Freezing or death feigning? Beetles selected for long death-feigning duration showed other tactics against different predators

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Abstract

Prey evolve anti-predator strategies against multiple enemies in nature. We examined how a prey species adopts different predation avoidance tactics against pursuit or sit-and-wait predators. As prey, we used two strains of Tribolium beetles artificially selected for short or long duration of death feigning. The results showed that, as prey, the short strains displayed the same behavior, escaping, against the two types of predators. On the other hand, death feigning is known to be effective for evading a jumping spider in the case of the long strains, while the present study showed that the long strain beetles used freezing behavior against a sit-and-wait type predator A. venator in this study. The short strain beetles were more easily orientated by predators and suffered a higher rate of predation than the long strains. The time to predation was also shorter in the short strains compared to the long strains. When the predator was starved, even the long strains were preyed upon when the predator was orientated toward the prey, suggesting the starvation period, i.e., prey density, is an important factor for antipredator behavior. Traditionally, death feigning has been thought to be the last resort in a series of anti-predator avoidance behaviors. However, our results showed that freezing and death feigning were not parts of a series of behavior, but independent behaviors against different predators, at least for these beetles. The results also suggest that the differences in feeding rates between the strains could be explained by differences in activity among the strains.

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