

# RESEARCH HIGHLIGHTS

Selections from the scientific literature

## GENOMICS

### How coffee got its buzz

The coffee plant makes caffeine using different genes from those found in tea and cacao, suggesting that the ability to produce the stimulant evolved at least twice in plants.

Victor Albert at the University of Buffalo in New York and his colleagues sequenced the genome of robusta coffee, *Coffea canephora*, which makes up about one-third of all coffee produced. They found that of the genes that are unique to this plant, most are involved in caffeine production.

The stimulant probably evolved in the ancestor of coffee plants and separately in a common ancestor of tea and cacao, perhaps to defend the plants against predators and to attract pollinators.

*Science* 345, 1181–1184 (2014)

## EVOLUTION

### Wooping frogs are bat bait

Bats use echolocation not only to navigate, but also to spot and capture male frogs that are in the act of courting.

Many male frogs inflate their vocal sacs while sending out calls to attract potential mates. Wouter Halfwerk at the Smithsonian Tropical Research Institute in Balboa, Panama, and his team exposed wild-caught fringe-lipped bats (*Trachops cirrhosus*) to robotic models of the male túngara frog (*Physalaemus pustulosus*)



that either puffed out a vocal sac (**pictured**) in time with a call or just emitted the call.

They found that all the bats preferentially attacked the model that inflated its sac in sync with the call. The bats used echolocation to detect the 'frogs' from 3–5 metres away, whereas female frogs use vision to assess the male's

vocal sac. The results suggest that sexual and natural selection can act on the same trait through different senses.

*J. Exp. Biol.* 217, 3038–3044 (2014)

## ANIMAL BEHAVIOUR

### Videos teach tricks to wild monkeys

Wild monkeys can learn new behaviours by watching instructional videos — a feat that had previously been accomplished only in the laboratory.

Tina Gunhold at the University of Vienna and her collaborators recorded video of two captive marmosets (*Callithrix jacchus*) as they opened a box to retrieve a reward, either by popping open a lid or by pulling out a drawer.

The team then placed the same type of box on a tree branch in a Brazilian forest, next to a laptop screen showing the videos (pictured).

Of the 108 wild animals studied, only 12 succeeded in the task, but 11 of those had watched the video. Most of the successful animals used the same technique they had seen in the video.

*Biol. Lett.* 10, 20140439 (2014)



TINA GUNHOLD

## PHYSICS

### Magnets used in suspension act

Researchers have developed a way to handle small objects in three dimensions using magnetic levitation, even when the objects themselves are not magnetic.

George Whitesides and his team at Harvard University in Cambridge, Massachusetts, suspended a non-magnetic nylon screw in a liquid that becomes magnetic when exposed to magnets. The authors placed one magnet

above the container and one below, which made the fluid shift towards the magnets, leaving the screw suspended in the middle.

When the apparatus is rotated, the object rotates with it. Moving an extra magnet around the outside of the device further shifts the liquid and the screw's orientation.

The technique could be useful on assembly lines, allowing the manipulation of materials that are too fragile or soft to be handled by other equipment.

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