliminary description of two new eutherian genera from the Late Cretaceous of Mongolia. — In: *ibidem*, VI. — *Ibidem* **33**, 5—16.
- and DASHZEVEG, D. 1978. New late Cretaceous mammal locality in Mongolia and a description of a new multituberculata. — *Acta Palaeont. Polonica*, **23**, 2, 115—130.
- and TROFIMOV, B. A. 1980. Cranial morphology of Cretaceous eutherian mammal *Barunlestes*. — *Ibidem*, **25**, 2, 167—185.
- SIMPSON, G. G. 1928. Further notes on Mongolian Cretaceous mammals. — *Amer. Mus. Novit.*, **329**, 9 pp.
- SZALAY, F. S. and MCKENNA, M. C. 1971. Beginning of the age of mammals in Asia: the Late Paleocene Gashato Fauna, Mongolia. — *Bull. Amer. Mus. Nat. Hist.*, **144**, 4, 269—317.

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NOWE MIEJSCE WYSTĘPOWANIA PÓZNO-KREDOWEGO SSAKA
ŁOŻYSKOWEGO ZALAMBDALESTES

Streszczenie

Zalambdalestes lechei Gregory i Simpson, późno-kredowy ssak łozyskowy, należący do rodziny Zalambdalestidae, rzędu Proteutheria, znany był dotychczas tylko z formacji Dżadochta, odsłaniającej się w miejscowości Bajn Dzak, w południowo-gobijskim ajmaku, w Mongolskiej Republice Ludowej (pl. 2). Podczas prac Radziecko-Mongolskiej Ekspedycji Paleontologicznej w 1978 roku, gatunek ten został znaleziony również w miejscowości Tugrig (pl. 1), położonej 30 km WNW od Bajn Dzak w szaro-żółtych piaskowcach określanych jako warstwy z Tugrig (Gradziński *et al.* 1977). W warstwach z Tugrig ssaki są niezmiernie rzadkie — dotychczas znaleziono tylko dwa okazy, zaliczone do różnych gatunków; są to multituberkulat *Tugrigbaatar saichanensis* i opisany w niniejszej pracy *Zalambdalestes lechei*. Warstwy z Tugrig uważane są za równowiekowe z formacją Dżadochta, na podstawie występowania dwóch wspólnych gatunków dinozaurów (Gradziński *et al.* 1977). Występowanie *Z. lechei* zarówno w warstwach z Tugrig jak i w formacji Dżadochta potwierdza ten pogląd. Zgodnie z tym wiek warstw z Tugrig można określić również jako ?późny santon i/lub wczesny kampan. Znaleziony okaz stanowi własność Instytutu Paleontologicznego Akademii Nauk ZSRR w Moskwie (pl. 1).

Praca została wykonana w ramach umowy o współpracy między PAN i AN ZSRR, temat 30.1.

EXPLANATION OF THE PLATES 1 AND 2

Plate 1

Zalambdalestes lechei Gregory and Simpson, 1926
Toogreeg beds, Toogreeg, Gobi Desert

- 1a. Stereo-photograph of the left lower jaw, of an adult individual, with root of I_1 , broken off I_2 and I_3 , C and $P_3 - M_3$, in inner view, PIN 3143-501 (see also pl. 2).
- 1b. Stereo-photograph of the same in occlusal view.

