

A NEW LINDHOLMEMYDID GENUS (TESTUDINES: LINDHOLMEMYDIDAE) FROM THE MID-CRETACEOUS OF UZBEKISTAN

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The monotypic *Khodzhakulemys* gen. nov. is erected to include *Mongolemys occidentalis* Nesson, 1984, from the Khodzhakul Formation (upper Albian – lower Cenomanian), Khodzhakulsai, Sheikhdzheili and Khodzhakul localities, Uzbekistan. New genus is distinguished from *Mongolemys* by stronger developed buttresses and presence of nuchal emargination. By degree of development of buttresses *Khodzhakulemys* occupies transitional position between *Mongolemys* and *Lindholmemyds*. Phylogenetic relationships of *Khodzhakulemys* could not be determined with certainty, due to scarce material on this genus. Presence of different genera of lindholmemydids in the late Cretaceous of Middle Asia (*Khodzhakulemys*, *Lindholmemyds*) and Mongolia (*Mongolemys*, *Gravemyds*, *Hongilemys*) emphasizes peculiarities of these late Cretaceous turtle faunas.

Key words: *Khodzhakulemys*, New genus, Lindholmemydids, Turtles, Cretaceous, Uzbekistan.

INTRODUCTION

Study of morphology and systematics of the lindholmemydid genus *Mongolemys* Khosatzky and Mlynarski, 1971 from the late Cretaceous of Mongolia requires status determination of some poorly studied species assigned to this genus. *Mongolemys occidentalis* Nesson, 1984 is one of them based upon fragmentary remains from the Khodzhakul Formation (Cenomanian – early Turonian) of Karakalpakia, Uzbekistan (Nesson and Krassovskaya, 1984). In the original description brief diagnosis and figures of remains of this species were given only but any description of material was absent. The age of Khodzhakul Formation was reassessed later (Nesson, 1997) as late Albian — early Cenomanian. In the latest review of Mesozoic turtles of Asia (Sukhanov, in press) this species was apparently missed by the author. According to L. A. Nesson (1997), *M. occidentalis* is found in the early Cenomanian turtle assemblage together with *Anatolemys oxensis* and cf. *Kirgizemyds* sp. (Macrobaenidae), *Kizylkumemyds shultzi* (Carettochelyidae), *Ferganemyds itemirensis* and *Adocus*(?) sp. (Adocidae), *Tienfucheloides undatus* (?Sinemydidae), *Basilemys* sp. (Nanhsiungchelyi-

dae), *Palaeotrionyx* sp., Trionychiinae indet. (Trionychidae), cf. *Oxemyds* sp. (Testudines indet.). Turtles of this age are poorly known in Asia (Sukhanov, in press.). However they are important for understanding of formation of later Cretaceous turtle assemblages in Middle Asia and also for correlation of the late Cretaceous faunas of Middle Asia with those of Mongolia and China (Inner Mongolia). Thus for instance the determination of the genus *Mongolemys* in the early Cenomanian assemblage of Karakalpakia could mean on the one hand that more advanced lindholmemydids *Lindholmemyds* Riabinin, 1935, known from the late Turonian – Santonian of Middle Asia (Nesson and Khosatzky, 1980), derived from *Mongolemys* and, on the other hand, that *Mongolemys* is the common turtle genus for the late Cretaceous of Mongolia and Middle Asia. V. M. Chkhikvadze described *Lindholmemyds martinsoni* Chkhikvadze, 1975 (Shuvalov and Chkhikvadze, 1975) from Sheeregeen Gashoon and Khuren Tsav localities of Mongolia and a carettochelyid *Anosteira shuvalovi* Chkhikvadze, 1979 (Shuvalov and Chkhikvadze, 1979) from Baishin Tsav locality of Mongolia (both from the upper part of Bainshereen Formation, upper Turonian – Santonian). The former species was recently assigned to the separate genus *Hongilemys* (Sukhanov, in press) and the latter was synonymized

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TABLE 1. Measurements (in mm) and Indices of the First Costal Plate in Some Lindholmemydids (see Fig. 1 for the scheme of measurements)

Specimen	LC	WC	WC/LC	LP	LP/LC	LB	LB/LC	LR	LR/LC	X	X/LC
<i>Mongolemys elegans</i>											
PIN 4691-4	26	18.5	0.71	7	0.27	8	0.31	11	0.42	10	0.38
PIN 4691-5	31	21	0.68	9.5	0.31	10	0.32	12	0.39	8	0.26
PIN 4691-6	35	23.5	0.67	11	0.31	13	0.37	15	0.43	11	0.31
PIN 4691-7	37	24.5	0.66	12	0.32	13.5	0.36	15	0.41	12	0.32
PIN 4691-8	44	34	0.77	13	0.30	15	0.34	15	0.34	13	0.30
<i>Lindholmemydids elegans</i>											
ZISP PH 1/7	19.5	15.5	0.79	–	–	12.5	0.64	5	0.26	5	0.26
ZISP PH 2/7	34	–	–	–	–	21	0.62	10	0.29	–	–
ZISP PH 3/7	45.5	32	0.70	12	0.26	–	–	12	0.26	12	0.26
ZISP PH 4/7	58	38	0.66	13	0.22	34	0.59	15	0.26	21.5	0.37
ZISP PH K32-1	71	–	–	18	0.25	45	0.63	18	0.25	–	–
<i>Khodzhakulemys occidentalis</i>											
CCMGE 19/12086	50*	31.5	0.63	8	0.16	23*	0.46	19	0.38	24	0.48

* Estimations.

with *Kyzylkumemys shultzi* Nessov, 1977 (Nessov and Krassovskaya, 1984).

