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## News

# Research Shows Exposure to Chemical Affects Frog Sexuality

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 Contributing Writer  
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Male leopard frogs in the wild have been found to be "feminized" by a common agricultural chemical, according to research being released today by a UC Berkeley integrative biology professor.

Tyrone Hayes' study complements earlier work in which similar results were found in captive African clawed frogs.

Amphibians, because of their sensitivity to environmental change, are akin to coal mine canaries—while canaries are sensitive to air pollutants, amphibian health is an indicator of water safety.

"Water is life. If there's enough atrazine in rainwater to produce gross abnormalities in these animals, then that's significant," Hayes said.

In ponds, ditches, rivers and streams across the Midwest where the herbicide atrazine was detected, Hayes' group observed frog feminization.

The highest degree of feminization was seen along the North Platte River in Wyoming, where 92 percent of male frogs were affected.

Atrazine runoff from agriculture may have contributed to a decline in amphibian populations, Hayes sa

"Anything that's having an impact on individuals that can be translated to an impact on a population or even species tells us something important," he added.

Hayes' team previously showed very low levels of the herbicide—about one-thousandth of a grain of a liter tank—could cause the African clawed frog to demasculinize and essentially become a hermaphro

"What I can tell you is that we don't see it in unexposed animals," Hayes said. "Even in populations wh occurs in the wild, we don't see it in the laboratory, but we do see it when we expose animals to atrazi the animals are exposed to atrazine by contamination in the wild."

Since atrazine has been used so extensively in farming, low levels of the chemical have been found fe from agricultural regions, even in rain and snow.

"The water is contaminated by something that we put in our food that causes males to allow eggs to g



Photo  
 Professor Tyrone Hayes has found that the chemical atrazine i feminization of male leopard frogs.

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testes," Hayes said.

The presence of female cells in testes resulted in impaired testosterone release, causing the frogs' larvae underdeveloped, Hayes said.

Atrazine's effect has also been studied at higher doses in alligators, turtles, fish and mammals.

Hayes' group is now looking at the chemical's effects on other species, as well as how it works at the biochemical and molecular level.

Kelly Haston, a member of Hayes' group who helped raise the leopard frogs in the laboratory, recognizes the limits of the controlled environment.

"It's not really close to the wild. The wild fluctuates," Haston said. "It's really hard to simulate the wild conditions."

The research will be published in the Oct. 31 issue of the British journal Nature.

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