Alternative reproductive strategies in pitvipers

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Alternative mating strategies can influence dispersal, effective population size, social structure, mating systems and reproductive success of organisms. Yet investigating alternative strategies within an evolutionary context has long been hampered by difficulties in parentage assignment in species with cryptic breeding habits. In recent years, however, these problems have been resolved by the relative ease with which DNA-based markers are developed and applied, thus permitting robust parentage assignment and pedigree. Using these tools we describe two alternative reproductive strategies utilized by pitvipers, namely exceptional long-term sperm storage (LTSS) and facultative parthenogenesis (FP). The capacity for female snakes to store viable sperm for extended periods of time has been documented across a variety of species over relatively short periods of time (weeks, months), but has also been inferred when interpreting births when females were isolated from mates for prolonged periods (years). Here we provide the first and longest genetically confirmed case of LTSS of exceptional duration (5+ years) in the eastern diamond-backed rattlesnake (\textit{Crotalus adamanteus}). We then describe FP events and their associated characteristics in each of two species of \textit{Agkistrodon} and \textit{Crotalus}. Furthermore, we describe FP in natural populations of two species of the former. In light of the growing evidence of widespread FP in captive specimens, confirmation under natural conditions removes the prevailing dogma that this alternative mating strategy is strictly a captive syndrome. With conclusive evidence of the utilization of alternative reproductive strategies it is now paramount that we understand both the ecological and evolutionary significance of such strategies within natural populations.