

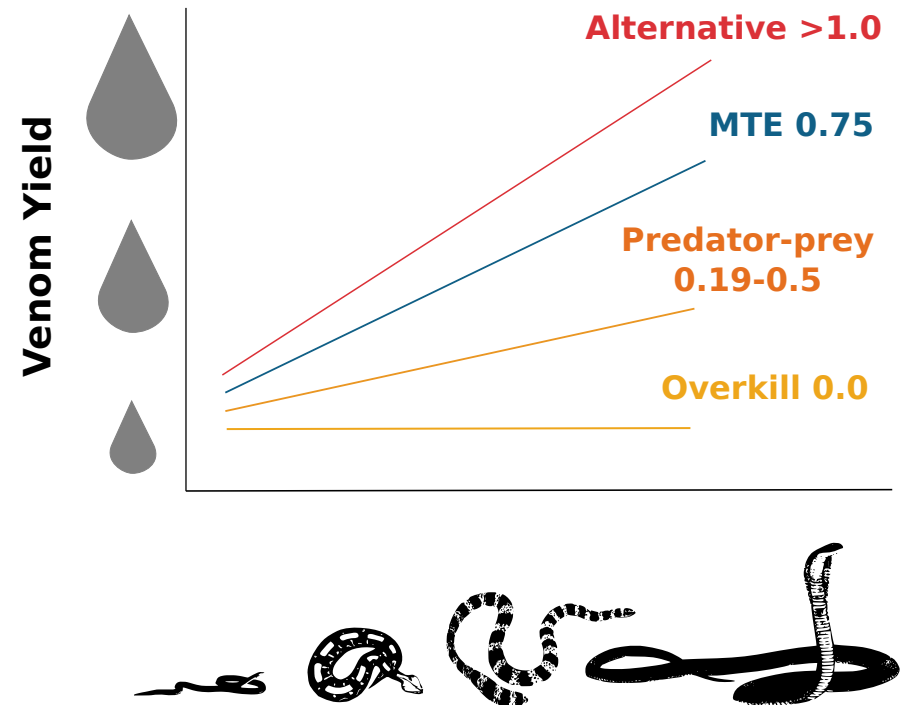
To test if venom is prey-specific we calculated the evolutionary distance between the LD₅₀ model species and the species of the diet.

For example, if LD₅₀ was tested on a mouse a diet comprising of mammals would have a distance of 0 Mya while a diet of fish would be 550 Mya (as shown above). Using this metric we test the following hypotheses:

Prey-Specific Venom: As venom is expected to be adapted towards typical prey targets it predicts a positive relationship between LD₅₀ and the distance between LD₅₀ model and diet.

The Overkill Hypothesis: Under neutral selection LD₅₀ is expected to show no pattern relating to prey identity.

Prey-Specific Immunity: If prey immunity evolves faster than venom potency LD₅₀ would be expected to be highest on phylogenetically distance venom naive species.



The amount of venom a snake produces is likely to be determined by factors relating to body mass. These potential drivers can be tested based on predictions of the allometric scaling of venom yield with body size including;

The Overkill Hypothesis: Predicts no relationship.

Predator-prey: If venom yield follows scaling associated with predator-prey size scaling a coefficient of between 0.19 and 0.51 is predicted (equation 2).

MTE: If venom production scales with according to the metabolic theory of ecology (MTE) venom yield would be expected to scale according to 0.75.

Alternative: Scaling exponents of >1 would suggest drivers such as sexual selection or defense are important in venom evolution.