ISSN 0031-0301, Paleontological Journal, 2016, Vol. 50, No. 5, pp. 504–513. © Pleiades Publishing, Ltd., 2016.
Original Russian Text © V.R. Alifanov, 2016, published in Paleontologicheskii Zhurnal, 2016, No. 5, pp. 73–82.

Lizards of the Family Hodzhakuliidae (Scincomorpha) from the Lower Cretaceous of Mongolia

V. R. Alifanov

Borissiak Paleontological Institute, Russian Academy of Sciences, Profsoyuznaya ul. 123, Moscow, 117997 Russia
e-mail: valifan@paleo.ru

Received August 18, 2015

Abstract—The lizard family Hodzhakuliidae (Scincomorpha) endemic to the Early Cretaceous of Central Asia is characterized in the light of finds from the Khoobur (Höövör) locality in Mongolia. Available material includes *Hodzhakulia magna* Nessov, 1985 described from the Upper Albian of Uzbekistan and three new genera and species. It is proposed that Hodzhakuliidae occupied the adaptive zone of small carnivorous predators before the appearance of Platynota.

Keywords: Scincomorpha, Hodzhakuliidae, lizards, Late Aptian–Early Albian, Early Cretacous, Mongolia
DOI: 10.1134/S0031030116050038

INTRODUCTION

The Hodzhakuliidae (Scincomorpha) are an Early Cretaceous lizard family endemic to Central Asia. Previously, I considered two species in its composition (Alifanov, 2000, 2012). One of them is *Hodzhakulia magna*. It was described by Nessov (1985) based on fragmentary jaw bones from the Upper Albian beds (lower part of the Khodzhakul Formation) of the Kyzyl Kum Desert (Uzbekistan) in the section "Lacertilia incertae sedis," with the remark that it resembles *Litakis* (Mongolochamopidae, Macrocephalosauria; identified by the author) from the Late Cretaceous and *Exostinus* (Xenosauridae, Anguimorpha) from Cretaceous—Paleogene of North America. Subsequently, Gao and Nessov (1998) assigned *H. magna* to Amphisbaenia without convincing morphological arguments. Another species, *Pachygenys thlastesa* (Figs. 1a, 1b), was described (Gao and Cheng, 1999) and assigned to Lacertoidea based on a lower jaw ramus from the Aptian—Albian Dushan Formation (Lucas, 2006) in China (Shandong). It was not indicated that the latter is similar to *H. magna,* although the similarity is observed in the high, few in number, and radially directed mandibular teeth. *P. thlastesa* also shows unusual elongation of the postdental part of the dorsal margin of the dentary. This character is observed in *H. magna*, but preserved in only one specimen, a dentary without teeth (specimen TsNIGR Museum, no. 32/12000; Nessov, 1985, pl. II, fig. 15). However, when restudying lizards from the Early Cretaceous of Uzbekistan, Gao and Nessov ignored this specimen and its used its collection number for designation of a different specimen representing a small dentary fragment with teeth. This specimen Nessov (1997, pl. 21, fig. 20; in this figure, it is glued to a part absent in the previous figures) later characterized as unnumbered. This ambiguity results from a typing error in the original description of *H. magna,* so that two specimens had identical marks.

Recently, hodzhakuliids represented by a fragment of a right lower jaw ramus from the Lower Cretaceous (dated by the U—Pb method as approximately 112 Ma, i.e., close to the Aptian—Albian boundary) of Japan (Hyogo) was described by Ikeda et al. (2015) as a new species, *Pachygenys adashii*. It is interesting that the authors of the description of this taxon put off the question of its taxonomic position, until new and more complete material appears. The species from Japan differs from *P. thlastesa* in the smaller size and structural details of the mandibular teeth, although the number of teeth is similar, nine.

Abundant Early Cretaceous lizard remains from the Khoobur locality (Hobur, Höövör, Khovboor, Guchin Us) in central Mongolia allow the involvement of new data in the study of Hodzhakuliidae. Although available material is rather fragmentary, mostly including jaw bones with teeth, it appeared possible to establish several species of this group (in particular, *Hodzhakulia magna*). Judging from their jaw bones, they had distinct premaxillary and occipital processes of the maxillae, which are usually associated with enlarged nares and orbits and also medially open Meckel's canal. These characters disagree with the hypothesis of the affinity of hodzhakuliids and Amphisbaenia. This hypothesis directly contradicts the large size of some members of the family discussed (for example, the skull of *Pachygenys thlastesa* is up to 70 mm long), which are sharply dis-

