

# External Anatomy of the Axolotl

*by Laura Gordon*





# The Axolotl

The axolotl, or *Ambystoma mexicanum*, is a type of salamander often referred to as the Mexican walking fish. In the wild, axolotls can only be found in Lake Xochimilco near Mexico City. Due to the lake's proximity to the city, it has been contaminated by both pollution and invasive species. This has caused the axolotl to become critically endangered.

The name axolotl originated from the Aztecs, axl meaning "water" and xolotl meaning "monster." In Aztec mythology, Xolotl was a disfigured god that was regarded as a monster. Before the Spanish invasion in it was a culinary delicacy and its fat was used as topical medicine. The axolotl is most closely related to the Mexican Tiger Salamander.



Axolotls are a dark green or brown color. The ones that are primarily white or pinkish in color are descended from a genetically mutated male; these axolotls are called "leucistic." Leucistic axolotls are differentiated from albino ones by their black eye color as opposed to red.

Axolotls are fully aquatic and neotenic, which means they can reach maturity without going through metamorphosis. Neoteny is caused by low levels of iodine and causes axolotls to maintain their juvenile traits into adulthood.

Today, the largest population of axolotls are bred in captivity. They are about a foot in length and have a lifespan of about fifteen years.

# Eye & Gills



Figure 1: close-up of eye

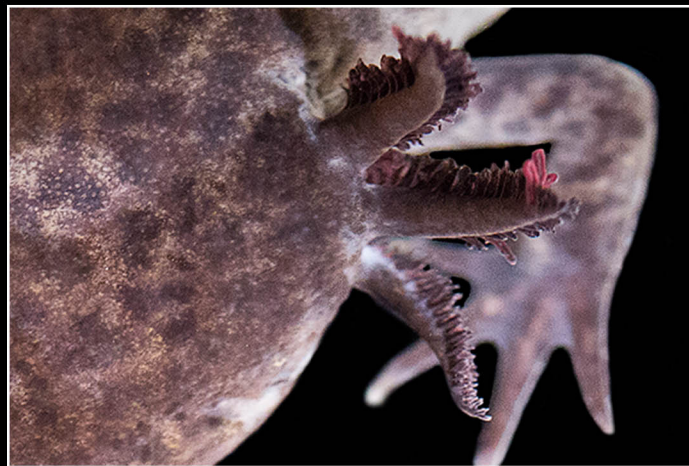


Figure 2: close-up of gills

Salimanders typically have larger photoreceptors than other amphibians but have fewer, which makes it difficult for them to see fine detail. Axolotls use their sense of smell and their lateral line system more than their eyesight to detect danger and prey.

As a result of axolotls being neotenic, they have both external gills and internal lungs. Axolotls primarily breathe through their gills however they can respire through their skin. The filaments attached to their gills help increase surface area for gas exchange.



