

AMERICAN MUSEUM NOVITATES

Number 357

Published by
THE AMERICAN MUSEUM OF NATURAL HISTORY
New York City

July 6, 1929

56.7,5 (117:78.1)

A NEW TELEOSTEAN FISH FROM THE NIOBRARA OF KANSAS

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An interesting species of fossil fish was recently sent to the American Museum for determination, by Mr. George F. Sternberg, of the Kansas State Teachers College, Hays, Kansas. The specimen consists of a small block of the yellowish chalk characteristic of the Niobrara formation (Cretaceous) of Kansas, on which are two small, deepened fishes, about three inches in length. Both are of one species, which apparently represents an undescribed genus.

Through the kindness of Mr. Sternberg, I here give a description of this new form. I am also indebted to Dr. W. K. Gregory, to whom the specimen was originally sent, for kindly placing it in my hands for study.

KANSIUS, new genus

Small fishes, with a general resemblance to *Holocentrus* in body form, fins, forked caudal, and in having one greatly enlarged anal fin-spine; but distinguished by the much smaller size (less than half the length of the Monte Bolca *Holocentrus*), and by the fact that the soft portions of the dorsal and anal fins are of different shape and lower, not higher, than the spinous portions. Origin of ventrals about opposite origin of pectorals. Operculum with a spinous process in its upper part (possibly more than one, but the specimen is defective here).

Vertebrae, 10 or 11 abdominal and about 14 caudal.

TYPE SPECIES.—*Kansius sternbergi*, new species.

Named for the State of Kansas, which has yielded to science a great wealth of fishes and reptiles of Cretaceous age. The generic name is formed from the abbreviation *Kans.* + *ius*.

Kansius sternbergi, new species

COTYPES.—Two small fishes, represented mostly by impressions, on a block of yellowish chalk, 11.5 by 15 cms. One fish is almost entire, lacking only extremity of the caudal fin; total length (if complete) 78 mm. The second fish shows the entire caudal but lacks the head. The description is based on both fishes.

In the collection of The Kansas State Teachers College, Hays, Kansas. Catalog No. 25.

GEOLOGICAL FORMATION AND LOCALITY.—Niobrara (Upper Cretaceous); one-half mile south of Castle Rock, Gove Co. (about 50 miles west of Hays), Kansas.



Fig. 1. *Kansius sternbergi*, new genus, new species. The two cotypes, on a small block of Niobrara chalk. Natural size.

A small fish, 78 mm. in total length (including caudal). Head slightly less than maximum depth; 3 times in total length.

Dorsal X or XI, and about 11 soft rays; its origin anterior to hind margin of operculum. Soft portion of dorsal follows immediately after spinous without a space between; base of soft dorsal a little more than half the base of spinous portion. Anal V¹, and about 8. Its origin opposite end portion of soft dorsal. Third anal fin-spine greatly enlarged and strong. This spine, under a lens, shows an ornamentation of low, anastomosing, longitudinal wrinklins or ridging.

Pectorals rounded, not reaching vertical through origin of soft dorsal. Ventrals with one spine and, apparently, more than 5 rays. (The number of rays cannot be counted exactly.) Origin of ventrals about opposite origin of pectorals, and opposite fourth spine of dorsal.

Caudal forked, with rounded extremities. Peduncle slender, about 10 in total length.

The cranial bones are not preserved, but in the region of back part of skull there are indications of rugosities, and a spiniferous process is present near upper margin of operculum. A few minute teeth can be made out, with a strong lens, in the mandible. No statement can be made about the type of scales, since no complete scales are preserved.

Named for Mr. George F. Sternberg, whose extensive collections from the Cretaceous of Kansas made by himself, or (in former years) jointly with his father, the veteran field paleontologist, Mr. Charles H. Sternberg, are in many great museums of the world.

To determine the relationship of *Kansius* with certainty, we need to examine the cranial bones, which are not available in the present specimen. We must therefore be guided by less important characters, considered collectively, namely—the form of the fish, the position of the fins and the relative development of their spinous and soft portions, the forked caudal, small rounded pectoral, and, that peculiar feature, one greatly enlarged anal fin-spine.