Reinvestigation of the type material on *Mongolemys occidentalis* allows to conclude that this species is actually not belonging to *Mongolemys* and should be recognized as a separate genus, *Khodzhakulemys* gen. nov. Thus, *Kyzylkumemys* became the only common turtle for the late Cretaceous of Mongolia and Middle Asia.

Turtle remains determined as *Mongolemys* sp., were mentioned from several localities of Karakalpakia: Sheikhdzheili II, Chelpyk (both are upper part of Khodzhakul Formation, lower Cenomanian) and Khodzhakul (lower and middle part of Khodzhakul Formation, upper Albian) (Nessov, 1997, Plate 25, Figs. 7, 11, 12, 15, 16). Fragmentary nature of most remains does not permit precise determination. At least some of them could belong to the new genus described below.

Some remains determined as *Tienfucheloides undatus* (Nessov, 1997, Plate 26, Fig. 24) could also belong to *Khodzhakulemys* gen. nov. These forms could be mixed due to slightly similar sculpture of the plates but they have distinct morphology.

Institutional abbreviations. CCMGE) Chernyshev's Central Museum of Geological Exploration, St. Petersburg; PIN) Paleontological Institute, Moscow; ZISP PH) Zoological Institute, St. Petersburg, Paleoherpetological collection.

MATERIAL AND METHODS

CCMGE 12086, ZIN PH 6, *Mongolemys occidentalis*: Khodzhakulsai, Sheikhdzheili, Khodzhakul, Chelpyk localities, collected by L. A. Nessov in 1978–1982.

Comparative materials. ZISP PH 7, K32-1, separate plates of *Lindholmemydids elegans* from Dzharakuduk locality (Uzbekistan); CCMGE 12/3413, type material (first costal) of *Mongolemys planicostatus* (Riabinin, 1930) from Amur basin; PIN 4691, separate plates of *Mongolemys elegans* from Khainch-Ula locality (Mongolia).

To determine reliable characters for diagnosing lindholmemydid genera measurements of the first costal were taken and indices were calculated in *Khodzhakulemys occidentalis*, *Mongolemys elegans* and *Lindholmemydids elegans* (Table 1). Reference points for measurements are given in Fig. 1.

SYSTEMATIC PALEONTOLOGY

Order Testudines Linnaeus, 1758

Parvorder Eucryptodira Gaffney, 1975

Suborder Polycryptodira Gaffney and Meylan, 1988

Family Lindholmemydidae Chkhikvadze, 1970

Genus *Khodzhakulemys*, gen. nov.

Type species. *Mongolemys occidentalis* Nessov, 1984.

