The non-linear Flow Properties of Snail Mucus

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**Non-Linearity**: A must for material properties of the polysaccharide- and protein-network to achieve adhesive locomotion

**Bingham Number** $Bn$: The dimensionless number for basic mucus quality

$$Bn = \frac{\tau_{yield}}{\eta \cdot \dot{\gamma}}$$

- $\tau_{yield}$: The minimum yield stress required to let the snail “stick” to the wall
- $\eta$: The post-yield viscosity determines viscous dissipation of energy and snail speed

**Requirements for adhesive locomotion**:
1. Non-linear fluid properties: $\eta(t) \neq \eta(t_n)$
2. Differential areas in motion under the snail foot

**Pipkin Space**: Sophisticated way to describe the (restructuring) time- and deformation dependent non-linear quality of snail mucus

**Lissajous Curves**: Visualizing non-linear stress response depending on time and deformation

**Information Condensation**: Lissajous Curves as the third variable in the Pipkin Space

**Fingerprint** of snail mucus: Pipkin Diagram for maximum sustainable stress from Lissajous Curves