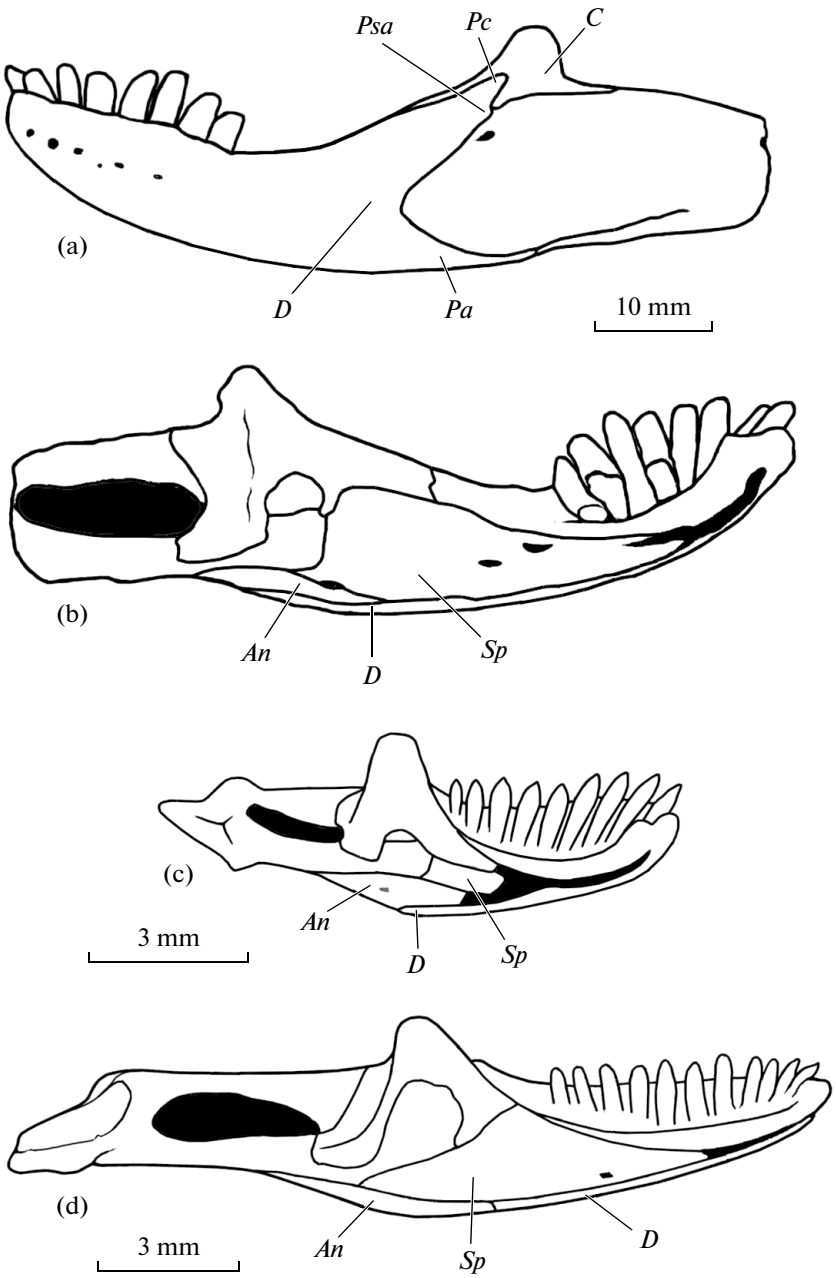


Fig. 1. Lower jaw rami of extinct Xantusiomorpha: (a, b) *Pachygenys thlastesa* Gao et Cheng, 1999 (Hodzhakuliidae; after Gao and Cheng, 1999, text-fig. 3B): (a) labial and (b) lingual views; (c) *Slavoia darevskii* Sulimski, 1984 (Slavoiidae; after Sulimski, 1984, text-figs. 1, *H1, H2*), lingual view; (d) *Eoxanta lacertifrons* (Eoxantidae; after Borsuk-Białynicka, 1988, pl. 2, fig. 2b), lingual view. Designations: (*An*) angulare, (*C*) coronoid, (*D*) dentary, (*Pa*) angular process, (*Pc*) coronoid process, (*Psa*) surangular process, (*Sp*) splenial.

tinguished by this parameter from others, generally small, Early Cretaceous lizards of Central Asia. An increase in the size of reptiles is usually connected with an increase in the proportion of small vertebrates in the diet. In hodzhakuliids, this was also promoted by the high and pointed jaw teeth.

In contrast to the majority of other Early Cretaceous lizard families of Central Asia, hodzhakuliids became extinct at the very end of the Early Cretaceous. This disappearance could have been caused by insufficient competitiveness in the adaptive zone of small carnivorous predators compared to members of Platynota (Anguimorpha). The latter group appeared in Central Asia already at the beginning of the Late Cretaceous.

In addition to the Hodzhakuliidae, the lizard association from the Khoobur locality includes eight more families: Ardeosauridae, Dorsetisauridae, Eoxan-

tidae, Gekkonidae sensu lato, Globauridae, Paramacellodidae, ?Temudjiniidae, and ?Xenosauridae. These data are emended compared to what was published previously (Alifanov, 1993a, 1993b, 2000a). It is noteworthy that some families of Khoobur lizards (Ardeosauridae, Dorsetisauridae, Globauridae, Paramacellodidae) are known outside Central Asia. The Paramacellodidae are the earliest in this group, coming from the Middle Jurassic of Europe and Central Asia. Other families are dated Late Jurassic and (or) Early Cretaceous. Judging from Mongolian specimens and our experience in identification of fossil material, all of them, except for Dorsetisauridae, have been recorded in the Upper Cretaceous beds of Mongolia. Other families of this association (Eoxantidae, Gekkonidae sensu lato, Hodzhakuliidae, ?Temudjiniidae, ?Xenosauridae) include new Early Cretaceous groups, the origin of which is probably connected with Central Asia.

The bone beds of the Khoobur locality were formed under lacustrine—deltoid conditions, probably within the time interval covering the terminal Aptian and basal Albian. The inland beds of Central Asia which are older than the Khoobur beds with remains of terrestrial vertebrates are usually of lacustrine genesis. At the same time, the pre-Khoobur time was connected with deficient habitat conditions for lizards. This is supported by the lowered diversity of this group, on the background of which one family, Ardeosauridae, prevails. Its members are abundant in the Barremian—Aptian beds of the Jehol Group of northeastern China shows and also recorded by us at all stages of the Early Cretaceous of Central Asia (original identification).

Descriptions of new taxa of the family Hodzhakuliidae should be preceded by brief remarks on the problem of the composition and reconstruction intragroup phylogenetic relationships in the infraorder Scincomorpha. This taxon is one of the most complex and contradictory among lizards. As mentioned above, in my opinion it includes the extinct family.

In addition, Scincomorpha includes a number of problematic families. This concerns extant Teiidae, Gymnophthalmidae, Lacertidae, and Feyliniidae as well as extinct Polyglyphanodontidae, Adamisauridae, and Gilmoreteiidae (earlier Macrocephalosauridae). The assignment of these groups to the discussed infraorder results from the absence of adequate morphological characteristics of the last group. In our opinion, these characteristics primarily concern the peculiar constitution of the lower jaw. It is observed in typical scincomorphs and usually manifested in the following characters: the development of a high coronoid process of the dentary; this process overlapping the labial surface of the dorsal and labial (if present) processes of the coronoid; reduction (usually complete) of the surangular process of the dentaries; occipital expansion of the angular process of the dentaries, so that it crosses the level of the anterior surangular foramen; the development of a deep and (or) extensive V-shaped cut between the coronoid and occipital processes. The above morphological characters are not observed in the above-listed problematic families, which can be classified differently, but they are present (or presumed) by us in extinct Ardeosauridae, Carusiidae, Eoxantidae, Globauridae, Paramacellodidae, Slavoiidae, and Hodzhakuliidae (Fig. 1a), which undoubtedly belong to Scincomorpha.