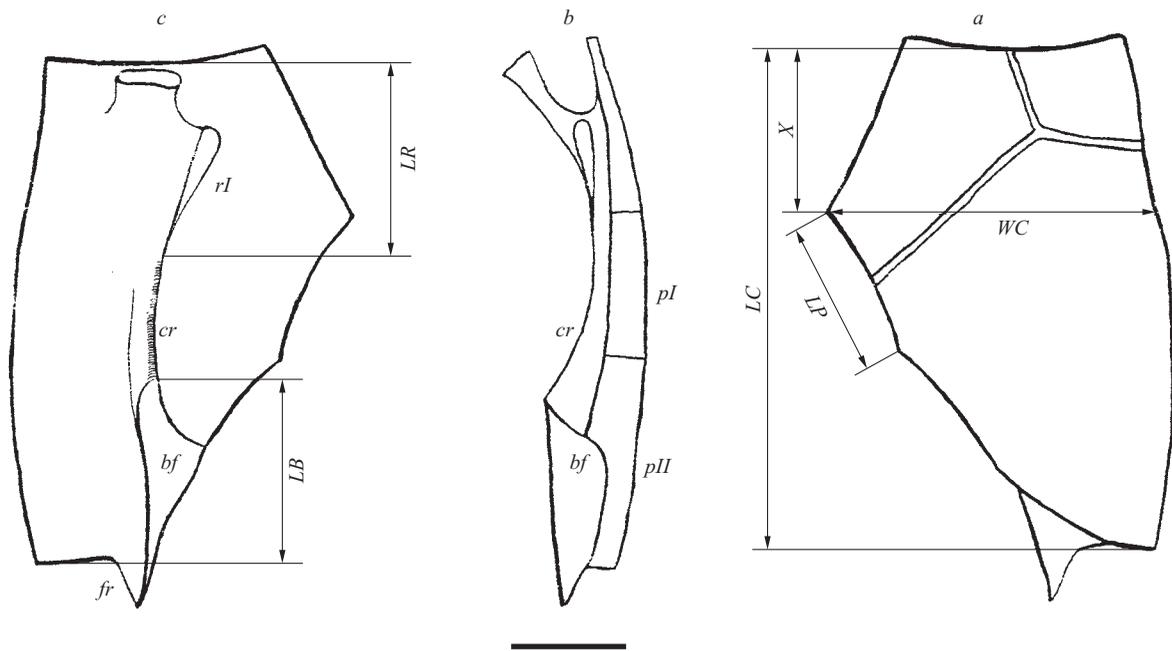


Fig. 1. Morphology of the first costal in *Mongolemys elegans* Khosatzky and Mlynarski, 1971 to show reference points for measurements in Table 1. **Abbreviations:** *bf*) Buttress fossa; *cr*) costal ridge; *fr*) free rib; *pI*, *pII*) surfaces for contact with the first and second peripherals; *rI*) scar of the first thoracic rib. **Measurements:** *LC*) Length of the first costal; *WC*) width of the first costal; *X*) distance from the middle of the neural edge of the first costal to the level of its maximum width; *LP*) length of contact with the first peripheral; *LB*) length of the axillary buttress scar; *LR*) distance from the neural edge of the first costal to the distal tip of the first thoracic rib or its scar. Based upon these measurements the following indices were calculated: WC/LC ; X/LC ; LP/LC ; LB/LC ; LR/LC . *a*) External view; *b*) anterior view; *c*) internal view. Scale bar is 1 cm.

Etymology. Named after the dried up lake Khodzhakul, Uzbekistan, nearby the type locality, and from Greek “emys” — a turtle.

Diagnosis. 1) Axillary buttress reaches about 1/2 length of the first costal; 2) first thoracic rib comparatively long (like in *Mongolemys*: distal end of the rib reaches about medial 40% length of the first costal); 3) maximal width of the first costal about the level of 1/2 length of the plate; 4) short contact between first costal and first peripheral; 5) small nuchal emargination (restricted to nuchal) present; 6) first central scute narrow; 7) unraised lateral edges of anterior peripherals; 8) surface of the shell plates with sculpture.

Comparison. New genus differs from *Lindholmemy* Riabinin, 1935 from the late Cretaceous of Middle Asia by less developed costal ridge of the first costal and by its less curvature, by less developed buttresses, by longer first thoracic rib, by different shape of the first costal, by shorter contact between first costal and first peripheral, by lower located pleuro-marginal sulcus on the posterior peripherals, by different cross-section of peripherals.

New genus differs from *Tsaotanemys* Bohlin, 1953 from the Cretaceous of Kansu, China by another shape of the first costal, by different cross-section of anterior peripherals, by narrower first central scute.

New genus differs from turtles of the genus *Mongolemys* Khosatzky and Mlynarski, 1971 from the late Cretaceous of Mongolia² by stronger buttresses (in *Mongolemys* (Fig. 1, Table 1) axillary buttress reaches about 1/3 length of the first costal), by different outlines of the first costal (maximal width of the first costal is in the medial third of its length in *Mongolemys*), by different cross-section of anterior peripherals (in *Mongolemys* their lateral edges are raised and section is thicker (Fig. 3)), by narrower first central scute, by medially narrowed first peripheral, by presence of nuchal emargination, by more

² According to our data, genus *Mongolemys* is represented at least by two species in the Late Cretaceous of Mongolia: *Mongolemys elegans* Khosatzky and Mlynarski, 1971 and *Mongolemys* sp. nov. Other species usually considered in this genus (Sukhanov, in press) probably represent different genera.

