Impacts of cannibalism on an all-female lineage of salamanders

Jasper Leavitt

"Environmental and Life Sciences Graduate Program, Trent University
1600 West Bank Drive, Peterborough, K9J 0G2, Ontario, Canada

Abstract

While broadly taboo in human cultures, cannibalism is a common phenomenon in nature. One commonly studied group for this act is mole salamanders, which are highly cannibalistic as larvae. Within mole salamanders is the “unisexual complex”, an all-female lineage that steals sperm from males to have offspring. Notably, they often don’t incorporate the male DNA, thereby producing clones of themselves. My work with these animals looks at cannibalism from two perspectives: choosing when to cannibalize and overcoming being partially eaten. To tackle the first topic, we used the theory of kin selection, which states that an individual is more likely to help another based on how closely related they are. If applied to clonal unisexuals, we would predict that individuals would be much more likely to eat non-siblings than siblings. We tested this by pairing up siblings and non-siblings and monitoring rates of cannibalism over the course of a month. For the second question, we compared tissue regeneration rates for individuals with differing amounts of DNA. When a unisexual does incorporate male DNA, the eggs have the genome added onto the mother’s full genome, creating offspring with more than the standard two sets of chromosomes. By cutting large portions of tail off salamander larvae and raising them in two temperatures, we tested the impacts of these extra genomes and temperature on their growth and survival. Preliminary results suggest that a salamander is more likely to eat a non-sibling, and that larvae grow larger in colder temperatures.

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