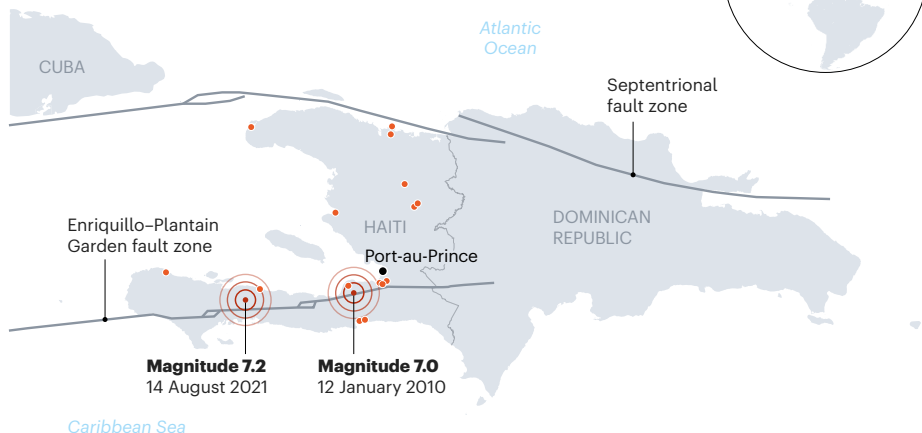


TRACKING HAITIAN TREMORS

Low-cost seismometers hosted in people's homes and workplaces are contributing to the scientific understanding of the recent earthquake in Haiti. The community-based effort launched after a massive quake in 2010 killed more than 100,000 people.

● Volunteer-science stations



generating landslides as aftershocks shook the ground, Boisson tells *Nature*. “It was pretty difficult” for them, he says.

DIY seismology

The challenge of doing fieldwork in Haiti helped to inspire the creation of the community seismology project in 2019. That was when Eric Calais, a seismologist at the École Normale Supérieure in Paris who has studied Haiti's earthquakes for years, happened across a company that sells seismic stations to hobbyists. Looking for ways around the national Haitian network's intermittent data, he used leftover money from a grant to buy some stations. Known as Raspberry Shakes, they contain tiny accelerometers that detect when the ground trembles.

These US\$500 stations are not as sophisticated as Haiti's official \$50,000 monitoring stations. “But when it comes to locating quakes, determining magnitude, doing basic seismology – they are really excellent,” says Calais. The team, which includes Calais, Boisson, Symithe and others, recruited people to host the stations. Boisson had one in his garden until he dismantled it to move it closer to the epicentre of the 14 August quake. The host who had the Raspberry Shake closest to the epicentre was chagrined that his station was offline during the quake; he immediately ran out and topped up his Internet plan, says Calais.

Funded by international supporters, Calais and his colleagues have kept the network of 15 stations operational for two years; they aim to ramp up to 50 or more stations soon. Community seismology networks have sprung up in other places around the world, but the Haiti network is unique in providing data in an area where few seismic data are otherwise collected, says Calais.

The Haitian community-seismology data feed into a nationwide experimental system

called Ayiti-Séismes, which is hosted at a website run by the Côte d'Azur University in Nice, France. Ayiti-Séismes also pulls data from official seismic stations in Haiti as well as those in nearby countries, including the Dominican Republic and Cuba. The result is a real-time map of aftershocks, blanketing southwestern Haiti in shades of red and orange. “The network is alive and well,” says Susan Hough, a seismologist at the US Geological Survey in

Pasadena, California, who has worked in Haiti for many years, including after the 2010 quake.

The quake's epicentre is fairly close to quakes that occurred in 1952 and 1953, which were probably between magnitudes 5 and 6, says Calais. In terms of future risk, the Enriquillo–Plantain Garden fault zone could still yield another major quake. “In this area, we cannot say that it's over,” says Boisson. Some speculate that the 2010 quake contributed to the recent one by transferring stress towards the region that just ruptured.

Boisson notes that many scientists have been worried about a different major geological region in Haiti's north, known as the Septentrional fault zone; it unleashed a major quake in 1842. “After 2010, we thought it would be this fault” that would cause future quakes, he says. “And then it was in the south again.”

