MICROPLASTIC EXTRACTION FROM SEDIMENTS WITH A CONTINUOUS FLOW ELUTRIATION PROCESS

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Background:

- The abundance of microplastic pollution in Oklahoma's freshwater systems is unknown.
- Elutriation is the process of separating particles by exploiting differences in density and settling velocities.
- Current research generally applies a batch elutriation process for microplastic extraction from sediments.

Objective:

Design a continuous flow process to extract microplastics from freshwater sediments.

Methods of Extraction:

Elutriation (Figure 2)

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Density separation (figure 3)

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Digest organic matter

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Vacuum Filtration (figure 4)

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Stereomicroscopy (figure 5)

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FTIR-ATR Analysis (figure 6)

Figure 1 – Plastic pollution

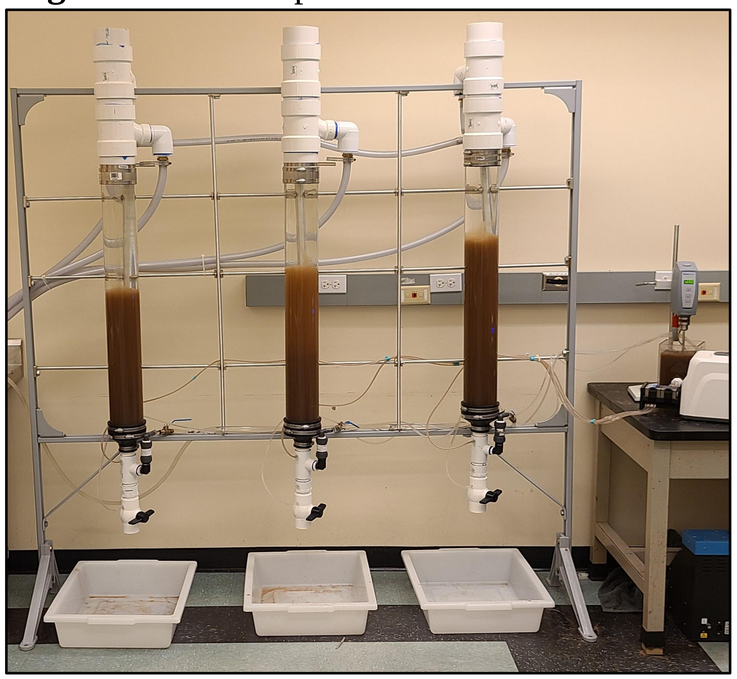

Figure 2 – Elutriation columns

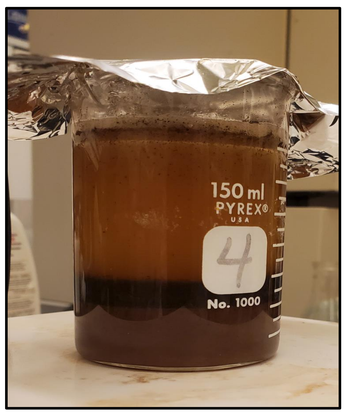

Figure 3 - Density Separation

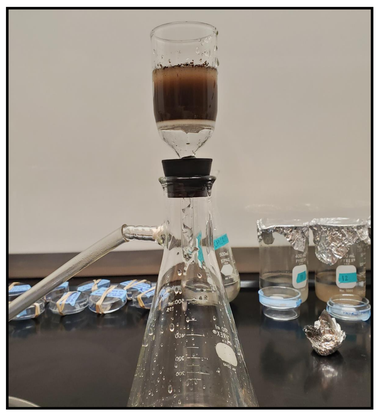

Figure 4 - Vacuum filtration

Preliminary Results:

- Optimized microplastic extraction process using continuous flow (figure 2.)
- Extracted microplastics from Boomer Creek (figure 5.)
- Began identification of polymers in samples e.g. Poly(ethylene:Propylene:ethylidenenorbornene) (EPDM) (figure 6.)

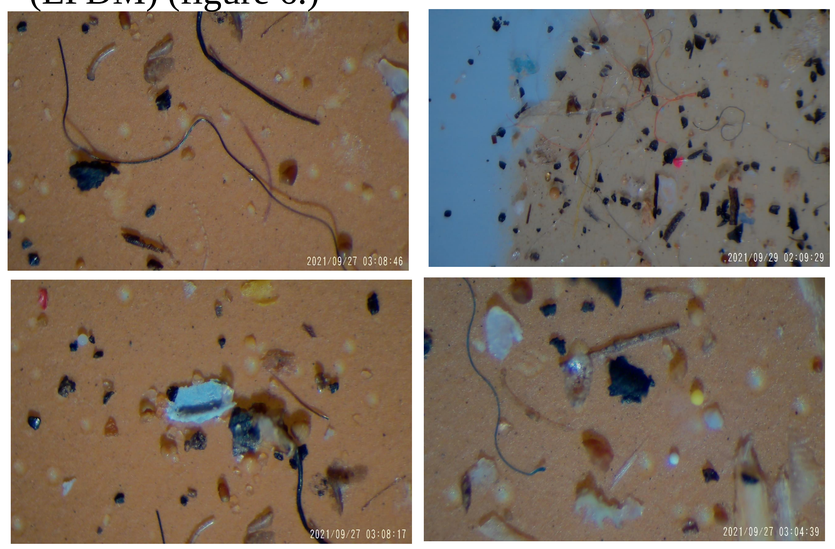

Figure 5- Potential Microplastics extracted from Boomer Creek

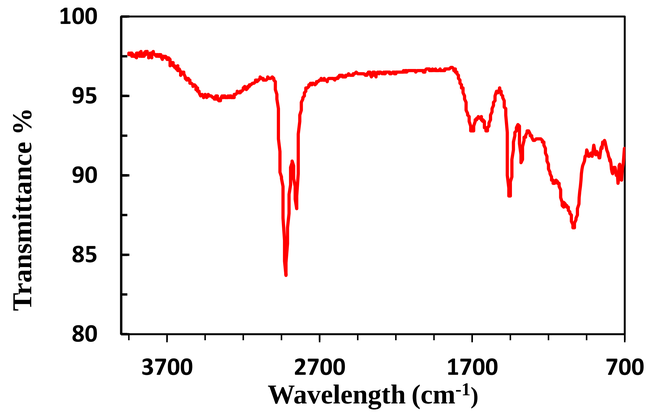

Figure 6- FTIR Spectrum of EPDM

Preliminary Conclusions:

- Boomer Creek has microplastics.
- Further investigation is necessary to evaluate occurrence of microplastics in Oklahoma's freshwater systems.

Acknowledgments:

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