A NEW SPECIES OF CROCODILE, *TELEORHINUS MESABIENSIS*, FROM THE IRON RANGE CRETACEOUS

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A NEW SPECIES OF CROCODILE, *TELEORHINUS MESABIENSIS*, from the Iron Range Cretaceous

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Among the much neglected fossil vertebrates of northern Minnesota's Late Cretaceous rocks, there is noteworthy evidence of a very large marine crocodile. The specimen, consisting only of the anterior portion of the snout was found by Mr. Vincent Garlough and Mr. Gary Garlough during the summer of 1967 in one of the numerous open-pit mine dumps that are so characteristic of the State's iron mining districts. Of closest kinship appears to be *Teleorhinus robustus* Mook, a long-snouted, marine mesosuchian, from the Benton shales of Montana. General form of the present specimen agrees with *T. robustus;* however, certain morphological differences indicate specific distinction. The present specimen is herein described as a new species, *Teleorhinus mesabiensis*.

Family PHOLIDOSAURIDAE

TELEORHINUS MESABIENSIS, new species

Type - SMVP P68.56.1. Anterior end of the snout separated just posterior to the fifth maxillary alveolus on either side of the skull.

Type Horizon and Locality - Coleraine formation (Turonian age), Late Cretaceous. N.E. ¼ Sec. 16, T.56N, R.23W., Itasca Co., Minnesota, (Mesabi Iron Range).

DESCRIPTION

The only specimen of this species available for study is slightly dorso-ventrally crushed so that in dorsal aspect the midline suture is somewhat displaced to the right of center. In palatal view the midline suture is nearly centered. A most distinguishing feature of the specimen is the downturned tip of the snout, essentially like that observed in *T. robustus*, which, of the described pholidosaurs, affords the best resemblance. In the present specimen, the downturned tip is slightly distorted as seen in palatal view (pl. 1).

Premaxillae - Comparisons between *T. robustus* and *T. mesabiensis* are based largely on the premaxillae, which normally show appreciably more variability than some other cranial elements; however, such distinguishing features as described below would not seem to fall within the limits of normal variability.

In 1934, Mook described *Teleorhinus robustus* as a new species, being separated from the type species *T. browni*, which was described by Osborn (1904), in having a more massive form all the way around. The present specimen presents us with a form still more massive in overall aspect as well as being structurally different.

Only two skull openings may be observed in *T. mesabiensis* – both in the premaxillaries (pl. 2). The first of these is the external narial aperture. It is situated further back on the snout than in *T. robustus*. The posterior rim of this opening extends well beyond the level of the maxillo-premaxillary suture. By way of further definition, unlike *T. robustus*, the narial opening is partially divided by a prominent process centered at the rear of the rim and to a lesser degree by a smaller ridge directly opposite on the anterior rim of the opening. The tip of the snout also has the appearance of being more squared off.

A second opening exists in the form of an elongate anterior premaxillary foramen. This is a salient feature on the ventral surface occupying the space on midline between and at a somewhat posterior level to two very large and deep pits that are evidently for reception of the first (right and left) mandibular teeth. The foramen is made quite obvious by its surrounding pedicle. The foramen is also prominent when viewed through the external narial aperture from directly above. It is located on the forward side on the floor of the narial chamber at the midline

suture. There is no evidence of this foramen in *T. robustus*. According to Mook (1934), if present, it would not have been a prominent feature.

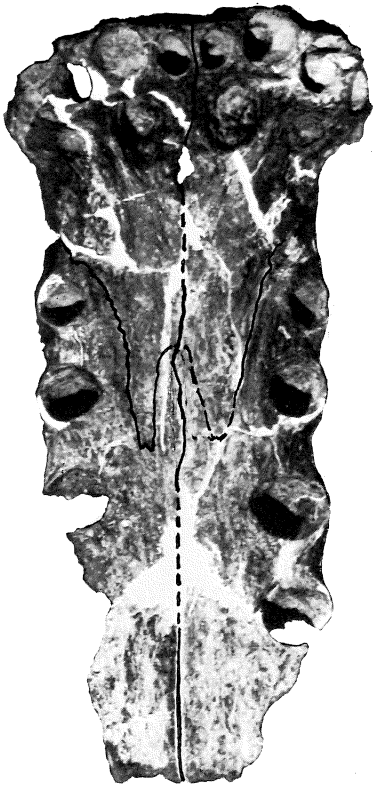

PLATE 1

Teleorhinus mesabiensis, TYPE SPECIMEN SMVP P68.56.1. PALATAL VIEW OF SNOUT. APPROXIMATELY 3/7 NATURAL SIZE.

Arrangement of teeth in the lower jaw is suggested by the above-mentioned pits. In contrasting these two crocodilians, the first tooth in each jaw half was extremely large in *T. mesabiensis* and quite small (perhaps about half the size) in the other species.

The premaxillae are considerably shorter in the present form. On the roof of the snout, it is estimated that they extended back to about the level of the fifth maxillary tooth instead of the

PLATE 2

Teleorhinus mesabiensis, TYPE SPECIMEN SMVP P68.56.1. DORSAL VIEW OF SNOUT. APPROXIMATELY 3/7 NATURAL SIZE.

tenth, and on the palate, reaching only to the position of the third maxillary tooth instead of the fifth. The maxillo-premaxillary suture takes on a peculiar pattern in *T. mesabiensis* in that it extends back to the level of the third maxillary tooth, then reverses direction and extends forward to about the level of the first maxillary tooth where it joins the midline. This can easily be seen in dorsal view where a section of the right premaxilla roofing the nasal passage has been removed (fig. 1).

