Five ingenious ways snakes manipulate their bodies to hunt and survive

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Credit: AI-generated image (disclaimer)

Do a quick search for "snakes" in the news and you'll find people terrified, bitten or, sadly, killed by these creatures. Many of us fear their slithering ways and researchers have found evidence which suggests that humans have evolved a tendency to spot snakes more easily than other animals.

But there are more than 3,500 species of snake in the world, and they have been around for 167m years – so they must be doing something right.

Although it seems strange to us, snakes' lack of legs mean that they have evolved numerous fantastic techniques to survive, making ingenious use of their cylindrical forms.

1. Some snakes can travel in straight lines

The majority of snakes bend their spines and exert force on the ground, trees, or water with the bends in their body or the edges of their coils to move. But some can travel in a perfectly straight line. Until recently, it was a mystery how they accomplished this, but new research demonstrates that Boa constrictors and other heavy bodied snakes use their belly scales like a tyre tread to seamlessly progress in a straight line.

Three sets of muscles work in union, with the first yanking the belly skin and scales forward. Meanwhile, the second shortens the skin as the belly scales move forward and come together, before pinning them in place as the third set brings the spinal column forward. This allows the snake to move forward at nearly constant speed, but they only do it when they are relaxed. A frightened snake in need of speed will revert to a more typical mode of locomotion.

Moving like this is thought to benefit snakes which spend time underground in narrow holes, allowing them to squeeze into animal burrows in search of refuge or prey.

2. Puff adders use their tongues as bait

Widespread across the grassy woodlands of sub-Saharan Africa and parts

of the Arabian Peninsula is a chunky venomous snake called the puff adder (*Bitis arietans*), so named for its habit of hissing loudly when disturbed. Puff adders are successful predators of small mammals, lizards, frogs and birds, but until recently one secret to their success was unknown.

Upon spotting a frog nearby, the puff adder begins flicking its tongue unusually slowly, seemingly mimicking a small worm. To frogs, juicy worms are irresistible, and their eagerness to eat them leads them straight into the waiting mouth of the viper. This hunting strategy is known as lingual luring.

3. Mock viper eyes change shape

While it is gifted with one of the most impressive scientific names of any snake – *Psammodynastes pulverulentus*, a mixture of ancient Greek and Latin meaning "dusty sand ruler" – the mock viper, unlike the puff adder, does not possess deadly venom. Living in the forested areas of south and southeast Asia, the mock viper is surrounded by dangerous animals such as leopard cats and is subject to the possibility of being eaten on a daily basis. To counter this and intimidate would-be predators, the mock viper earns its name by physically resembling a viper, possessing the well-defined triangular head that characterises real vipers in the area.

This disguise is not enough for these snakes, though. When threatened with imminent danger, the mock viper alters the shape of its pupil from round to a thin, vertical slit. These "elliptical pupils" are typical of actual vipers in the area. It is thought that this last-ditch defence may be enough to persuade a predator to think twice and allow the mock viper to slither to safety.

4. Boas line up to catch prey

In Cuba's Desembarco del Granma national park, Jamaican fruit bats have found their ideal home in the chambers of sinkhole caves – deep holes sunk vertically into the ground. Unfortunately, it is no easy life: Cuban boas (*Chilabothrus angulifer*), large, constricting snakes with striking zigzag patterns, also live around these caves, and have developed a taste for the bats.

Though the bats spend the daytime comfortably roosted deep in the caves, they leave every evening to forage for fruit. The boas take up position on the cave ceiling late in the evening and wait for this nightly passage to take place. But their positioning is not random. The boas spread themselves in a line, forming a rudimentary barrier. This coordinated hunting increases their chances of catching a bat because their prey has no choice but to fly past a snake to exit the cave.

5. Sea snakes tie themselves in knots

Sea snakes spend their entire lives in water, even giving birth to live young in the ocean. They have many adaptations to survive including a flat, paddle shaped tail, and an ability to excrete salt using a gland under the tongue.

Despite their name, yellow-bellied sea snakes (*Hydrophis platurus*) are not cowardly, but rather possess bright yellow undersides. These snakes have developed a bizarre strategy to help them shed their old skin. Because there is not much in the open sea to rub up against to loosen the skin, they actually tie themselves in a knot, using their own bodies as a scratching post to remove it in one piece, much like peeling off a sock.

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