Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Pump Function of C. elegans Pharynx in Highly Viscous Environments YUKI SUZUKI, KENJI KIKUCHI, Department of Finemechanics, Graduate School of Engineering, Tohoku University, KEIKO NUMAYAMA-TSURUTA, Graduate School of Biomedical Engineering, Tohoku University, TAKUJI ISHIKAWA, Department of Finemechanics, Graduate School of Engineering, Tohoku University
— A nematode C. elegans is a filter feeder, which lives in various viscous habitats such as soil and rooting fruits. C. elegans draws a suspension of food bacteria and separates them from the solvent water by using the pharyngeal pump. Former studies have proposed the mechanism of the food condensation only in low viscosity environments. Although C. elegans lives mostly in highly viscous habitats, few studies have investigated the food condensation in highly viscous conditions. Hence, it is not clear how C. elegans can eat bacteria to survive in highly viscous environments. In this study, we investigated the effect of viscosity on the survival of worms and the pump function of the pharynx in highly viscous conditions. We found that the survival rate of worms diminished with increase in viscosity. We also found that the pump function weakened due to higher viscosity while the pump power rose with increase in viscosity. This result suggests that the amount of ingested food declined with increase in viscosity since the pharyngeal pump could expand and contract inadequately in high viscosity. Finally, our results indicate that decrease in the survival rate of worms would be related with decline in the amount of food ingested by the pharyngeal pump in high viscosity.

Yuki Suzuki
Dept of Finemechanics, Graduate School of Engineering, Tohoku University

Date submitted: 02 Aug 2019 Electronic form version 1.4