Late Pleistocene Fishes of the Clear Creek and Ben Franklin Local Faunas of Texas

TERUYA UYENO*

ABSTRACT

Fossil fishes of the Clear Creek local fauna, assigned to the Sangamon interglacial stage, and of the Ben Franklin local fauna, which is of Late Wisconsin glacial age, are here described. All of the species that were found live today in the same area, and are more or less widely distributed east of the Rocky Mountains in North America. As compared with the changes that have occurred in the mammalian fauna, the fish fauna in this area seems to have been rather stable during the Late Pleistocene and Recent.

In recent years, abundant remains of Late Pleistocene mammals have been discovered in Texas (Stovall and McAnulty, 1950; Slaughter, *et al.*, 1962; Dalquest, 1962; etc.). Although fossil fishes have also been unearthed along with the mammals, they have not yet been as thoroughly studied (Uyeno and Miller, 1962).

Using a washing technique similar to that described by Hibbard (1949), Mr. Bob H. Slaughter has recovered fossil fishes from the Clear Creek and Ben Franklin local faunas. In contrast with the mammalian fossils described elsewhere in this symposium, the fish remains are rare and fragmentary. All of the specimens described have been deposited in the Shuler Museum of Paleontology at Southern Methodist University.

Thanks are due to Mr. Slaughter for the specimens and for data pertinent to the completion of this study, which was supported by National Science Foundation Grant 15914 to Robert Rush Miller of the University of Michigan. I am grateful to Dr. Miller for valuable suggestions in preparing the manuscript.

THE CLEAR CREEK LOCAL FAUNA

The fossil fishes described below were washed — along with molluscan, mammalian and herpetological remains — from about ten tons of alluvium. They were found in the second terrace above Clear Creek, at Trietsch Pit, which is situated on the northeast side of the creek four miles upstream from its junction with Elm Fork of the Trinity River in Denton County, Texas. The fossils were embedded in six to eight feet of coarse to fine, sandy clay, heavily charged with

* Museum of Zoology, University of Michigan

iron in some places and with freshwater marl in others. From the evidence of the mammalian fauna and radiocarbon dating, the fossil-bearing bed is assigned to the Sangamon interglacial stage (Slaughter and Ritchie, this symposium).

Family LEPISOSTEIDAE

Lepisosteus sp.

Fig. 1, A.

Referred specimens.—Seven gar scales, of which four are almost complete (SMUMP 60740). The smooth surface suggests that these scales belong to *L. oculatus* (Winchell) or *L. platostomus* Rafinesque.

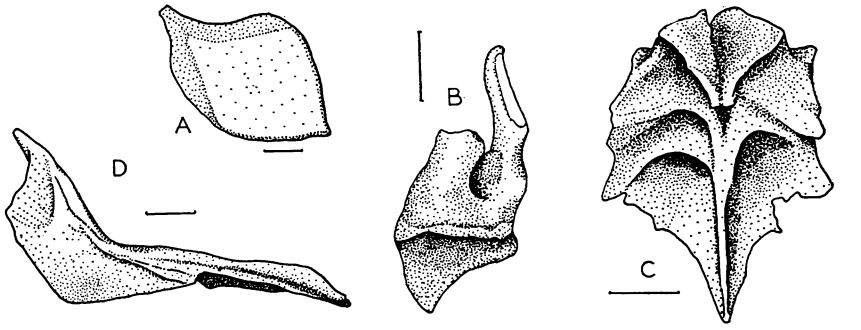


Figure 1. A, lateral view of a gar scale (SMUMP 60740); B, anterodorsal view of an incomplete left pharyngeal of *Campostoma* ? (SMUMP 60741); C, dorsal view of the urohyal of *Ictalurus* sp. (SMUMP 60746); D, lateral view of a right cleithrum of *Lepomis* sp. (SMUMP 60747). Scale bars indicate one millimeter except as D, which represents 3 millimeters.

Family CYPRINIDAE

Campostoma?

Fig. 1, B.

Referred specimens.—A piece of pharyngeal bone with two broken teeth (SMUMP 60741). The presence of a grinding surface, a slightly hooked tip, and a single row of teeth support this tentative identification.

Family CATOSTOMIDAE ?

Referred specimens.—17 vertebrae (SMUMP 60742), and one half of a fairly large, regenerated scale (greatest diameter, 14mm) (SMUMP 60743). Since vertebrae and scales are not absolutely diagnostic, this identification is tentative.

Family ICTALURIDAE

Ictalurus punctatus (Rafinesque) or *I. furcatus* (LeSueur)

Referred specimen.—The proximal half of a left pectoral spine (SMUMP 60744). Three moderately developed dentations along the posterior edge of the spine indicate that it represents one of these catfishes. The form is similar to Fig. 2, E.

Ictalurus melas (Rafinesque) or *I. natalis* (LeSueur)

Referred specimen.—The proximal two-thirds of a right pectoral spine

(SMUMP 60745). The smooth posterior edge of the spine suggests that this material belongs to either the brown bullhead or yellow bullhead.

