An Investigation of the Testudine Mitochondrial Control Region

The mitochondrial control region, or D-loop, is the fastest evolving region in the mitochondrial genome. Different rates of evolution have been observed in different regions of the D-loop. The mitochondrial D-loop has been well characterized in mammals and contains several highly variable regions as well as regions that are highly conserved. These conserved regions of the D-loop are hypothesized to represent functional regions associated with heavy strand replication and termination in mammals. In this study, 95 sequences of the mitochondrial control region were obtained from GenBank for 55 species of turtles (Order Testudine). The alignment of these sequences has allowed for the identification of variable and conserved sequence regions and detection of unique characteristics of the D-loop within specific taxonomic groups of turtles. Especially high levels of genetic diversity were observed within the soft-shell turtles (Family Trionychidae) as the result of areas containing variable numbers of tandem repeats with motifs ranging from 2 to 50 base pairs. These results suggest distinctive molecular evolution of the D-loop within soft-shell turtles as compared to other families within the order Testudine as well as the presence of heteroplasmy: multiple haplotypes within an individual.