

One scent woos elephants and insects



National Zoological Park

The natural result of pheromones.

Some female insects and elephants release the same airborne compound to attract the attention of males, a new study reveals.

After analyzing about 4,000 liters of elephant urine, researchers isolated the pheromone that appears just before ovulation and alerts males to the female's readiness to mate.

"Remarkably, it is the same compound. . . used by insects" from cabbage loopers to dingy cutworms, report L.E.L. ("Bets") Rasmussen of the Oregon Graduate Institute of Science and Technology in Portland and her colleagues in the Feb. 22 NATURE. Some insect traps contain a synthetic version of the chemical, (Z)-7-dodecen-1-yl acetate.

Despite the common pheromone, elephants and insects probably don't pick up on each other's sexual signals, Rasmussen says. They produce dramatically different amounts of the pheromone and combine it with different chemicals.

The researchers monitored the response of bull elephants at three U.S. zoos to various chemicals extracted from the urine of Asian elephants (*Elephas maximus*). Pheromone-laced urine elicits a so-called flehmen response from a bull. He dips his trunk in the liquid, then touches the tip of his trunk to the roof of his mouth. The stronger the concentration of (Z)-7-dodecen-1-yl acetate in the samples, the more often the Asian elephants repeated the flehmen response.

In fact, says Rasmussen, whose pheromone work grew out of her interest in artificial insemination of elephants, the animals sometimes get erections from the samples. Wildlife managers and zookeepers may find the chemical useful for collecting semen, she asserts.

The compound may prove useful under special conditions, agrees Nancy Pratt of the National Zoological Park in Washington, D.C. However, getting semen from captive elephants is already fairly easy, and artificial insemination has yet to work in elephants, she says.

Recognizing relatives by their odors

Wasps rely on variations in pheromone mixtures to detect family members. Wasps also treat family members better than strangers. Now, a study links the similarity of pheromones to kindness among kin.

George J. Gamboa of Oakland University in Rochester, Mich., and his colleagues marked the residents of 20 paper wasp (*Polistes fuscatus*) colonies in the wild that had related queens. They then scared off some of the residents and moved the nests, so many wasps returned to the wrong nest. The researchers watched how the newcomers were treated.

Karl E. Espelie of the University of Georgia in Athens analyzed hydrocarbons on the wasps. The wasps that were most closely related had the most similar sets of hydrocarbons and behaved most kindly to each other, the scientists report in the March ANIMAL BEHAVIOR.



Göran Engqvist

A paper wasp (Polistes metricus) on her laboratory nest.

Pigment protects heart's arteries

Too much bilirubin—a yellow pigment in the bloodstream with no known function—causes jaundice. However, a recent study hinted that a slight excess of bilirubin might protect against clogged arteries. Now, researchers have additional evidence regarding bilirubin and heart disease.

Paul N. Hopkins of the University of Utah School of Medicine in Salt Lake City and his team have been studying 120 men and 41 women who had signs of early heart disease. Hopkins' team had data from blood tests entered into their computer, including values for bilirubin. They looked to see if this pigment shielded the heart.

"I found, to my amazement, that [bilirubin] was incredibly protective," Hopkins says.

The team compared the people with heart disease to 155 men and women with no sign of heart problems. The researchers divided the study participants into fifths on the basis of their bilirubin test scores. Men and women in the top quintile for bilirubin showed an 80 percent reduction in risk of heart disease compared to those in the lowest fifth.

Men and women in the top fifth had between 17 and 16 micromoles of bilirubin per liter of blood, respectively—values that are high but still within the normal range. In contrast, people with jaundice would have bilirubin scores three times as high, Hopkins says. Men and women in the lowest fifth had average bilirubin values of 6.9 and 5.1, respectively, the team reports in the February ARTERIOSCLEROSIS, THROMBOSIS AND VASCULAR BIOLOGY.

If the results are confirmed, they suggest that people at the low end of the bilirubin spectrum face a higher-than-average risk of heart disease, Hopkins says. Bilirubin may prevent oxidation of LDL, or low-density lipoprotein, also known as bad cholesterol. Researchers believe that oxidized LDL promotes the formation of the fatty plaque that can choke off an artery and cause a heart attack. So far, nobody has looked at whether a person can increase bilirubin values.

Allergy may foretell breathing trouble

The dust that makes you sneeze today may give you breathing problems in the future, says a new report.

Daniel J. Gottlieb and George T. O'Connor of the Boston University School of Medicine knew that smoking can lead to chronic obstructive pulmonary disease (COPD), a permanent narrowing of the lung's airways. So they examined people who react to common allergens to see whether they also risk acquiring this disorder.

Gottlieb, O'Connor, and their colleagues analyzed data collected from 1,025 male veterans who had been participating in a study of aging. The researchers tested the men for allergies to house dust, ragweed, and pollen from trees or grasses. They also measured the veterans' lung function periodically.

While everyone loses some lung function with age, the team found that the men with allergies lost more than the average older person's 30 milliliters per year. Lung function, measured by the volume of air a person can expel in a second, fell by an additional 9.45 milliliters among these veterans, the investigators report in the February AMERICAN JOURNAL OF RESPIRATORY AND CRITICAL CARE MEDICINE. The correlation persisted even after the researchers factored out smoking, which results in a loss of about 28 milliliters. This finding suggests that allergies may prove to be an independent risk factor for chronic obstructive pulmonary disease.

Will that small drop in lung function make a difference? Over 20 or 30 years, even small losses start to add up, O'Connor says.

The researchers speculate that allergies cause inflammation, which, in turn, may cause permanent damage and narrowing of the airway.