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Effects of foil shape on fish-like swimming. COOPER KOVAR, MARGARET BYRON, AZAR ESLAM-PANAH, Penn State University — Aquatic animals have evolved a diversity of propulsive mechanisms to locomote effectively through water. Fishes produce hydrodynamic thrust by acceleration of water through movement of their body and tails, while simultaneously reducing the resistance to their motion through morphological design, phased kinematics, and behaviors. In this study, the effect of the shape of a fish-like caudal fin as well as changes in the frequency of the linear motion of the fin is investigated. Many numerical tests have been done due to optical limitations, and it's time for experimental test to confirm the numerical data. Experiments were conducted on a square fin, triangle fin, and forked triangle fin in order to compare and observe the changes in efficiency and thrust produced. Furthermore, the amplitude and frequency of linear oscillations were varied to see the data at different speeds within the optimal Strouhal number range at which fish are more efficient. The results of this research can be used to confirm the data collected from numerical experiments and further be applied to future biomimicry.

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