# Costal Grooves & Legs

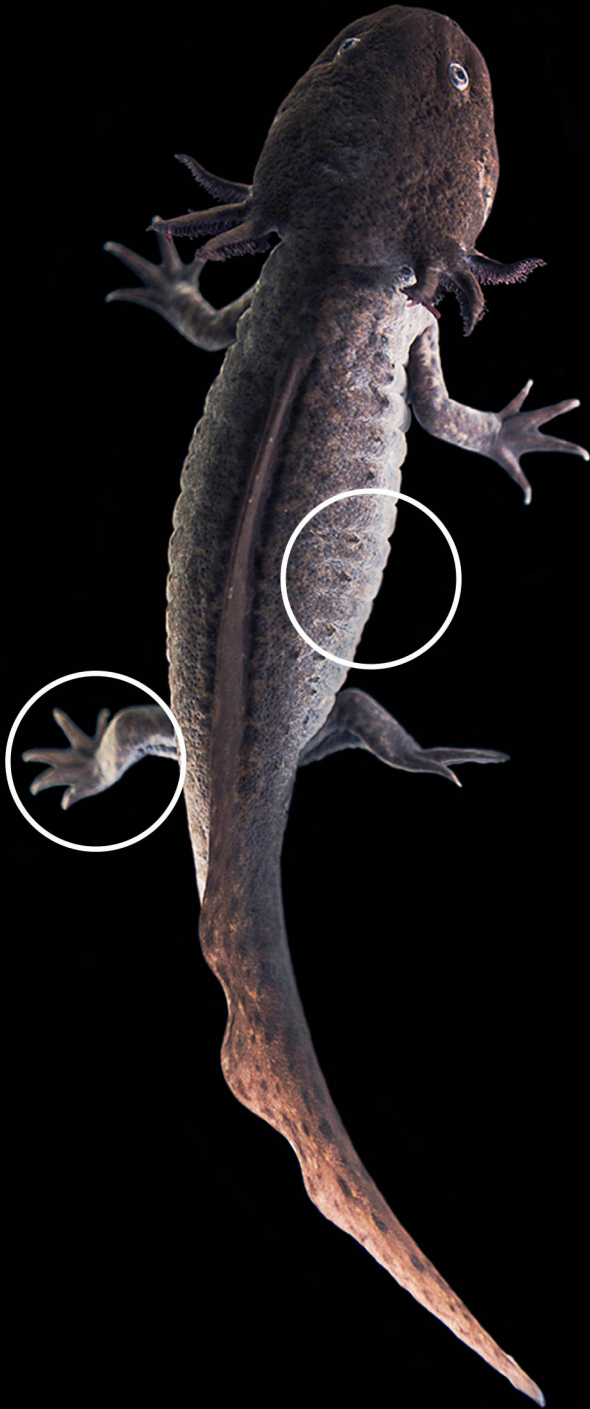


Figure 5: close-up of dorsal crest



Figures 6 & 7: Left - rear leg  
Right - front leg

Costal grooves are vertical grooves on each side of an axolotl's body that air in respiration. This body characteristic is specific to mole salamanders or Ambystomids. Costal grooves rest on the lower border of axolotls' ribs and contains several vessels and veins.

The feet of axolotls change color when they have reached sexual maturity. The tips of their toes become much darker color.

Axolotls have the ability to regenerate any part of their body, including their legs, spine, and brain.



# Dorsal Crest & Tail



Figure 3: close-up of dorsal crest

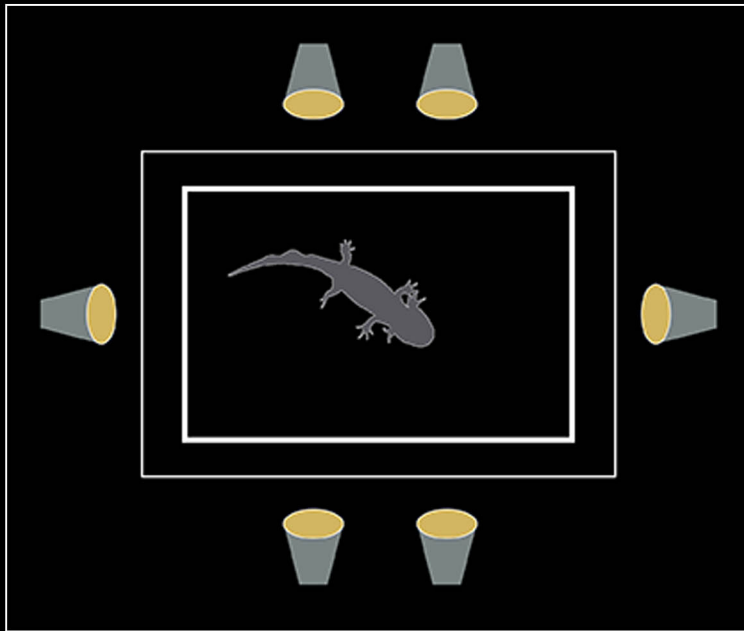


Figure 4: close-up of tail

Before reaching sexual maturity, the dorsal crest was part of the tail and aided the axolotl in swimming. When an axolotl reaches maturity, the dorsal crest still contributes to their ability to swim, however their legs and become their primary form of movement.

Axolotl tails are typically laterally compressed or roundish. They have tails by the young larva stage of their life. However, because of their neotenic nature, axolotls' tails grow until they reach sexual maturity along with the growth of their hind legs.

# Photographic Technique

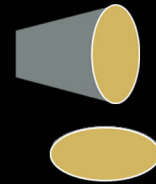


Top-Down View



Side View

## Diagram Key



Fiber Optic Light



Black Velvet



Subject



Glass Tank

When photographing the axolotl, it was placed in a handmade glass tank filled with water, placed on a piece of black velvet to achieve a black background. Six fiber optic lights with diffusers were directed into the tank, parallel to the bottom of the tank. The photos were taken from above and through the sides of the tank. All images were taken with a Canon 5D Mark III and 100mm macro, 50mm macro, and 24-70mm lenses.



# About the Author

Laura is a third year photography student at the Rochester Institute of Technology. She is graduating in the Spring of 2017 with a degree in Photographic and Imaging Technology and a concentration in Art History. She plans on pursuing a career as a photography teacher. When she isn't working in the High Magnification Lab, Laura likes to visit art museums and focus on her fine art photography work in the darkroom. To contact Laura, please email [Img6737@rit.edu](mailto:Img6737@rit.edu).



## Resources

"Biology of Axolotls." Axolotls. Caudata.org, 2012. Web. 04 Dec. 2016.

O'Connell, Rebecca. "11 Awesome Axolotl Facts." Mental Floss. N.p., 16 Apr. 2015. Web. 04 Dec. 2016.

Society, National Geographic. "Mexican Axolotls, Mexican Axolotl Pictures, Mexican Axolotl Facts - National Geographic." National Geographic. N.p., n.d. Web. 04 Dec. 2016.

"Axolotl (Ambystoma Mexicanum)." EDGE of Existence. N.p., n.d. Web. 04 Dec. 2016.

Chris Mattison. "Axolotls." Nature Guide: Snakes and Other Reptiles and Amphibians. N.p.: DK, 2014. 238.