Avoidance of Fungal and Nematode Parasitic Threats by Red Flour Beetles (*Tribolium castaneum*)

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Hosts have effective defences, both physiological and behavioural, to counter the ubiquitous threat of parasitism. Avoidance should be a common first-line defence given its reduced resource costs relative to most post-contact responses. However, avoidance requires that hosts can assess their environment for potential risk of infection based on cues involving sight, olfaction, or chemosensory perception. Various studies have established parasite avoidance in a range of animals, but this is poorly understood for insects. It is also unclear whether potential hosts exhibit avoidance behaviours that correspond to the level of threat. In this study, we investigated how red flour beetles (Tribolium castaneum) exhibited behavioural avoidance in response to a series of choices involving two different parasites, the fungal pathogen Beauveria bassiana (BB) and nematode Steinernema carpocapsae (SC). Beetles were placed in arenas with two chambers, allowing them to choose between two options represented by: 1) BB vs. no threat (NT), 2) SC vs. NT, 3) BB vs. SC, 4) BB vs. BB+SC, and 5) SC vs. BB+SC. The choices made by red flour beetles when facing these different parasite threat conditions will be discussed. This work has implications for understanding avoidance as an anti-parasite behaviour across different host taxa.