These characters, taken together, agree best with the Holocentridæ (Squirrel-fishes), and I accordingly refer *Kansius* to that family.

The Holocentridæ were not previously known by fossil forms from America; but representatives of the family have been described from the Miocene of Malta, and the Upper Eocene of Monte Bolca, Italy,² and Regan has referred to this family several imperfectly known genera from the Cretaceous of England.³

Only a few genera of the small fishes of the Niobrara are as yet known, and *Kansius* is a welcome addition to the list. Considering the

¹In one of the cotypes (the lower fish in Fig. 1) three anal fin-spines are preserved—the enlarged one and two smaller ones posterior to it—and there is an indication that probably two additional small spines have been lost from the matrix in front of the enlarged one. In the second cotype (upper fish in Fig. 1), there is an impression of a small spine in front of the enlarged one, and a papilla-like spine seems to be present in front of this.

There is therefore no doubt about four anal fin-spines, with a strong probability that there were five, as in the existing *Holocentrus*.

²A. S. Woodward: Cat. Fos. Fishes Brit. Mus., Pt. IV, p. 412.

³C. Tate Regan: Ann. Mag. Nat. Hist., ser. 8, vii, 1911, p. 8.

number of genera and species of large, predaceous fishes that have been described from the Niobrara, we must conclude that a considerable small-fish fauna existed to support them. But the conditions for the preservation of small, delicate forms were evidently not very favorable in that sea—not as favorable, for example, as in the case of the Cretaceous of Syria, from which many genera of small fishes have been described, exquisitely preserved in the fine-grained limestone of that formation.

The fact that two little fishes (and a fragment of a third) occur within the space of this small block, indicates that the Cretaceous genus was more or less gregarious, like existing Holocentridæ.

The greatly enlarged anal fin-spine calls for special comment. This character occurs in only a few families of teleosts, such as the Holocen-

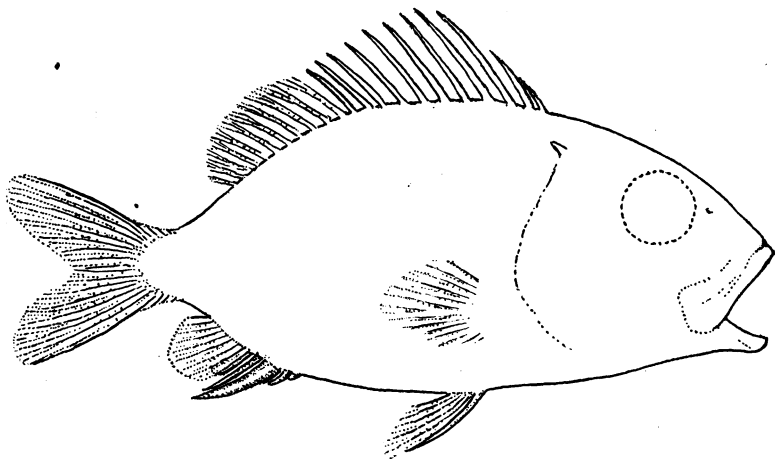


Fig. 2. *Kansius sternbergi*. Restored outline based on the two cotypes. $\times 1\frac{1}{2}$

tridæ (Squirrel-fishes), Hæmulidæ (Grunts), and the Lutianidæ (Snappers). It seems to be best developed in the Holocentridæ. It is remarkable that a seemingly unimportant character like this should persist for such a great length of time—from the Cretaceous up to the present day. It is even more remarkable that its ornamentation of very fine longitudinal wrinklins, which are hardly visible to the unaided eye, and for which we can conceive no function of service to the fish, should likewise have persisted during this vast period of time, unaffected by evolutionary change.

An analogous case is afforded by the microscopic markings on the scales of teleosts, which, as Professor Cockerell has shown in his papers on fish scales, are constant in some families, so that it is often possible to identify the family to which a given fish belongs by only a few scales.