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Collective behavior of nematodes in a thin fluid SEAN GART, SUNGHWAN JUNG, Department of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University — Many organisms live in a confined fluidic environment such as in a thin fluid layer on dermal tissues, in saturated soil, and others. In this study, we investigate collective behaviors of nematodes in a thin fluid layer. The actively moving nematodes feel various hydrodynamic forces such as surface tension from the top air-liquid interface, viscous stress from the bottom surface, and more. Two or more nematodes in close proximity can be drawn together by the capillary force between bodies. This capillary force also makes it difficult for nematodes to separate. The Strouhal number and a ratio of amplitude to wavelength are measured before and after nematode aggregation and separation. Grouped and separate nematodes have no significant changes of the Strouhal number and the ratio of amplitude to wavelength, which shows that body stroke and kinematic performance do not change while grouped together. This result implies that nematodes gain no mechanical advantage during locomotion when grouped but that the capillary force draws and keeps nematodes joined together.

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