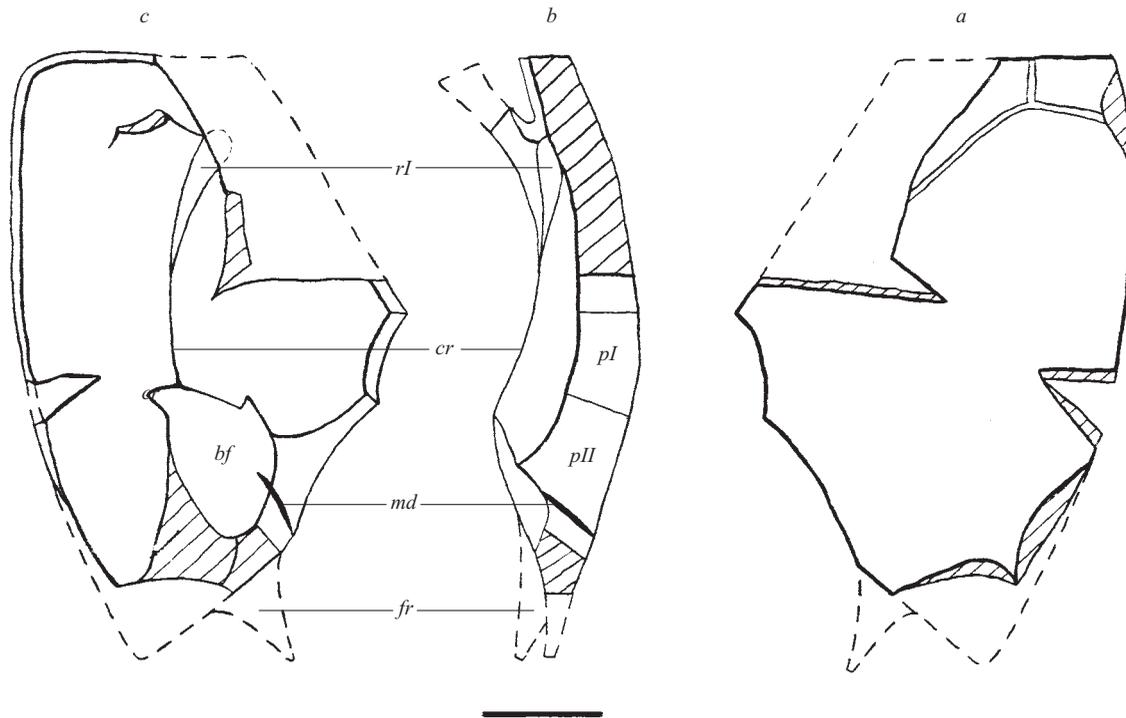


Fig. 2. Reconstruction of the first costal of *Khodzhakulemys occidentalis* (Nessov, 1984) based on CCMGE 19/12086. **Abbreviations:** *md*) Muscus duct; other abbreviations see in Fig. 1. *a*) External view; *b*) anterior view; *c*) internal view. Scale bar is 1 cm.

strongly pronounced costal ridge and by thicker plates.

New genus differs from *Elkemys* Chkhikvadze, 1976, based on *Mongolemys australis* Yeh, 1974 from the Paleocene of Guangdong Province, China, by presence of nuchal emargination. By opinion of V. B. Sukhanov (in press), this genus should be referred to Emydidae.

New genus differs from *Gravemys* Sukhanov and Narmandakh, 1984 from the late Cretaceous of Mongolia by longer first thoracic rib, by shape and size of the precentral scute, by different shape of the first costal, by lower located pleuro-marginal sulcus on the posterior peripherals, by smaller nuchal emargination, by first costal contacting three anterior peripherals instead of four anterior peripherals as in *Gravemys*. It is similar with *Gravemys* in the degree of buttress development.

New genus differs from *Hongilemys* Sukhanov, in press, from the late Cretaceous of Mongolia by longer first thoracic rib and by less developed buttresses. It is similar with *Hongilemys* in the presence of nuchal emargination.

New genus differs from "*Mongolemys*" *planicostatus* (Riabinin, 1930) from the late Cretaceous of Amur basin (China) by lower costal ridge, by less developed axillary buttress, and by longer first thoracic rib, by different sculpture of the plates. I agree with V. B. Sukhanov (Sukhanov, in press), that there are no reason for assignment of this species to *Mongolemys*. By morphology of the first costal "*Mongolemys*" *planicostatus* is closer to *Lindholmemyx*.

New genus differs from "*Mongolemys*" *tatarinovi* Sukhanov and Narmandakh, 1976 from the late Paleocene of Mongolia by presence of nuchal emargination, by narrower first central scute, by different shape of the first costal, by different cross-section of anterior peripherals (Sukhanov and Narmandakh, 1976, Plate 5, Fig. 3) but it similar in the degree of development of axillary buttress (45% length of the first costal in "*Mongolemys*" *tatarinovi*).

Comparison with "*Mongolemys*" *reshetovi* Sukhanov and Narmandakh, 1976 from the Paleocene of Mongolia is difficult due to fragmentary material on this species. It is known only that "arrangement of sulci on the first costal corresponds to those in other species of the genus *Mongolemys*" (Sukhanov and

Narmandakh, 1976), and therefore the first central suture must be wider than in *Khodzhakulemys*.

Comparison with “*Mongolemys*” *trufanensis* Yeh, 1974 from the Upper Cretaceous — Paleocene deposits of Xinjiang, China is also difficult due to inadequate description of this species. According to the diagnosis (Ye, 1994), “nuchal large, confined to first vertebral,” thus the latter (= first central) wider than in *Khodzhakulemys*.

