

Widely used pesticide triggers body changes in tadpoles

Tadpoles naturally alter their body shape to match their environment. New research suggests that exposure to the pesticide Roundup causes them to grow longer tails, which can put them at a disadvantage.



Credit: [US Fish and Wildlife Service Southeast](#)

Roundup is a trade name for glyphosate (N-(phosphonomethyl)glycine), a weed killer commercially sold under many names including Roundup and Vision.

Professor Rick Relyea of the University of Pittsburgh has demonstrated that sublethal and ‘environmentally relevant’ concentrations of Roundup caused two species of amphibians to alter their morphology. His paper is published in [Ecological Applications](#).

Professor Relyea set up large outdoor water tanks containing many of the components of natural wetlands.

Some tanks contained caged predators, which emit chemicals that naturally induce changes in tadpole morphology (such as larger tails to better escape predators). After adding tadpoles to each tank, he exposed them to a range of Roundup concentrations. After three weeks, the tadpoles were removed from the tanks.

‘It was not surprising to see that the smell of predators in the water induced larger tadpole tails,’ says Prof. Relyea.

‘That is a normal, adaptive response. What shocked us was that the Roundup induced the same changes. Moreover, the combination of predators and Roundup caused the tail changes to be twice as large.’

Because tadpoles alter their body shape to match their environment, having a body shape that does not fit the environment can put the animals at a distinct disadvantage.

Predators cause tadpoles to change shape by altering the stress hormones of tadpoles. The similarity of shape changes that occur when the tadpoles are exposed to the pesticide suggest that it may interfere with the hormones of tadpoles and potentially many other animals.

‘This discovery highlights the fact that pesticides, which are important for crop production and human health, can have unintended consequences for species that are not the pesticide’s target,’ says Relyea.

‘Herbicides are not designed to affect animals, but we are learning that they can have a wide range of surprising effects by altering how hormones work in the bodies of animals.

‘This is important because amphibians not only serve as a barometer of the ecosystem’s health, but also as an indicator of potential dangers to other species in the food chain, including humans.’

Source: University of Pittsburgh

From **ECOS** online <http://www.ecosmagazine.com/?paper=EC12248>