

If Mom chooses Dad, more ducklings survive

A female mallard that gets to pick her guy has ducklings that survive infancy better than the offspring of a less happy coupling, according to a new test in Canada.

Pairing the female with her first choice, instead of with a reject, raised duckling survival by about a third, reports Cynthia K. Bluhm of the Delta Waterfowl Research Station in Portage la Prairie, Manitoba. She and Patricia A. Gowaty of the University of Georgia in Athens presented their results at the annual meeting of the Animal Behavior Society this week in Lewisburg, Pa.

What advantages come from a female choosing her mate "is a very basic question that we don't know the answer to," Gowaty says. She and an international consortium of collaborators funded by the National Science Foundation are striving to answer that question for fruit flies, guppies, mice, and cockroaches, as well as mallards.

Though Charles Darwin argued that female choice wielded great power in evolution, "nobody believed him for about 100 years," Gowaty explains. Even when researchers started testing the idea, she notes, their experiments focused on whether feminine fancy drove evolution of male fripperies such as the peacock's tail and whether such ornaments honestly identified males that would sire the healthiest young.

The new wave of female-choice experi-

ments avoids any such assumptions about what constitutes irresistible hunkeness in another species and just lets females choose. These experiments should illuminate questions about how female choice helps shape an animal's social system, Gowaty predicts.

Mallards form pair bonds, but to human observers it's far from obvious why they bother, she says. The ducklings break out of their eggs essentially ready to swim to breakfast and hardly seem to need two parents. "The mothers build the nest, the mothers sit on the nest, the kids feed themselves, but the daddies hang around. We don't get it," says Gowaty.

Mallards also intrigued the researchers because a male often gives a female no choice in mating, even gouging her eye or snapping her leg in the struggle. "Mallard rapes are not nice," as Gowaty puts it.

Bluhm raised a colony of captive ducks from eggs she'd collected in the wild. She then showed each of about 70 females three different males. When females showed a clear tendency to hover near the enclosure of a particular male, Bluhm designated that fellow the preferred mate. She paired about half the females with their chosen drake and mated the rest with a rejected male.

"I didn't use any crummy drakes," Bluhm says. She also gave all the ducks what she calls "the spa treatment," protecting them from predators and keeping

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Female mallards in the wild often get little choice about who fathers their brood.

their eggs in an incubator.

"It was a very conservative experiment," Gowaty says. Seeing a greater duckling survival under such plush conditions suggests to her that the effects would be even more dramatic in the real world.

Why ducklings of preferred matings survived better "is a mystery," Bluhm says. Gowaty agrees. But she speculates that an aspect of compatibility, perhaps the mix of immune factors, plays a role.

John A. Byers of the University of Idaho in Moscow comments that the mallard study "comes closer than many people have to getting at the benefits of female choice." Byers, who studies how pronghorn antelope choose mates, calls for much more work on female choice in natural settings to complement the captive experiments.

"I think female choice is going to turn out to be really important," he says, "and it's going to have stronger effects than we expected." —S. Milius

Bt-treated crops may induce allergies

Bacillus thuringiensis (Bt), a moth-killing bacterium that farmers use as an insecticide, has been considered non-toxic to all but a few types of insect larvae. It may pose some health risk for people, however. A new study of Ohio crop pickers and handlers finds that Bt can provoke immunological changes indicative of a developing allergy.

With long-term exposure, affected individuals might develop asthma or other serious allergic reactions, notes study leader I. Leonard Bernstein of the University of Cincinnati College of Medicine.

During more than 30 years of use, Bt has exhibited little human toxicity. However, "its potential allergenicity had never been carefully addressed," Bernstein says. So, he studied farm workers before and after fields were sprayed.

In the July ENVIRONMENTAL HEALTH PERSPECTIVES, his team demonstrates Bt's allergenicity. Before the pesticide's application, 4 of 48 crop pickers, about 8 percent, had a positive skin test to Bt, indicating a sensitivity that can lead to an allergy. One month after harvesting Bt-sprayed celery, parsley, cabbage, kale,

spinach, and strawberries, half the pickers tested positive. That share climbed to 70 percent within another 3 months.

Workers with less direct exposure proved less likely to develop Bt sensitivity. Of 34 packers who washed and crated Bt-treated crops, just 5, or 15 percent, had positive skin tests after the spraying. Among 44 field hands working 3 miles away from Bt-sprayed fields, only 5, or 11 percent, tested positive.

Blood tests confirmed that many workers who tested positive also had immunoglobulin E antibodies to the strain of Bt sprayed. These antibodies can signal a developing allergy. Hay fever sufferers, for instance, often produce such antibodies 4 or 5 years before symptoms such as sneezing develop.

"We'll take a look at this study," notes Chris Klose, a spokesman for the American Crop Protection Association in Washington, D.C. If the new study's findings are confirmed, "the [pesticides] industry would be concerned," he says.

"In terms of consumer safety, there is probably also reason for concern," says Brian Baker of the Organic Materials Review Institute in Eugene, Ore. Gar-



Bt is used on crops including strawberries.

deners and others "should remember Bt is a pesticide and show it the same respect they would other pesticides," he adds.

Though the data show that Bt "has the potential to elicit allergic responses," the pesticide was "not horribly allergenic," observes coauthor MaryJane K. Selgrade of the Environmental Protection Agency in Research Triangle Park, N.C. However, the new data are prodding the agency to develop standardized assays so that microbial-pesticide developers can rank the relative allergenicity of their products. Indeed, Selgrade notes, if what makes Bt allergenic is not what makes it pesticidal, developers might one day genetically manipulate Bt to make it less worrisome. —J. Raloff