Remarks. L. A. Nesson referred this species to the genus *Mongolemys* based on the presence of the “typical buttresses and not long first thoracic rib.” As a specific peculiarities of the species thickness of the plates and peculiar sculpture of the shell were mentioned. Plastral buttresses of *Khodzhakulemys occidentalis* is actually typical for lindholmemydids but by degree of development they are different from condition observed in *Mongolemys*. Shortened first thoracic rib (in comparison with primitive Polycryptodira — Xinjiangchelyidae) is again a character of all lindholmemydids and testudinoids. However if compare with advanced lindholmemydids — *Lindholmemyx*, this rib should be considered long in *Mongolemys* and *Khodzhakulemys* (see discussion). This is a primitive character for lindholmemydids, and thus could not be used for assignment of “*Mongolemys*” *occidentalis* to *Mongolemys*. Thickness of plates of the shell could be variable feature (for instance in *Lindholmemyx elegans*) and is not included in the diagnosis of *Khodzhakulemys*.

Included species. Type species only.

Locality and horizon. Khodzhakul Formation, ?upper Albian – lower Cenomanian; Khodzhakul, Khodzhakulsai, Sheikhdzheili II and Chelpyk localities, Karakalpakia, Uzbekistan.

Khodzhakulemys occidentalis (Nesson, 1984)

Mongolemys occidentalis: Nesson and Krassovskaya, 1984: pp. 24 – 25, Figs. 3.16 – 20; Nesson, 1987: Plate II, Figs. 2, 3; Nesson, 1997: Plate 25, Figs. 8 – 10, 13, 14.

?*Mongolemys* sp.: Nesson, 1997, Plate 25, Figs. 7, 11, 12, 15, 16.

?*Tienfucheloides undatus* (part.): Nesson, 1997, Plate 26, Fig. 24.

Holotype. CCMGE 19/12086, the first left costal; Karakalpakia, Khodzhakulsai locality, SKh-25 site, upper part of Khodzhakul Formation, lower Cenomanian.

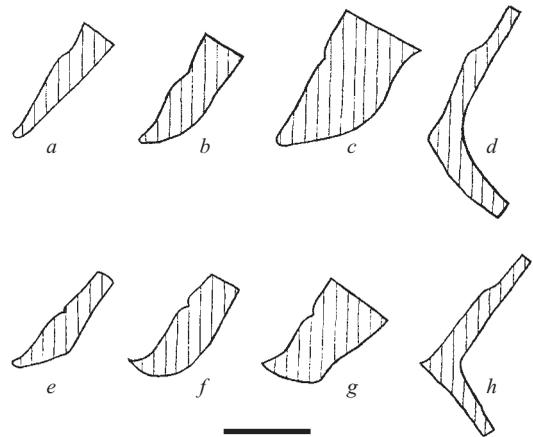


Fig. 3. Cross-sections of peripherals: *a – d*) *Khodzhakulemys occidentalis* (Nesson, 1984); *e – h*) *Mongolemys elegans* Khosatzky and Mlynarski, 1971; *a, e*) in contact of nuchal and first peripheral; *b, f*) in contact of the first and second peripherals; *c, g*) in contact of the second and third peripherals; *d, h*) in contact of the third and fourth peripherals. Scale bar is 1 cm.

Referred specimens. CCMGE 61/12086, medial fragment of the first costal; CCMGE 30/12086 — fragment of two sutured costals (fifth and sixth) of the left side; CCMGE 17/12086, the first right peripheral; CCMGE 16/12086, the second right peripheral; CCMGE 20/12086, the seventh peripheral with fragment of the fifth costal; CCMGE 70/12086, fragment of nuchal — all from SShD-8a site (Sheikhdzheili locality, upper part of Khodzhakul Formation, lower Cenomanian); ZISP PH 1/6 — the third left peripheral from SKh-25 site (Khodzhakulsai locality, upper part of Khodzhakul Formation, lower Cenomanian); CCMGE 15/12086, fragment of nuchal from SKh-20 site (Khodzhakul locality, lower and middle part of Khodzhakul Formation, ?upper Albian).

Description. CCMGE 19/12086 (Figs. 2; 4a–c): the left first costal plate with broken off anteromedial edge and lateral end. Estimated length of the plate is 50 mm. Anterolateral edge of the plate consists of three concave surfaces for contact with the first, second and third peripherals respectively. Contact with the first peripheral short, it composes 1/5 the estimated length of the anterolateral edge. Contacts with the second and third peripherals compose about 2/5 the estimated length of this edge each. Posterior edge of the plate slightly convex. Maximum width of the plate is about the level of 1/2 of its length. On the external surface of the plate sulci from the first and sec-

