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The Changes in Growth Rates, Ages, and Feeding for the Largemouth Bass

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**Introduction**

*Micropterus salmoides* otherwise known as Largemouth Bass have a very diverse life including their growth (meristics and morphometrics), reproduction, and feeding. Largemouth Bass can be found in rivers and lakes all over. They are not listed as endangered or close to extension, and the population levels of Largemouth are regulated for commercial use (IUCN, 2018). Though this is true, some ecological pressures and habitat changes can directly affect a fish, but it was found that characteristics of their habitat such as water area and maximum depth has no direct correlation to the bass’ growth rates or morphology (Daniel, 2000).

All Largemouth Bass can mature after a year, thus resulting in faster spawning times than other fish. Though the bass mature quickly, it is found that female bass grow at a significantly slower rate than males (Beamish, 2005). It was also found that the maturity of the bass can be dependent on the size of the fish and not just the age (Gibertini, 2007). Once maturity is reached the fish spawn once a year and are iteroparous meaning they can reproduce many times. Studies have shown the gonadal weight in both sexes after spring drops, this means that reproduction takes place in a short amount of time (Rodriguez-Sanchez, 2009). This occurrence is most likely to maximize energy and time.

Largemouth Bass are piscivory species meaning they are carnivorous and eat mainly fish. Piscivory by Largemouth Bass causes resource partitioning of smaller species in the ecosystem. The largemouth decides its prey size compared to their own size (Do, 2016). Once they are larger, they prefer large adult species to maximize their energy. It was also found that they can travel in schools up to 1000 fish and are usually found in or around aquatic vegetation. This helps them with capturing food and minimizing energy costs (Bettoli, 1992). Predation of Largemouth can largely affect benthic species during the fall and winter, but it was found that during the spring the predation doesn’t show a drastic change in the benthic species population (Gilinsky, 1984).

Largemouth Bass are able to grow large in size quickly, live a long time, and breed successfully for multiple years. A rising issue of this trait is that they can be very dangerous and cause significant ecological damage to other species (Beamish, 2005). The purpose of this study was to compare the growth rates, ages, and feeding of the Largemouth Bass in Briery Creek Lake to previous studies in that area.

**Methods**

*Collection:*

Thirteen fish specimens were collected through electrofishing on September 21st at Briery Creek Lake located in Farmville Virginia. Nets were used to scoop the unconscious fish out of the water and place them into a holding container. The fish were then examined for length. The larger fish were kept, and the smaller ones were returned to the water. The fish were placed into a bucket to be euthanized in MS-222 and later stored in ethanol.

*Examination:*

The thirteen fish were analyzed individually by the four group members. A ruler and caliper were used to determine the morphometrics of the fish, and a teasing needle and microscope were used for the meristic data. The fish were analyzed on different lengths, spine, ray, and scale counts, and weight. Each fish was assigned with its own identification number, and an area was clipped on the fish to show a visual signification that the fish was analyzed. The fish were then cut open to exam gut contents. The fish were tossed shortly after and the examination ended due to rotten fish.

**Results**

*Meristic data*

Graphs and tables were created to compare scale, spine, and ray counts. Average scale counts for all thirteen fish were collected from the following areas: the predorsal area, above the lateral line, below the lateral line, and along the lateral line. Standard deviation error bars were also added to show the extent of deviation. The scale counts along the lateral line averaged to be the largest number; this is expected because it runs almost the entire length of the body (meaning more scales). The smallest average scale counts were found above the lateral line; this is also expected because it is a shorter area of the fish (Figure 1). Spine counts were taken for the dorsal and anal fins of the thirteen fish. The least number of spines per fin and the greatest number of spines per fin for all thirteen fish were compared (Table 1). Ray counts were also taken for the caudal, pectoral, pelvic, dorsal, and anal fins. The least number of rays per fin and the greatest number of rays per fin for all the fish were compared as well (Table 2).

*Morphometric data*

Graphs were created to compare the ratio to the standard length and the ratio to head lengths. Measurements were taken and ratioed for the predorsal length, prepelvic length, body greatest depth, caudal peduncle least depth, dorsal fin, pectoral fin, pelvic fin, and anal fin lengths. Standard deviation bars were added as well. Predorsal length is the largest and can be expected because it is one of the longest measurements running from the top lip of the fish to the beginning of the dorsal fin. Caudal peduncle least depth is one of the smallest measurements and this is expected as well because it is the smallest measurement running from the top of the caudal peduncle to the bottom (Figure 2). Measurements were taken and ratioed for the head width, head depth, preorbital length, orbit diameter, upper jaw length, and gape width. Standard deviation error bars are also present for each area measured. Head depth was the largest measurement because it runs from the top of the head to the bottom of the head in a vertical measurement. The orbit diameter was the smallest because it is just the size of the eye (Figure 3).

**Discussion**

The original comparison that was desired could not be performed. Minor issues arose and eliminated some of the study. The fish’s otoliths and scales were taken to eventually determine age. Since time was limited the otoliths and scales were scrapped, and the age was never determined. The weight was going to be compared to the fish’s ages and used to create a growth and age plot, but due to the lack of information of age the plot was not created. The feeding analysis and sex of the fish was not preformed due to the fish being rotten inside. The main comparisons that can be made with other studies are the morphometric and meristic data collected. The data that is present doesn’t represent a large discovery, but it does help with other studies. Further analysis can be done on Briery Creek Lake such as capturing the fish and preforming another experiment.

**Figures**

**Figure 1. Average scale counts.** Scale counts for every fish were taken and averaged for the following areas: predorsal, above lateral line (LL), below (LL), and along (LL). Standard deviation error bars (black bars) are also present for each area.

**Figure 2. Ratio to standard length.** A ratio was taken for the following lengths: predorsal, prepelvic, body greatest depth, caudal peduncle (cp) least depth, dorsal fin, pectoral fin, pelvic fin, and anal fin. Standard deviation error bars are also present for each length.

**Figure 3. Ratio to head lengths.** A ratio was taken for the following measurements: head width, head depth, preorbital length, orbit diameter, upper jaw length, and gape width. Standard deviation error bars are also present for each area measured.

**Tables**

|  |  |  |
| --- | --- | --- |
|  | Least # of Spines | Greatest # of Spines |
| Anal Fin | II | III |
| Dorsal Fin | VIII | IX |

**Table 1. Spine counts.** Spines were counted for the anal and dorsal fins of the thirteen fish. The least number of spines found per fin are listed as well as the greatest number of spines found per fin.

|  |  |  |
| --- | --- | --- |
|  | Least # of Rays | Greatest # of Rays |
| Caudal Fin | 17 | 20 |
| Pectoral Fin | 12 | 15 |
| Pelvic Fin | 5 | 7 |
| Dorsal Fin | 12 | 14 |
| Anal Fin | 18 | 13 |

**Table 2. Ray counts.** Rays were counted for the fins of the thirteen fish. The least number of rays found per fin are listed as well as the greatest number of rays found per fin.

**Citations**

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