

# SCIENCE & TECHNOLOGY



THIS ARTICLE

<https://www.facebook.com/sharer/sharer.php?u=http://www.futurity.org/critters-give-camo-look-toxic>

<http://www.futurity.org/critters-give-camo-look-toxic>

<https://twitter.com/share?url=http://www.futurity.org/critters-give-camo-look-toxic>

**WHY SOME CRITTERS GIVE UP CAMO TO LOOK TOXIC**

MICHIGAN STATE UNIVERSITY (<http://www.futurity.org/university/michigan-state-university/>)

➔ Original Study

(<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0091783>)

Posted by [Layne Cameron-Michigan State](http://www.futurity.org/author/michigan-state-cameron/) (<http://www.futurity.org/author/michigan-state-cameron/>) on

March 12, 2014

Imitation is the most sincere form of flattery—especially in the predator/prey/poison cycle.

In nature, bright colors are basically neon signs that scream, “Don’t eat me!” But how did prey evolve these characteristics? When did predators translate the meaning?

In the current issue of the journal *PLoS One*

(<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0091783>),

researchers reveal that these color-coded messages evolve over time through gradual steps. Equally interesting, the scientists show how drab-colored, oft-eaten prey adopt garish colors to live long and prosper, even though they aren’t poisonous, says Kenna Lehmann, a doctoral student of zoology at Michigan State University.



([http://www.futurity.org/wp/wp-content/uploads/2014/03/poison\\_frog\\_770.jpg](http://www.futurity.org/wp/wp-content/uploads/2014/03/poison_frog_770.jpg))

Bright colors scream, “Don’t eat me!” (Credit: Drriss and marrionn/Flickr)

(<http://www.flickr.com/photos/drriss/5637344386/in/photostream/>)

“In some cases, nonpoisonous prey gave up their protection of camouflage and acquired bright colors,” says Lehmann, who conducted the research through the BEACON Center for the Study of Evolution in Action.

---

## RELATED ARTICLES ON FUTURITY



(<http://www.futurity.org/mushroom-extends-lives-of-dogs-with-cancer/>)

University of Pennsylvania (<http://www.futurity.org/university/university-of-pennsylvania/>)

**Mushroom extends lives of dogs with cancer** (<http://www.futurity.org/mushroom-extends-lives-of-dogs-with-cancer/>)



(<http://www.futurity.org/sewage-helps-spread-west-nile-virus/>)

Emory University  
(<http://www.futurity.org/university/>)

**Sewage helps spread West Nile virus**

(<http://www.futurity.org/sewage-helps-spread-west-nile-virus/>)



(<http://www.futurity.org/polar-bears-may-have-brown-ancestors/>)

Penn State  
(<http://www.futurity.org/penn-state/>)

**Polar bears may have brown ancestors**

(<http://www.futurity.org/polar-bears-may-have-brown-ancestors/>)

---

“How did these imitators get past that tricky middle ground, where they can be easily seen, but they don’t quite resemble colorful toxic prey? And why take the risk?”

## **WHY NOT DEVELOP POISON?**

They take the risk because the evolutionary benefit of mimicry works. A nontoxic imposter benefits from giving off a poisonous persona, even when the signals are not even close. Predators, engrained to avoid truly toxic prey, react to the impersonations and avoid eating the imposters.

An example of truly toxic animals and their imitators are coral snakes and king snakes. While coral snakes are poisonous, king snakes are not. Even though king snakes are considered imperfect mimics, they are close enough that predators don’t bother them.

Why don't all prey have these characteristics, and why don't the imitators evolve to develop poison instead? Leaving the safety of the cryptic, camouflage peak to go through the exposed adaptive valley over many generations is a dangerous journey, Lehmann says.

“To take the risk of traversing the dangerous middle ground—where they don't look enough like toxic prey—is too great in many cases,” she says. “Toxins can be costly to produce. If prey gain protection by colors alone, then it doesn't make evolutionary sense to expend additional energy developing the poison.”

## VIRTUAL EVOLUTION

The results suggest that these communicative systems can evolve through gradual steps instead of an unlikely large single step. This gives insight into how complex signals, both sent and received, may have evolved through seemingly disadvantageous steps.

Rather than conduct experiments of voracious predators chasing and eating, or completely avoiding, prey, the scientists used evolving populations of digital organisms in a virtual world called Avida.

Avida is a software environment, developed at Michigan State, in which specialized computer programs compete and reproduce. Because mutations happen when Avidians copy themselves, which lead to differences in reproductive rates, these digital organisms evolve, just like living things.

The National Science Foundation funded this research.

*Source: Michigan State (<http://msutoday.msu.edu/news/2014/impersonating-poisonous-prey/>)*



0 COMMENTS



SHARE

You are free to share this article under the Creative Commons Attribution-NoDerivs 3.0 Unported ([http://creativecommons.org/licenses/by-nd/3.0/deed.en\\_US](http://creativecommons.org/licenses/by-nd/3.0/deed.en_US)) license.

DOI: 10.1371/journal.pone.0091783 → Original Study

(<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0091783>)

Related Topics: animals (<http://www.futurity.org/topic/animals/>), colors

(<http://www.futurity.org/topic/colors/>), computer model

(<http://www.futurity.org/topic/computer-model/>), evolution

(<http://www.futurity.org/topic/evolution/>), predators

(<http://www.futurity.org/topic/predators/>)

NEXT UP

**MONKEY BRAIN SIGNALS  
MENTAL WANDERLUST  
([HTTP://WWW.FUTURITY.ORG/MONKEY-  
BRAINS-SIGNAL-MENTAL-  
WANDERLUST/](http://www.futurity.org/monkey-brains-signal-mental-wanderlust/))**

---

Duke University (<http://www.futurity.org/university/duke-university/>)

**0 COMMENTS**

 **ADD A COMMENT**

 **FUTURITY**

© 2014 Futurity. All Rights Reserved.