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Medicine & Science

The Mating Game

Why does this tree swallow cheat on its mate? Scientists say animals who fool around may be preserving the species.

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WHY DO SOME marriages work while others fall apart? What makes some birds cheat on their partners and others remain faithful? How do some monkeys shut down their sex drive?

Scientists are probing those questions and others like them in increasing numbers, examining a subject that preoccupies schoolboys and fascinates everyone from therapists to talk show hosts - how sex works.

Researchers have spent years looking at the mating habits of every species from dung beetles to humans, and they've released new studies focused on traits and behaviors animals use to attract mates and spawn offspring.

Some scientists say the increased activity is nothing new: Sex has always been a hot topic.

"We're still evolving our understanding of how animals co-exist, how they reproduce and pass on their genetic material," said David Abbott, a University of Wisconsin-Madison professor of reproductive physiology who has studied the mating habits of monkeys. "In a way, we're just now scratching the surface."

Some studies address medical and scientific applications, such as Abbott's research into the use of pheromones to trigger ovulation cycles in marmosets. The work could help resolve human health and reproductive problems. But other studies focus on psychology and the emotions, such as what makes for a faithful mate.

Cornell University researchers confirmed last month what marriage counselors have advised for years:

When it comes to a mate, it's safest to pick someone like yourself. The study, the result of questionnaires distributed to 978 college-age adults in Ithaca, N.Y., found that wealthy men who seek "quality partners" (a scientific term for good-looking women) are more likely to be disappointed than those who seek mates with interests close to their own.

"Our results suggest that individuals seeking stable, long-term relationships should not seek the highest quality partner available, but should simply look for partners who are similar to themselves," said the study, published in Proceedings of the National Academy of Sciences.

By contrast, if you're a bird, having a lot in common is no guarantee of faithfulness. Avian experts say that birds with mates that share similar genetic material are more likely to cheat and bear "illegitimate" offspring than birds who search far and wide for a nesting partner.

In a study published last fall in Nature, researchers took blood samples of plovers, sandpipers and their offspring to determine the fidelity of nesting partners. Among Swedish sandpipers, who tend to pick genetically similar mates, 20 percent of the chicks were of mixed paternity. Among plovers in Turkey, who don't care much about genetics, only 5 percent were mixed.

By contrast, the most promiscuous bird in North America is the tree swallow, with 50 percent to 60 percent of offspring produced by "extramarital" relationships, said Peter Dunn, a biologist at the University of Wisconsin-Milwaukee.

Dunn said the American bird's promiscuity is surpassed worldwide only by Australia's fairy-wren. About 75 percent of the wren's offspring are the result of extra-pair matings - often after a seduction ritual in which a male lures a female away from her mate by bringing her an acacia petal in his beak.

Thus enticed, the female sneaks off early in the morning for a quick liaison with the outsider, then returns to the nest to join her mate and care for their young, Dunn said.

Many birds' mating habits have only been documented in the past two decades thanks to the same DNA fingerprinting techniques that police use on criminals.

"For hundreds of years we didn't know we had all this fooling around going on," Dunn said. "Now we do."

But don't blame the birds. Scientists say they cheat for a reason - it spawns genetic diversity that will ensure healthy offspring. "What they're trying to do is avoid inbreeding depression," said Brent K. Sandercock, an avian ecologist at Kansas State University and an author of the plover and sandpiper study.

He said how birds sense genetic similarities and differences among themselves remains a mystery. Birds have a poor sense of smell and their calls don't vary much within a species. "It's one of the real puzzles, how are they able to recognize their kin," Sandercock said.

Birds are popular among animal sex researchers in part because they have such a wide variety of mating

signals, including the length of their tails, their colors and their calls.

Scientists are still trying to answer a question that has puzzled them since Charles Darwin developed his theory of natural selection - how brightly colored birds survive at all.

Natural selection is based on the concept that a species develops survival characteristics, such as camouflage and dull coloration, to avoid predators. So logically, birds with bright feathers and beaks should be killed off because they're easier targets. "The more specialized a bird is, the more prone it is to extinction," said Paul Doherty, an avian ecologist at Colorado State University.

But Darwin, Doherty and other experts say that many animals sport bright colors for a reason - to attract mates. In a study published in April, Doherty concluded that nature performs a balancing act: If brightly colored feathers attract predators, they also attract enough mates to ensure a species' survival.

The study, in Proceedings of the National Academy of Sciences, split birds into two groups: those with males and females of different colors (dichromatic) and those with the same coloring (monochromatic).

Using 21 years of bird counts from the North American Breeding Bird Survey, researchers examined more than 300 species and found that colorful birds had higher local extinction rates than their monochromatic counterparts. But they also were replaced by new colonies more quickly than less colorful birds.

While it's not always obvious, there are human implications in animal sex studies. Abbott said his research into the way monkeys turn their sex drive on and off to keep peace in their colonies could lead to cures for human fertility problems.

Marmosets - monkeys that grow to about 7 inches, weigh a pound and have a life span of 12 years - live in groups of 10 to 15 in jungles of northeast Brazil. But only one dominant female in any group will reproduce.

What attracted Abbott to marmosets was their lifestyle: Unlike other primates, marmosets will continue to live in family groups well after reaching sexual maturity. The young will leave only when a place for a dominant animal opens up in a neighboring group. Gorillas, by contrast, will leave their groups when they reach puberty and live in "bachelor bands."

Abbott said subordinate female marmosets have learned to survive and avoid the wrath of the dominant female by shutting off reproductive cycles and stopping ovulation. The shutdown is triggered by the scent of the dominant female, a combination of 160 chemicals. "This animal has developed an ability to turn on and off their reproductive cycles depending on their social status," he said.

Abbott hopes to obtain funding to discover which neurotransmitters in a monkey's brain trigger its ovulation cycle. The work could lead to discoveries that address human hormone and fertility problems, he said.

"What we're looking for is a better understanding of how the brain controls reproduction cycles in the primate," he said. "I think that could offer a number of possibilities, maybe even a better understanding of the human reproductive system."

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