CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
S1903

Project Title
A Study of How Fish Use Their Pectoral and Caudal Fins during Locomotion against a Current

Abstract

Objectives/Goals
The purpose of the experiment was to determine how different aspects of a fish such as size, body shape, and fin design affect how a fish uses its pectoral and caudal fins when swimming against a current. It was predicted that the size of a fish would play the most impacting role in how much a fish must utilize its fins.

Methods/Materials
A self-constructed flow tank was used to create a one way current in an aquarium. Bala sharks, blue gouramies, and different varieties of goldfsih were then individually placed into the aquarium and were filmed swimming against the current using a lateral and overhead view. The videotapes were then reviewed and the amount of times each fish moved their pectoral fin per second was counted as well as how greatly each fish moved their caudal fin.

Results
The bala sharks tested used the lowest amount of pectoral movements at an average of 1 fin movement per second. The fantail goldfish used the most pectoral fin movements of the fish tested with an average of 3.6 fin movements per second. It was also found that the small common feeder goldfish tested used the smallest caudal fin movements of 35 degrees and the small blue gourami tested used the largest caudal fin movements of 55 degrees.

Conclusions/Discussion
It was found that body shape and size, and fin design all play factors in how a fish utulizes its fins. Streamlined fish are able to use less fin movements than fish with laterally compressed or spherical bodies because their body shape reduces drag. Larger fish generally use less fin movemnts than smaller fish because the current pushes them less. Rigid fins allow for less fin movements than wavy fins because they cut through water more effectively.

Summary Statement
The project studied how different varieties of fish use their fins while swimming against a current.

Help Received
My father helped me create my experimental set-up.