In addition to the above characters of the lower jaw, the classification of scincomorphs requires taking into account some structural details of the palatal complex. Two types of this complex have been recognized. One of them is termed diploglossopalatine (Fig. 2a), implying that the maxillae enter the frame of the suborbital fenestrae and the lateral processes of the palatine and ectopterygoid are positioned dorsal to the supradentary crest of this bone. This state is characteristic of extant Acontiidae, Scincidae, and Cordylidae and also extinct Ardeosauridae, Carusiidae, Globauridae, and Paramacellodidae. The second type is platynotopalatine (Fig. 2b), which is distinguished by the connection of the lateral processes of the palatine and ectopterygoid with each other and the medial position with reference to the maxillae, thus, excluding them from the frame of the suborbital fenestrae. Among living scincomorphs, the platynotopalatine type of the palate is only observed in Dibamidae. It is interesting that some members of the family Xantusiidae lack suborbital fenestrae (Fig. 2c), but the position of the maxillary processes of the palatine and ectopterygoid is medial (rather than dorsal, as in the diploglossopalatine type) to the supradental crest of the maxillae is evidence that such constitution is archaic only relative to the platinotopalatine type. If this is the case, the families Xantusiidae and Dibamidae form a special group within scincomorphs. Extinct Central Asiatic Eoxantidae and Slavoiidae known from cranial material are similar in the palatal pattern to the last group. The hypothesis of the affinity of Hodzhakuliidae (only known from fragments) and platinotopalatine scincomorphs is supported by a number of other characters, which are considered in the taxonomic section of the present paper.

The palatal structure is regarded as a key character for the classification of scincomorphs (Alifanov, 2012). The diploglossopalatine forms are combined in the microorder Leptoglossa and platinotopalatine taxa are assigned to Xantusiomorpha (Fig. 3a).

The above palatal patterns are also recorded in other lizard infraorders, providing an example of parallelisms characteristic of this group. In some cases, parallelisms show a complex character, involving a wide range of cranial and postcranial structures, sometimes resulting in the formation of morphologically similar groups ("doublers"). For example, family Dibamidae (Scincomorpha) has much in common with Anniellidae (Anguimorpha) in the cranial structure. They are clearly distinguished, as respective

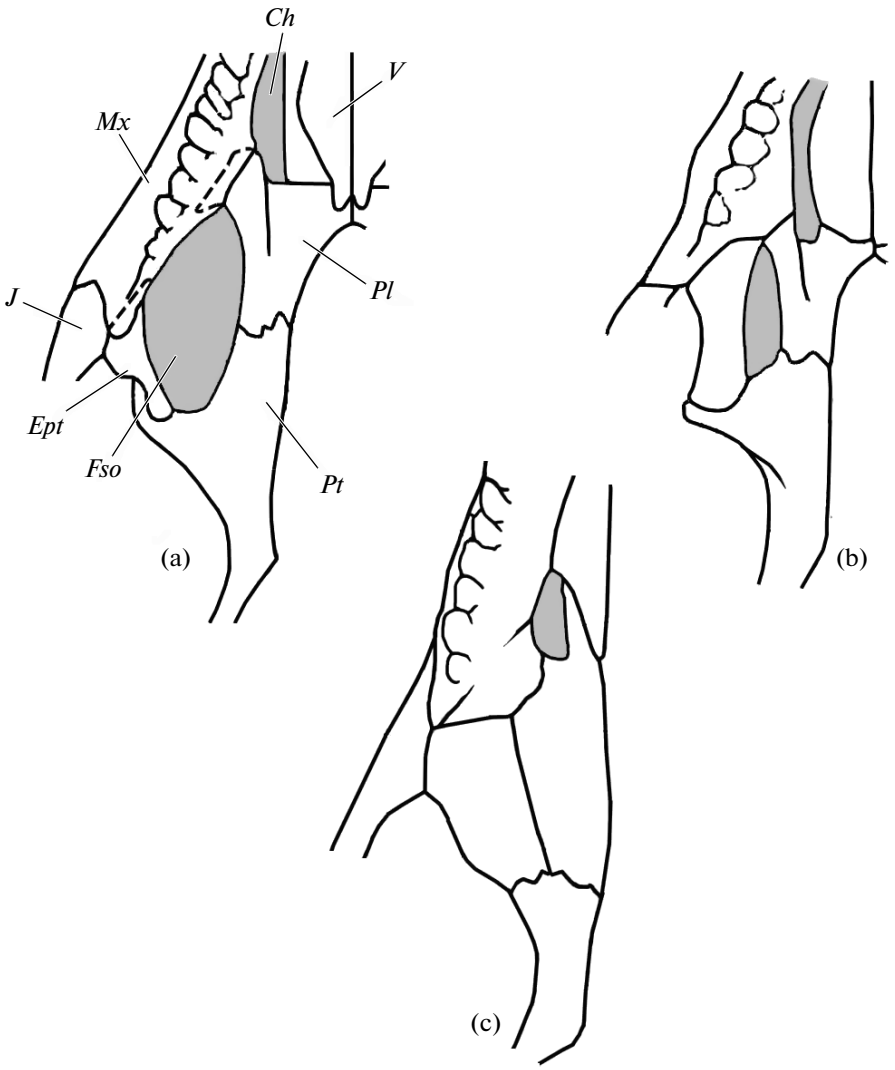


Fig. 2. Palatal types in lizards: (a) diploglossopalatine (*Globaura venusta,* Globauridae; after Borsuk-Białynicka, 1988, pl. 1.1); (b) platynotopalatine (*Eoxanta lacertifrons,* Eoxantidae, Late Cretaceous of Mongolia; after Borsuk-Białynicka, 1988, pl. 1.2), (c) proplatynotopalatine (*Lepidophima flavimaculatum,* Xantusiidae). Designations: (*Ch*) choana; (*Ept*) ectopterygoid; (*Fso*) suborbital fenestrae; (*J*) jugal; (*Mx*) maxilla; (*Pl*) palatine; (*Pt*) pterygoid; (*V*) vomer.

infraorders, only by the lower jaw structure. At the same time, scincomorph Dibamidae and Acontiidae differ from each other not only in the absence in the first and presence in the second of body osteoderms, but also in the palatal structure.

The above reasoning is intended to show that, without taking into account the data on the lower jaw and palatal structure, reliable classification and sensible reconstruction of relationships within Scincomorpha and other large lizard groups (infraorders) are impossible.

The following abbreviations of organizations and institutions are used in the present study: (PIN) Borissiak Paleontological Institute of the Russian Academy of Sciences, Moscow; (TsNIGR Museum) Chernyshov Central Research Prospecting Museum, St. Petersburg.

SYSTEMATIC PALEONTOLOGY

ORDER LACERTILIA

INFRAORDER SCINCOMORPHA

MICROORDER XANTUSIOMORPHA

Family Hodzhakuliidae Alifanov, 1993

Type genus. *Hodzhakulia* Nessov, 1985; Early Cretaceous of Uzbekistan and Mongolia.

