

# Drab now, female birds had more colorful evolution

Male changes did not drive differences in avian plumage

BY SUSAN MILIUS

Color evolution among grackles and their kin is not about males showing off their fine feathers. It's more about females switching their looks, a new analysis indicates.

Among 37 species of grackles, blackbirds and other icterid relatives, males clearly do flash more diverse feather colors than females do, says Jordan Price of St. Mary's College of Maryland. Bright epaulets on glossy black plumage or shimmering iridescence often gives distinctive looks to males. Females, however, look either generically drab or similar to males.

Scientists have long debated whether today's sex differences in bird color arose from evolutionary pressures on drab ancestors for males to look sexy. For the grackle group and probably other species, it's "just not the case," Price says.

He and Muir Eaton of Drake University in Des Moines, Iowa, worked backward along a genealogical tree of grackle relatives to reconstruct the history of male and female color differences.

During that history, male plumage did diversify, the researchers report May 6 in *Evolution*. But female plumage did a lot more changing. Females often went from dramatic to drab and then sometimes went colorful again. The forces of sexual selection on males were not the main story.

"We pay all this attention to males because they're flashy, they're eye-catching," Price says. "But most of the evolutionary action is with females."

Female color change may matter a lot in other kinds of birds, too. The common ancestors of today's New World orioles probably sported colorful his-and-hers plumage. But then some females went



Male red-winged blackbirds (top left) and male boat-tailed grackles (bottom left) may be flashy, but it's the females (right column) that have made the difference in evolving plumage diversity.

dull, a 2008 reconstruction of feather history concluded. And females among fairy wrens also appear to have done a lot of color changing, Price reported last year with other collaborators.

What's different about the new grackle study, Price says, is that Eaton made elaborate bird's-eye-view measurements of feather colors so that researchers could quantify changes. For each species, Eaton took readings of plumage color from 22 small spots on the body and calibrated readings for songbird vision. With four kinds of color detectors instead of humankind's three, many birds see a wider span of the color spectrum (stretching into the ultraviolet) than people can detect, as well as finer distinctions between colors.

The team used these measurements to look at the degree of male-female color differences for today's species and then analyzed a genealogical tree of living birds to work backward to determine the probable pattern of ancestral color changes that produced today's diversity.

In this reconstructed history, females' color changes more overall than males'

The story starts with ancestors sporting fairly similar colorful feathers. When females downplay their plumage for a camouflage look, the change seems to progress at about the same pace as the males' changes. But when females revert to more flashy, guy-type plumage, "they snap back to it really fast," Price says. It's mostly these drastic reversions that make females outrank males as the faster color-changing sex.

The accumulating evidence for the importance of females in plumage evolution is "an exciting drumbeat," says Kevin Omland of the University of Maryland, Baltimore County, who worked on the oriole study. "For too long researchers have ignored female coloration and female song," he says.

Those songs may reveal similar sex-related twists in evolutionary history. Among temperate songbirds, males sing but females typically don't. Yet in March, a reconstruction of vocal differences between the sexes concluded that in the songbirds' common ancestral species, both males and females probably sang. Over time, the females stopped. ■