At least 600 aftershocks have been detected from the 14 August quake – compared with roughly 10 in the same time period after the 2010 quake, although there were undoubtedly more that were not detected, says Calais. “We now have very strong information about not only where the [14 August] quake occurred, but also how wide the rupture was, in which direction the fault was dipping,” he adds. “That's essential” to understanding why the quake occurred, and what to expect in the future.

AUSTRALIA'S CANE TOADS EVOLVED TO BE CANNIBALS AT FRIGHTENING SPEED

Study suggests that the noxious pests have become so numerous, they've developed a taste for each other.

By Max Kozlov

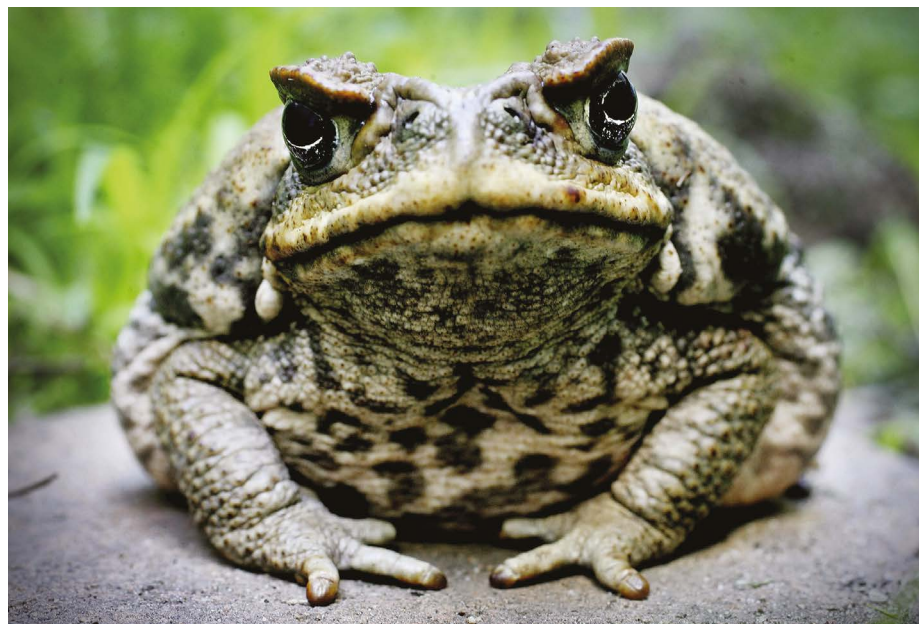
The list of ‘deadly animals in Australia’ just got a little weirder. The cane toad, a toxic, invasive species notorious for devouring anything it can fit in its mouth – household rubbish, small rodents and even birds – has become highly cannibalistic in the 86 years since it was introduced to the continent, according to a study. Its counterparts in South America, where cane toads originated, are much less cannibalistic.

The discovery could help researchers to understand the evolutionary underpinnings of this uncommon and extreme behaviour. Scientists have seen cannibalism evolve in species before, says Volker Rudolf, a community ecologist at Rice University in Houston, Texas, who studies the phenomenon. But

what's exciting about this work, he says, is that the researchers are almost seeing it “develop in front of their eyes”, given that the behaviour arose in less than 100 years – the blink of an eye by evolutionary standards.

“These toads have gotten to the point where their own worst enemy is themselves,” says Jayna DeVore, an invasive-species biologist at the Tetiaroa Society, a non-profit organization in French Polynesia, and a co-author of the study, which was published on 23 August (J. L. DeVore *et al. Proc. Natl. Acad. Sci. USA* **118**, e2100765118; 2021).

Scientists estimate that there are well over 200 million of the amphibians in Australia. They have become so abundant, says DeVore, that they face more evolutionary pressure from each other, as they compete for resources, than from anything else in Australia.



The cane toad, whose skin is toxic, is an invasive species in Australia.

