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NEWS

## For Male Birds, Colors Count

October 18, 2005

By David Austin Gura  
Sun Senior Writer

Female North American barn swallows pick potential mates based on the color of their plumage, scientists say. According to a recent article published in *Science*, and researched at Cornell, male barn swallows with dark, lustrous red breast feathers are more attractive to females.

In "Dynamic Paternity Allocation as a Function of Male Plumage Color in Barn Swallows," Rebecca J. Safran Ph.D. '04, Kevin McGraw Ph.D. '04, Colby Neumann '05, and Prof. Irby Lovette, ecology and evolutionary biology, explore swallows' private lives: how they pick their mates and live as pairs. "In many animals, social pair bonds are not what they seem," Safran said. "In most cases, females and males will mate secretly with other individuals in the population."

North American barn swallows are no exception. Although they live in pairs, they regularly mate with others, and male swallows often rear babies that are not their own.

After Safran and McGraw observed several swallows' infidelity in their early field research, the pair began to wonder about the female songbirds' motives, and tried to determine what physical features constitute a good, attractive mate.

"We didn't know how individuals are assessing one another, and how they are making decisions about when to sneak off and mate with other individuals," Safran said.

Among European swallows, desirable males have long, fork-shaped tails. To female barn swallows in North America, however, tail length does not determine which male birds are most desirable. "Tail streamers, although they are elongated in North American males, don't seem to be indicators of a male's quality," Safran said. "They don't correlate with the ability to attract a mate, the number of young that he sires in a breeding season, etc."

So, Safran and her colleagues turned their attention to the male swallow's breast feathers. They observed that male swallows with darker feathers held a distinct advantage over those with lighter, duller-red breasts.

"We found out that color is an important signal of quality," Safran said. "More colorful males were able to acquire mates earlier, and have more breeding attempts in a season."

In search of further evidence to corroborate their theory, the scientists chose 15 swallow nesting sites in Tompkins County. After the birds settled and laid their eggs, the scientists took them to Cornell, where they extracted embryonic tissue samples. They later captured all of the males, and, in Safran's words, made a third of them "look more sexy."

According to McGraw, who is now a professor at Arizona State University, he and Safran found a way to darken their male swallows' breast fathers creatively.

"We went to the art store, sampled a whole bunch of brown, red and orange markers, and tried them out," McGraw said.

Using a spectrometer, McGraw examined all the birds and feather samples to find color combinations that were within the natural range of color variation. He wanted colors that looked realistic. The markers, which were nontoxic and permanent, did not hurt the feathers' delicate microtexture.

"We were hoping that females would be assessing the differences, so we followed these pairs and found that the males who became more sexy gained paternity," Safran said. "The others either lost paternity or stayed normal. Females are making really short-term

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assessments. They are dynamically updating.”

Judging someone, especially a potential mate, by appearance is not uncommon among many species (humans, in particular).

“In human populations, whether we like it or not, appearance, or signals of quality, count,” Safran said. “Like brand of clothing, style of clothing, and type of clothing. All those things convey some message to other members of the population.”

When Safran and McGraw gave those swallows their new coats, she said, “it was sort of like giving a guy a Gucci suit instead of a J.C. Penney suit.”

Safran, who is currently a post-doctoral fellow at Princeton University’s Council on Science and Technology, and McGraw continue to collaborate. They are currently studying how plumage can retain its color and luster as birds age.

“Coloration is subject to abrasions and degradations,” McGraw said. “So males must not only do well in making that color, but in keeping it as bright and reflective as possible. We’re in the process of completing a study where we’ve looked at changes of color over the season.”

The composition and purpose of the oil birds use to preen themselves is of particular interest to McGraw. He wonders if it could act like a sunscreen against ultraviolet rays, or if it might serve as an antibacterial buffer.

Safran and McGraw plan to release their results next month.

#### **For Male Birds, Colors Count**

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