

The world's fastest ant clocks record speed of 108 times its own body length

Enlarge / A soldier Saharan silver ant (*Cataglyphis bombycina*) in the desert at Douz, Tunisia.

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Saharan silver ants routinely brave the blazing-hot midday sun in the desert to forage for food. That's a time of day when sand temperatures can be as high as 140°F (60°C), and many insects perish under those conditions, making it prime foraging time. But it's also risky for the silver ants. Perhaps that's why they are also one of the fastest creatures on the planet, capable of covering their own body length 108 times in a single second, according to a new paper in the *Journal of Experimental Biology*. That's equivalent to a human being running roughly a nine-second mile.

Silver ants have a number of ways to deal with the harsh desert conditions. Their silver appearance, for instance, is due to small triangular hairs that help them regulate temperature. The ants also have strong navigational skills, often finding pockets of shade under small rocks or blades of grass. And they return regularly to their nests to cool off. Being able to move across the sand quickly is key to their survival—and anyone who has walked or run on a beach knows that the granular nature of sand can slow down movement and

expend more energy than walking or running on, say, a dry salt pan.

Harald Wolf, a neurobiologist at the University of Ulm in Germany, noticed the presence of silver ants (*Cataglyphis bombycina*) during a trip to the Tunisian desert to study one of its larger cousins, *Cataglyphis fortis*. He returned to the Tunisian town of Douz with his team in 2015 to study the creatures more closely.

Locating the nests wasn't easy. Co-author Sarah Pfeffer noted it required tracking a foraging ant back to the nest or keeping an eye out for ants that were digging. Once the researchers found a nest, they lured ants out with a feeder filled with mealworms at the end of an aluminum tube and recorded the ants' gait with high-speed cameras as the creatures scurried back and forth from the food to the nest. Wolf and his team also brought a nest back to their lab in Germany to see how cooler temperatures affected the insects' gait.

Enlarge / Filming Saharan silver ants near Douz, Tunisia.

Verena Wahl

Wolf *et al.* found the silver ants were able to hit speeds of 0.855 meters per second, or 108 body lengths per second. Only the California coastal mite and the Australian tiger beetle are faster, clocking in at 377 and 171 body lengths per second, respectively. In contrast, *Cataglyphis fortis* can only manage a paltry 50 body lengths per second, despite having longer legs than the silver ant. To understand why this would be the case, the team took a closer look at the underlying kinematics of the silver ant's gait.

It turns out that the silver ant's shorter limbs translate into smaller mass, and hence it can swing its legs at very high frequencies: as much as 47 strides per second. Technically, the ants are galloping at high speeds, with all six feet off the ground simultaneously. The six-leg movements are also highly synchronized into coordinated tripods, known as an alternating tripod gait that keeps body weight evenly distributed so ants can remain upright as they zoom across the loose, shifting sand. Each foot is in contact with the ground for as little as seven milliseconds before the next stride.

"One reason the silver ants may have evolved their peculiar locomotor behavior is the Saharan sand dune habitat, as opposed to the hard-baked clay in the salt pans habitat of *C. fortis*," the authors concluded. "This coordination results in brief, synchronous, and forceful impacts of three legs on the sand substrate which may serve to minimize sinking into the yielding sand dune," further aided by their smaller body size compared to *C. fortis*.

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