

Ansell's mole-rats found to use their eyes for south-easterly orienteering

September 30 2020, by Bob Yirka



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A team of researchers from the University of Duisburg-Essen, Charles University and the Max Planck Research Group Neurobiology of Magnetoreception, has found that Ansell's mole-rats use their eyes to

orient their nesting habits based on the Earth's magnetic field. In their paper, published in *Journal of the Royal Society Interface*, the group describes experiments they conducted with Ansell's mole-rats and what they learned about them.

Prior research has shown that many creatures can detect magnetic fields and use that information for orienteering. Birds, bees and even turtles have been observed using magnetic fields for a variety of purposes. Unfortunately, efforts by scientists to understand how this sense works have met with little success. In this new effort, the researchers sought to learn how Ansell's mole-rats use magnetoreception when building nests. They demonstrate a clear preference for building nests in south to east sectors of circular areas. Interestingly, other species of mole rats have been found to do the same, but in different alignments. In this new effort, the researchers sought to learn which organ the mole rats use for orienteering. Prior research had suggested that the eyes were involved, but those experiments had left some doubt as to whether it was the eyes or some part of the brain.

To find out once and for all which organ was involved, the researchers began by capturing mole-rat specimens, removing their eyes and releasing them back into their natural habitat. Prior research had shown that the eyes of Ansell's mole-rats are barely useful for vision—their acuity is very low, and all they see are shadows. Thus, the researchers expected that removing their eyes would not impact their ability to live normally. In studying the mole-rats after eye surgery, the researchers found their assumptions were correct: the behavior of the mole rats was virtually the same as before the surgery. There was one significant difference, however: The mole-rats ceased building their nests in south to east sectors of their nesting areas. Instead, their nesting orientation became random. In another experiment, the researchers removed the eyes of another 10 mole-rats and compared their actions with a [control group](#) that still had their eyes. Only those in the control group continued

to align their nests with magnetic fields. The researchers conclude by suggesting that magnetoreception in Ansell's mole-rats is carried out using the eyes.

More information: Kai R. Caspar et al. Eyes are essential for magnetoreception in a mammal, *Journal of The Royal Society Interface* (2020). [DOI: 10.1098/rsif.2020.0513](https://doi.org/10.1098/rsif.2020.0513)

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Citation: Ansell's mole-rats found to use their eyes for south-easterly orienteering (2020, September 30) retrieved 22 September 2024 from <https://phys.org/news/2020-09-ansell-mole-rats-eyes-south-easterly.html>

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