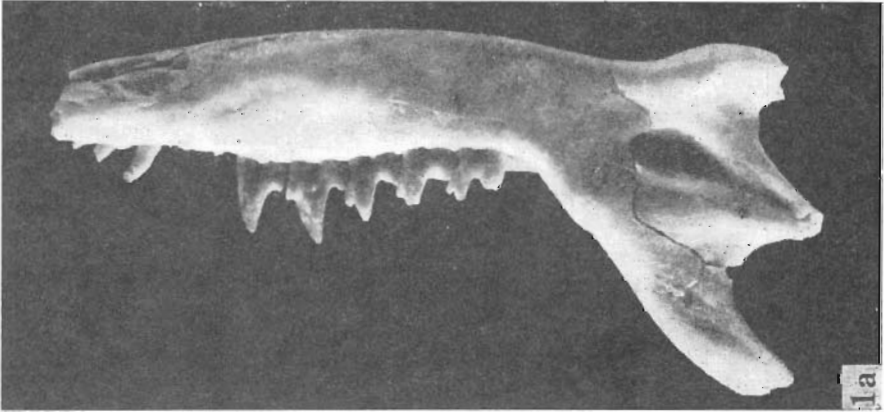
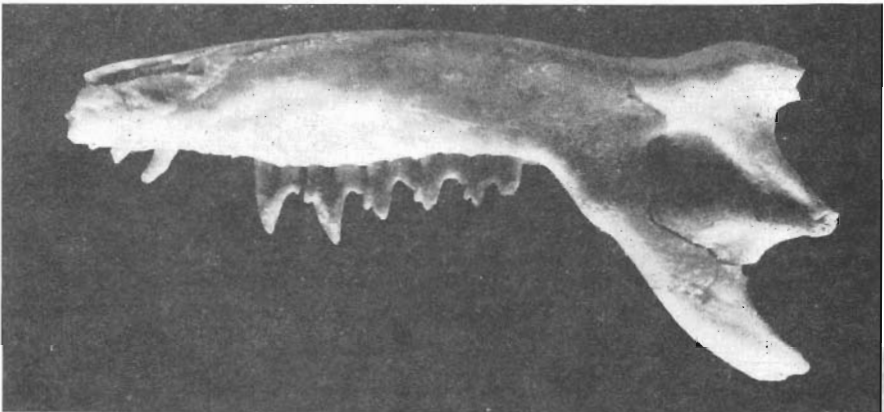
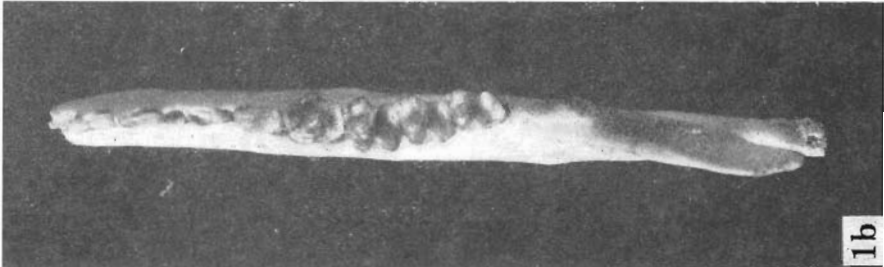
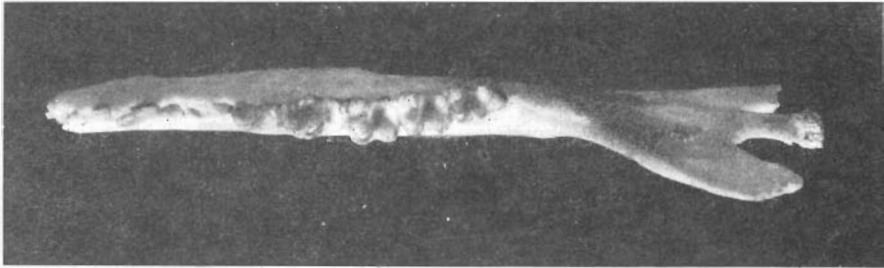
Both $\times 3$

