Biology

Measuring the metal of mussels

Scientists appreciate mussels not just for their taste but also for their value as indicators of water quality. The animals retain pollutants found in their aquatic habitat, withstand dirty environments, and remain in the same spot for all of their adult lives.

Now, new research is distinguishing which contaminants the mussels take in from the surrounding water and which they pick up from their food, phytoplankton. Although regulators usually measure dissolved pollutants to set water quality standards, contaminants in plants and sediment may sometimes prove more important, says Nicholas S. Fisher of the State University of New York (SUNY) at Stony Brook.

In two studies, Fisher and his colleagues examined the concentrations of seven coastal pollutants in two common, closely related mussels, *Mytilus galloprovincialis* and *M. edulis*.

They exposed the animals to water or phytoplankton laced with radioactive isotopes of these metals. After measuring the concentrations and locations of the isotopes in the mussels, the researchers put some of the animals in mesh cages off the Mediterranean coast for up to 4 months and left others in aquariums containing Mediterranean seawater.

The selenium, lead, cobalt, and americium stored in the mussels came mainly from phytoplankton, Fisher, Wen-Xiong Wang of SUNY at Stony Brook, and Samuel N. Luoma of the U.S. Geological Survey in Menlo Park, Calif., report in the Sept. 12 MARINE ECOLOGY PROGRESS SERIES. The animals absorbed most of their cadmium from the water. Whether zinc and silver were absorbed primarily from water or food depended on the water conditions.

How much of each contaminant the mussels took in varied considerably. For instance, the animals absorbed 4 percent of the americium present in the food or water they consumed and about 60 percent of the silver, Fisher and his colleagues note in the November ENVIRONMENTAL SCIENCE & TECHNOLOGY.

Once inside a mussel, the pollutants met with different fates. The animals took from 10 to 60 days, depending on the metal, to expel half of the original amount absorbed.

The authors developed a mathematical model for determining the relative importance of food and water as sources of pollutants in mussels. The model also predicts the amounts of the various metals that the animals will accumulate under varying water conditions.

The metals remain in the mussels' feces for different lengths of time, the team reports. Whereas half of the silver leached out in 18 days, it took 107 days for half of the americium to disperse.

Studying mussel feces "sounds awfully obscure, I realize," says Fisher, but contaminants pass from fecal matter into the sediment, where worms and other fish foods dwell. — *T.A.*

Chemistry comes to lobster guards' aid

Harvesting egg-bearing lobsters is illegal, so for years some lobstermen have removed the eggs before inspectors examine their catch. The latest technique in this subterfuge involves dipping the lobsters in chlorine, which dissolves the unusually hard-to-remove glue that holds eggs to the mother's shell.

In response, inspectors have recently begun to use a new test that can detect chlorine on lobsters up to 10 days after a chemical dip. They put the lobsters' swimmerets, the small appendages on their abdomens, in a solution of potassium iodide, which turns yellow in the presence of chlorine, explains Robert A. Bullis of the Woods Hole (Mass.) Marine Biological Laboratory, who helped invent the test.

Mike Syslo of the State Lobster Hatchery and Research Station in Vineyard Haven, Mass., hopes that use of the new test will provide enough evidence to prosecute the chlorine dippers. — *T.A.*

Biomedicine

Rhythmic ear growth . . .

Medical journals aren't known for humor, as their editors will undoubtedly concede. Sometimes, however, a study may provide some amusement, even as the findings convey intriguing information. Three entertaining reports in the Dec. 21/28 BRITISH MEDICAL JOURNAL (BMJ) demonstrate that its editors are not immune to levity.

First, there's an account of "Circaseptennial rhythm in ear growth." The journal's press summary offers this tantalizing peek at the article's content: "Last year's Christmas issue of BMJ showed that older men have bigger ears. This year's shows that men's ears grow in 7-year cycles."

The authors of the new report, Jos Verhulst of the Louis Bolk Institute in the Netherlands and Patrick Onghena of the University of Leuven in Belgium, contend that the notion of a 7-year rhythm in human development dates back at least to ancient Greece. Their study shows that the Greeks were on target—at least as far as the ear is concerned.

The researchers used as their starting point the raw data that produced last year's offering, "Why do old men have big ears?" by James A. Heathcote, a general practitioner at Southview Lodge in Bromley, England.

After calculating the "mean ear length" of British men at each year of age from 30 to 83, they were able to assess "mean smoothed growth rates." They found that ears reach their peak growth velocity every 7 years, then rest.

The researchers concede that important questions remain: Do the findings apply to women? To other men? Do other anatomical structures, such as the nose, follow the same pattern? — *S.S.*

. . . gray hair from smoking . . .

Then there's smoking. Aside from the risk of getting heart disease or cancer, smokers must endure a plethora of vanity-busters, including facial wrinkles, bad breath, and yellow teeth. Another report throws baldness and gray hair into that mix.

J.G. Mosley at the Leigh Infirmary in Lancashire, England, and his colleagues studied 268 men and 338 women attending an outpatient surgery clinic; 304 of them were smokers. The team noted each patient's smoking habits and assessed their hair color and degree of baldness.

After controlling for age, they found that smokers were four times more likely to have gray hair than nonsmokers. The team also found a link between hair loss in men and cigarette smoking. The results don't prove that smoking causes hair to fall out or turn gray, but the team believes it may speed the aging process. The authors hope the bad news will encourage smokers who have made a New Year's resolution to quit. — *K.F.*

. . . and the color of medicine

Finally, another group of researchers found inspiration in the colorful array of bottles lined up in the average medicine cabinet. Does the hue of a pill affect the user's perception of how well it works? they wondered. Anton J. M. de Craen of the University of Amsterdam and his colleagues turned to the medical literature to find out.

Their review of 12 previous reports showed that people associate the colors red, yellow, and orange with a stimulant effect and find blue and green calming. In one study, researchers told 56 volunteers that they would be getting either a stimulant or a sedative. In fact, all the participants were given dummy pills, some pink and some blue. The study found that 72 percent of those given the blue tablets reported feeling sleepy, compared to just 37 percent of people taking pink pills.

If the color of a pill matches its expected effect, patients might be more likely to take their medicine, the team notes. — *K.F.*