Farmers first introduced about 100 cane toads (*Rhinella marina*) to Australia from their native range in South America in 1935 to control cane beetles (*Dermolepida albobirtum*), which were wreaking havoc on sugar-cane plantations. The giant toads failed to knock down the beetle populations, but they succeeded in multiplying astronomically. Because of their poisonous skin, which is coated in bufotoxins, they had no natural predators and went on to invade large swathes of the northern and eastern parts of the country.

Tadpole terror

Although adult cane toads are fearsome – they grow to up to 25 centimetres long – it's their tadpoles that are usually the cannibals. A group of tadpoles can gobble up more than 99% of the hatchlings that emerge from the tens of thousands of eggs in a single clutch (J. L. DeVore *et al. Ecol. Monogr.* **91**, e01426; 2020).

DeVore and colleagues were curious to see whether the cannibalistic behaviour was common across all cane toads, or if it was due to how invasive the Australian ones are. So they collected cane toads from Australia and from French Guiana, and bred them, producing hatchlings and older tadpoles. The team then exposed a single tadpole to 10 hatchlings from its group – either from Australia or South America – hundreds of times and found that invasive Australian tadpoles were 2.6 times as likely to cannibalize hatchlings as were native South American ones.

Researchers have long known that the Australian tadpoles are attracted to the hatchlings because of the scent of the younger animals' toxic skin. "You'll get this huge avalanche of thousands and thousands of tiny cane-toad tadpoles coming toward this chemical,"

says Rick Shine, an evolutionary biologist at the University of Sydney in Australia, and a co-author of the study. DeVore, Shine and their co-workers saw this play out in their experiments: the Australian tadpoles were nearly 30 times as likely to swim towards a trap

containing hatchlings as towards an empty trap, whereas the South American tadpoles showed no preference for either.

Although the speed with which the toads evolved this behaviour is impressive, the team was even more surprised by how fast the animals had evolved a defence to protect against it. The researchers found that when invasive Australian hatchlings shared a tank with caged, older tadpoles from the same group, the hatchlings were more likely to have a shorter developmental period than that of the South American hatchlings.

Older tadpoles don't tend to eat older tadpoles – so the toads might have evolved to speed up their hatchling phase, the researchers found. This would limit the amount of time they spend vulnerable to cannibalism, even if the adaptation eventually stunts their growth, says DeVore.

Roshan Vijendravarma, an evolutionary biologist at the Curie Institute in Paris, who has studied cannibalism in fruit flies, says the differences between the invasive and native toads' behaviour probably have a genetic basis, given how extreme they are and how quickly they evolved over relatively few generations of toads. Shine and his colleagues think this idea is worth exploring and are studying it now.

IAN WALDIE/GETTY

THE VENEZUELAN HEALTH-CARE WORKERS SECRETLY COLLECTING COVID STATS

Fearing detainment, doctors and nurses are quietly working to report reliable data.

By Luke Taylor

"The hardest part of watching my colleagues and patients suffer is not being able to say anything about it," says Gabriel Romero, an attending physician at one of Venezuela's largest public clinics.

Romero, who asked that *Nature* not use his real name for fear of punishment by the Venezuelan government, is one of the many health-care workers in the country fighting COVID-19 despite a lack of basic medical equipment, a steady power and water supply, and adequate pay. When they have spoken out about what they say are unacceptable conditions, some have been detained by government forces.

Included in their list of complaints is a lack of reliable COVID-19 data.

Officially, Venezuela reports that it has

had about 135 COVID-19 fatalities per million people. By contrast, its next-door neighbours Colombia and Brazil report about 2,440 and 2,700 fatalities per million people, respectively (see 'Questionable COVID data').

In looking at the data for South America, Romero and others say it's obvious that Venezuela's numbers do not reflect reality, and that the drastic undercount is driven by a lack of testing and infrastructure – but also by a deliberate effort by the government to downplay the pandemic. Because accurate statistics are crucial for aid organizations deciding where to send resources, and for local officials mulling whether to open schools and businesses, many doctors and nurses have taken matters into their own hands, collecting data from hospitals and reporting the numbers secretly to various research networks and non-governmental organizations (NGOs). These numbers are