

Ursidae: The Undergraduate Research Journal at the University of Northern Colorado

Volume 7

Number 1 *Research Day 2017 - Undergraduate
Research Excellence Award Winners & Finalists*

Article 2

December 2017

Thermal Effects During Incubation on Corn Snake (*Pantherophis guttatus*) Pigment and Pattern Formation

Hawken Carlton

UNC, janice.dickensheets@unco.edu

Follow this and additional works at: <https://digscholarship.unco.edu/urj>



Part of the [Animal Sciences Commons](#)

Recommended Citation

Carlton, Hawken (2017) "Thermal Effects During Incubation on Corn Snake (*Pantherophis guttatus*) Pigment and Pattern Formation," *Ursidae: The Undergraduate Research Journal at the University of Northern Colorado*: Vol. 7 : No. 1 , Article 2.
Available at: <https://digscholarship.unco.edu/urj/vol7/iss1/2>

This Abstract is brought to you for free and open access by Scholarship & Creative Works @ Digital UNC. It has been accepted for inclusion in *Ursidae: The Undergraduate Research Journal at the University of Northern Colorado* by an authorized editor of Scholarship & Creative Works @ Digital UNC. For more information, please contact Jane.Monson@unco.edu.

Thermal Effects During Incubation on Corn Snake (*Pantherophis guttatus*) Pigment and Pattern Formation

Carlton, Hawken

Faculty Sponsor: Mackessy, Stephen

Coloration and patterning can be as critical to an animal's survival and fitness as its physiology and behavior, and how appearance develops is key in determining likelihood of survival. In reptiles, the environmental factor of higher vs. lower mean temperatures during egg incubation can influence physical and physiological traits and incubation length to hatching, important in temperate regions or habitats with seasonal food supplies; fluctuating temperatures may have additive effects. Pattern or color may also influence fitness via aposematism, crypsis, and other survival strategies; however, thermal effects on pattern development have not been fully studied. This experimental study used the Corn Snake (*Pantherophis guttatus*) as a model species, with parents (one male, two females) showing genetically-determined polymorphic traits. Egg clutches were incubated under three temperature regimes (control and two lower temperatures) to evaluate effects on the level of pigment deposition/development and whether pattern phenotype is altered by exposure to temperatures below a standard average. Image analysis was used to quantify differences between treatment groups; significant impact on both color intensity and pattern structure, as well as other observable irregularities, was observed. Additional data on specific effects of temperature on both erythrin pigment and iridophore cell layers were also analyzed and decreased deposition of both were observed as incubation temperature decreased; anecdotal evidence of increased melanin production was also noted. This study provides evidence that temperature has a significant impact on the development of corn snake pattern, effects that can strongly influence survival of this wide-ranging species at differing latitudes.