Diagnosis (improved). Orbits large. Premaxillae unpaired. Subdental and supradental crests arched. Postdental part of dorsal margin of dentaries extended. Rostral end of angular bones elongated, positioned vertically, and wedging in between lower edge of dentary and ventral edge of large splenial. Teeth high, eu- and subpleurodont in attachment, at most 17 or 18 in each jaw bone. Apical part of all teeth flattened labio-

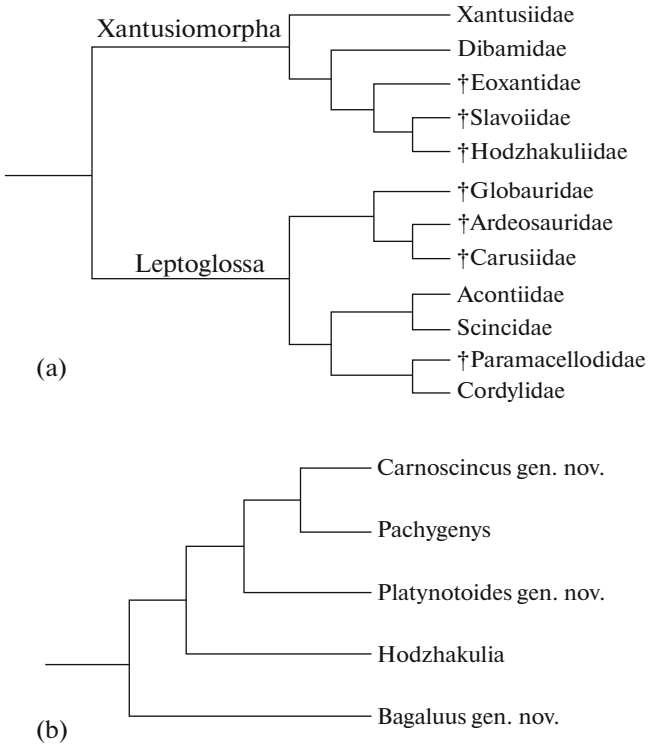


Fig. 3. Position of the family Hodzhakuliidae in the infraorder Scincomorpha (a) and phylogenetic relationships of genera of the family Hodzhakuliidae (b). For explanations, see the text.

lingually and tooth bases in anterior part of tooth row widened transversely and flattened rostroccipitally. In region of transition of actually differently directed widened apices and bases, medial projection usually formed. Anterior dentary teeth inclined rostrally at approximately 30°–45°. Members of family showing trend towards reduction of number of teeth, increase in their height, formation of radial orientation of dental axes, cutting borders on edges of pointed apex and dividing facets between them, and also elongation of toothless (postdental) part of occipital process of maxillae and dorsal margin of dentaries.

Generic composition. In addition to the type genus, *Pachygenys* Gao et Zeng, 1999, Early Cretaceous of northwestern China; *Bagaluus* gen. nov., *Carnoscincus* gen. nov., *Platynotoides* gen. nov., Early Cretaceous of Mongolia.

Comparison. Hodzhakuliidae differs from other families of the microorder Xantusiomorpha in the elongated postdental parts of the maxillae and dentaries, the subpleurodont attachment of teeth, the transversely widened and rostroccipitally compressed bases of teeth, and the labiolingual flattening of their apex. In addition, it differs from Xantusiidae in the presence of splenials (and presumable presence of suborbital and upper temporal fenestrae); from Dibamidae in the long premaxillary and occipital processes of the maxillae and in the relatively low coronoid process of the dentaries; from Eoxantidae in the elongation and vertical position of the rostral end of the angular bones; and from Slavoiidae in the large orbits, less massive maxillae, and long splenials.

Remarks. The reconstruction of phylogenetic relationships of Scincomorpha families is shown in Fig. 3a. The hypothesis of direct affinity between Hodzhakuliidae and Slavoiidae within Xantusiomorpha is based on the elongation and vertical position of the rostral end of angular bones (Figs. 1b, 1c), which is not observed in Eoxantidae (Fig. 1d). The basal position of Xantusiidae in the composition of Xantusiomorpha follows from the absence of temporal and suborbital fenestrae. Dibamidae are advanced compared to Xantusiidae in the presence of suborbital fenestrae, but simultaneously deviate in the loss of limbs, specialization of certain elements of the braincase (in particular, reduction of its membranous part), and transformation of the auditory region (in particular, the formation of a stout stapes).

The large size, a decrease in the number of teeth, their radial positions, formation of cutting borders and dividing facets on the sides of pointed apex, and also postdental elongation of the dorsal margin of the dentary are regarded as the key characters for the reconstruction of phylogenetic relationships between genera of the family Hodzhakuliidae (Fig. 3b). The condition of these characters suggest the following: *Pachygenys* and *Carnoscincus* gen. nov. are most advanced evolutionarily; *Platynotoides* gen. nov. is probably more advanced than *Hodzhakulia*; *Bagaluus* gen. nov. is the basal taxon.

Genus *Hodzhakulia* Nessov, 1985

Hodzhakulia: Nessov, 1985, p. 208; Alifanov, 1993, p. 79; 2000b, p. 382; 2012, p. 21; Gao and Nessov, 1998, p. 298.

Type species. *Hodzhakulia magna* Nessov, 1985.

Diagnosis (emended). Premaxillary process of maxillae wide at base. Jugal process of these bones relatively short. Its occipital part lacking teeth, quarter or one-fifth as long as tooth row. Postdental part of dorsal margin of dentaries shorter in length than tooth row. Flank of their subdental crest insignificantly rostrally widened. Teeth oriented slightly radially and frequently curved slightly rostroccipitally. Largest teeth located in middle part of tooth row. Near their apex, there short cutting borders outlined by lingual facets. In rostral maxillary and dentary teeth, projection near transition from base to apical part poorly developed. Maxillary teeth projecting beyond dental crest for approximately half or third of their height. Maxillary teeth eight or nine in number. Dentary teeth projecting above dental crest for at most one-third of their height. Dentaries with 11 or 12 teeth.

Species composition. Type species.

Comparison. *Hodzhakulia* differs from *Pachygenys* (Figs. 1a, 1b) in the narrow flank of the subdental crest, the relatively short postdental part of the dorsal margin of the dentary (and probably the postdental part of the occipital process of the maxillae), the loose arrangement of teeth, the greater number and rostroccipital curvature of teeth.

Remarks. Some characters are included in the generic diagnosis for the first time, because in the type series, many of them were impossible to establish.

Hodzhakulia magna Nessov, 1985

Plate 12, figs. 1–4

Hodzhakulia magna: Nessov, 1985, p. 208, pl. I, figs. 4–6, pl. II, fig. 15; 1997, p. 205, pl. 21, figs. 1, 2, and 20; Gao and Nessov, 1998, p. 298, text-fig. 4; Alifanov, 2000a, p. 62; 2012, p. 21, text-fig. 5.

