SAMPLINGS

Dark Meat Chicken


FREYJA IMSLAND
Chinese Silkie rooster

The Silkie chicken, a breed that originated in China, has long been famous for its downy feathers, which come in a variety of colors, and its spectacular dark skin and black internal tissue. Ancient Chinese cooking and traditional medicine texts describe the popular bird, while Marco Polo purportedly referred to it in thirteenth-century writings. Researchers led by Leif Andersson, a professor of functional genomics at Uppsala University in Sweden, recently identified the mutation that creates a Silkie's midnight complexion. The discovery speaks to how human preferences have influenced the evolution of domesticated animals.

The mutation itself is remarkably complex, involving the duplication and inversion of two chromosomal segments. Such rare rearrangement pumps up the activity of the endothelin 3 gene, which leads to an overproduction of pigment cells and this, in turn, causes the dramatic change in appearance. The fact that this hyperpigmentation trait went on to become a characteristic of an entire breed suggests that the farmer who first stumbled upon it liked what he saw. The farmer bred the weirdly dark chicken, and other farmers bought the offspring at market, spreading the mutation, Andersson speculates.

The appreciation did not stop there. Andersson's group showed that three other chicken breeds with similarly intense dark skin, such as the Svarthöna in Sweden, carry the exact same mutation as the Silkie. It is extremely unlikely that such a complex mutation would happen twice. The results instead point to traders hundreds of years ago bringing the attractive Silkie chickens from Asia into Europe. "It's very clear that humans have long cared about how their domestic animals look," says Andersson. (*PLoS Genetics*) —*Adam Hadhazy*

Eau de Cockroach

So much of the diet of the endangered red-cockaded woodpecker—more than half of what the bird eats—consists of broad wood cockroaches (*Parcoblatta lata*) that the insect's abundance in pine forests may be an indicator of the suitability of habitat for the woodpecker. Female cockroaches, which live in decaying logs, have reduced wings and do not fly, but use a volatile sex pheromone to attract the long-winged males. In a recent paper, Dorit Eliyahu of North Carolina State University and eight colleagues reveal the chemical structure of the cockroach's irresistible fragrance.

The team dissected 1,400 sexually mature female wood cockroaches, reared in the laboratory, to obtain extracts. They used gas chromatography to separate the extracts into fractions and electroantennography to measure the electrical response of a cockroach's ablated antenna to the different fractions. Thus, they identified and described the cockroach's sex pheromone, which they named "parcoblattalactone," and found that its chemical structure is radically different from that of previously described pheromones in cockroaches. The researchers went on to synthesize the pheromone in the lab and test its capacity to attract males in the field, using sticky traps.

The red-cockaded woodpecker, native to the southeastern United States, has suffered a sharp decline in its population due to destruction of its old-growth pine forest habitat, and has disappeared altogether in at least three states. Previous habitat assessments have relied on monitoring insect prey populations with nonselective insect traps, which captured many insects that were not part of the woodpeckers' diet. Traps baited with parcoblattalactone specifically attracted *P. lata* wood cockroaches, as well as two other species in the same genus. The newly discovered pheromone thus offers an effective tool for evaluating the quality and suitability of foraging habitats of the endangered red-cockaded woodpecker. (*Proceedings of the National Academy of Sciences*) —*Lesley Evans Ogden*

Pole Watchers

For more than twenty-six years, scientists have been measuring stratospheric ozone above the South Pole to track the severity of the ozone hole. The loss of ozone in the stratosphere, attributed mainly to the use of chlorofluorocarbons and similar compounds, allows more ultraviolet solar radiation to reach lower levels of the atmosphere. That can lead to increased incidence of skin cancer, eye damage, and other health and environmental problems. The 1987 Montreal Protocol requires its signatory nations (197 to date) to reduce and eventually eliminate ozone-depleting substances, especially chlorofluorocarbons.

The crucial South Pole measurements are made year round by ozone detection instruments known as ozonesondes, carried aloft by rubber balloons, which rise to an altitude of about twenty-two miles and report data on ozone quantities along with altitude, pressure, temperature, and relative humidity. The data from about sixty soundings per year from 1986 to 2010 show seasonal changes of the ozone layer and the annual development of the ozone hole, according to a report by Birgit Hassler of the National Oceanic and Atmospheric Administration and the University of Colorado in Boulder, together with four colleagues. The fastest ozone loss occurs during the Antarctic late winter and early spring—from late August to late September. The ozone then recovers by early summer.

Over the long term, the ozonesonde measurements show a stabilization in the rate of ozone loss since 2000, which the team attributes to implementation of the Montreal Protocol. Asked about what that might mean for the future, Hassler notes that chlorofluorocarbons are very long lived in the atmosphere. Nevertheless, the current stabilization and the projected slowdown of ozone loss by the end of the current decade can be seen as a first sign of ozone recovery, which is expected to continue over the coming decades. (*Journal of Geophysical Research–Atmospheres*) —*Harvey Leifert*


NICK MORGAN/NOAA
Ozonesonde launch from South Pole Station