

Jordan Habibi

Dr. Frohlich

Evolution

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Writing Assignment 1

Biologists have become more concerned with diversity. Questions in the biological community largely concern the origins, development, and preservation of biodiversity.

Thankfully, certain organisms have traits that help us answer the questions we ask. One type of organism is the finch. Specifically, Darwin's finches. These finches help answer evolutionary questions because of the conditions surrounding their evolution. The article delves into the studies this group of scientists ran on the galapagos finches.

The galapagos finches are very closely related despite their differences. Because of this, we can more effectively track what specific causes there are for their speciation. One case is how their beaks and behavior correspond to their diet. However, this is not sufficient evidence to explain the evolutionary progression of the finches. Unknowing of this insufficiency, the research team began their project thirty years ago.

The researchers began their observations by capturing finches and recording their phenotypic variations. They also noted certain variations that would die when the environment underwent certain changes. These changes tended to occur in cycles, ever-changing in which variants would be favored. This causes the finch populations to always be morphologically changing. From this study, the researchers have learned four things about natural selection: it

oscillates in direction, happens when the environment changes, has evolutionary consequences, and is an observable, interpretable, and repeatable process in a natural environment.

Speciation in this study is when two populations coexist yet stop interbreeding. It starts with the divergence of population. The researchers witnessed the establishment of a new population founded by a single pair of breeding finches. There were also several other non-environmental factors that produced added variation in the alleles of the finch populations. This is how speciation begins. In the research, speciation ends when two populations are allopatrically distributed in such a way they no longer interbreed. However, there are some finch species that sympatrically coexist without interbreeding. The researchers wondered how. When researching it seemed like differences such as beak and song type played a large role. Song type is inherited through cultural exposure, making it more peculiar in speciation. It was also noted that females only bred with males that sang similar songs to the ones of their own fathers. However, songs were sometimes hybridized because of exposure to other songs in developmental stages. This hybridization proved to mix some of the finch populations with notable changes in their appearances. Through this the researchers noted that the primary differences in the finch population are their beaks and their songs. They also noted that the finch populations are not quite their own species.

The present is known; the past is inferred. In efforts to track the history of evolution, we must use genes. The researchers found that we can track the finches likely descended from seedeaters on the Central and South American mainland around two to three million years ago when storms increased likelihood of colonizations of the galapagos islands.

We know that the finches are different from each other in the modern day, but it isn't quite concrete how they began to differentiate. An early theory had it that the finches specialized by filling in niche space. Another that they differentiated because of fixed geography. However, the landscape has changed too, making it much harder to track how the finches evolved.

Considering the changes in the finches' environment, it is likely that the finch diversity we see today was caused by the changing of the environment with new species rising and falling with each change.

In conclusion, evolution begins in allopatry and ends once populations can sympatrically coexist as separate species. Though we will likely never see all the steps in the evolution of a species, we can still make many observations in nature. Environmental change played a large role in their development, but we still need more information to get the full picture.