

BEHAVIOURAL ECOLOGY

Push on the marching crickets

Stephen J. Simpson and colleagues have a gory story to tell (*Proc. Natl Acad. Sci. USA* doi/10.1073/pnas.0508915103; 2006). They investigated the factors that contribute to the mass movements of flightless mormon crickets (*Anabrus simplex*), which inhabit western North America. Under certain conditions, these insects form into marching bands millions strong and several kilometres in length, and can walk up to 2 kilometres a day.

From their studies, Simpson *et al.* conclude that group movement is driven not only by 'pull' from in front, in the form of the search for specific nutrients (protein and salt), but by 'push' from behind — cannibalism. The crickets are themselves "walking packages of protein and salt". So unless an individual is in the forefront of the band as it rolls into new territory, its only recourse to satisfy its dietary needs may well be to make a meal of a fellow traveller. As this picture shows, mormon crickets have a

taste for their own. It was taken near Reno, Nevada, and shows one unfortunate individual, killed by a car, being consumed by another (a phenomenon that sometimes occurs on a mass scale).

To identify which nutritional components might drive mass movement, Simpson and colleagues conducted feeding-preference tests for nutrients placed in the path of a marching band. The results showed, for example, that marching crickets have a decided requirement for protein over carbohydrate, and for salt solution over water (to the extent that the insects fought for the preferred salt concentration).

Other experiments demonstrated that crickets that had had their fill of protein and salt were much less likely to be cannibalistic. And other experiments again, using crickets with compromised movement, showed that the crickets safest from cannibal attacks were those able to defend themselves with



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their hind legs. But inactivity or reduced mobility meant that the cricket concerned was literally dead meat.

Cannibalism presumably sets a high cost on group life, so why do the bands of mormon crickets stick together? Simpson *et al.* answer this question by pointing to previous work involving the use of radiotelemetry which showed that the price of leaving the

migratory group is the high likelihood of being killed by a predator. Better, then, to opt for the protection conferred by being one of a crowd, even at the risk of being consumed by one of your own — or, as the authors put it, being a member of a cricket migratory band "is a compromise that makes the best of a seemingly very bad situation".

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