

Abstract Submitted
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Can the copepod seta sense the hydrodynamic disturbance of prey entrained in the feeding current? XINHUI SHEN, MARCOS MARCOS¹, Nanyang Technological University, HENRY FU, University of Utah — The prey detection of feeding-current feeding copepods is achieved by beating their cephalic appendages to generate flow entrainment and utilizing their mechanoreceptional setae to sense the presence of the prey. The hydrodynamic characteristics of the copepod's feeding current have been extensively studied; however, there is little knowledge on if the copepod seta is capable of sensing the hydrodynamic disturbance of prey, or otherwise a direct contact of the setae and prey is required. Here we present a mechanical model to examine the deformation mechanics of the copepod setae when subjected to the flow disturbance of an inert particle entrained in the copepod's feeding current. We first determine the hydrodynamic characteristics of a copepod and beating stroke of its cephalic appendages through video analysis, and utilize the immersed boundary method to solve for the flow fields around the seta with and without the presence of the entrained prey. We then proceed to evaluate the setal deformation induced by such flows, and demonstrate that the flow disturbance induced by the entrained prey leads to a different setal deformation pattern, which may be sensed by the copepod.

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