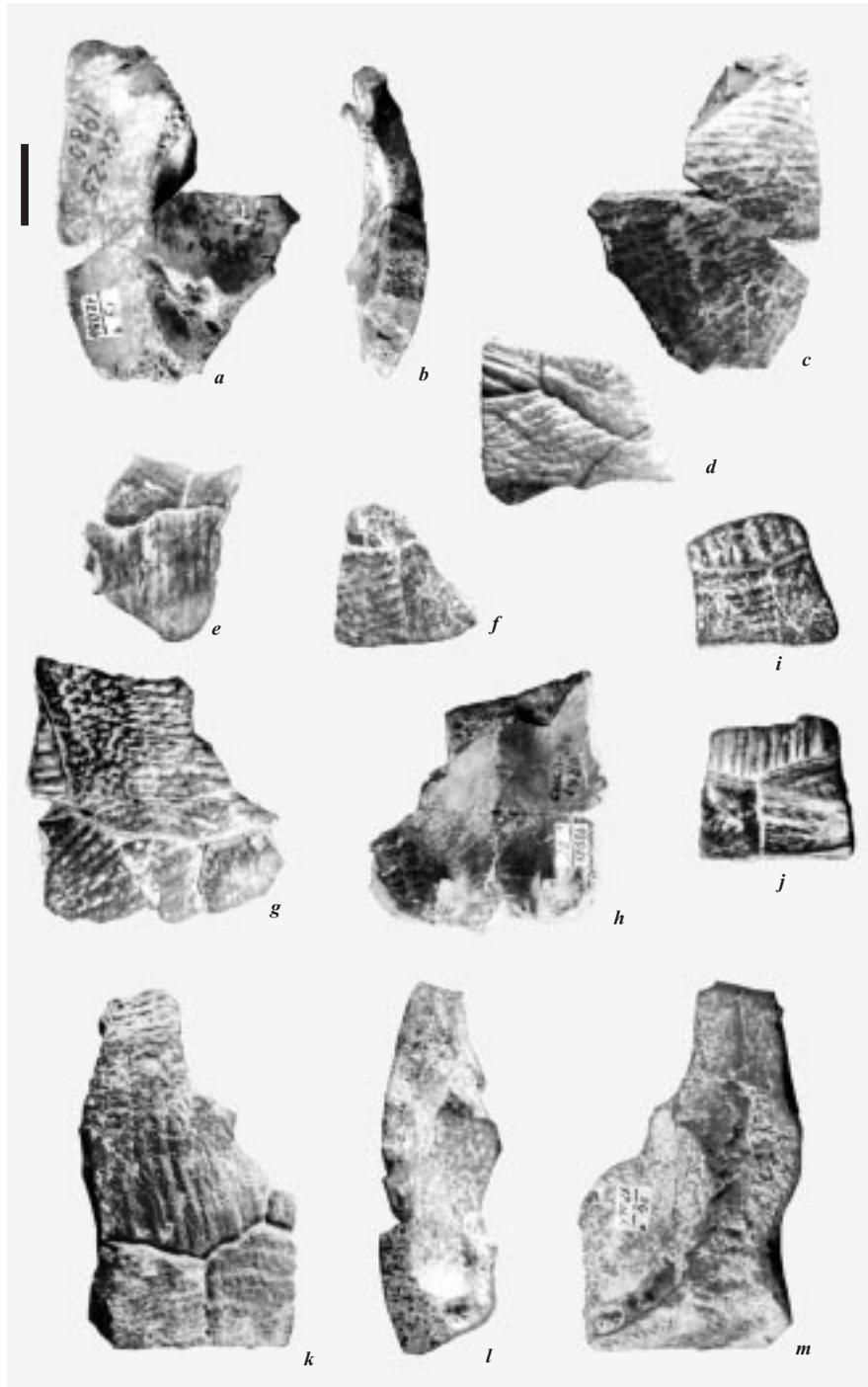


Fig. 4. Remains of *Khodzhakulemys occidentalis* (Nessov, 1984): *a – c*) the left first costal CCMGE 19/12086: *a*) in internal, *b*) in anterior, *c*) in external view; *d*) medial fragment of the right first costal CCMGE 61/12086 in internal view; *e*) fragment of nuchal CCMGE 70/12086 in external view; *f*) the first right peripheral CCMGE 17/12086 in external view; *g, h*) fragment of two sutured costals CCMGE 30/12086: *g*) in external, *h*) in internal view; *i*) the second right peripheral CCMGE 16/12086 in external view; *j*) the third left peripheral ZISP PH 1/6 in external view; *k – m*) the seventh peripheral with fragment of the fifth costal CCMGE 20/12086: *k*) in external, *l*) in anterior, *m*) in internal view). Scale bar is 1 cm.

ond central scutes are visible. Sculpture of the plate is represented with distinct ridges directed from the posterior edge of the plate anteriorly and laterally. There is a distinct buttress fossa on the internal surface of the plate, posteromedially from the contact with the second peripheral. This fossa is of triangle shape with its longer side parallel to the posterior edge of the first costal and with another side participating in the anterolateral edge of the plate. There is a tuberosity in the bottom of the fossa, which proves sutural contact with axillary buttress. The latter reaches about 45% of the first costal length. Costal ridge is well developed, high, directed towards medial point of the buttress fossa and slightly curved posteriorly (like in *Mongolemys*). Scar from the first thoracic rib lying along the anterior border of the costal ridge and its distal end reaches about medial 40% of the length of the first costal. Thickness of the first costal decreased sharply anteriorly to the costal ridge and more gradually behind it (thickness of the plate in the medial part of the costal ridge is 9 mm, anteriorly to the first thoracic rib is 6 mm). Costal ridge becomes higher laterally (thickness of the plate in the lateral part of the costal ridge is 10.7 mm). Maximal thickness of the plate along its anterolateral margin (9.3 mm) is on the anterior border of the buttress fossa. Thickness of the plate along its posterior border is 5.2 mm.

