Expelling mechanism of dragonfly larvae

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Abstract

Anisopteran dragonfly larvae are aquatic organisms that allow water to flow in and out of their modified hindgut chamber through their anal openings. This system has been shown to be the basis of respiration, ventilation patterns, and propulsion of the larvae through water. Recently, we discovered that one of the forms of ventilation, which exhibits as an anteriorly propagating wave of the chamber wall, accelerates particles from within the hindgut chamber to outside the organism. This study analyzes the kinematics of the ventilating waves using high speed video of the wave motion. We aim to discover which phase of the wave propagation is responsible for this expelling mechanism. The findings may prove useful for application in engineering fields focusing on internal flow control.

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