

NORTHERN ILLINOIS UNIVERSITY

**VARIATION IN THERMAL BIOLOGY AS A FUNCTION OF BODY
SIZE IN THE PLAINS GARTER SNAKE (*THAMNOPHIS RADIX*)**

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ABSTRACT

This research focuses on whether thermal differences exist between neonate and adult plains garter snakes and what affect these differences may have on physiological performance. To test for possible differences in the maximum attainable temperatures of neonate and adult snakes, latex models were placed in the field from May – October 2000 and temperature was recorded every 5 minutes. Air temperature, cloud cover, and wind speed were obtained from a nearby NOAA recording station. The effect of size on model temperatures was highly time-dependent. Small models were warmer early in the day whereas large models were warmer later in the day. Small models were also more variable in temperature than large models. To test physiological performance, maximum sprint speed was measured at temperatures ranging from 15 – 38 °C. Fifty-two neonates from 13 litters (2 males and 2 females per litter) and their dams were each tested four times. Performance curves were generated using cubic regression. Neonates significantly exceeded adults in the temperature at which maximum sprint speed was attained (32.1 vs. 29.1 °C). Adults can attain temperatures necessary to sprint at 80% of maximal performance 46% of the day whereas neonates can attain such temperatures only 33% of the day. These findings indicate that adults have a thermal advantage over neonates.