Plate 2

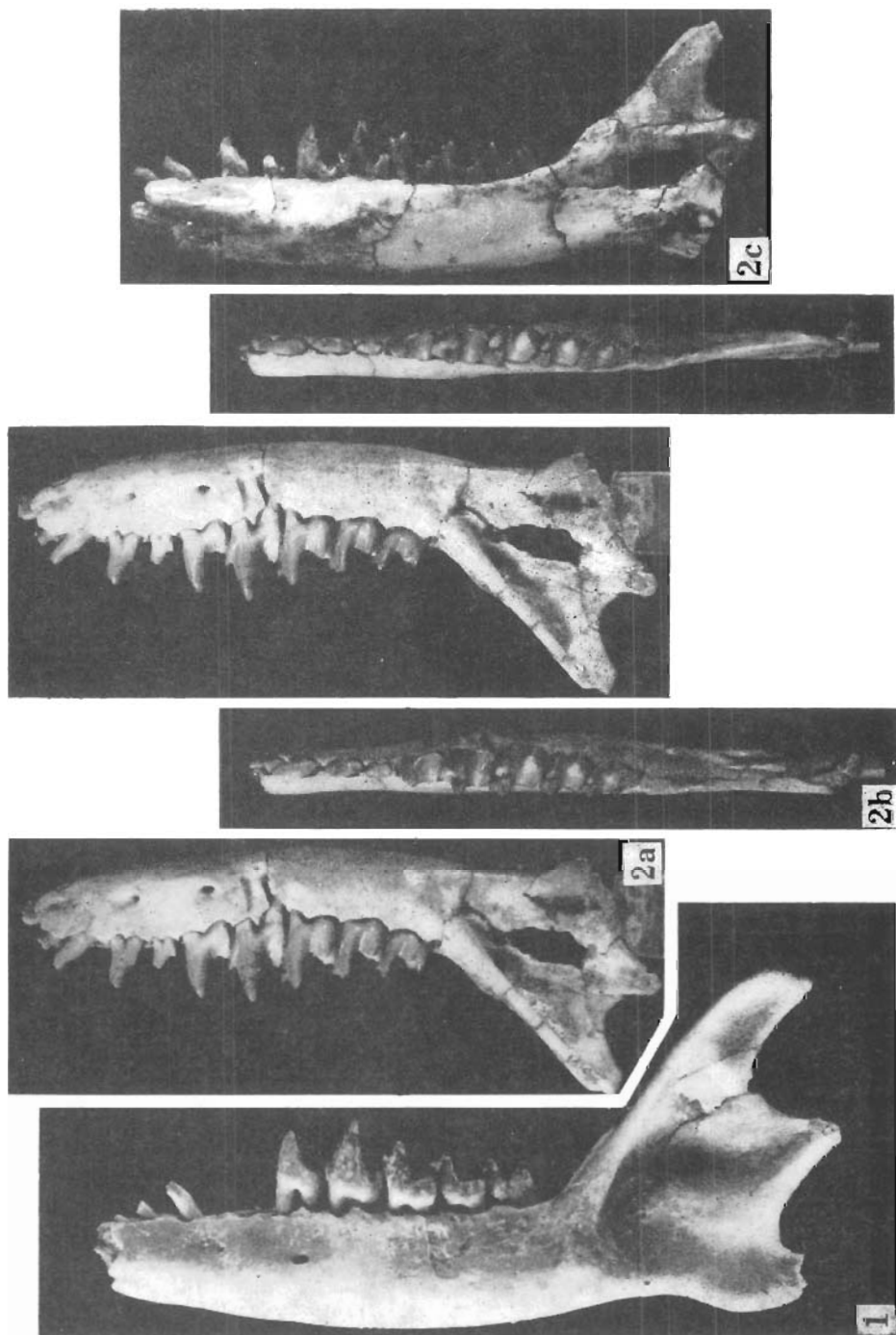
Zalambdalestes lechei Gregory and Simpson, 1926

1. Left lower jaw of an adult individual with root of I_1 , broken off I_2 and I_3 , C, $P_3 - M_3$, in outer view, Toogreeg beds, Toogreeg, Gobi Desert, PIN 3143-501 (see also pl. 1).
2. Stereo-photograph of the right lower jaw of a young individual, with roots of I_1 and I_3 (I_2 not erupted) and C— M_3 in (a) outer, (b) occlusal and in (c) inner views, Djadokhta Formation, Bayn Dzak, Gobi Desert, ZPAL MgM-1/51.

All $\times 3$



Phot. E. Wyrzykowska



Phot. E. Wyrzykowska
M. Czarnocka