

# Did crab turn hunter from scavenger?

Video of coconut crab killing seabird poses question; such behaviour is rare, say experts

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It is a scene straight out of a horror movie: a giant, land-dwelling crustacean climbs a tree in the dead of night, seizes a sleeping bird and breaks its wing. Then, the coconut crab climbs back down to the bird, which has fallen to the ground, snaps its other wing like a twig and eats it alive.

The video of the kill, which has gone viral, had some speculating that the crab species had morphed from scavenger to hunter. It was the first time such predatory behaviour had been observed in the species, fuelling speculation that the transformation could have significant impact on the ecosystems where they live.

But other crab experts say that this behaviour is rare for a coconut crab, that the individual in the video was likely an opportunistic arthropod which got lucky, and which will probably learn from the experience.

Coconut crabs, also known as robber crabs and by their scientific name *Birgus latro* – roam forests and climb trees in search of nuts and fruits like its favourite coconuts. But being scavengers, they also feed on anything edible they come across, such as carrion. They have a keen sense of smell, and can detect odours kilometres away.

Said Professor Peter Ng, programme director of Singapore's Marine Science Research and Development Programme and a renowned crab expert: "What is possible is that this particular crab smelled something on the tree and climbed up to explore, probably expecting a dead bird or something that was rotting.

"Instead, he climbs onto a bird... the crush of his claw is so powerful so it breaks the bird's wing. And from then on he responds like any scavenger does."

Prof Ng, who is also head of the Lee Kong Chian Natural History Museum, said he doubts this is something the crabs do on a regular basis, going by his observations through his research on crabs since the 1990s, including trips to Christmas Island to study coconut crabs.

None of the crab researchers that he has spoken to has ever described the coconut crab as a predator either.

"Here you have a crab that got lucky," he said.

The odd behaviour was recorded by Assistant Professor Mark Laidre of Dartmouth College in the United States, while he was studying the giant crabs in the remote Chagos Islands in the Indian Ocean.

He wrote in scientific journal *Frontiers In Ecology And The Environment* that he had observed the



Dr Yoshihisa Fujita, a crab researcher, holding a coconut crab on a Christmas Island expedition with Professor Peter Ng in 2010. PHOTO: COURTESY OF PETER NG

coconut crab attack and kill an adult red-footed booby – a common sea bird – in the middle of the night in March last year.

The booby had been sleeping on a low-lying branch, less than a metre up the tree, when the crab grabbed its wing with its claw, broke the bone and caused the booby to fall to the ground.

The crab then clambered down and grabbed and broke the bird's other wing. Within 20 minutes, five more coconut crabs had arrived for the feast.

"As the booby lay paralysed, the crabs fought, eventually tearing the bird apart over several hours, carrying it away, and consuming it," Prof Laidre wrote.

The coconut crab is the largest land-based invertebrate, weighing up to 4kg and with a leg span of over 1m.

And these animals have been turning heads since the time of Charles Darwin, the father of evolutionary biology, who described their size as "monstrous", and who observed them tearing off the husk of coconuts, and then cracking the fruit open by hammering it with their heavy claws.

According to a study published by researchers from the Okinawa

The crabs, however, are not known to be aggressive, and predatory attacks, like the one on the red-footed booby, are rare.

Prof Laidre had noted in his paper that such attacks could potentially influence boobies' and other bird species' choice of islands, especially where they nest.

He conducted surveys on three small islands in the mouth of the Diego Garcia lagoon, and found that birds were less likely to live on islands where coconut crabs lived, and vice versa.

Prof Ng agrees that the coconut crab can influence bird populations, but not in a substantial way.

He believes that seabirds will continue to favour such isolated islands as they are free from agile predators like lizards and weasels, which due to their speed, can wipe out populations.

Coconut crabs move slowly and noisily, so it is near impossible for them to sneak up on a bird, explained Prof Ng.

"In this case, the bird was a little slower," he said.

While it takes a long time for an entire species to learn a new behaviour, an individual can do so in a much shorter amount of time.

So it is likely that this particular crab might try climbing a tree to get a bird again.

"If it succeeds after one or two times, will it do it repeatedly as a habit? Yes, it could," Prof Ng said.

But he noted that it is unlikely that this crab would or could teach others to do the same, as crabs are unlikely to learn by imitation the way higher mammals such as primates do.

Prof Ng and other researchers in Singapore are currently studying the biology of these crabs, including how they are distributed, and their patterns and colours, which they hope will help in conservation efforts.

These days, this species of crab is believed to be rare and is protected in most regions, though there is insufficient data to confirm their numbers.

Prof Ng has however eaten it once, decades ago. He said it tasted like any other crab but with a slight coconut flavour.

"I will never do it again. Once you work with these crabs you will know they have character, and to eat them is such a waste," he said.

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The Lee Kong Chian Natural History Museum will be holding an exhibition, Christmas Island Red, from Dec 18, on the creatures found on the island, including the coconut crab.

## FACTS ON THE COCONUT CRAB

- They are the largest land-based invertebrate and the largest hermit crab on the planet, although they have no need for a shell to retreat into. Following a brief larval stage in the ocean, these crabs spend the rest of their lives on land.
- They can weigh up to 4kg and have a leg span of more than 1m.
- They can live for more than 60 years.
- They are found on islands across the Indian and Central Pacific oceans.
- They like to eat coconuts and are known to tear the husk off with their claws and hammer the fruit till an opening is made. Sometimes, they climb trees while carrying a coconut and throw it to the ground to break it.
- They are tasty because of their diet. Those who have eaten the crab say it has hints of coconut. Considered a delicacy in some circles, its numbers are believed to have declined significantly.
- Their pincers generate a force about 90 times their own body weight. The biggest crabs exert a claw force that could nearly rival a lion's bite.
- Some believe that coconut crabs ate American aviation pioneer Amelia Earhart's remains after she crashed on Nikumaroro Island in the western Pacific Ocean.

## DARWIN'S TAKE

The crab begins by tearing the husk, fibre by fibre, and always from that end under which the three eye-holes are situated; when this is completed, the crab commences hammering with its heavy claws on one of the eye-holes till an opening is made. Then turning round its body, by the aid of its posterior and narrow pair of pincers it extracts the white albuminous substance.

I think this is as curious a case of instinct as ever I heard of, and likewise of adaptation in structure between two objects apparently so remote from each other in the scheme of nature as a crab and a cocoa-nut tree.



EVOLUTION THEORIST CHARLES DARWIN, on the coconut crab.

## POWERFUL CLAWS

When I was pinched, I couldn't do anything until they unfastened their claws. Although it was a few minutes, I felt eternal hell.



DR SHIN-ICHIRO OKA, a zoological researcher at Japan's Okinawa Churashima Research Centre, told *The Washington Post*. He was accidentally pinched twice during research to determine the crushing force of the crab's pincers.

The coconut crab can live for more than 60 years and can weigh up to 4kg. PHOTO: NUS

