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Desert ants' use of green-ultraviolet contrast for directional information

Ken Cheng, Patrick Schultheiss, Sebastian Schwarz, Antoine Wystrach, Jonathan Ives

Ants are known to use the terrestrial panorama as a source of directional information. The skyline - where the tops of terrestrial objects meet the sky - is a major cue in this terrestrial visual compass. Theoretically, a good way for an insect's brain to define the skyline is to use the maximal green-ultraviolet contrast as the boundary between the sky and ground objects. The sky contains relatively more ultraviolet wavelengths, while ground objects reflect relatively more green (longer) wavelengths. A brain using a ratio of different wavelengths gains constancy in the face of changing light levels. We began to test this hypothesis by using a transparent plastic that blocked most of the ultraviolet wavelengths of light. Central Australian desert ants *Melophorus bagoti* were trained in their natural habitat to visit a feeder provisioning food. The feeder was located either in the natural terrain, or else inside a uniformly green-coloured circular arena with a skyline created by distinctive variations in the height of the arena's wall. On tests, an ant was allowed to run home with food from the feeder, but captured just before she entered the nest, and brought back to the feeder location for a test. Such zero-vector ants are forced to rely on the terrestrial panorama for homing. On crucial tests in the natural panorama or arena, the ultraviolet-blocking plastic of uniform height stood between the homing ant and the panorama. This manipulation reduced homing accuracy in the natural panorama, and abolished significant orientation in the artificial arena. We conclude that green-ultraviolet contrast is a major component in the ant's use of the terrestrial panorama.