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Paramecia Swim with a constant propulsion in Solutions of Varying Viscosity[1] JAMES M. VALLES, JR., ILYONG JUNG, HARRY MICKALIDE, HOJIN PARK, THOMAS POWERS, Brown University — Paramecia swim through the coordinated beating of the 1000's of cilia covering their body. We have measured the swimming speed of populations of Paramecium Caudatam in solutions of different viscosity, η, to see how their propulsion changes with increased drag. We have found the average instantaneous speed, V to decrease monotonically with increasing η. The product ηv is roughly constant over a factor of 7 change in viscosity suggesting that paramecia swim at constant propulsion force. The distribution of swimming speeds is Gaussian. The width appears proportional to the average speed implying that both fast and slow swimmers exert a constant propulsion. We discuss the possibility that this behavior implies that the body cilia beat at constant force with varying viscosity.

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