

Scientist identifies cone snail's strike as one of the quickest in the animal kingdom

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Ecology and Evolutionary Biology Associate Professor Emanuel Azizi in his research lab. Credit: Shannon Cottrell, University of California, Irvine

With the use of ultra-high-speed videography, Ecology and Evolutionary Biology Associate Professor Emanuel Azizi and colleagues from Occidental College Los Angeles have shed light on the hunting mechanism of the cone snail *Conus catus*. Published online in *Current*

Biology - Cell Press, the researchers identified the snail's hydraulically propelled feeding structure as the quickest movement among mollusks by an order of magnitude.

Most people may not equate snails with speed, but members of the aquatic species *C. catus* have been found to possess some of the quickest movement among the [animal kingdom](#). While many [land snails](#) use their radula, or feeding structure, to munch on plants, members of *C. catus* use their chitinous radula to catch fast moving fish and other [marine animals](#) with remarkable speed. And Professor Azizi and his colleagues were interested in determining just how fast their harpooning radula could function.

"When studying movement in animals, we found that latch and muscular sphincter structures like the one found in the cone snail's hydraulically propelled radula are capable of producing movements at remarkable speeds. By evaluating the anatomy and functional limits of these structures, we hope to uncover insights into how they evolve and how their design could inspire new forms for robots or [medical devices](#)," said Professor Azizi.

When searching for food, [cone snails](#) use their radula as a projectile and conduit for the delivery of powerful venom. Scientists believe that the high speed of the movement is necessary to deliver the venom quick enough to exceed the escape time of potential prey, which include fast swimming fish. Using high-[speed](#) videography, the researchers determined that the radular harpoon can be propelled into prey within 100 microseconds, with a peak acceleration exceeding 280,000 m/s² and a maximal acceleration exceeding 400,000 m/s². These extreme speeds are similar to a fired bullet.

"We are still somewhat puzzled by the fact that cone snails are so darn fast despite the fact that their prey are two orders of magnitude slower,"

says Professor Azizi. "We are continuing to work on the species, and are following up on potential reasons for such extraordinary speeds."

More information: Joseph R. Schulz et al, The high speed radular prey strike of a fish-hunting cone snail, *Current Biology* (2019). [DOI: 10.1016/j.cub.2019.07.034](https://doi.org/10.1016/j.cub.2019.07.034)

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