# Sensory Input Underlying Natural Behaviors in Sepsis punctum (Diptera: Sepsidae)

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Introduction: It is known that mechanosensory halteres, the reduced hindwings of flies, send information to the brain about wing-steering, head movement, and take-off stabilization. Most flies oscillate their halteres when walking; however, Sepsis punctum differ in regards to their haltere oscillation pattern. Sepsis punctum irregularly and slowly oscillate their halteres when walking, and previous research leaves the cause of this behavior unknown. Hypothesis: Sepsis punctum use sensory information from haltere movements to coordinate its wing movements. Methods: With the halteres intact, footage of each fly was recorded in the lab (a controlled environment) from side and above angles. Using UV-activated glue under a Leica S6E microscope, both halteres were immobilized. Footage of the flies with both halteres immobilized was then recorded from the aforementioned angles, and the footage was analyzed and digitized using DLT Dataviewer. Results: We examined 37 Sepsis punctum from Squire Valleevue and Valley Ridge Farms. Preliminary intact haltere movement data show wing elevation levels (in pixels) ranging from 0 to 68 in a span of 400 milliseconds. While immobilized haltere movement data only has wing elevation levels from -6 to 5 pixels in the same span of 400 milliseconds. Conclusion: The sizeable difference in the range of wing elevation levels between intact and immobilized halteres supports the hypothesis, as wing movements greatly decreased when the ability for haltere movement was eliminated. This project provides a vital step in understanding the mechanosensory system of flies, who are a model organism for humans; specifically, cardiologists and heart specialists rely on a greater understanding of the human sensory system to cure heart disease, defects, etc.

**Awards Won:**