

Flies may also spread disease among monkeys and apes

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Fly clouds are following sooty mangabeys through the forest and may spread disease among them. Credit: Jan Gogarten, Tai Chimpanzee Project

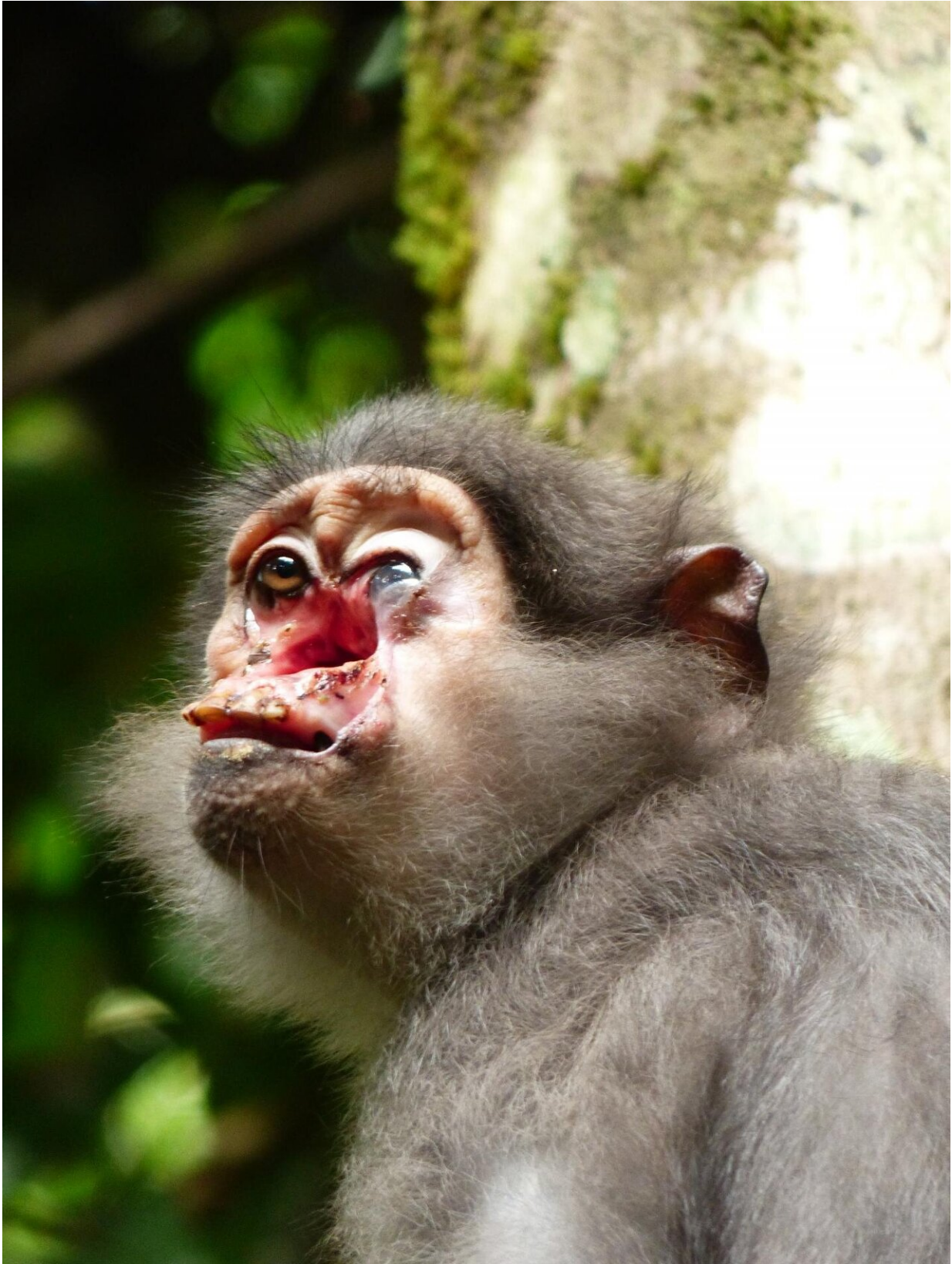
People the world over have a good sense that flies are filthy and that we do not want them landing on our food during our summer picnics. Research has justified that disgust, showing that flies associated with humans and their livestock spread a diversity of pathogens. In a collaboration with Roman Wittig of the Max Planck Institute for Evolutionary Anthropology and the Tai Chimpanzee Project, a research team led by Fabian Leendertz at the Robert Koch Institute in Germany has now shown that such fly associations also exist in highly mobile non-human primate groups as they move kilometers every day through the rainforest.

The researchers first looked at fly densities inside and outside groups of wild sooty mangabeys and chimpanzees in Tai National Park, Ivory Coast, finding many more [flies](#) in primate [social groups](#) than outside them. First author Jan Gogarten then carried out a quirky experiment to understand how this high [density](#) of flies was maintained, marking over 1,700 flies with nail polish in a group of mangabeys. To their surprise, the researchers recaptured these colorful flies in the mangabey group up to two weeks later and nearly a kilometer and a half from where they were marked. "These surprising results suggest there is a high density fly cloud following monkeys as they move kilometers each day through the forest," says Gogarten.

Given that monkeys and apes have flies buzzing around them in high density swarms, the team set out to test whether flies pose a disease risk like they do for humans. Indeed, nearly seven percent of flies in the mangabey group contained high concentrations of [anthrax](#) (*Bacillus cereus* biovar anthracis). It was possible to culture anthrax from these flies, confirming the viability of this pathogen. Previous research by the team has shown that anthrax is responsible for nearly forty percent of all animal deaths in Tai National Park, suggesting that these fly associations may pose a major risk to primates. Flies also contained the DNA of the bacterium *Treponema pallidum pertenuis*, which causes Yaws disease in

humans and infects mangabeys in this ecosystem causing horrific lesions. "This study is the first to show that flies actively track primates in the forest and in doing so expose them to dangerous bacterial pathogens," says Wittig. "These experiments suggest that fly associations represent an understudied cost of sociality and that flies are a nuisance that not only affects humans at their summer picnics, but exist more broadly in monkey and great ape populations," says Leendertz.

There is a silver-lining to these findings—while a pathogen carrying fly swarm clearly represents bad news for these primates, they are a useful tool for monitoring the health of these populations, providing much needed data about the [pathogens](#) circulating in wildlife without necessitating the darting of wild animals, which always poses a risk to both researchers and wildlife.



An adult female sooty mangabey suffering from a *Treponema pallidum pertenu* infection. Nearly six percent of flies in the mangabey group were found to carry the DNA of this pathogen. Credit: Alexander Mielke / Tai Chimpanzee Project

More information: Jan F. Gogarten et al, Tropical rainforest flies carrying pathogens form stable associations with social non-human primates, *Molecular Ecology* (2019). [DOI: 10.1111/mec.15145](https://doi.org/10.1111/mec.15145)

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