

## Bait salamanders, virus linked

### ASU biologist sees similarity to mass frog die-offs

Saturday, August 28, 2004  
Web posted at 12:00:01 AM EST

**William Hermann**  
**The Arizona Republic (USA)**

(PHOENIX, AZ, USA) The mystery of worldwide, mass frog die-offs for years has made scientists jumpy, and none more so than Arizona State University ecologist and evolutionary biologist James Collins.

Collins has written extensively, most recently in the June issue of Natural History magazine, about the widely studied phenomenon of frog species dying off in nations around the globe.

Collins, 57, thinks the same sort of virus that has been killing frogs has come to Arizona and is slaying salamanders, commonly called waterdogs. He says salamanders used for bait and imported into Arizona from Midwest ranches and farms may be spreading the virus.

He and colleagues fear that the same factors that cause the deaths and even the extinction of amphibian species worldwide could afflict livestock, birds, deer and other wildlife.

Most of the salamander deaths that Collins has studied have been seen in streams and cattle tanks in the San Rafael Valley, near Sierra Vista in southern Arizona.

"With this virus we see how introducing a non-native species can cause the sort of disease that can bring about an extinction," Collins said. "Just like Europeans brought smallpox to Native Americans and birds are bringing West Nile virus to Arizona, these salamanders may be bringing in a very dangerous virus."

Arizona Game and Fish Department officials have been taking Collins' research "very seriously" for years, department herpetologist Michael Sredl said.

He said the department has made it illegal for fishermen to use salamanders as bait in the southern Arizona area that Collins has studied.

"Banning waterdogs brought in from outside Arizona altogether is one thing that could be considered in the future," Sredl said.

Collins said his evidence comes from the genetic analysis of an emerging virus that has been implicated as a cause of infectious disease in amphibian populations in the western United States.

He said he and ASU colleagues James Jancovich, Elizabeth Davidson and Bertram Jacobs have evidence of new amphibian viruses in Arizona and Colorado that are identical, indicating a recently emerged or introduced strain. The strain closely matches viruses isolated from imported salamanders found in Valley bait shops,

indicating a possible source for the virus' introduction.

The genetic study indicates that the virus may have been transmitted by infected salamanders being introduced to uncontaminated environments by fishermen and interstate bait wholesalers.

The ASU study was funded by a \$3 million National Science Foundation project.

The salamander virus that Collins and his team discovered is related to another virus strain that is endemic in frog populations.

But preliminary analysis by the team has found that the salamander-killing virus is even closer to a virus found in sport fish, which the researchers suspect resulted when the virus jumped from frogs to fish. The salamander virus, however, is distinct from either of these and may be a recent development because of its lack of genetic diversity, Collins said.

"The basic story, based on the molecular analysis, is that the virus has a very recent history in some places in the West and it is a history that suggests in its patterns that the viruses have been moved around in less than traditional ways," Collins said. "Bait is one of the ways it is probably getting around."

Craig Schultz, owner of three Waterdog Willy's bait shops in the Valley, said he has doubts that the bait is spreading the virus.

"Waterdogs do carry lots of viruses and diseases and so do other bait fish being imported," Schultz said.

"But as far as putting a finger on these salamanders spreading that virus, I don't know. Like, my kid went to school and got a cold and I have a cold and so it came from school. Proving that is tough. I'd like to wait and hear more."

But a national authority on the question of the dying amphibians thinks that Collins' research may be of "immense importance."

Peter Daszak, director of the Consortium for Conservation Medicine at Wildlife Trust, a non-profit organization in New York, has been following Collins' work with interest.

"We've known for a long time about chemical pollution, but here is another type of pollution -- spreading germs around by moving animal species around," Daszak said. "What (Collins') group has may become a classic case of virus pollution."

Collins said he believes that his theory could cause fairly extensive changes in fishing practices in Arizona. But he insists that what he and his colleagues are learning has worldwide implications.

"The larger set of issues is the global decline of amphibians," Collins said. "We are seeing this kind of virus present wherever we have these large die-offs, especially in tropical countries. Several species of tropical amphibians have just gone missing.

"Imagine if you went for a walk in a park and most of the birds you were familiar with just weren't there anymore, what a shock it would be. That's the same kind of thing we're seeing happening with amphibians around the world."

Copyright Notice:

Copyright 2004, All Rights Reserved, The Arizona Republic (Phoenix, AZ)