

*On some new or little known Reptiles and Fishes of the Cretaceous No. 3,
of Kansas.*

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TOXOCHELYS LATIREMIS Cope.

Final Report U. S. Geol. Surv. Terrs. II. pp. 98, 299.

Two nearly complete crania of this species found by Mr. Sternberg, enable me to give the genus a definite position in the system.

The prefrontals have an extensive mutual contact, and extend to the external nares, where they are somewhat contracted by the superior processes of the maxillary. They descend to the vomer, and are extensively in contact with it. There are no distinct nasal bones. Lachrymal foramen rather small. The temporal fossa is extensively roofed, and the supraoccipital crest much produced backwards.

The posterior nares are rather anterior, and are separated, and not underroofed by the osseous vomer. This element expands in front of the nares, where it separates the maxillaries.

A foramen separates the maxillaries from the palatines, and the ectopterygoids expand laterally. The superior alveolar surface is wide, and slightly concave. The external border is elevated and acute, and the inner border is slightly prominent and is roughened.

The characters above adduced show that the genus *Toxochelys* is one of the *Cryptodira*, and that it is distinct from *Euclastes* (Cope) of the cretaceous No. 5. In that genus the posterior nares are underrun by a production of the vomer, and the alveolar faces of both jaws are much wider. The general form of the skull of *Toxochelys* is much like that of many *Trionychidæ*, but from these the characters of the marginal bones of the carapace, and the form of the extremities separate it.

ICHTHYODECTES GOODEANUS sp. nov.

This largest species of the genus is represented by a right premaxillary and a large part of the maxillary bones. The alveolar border is concave at the anterior part of the latter, and then becomes convex. The maxillary border is incurved at its anterior extremity, so that the line of teeth is turned inwards as well as strongly upwards, the middle part of the border being the most prominent. In this respect it differs from the other species, where the anterior part of the alveolar border is the most prominent. The anterior border is sigmoidally curved, and the vertical diameter is twice the transverse. The premaxillary teeth number thirteen and are somewhat compressed so as to have opposed cutting edges; they are without grooves or ridges. The maxillary teeth are round in section. The posterior maxillary condyle is not protuberant, and is decurved anteriorly. The maxillary underlaps the premaxillary to near its anterior border.

<i>Measurements.</i>		M.
Depth of maxillary behind condyle.....		.047
“ “ at “		.053
“ premaxillary.....		.069
Length “ at middle.....		.037
Four functional maxillaries in.....		.020

This species is dedicated to my friend Prof. G. Brown Goode, of Middleton, Conn., collaborator of the Smithsonian Institution.

I may here state that another very distinct species of this genus is the *Ichthyodectes arcuatus* (*Portheus accuatus* Cope. 4to Report U. S. Geol. Surv. Terrs. II. p. 204). It is characterized by the attenuation of the bones of the face, and jaws, and the small size and large number of its teeth. Those of the maxillary bone are so small as to become obsolete on the posterior half in old individuals.

ICHTHYODECTES ACANTHICUS sp. nov.

The smallest species of the genus, distinguished by the attenuated and curved crowns of the teeth. It is represented in my collection by portions of the dentary, parasphenoid, and other bones. The teeth on the anterior part of the dentary bone are nearly round in section, and their enamel is smooth. The crowns are curved inwards towards the apices, which are slender and acute. The anterior tooth is on the extremity of the dentary. The lateral processes of the parasphenoid are wide and flat, and are pierced at the base by the usual two foramina. The interorbital portion of the bone is concave in the section of its inferior surface.

<i>Measurements.</i>		M.
Length of the crown of a tooth.....		.005
Diameter “ “ “		.001
Five mandibular teeth in.....		.012
Width of parasphenoid at middle.....		.006
Depth of parasphenoid at middle.....		.004

This species and the last described were obtained by my assistant, Chas. H. Sternberg, from the chalk of the Cretaceous No. 3 of Kansas.

ORICARDINUS TORTUS gen. et sp. nov.

Char. gen. Teeth inserted in shallow aveoli, with the roots more or less exposed; on the posterior half of the maxillary bone unequally so, so as to be pleurodont. The anterior part of the maxillary bone depressed, with superior articular facet, and united with the premaxillary by a ginglymus.

This genus is apparently nearly allied to *Pachyrhizodus* as I have defined it. In that genus the anterior maxillary teeth are strongly pleurodont, and the maxillo-premaxillary suture is squamosal. To *Oricardinus* must probably be referred the *P. sheareri* m.

