

## Growth of Young Gar (*Lepisosteus*) in Aquaria<sup>1</sup>

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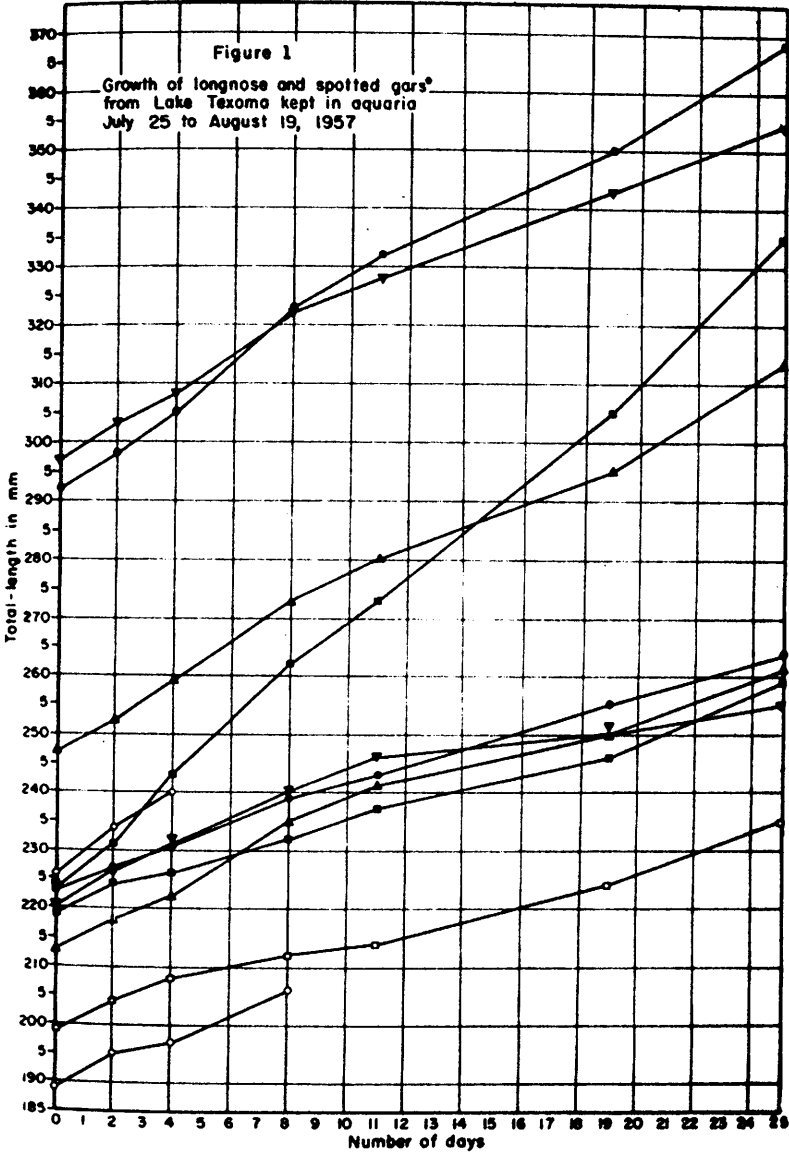
Conditions for spawning in Lake Texoma in the spring of 1957 were apparently excellent for gars (*Lepisosteus*), particularly the longnose gar, *L. osseus*, and the spotted gar, *L. productus*. Young-of-year of both species were common and were collected regularly in small seines throughout most of the summer.

Specimens of both species were brought into the laboratory and placed in aquaria for class observation. We became so fascinated by several aspects of their behavior that we kept from 10 to 15 throughout the summer. When these fish reached an average total-length of about 240 mm., it occurred to us that since they were constantly being supplied with abundant food which they were eating regularly and apparently naturally, and since their rate of growth was quite similar to that of young gar which we were still collecting in the lake, we might accurately determine the growth rate of the fish kept in the aquaria for the remainder of the summer. Five long-nose gar and six spotted gar were used. Each fish was kept in a separate 10-gallon aquarium. The fish were weighed and measured individually (as rapidly as possible) between 8:00 and 10:00 P.M. They did not seem to be particularly disturbed by the process since their behavior was apparently normal as soon as they were returned to the aquaria. At least three different gar ate a small fish within 10 minutes after the gar had been returned to the aquarium.

