

Tuesday, March 11, 2014 5:41 PM EDT

Animals 'Impersonate' Poisonous Prey To Survive

By Shweta Iyer

"Fake it 'til you make it" is an art perfected by creatures in the wild; especially when it comes to harmless prey faking its appearance to look dangerous to predators. In the wild, having bright colors is not just a fashion statement but a necessary tool to ward off predators, as most predators associate bright and gaudy colors to venom. Scientists have now attempted to understand when bright colors started evolving in prey and how predators learned to avoid them.

In the latest issue of the journal *PLOS ONE*, researchers from Michigan State University (MSU) state that these color signals evolved gradually during the evolutionary timescale, according to [a press release](#) Tuesday. And not only poisonous prey, even often eaten nonvenomous prey take on bright colors to protect themselves from being devoured or attacked.

Kenna Lehmann, an MSU doctoral student of zoology who conducted the research, said, "In some cases, nonpoisonous prey gave up their protection of camouflage and acquired bright colors. 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?"

Taking this risk is essential to their survival and proliferation, say researchers. By impersonating a venomous animal, a nonvenomous animal has the benefit of avoiding its predators—predators who have a natural instinct to steer clear of brightly colored venomous prey. So these animals fake dangerous colors and get away from their predators.

A perfect example of originals and impostors can be found in coral snakes and king snakes. The two snakes look almost similar except for slight variations in their band colors. The nontoxic king snake mimics the very toxic coral snake, in appearance, and succeeds in fooling its predators, who avoid them from fear of being bitten to death.

But being an imitator is not that easy according to researchers. The king snake is a bold specimen, since it managed to leave the safety of its camouflage to take on garish colors over a gradual but dangerous evolutionary journey. Also, changing colors is a more effective way of protection than producing toxins, according to Lehmann.

"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 said. "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."

These experiments were conducted in a virtual environment, using a software called Avida. In Avida, digital organisms reproduce, evolve, and mutate just like living things.

