Chemical Cues Mediate Preference for Native Tree Snails by an Invasive Predatory Flatworm

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Platydemus manokwari is a flatworm native to Papua New Guinea that preys on terrestrial gastropods. Previous research suggests that Platydemus may use chemical cues to track and find prey. Platydemus was introduced to the island of Guam as a biological control for invasive snails. However, it has been implicated in the recent declines of Partula radiolata, a native tree snail once common in Guam forests. The purpose of this research was to determine whether Platydemus uses chemical cues to detect Partula radiolata and an introduced snail Drymaeus multilineatus, which is similar in form to Partula and is potential prey for Platydemus. A Y-maze was used to test predator preferences for cues from snail slime and controls lacking cues. Three different combinations were tested: Partula vs. Control, Drymaeus vs. Control, and Partula vs. Drymaeus. Stimuli were added to arms of the Y-maze and an air pump delivered the cues to the predator at the beginning of the maze. Trials were timed until flatworms reached the end of an arm of the maze. Overall, Platydemus manokwari were attracted to cues from P. radiolata in the majority of replicates when paired with Drymaeus and when paired with controls. Flatworms also appeared to not recognize or avoid Drymaeus slime when paired with a control, showing a preference for the control in all but one trial. These results suggest that Platydemus uses chemical cues to locate native tree snails and that Partula radiolata is more vulnerable to predation by flatworms than non-native Drymaeus.

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