

Lemurs mix smelly secretions to make richer, longer-lasting scents

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A male ring-tailed lemur stops to sniff the scent of another lemur. Lemur males mix and match their smelly secretions to make richer, longer-lasting scents and outstink their rivals, researchers report. Credit: David Haring, Duke Lemur Center

Humans aren't alone in their ability to mix perfumes and colognes.

Lemurs, too, get more out of their smelly secretions by combining fragrances to create richer, longer-lasting scents, finds a study led by Duke University.

The results appear online April 20 in *Royal Society Open Science*.

The "perfume" of the ring-tailed lemur could never be confused with Chanel. Male ring-tailed [lemurs](#), our distant primate cousins, produce their distinctive musky odor with help from a pair of glands on their wrists that give off droplets of clear, fast-evaporating fluid, and a second pair of glands on their chests that secrete a brown, foul-smelling paste.

Males use their scents to mark territories and tell rivals to back off. Sometimes they deposit wrist [secretions](#) alone, rubbing their wrists directly onto branches and saplings. Other times they mix the two, pressing the insides of their wrists against their chest glands to mingle the scents. They also smear the pungent mixture on their tails, waving them in the air and wafting them at opponents to see who can outstink the other in a ritual called "stink-fighting."

Many animals combine odors from sources such as glands, urine, feces and saliva, but why they sometimes blend and layer these fragrances, and other times deposit them alone, is not well understood.

To find out why lemurs mix their scents, researchers presented pure and mixed scent secretions from unfamiliar males to 12 ring-tailed lemurs at the Duke Lemur Center in Durham, North Carolina.

The secretions were collected with cotton swabs and then rubbed onto three wooden rods—one rod with wrist secretions only, another with secretions from the chest, and a third with a mixture. Each male participated in two sets of trials, one set with fresh secretions and another in which the secretions were allowed to air out and evaporate for

12 hours first.

The researchers found that the lemurs paid more attention to the mixtures, spending more time sniffing rods covered with mixed secretions than pure ones. Surprisingly, the lemurs showed an even stronger preference for mixed secretions after the scents had aired out, shifting from sniffing them when fresh to licking them intently when dried.

The results suggest that mixing scents serves two purposes. First, like blending perfumes with complementary notes, blending secretions may increase the amount of information conveyed by a single dab of scent, said Christine Drea, a professor of evolutionary anthropology at Duke who led the study. The wrist and chest secretions of male ring-tailed lemurs differ somewhat in composition, previous studies show. Chemical analyses have identified dozens of odor molecules in the wrist secretions alone.

Mixing wrist and chest secretions may also lock in the more fleeting aromas and boost their staying power, said co-first author Lydia Greene, a graduate student at Duke. The greasy goo from the chest glands contains a chemical called squalene, an oily substance produced by many plants and animals and commonly used as a preservative in perfumes and skincare products. The longer-lasting mixtures that result may send a signal to males from other groups, who may not wander by a scent-marked tree or sapling until days later, the researchers say.

More information: Mix it and fix it: functions of composite olfactory signals in ring-tailed lemurs, *Royal Society Open Science*, [rsos.royalsocietypublishing.org ... /10.1098/rsos.160076](https://rsos.royalsocietypublishing.org/.../10.1098/rsos.160076)

Provided by Duke University

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