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The Effects of Road Salt on *Lithobates clamitans* Tadpoles

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Abstract

In areas that see heavy snowfall and icy roads, road salt is used to improve driving conditions. However, after snow melts, road salt does not disappear. Instead, it dissolves into melted snow and flows into bodies of water where amphibians breed and live. Altering the salinity of the environment has been seen to affect different species of frogs. It is unclear, however, whether those findings generalize to other anurans. Here, we examined how exposure to road salt affects the development of green frog tadpoles (*L. clamitans*). We caught 80 *L. clamitans* tadpoles at the Ross Biological Reserve near Purdue University. We divided 60 tadpoles of average Gosner stage 37 into three treatments: control (well water), road salt (860 mg Cl/L), and an alternative road deicing salt product (beet juice/20% salt brine mixture). To examine the effects of salt exposure at earlier developmental stage, 20 younger tadpoles (average Gosner stage 30) were exposed to road salt. These tadpoles were kept at 3 degrees Celsius for 21 days and warmed up post-exposure mimicking natural conditions at the end of the winter. Preliminary results revealed no significant differences in the developmental rate or size (mass and total length) of the tadpoles across all treatments. Following the individuals as they complete metamorphosis will provide more insights about the long-term effects to road salt. Overall this study will provide insights about the effect of road salt on green frog development and the consequences of using a relatively recently developed method for more efficient road deicing.

Keywords:

Winter conditions, road salt, tadpoles, growth, development, metamorphosis, frogs, ecological contaminants