

CROP SCIENCE

A gene for better and longer rice

A gene that can improve the quality of rice without reducing yield has been identified by two separate teams.

Long, slender grains are considered a mark of quality for rice in many parts of the world. Xiangdong Fu of the Chinese Academy of Sciences in Beijing and his team mapped the genomes of 4,500 plants from a long-grain rice variety and zeroed in on a gene known as *Os07g0603300*. Upregulation of this gene increases cell division in the longitudinal direction and decreases it in the transverse direction. This results in a long, thin grain with very little ‘chalkiness’ — an undesirable opaque appearance — and no yield penalty. The gene can be repressed by a transcription factor encoded by a neighbouring gene.

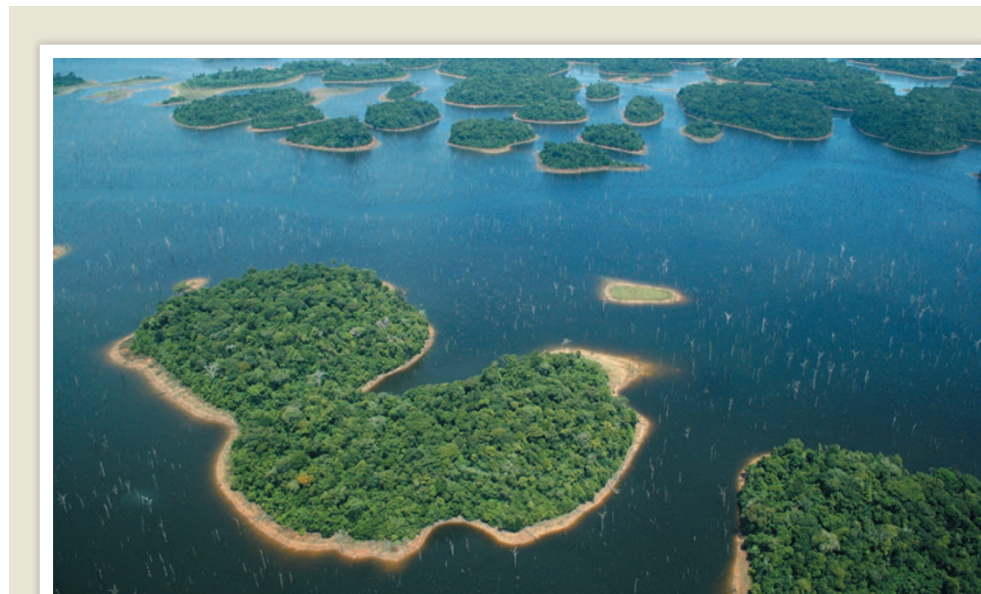
Independently, Qian Qian of the Chinese Academy of Agricultural Sciences in Shenzhen, and his team discovered extra copies of *Os07g0603300* in rice varieties with these desirable traits. *Nature Genet.* <http://dx.doi.org/10.1038/ng.3352>; <http://dx.doi.org/10.1038/ng.3346> (2015)

PHYSICS

Tighter limits on dark matter

Atomic spectroscopy can aid the search for ultralight dark matter.

Ken Van Tilburg at Stanford University, California, and his team measured the energy emitted as atoms of the rare-earth element dysprosium transitioned between two electronic states of very similar energy over a two-year period. They looked for fluctuations



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CONSERVATION

Amazon wildlife hit by hydropower

A major hydroelectric dam in the Amazon basin has severely reduced biodiversity.

Brazil's Balbina Dam left more than 3,000 square kilometres of Amazonian forest underwater and created thousands of islands (pictured) when it was built in 1986. Maira Benchimol and Carlos Peres from the University of East Anglia in Norwich, UK, surveyed 37 of these islands for 35 large and medium-sized mammal, bird and reptile species, using walking surveys and motion-activated cameras.

They estimate that, in the 26 years between the dam's construction and their survey, isolation has led to an overall species loss of 70% across all islands created by the dam, with smaller islands suffering the most. Just 25 of the 3,546 islands are likely to host 80% or more of the animals that they looked for. Such negative impacts have not been generally considered, and biodiversity impacts should be better assessed before future hydropower projects go ahead, the authors suggest.

PLoS ONE <http://doi.org/5xh> (2015)

in this energy over time, which would reveal short-term, local changes in the strength of the electromagnetic force. These could be caused by interactions with certain ultralight dark-matter particles.

No fluctuations were observed, meaning that any such dark-matter particles interacting would have to be heavier than 3×10^{-18} electronvolts or would have to interact very weakly. The results improve on previous bounds for the strength of such interactions by four orders of magnitude. If similar measurements were performed

with atomic clocks, the limits might be improved by another order of magnitude.

Phys. Rev. Lett. 115, 011802 (2015)

ANIMAL BEHAVIOUR

Flying spiders also sail on water

Spiders that use wind to carry them to new locations not only can survive a landing on water, but can also sail, even on fairly turbulent surfaces.

Many spiders exhibit ‘ballooning’ behaviour — they spin silken sails to travel

long distances on the wind. It had been thought that encountering water would be fatal. But Morito Hayashi at the Natural History Museum, London, and his team found that some species could survive on fresh and salt water in laboratory tests carried out at the University of Nottingham, UK, and would raise their legs or abdomens to use as sails to move across the surface. The spiders also used silk to anchor themselves in place while afloat.

This ability to control movement on water counterbalances the risks of