Ictalurus sp.

Fig. 1, C.

Referred specimen.—The proximal one-third of the lower jaw, seven cleithra, and an incomplete urohyal (SMUMP 60746). These remains are too fragmentary for identification below the generic level.

Family CENTRARCHIDAE

Lepomis sp.

Fig. 1, D.

Referred specimens.—An incomplete cleithrum and the proximal one-third of the left lower jaw (SMUMP 60747). The identification was made by Gerald R. Smith of The University of Michigan Museum of Zoology who is making a comparative study of these bones in sunfishes.

Nine of the 30 mammalian species found with the above fish remains are extinct, including mammoth, camel, bison, peccary, horse, and ass (Slaughter and Ritchie, this symposium). The habitat relations of the fishes and their small sizes probably indicate that the water body which they inhabited was a rather small pond with inlet and outlet or river pool of low gradient with some vegetation. All of the fishes thus far discovered in the Clear Creek local fauna are living in the same area today (Hubbs, 1958), and are widely distributed in the temperate to subtropical climatic zone east of the Rocky Mountains in North America.

THE BEN FRANKLIN LOCAL FAUNA

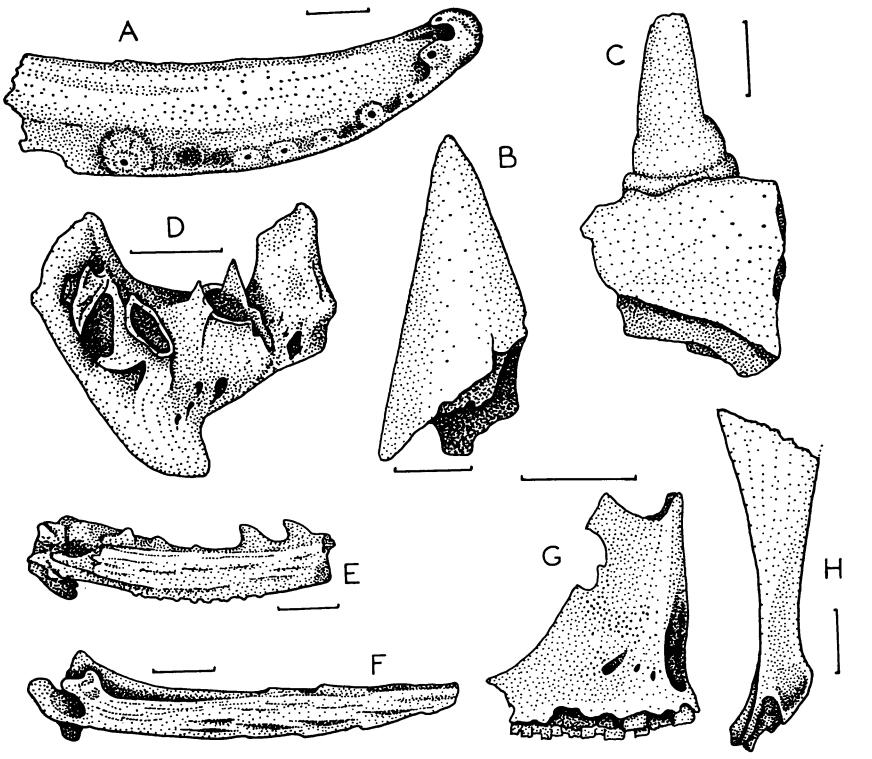
The Ben Franklin local fauna from the Sulphur River Formation is described by Slaughter and Hoover in this symposium. The fish fossils described below were found with molluscan, mammalian, and herpetological materials in several tons of matrix. These remains are from five quarry sites near the state highway 38 bridge crossing the Sulphur River, a tributary of the Red River, just north of the town of Ben Franklin, Delta County, Texas. All quarries are within six hundred yards of the highway bridge. The age of the fossil-bearing bed is reported as Late Wisconsin by Slaughter and Hoover.

Family ESOCIDAE

Esox sp.

Fig. 2, A - C.

Referred specimens.—The anterior half of a dentary (SMUMP 60749), four teeth (SMUMP 60750-60752), and 61 vertebrae (SMUMP 60753-60754). Though the remains are too fragmentary for specific identification, information on the age of the formation, recent distribution of species of *Esox*, and the size of the fossils suggest that the fragments belong to *Esox americanus* Gmelin or *E. niger* LeSueur.



Figue 2. A - C, *Esox* sp.: A, dorsal view of right dentary (SMUMP 60749); B, lateral view of tooth (SMUMP 60751); D, *Notemigonus crysoleucas*: dorsal view of an incomplete pharyngeal (SMUMP 60755); E, *Ictalurus punctatus* or *I. furcatus*: dorsal view of right pectoral spine (SMUMP 60757). F, *Ictalurus melas* or *I. natalis*: dorsal view of right pectoral spine (SMUMP 60756). G - H, *Lepomis* sp.: G, anterior view of median part of premaxilla (SMUMP 60763); H, lateral view of lateral part of maxilla (SMUMP 60764). Scale bars indicate one millimeter.

