The Role of Venom in Releasing the Constraint on Vertebrae Counts in Snakes (*Serpentes*)

From the theory of evolution, many hypotheses can be developed and tested in an attempt to further the understanding of the mechanisms that influenced life diversification. One of these hypotheses is the constraint-release hypothesis, which states that there are constraints on certain adaptations that can be released by other adaptations or by environmental change. In this study, we test the constraint-release hypothesis by looking at snake vertebrae. Snakes that rely on constriction to catch prey are limited to having a certain number range of vertebrae that is ideal for constriction. When a snake uses venom, there is a lower evolutionary pressure to maintain a certain number of vertebrae. Thus, the restriction on vertebrae counts would be released in venomous snakes, giving them higher variability in vertebrae counts. By investigating the number of vertebrae in constricting and non-constricting snakes, we hoped to find evidence supporting or not supporting this hypothesis. Our hypothesis based on the constraint-release hypothesis states that there will be more variation in the number of vertebrae of venomous snakes than constricting snakes. To investigate this, we conducted a literature review to find the vertebrae counts of a representative species for all snake families. Then we separated the data into two groups: constricting and non-constricting snakes. We then ran statistical tests on these groups to see if one group had a higher variability in vertebrae counts than the other. After collecting the data a d running the analysis, it was fpund that neither group had more variable vertebrae counts than the other. Thus, the hypothesis was not supported. This indicates that vertebrae counts was not a trait released by the advent of venom, providing insight into snake evolution and even perhaps the role that verebrae counts play in constriction.