

P187

Searching behaviour of two desert ants from contrasting visual environments

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Within the navigational toolkit of desert ants, one well-established component is visual navigation using terrestrial objects. With experience, a foraging ant is able to use the visual appearance of an arrangement of objects to navigate along routes, and to pinpoint locations of interest, such as the nest entrance. Should the ant be unable to find the exact location of the nest, her path will loop around the spot of its expected location, thus leading to a systematic search. All navigational mechanisms continue during this search, including visual navigation. Here, we investigated how two ants of similar phylogenetic history but vastly different natural visual ecology cope with large changes to their visual environment. We compared the two Australian species *Melophorus bagoti*, living in visually cluttered arid bushland, and *Melophorus sp.* (an as yet unnamed species), living in visually barren dry salt-pans. Two prominent visual objects ('walls') of black cloth were erected close to the nest entrance, and foragers trained to visit feeding stations. On a test, the ants were hindered from entering the nest, and were tested either with the two prominent walls in place, or removed. Their return paths from the feeder to the nest and the subsequent searches were comparable in the two species. With the walls in place, the search was tightly concentrated around the expected nest location in both species. With the walls removed, the search of both species increased considerably in size, but was nonetheless centred on the nest location. It appears that the habitual visual ecologies of the respective species are of minor importance in this regard, and the two species may have a similar searching strategy for coping with unexpected visual changes.