Average telomere length in cave vs surface *Astyanax mexicanus*

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Abstract

Telomeres are specialized and highly repetitive noncoding DNA structures at the end of linear chromosomes that are essential for maintaining genomic integrity. Each time a cell divides, telomeres are not fully replicated and the resulting cells have shorter telomeres than the progenitor cells. This incomplete replication of telomeres (i.e., shortening) is considered one of the major mechanisms of aging. Furthermore, telomeres are not only shortened by cell divisions, but multiple environmental stressors can also reduce their length (known as somatic redundancy). Studies of telomere length that include a comparison between subterranean and surface species can make an important contribution to understanding the role of these DNA structures in aging and in the ability of individuals to cope with environmental stressors. We conducted a preliminary assessment of the potential divergence of average telomere length in the Mexican tetra *Astyanax mexicanus*. This fish has surface and subterranean populations (i.e., ecomorphs), each characterized by specific adaptations to its environment. The study of telomere length in conspecific ecomorphs can provide valuable information on the effects of telomeres on the lifespan and longevity of individuals, as well as the role of various environmental stressors on telomere lengths. By adopting a single-species model, it is possible to reduce the potential variability due to the highly divergent evolutionary history or genetics of different species.

Keywords

Adaptation; aging; senesence; cavefish; subterranean

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