Holotype. TsNIGR Museum, no. 30/12000, fragmentary right maxilla with teeth; Uzbekistan, Karakalpakstan, Khodzhakul locality; Lower Cretaceous, Upper Albian, Khodzhakul Formation.

Description (Fig. 4a). Small lizards; the skull is 20—25 mm long. The premaxillae are fused, with a wide ventral part and basally narrow ascending process. The number of premaxillary teeth is eight.

The dorsal process of the maxillae is high and wide at the base. Its upper margin curves medially and has a relatively small, occipitally pointed projection. In lateral view, distinct transition between dorsal and jugal processes is absent. The lingual surface of the dorsal process of the maxillae has a short subhorizontal crest, which begins from the level of the second maxillary tooth, extends obliquely upwards, and terminates at the level of the fourth teeth. The lip foramens are seven—nine in number; the anterior and posterior foramens are larger than the others. The dorsal surface of the premaxillary process has a large foramen. Several small foramens are scattered on the labial surface of the dorsal process of the maxillae. The flank of the supradental crest is narrow throughout its extent. The alveolar canal enters the supradental crest at the level of the posteriormost maxillary tooth.

The rostral narrowing of dentaries is weak. The mandibular alveolar canal opens somewhat occipital to the posteriormost tooth. There are five—seven lip foramens. The posteriormost of them is located rostral to the penultimate tooth.

Measurements in mm. Maxilla (specimen PIN, no. 3334/534; Pl. 12, figs. 1, 2): height, 4.5; length, 9.8; width, 2; premaxillary process length, 1.5; occipital process length, 2; height of largest teeth, 3; dentary (specimen PIN; no. 3334/529; Pl. 12; figs. 3; 4): total length, 11 (reconstruction, 13); length of postdental part of dorsal margin, 2 (3); length of dental row, 8; depth at posteriormost tooth, 2.3; depth of the largest tooth, 2.

Remarks. In the collection of *Hodzhakulia magna* Nessov, 1985 from Khoobur, specimens vary in the extent of curvature, density of arrangement, thickness, and number of teeth. However, a large proportion of specimens display a mixture of features, which allow individual variation. Some dentaries are similar in all details to the specimen without number from the type collection of *H. magna* Nessov, 1985 (Nessov, 1985, pl. XII, fig. 6; 1997, pl. 21, fig. 20).

Material. In addition to the holotype, specimen TsNIGR Museum, no. 31/12000, fragmentary left maxilla with teeth; TsNIGR Museum, without number, right dentary with teeth; type locality; specimens PIN, nos. 3334/525–530, 3334/536–542, incomplete dentaries with teeth; specimen PIN, nos. 3334/534, 535, 543, variously preserved maxillae; specimen PIN, no. 3334/544, premaxilla; Mongolia, Övörkhangai aimag, Khoobur locality; Lower Cretaceous, Upper Aptian–Lower Albian, Hühteeg Horizon.

Genus *Bagaluus* Alifanov, gen. nov.

Etymology. From the Mongolian *baga* (small) and Mongolian *luu* (dragon).

Type species. *Bagaluus primigenius* sp. nov.

Diagnosis. Total number of upper teeth more than 16, probably, 17 or 18. First four of them enlarged and inclined rostrally. Other teeth densely spaced and gradually increasing in size occipitally. Rostral teeth projecting beyond dentary edge for two-thirds of their height, and occipital teeth, for half height. Bases of all teeth widened transversely and compressed rostroccipitally. Lingual facets near central apex absent.

Species composition. Type species.

Comparison. The new genus differs from known genera of the family in the large number of closely positioned teeth, the transverse expansion of their bases, the absence of dividing lingual facets, the presence of a rostral series of enlarged maxillary teeth, and in the gradual occipital increase in the tooth height in the posterior part of the row.

Remarks. Judging from the large number are close positions of the maxillary teeth and the absence of dividing facets near the central apex, *Bagaluus* gen. nov. is the most archaic genus of the family (Fig. 3b). Compared to other genera of the family, the new genus shows a number of unique characters, including the presence of a rostral series of enlarged maxillary teeth (established by the large bases of these teeth), occipital enlargement of teeth in the posterior half of the tooth row, and transverse expansion of the bases of all (instead of only rostral) teeth.

Bagaluus primigenius Alifanov, sp. nov.

Plate 12, figs. 5 and 6

Etymology. From the Latin *primigenius* (primogenial).

