True blue

As *Elacatinus* gobies evolved from living and feeding inside sponges to eating parasites off other fish, their stripes changed from yellow to green to blue. To visiting client fish, blue stands out the most against the dominant reef colours.

Blickwinkel/SpecialistStock

Ant vision

Ants can discriminate between very similar shades of colour, especially green. This may help foragers to locate fresh, healthy plants for food or shelter, and find prey and/or honeydew-secreting aphids hiding among the foliage.

IN BRIEF

HAPPY FEET

Insect feet are self-cleaning. Beetles and stick insects, whose feet represent the two clinging forms found in insects, can shed all foot contaminants and regain 100 per cent of their 'stickiness' in a few steps. How it works has yet to be clarified, but both types of foot exude a fluid that helps critters to cling – and may also continuously wash away dirt (J. of Exp. Biol., vol 213, pp635–42).

WORMY EATS

The common earthworm *Lumbricus terrestris* actively seeks out and consumes viable seeds and young seedlings, with a preference for nitrogen-rich legumes. The findings could be used to lure worms into certain crop fields. They also reveal an unexpected danger of introducing them into non-native habitats (Soil Bio. & Biochem., vol 327, pp326–7).

GOOD VIBRATIONS

The egg-encased babies of red-eyed tree frogs *Agalychnis callidryas* detect the vibrations of an attacking predator, such as a snake, and hatch early to escape. It turns out that they can also identify rainstorms – based on their often higher vibration frequencies and/or gradual build-up of intensity – to avoid false alarms (Animal Behaviour, vol 79, pp255–60).

Christian Ziegler/Minden/FLPA

To stay or not to stay? The dry season forces Amazonian manatees to make tough decisions.

Luciano Candisani/Minden/FLPA

Damned if you don't...

Manatees migrate to avoid being outflanked by predators.

Amazonian manatees *Trichechus inunguis* in north-west Brazil spend roughly the first half of the year in lakes and flooded forests, mostly feeding on aquatic plants, but the last half several hundred kilometres away in submerged river valleys called *rias*. There are no major temperature swings, and the animals appear to fast after their long and dangerous journey. So, why migrate?

A team led by Eduardo Moraes Arraut from Brazil's National Institute for Space Research radio-tracked 10 animals over 12 years and studied landscape changes using satellite images. The researchers found that each year, around August, it was as if someone pulled the plug on the floodplain – water levels began to drop rapidly, falling up to 16m by November. This not only reduced the total water coverage by about 95 per cent, but transformed the almost unbroken expanse of wetland into a mostly dry landscape peppered with relatively few small, isolated lakes.

They also discovered that the manatees' main predators follow the receding water. Caimans aggregate in the remaining pools, jaguars frequent the shores and humans harvest the high concentrations of fish. What's left of their habitat becomes hopping with hunters, so they leave.

However, the locals have learned this, and ambush the travellers as they pass through narrow channels. Hence, for the manatees, migrating means choosing the lesser of two evils, where facing one enemy en route is apparently better than staying and dealing with three.

MANATEE MORSELS

- The Amazonian is the smallest manatee species. It is about 3m long and weighs roughly a tonne.
- There are two other species of manatee, the West Indian *T. manatus* and West African *T. senegalensis*. All three are endangered.
- The Steller's sea cow *Hydrodamalis gigas*, a giant ancestor of manatees, was about 9m long and weighed 8–9 tonnes. It was hunted to extinction in the mid-1700s.
- A manatee can swim up to 60kmph and can remain underwater, holding its breath, for 15–20 minutes.
- It adjusts its depth in the water using the air in its lungs, which span its back like two sausage-shaped buoys. These organs can be punctured by boat propellers.

SOURCE: Journal of Zoology, vol 280, pp246–256 LINK: www.edgeofexistence.org/mammals/species_info.php?id=84

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DISCOVERIES

Practice makes perfect

For some Brazilian monkeys, nut-cracking is a way of life.

There really is more than one way to crack a nut, according to new research on Brazil's bearded capuchins *Cebus libidinosus*.

This species feeds on a variety of nuts by placing them on boulders or fallen tree trunks and breaking them open with stones. To take a closer look at this behaviour, a research team led by Dorothy Fragaszy from the University of Georgia (USA) studied a wild troop at a popular nut-cracking site in the north-east. The scientists placed a supply of very hard palm nuts and a hammer-stone near a tree-trunk anvil, then set up a camera to record the action.

