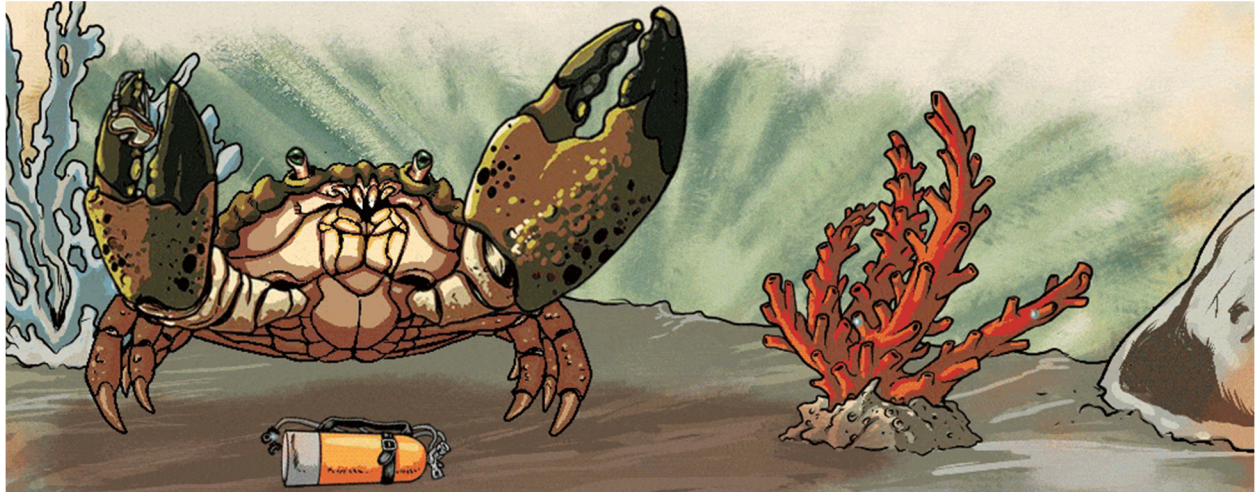


No spines but plenty of guts

Meet the oceans' most fierce B-movie invertebrate predators

By Sarah Pratt on May 22, 2015



Illustrations by Pulp Studios

From the world's largest habitat, the ocean, come bizarre tales of predatory creatures seemingly spawned in a laboratory nightmare. Surely fodder for low-budget horror movies, these marine invertebrates are among the most fantastic and efficient killers, hunting and devouring prey with ingenuity and precision.

Lindsey Leighton, an associate professor in Earth and Atmospheric Sciences, describes some of his favourite B-movie marine predators, so prepare yourself for the most ghastly ocean rituals of creatures that are anything but spineless.



A .22-calibre punch and an attitude to match

Name: Stomatopoda or mantis shrimp

Size: five to 18 centimetres long

Prey: gastropods, crustaceans

In aquatic burrows and rocky outcrops hides a territorial, solitary predator. With a hypnotic exoskeleton of blue, green, red or orange, the most complex eyes in the animal kingdom, and a punch with the force of a .22-calibre bullet, this invertebrate marine creature is almost too fantastic to believe.

The mantis shrimp's compound eyes have trinocular vision, depth perception and the ability to see UV, visible and polarized light. Add to this 12 colour photoreceptors compared with a human's three, as well as the ability for each stalk-mounted eye to move independently and in all axes, and few can escape the stomatopod's crosshairs.

The mantis shrimp has in its arsenal two club-like smashing arms at the front of its body. When it releases one of these to hammer open a shell or exoskeleton, it unleashes the fastest predatory strike on the planet. With a speed of 80 kilometres per hour and 880 Newtons of force, the movement creates a vapour bubble in front of it that, when it implodes, creates heat, light and sound. The collapse of the bubble can produce additional force on the prey, helping the mantis shrimp reach the tasty flesh of its victim.

Legend has it that this creature's strike can break aquarium glass or even a bone in a person's hand. If humans could accelerate their arms at one-tenth the speed of the mantis shrimp's appendage, they could throw a baseball into orbit.



Poison harpoons at the ready

Name: Conus or cone snail

Size: about 15 centimetres long

Prey: fish

Beneath the water of the world's tropical oceans lurks a paralyzing terror. What looks like a harmless traveller's souvenir is actually the predatory cone snail. Don't be fooled by this marine gastropod's slight stature or pretty appearance. Some forms of this bestial beauty are among the most venomous creatures in the water; some can even kill a human.

