INSIDE JEB

Blood pythons use their environment for faster strikes

A blood python on a coarse surface. Photo credit: Derek Jurestovsky.

For an animal with no legs, snakes are capable of some remarkable feats. From crawling on land to swallowing their prey whole, snakes have come up with clever solutions to limbless life. But with no legs to push with, how do snakes launch themselves toward their food? Derek Jurestovsky from the University of Akron, USA, thinks that some heavy-bodied snakes, such as the blood python (*Python brongersmai*), can take advantage of the features in their environment to enable them to make faster strikes, helping them in their quest for food.

Working with Sidarth Joy and Henry Astley, also of the University of Akron, Jurestovsky set about measuring whether blood pythons improved their strikes in situations where they had environmental features to use. The researchers placed the pythons on a carbon fibre platform, covered in a surface similar to coarse sandpaper and videoed their strikes. The platform was either open on all sides or had two adjacent walls forming a corner and it was equipped with sensors to measure the force that the snakes generated when they pushed off. With the walls in place, the pythons used their bodies to press against the walls to generate force for their strikes. However, the team found that speed and force of the strikes didn't differ from when the snakes had no walls to push off from. So, what were the snakes doing when they didn't have any environmental features to help them generate more forward force?

Isaac Newton's third law of motion states that for every action there must be an equal and opposite reaction, meaning that for the pythons to strike forward, they need to push against the ground or their tail. From the recordings, the team discovered that the blood pythons were using their tails more to generate this force as the tail movement was much higher when the snakes didn't have walls to push against. Jurestovsky suggests that, without the walls to push off from, the pythons are using their tail movement not only to help generate the power to strike forward but also to prevent themselves from slipping. Jurestovsky also suggests that the blood pythons, like many other large-bodied snakes, may be retaining their faeces to create a kind of anchor point near their tail to push off from. Jurestovsky adds that when the snakes swing their tails in the open space during their strike, the added weight stops them from slipping backwards.

Jurestovsky and colleagues are quick to point out that using the tail in this way is likely not unique to blood pythons and could apply to other large-bodied snakes, such as boas and other pythons, in relatively open areas. However, more studies are needed to confirm whether other snakes use similar tactics. The researchers also note that snakes are unlikely to find themselves stuck in a corner like the one on the experimental platform, so it is probable that wild blood pythons use a combination of pushing off from the ground using their tail as leverage and pushing against any environmental obstacles that might help propel their strikes forward. So, it seems that snakes can change how they strike depending on their terrain, making life without legs just a little easier.

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