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Abstract

Effect of Experimental Bubble and Light Barriers on Fish Attraction or Repulsion †

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Abstract

Introduction: The entry and accumulation of fish inside the suction tubes of hydroelectric power plants can pose risks to these animals. To protect ichthyofauna, repulsion systems employing diverse methodologies have been developed. **Objective:** The main objective of this study was to investigate the dissuasive effectiveness of a bubble and light barrier on ichthyofauna. **Methodology:** The experiment consisted of video recording in three stages, performed in triplicate: before activating the barrier, while the barrier was active, and after deactivating it. The movement of five juvenile Amazonian species (*Cichlasoma amazonarum*, *Dianema urostriatum*, *Pimelodus blochii*, *Brycon* spp., and *Colossoma macropomum*) was analyzed across the three stages by counting individuals in specific sectors every 15 s. A total of 30 specimens of each species were used, with 10 individuals allocated to each aquarium. **Results**: Barrier activation induced repulsion in *Pimelodus blochii*, *Brycon* spp., and *Colossoma macropomum*, but attraction in *Cichlasoma amazonarum* and *Dianema urostriatum*. The study reveals that the tested species respond dissimilarly to stimuli from the behavioral barrier. **Conclusions:** These findings address a research gap regarding native species′ responses to behavioral barriers. They underscore the importance of understanding regional ichthyofauna behavior for designing optimized bubble and light barrier systems to enhance method efficacy. The observed effectiveness highlights the potential of this robust, low-cost technology for ichthyofauna protection in hydroelectric plants.

Keywords: deterrence of ichthyofauna; air bubbles; lights; behavioral effect; behavioral barriers

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