

# Correlating Scale Growth with the Maturity of the Lateral Line Scales in Blacktail Shiner *Cyprinella venusta*

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## Abstract

In this preliminary study *Cyprinella venusta* (Blacktail Shiners) scales were analyzed and the growth of circuli located on each scale were correlated with the growth of the lateral line. This study was conducted using a combination of seine, dip nets, and scanning electron microscopy. After preserving the fish, the 7th scale from the operculum located on the lateral line, was removed, magnified, and measured. As expected, there was a clear correlation between the growth of the scale and maturity of the lateral line.

## Introduction

The Blacktail Shiner has lateral scales which help the fish detect changes in its surroundings. However, there is no certainty if these abilities increase as the fish ages, or if they are born fully equipped with all lateral pores [1]. This study will focus on recording how the lateral scales correlates with growth and formation of the scales, and if the circuli within them mature into annuli as the fish ages [2].

## Methods and Materials

Sampling was conducted at 5 sites in the Big Thicket National Preserve and Lake Ray Hubbard. Sampling was conducted using a Seine. The fish were preserved in 20% Formalin solution for a period of approximately 5 days to fix the tissues. From the pool of collected fish, 12 were used ranging in size from 2cm to 10cm in length. The 7th lateral scale away from the operculum was removed from each specimen in order to observe changes in the lateral line and annuli formation as the fish progressed in age and length. The specimens were viewed with a Scanning Electron Microscope Hitachi S-3400N at magnifications between 30 and 70 times actual size for analysis. Micrographs of each scale were taken and measurements of scales length, scale width, lateral line length, and lateral line width were recorded.

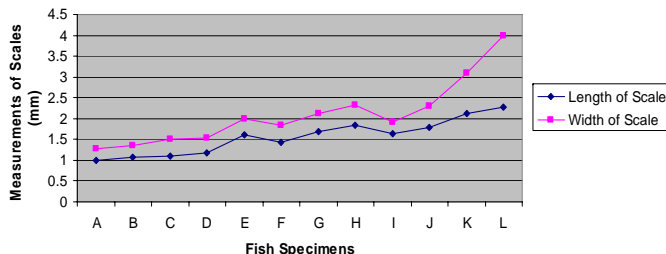


Figure 1. Full body of the *Cyprinella venusta* (Blacktail Shiner). Photo taken by Mary Blake.

## Results

The results state that there is a steady correlation between the scale growth and the maturity of the lateral line scales as the fish ages. The circuli also extend. Most importantly, the data clearly shows that the length and width of both scales and lateral lines increase, however, no annuli were found in any of the scales.

Scale growth in *Cyprinella venusta*



Graph1. Shows of the trend of growth in lateral line length and width as measured under SEM. Units are millimeters.

## Discussion

As the scales grew the lateral lines also grew and matured. The scale growth increased width wise because it helped cover more surface area on the body. Although there were larger and perhaps older fish, some of their scales were smaller in comparison to younger fish with larger scales. This is an unknown variable which could be linked to the location caught or amount of food consumed. No annuli were found, but there were other factors indicating fish had lived more than a year. The graph shown displays how steadily scales and lateral lines grow, but do not indicate reasons for variations.

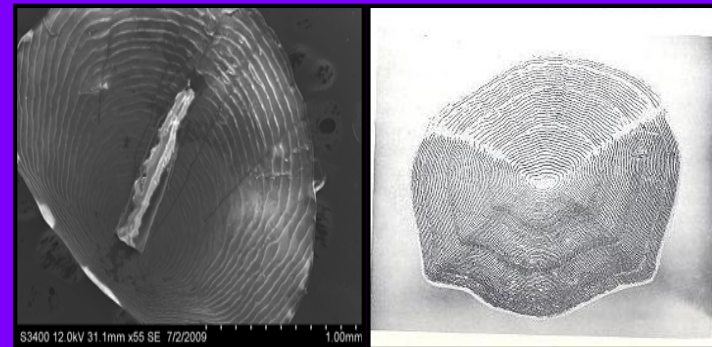


Figure 3. Lateral scale found on Blacktail Shiners, micrograph taken with SEM. Figure 4. Scale showing annuli. R.E., Lennon Fish and Wildlife Services.

## Literature Cited

1. Robins, C.R., Baily R.M., "Cyprinella Venusta." *American Fishers Society*. 20 June 2007. pg 1-8. <http://www.natureserve.org/explorer/servlet/NatureServe?sourceTemple>
2. Behavior in Texas and Blacktail Shiners." *Brief Communications* 27 February 2003. pg 776-782

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