CCMGE 61/12086 (Fig. 4d): medial fragment of the right first costal, on which slightly concave medial edge of the plate is visible for the contact with the first neural. Arrangement of sulci on the plate proves narrowness of the first central scute.

CCMGE 30/12086 (Fig. 4g, h): medial fragments of two sutured costals (fifth and sixth). Medial widths of the costals are 17 and 14 mm, respectively. According to the shape of the neural border of the costals, neurals were short sided anteriorly. The sixth neural seems to be shorter than the fifth one. Costal ridges of the costals are pronounced only in their medial parts. Costal plates convex internally in the rest of the plate. Thickness of the costals along the costal ridge and in intercostal suture is 7 and 5 mm, respectively. The described fragment is covered by parts of the third and fourth pleural and third and fourth vertebral scutes. Interpleural sulcus lies close to the posterior border of the sixth costal. On the external surface of the plates sculpture is represented with granulations in the posterior part of the third pleural and with ridges in its anterior part. The granulations restricted to the part of the sixth costal anterior to the inter-

pleural sulcus. Direction of the ridges is parallel to the long axis of the shell. Ridges within the fourth vertebral posteromedially directed from anterior and anterolateral borders of the scute.

CCMGE 15/12086 (Fig. 4e): fragment of nuchal. Anterior edge of the nuchal concave, that proves presence of nuchal emargination. There are anterolateral, posterolateral and less distinct lateral margins of the nuchal. On the external surface of the plate, along its lateral edge a short fragment of centro-pleural sulcus is visible. Precentral scute is narrow slightly broadened posteriorly. In smaller fragment CCMGE 70/12086 precentral is wider and narrowed posteriorly. Sculpture represented with radiating ridges confined to the area of the first central scute.

CCMGE 17/12086 (Figs. 3a, b, 4f): the right first peripheral. The plate with lateral edge slightly rounded anteriorly, strongly shortened medially on the contact with the first costal (ratio medial length/lateral length is 0.37). Pleuro-marginal sulcus lies in the upper (medial) third of the plate. Interpleural sulcus does not cross the first peripheral. Cross-section of the contact with nuchal is wedge-like with a base of 5.5 mm, cross-section of the contact with the second peripheral is more thick, sides of the wedge become more convex, the base is 6.3 mm.

CCMGE 16/12086 (Figs. 3b, c, 4i): the right second peripheral. The plate is more thickened posteriorly (thickness in contact with the first costal is 10 mm), internal surface of the plate is more convex. Unlike *Mongolemys* lateral edge of the second peripheral is unraised. On the internal surface of the plate, near its posteromedial corner there is a slanting surface for contact with axillary buttress. Maximal thickness of the first and second peripherals is in the suture with the first costal.

ZISP PH 1/6 (Figs. 3c, d, 4j): the left third peripheral. The plate is higher and shorter than in *Mongolemys*, its height along anterior border is almost equal with medial width. Lateral edge of the plate is unraised. In the internal view hyoplastral border of the plate crosses its in diagonal direction from the posteroventral corner to the anterodorsal one, whereas in *Mongolemys* raising of the hyoplastral border begins in the anterior half of the plate. This may mean more steep and strong raising up of the bridge parts of hyoplastra in this form.

CCMGE 20/12086 (Fig. 4k – m): the right seventh peripheral with fragment of the fifth costal. This

specimen belongs to larger individual with strongly developed sculpture of the shell. The seventh peripheral is high, with pleuro-marginal sulcus on the middle of the plate, that is lower than on the same plates in *Mongolemys* and *Lindholmemyis*. Interpleural sulcus crosses the seventh peripheral anteriorly. In the anterior view the lateral edge of the plate is rounded, not wedge-shaped as in *Mongolemys*. In the internal view hypoplastral border of the plate raising up steeper than in *Mongolemys*. The inguinal buttress stretches along the posterior border of the fifth costal.