The cone snail is an ambush predator. Lying in wait, it scents prey by extending a tube-like proboscis as much as twice its body length, then launches a barbed harpoon called a radula that punctures the skin of the prey and releases a deadly cocktail of neurotoxins. The victim is paralyzed, alive but unable to move, pulled into the mouth and eaten whole. The cone is always armed — it harbours a supply of these harpoons at the ready, and they can fire in any direction.



MOON SNAIL DRILLING FOR FLESH

Drilling inexorably for flesh

Name: Naticidae or moon snail

Size: one to four centimetres

Prey: bivalves, barnacles, gastropods

This carnivorous sea snail is a favourite among scientists because of its unique behaviour.

As it oozes, half submerged, through the ocean floor's detritus, it searches for prey. The snail envelops its victim with an expandable, bulldozer-like appendage, referred to as a foot. On its foot lies an "accessory boring organ" that secretes chemicals, including hydrochloric acid, which soften a spot on the prey's shell. Meanwhile, the snail's radula, a tongue-like organ covered in teeth, scrapes away at the prey's shell. It can take days to drill a hole into the shell, through which the snail slowly sucks the flesh of its prey.

Scientists have found these unique conical holes in fossil records dating back millions of years. Leighton has a collection of 380-million-year-old brachiopods that show such drill holes.



STONE CRAB CRUSHING CLAWS

Claws more mighty than a crocodile

Name: Menippe mercenaria or stone crab

Size: seven to eight centimetres across the carapace (upper section of the exoskeleton)

Prey: bivalves, gastropods, echinoderms

The stone crab's sizeable claw may have seafood lovers dreaming of clarified butter and jambalaya, but in its natural environment, this small crustacean is a determined hunter with a crushing claw of death.

"If it gets hold of your finger, it's like having it run over by a dump truck."

For perspective, let's remember that the grip of man's hand has an average force of 660 kilopascals (96 pounds per square inch). Saltwater crocodiles, with one of the strongest bites in the animal kingdom, have a bite force of 25,500 kPa (3,700 psi). Meanwhile, the seemingly innocuous stone crab is armed with a crushing claw that can exert at least 96,000 kPa (14,000 psi), a number usually associated with high-strength concrete used to build super skyscrapers.

"The claw is so huge, it looks like [the forearm of] Popeye," says Leighton. "If it gets hold of your finger, it's like having it run over by a dump truck."

This awe-inspiring claw is often as long as the crab's shell and makes up nearly half of its body weight. Leighton recalls one stone crab that could shuck an oyster, chipping away at the shell until it could reach its huge claw inside and sever the muscle that holds the oyster shell together. The shell would pop open and offer up a meal.

Source: New Trail | <http://newtrail.ualberta.ca/featurestories/no-spines-but-plenty-of-guts>



DAWSON'S SUN STAR A STOMACH FOR KILLING

A stomach that goes in for the kill

Name: Solaster dawsoni or Dawson's sun star

Size: up to 50 centimetres in diameter

Prey: echinoderms, including other sea stars, bivalves

Imagine, if you will, a blind, cannibalistic predator with 12 to 13 arms and an ambitious appetite. It lives on the rocky ocean floor and creeps along on thousands of sensitive tube feet, searching for prey that's often bigger than it is.

This is *Solaster dawsoni*, a sea star few creatures can escape once it mounts and wraps itself around its victim. When its prey is immobilized, the sun star extrudes its stomach, which can slip through even the smallest of gaps in a bivalve shell, and its digestive juices begin to dissolve the prey's flesh. It's a whole different way of eating the clam on the half shell.

"While researching these guys, we would take them out of the tank and put them on our arms and they would try to eat us," says Leighton. "Their digestive juices weren't strong enough to do any harm, but it is creepy and feels really weird, and they are hard to get off because of all those tube feet."



SHAME-FACED CRAB CAN OPENER OF DEATH

Creepy can opener of death

Name: Lopholithodes foraminatus, calappid, box crab or shame-faced crab

Size: eight to 10 centimetres across the carapace

Prey: gastropods

Don't be fooled by the shame-faced crab's deceptively bashful name, for this crustacean is bold and scientifically beautiful in its precise destruction.

The unusual-looking calappid uses its exacting, asymmetrical claws to kill and eat its prey. The right-handed pincer features a specialized, curved tooth that is inserted into the prey's shell and used like a can opener to cut a channel along the shell. When the victim is exposed, the crab's left forcep-like pincer extracts the flesh from within.

Just try not to let the image of a serrated tooth carving through an exoskeleton imprint itself on your mind in a grim, slow-motion mental loop. (Insert sawing sound effect here.)