**Skunk's Strategy Not Just Black And White**

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Predators with experience of skunks avoid them both because of their black-and-white coloration and their distinctive body shape, according to UC Davis wildlife researcher Jennifer Hunter. The study was published online Oct. 21 in the journal Behavioral Ecology.

Hunter wanted to know how predators know a skunk is a skunk. Biologists had assumed that the distinctive black-and-white color scheme was a marker saying, "keep away."

Hunter prepared taxidermy mounts of skunks and of gray foxes, an animal about the same size but a distinctly different shape. Some of the stuffed skunks she dyed gray, and some of the foxes she dyed black-and-white. She then placed the animals at 10 sites around California -- in locations where skunks were abundant as well in areas where they were uncommon -- and monitored them with infrared video cameras.

In locations where wild skunks were not commonly found, predators such as bears, mountain lions, bobcats and coyotes would approach, lick, roll on or attempt to drag away the stuffed skunks as well as the stuffed foxes. But in places where skunks were common, potential predators gave anything skunk-like, either in shape or color, a wide berth.

"They wouldn't go near them," Hunter said.

The results suggest a much stronger learning component in prey recognition than was previously thought, Hunter said. She was also surprised to find that body shape, not just color, was important. Previous studies, mostly conducted in the laboratory rather than in the wild, had suggested that animals have an inbuilt tendency to avoid brightly colored or multicolored prey.

The study also raises the question: Does anything actually eat skunks? Possibly not, Hunter thinks.

While numbers of most animals are controlled by predators above them in the food chain, skunks may be a rare example where the main check on their numbers comes from disease, food supply or lack of habitat -- factors that depend mainly on the number of skunks themselves.

**Impersonating poisonous prey: Evolution of interspecific communication**

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*, researchers at Michigan State University reveal that these color-coded communiqués 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, said Kenna Lehmann, MSU doctoral student of zoology.

"In some cases, nonpoisonous prey gave up their protection of camouflage and acquired bright colors," said Lehmann, who conducted the research through MSU's BEACON Center for the Study of Evolution in Action. "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?"

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 said.

"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."

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.