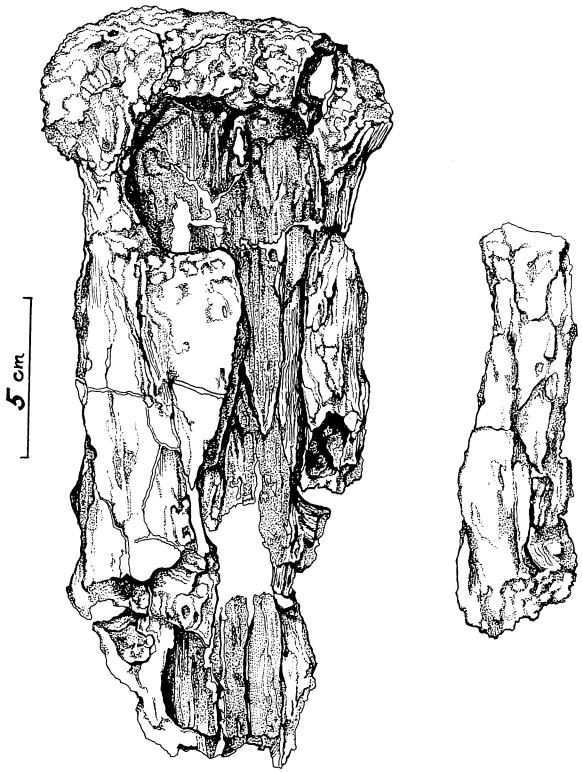

FIGURE 1

Teleorhinus mesabiensis, TYPE SPECIMEN SMVP P68.56.1. DORSAL VIEW WITH SECTION OF PREMAXILLARIES REMOVED. NOTE INTERNAL ASPECT OF MAXILLO-PREMAXILLARY SUTURE.

Ten teeth (5 in each premaxilla) are lined up across the tip of the snout as is characteristic of the genus, ranging in diameter from 10-17 milimeters, with much the same size emphasis of the respective alveoli as *T. robustus*. Two replacement teeth can be observed: one in the third alveolus of the left premaxilla; the other, a much smaller, newly erupted tooth at the bottom of the second alveolus in the same bone. The fourth and fifth alveoli are located higher up at the sides of the downturned tip. As a result, the teeth fitting these would have projected downward and outward at about a 45 degree angle.

Maxillaries - As preserved, the maxillaries resemble those of *T. robustus* strongly including the distinct longitudinal groove separating the palatine portion of each maxilla from the dental border, mentioned by Mook (1934). A noticeable difference exists in the larger alveoli of *T. mesabiensis*. The teeth were not only larger but graduated in size from the first, measuring 12 mm. in diameter through the fourth, which is 20 mm. in diameter. This disagreement in dentition accounts for the fact that the interalveolar spaces are shorter as compared to tooth diameter in the larger form, and not greater as in the smaller species. In this form the alveoli are essentially uniform in size. The diameter of each alveolus is about 10 mm., and the spaces between are 15 mm. according to Mook (1934). The diameter of the alveoli in *T. mesabiensis* are 12-20 mm.; and the spaces between, from 10-16 mm. The maxillary teeth projected somewhat forward and outward.

MEASUREMENTS

Teleorhinus mesabiensis, type, SMVP P68.56.1

	mm.
Overall length, as preserved	203
Maximum breadth, across tip of snout	107
Maximum depth, tip of snout	62
Breadth of snout, anterior to 1st maxillary alveoli	83
Length of external narial aperture, maximum	47
Breadth of external narial aperture, maximum	60
Diameter of 1st maxillary alveoli	12
" " 2nd " "	16
" " 3rd " "	18
" " 4th " "	20

SUMMARY

The presence of a marine crocodile in the Mesabi sediments (Coleraine formation), which are transitional in nature from open shallow sea deposits in the west to estuarine eastward, is not unexpected. Some other associated vertebrate remains will be the subject of a subsequent report on the Coleraine fauna. From invertebrate evidence, Berquist (1944) suggests an age correlation with the lower Benton shales of the western U. S. If this be the case, the present occurrence indicates that *T. mesabiensis* may have been contemporary with the other known members of its genus and was indeed the largest marine crocodile of the time.

Reptilian teeth are occasionally found in association with other fossils in the Mesabi district. In some instances these can be tentatively identified as crocodilian. The single, nearly full-sized tooth preserved in the present form is not especially diagnostic, and it is doubtful that the identification of any of these other occasional "loose" teeth can be made much less provisional on the basis of it. However, it is now possible, in light of the present specimen, to say that some of the "crocodilian" teeth of the Mesabi are in fact that.

The writer wishes to express his sincere appreciation to Dr. Wann Langston for his helpful suggestions on this specimen, to Museum staff members Paul Snyder and Bruce Raymond respectively for their illustrations and photographs, and to Inez Roach for editing and Lydia Wederath for varityping this publication.

REFERENCES

Berquist, H. 1944. Cretaceous of the Mesabi Iron Range, Minnesota. Jour. Paleo., XVIII.

Mook, C. C. 1934. A New Species of *Teleorhinus* from the Benton Shales. Nov. Amer. Mus. Nat. Hist., No. 702.

Osborn, H. F. 1904. *Teleorhinus browni* - A Teleosaur in the Fort Benton. Bull. Amer. Mus. Nat. Hist., XX, Art. XXI.

PLATE 3

Teleorhinus mesabiensis, TYPE SPECIMEN SMVP P68.56.1. LEFT LATERAL VIEW OF SNOUT. APPROXIMATELY 3/7 NATURAL SIZE.