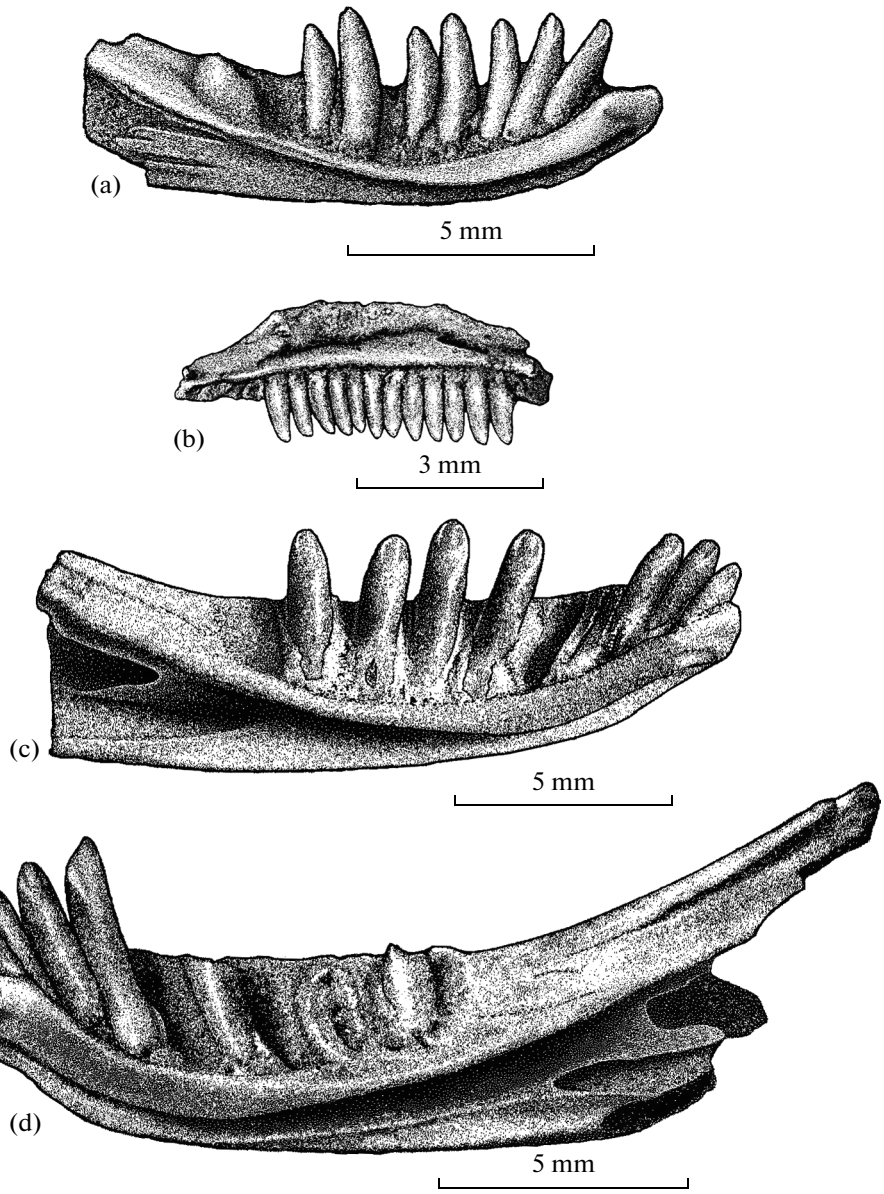


Fig. 4. Members of the family Hodzhakuliidae; Khoobur locality, Övörkhangai aimag, Mongolia; Hühteeg Horizon, Upper Aptian—Lower Albian, Lower Cretaceous: (a) *Hodzhakulia magna* Nessov, 1985, specimen PIN, no. 3334/529, left dentary, lingual view; (b) *Bagaluus primigenius* gen. et sp. nov., holotype PIN, no. 3334/512, right maxilla, lingual view; (c) *Platynotoides altidentatus* gen. et sp. nov., holotype PIN, no. 3334/531, left dentary, lingual view; (d) *Carnoscincus eublepharus* gen. et sp. nov., holotype PIN, no. 3334/514, right dentary, lingual view.

Explanation of Plate 12

Jaw bones of lizards of the family Hodzhakuliidae; Khoobur locality, Övörkhangai aimag, Mongolia; Hühteeg Horizon, Upper Aptian—Lower Albian, Lower Cretaceous.

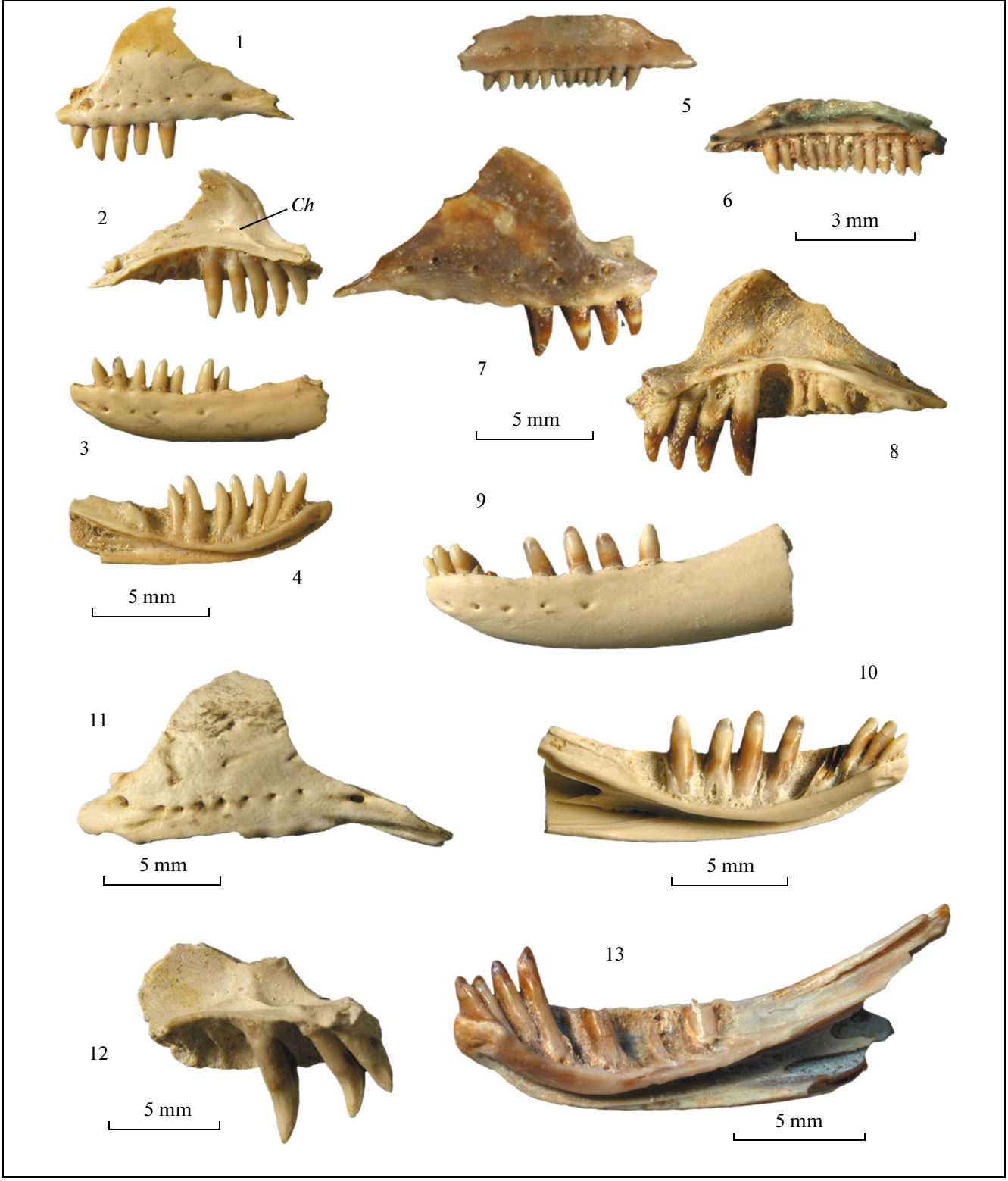
Figs. 1–4. *Hodzhakulia magna* Nessov, 1985: (1, 2) specimen PIN, no. 3334/534, left maxilla: (1) labial and (2) lingual views; (3, 4) specimen PIN, no. 3334/529, left dentary: (3) labial and (4) lingual views. Designations: (*Ch*) subhorizontal crest.

