

Sciencewatch

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The world's oldest living thing

When people think of the oldest living things they often think of trees, such as Great Basin bristlecone pine trees in California and Nevada, which are nearly 5000 years old. Recently, Sophie Arnaud-Haond of Ifremer, in Plouzané, France, and the Universidade do Algarve and colleagues sampled and sequenced DNA from *Posidonia oceanica* – a seagrass – at 40 sites along 3500 km of sea floor from Spain to Cyprus. This plant, like other seagrasses, reproduces by cloning, so it grows as one big organism comprised of genetically identical cells.

Based on the known (and slow) growth



Does the seagrass Posidonia oceanica form the oldest living thing? (Image credit: planctonvideo/dreamstime.com.)

rate of this grass, the researchers estimate that the patch of genetically uniform plants along 15 km of coastline of the island of Formentera must be between 80,000 and 200,000 years old, making it the oldest living thing known on Earth.

● Further reading

S Arnaud-Haond *et al.* 2012 *PLoS ONE* **7**(2): e30454, doi:10.1371/journal.pone.0030454.

Compelling illusions

Illusions are usually thought of as tricks of the mind, but new research by Bruno Laeng and Tor Endestad of the University of Oslo shows that they can also cause direct physiological changes. They used infrared eye-trackers to monitor pupil size in people looking at drawings designed to give the illusion of a white region being brighter or dimmer, despite being objectively of equal brightness.

On glancing at the “brighter” images – despite not really being brighter at all – people’s pupils rapidly contracted before gradually expanding as they adjusted to the true intensity. So, just thinking that something is bright seems to fool the eye itself and not just the brain, at least for a while.

● Further reading

B Laeng and T Endestad 2012 *Proc. Nat. Acad. Sci.* **109** 2162.

A super hangover cure

Give rats the human equivalent of 15 to 20 beers in under two hours and they will pass out. Put them on their backs and they will need about an hour’s rest before they are able to flip back over again. However, if they had taken some dihydromyricetin (DHM) with their booze they would roll over in just 15 minutes and have less of a hangover two days later, as measured by reduced anxiety and incidence of seizures.

The remarkable effects of this substance have been discovered by Jin Liang of UCLA and colleagues, who found it in an extract

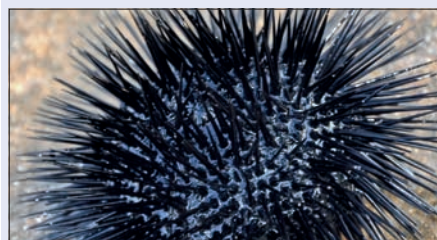
Sea-urchin spines understood

Sea urchins have tough spines – hard but able to resist shock. Now, Helmut Cölfen of the University of Konstanz and colleagues have found out why. The team used X-ray scattering at the European Synchrotron Radiation Facility in Grenoble to show that the spines are made of nanometre-sized bricks of magnesium-calcite crystals aligned in parallel and glued together with non-crystalline lime made of almost pure calcite with a 0.1% admixture of protein.

This is the first detailed study of a biological mesocrystal and it opens the door for synthesizing novel strong materials that combine high degrees of hardness with resilience. It seems that sea urchins get the substance to crystallize from an amorphous precursor phase.

● Further reading

J Seto *et al.* 2012 *Proc. Nat. Acad. Sci.*, doi: 10.1073/pnas.1109243109.



Tough urchin spines. (Image credit: LuciaPescaru |dreamstime.com.)

from the seeds of *Hovenia dulcis*, a plant known in traditional medicine for more than

1300 years as being a hangover cure. Even more remarkably, alcohol given with DHM does not seem to cause addiction. This is not to say that it makes drinking alcohol safe, because alcohol affects numerous systems in the body, but tests are planned on humans. Any volunteers?

● Further reading

Y Shen *et al.* 2012 *Journal of Neuroscience* **32** 390.

Non-exponential decays and carbon dating

Radioactive decay is often assumed exponential, and in many cases that turns out to be a good description. However, in radioactive carbon dating, there are disagreements between radiocarbon dates and dates from dendrochronology (counting tree rings). These have traditionally been attributed to variations in atmospheric carbon-14 levels, but Philip Aston of the University of Surrey points out that strictly exponential decay is impossible in quantum mechanics (using energy instead of time gives a non-normalizable Lorentzian); he also shows that predicted atmospheric affects that assume exponential decay do not match predictions from modelling.

For slowly decaying isotopes there is little direct experimental knowledge of the decay curves over long times, so dating based not only on carbon-14 but also on other isotopes may have to be revisited. Both theoretical and experimental input would be interesting.

● Further reading

P J Aston 2012 *Euro Phys Letters* **97** 52001.