RESEARCH HIGHLIGHTS

Selections from the scientific literature

MICROBIOLOGY

'Jet lag' weakens malaria parasite

The periodicity of the life cycle of malaria parasites during host infection suggests that these organisms are regulated by circadian rhythms. Aidan O'Donnell at the University of Edinburgh, UK, and his team found that parasites whose rhythms were not synchronized with those of their hosts were less able to replicate in, and transmit out of, the hosts.

The researchers 'set' the circadian rhythms of mice and the rodent parasite *Plasmodium chabaudi* by keeping them in one of two rooms with opposing 12-hour light–dark cycles. They then infected the mice with parasites that were either in or out of sync with the animals' own cycles.

When mouse and malaria rhythms were the same, parasite densities during the replication and transmission stages of infection were double those seen for parasites that were out of sync with the mice.

Proc. R. Soc. B **doi:10.1098/rspb.2010.2457 (2011)**

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CLIMATE CHANGE ECOLOGY

Butterflies break out earlier

As Earth's climate changes, many butterfly species are emerging — from cocoons or from hiding — earlier in spring. Researchers have identified traits in UK butterflies that predict the largest shifts seen in emergence times over the past 30 years.

Sarah Diamond, then at the University of North Carolina, Chapel Hill, and her colleagues analysed a data set on UK butterflies such as the speckled wood (*Pararge aegeria*, **pictured**) during a period in which the country's spring temperatures rose by 1.5 °C. Butterflies that eat a lower diversity of plant species as caterpillars showed larger shifts in emergence time. The authors suggest that the butterflies may be tracking changes in their host plants' annual schedules.

Bigger shifts were also apparent in butterflies that overwinter as adults rather than as pupae or larvae. These species may respond more quickly to warm temperatures, the authors say.

Ecology **doi:10.1890/10-1594.1 (2011)**

ECOLOGY

The effects of opossum shrimp

J. STANFORD

An analysis of more than a century's worth of ecosystem data has revealed how the introduction of a single species of shrimp to a US lake led to a cascade of changes in the food web.

Bonnie Ellis at the University of Montana's Flathead Lake Biological Station in Polson and her colleagues examined published data from Flathead Lake (**pictured**) dating back to the end of the nineteenth century. They found that the opossum shrimp (*Mysis diluviana*), which was introduced into the lake in the mid-1980s, became a food source for the previously introduced but theretofore unobtrusive lake trout, which now dominates the lake.

The lake trout went on to eat all of the kokanee salmon, depriving eagles of their annual spawning kokanee feast. In addition, the shrimp consume large zooplankton, so small zooplankton now dominate. Because the latter do not consume as much algae, algal levels have increased, leading to a 21% rise in photosynthesis.

Proc. Natl Acad. Sci. USA **doi:10.1073/pnas.1013006108 (2011)**

CELL BIOLOGY

Best of two microscopes

Electron microscopes allow cell biologists to visualize the tiniest of cellular features, but struggle to locate rare features or events. Fluorescence light microscopy (FM) is well suited to this task, but its resolution is low. So Marko Kaksonen, John Briggs and their colleagues at the European Molecular Biology Laboratory in Heidelberg, Germany, combined the two modalities to image rare