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Sedimentation dynamics and diffusion of suspensions of swimming E. coli[1] PAULO ARRATIA, ALISON PATTESON, JASPREET SINGH, PRASHANT PUROHIT, University of Pennsylvania — Sedimentation in active fluids has come into focus due to the ubiquity of swimming micro-organisms in natural and man-made environments. Here, we experimentally investigate sedimentation of passive particles in water containing various concentrations of the bacterium *E. coli*. Results show that the presence of live bacteria reduces the velocity of the sedimentation front even in the dilute regime, where constant sedimentation velocity is expected to be independent of particle concentration. The presence of live bacteria increases the effective diffusion coefficient, which determines the width of the sedimentation front. For higher bacteria concentration, we find the development of two sedimentation fronts due to bacterial death. A model in which the advection-diffusion equation describing the settling of particles under gravity is coupled to the population dynamics of the bacteria captures the experimental trends relatively well.

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