have discovered hitherto unnoticed blue-fluorescent compounds in the peel of ripe bananas, which they attribute to the chemical degradation products of chlorophyll. These compounds, which have previously only been seen, fleetingly, in ageing leaves, are most abundant when the peels look the most yellow in daylight. They might have an important antioxidant role, delaying the decay of the ripe fruit.

BIOCHEMISTRY

Fungal facilitation

Ind. Eng. Chem. Res. **47,** 7476–7482 (2008)

A fungus has been found that can remove sulphur from crude oil more easily than conventional refining methods.

Jalal Shayegan and his colleagues at Sharif University of Technology in Tehran discovered the fungus *Stachybotrys sp.* while studying the microfauna of soil samples that were continuously being contaminated by oil. When they exposed the fungus to heavy crude oil samples, it removed up to 76% of the sulphur present.

Traditional sulphur-removal methods generally require temperatures above 400 °C and high pressures. The fungus, which functions perfectly well at 30 °C and atmospheric pressure, is expected to drastically improve the efficiency of oil refining methods.

ECOLOGY

Grunter gathering

Biol. Lett. doi:10.1098/rsbl.2008.0456 (2008); *PLoS ONE* **3,** e3472 (2008)

In the southeastern United States, some make their living by gathering worms for fishing bait through 'worm grunting'. Worm grunters drive a wooden stake into the ground and then scrape it with a metal sheet; within minutes worms pop out of the ground and the grunters pick them up.

Two reports have recently been published on the phenomenon. Jayne Yack of Carleton University in Ontario, Canada, and her team found that the worms emerge in response to vibrations from the grunting — low-frequency pulsed vibrations at below 500 hertz that could be felt by researchers standing several metres away. They suggest that the vibrations mimic rain or the foraging of predators.

Kenneth Catania of Vanderbilt University in Nashville, Tennessee, compared the grunters' vibrations with those made by rain and worm-devouring moles, and studied their relative effects on worms. He puts his chips on the vibrations mimicking the movement of the moles, causing the worms to flee.

ANIMAL BEHAVIOUR

Idle ants

Proc. R. Soc. B doi:10.1098/rspb.2008.1215 (2008)

The ant *Pristomyrmex punctatus* has no queens — female workers reproduce asexually. But that doesn't mean that everyone is equal. Some nests harbour 'cheaters' that shirk their duties and concentrate on reproduction.

Shigeto Dobata of the University of Tokyo and his colleagues found that there are two morphologically distinct types of *P. punctatus* worker. One does the work; the other, which is larger (pictured below, right) and has more ovarioles, does hardly anything except lay eggs.

Genetic tests showed that cheaters, although closely related to their nest-mates, are genetically distinct. They also revealed the same cheater lineage in more than one nest, suggesting that it can spread between colonies, and leading the researchers to describe the cheats as a transmissible 'social cancer' that has evolved to exploit the cooperative behaviour of the majority.

S. DOBATA

DRUG DESIGN

Hitting the hinge

Cell 135, 295–307 (2008)

Once a strain of bacteria has built up resistance to an antibiotic, a new antibiotic with a different mechanism is our next move in the arms race against pathogens such as tuberculosis. To this end, Eddy Arnold and Richard Ebright of Rutgers University in Piscataway, New Jersey, and their colleagues have found a new point of attack on an already popular target, bacterial RNA polymerase. This enzyme makes a good target because it is essential for making proteins from RNA and is highly conserved across bacteria.

The new target is at the hinge of a dynamic region of the enzyme that exposes or hides its active site. The researchers show that three natural products, myxopyronin, corallopyronin and ripostatin, all compounds certain bacteria use against one another, bind at the hinge and shut down RNA polymerase activity, crippling the bacterium.

JOURNAL CLUB

Lynne B. McCusker
Laboratory of Crystallography, ETH Zurich, Switzerland

A crystallographer celebrates a method with niche applications.

In 2004, Oszlányi and Sütő introduced a new way to determine crystal structures from diffraction data. To many crystallographers, including myself, this was a remarkable development. Although most of us had assumed that the trend of incremental but significant improvements to existing methods would continue, we had not expected a completely different approach to be discovered. The algorithm is an elegant one, based on a very simple perturbation (called charge flipping) of electron-density maps that are generated during the structure solution process.

Initially, the algorithm was viewed as a curiosity. After all, existing methods for solving structures work very well about 95% of the time, so a new technique was not really needed. However, the algorithm caught the attention of some inquisitive crystallographers, who tested it on their favourite problem cases. The result is that, just 4 years after its development, the approach has found niches in areas in which traditional methods flounder (*Acta Cryst.* **A64,** 123–134; 2008).

Scientists studying aperiodic materials (modulated structures and quasicrystals, whose structures are best described in more than three dimensions) were among the first to recognize the possibilities offered by the algorithm, because it could be easily adapted to work in higher dimensions. Charge flipping has enjoyed great success with such structures, and is now considered the method of choice by this community.

The algorithm has also proved effective in solving the structures of polycrystalline materials, mainly because complementary information from other sources (such as chemical analysis and electron microscopy) can be easily included. Now small protein structures and neutron- and electron-diffraction data are being explored — no doubt further niches will be found.

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