

How environmental disturbances can affect predator-prey interactions in the wild

May 26 2023



Credit: Pixabay/CC0 Public Domain

Over thousands of years some animals have specialized to live in environments where the sun never shines: giant squid with eyes the size of volleyballs see even in the darkest depths while others, like cave-dwelling olms, have lost the functionality of their eyes completely. But

for animals that do not live in these extremes, how do species manage a world that suddenly becomes dark?

Lakes that become turbid from [algal blooms](#), agricultural run-off, or other [environmental pollutants](#) represent common examples of environmental disturbances that can impact the visual scene that [aquatic animals](#) must navigate to survive.

Metamorphic animals provide a unique opportunity to explore the effects of environmental turbidity throughout development

Researchers from the University of Jyväskylä turned to a peculiar species to explore the effects of long-lasting turbidity on animal behavior: Neotropical poison frogs.

While [poison frogs](#) may not be the first animal that comes to mind to understand the impact of disturbance on vision in aquatic animals, the unique life history of these frogs makes them the perfect candidates to study the effects of turbidity throughout development. Poison frog tadpoles grow in small pools of water formed by vegetation (such as a leaf axil of a bromeliad) that serve as nurseries where individuals are confined until metamorphosis.

"These small pools of water can readily serve as natural 'simulations' of larger environments, such as lakes, as their [small size](#) makes them easy to measure and these pools vary significantly in their turbidity," explains Chloe Fouilloux from The Department of Biological and Environmental Science at the University of Jyväskylä.

Naturally, the water in pools can range from being as clear as drinking water to as dark as wine. As such, these environments can serve arenas to

test how rearing conditions affect an animal's response to risk.

Visibility makes a difference

Unexpectedly, the world within a leaf axil can be teeming with life from invertebrates to amphibian tadpoles. The goal of this multi-species comparison was to measure how turbidity affects an individual's response to the visual cues of predators in novel conditions. Researchers found that poison frog tadpoles that develop in clear environments are able to visually discriminate between different types of predators and respond accordingly. In contrast, those that have developed in darker environments exhibit weaker responses to the visual cues of predators.

"The responses from tadpoles illustrate how predator-prey interactions may shift in dynamic light environments and have important implications for the visual plasticity of animals in response to environmental change," says Bibiana Rojas, the project leader currently based at the Konrad Lorenz Institute of Ethology, Vienna.

Researchers believe their findings may serve as a useful model to understand animal responses to habitat disturbance and how communities may shift when visually-guided [animals](#) are challenged.

The paper is published in the *Journal of Experimental Biology*.

More information: Chloe A. Fouilloux et al, Visual environment of rearing sites affects larval response to perceived risk, *Journal of Experimental Biology* (2023). [DOI: 10.1242/jeb.245822](https://doi.org/10.1242/jeb.245822)

Provided by University of Jyväskylä

Citation: How environmental disturbances can affect predator-prey interactions in the wild (2023, May 26) retrieved 18 April 2024 from <https://phys.org/news/2023-05-environmental-disturbances-affect-predator-prey-interactions.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.