

*Analysis of Mitochondrial DNA Adaptations in Darter Fish*

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There are over 200 species of darters, a type of fish found primarily in rivers and streams in the Southeastern United States. Speciation is the cumulative result of mutation and selection. Eukaryotic organisms have two types of chromosomes: those located in the nucleus and those located in the mitochondria. In this study, the evolution of the mitochondrial chromosomes in several darter species was examined. The mitochondrial DNA from five darter species was sequenced, and the entire mitochondrial chromosome of each of these five species was assembled. The individual genes in these mitochondrial DNA sequences were then identified utilizing the annotated mitochondrial chromosomes from other related species obtained from GenBank as reference sequences. Mitochondrial DNA sequences from additional darter species sequenced and annotated by other researchers were obtained from the GenBank database. The types of evolution of the darter genes was then determined by MEME analysis. Results obtained from this analysis show that signs of adaptive evolution of some of the mitochondrial genes are detectable, indicating that certain mutations were likely selected during darter evolution to better adapt the various darter species to different river or stream environments.