

## Rats with poisonous hairdos live surprisingly sociable private lives

Susan Milius | January 12, 2021

Crested rats don't just chew tree bark that's poisonous enough to kill an elephant. The rabbit-sized rodents dribble and lick the toxic drool into their long rat fluff for a weaponized hairdo. Yet these dangerous rats, which scientists assumed were loners, turn out to have a close and cuddly family life. They even purr.

Chewing on bark or other parts of East Africa's arrow poison trees gives the rats toxic saliva to apply to specialized zones of fur. The toxins sink in to porous, easily detached hairs on the rat's flanks. Any predator foolish enough to bite a *Lophiomys imhausi* gets a hairy mouthful of bitter toxins that human poachers use on arrows for hunting big game.

The rats "have the personality of something poisonous," says ecologist Sara Weinstein, who studied them during a Smithsonian fellowship at the Mpala Research Center in Kenya. "They can run quickly if they feel like it, but they don't typically." The rats are more likely to jog away from trouble or stand their ground, hissing, growling and grunting.

Trapping crested rats took some experimenting, says ecologist Katrina Nyawira, who worked on the project with Weinstein before moving to Oxford Brookes University in England. "Sometimes we'd set traps for about two weeks and just get one individual and, trust me, that would be a win."

Researchers set traps in a weird variety of locations, from remote spots in the Kenyan savanna to behind somebody's bedroom door, Nyawira and Weinstein realized that the common success factor was access to arrow poison trees (*Acokanthera schimperi*).

With glossy, green leaves shaped like fat teardrops, this widespread shade tree is a cousin of the North American milkweeds that give monarch butterfly caterpillars their defensive toxins. From roots to shoots, the arrow poison tree carries potent cardenolides that can give would-be predators a heart attack.

When Weinstein and Nyawira had trapped a crested rat for a few days of video observation, the researchers tucked some shreds of the deadly tree bark and roots in the temporary cages.

Cameras occasionally caught a nocturnal rat touching up its poison hairs. Rather than luxuriate in grooming, the animals got the poison-handling over with in 10 minutes.

Weinstein wondered if the 25 animals they caught paid some price for licking toxins: “Do they get sick and have to take a nap to sleep it off?” The videos, however, overall showed no extra naps, no sluggishness or other noticeable changes in behavior after hair care. For crested rats, poison really may be just mousse.

How these rats withstand the stuff is an ongoing mystery, with lots of speculation. This species’ stomach, for instance, has chambers more “like a cow...than your typical pizza rat’s,” says Weinstein, now at the University of Utah in Salt Lake City.

She hadn’t planned to study crested rat home life, but one why-not whim changed that. Weinstein once reset a trap in the same place she had just caught a crested rat. She’d heard that the rats were solitary, so her first catch should have emptied the territory. Yet she quickly caught a second rat in the same spot.

“We put the two rats sort of next to each other,” says Weinstein, “They start purring — this vocalization that we’ve never heard before.”

“They very much looked as if they wanted to be together,” she recalls. One was male, the other female. When Weinstein allowed the rats into the same cage, the two started grooming each other. One began following the other around, and the couple eventually retired to the cage’s private retreat, a nest box.

Over the course of several months, Weinstein and Nyawira eventually caught four more male-female pairs. Two pairs had youngsters, and each family snuggled together when reunited in captivity. In videos, [pair members stayed close](#), spending about half of their waking time within just 15 centimeters of each other, the researchers reported online November 17 in the *Journal of Mammalogy*.

Videos inside the nest box looked especially cozy. Pairs bundled together in nose-to-tail swathes of fluff “like a big scarf,” Nyawira says. Their hair is “really soft, like cat’s fur.” Or as Weinstein puts it: “They’re super cute.”