

Cichlid Behavioral Ecology: Streams of Costa Rica

Abstract

Convict cichlids, indigenous to Central America, are a common study organisms in the fields of ethology, behavioral endocrinology, and evolutionary biology. A clear understanding of their behavior within their natural environment is critical to understanding the evolutionary history of this species. Convict cichlids are monogamous bi-parental fish which live in a world of enormous predation pressure. In order to achieve reproductive success, they must not only defend their territory from would-be predators, but must also maintain a strong pair bond with their partner. Here we test three interrelated hypotheses related to territorial defense: 1) that aggression is positively correlated with predator density 2) Defense distance (the distance from the nest the animals will engage a potential threat) will vary by type of threat (size, species) 3) Different habitats will contain different predators. We will conduct these studies in various habitats in Guanacaste, Costa Rica, during the breeding season. We will identify convict territories in several habitats, quantify rates of aggression, survey predator species density, and record distance of engagement in each habitat. Finally we will compare rates of aggressive behavior in the field, to those observed in group environments in the lab. This work will contribute to a greater understanding of the behavioral ecology of this species and aid in the design of more naturalistic experiments in the future.

In the study, data will be collected from three sources; the lab where there are no predators, the Streams of Costa Rica, and in the pool. The primary method of data collection that will be used is observation. The data from the three sources will be analyzed statistically and

results used to try understand the aggression of cichlids in the different environments. The different habitats will help understand how predator density and type influences aggregation rate of cichlids. Furthermore, it will help understand how the adaptation to the environment influences their aggression.

The aim for carrying out these studies is to understand and appreciate the natural world. It will also help people with aquariums because many have had challenges in dealing with the aggressive behavior of the aquatic animals.