Family Cyprinidae

Notemigonus crysoleucas (Mitchill)

Fig. 2, D.

Referred specimens.—16 pieces of pharyngeals (SMUMP 60755), some of which retain teeth. The teeth are in a single row, have a weakly-developed grinding surface, and the dental formula is 5-5. The posterior part of the dentigerous surface is considerably elevated. These features are characteristic of the golden shiner.

Family Catostomidae

Referred material.—The fragment of an opercle (SMUMP 60769). The form of the anterodorsal projection indicates that the specimen belongs to this family.

Family ICTALURIDAE

Ictalurus punctatus (Rafinesque) or *I. furcatus* (LeSueur)

Fig. 2, E.

Referred specimens.—Parts of 9 pectoral spines (SMUMP 60757). These spines have moderately-developed serrations along their posterior edges that are indicative of these species. The serrae are not strongly curved as in species of *Noturus*.

Ictalurus melas (Rafinesque) or *I. natalis* (LeSueur)

Fig. 2, F.

Referred specimens.—23 pieces of pectoral spines (SMUMP 60756). The posterior edges of the spines are weakly or not at all serrated.

Ictalurus sp.

Referred specimens.—Fragments of the following bones: 30 cleithra (SMUMP 60758), 5 premaxillae (SMUMP 60759), 8 dentaries (SMUMP 60760), 68 pieces of proximal ends of spines (SMUMP 60761), 1 basioccipital, 2 opercles, 2 lower jaws, 1 urohyal, 1 left coracoid, and 1 first dorsal proximal pterygiophore (SMUMP 60762).

Family CENTRARCHIDAE

Lepomis sp.

Fig. 2, G. and H.

Referred materials.—The median part of a premaxilla (SMUMP 60763), 3 fragments of maxillae (SMUMP 60764), 7 atlas vertebrae (SMUMP 60766), fragments of a urohyal, 1 opercle, and 1 first anal pterygiophore (SMUMP 60765). This material was also identified by Gerald R. Smith.

Incertae sedis

Referred materials.—Many vertebrae (SMUMP 60767 and 60768) and many miscellaneous spines (SMUMP 60770).

Among the 22 mammalian species collected with the fish remains, *Sorex cinereus, Blarina* sp., *Microtus pennsylvanicus* and *Synaptomys* suggest considerably cooler weather — especially in the summer — than now prevails in northeastern Texas. However, all of the fishes thus far discovered in the Ben Franklin local fauna are living in the same area today, and are more or less widely distributed throughout the temperate to subtropical climatic zone to the east of the Rocky Mountains.

Judging by their size and species the fishes of the Ben Franklin local fauna lived in a rather small body of water which was probably similar to the one described in the Clear Creek local fauna.

Examination of fossils from Clear Creek, Sulphur River, and the T-2 terrace of the Trinity River in Texas (Uyeno and Miller, 1962) has now revealed eleven species of fishes, including two gars, one pickerel, two minnows, one sucker, three catfish, one sunfish, and the freshwater drum. In comparison with the mammalian

faunas, which exhibited remarkable changes between Sangamon or Wisconsin time and the Recent, the ichthyofauna appears to have remained relatively stable.

REFERENCES CITED

Dalquest, W. W., 1962, The Good Creek Formation, Pleistocene of Texas, and its fauna: J. Paleont., v. 36 (3), p. 568-582.

Hibbard, C. W., 1949, Techniques of collecting microvertebrate fossils: Univ. Michigan, Mus. Paleont., Contr., 8 (2), p. 7-19.

Hubbs, Clark, 1958, A check list of Texas fresh-water fishes: Texas Game and Fish Comm., Div. Inland Fish., IF ser. no. 3, p. 1-14.

Slaughter, B. H., *et al.*, 1962, The Hill-Shuler local faunas of the upper Trinity River, Dallas and Denton counties, Texas: Univ. Texas, Bur. Econ. Geol. Rep. Investig. no. 48, p. 1-75.

————, and Hoover, B. R., 1963, Sulphur River Formation and the Pleistocene mammals of the Ben Franklin local fauna: This symposium.

————, and Ritchie, Ronald, 1963, Pleistocene mammals of the Clear Creek local fauna, Denton County, Texas: This symposium.

Stovall, J. W., and McAnulty, W. N., 1950, The vertebrate fauna and geologic age of Trinity River terraces in Henderson County, Texas: Am. Midl. Nat., v. 44, p. 211-250.

Uyeno, Teruya, and Miller, R. R., 1962, Late Pleistocene fishes from a Trinity River terrace, Texas: Copeia, 1962 (2), p. 338-345.