The first measurements were made on July 25, 1957, the last on August 19. These included total-lengths in mm. (to the nearest mm.) and weight in grams (to the nearest half-gram). Unfortunately, we were not able to make the measurements at regular intervals over the 25-day period. The intervals between measurements were 2,2,4,3,8, and 6 days. Average daily growth during these intervals ranged from 2.4 to 4.0 mm. for the longnose gar, and 1.1 to 2.6 mm. for the spotted gar. The smallest average daily growth for both species occurred in the 8-day interval; the greatest in the 4-day interval for the longnose gar and the first 2-day interval for the spotted gar. During the entire period, each gar was provided daily with more small fishes than it was able to eat; therefore, the differences in daily growth are not due to fluctuations in food availability. The fact that the greatest daily growth occurred during the shorter intervals between measurements is further indication that the process of measurement did not interfere with growth.

During the period of observation, the longnose gar grew more rapidly than the spotted gar in both length (Figure 1) and weight. The average daily increment in length was 3.2 mm. (range: 2.3 to 4.5) for the longnose gar, and 1.7 mm. (range: 1.4 to 2.1) for the spotted gar; average daily weight increments were 1.8 gms. (range: 1.3 to 2.3) and 1.0 gms. (range: 0.7 to 1.3) respectively. On the first day of the observations, the length of one fish of each species was 223 mm. (Figure 1). By the end of the period, the length of the longnose gar increased 112 mm., the spotted gar, only 41 mm. This is not typical of the differences in growth rate, because this longnose gar had the greatest total growth of all of the gar observed, but it is indicative of the more rapid growth.

<sup>1</sup> Contribution of the University of Oklahoma Biological Station, Lake Texoma.



\*The lower six curves are for the spotted gar;  
the upper five are for the longnose gar.

Growth curves for *L. productus* are more uniform than those of *L. osseus* (Figure 1). At the beginning of the observations the difference in the length of the smallest and largest spotted gar was 24 mm.; at the end it was 29 mm. Similar differences for *L. osseus* were 74 mm. and 56 mm., respectively.

Since our data are based on so few fish and since these fish were raised under artificial conditions, we cannot be certain that the growth rate of the experimental fish is representative of the fish in Lake Texoma. However, on August 16, seven young-of-year longnose gar were taken from the lake in a 25-foot bag seine with  $\frac{1}{4}$ -inch mesh. The lengths of these gar ranged from 227 mm. to 364 mm. The average length, 346 mm., compares favorably with the average of 343 mm. for the aquarium-raised longnose gar on August 19.

We have been unable to find any comparable data in the literature on growth of gars. Hammett and Hammett (1939) studied proportional length growth of a gar, presumably *L. platostomus*, but unfortunately provided no data on growth rate. From July 10 to October 8, 1954, Dr. Virgil E. Dowell, at that time a graduate student working at the University of Oklahoma Biological Station, attempted to determine increments in total-length for seven young gar including four *L. osseus*, one *L. productus*, and two *L. platostomus*. The average daily length increment for these fish for the period of July 25 to August 15 was 2.7 mm. for *L. osseus* and 1.5 mm. for the *L. productus*. The average length of these longnose gar on July 25 was 253 mm., similar to the average length of our *L. osseus* (257 mm.) on the same date in 1957.

One of the fascinating aspects of the behavior of the young gar was the use of what we called the notochordal filament for locomotion. This very thin, lance-shaped structure is apparently the posterior end of the notochord and it extends upward and posteriad from the upper margin of the caudal fin. It can be flexed to either side and vibrated rapidly. In this way it is used to propel the fish slowly. This filament is above the ray-supported portion of the caudal fin. It is obviously not present in gar more than 10 inches long. In these larger gar the notochord extends into the fleshy, scale-covered upper portion of the abbreviate-heterocercal tail. Sometime then, during the first few months of life of the gars, the filament becomes adnate to the lower portion of the caudal fin.

We determined the length of the gar at the time of adnation for nine of the 11 specimens measured. The tail of one fish was too badly damaged for this determination, and the filament of the remaining fish remained free until the close of our observations. The average total-length at adnation for the spotted gar was 236 mm. (range: 210 to 250); for the longnose gar it was 279 mm. (range: 247 to 301).

#### LITERATURE CITED

- Hammett, F. S., and D. W. Hammett. 1939. Proportional length growth of gar (*Lepisosteus platyrhincus De kay*). Growth 3 (2): 197-209.