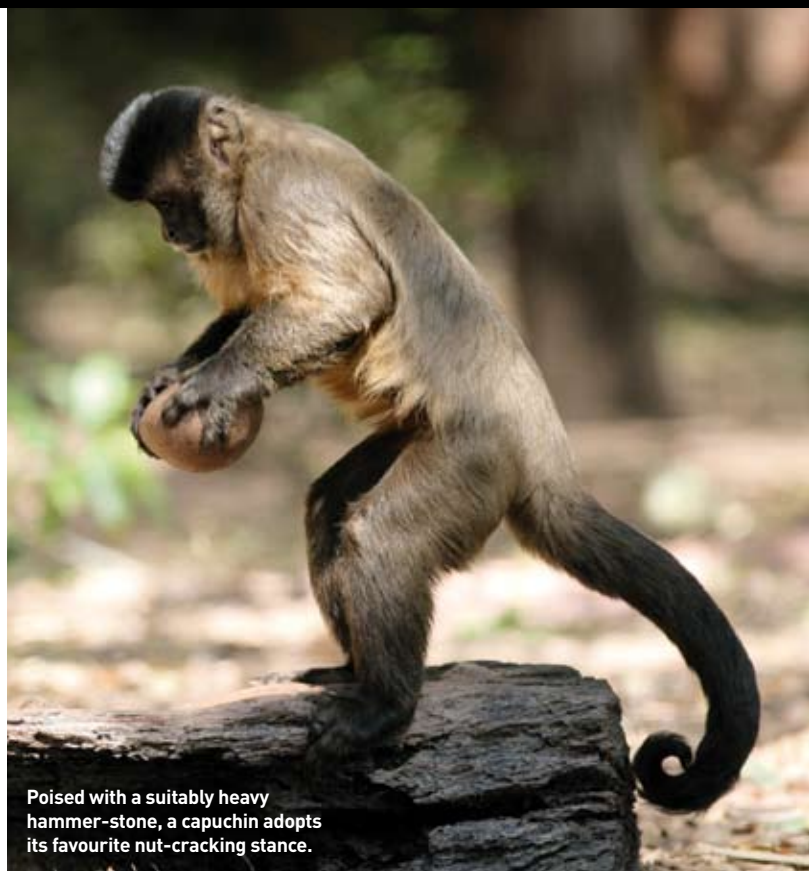
They found that only the biggest, heaviest capuchins were good crackers, taking about seven strikes to crush a nut. But size didn't stop the less burly from trying. They were irrationally persistent, whacking the nuts up to 75 times to break them. Since this time-consuming, tiring and loud behaviour seemed to maximise their vulnerability to predators, it begged the question why smaller individuals did it at all.

Well, they may have been practising. The monkeys almost always placed the nuts in pits in the log, reducing the chance of them flying off and getting lost. Moreover, the researchers have found that, when not limited to an experimental set-up, the capuchins prefer seeds that are easier to crack, anvils that are more effective and heavier hammer-stones. In other words, they know what works best.

The team also learned that each monkey picked a particular body position and angle to the log, and stuck with it for three out of every four strikes.

So, it appears that each capuchin repeatedly applies a basic knowledge of nut-cracking in its own unique style, where practice makes perfect. Indeed, as the biologists point out, repetitive motion can condition muscles for a given task (try brushing your teeth with your 'other' hand). In this way, a monkey is bound to master its method by the time it's big and strong enough to efficiently crack even the hardest nuts, which are off-limits to most other animals in the forest.

SOURCE: Animal Behaviour, vol 79, pp321–32 LINK: www.ethocebus.org



Poised with a suitably heavy hammer-stone, a capuchin adopts its favourite nut-cracking stance.

Mike Lane/NHPA

NUTTY NUGGETS

- The exact skills the capuchins may hone over time are currently being investigated, but could include angle of impact and control of the hammer.
- The monkeys begin cracking things, including some nuts, at an early age. They have plenty of incentive, as processing sites are often littered with partially cracked nuts from the failed attempts of previous users – and capuchins of all sizes can open these with ease.
- All of the monkeys in this study stood with their feet at the same level, ie both on the log or both on the ground. This may maximise stability and downswing force.
- The researchers found a novel way to weigh their subjects, using a scale as a platform at a makeshift fountain.

Ochre sea stars have a clever way of coping when they feel the heat.

Matthew Maran/naturepl.com

Cooling off

How sea stars handle hot spells.

Low tide may leave ochre sea stars *Pisaster ochraceus* high and dry, but they still keep their cool, according to new research.

Sylvain Pincebourde and Brian Helmuth (University of South Carolina) and Eric Sanford (University of California-Davis) simulated the tide-cycle for captive ochres for a week, exposing them to warm air at low tide. They found that the animals' body temperatures increased by several degrees Celsius during the first low tide, but dropped every day thereafter, even though the air and water temperatures never changed. They were clearly cooling off, but how?

The researchers discovered that the stars, which weren't allowed to eat, actually gained weight each day – they were taking on water. In other words, if an individual gets too toasty when marooned ashore, it will soak up extra seawater while submerged at the next high tide. The internal pool cools down the star and prevents overheating during its next run in the sun.

This novel thermo-regulatory trick may enable sea stars to remain near their favourite prey – mussels, which live high on the shore. Instead of moving to deeper waters during hot spells, they can safely stay put, with food just an arm's length away.

SOURCE: Am. Nat., vol 174, pp890–7 LINK: http://animaldiversity.ummz.umich.edu/site/accounts/information/Pisaster_ochraceus.html