DISCUSSION

Two synapomorphies shared by lindholmemydids and testudinoids (emydids, batagurids, and testudinids) are connected with the structure of the first costal. These are well developed axillary and inguinal buttresses contacting costal bones and therefore presence of buttress fossae on the corresponding costals and shortened first thoracic rib (in comparison with primitive Polycryptodira — xinijangchelyids and macrobaenids [Brinkman and Peng, 1993]). These characters probably reflect main trends in the evolution of lindholmemydids and could be used for diagnosing genera. By degree of development of plastral buttresses three character states could be distinguished in the Lindholmemydidae (Sukhanov and Narmandakh, 1984). The first, demonstrated by *Mongolemys*, when buttresses weakly developed (axillary buttress reaching about 1/3 length of the first costal), probably is most close to the primitive condition, represented by xinijangchelyids and macrobaenids when plastral buttresses contact peripherals (second and eight). The second character state demonstrated by *Gravemyis*, *Khodzhakulemys*, and “*Mongolemys*” *tatarinovi*, which have moderately developed buttresses (axillary buttress reaching about 1/2 length of the first costal). The third character state demonstrated by *Lindholmemyis* and *Hongilemys*, which have strongly developed buttresses (axillary buttress reaching about 2/3 length of the first costal). Thus by the degree of development of the axillary buttresses *Khodzhakulemys* occupies transitional position between *Mongolemys* and *Lindholmemyis*. Lindholmemydids show two conditions of the first thoracic rib: it could be shortened, in comparison with primitive Polycryptodira, which have long first thoracic rib (*Mongolemys* and *Khodzhakulemys*), or strongly shortened (*Lindholmemyis*, *Hongilemys*, and probably *Gravemyis*). In the first case distal tip of the

first thoracic rib (or its scar) reaches about medial 40% of the length of the first costal. In the second case distal tip of the first thoracic rib reaches about medial 25% of the length of the first costal.

The determination of *Mongolemys* in the early Cenomanian assemblage of Karakalpakia (Nessov and Krassovskaya, 1984) could mean that *Mongolemys* was ancient and probably primitive genus of the Lindholmemydidae and thus could be an ancestor for more advanced lindholmemydids *Lindholmemyis*, known from the late Turonian – Santonian of Middle Asia (Nessov and Khosatzky, 1980). Instead, results of this study show that there are no *Mongolemys* in the Cenomanian of Middle Asia. The ancient nature of *Mongolemys* was indirectly proved by *Mongolemys* sp., described from Sheeregeen Gashoon locality (upper part of Bainshireen Formation, late Turonian – Santonian) of Mongolia (Mlynarski and Narmandakh, 1972). Reinvestigation of this specimen (Danilov, in preparation) showed that it is actually not belonging to *Mongolemys*. Turtles from the upper part of lower Cretaceous of Mongolia provisionally recognized as *Mongolemys* sp. (Sukhanov and Narmandakh, 1974) are still undescribed. Therefore there are no reasons to consider *Mongolemys* as an ancient genus of the Lindholmemydidae. According to our data, distribution of *Mongolemys* is restricted to Maastrichtian of Mongolia.

Being primitive in structure of the first costal (weakly developed buttresses, shortened first thoracic rib) and some other characters (wide first central scute, raised lateral edges of peripherals) *Mongolemys* is advanced in the absence of the nuchal emargination which is variably developed in other genera of lindholmemydids and in primitive Asiatic Mesozoic turtles — macrobaenids and xinijangchelyids (Sukhanov, in press). By this reason *Mongolemys* could not be considered as ancestral form for *Lindholmemyis*, which has nuchal emargination, strongly developed buttresses and strongly shortened first thoracic rib. By possession of moderately developed buttresses, shortened first thoracic rib, narrow first central scute, unraised lateral edges of peripherals and nuchal emargination *Khodzhakulemys* is much more suitable to be precursor of *Lindholmemyis*-like turtles. Although phylogenetic relationships of *Khodzhakulemys* could not be determined with certainty, due to scarce material on this genus, it is possible to suppose level of its morphological transformation, which is, by our opinion, transitional between *Mongolemys* and *Lindholmemyis*. Perhaps close to *Khod-*

zhakulemys level of morphological transformation is demonstrated by *Gravemys* and “*Mongolemys*” *tatarinovi* both of which have moderately developed buttresses. But two latter turtles have four pairs of inframarginals and probably represent different line of evolution of lindholmemydids than *Mongolemys* and *Lindholmemyds* do, having only three pairs of inframarginals. Previously reported information (Khosatzky and Mlynarski, 1971; Sukhanov, in press) about the presence of three to four pairs of inframarginals in *Mongolemys elegans* was based on erroneous data. Unfortunately, number of inframarginals in *Khodzhakulemys* is unknown.

The absence of the representatives of *Mongolemys* in the Middle Asia (this paper) and *Lindholmemyds* in Mongolia (Sukhanov, in press) emphasizes peculiarities of the late Cretaceous turtle assemblages of Middle Asia and Mongolia (Nessov, 1987). However, presence of different genera of lindholmemydids in the late Cretaceous of Middle Asia (*Khodzhakulemys*, *Lindholmemyds*) and Mongolia (*Mongolemys*, *Gravemys*, *Hongilemys*) may be at least partially explained by age difference of faunas. Actually, *Khodzhakulemys* known from the ?late Albian – early Cenomanian, *Lindholmemyds* — late Turonian – Santonian, *Mongolemys* and *Gravemys* — Maastrichtian, and *Hongilemys* — late Turonian – Campanian. It is interesting that contemporaneous genera in Middle Asia and Mongolia morphologically are most similar (*Lindholmemyds* and *Hongilemys*).

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