Figs. 5 and 6. *Bagaluus primigenius* gen. et sp. nov., holotype PIN, no. 3334/512, right maxilla: (5) labial and (6) lingual views.

Figs. 7–10. *Platynotoides altidentatus* gen. et sp. nov.: (7, 8) specimen PIN, no. 3334/533, right maxilla: (7) labial and (8) lingual views; (9, 10) holotype PIN, no. 3334/531, left dentary: (9) labial and (10) lingual views.

Figs. 11–13. *Carnoscincus eublepharus* gen. et sp. nov.: (11) specimen PIN, no. 3334/548, left maxilla, labial view; (12) specimen PIN, no. 3334/549, left maxilla fragment, lingual view; (13) holotype PIN, no. 3334/514, right dentary, lingual view.

Plate 12



Holotype. PIN no. 3334/512, left maxilla fragment with teeth; Mongolia, Övörkhangai aimag, Khoobur locality; Lower Cretaceous, Upper Aptian—Lower Albian, Hühteeg Horizon.

Description (Fig. 4b). Small lizards. The dorsal process of the maxillae is wide at the base. The supradental crest is only slightly arched. The premaxillary process of maxillae is relatively short. There are

seven lip foramens. The opening of the alveolar canal is large. It opens in the dorsal surface of the supradental crest at the level of teeth 12–14.

Measurements of the holotype, mm. Length of preserved part of maxilla, 6 (reconstruction, 8); width, 1.3; premaxillary process length, 1; its height, 1.5 (reconstruction, 2); mean height of teeth, 1.2; tooth diameter, 0.3.

Material. Holotype.

Genus *Platynotoides* Alifanov, gen. nov.

Etymology. From Platynota and the Greek *eidos* (similar).

Type species. Platynotoides altidentatus sp. nov.

Diagnosis. Jugal process of maxillae short. Its occipital part composing quarter or one-fifth of tooth row length lacking teeth. Postdental dorsal margin of dentaries only slightly shorter in length than tooth row. Eight maxillary and ten mandibular teeth present. Bases of rostral teeth widened strongly transversely and compressed rostroccipitally. Borders at apex of maxillary teeth extended, separated by medial facets. Upper teeth loosely spaced and projecting beyond edge of dental crest of maxillae for half or two-thirds of their height. Rostral maxillary and dentary teeth with small medial projection. Fourth and fifth maxillary teeth largest. Dentary teeth straight in lateral view, separated by wide interspaces and projecting beyond edge of dentaries for almost half of their height.

Species composition. Type species.

Comparison. The new genus differs from all genera of the family in the loosely spaced teeth, which significantly project beyond the edge of jaw bones, the strong transverse expansion and rostroccipital narrowing of the bases of anterior teeth, and in the presence of a well-pronounced medial projection on these teeth. In addition, it is distinguished from *Hodzhakulia* by the longer postdental dorsal margin of dentaries, the fewer teeth straight in lateral view, with elongated cutting borders near the apex; from *Bagaluus* gen. nov. by the presence of dividing facets, the absence of transverse expansion of the base of the occipital teeth, and presumably by the presence of the toothless part of the occipital process of the maxillae; and from *Pachygenys* by the greater number of less massive teeth.

Remarks. Morphologically, *Platynotoides* gen. nov. differs from *Hodzhakulia* to a lesser extent than from *Bagaluus* gen. nov., but is more similar to *Pachygenys* (Fig. 3b) in the greater extent of the postdental part of the dorsal margin of the dentaries and the fewer jaw teeth.

Platynotoides altidentatus Alifanov, sp. nov.

Plate 12, figs. 7–10

Etymology. From the Latin *altus* (high) and the Latin *dentatus* (toothed).

Holotype. PIN no. 3334/531, left dentary with teeth; Mongolia, Övörkhangai aimag, Khoobur locality; Lower Cretaceous, Upper Aptian—Lower Albian, Hühteeg Horizon.

Description (Fig. 4c). Lizards with the skull up to 30—35 mm long. In a number of structural details, the maxillae resemble *Hodzhakulia magna*. The differences are mainly restricted to the greater stoutness and longer premaxillary process. The dorsal and ventral margins of the dentaries are slightly arched. The flank of the subdental crest is widened slightly rostrally, beginning from the level of the middle of the tooth row. The alveolar canal enters the dentary occipital to the level of the posteriormost tooth. The bone has five—seven lip foramens. The posteriormost foramen is located at the level of the middle of the tooth row. The axes of all tooth are curved internally.

Measurements in mm. Maxilla (specimen PIN; no. 3334/533): height, 5.5; length, 13.5; width, 2.5; premaxillary process length, 3; occipital process length, 2.5; height of the largest tooth, 5; dentary (holotype PIN; no. 3334/531): length, 15.5 (reconstruction, 17); occipital height, 4.5; tooth row length, 11; depth in middle of tooth row, 3.5; length of postdental part of dorsal margin, 4 (6); height of the largest teeth, 4; their transverse diameter, 1.3.

Material. In addition to the holotype, specimen PIN, no. 3334/532, right dentary fragment; specimen PIN, no. 3334/533, maxilla; type locality.

Genus *Carnoscincus* Alifanov, gen. nov.

Etymology. From the Latin *caro* (flesh) and *Scincus,* the type genus of Scincidae.

Type species. *Carnoscincus eublepharus* sp. nov.

Diagnosis. Occipital part of jugal process (lacking teeth) of maxillae one-third as long as tooth row. Postdental part of dorsal margin of dentaries as long as tooth row. Seven maxillary and eight dentary teeth present. Borders near pointed apex elongated, separated from it by lingual facets. Series of rostral maxillary and dentary teeth with distinct medial projections. These teeth extending beyond edge of dental crest of maxillae for two-thirds of their height. Third–fifth teeth largest and seventh (posteriormost) smallest. Base of the first dentary teeth strongly transversely widened and extremely rostroccipitally flattened. In lateral view, teeth straight.

Species composition. Type species.

Comparison. The new genus differs from the majority of genera of the family in the extended toothless segment of the occipital end of the jugal process of the maxillae and the postdental part of the dorsal margin of the dentaries (except for *Pachygenys*), the fewer jaw teeth relatively larger in size, and also in the abruptly transversely widened bases of anterior dentary teeth and the large medial projections on them. In addition, it differs from *Bagaluus* gen. nov. in the presence of separating facets on teeth, the absence of transverse basal expansion of the occipital teeth, and presumably the presence of a

toothless part of the jugal process of the maxillae; and from *Hodzhakulia* in the straight teeth and the long cutting borders near their apical part.

