

Abstract Submitted
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Colony Rheology: Active Arthropods Generate Flows KAREN DANIELS, MICHAEL MANN, North Carolina State University, PATRICK CHARBONNEAU, Duke University — Hydrodynamic-like flows are observed in biological systems as varied as bacteria, insects, birds, fish, and mammals. Both the phenomenology (e.g. front instabilities, milling motions) and the interaction types (hydrodynamic, direct contact, psychological, excluded-volume) strongly vary between systems, but a question common to all of them is to understand the role of particle-scale fluctuations in controlling large-scale rheological behaviors. We will address these questions through experiments on a new system, *Tyrolichus casei* (cheese mites), which live in dense, self-mixing colonies composed of a mixture of living mites and inert flour/detritus. In experiments performed in a Hele-Shaw geometry, we observe that the rheology of a colony is strongly dependent on the relative concentration of active and inactive particles. In addition to spreading flows, we also observe that the system can generate convective circulation and auto-compaction.

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