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Home > News > Daily News Archive > 2007 > May > 30 May (Pennisi)



Red Hot Monkey Love

By Elizabeth Pennisi
ScienceNOW Daily News
30 May 2007

Red is the color of romance, and not just for people. Among South American monkeys called red uakari, females prefer males with fiery faces: the brighter the red, the better. New research indicates such dramatic coloration arose only after primates evolved the ability to see it, and not vice versa, as some researchers have suggested.

Valentine face.

Females find the bright red face of male uakari quite attractive.

Credit: Evgenia Kononova

suggested—to aid mate choice.

Mate choice turned out to be an unlikely reason. To learn that, Fernandez and his adviser Molly Morris first reconstructed the evolutionary history of tricolor vision and skin color. He combed the scientific literature for information about more than 200 primates, noting skin and coat colors; whether each animal lived in groups; and whether each could see reds as well as the usual blues and greens. He then charted when these various traits appeared by looking at them in the context of each species' place on the primate family tree.

Fernandez and Morris discovered that three-color vision dates back to relatively early in primate evolution. The first primates able to pick out all colors of the rainbow appeared an estimated 77 million years ago and were the ancestors of tarsiers and Old and New World Monkeys. Social systems with multiple members and partners and red coloration didn't show up until 59 million years later. This sequence indicates that color vision was not honed as a way to detect the best mates, Fernandez and Morris report in the July issue of *The American Naturalist*.

Instead, broad color vision likely translated into better foraging skills and greater survival. Once red vision was in place, redder mates, like riper fruit, proved more appealing than drab brown ones, encouraging the evolution of brighter fur and skin, Fernandez says. As vision became fine-tuned for mate selection, it may have become less effective at detecting ripe fruit, he adds.

"The study is significant because it ... moves beyond the food or sex debate for the evolution of trichromatic vision," says Nathaniel Dominy, a physical anthropologist at the University of California, Santa Cruz. But Mark Changizi, a theoretical neurobiologist at Rensselaer Polytechnic Institute in Troy, New York, thinks that sex was an important driving factor in the origin of tricolor vision; last year, he proposed that it was advantageous for animals to detect blushing. Fernandez and Morris didn't look to see which primates had bare skin patches, he says, and thus the authors can't determine which came first—blushing or color vision.

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