Char. specif. This is derived from a right maxillary bone and a num-

ber of vertebræ, supposed to belong to the same individual by my assistant, Russell Hill, who discovered it.

The proximal extremity of the maxillary bone is depressed, both the external and internal aspects presenting prominent ribs. The inner rib soon disappears, and the alveolar border becomes interior in position, the teeth then assuming a more pleurodont character. The external rib continues, and rises so as to form the superior border of the jaw, but continues to have an oblique direction outwards. It is separated by a longitudinal concavity from the portion that bears the alveoli. The teeth are subcylindric in section, and the crowns are acute and incurved. The proximal end of the maxillary forms a condyle for transverse movement, which is divided by a transverse groove. Above this groove the extremity is fissured.

The vertebral centra are somewhat hour-glass shaped, and present a deep longitudinal fossa on each side of the base of each neural and hæmal arch, which is divided by a vertical rod on partition of bone, which strengthens the arch. The arrangement is that seen in the genus *Empo*, The sides of the centra are marked with rather regular linear grooves, which disappear at the contraction.

<i>Measurements.</i>		M.
Length of maxillary bone preserved.....		.066
Distal depth.....		.011
" width.....		.005
Proximal depth.....		.005
" width.....		.006
Eight teeth in.....		.020
Diameter of caudal centrum	{ longitudinal.....	.010
	{ transverse.....	.009
	{ vertical.....	.010
Diameter of anterior centrum	{ longitudinal.....	.009
	{ transverse.....	.011
	{ vertical.....	.009

In the *O. shearerii* the dental alveoli are transverse to the long axis of the maxillary bone, while here they are longitudinal or round; the bone is more laminiform in the *O. tortus*.

ANOGMIUS FAVIROSTRIS sp. nov.

The characters of the genus *Anogmius* Cope having up to the present time rested upon but one species (*A. aratus*), it is satisfactory to be able to confirm them by the study of new material. This, which was obtained in Kansas by Mr. Sternberg, consists of the almost entire superior part of the skulls of two individuals, one of them with thirteen vertebræ.

The vertebræ, which undoubtedly belong to the skull, have no lateral grooves, but the superior and inferior pairs of fossæ are present. The inferior fossæ are separated by a plane interval on the anterior centra, which rapidly narrows posteriorly. The centra are not elongate nor

contracted at the middle, and are sculptured with fine longitudinal grooves.

The cranium is depressed, and was so in life. The form of the muzzle is the extremity of an oval, at the apex of which are the two short premaxillaries, while the sides are composed of the long maxillaries. The top of the head is nearly smooth, marked only posteriorly by a few delicate radiating grooves and dots.

The inferior view displays the vomer, palatine, and maxillary bones with their myriad teeth *en brosse*. Those of the maxillaries form a narrow band, those of the premaxillaries a little wider one. The palatines are long flat bones similar to those of the *Stratodus apicalis*, but of less elongate proportions, and the teeth they bear are relatively smaller and not in longitudinal rows as in that fish. The teeth of the median line of the palate form an elongate tongue-shaped patch, flat and acuminate in front, but gently convex, and with lateral bevels more posteriorly. The teeth it supports are very close together as on the palatine bones. The posterior portion of this patch is broken away. The mandibular ramus is not deep and the symphyseal surface is a rectangular truncation of the nearly parallel inferior and superior edges. The teeth are in many rows, the number diminishing posteriorly. The dentary is incurved to the symphysis. The premaxillary bone is not smooth like the others of the cranium, but is pitted anteriorly, and radiately ridged posteriorly.

<i>Measurements.</i>		M.
Length of cranium.....		.102
Width of cranium behind.....		.050
Length of premaxillary bone.....		.015
Depth of the dentary.....		.009
Length of palatine bone.....		.052
Width " " "		.010
" " vomerine dentate patch.....		.010
Diameter of a cervical vertebra	{ longitudinal.....	.005
	{ transverse.....	.009
	{ vertical.....	.007

ANOGMIVS EVOLUTUS Cope.

This fish is represented by an entire left mandibular ramus. As corresponding parts are preserved in the typical specimens of *A. aratus* and *A. favirostris*, comparison with these species is easy.

