Ylönen, H., Jacob, J., Davies, M.J. and Singleton, G.R. 2002. Predation risk and habitat selection of Australian house mice (*Mus domesticus*) during an incipient plague: desperate behaviour due to food depletion. – Oikos 99: 285-290.

Abstract

We studied habitat selection and foraging behaviour of the house mouse (*Mus domesticus*) related to increasing mouse densities and depleting food resources over the breeding season. The study was conducted during the increase phase of an incipient outbreak of mice in a grain-growing area of southeastern Australia. A 3-year rotation created a mosaic of large paddocks of grain crop, pasture, and fallow. The narrow fence lines between paddocks provide an important stable habitat for the mice. We monitored population densities with live-trapping and habitat preference by measuring giving-up-densities (GUD) using artificial food patches. Food patches were established in crop fields, fence lines, and pasture. Avian predation risk was assessed by daily counts of raptors. Before harvest most mice were found in the crop fields. Fewer mice were found along the fence lines and no mice were found in the pasture. After harvest, the number of mice increased along the fence line and in the pasture. Mice started to exploit pasture but only a few trays were visited. As the population densities of mice increased, they inhabited all habitats. Feeding activity in the pasture remained low due to high predation risk. Along fence lines feeding activity increased and mice exploited open and covered patches similarly. We conclude that during high densities mice experience a strong trade-off between food and safety. Vegetation along fence lines offered cover but little food. However, soon after harvest this habitat was favoured by mice. Pasture offered little food and was an extremely risky habitat because of the lack of cover. We suggest that during high densities of mice, habitat use became more opportunistic. Mice took greater risks in all habitats and within each habitat at the microhabitat level. The “Stalingrad effect” is a good descriptor of foraging decisions of mice during the progression of an incipient plague in the cereal-growing regions of southeastern Australia.