An Assessment of Otoliths, Spines, and Scales for Assigning Ages to Ruffe

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Introduction

- Ruffe (*Gymnocephalus cernuus)* is invasive to Lake Superior
- The age of Ruffe has been estimated from a variety of calcified structures
- No study has determined which calcified structure provides the most accurate estimate of age for Ruffe

Objective

- Determine the most interpretable structure for estimating the age of Ruffe

Methods

- Ruffe were collected from several locations within the Lake Superior watershed in 2008
- Scales (n=535), spines (n= 15), and otoliths (n= 75) were removed from a subsample of fish
- Scales were pressed into acetate (Figures 1A & 2A)
- Spines (Figures 1B & 2B) and otoliths (Figure 2C) were set in epoxy and sectioned
- Otoliths were also cracked and burnt (Figure 2D)

Results

- Scales (Figures 1A & 2A) and spines (Figures 1B & 2B) generally showed the clearest and most distinct annuli
- Annuli were difficult to identify on spines from young, small fish (Figure 1B) and on scales from large, old fish (Figure 2A)
- Otoliths did not exhibit distinct annuli and included several other checks or false annuli (Figures 2C & 2D)

Conclusions

- Scales and spines hold the most promise for assigning accurate ages to Ruffe
- Scales may be used for small, young fish
- Spines may be used for large, old fish

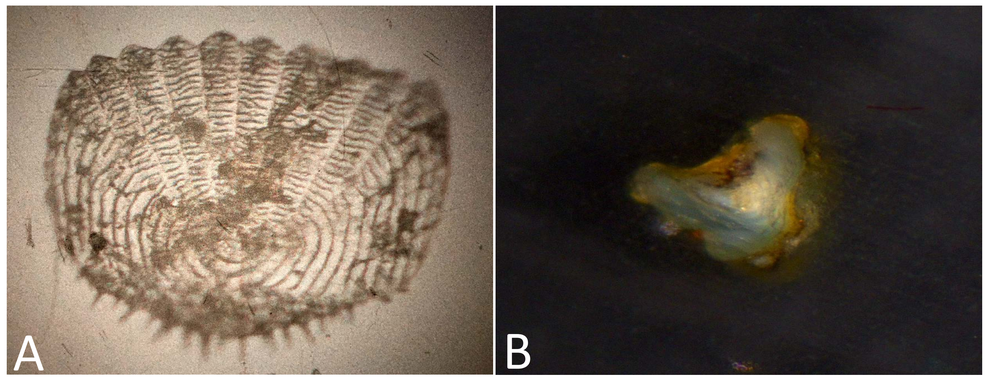

Figure 1. Pressed scale (A) and sectioned spine (B) from a 61 mm Ruffe

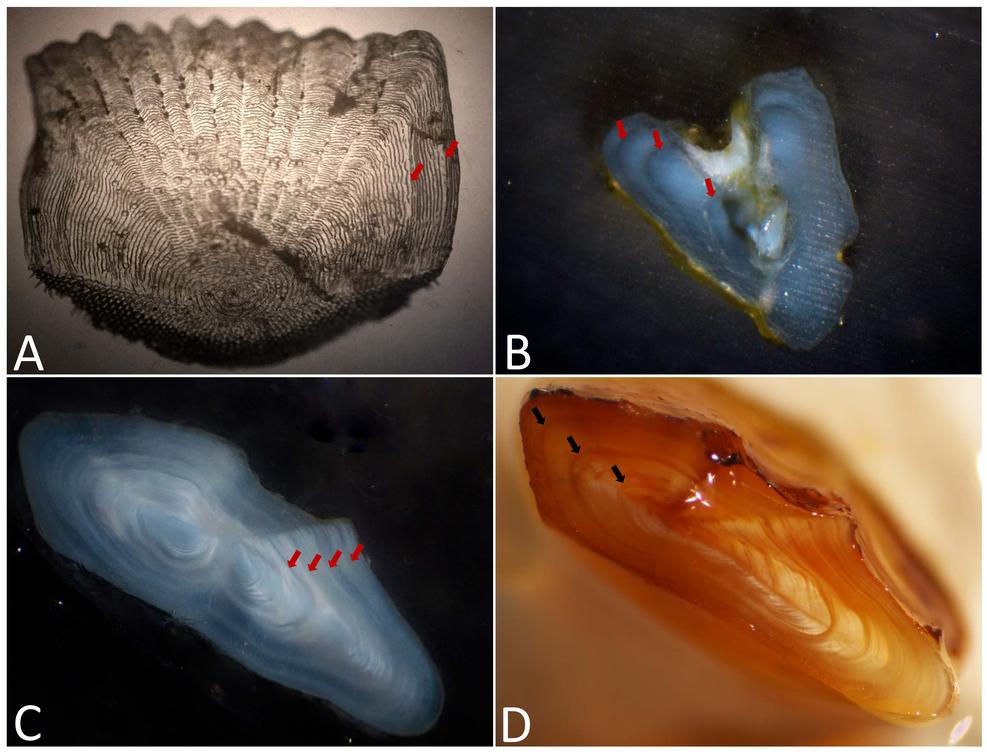

Figure 2. Pressed scale (A), sectioned spine (B), sectioned otolith (C), and cracked and burnt otolith (D) from a 161 mm Ruffe (putative annuli marked with arrows)

Future Work

- Assess the precision and accuracy of scales and spines for assigning age, especially in relation to the size of the fish