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Motility of flagellated bacteria in colloidal media[1] SHASHANK KAMDAR[2], LORRAINE F. FRANCIS, XIANG CHENG, Department of Chemical and Materials Science, University of Minnesota Twin Cities — Recent years have seen increasing interests in understanding the mechanism and motility of microswimmers in non-Newtonian fluids due to their relevance in biological and biomedical applications. Nevertheless, despite extensive study on the locomotion of microswimmers in polymeric fluids, their motion in a colloidal suspension remains largely unexplored. Here, we study the motility of *E. coli*, a flagellated bacterium in colloidal media. We systematically vary the size of colloidal particles from 50 nm to 1 μm and the volume fraction up to 20%. The motion of fluorescent-labeled bacteria is imaged using confocal microscopy and speeds of bacteria are extracted using a robust in-house tracking algorithm. Our results show that bacterial mobility decreases with increasing volume fractions at low volume fractions, but remains constant beyond a critical volume fraction. In addition, we find that the motility depends on the size of passive colloid. Finally, we construct a simple model that qualitatively explains our experimental observation. This work enriches the current understanding of microswimmers' locomotion in complex fluids.

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