Biology

Island has the world's only red nectars

The only three plant species known to produce colored nectar live on Mauritius, an island in the Indian Ocean.

Botanists discovered the first red-nectared plant, a bellflower relative called *Nesocodon mauritianus,* in 1976. Now, a Danish research team reports that two other species on Mauritius also secrete scarlet nectar. These two, *Trochetia blackburniana* and *T. boutoniana,* belong to the same family as the cocoa plant and are unrelated to the first find.

The role of the red pigment "remains unclear," report Jens M. Olesen of Aarhus University and his colleagues in the June 11 NATURE. They note that birds pollinate all three species, but the researchers find it "unlikely" that the red color evolved as an avian lure only on one island. They also are dissatisfied with the explanation that the red evolved as a warning to deter animals that steal nectar. The flowers frequently get robbed, they say.

Nesocodon mauritianus *lives only on Maruitius.*

The explanation might lie with some pollinator that has now gone extinct. However, "ghosts are not easy to pin down," the researchers lament. —*S.M.*

Washington has the really tough singers

For musical machismo, try Washington State. And as for Pennsylvania—forget about it!

The first geographic comparison of a guy thing called song matching has uncovered a big musical gap within the song sparrow species, says Stephen Nowicki of Duke University in Durham, N.C.

Males match songs by listening to a neighbor and then responding with a song from the repertoire they share. Nowicki compares it to the challenge of staring directly at a competitor, rather than looking away. "It's upping the ante," he says.

Earlier work found plenty of song matching among song sparrows in a Washington population. There, a male's repertoire of songs overlaps his neighbors' by some 40 percent.

When Nowicki and his colleagues checked for similar behavior in Pennsylvania, they found practically nothing. Neighboring males' repertoires overlap only about 4 percent. The birds don't know enough of the same music for a rip-roaring song match.

The birds even learn music differently. Washingtonians pick up songs whole, but Pennsylvanians learn segments, fitting them together in their own ways. Causes of such differences are not clear, says Nowicki. The study appears in the June BEHAVIORAL ECOLOGY AND SOCIOBIOLOGY. —*S.M.*

If a tree falls, will lizards listen?

Cutting even single trees scattered through an Amazonian forest might change the natural mix of surrounding species, warns a collaboration of U.S. and Brazilian researchers.

Conservationists sometimes propose such a limited logging practice as a kinder, gentler way to timber, mimicking how old trees sporadically topple.

However, even cutting isolated trees might damage a forest if they are too close to each other, cautions Laurie J. Vitt of the University of Oklahoma in Norman. She and her colleagues have published a treefall analysis in the June CONSERVATION BIOLOGY.

Gaps left by single-tree loggers had less shade and higher peak temperatures (95 °F vs. 79 °F) than natural treefalls. Such a change might have a variety of consequences. For example, the researchers found that the higher temperatures attracted big, heat-loving lizards. These predators sunbathe and then lunch in the surrounding forest. More sunny spots—and more lunching lizards—might threaten both their prey and competitors. If loggers punch too many holes in the canopy, lizards could prowl from one sunny spot to another, expanding their forest access. —*S.M.*

Earth Science

Life got a kick out of dreary years

For geologists, the period from 2 billion to 1 billion years ago stands out as a yawner of an epoch that some have dubbed "the dullest time in Earth's history." But don't consider that an insult. The billion boring years may have nurtured the evolution of complex organisms, according to a new theory.

Martin D. Brasier of Oxford University and John F. Lindsay of the Australian Geological Survey Organization in Canberra proposed this idea after studying ancient rocks collected by drilling operations in northern Australia. Analysis of the drill cores shows exceedingly little variation in the ratio of two carbon isotopes during a long stretch of time between 1.7 billion and 1.5 billion years ago. Combined with previous work, these new data suggest that the carbon isotopic ratio remained nearly the same for the entire period lasting from 2 billion to 1 billion years ago, the scientists report in the June GEOLOGY.

The isotopic ratio shifts in moments of unrest, when huge mountain ranges develop or when glaciers spread over the globe. So the evidence of unwavering values reflects a geologically monotonous period. With few mountain ranges forming, there would have been little erosion to carry new nutrients into rivers. Phosphorus, a biologically necessary element, would have grown scarce in the oceans, speculate Brasier and Lindsay.

Although a hardship for life at the time, this starvation diet provided just the force needed to spur evolutionary developments, they say. "The conditions were exactly the sort of thing that would have fostered symbiotic associations," says Brasier. Research on existing species suggests that organisms typically develop certain symbiotic arrangements while trying to eke out an existence in a nutritionally deprived environment, he notes.

The link may be important because biologists believe that symbiosis played a critical role in the evolution of complex organisms, called eukaryotes, which include algae, fungi, plants, and animals. Algae and plants contain the remnants of photosynthetic bacteria that originally lived on their own. At some point after 2 billion years ago, these harvesters of sunlight entered into symbiotic links with other cells and eventually became incorporated in the larger hosts. The long epoch of geologic stability provided the time necessary for those pacts to become permanent, speculate the researchers.

Although intriguing, the hypothesis draws criticism from other researchers. "It's a house of cards," comments Alan J. Kaufman, a geochemist at the University of Maryland in College Park. The idea suffers because Brasier and Lindsay don't offer evidence that phosphorus was actually limited in the oceans during the time of unvarying carbon isotopes, he says. Their ideas on symbiosis also remain speculative. Nonetheless, Kaufman agrees that the seemingly stable period "was an unusual time in Earth history." —*R.M.*

Global warming eggs on El Niño

Global temperatures reached all-time highs during the first part of 1998, reflecting a synergy between El Niño and global warming, according to a report issued last week by Vice President Gore and the National Oceanic and Atmospheric Administration (NOAA). Strong El Niño episodes have grown more frequent and warmer over the last century, according to the federal researchers, who say that global warming may be amplifying El Niño's effects. Temperatures for each month this year broke previous records; the average for the 5-month period reached a whopping 0.25°C above the same value for any earlier year, they report.

Oceanographer James J. O'Brien from Florida State University in Tallahassee takes issue with the report. The NOAA scientists only looked at El Niños for this century, ignoring the late 1800s when they came just as frequently as today, he says. —*R.M.*