

Mitochondrial DNA phylogeography of the polytypic north American Rat Snake (*Elaphe obsoleta*): a critique of the subspecies concept

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Abstract

Subspecies have been considered artificial subdivisions of species, pattern classes, or incipient species. However, with more data and modern phylogenetic techniques, some subspecies may be foun to represent true species. Mitochondrial DNA analysis of the polytypic snale, *Elaphe obsoleta*,

yields well-supported clades that do not conform to any of the currently acceptes subspecies

Complete nucleotide sequences of the cytochrome

b

gene and the mitochondrial control region produced robust maximum-parsimony and maximum-likelihood trees that do not differ statistically. Both trees were sgnificantly shorter that a most parsimonious tree in which each subspecies was constrained to be monophyletic. Thus, the subspecies of *E. obsoleta* do not represent distinct genetic lineages. Instead, the evidence points to three well-supported mitochondrial DNA clades confined to particular geographic areas in the eastern United States. This research underscore the potential problems of recognizing subspecies based on one or a few characters.

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