Remarks. Judging from the smallest number of teeth, the development of long cutting borders near the apices, isolation of their separating facets, extent of rostroccipital narrowing of the dentary anterior maxillary and dentary teeth, elongation of the postdental parts of the maxillae and dentaries, *Carnoscincus* gen. nov. is the most advanced taxon of the family (Fig. 3b).

***Carnoscincus eublepharus* Alifanov, sp. nov.**

Plate 12, figs. 11–13

Hodzhakulia sp.: Alifanov, 2000a, p. 65, text-fig. 28g; 2012, p. 22.

Etymology. From the Greek *eublepharos* (sharp-sighted).

Holotype. PIN, no. 3334/514, right dentary with teeth; Mongolia, Övörkhangai aimag, Khoobur locality; Lower Cretaceous, Upper Aptian—Lower Albian, Hühteeg Horizon.

Description (Fig. 4d). Lizards with the skull up to 40–45 mm long. The dorsal process of the maxillae is high and wide. Its upper edge curves lingually. The subhorizontal crest on the internal surface of this process reaches the level of the posterior edge of the dorsal process. In lateral view, the region of transition from the dorsal to jugal processes is ledged. The last process is approximately one-third as long as the bone. The bone has nine lip foramens; the anterior and posterior foramens are larger than the others. Several foramens are scattered on the labial surface of the maxillae above the lip row. One more series of foramens is in the dorsal surface of the premaxillary process. The flank of the supradental crest is strongly curved in lateral view. The foramen of the maxillary alveolar canal is located in the dorsal surface of the supradental crest occipital to the level of the posteriormost maxillary tooth.

The dentaries are elongated, widened distinctly occipitally. The flank of the subdental crest of the holotype is widened at the level of the fourth tooth. The bone has seven lip foramens; the posterior foramen is located rostral to the posteriormost tooth. The apex of the maxillary teeth are medially arched. The length of the cutting borders of the dentary teeth reaches one-third of the tooth height.

Measurements in mm. Maxilla (specimen PIN, no. 3334/548; Pl. 12, fig. 11): height, 7.5; length, 16.5; width, 3.5; premaxillary process length, 2.5; occipital process length, 5; dentary (holotype PIN, no. 3334/514): length, 20 (reconstruction, 21); occipital depth, 6.3 (7); depth at the middle of the tooth row, 4; tooth row length, 10; length of postdental part of dorsal margin, 9 (11); height of the largest teeth, 4.5 (5); their transverse diameter, 1.5.

Remarks. Specimen TsNIGR Museum, no. CMGE 32/12000 from the type series of *Hodzhakulia magna* (Nessov, 1985, pl. II, fig. 15; 1997, pl. 21, fig. 2) differs from *Carnoscincus eublepharus* gen. et sp. nov. only in the smaller size (the bone possibly belongs to a young individual). Therefore, this specimen is referred to the last species.

Material. In addition to the holotype, specimens PIN, nos. 3334/546, 547, fragmentary dentaries; specimens PIN, nos. 3334/548–550, fragmentary maxillae; type locality; specimen TsNIGR Museum, no. CMGE 32/12000, right dentary without teeth; Uzbekistan, Karakalpakstan, Khodzhakul locality; Lower Cretaceous, Upper Albian, Khodzhakul Formation.

ACKNOWLEDGMENTS

The study was supported by the Russian Foundation for Basic Research, project no. 16-05-00408.

REFERENCES

Alifanov, B.R., Lizards from the Upper Cretaceous of Mongolia and problem of the first inter-American link, *Paleontol. Zh.,* 1993a, no. 3, pp. 79–85.

Alifanov, V.R., Some peculiarities of The cretaceous and Palaeogene lizard faunas of the Mongolian People's Republic, *Kaupia,* 1993b, no. 3, pp. 9–13.

Alifanov, V.R., Macrocephalosaurs and early stages of the evolution of lizards of Mongolia, *Tr. Paleontol. Inst. Ross. Akad. Nauk,* 2000, vol. 272, pp. 1–126.

Alifanov, V.R., The fossil record of Cretaceous lizards of Mongolia, in *The Age of Dinosaurs in Russia and Mongolia,* Benton, M., Shishkin, M.A., Unwin, D.M., Kurochkin, E.N., Eds., Cambridge: Cambridge Univ. Press, 2000, pp. 368–389.

Alifanov, V.R., Order Lacertilia, in *Iskopaemye reptilii i ptitsy. Chast' 2* (Fossil Reptiles and Birds: Part 2), Kurochkin, E.N. and, Lopatin, A.V., Eds., Moscow: GEOS, 2012, pp. 7–136.

Borsuk-Białynicka, M., *Globaura venusta* gen. et sp. n. and *Eoxanta lacertifrons* gen. et sp. n.—non-teiid lacertoids from the Late Cretaceous of Mongolia, *Acta Palaeontol. Polon.,* 1988, vol. 33, no. 3, pp. 211–248.

Gao, K. and Cheng, Zh., A new lizard from the Lower Cretaceous of Shandong, China, *J. Vertebr. Paleontol.,* 1999, vol. 19, no. 3, pp. 456–465.

Gao, K. and Nessov, L.A., Early Cretaceous squamates from the Kyzylkum Desert, Uzbekistan, *Neues Jahrb. Palaeontol., Abh.,* 1998, vol. 207, pp. 289–309.

Ikeda, T., Ota, H., and Saegusa, H., A new fossil lizard from the Lower Cretaceous Sasayama Group of Hyogo Prefecture, Western Honshu, Japan, *J. Vertebr. Paleontol.,* 2015, vol. 35, no. 1, pp. e885032-1–e885032-5.

Lucas, S.G., The *Psittacosaurus biochron,* Early Cretaceous of Asia, *Cret. Res.,* 2006, vol. 27, no. 2, pp. 189–198.

Nessov, L.A., Rare bony fishes, terrestrial lizards and mammals from the zone of estuaries and seaside lowlands of the Cretaceous of the Kyzyl Kum Desert, *Ezhegodn. Vsesoyuzn. Paleontol. Ob-va,* 1985, vol. 28, pp. 199–219.

Nessov, L.A., *Nemorskie pozvonochnye melovogo perioda Severnoi Azii* (Nonmarine Vertebrates from the Cretaceous of Northern Asia), St. Petersburg: Botan. Inst. Ross. Akad. Nauk, 1997.

Sulimski, A., New Cretaceous scincomorph lizard from Mongolia, *Palaeontol. Polon.,* 1984, no. 46, pp. 143–155.

Translated by G. Rautian