The ramus is less curved than in either of the species mentioned, indicating an elongate and wedge-shaped head. The symphysis is short; deeper than wide, and but little incurved. The ramus is much contracted vertically at the glenoid cavity, which is deeply impressed and decurved on the inner side, having thus a convex transverse section. The angle is recurved behind the glenoid cavity, and also produced for a short distance in line with the inferior margin of the ramus, this portion being separated by a sinus from the superior process. The form of the angle is then that

of a boot with the toe elevated. The inferior edge of the inferior process is acute.

The inferior border of the ramus is thin. The superior border is thickened, and its tooth bearing surface descends on both the internal and external faces of the bone. Posteriorly, this face is presented inwards, but this tooth-band narrows forwards on this side, and widens on the external face. Its greatest width on the latter is posteriorly, an inch in front of the widest internal exposure; it then gradually contracts, its inferior border rising to a short distance behind the symphysis.

The dental alveoli are small and round, densely packed, and sub-equal in size. Near the middle of the ramus, thirty longitudinal rows may be counted. Not a tooth remains. A transverse section of the greater part of the length of the dentary is strongly convex; anteriorly it is flattened above.

<i>Measurements.</i>	<i>M.</i>
Length of ramus.....	.234
“ “ tooth band.....	.150
Depth of symphysis.....	.016
“ at posterior end of tooth band.....	.050
“ at glenoid cavity.....	.019
“ at angle.....	.030

STRATODUS OXYPOGON Cope.

This fish is represented in Mr. Sternberg's collection by a dentary bone, a probable maxillary, and a portion of the palatine, both the latter without their extremities. A number of vertebræ accompany the jaws, which probably belong to the same individual.

The dentary is narrow and cuneiform, and rather robust for its depth. The tooth band is wide, covering more than half the vertical diameter of the bone, and is bounded below by a groove. The external face is convex. A delicate groove extends along the superior margin just below it; and a wide open groove commences behind the middle of the length and above the middle of the vertical diameter, opening widely behind. The inferior edge is compressed and flat, and is abruptly distinguished from the convex portion. The symphyseal surface is short, and the infero-anterior border is produced into an acute angle. The teeth are in six rows on the widest part of the band. Of these one contains larger teeth than the others; at one point it is the second from the external margin, but its position becomes more interior on the anterior part of the band. The teeth are recurved, round in section, and with simple, very acute apices. These are transparent and vitreous; the remaining portion of the tooth is opaque, and marked with whitish dots. At the anterior extremity of the dentary, but two rows of the smaller sized teeth remain.

The alveolar fossæ of the teeth of the three interior series of the dentary band, have a peculiar character. The internal half of the border has short radiating lines touching its circumference, but the external half supports

three convex lobes of dense tissue. The lateral of these are divergent and dorsal; the median is narrower, and is radial to the circumference. This structure does not appear in the alveolar fossæ of the three external rows. It is probably a hinge like attachment permitting elevation and depression of the teeth of the inner rows.

The supposed maxillary bone presents a wide open groove on both sides. The superior border is convex in section and not so wide as the tooth bearing face, which is slightly oblique. But for this obliquity the section would be that of a T-rail. The groove of the internal face is continued further forward than that of the external face. There are six rows of teeth arranged as in the dentary bone, but in reversed order.

The fragment of palatine bone is densely packed with teeth, which are longer than those of the jaws. Their apices are as in the latter, simple. Those of one border are longer than those of the other, and the alveolar fossæ of these (the only ones I can see) bear the three adjacent tuberosities above described.

The vertebræ considerably resemble those of *Empo*. Their centra in both abdominal and caudal regions are elongate and contracted medially. There is a shallow longitudinal groove at the bases of the neural and hæmal arches, which are divided vertically by a median rib-like buttress. The median lateral portion is smooth or nearly so.

<i>Measurements</i>		<i>M.</i>
Length of dentary bone preserved.....		.0550
Depth " " " at middle.....		.0080
" " dentary tooth band at middle.....		.0050
" " " at symphysis.....		.0045
Length of maxillary bone preserved.....		.0530
" " " tooth.....		.0045
Depth " " at middle.....		.0060
Width " " " "		.0050
" " palatine bone.....		.0100
Diameter of an abdominal vertebra	{ longitudinal.....	.0160
	{ transverse	.0115
	{ vertical.....	.0125

This species differs from the *S. apicalis* in the simple form of the apices of the teeth. The type specimen is much smaller than that of *S. apicalis*.



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