

Male common marmosets smell female fertility

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Common marmoset. Credit: © Almuth Einspanier

Scientists from the University of Leipzig and the Max Planck Institute for Evolutionary Anthropology found that male common marmosets are able to detect the fertile phase of females based on changes in their body odor. Using a combination of chemical analyses and a behavioral test they found that female common marmosets release various substances that produce a specific smell during their fertile phase and that males can perceive these olfactory changes.

To study the importance of olfactory changes for the social life of common marmosets the scientists collected odor samples from the anogenital region of female common marmosets at multiple points in time over the menstrual cycle. One part of these samples was used for chemical analyses using gas chromatography coupled with mass spectrometry to examine the composition of odor profiles. A comparison of odor profiles between different cycle phases revealed substances that changed in intensity during or after ovulation. "Males may use those substances to detect onset and end of the fertile phase of [females](#)," says Marlen Kücklich, lead author of the study, from the University of Leipzig and the Max Planck Institute for Evolutionary Anthropology. Therefore, in a second part of the study, [odor](#) samples were presented to males to observe their interest in these odors. Males generally showed considerably more interest in odors from females during ovulation than in samples of females in nonfertile phases.

Common marmosets live in extended family groups in which breeding is normally restricted to the dominant breeding pair. Females give birth to twins and earlier research showed that paternal care is of essential importance for the survival of the offspring. "This [energy expenditure](#) is only worthwhile for the male, if he is the actual father of the infants.

Using odors of the female would allow him to maximize his mating efforts during the fertile phase and assure his paternity against extra-group [males](#). Hence, olfaction could be used to strengthen the pair bond and to increase the probability of survival for infants," Marlen Kücklich explains.

New technique to detect odors

In their study the authors not only addressed the behavioral reactions to social odors but also chemically analyzed the composition of female scents. "Methodological problems have hampered the collection of animals' scents for a long time. We recently adopted and validated a method from plant ecology to collect volatile [body odor](#) in free-ranging mammals. This approach is exciting because it allows us to detect chemical substances which are specific for fertility, dominance, health or fitness," says Anja Widdig, the senior author, also a researcher at both institutions. This will enable us understand social communication in nonhuman primates and even humans a lot better."

More information: Marlen Kücklich et al. Chemical cues of female fertility states in a non-human primate, *Scientific Reports* (2019). [DOI: 10.1038/s41598-019-50063-w](https://doi.org/10.1038/s41598-019-50063-w)

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