

# Grasshoppers update escape response 'real time'

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When escaping from repeated predator threats *S. alutacea*, changed its strategy from perpendicular movement to flying further away in a direct line. Credit: Jerry Oldenettle

Two grasshopper species have been examined to see if they modify their

fleeing strategies when repeatedly approached by a predator.

The study looked at *Schistocerca alutacea*, a medium to large [grasshopper](#) species (30-54mm body length) found in open woods and pastures on woodland edges, and *Psinidia fenestralis*, a smaller species (20-33 mm body length) found in sandy areas.

Curtin University's Dr Bill Bateman and Murdoch University's A/Professor Trish Fleming say the intention was to challenge the traditional belief that organisms converge on an 'optimum escape strategy' and test the theory that they can modify strategies in real time through risk/cost analyses.

"We found that in response to persistent pursuit by an assumed [predator](#), two grasshopper species altered their behaviour from their initial tactics, switching to 'Plan B', which involved potentially riskier behaviours," A/Prof Fleming says.

"For *S. alutacea*, a strong flier, this involved abandoning the strategy of perpendicular movement and flying further and further away from predators in a direct line.

"*P. fenestralis*, on the other hand, began to initiate their escapes earlier, at longer distances from the predator, but their flight distances actually decreased."

The researchers suggest this could be due to decreased energy reserves.

*P. fenestralis* also modified its choice of landing areas.

"Of first escape attempts, 88 per cent were to bare sand. As the field was divided almost evenly between sand and grassed areas, this suggests that *P. fenestralis* were not landing randomly, but were initially selecting the

sand," A/Prof Fleming says.

"*P. fenestralis* can seem to vanish immediately upon landing on sand due to their colouring, which can be enhanced by disorientation of the predator by the flashing and then disappearing of the coloured underwings upon landing, particularly when it occurs laterally to the predator's path and is only seen by peripheral vision.

"However, over successive escape attempts, when this camouflage was no longer a safe strategy, due to still being pursued, an increasing number of animals moved towards grassy refuges where they would move into the grass clump and become impossible to locate or flush."

The researchers found that grass is likely a least-preferred option in general for *P. fenestralis* due to ground predators and reduced camouflage to birds, but the best option in certain situations.

"The study suggests that even in 'simple' organisms like grasshoppers, escape behaviour is dynamic and variable and individuals can update their escape response in the face of changes in a predator's behaviour or persistence," they say.

**More information:** Philip W. Bateman, Patricia A. Fleming.

"Switching to Plan B: changes in the escape tactics of two grasshopper species (Acrididae: Orthoptera) in response to repeated predatory approaches." *Behavioral Ecology and Sociobiology* . March 2014, Volume 68, Issue 3, pp 457-465. [link.springer.com/article/10.1007/s00265-013-1660-0](http://link.springer.com/article/10.1007/s00265-013-1660-0)

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