



WILDERNESS IMAGES

Eastern Newt (*Notophthalmus viridescens*)

Samuel Christopher Holstege, BSc; Alexander B. Baer, MD

Division of Medical Toxicology, Department of Emergency Medicine, University of Virginia, Charlottesville, VA



Figure. Terrestrial red eft stage (left); aquatic adult stage (right).

The North America eastern newt (*Notophthalmus viridescens*) is commonly seen on hikes within the eastern United States and Canada. It has 3 life stages: an initial aquatic larva stage, a terrestrial red eft stage (Figure, left), and an aquatic adult stage (Figure, right). The pictures included in this submission were taken at Sherando Lake Recreation Area (latitude 37.92 and longitude -79.01) within Virginia's Blue Ridge Mountains. The eastern newt is a larva for approximately 1 y before embarking on its terrestrial life stage. The terrestrial phase can last 3 y until the red eft

resubmerges to become an aquatic adult. Eastern newts can live up to 15 y. The eastern newt can also develop through neoteny route when the terrestrial phase is omitted entirely and the larva develops directly into an adult.

The eastern newt is not dangerous unless it is eaten. Its organs contain tetrodotoxin (TTX). The TTX is first found in the newt during the red eft stage when it becomes terrestrial. It is speculated that the toxin is derived from their diet while in the terrestrial stage.¹ If an eastern newt develops through neoteny, the TTX is not found.

Upon ingestion of TTX, the toxin binds to neuronal voltage-gated sodium channels and blocks cellular sodium influx.² This action inhibits charged action potentials in the neurons. Symptoms following ingestion of TTX include rapid weakness leading to paralysis of muscles which can lead to respiratory arrest and death.³

Corresponding author: Samuel Christopher Holstege, BSc, Division of Medical Toxicology/Department of Emergency Medicine, University of Virginia, P.O. Box 800774, Charlottesville, Virginia, 22908-0774; e-mail: Sholstege8@gmail.com.

Submitted for publication May 2020.

Accepted for publication September 2020.

Depending on the TTX dose, symptoms can occur as early as 20 min following ingestion. There is no antidote to TTX and patient care is supportive with respiratory assistance if necessary.

Author Contributions: SCH took the photographs depicted in the figures and drafted the associated brief report; ABB mentored SCH, reviewed and revised the report, and helped to guide SCH on his first journal submission.

Financial/Material Support: None.

Disclosures: None.

References

1. Johnson PTJ, Calhoun DM, Stokes AN, Susbilla CB, McDevitt-Galles T, Briggs CJ, et al. Of poisons and parasites—the defensive role of tetrodotoxin against infections in newts. *J Anim Ecol*. 2018;87(4):1192–204.
2. Moczydlowski EG. The molecular mystique of tetrodotoxin. *Toxicon*. 2013;63:165–83.
3. Bradley SG, Klika LJ. A fatal poisoning from the Oregon rough-skinned newt (*Taricha granulosa*). *JAMA*. 1981;246(3):247.