Big Love: Promiscuity and Monogamy in the Animal Kingdom

The subject of promiscuity is rampant in the news. It appears in a social context – an affair can take down the campaign of a presidential candidate – and in a scientific one, as when theoreticians speculate on the evolutionary underpinnings of our relationship choices. As humans, we are the “monkey in the middle,” promiscuity-wise: our closest living relatives, chimpanzees, are highly promiscuous, but our slightly more distant cousins, gorillas, demonstrate female monogamy. And it goes without saying that the vast majority of us have given some serious thought to the choice between promiscuity and monogamy, whatever our conclusions. But is this choice a haphazard one? At least at the species level, the answer is an emphatic “no.” Promiscuity and monogamy each have a distinct set of causes – from resource abundance to the rate of development in offspring – and they also have a fascinating array of biological consequences, from the peacock’s tail to cooperative sperm in rodents (!). But even though there is an astonishing diversity of mating systems and strategies across the animal kingdom, each has one thing in common – it rises and falls at the whim of natural selection – fidelity and philandering will only survive to the extent that they help individuals pass on their genes to a copious quantity of offspring.

Speakers:

ALEXIS HARRISON

As a life-long herpetologist (noun: biologist obsessed with lizards, snakes, and frogs), Alexis Harrison studied natural selection on the body color of Ensatina salamanders at the University of California-Santa Cruz, where she completed her Bachelor of Science degree. After graduation, Alexis worked briefly with mammals in New Mexico—relocating prairie dogs and documenting hantavirus prevalence in deer mice—before realizing that she could never love catching rodents the way she loved catching lizards. Alexis is now in the final year of her Ph.D. program in the Department of Organismic & Evolutionary Biology at Harvard University, where she is studying the role of natural and sexual selection in shaping the male dewlap—a colorful piece of throat skin that can be extended or retracted—in Floridian green and brown anole lizards. Alexis has used lizard clay models and DNA fingerprinting in mainland and island populations to test whether more colorful dewlaps increase predation or improve a male’s reproductive success. Alexis received a National Science Foundation dissertation improvement grant for this research in 2012. In her spare time (i.e. when procrastinating from finishing her Ph.D.), Alexis enjoys playing the ukulele, keeping a pet skink, and cooking obscenely spicy food.

EMILY KAY

Emily Kay completed her Bachelor's degree at the University of Chicago in 2005. Before starting a Ph.D. program in Organismic & Evolutionary Biology at Harvard University in 2007, Emily conducted research on the mating habits of Australian splendid fairy wrens and the genetic basis of avian sexual dimorphism. Her dissertation research reflects her preoccupation with animal sex; it is focused on understanding how two closely related species of North American mice avoid hybridizing in nature using a combination of fieldwork, genetic analyses, and behavioral experiments in the lab. So far, she has found that female preferences for males of the same species prevent mice from accidentally mating with the wrong species, highlighting the potential for sexual behavior to promote the evolution of new species. Emily has received numerous grants to support this work, including a National Science Foundation fellowship and a dissertation improvement grant. When Emily isn’t doing research, she has fun running half marathons, playing clawhammer banjo, and trying to grow vegetables in her community garden.
EMILY JACOBS-PALMER

Emily Jacobs-Palmer received her undergraduate degree in Molecular Biology & Biochemistry from Wesleyan University in 2006. Because she then felt a strong desire to study something she could actually see, she went on to be a professional tide-pooler at the Hopkins Marine Station in Monterey, California for two years, where she discovered a new species of hermit crab. At the moment, she is a graduate student in the Hoekstra Lab at Harvard’s Museum of Comparative Zoology. While at work, she compares the slow, dawdling sperm of monogamous mice with the fast, competitive sperm of promiscuous mice, in the hopes of uncovering details about the genes and evolutionary processes that control these differences. When she’s not in the lab, Emily spends way too much of her time on arts and crafts projects, and on dancing, running around, or playing the concertina. In the future, Emily would like to work full time on communicating science through teaching, writing, and exploring the great outdoors with curious students.

Glossary of Important Terms:

- **Bateman principle**: The principle that male reproductive success is usually limited by access to mates, while female reproductive success is limited by access to resources.
- **Fitness**: The number of descendants an individual contributes to future generations.
- **Hermaphrodite**: An animal possessing functional male and female reproductive organs.
- **Lek**: An aggregation of males visited by females seeking mates.
- **Mating system**: A general term to describe the patterns of mating in a species.
- **Monogamy**: A mating system in which, on average, one male and one female mate exclusively.
- **Natural Selection**: A major process in evolution wherein animals with traits that confer higher fitness leave more offspring, leading to the spread of that trait in the population.
- **Polygyny**: A mating system in which, on average, males will try to mate with several females while females will mate with only one male.
- **Polyandry**: A mating system in which, on average, females will try to mate with several males while males will mate with only one female.
- **Promiscuity**: A mating system in which, on average, both males and females will mate with multiple partners.
- **Sexual Dimorphism**: The difference in size, appearance, or behavior between males and females.

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October 10th - Biotechnology and the Emergence of New Therapeutics

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