Unisexual Mole Salamander Complex (*Ambystoma spp*.)

Family Ambystomatidae
Subspecies: N/A
Updated 2025

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Description/Identification: Unisexual Mole Salamanders, also known as the Tremblay's Salamander (*Ambystoma tremblayi*) in Wisconsin, resemble adult female Blue-spotted Salamanders (*Ambystoma laterale*) in color, having a dark black to bluish-black dorsal colors, and large, turquoise blue or whitish blue spots or flecks. In the unisexual Mole Salamander complex, these spots or flecks tend to be more diffuse, and lighter blue or white in color. These salamanders range from about 3 ½ to 6 ½ inches in total, snout-to-tail length, or about 2.3 to 3.5 inches snout-to-vent length, making them larger than adult female Blue-spotted Salamanders. As with the Blue-spotted Salamander, these salamanders have 12 to 14 costal grooves, and five toes on the hind feet and four on the front. Larval unisexual salamanders aren't readily distinguishable with certainty from Blue-spotted Salamanders, or other species in their complexes, apart from perhaps being slightly larger in size. Inside the mouth, and like the other ambystomid salamanders, unisexual Mole Salamanders have 3 different rows or groups of very tiny, vomero-palatine teeth, much more like sandpaper, which are perhaps best observed and seen under an electron microscope. Like Blue-spotted Salamanders, unisexual salamanders have elongated, adhesive tongues which are quickly contracted by muscles and the hyoid bone inside their mouths during feeding.

Bogart (2019, Herpetologica 75: 259–267) discussed the biological and taxonomic history of the unisexual Ambystoma, concluding that "none of the various unisexual salamanders can be considered a distinct species" (SCIENTIFIC AND STANDARD ENGLISH NAMES OF AMPHIBIANS AND REPTILES OF NORTH AMERICA NORTH OF MEXICO, WITH COMMENTS REGARDING CONFIDENCE IN OUR UNDERSTANDING, 31 March 2025. 2025 SOCIETY FOR THE STUDY OF AMPHIBIANS AND REPTILES. Ninth Edition).

Larval Form of a Unisexual Ambystomid Salamander. Location, Specific Species, and Photographer Unknown.

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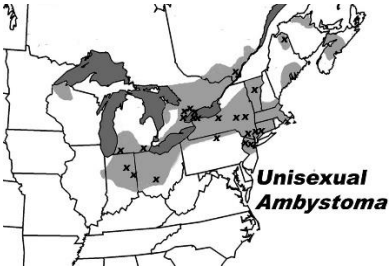
Blue-spotted Salamander Larval Form. © NatureNorth.

Larger specimens of these unisexual complexes can be identified with fair certainty in some cases due to their size alone; however, the only other reliable means of identifying these triploid variant salamanders are to measure their red-blood cells. When the red blood cells are suspended in isotonic saline water, they expand 1.5 times larger in optical section through the two longer axis' than normal Blue-spotted Salamander red blood cells. Unisexual Mole Salamanders are triploid species comprising entirely of females, and no males, and no further subspecies are known or recognized.



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Range and Distribution: Unisexual Mole Salamanders occur within various populations of Blue-spotted Salamanders, or other parent species in varying densities throughout the ranges of the latter described species. In Wisconsin, these unisexual salamanders have been documented mainly in the northern half of the state amongst various scattered populations of Blue-spotted Salamanders, although they may potentially occur within Blue-spotted Salamander populations throughout the state.

Habitat: Unisexual Mole Salamanders probably occur within the same or similar forested or woodland habitat associations as those described for the Blue-spotted Salamander, or other parent species elsewhere in the U.S.

Feeding and Diet: The feeding and diet of these unisexual salamanders are probably similar to those of Blue-spotted Salamanders. Both larval and adult unisexual salamanders are primarily carnivorous, feeding on a wide variety of small, terrestrial and/or aquatic prey. They may consume small insects and insect larvae, arachnids, worms, tiny crustaceans or mollusks, and other microinvertebrates either living on the bottoms of their ephemeral wetlands or in or amongst the forest floor debris.

Natural History: Previously known as Tremblay's, or Silvery Salamanders, these unisexual Mole

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Salamander complexes have been known to possess at least 26 separate genetic combinations including *Ambystoma laterale, texanum, jeffersonianum, and tigrinum* complexes and possibly others. It was generally believed to be the accepted theory that these salamanders resulted from the hybridization between one or more of the aforementioned parent species, resulting in an all-female offspring, which could only breed or reproduce back to males of one of the parent species (in the case of Wisconsin, a male Blue-spotted Salamander), the sperm of which only stimulates egg development, but contributes no further genetic material, essentially creating clones of the original hybrid's genetics.

Ventral/Belly View (Similar to Blue-spotted Salamander). © PA Herp Identification.

It has essentially been theorized that these hybridizations occurred prior to Wisconsin's glaciation, or prior to other isolating mechanisms took place. However, due to the fact that some of these hybrid populations occur far outside of the range of all but one of the aforementioned species, this theory may not be the case, unless the mere presence of said hybrids eventually extirpated one of the parent species. Others believe that these unisexual salamanders are evidence of evolution and speciation still taking place. These unisexual salamanders act as "sperm-thieves" in a sense; fertilizing themselves by utilizing the sperm packets deposited by male of one of the nominate species in the area. Nevertheless, these unisexual specimens tend to lay fewer eggs than the parent species, but have about the same level of incubation time and transformation periods as Blue-spotted Salamanders. However, larval unisexual Mole Salamanders require about 9 or more weeks more to fully develop into adult salamanders. Unfortunately, there are few other studies or observations of these salamander's habits or natural history outside of their breeding and reproduction, although it may generally be similar to those of the Blue-spotted Salamanders, or other parent species.

Larval and aquatic stages of unisexual salamanders may be eaten and consumed by large aquatic invertebrates such as large crayfish or water bugs, fish, or other amphibians and/or predatory amphibian larvae. Many different species of birds, turtles, snakes, and carnivorous small mammals, such as shrews, weasels, and other mammals (such as skunks, opossums, raccoons, and foxes) may also eat unisexual salamanders as well.

Conservation Status: Unisexual Mole Salamanders do not have any specific conservation statuses in Wisconsin, although the parent species, the Blue-spotted Salamander, is regarded as "Common" in Wisconsin. All of Wisconsin's native reptiles and amphibians are regulated and protected, however under N.R. 16. In Wisconsin, these unisexual populations, or individuals tend to be rare to uncommon.

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Unisexual Mole Salamanders are currently not protected or regulated federally. Unisexual Mole Salamander complexes are not currently evaluated for any IUCN Red-List Least status.