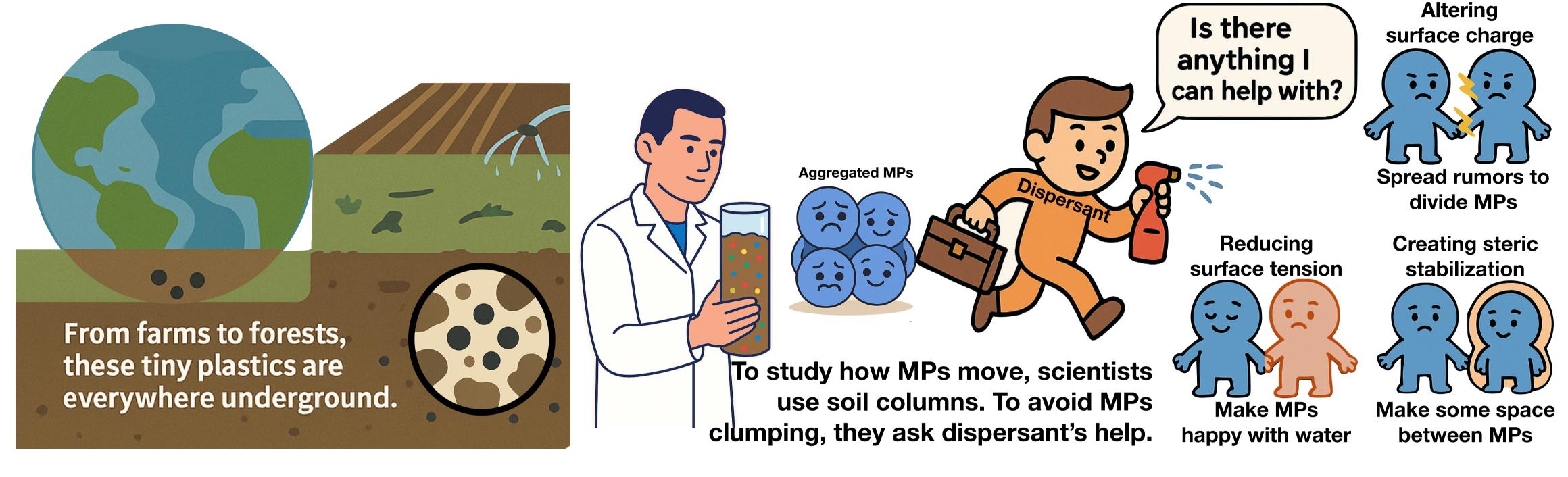
Avoiding Bias in Microplastic Transport: Development of a Dispersant-Free Soil Column Experiment Protocol



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But dispersants don't just help MPs stay suspended.

They alter how MPs behave, move, and interact with soil, making lab results look nothing like what really happens in nature.

That's where our study begins. ? We asked:

- 1. Can we trust dispersant-based soil column experiments and does soil complexity change the answer?
- 2. Can we design a better soil column protocol no dispersants, still precise?
- 3. What does MP transport model without dispersants really look like?

Dispersant-Free Soil Column Experiment Design

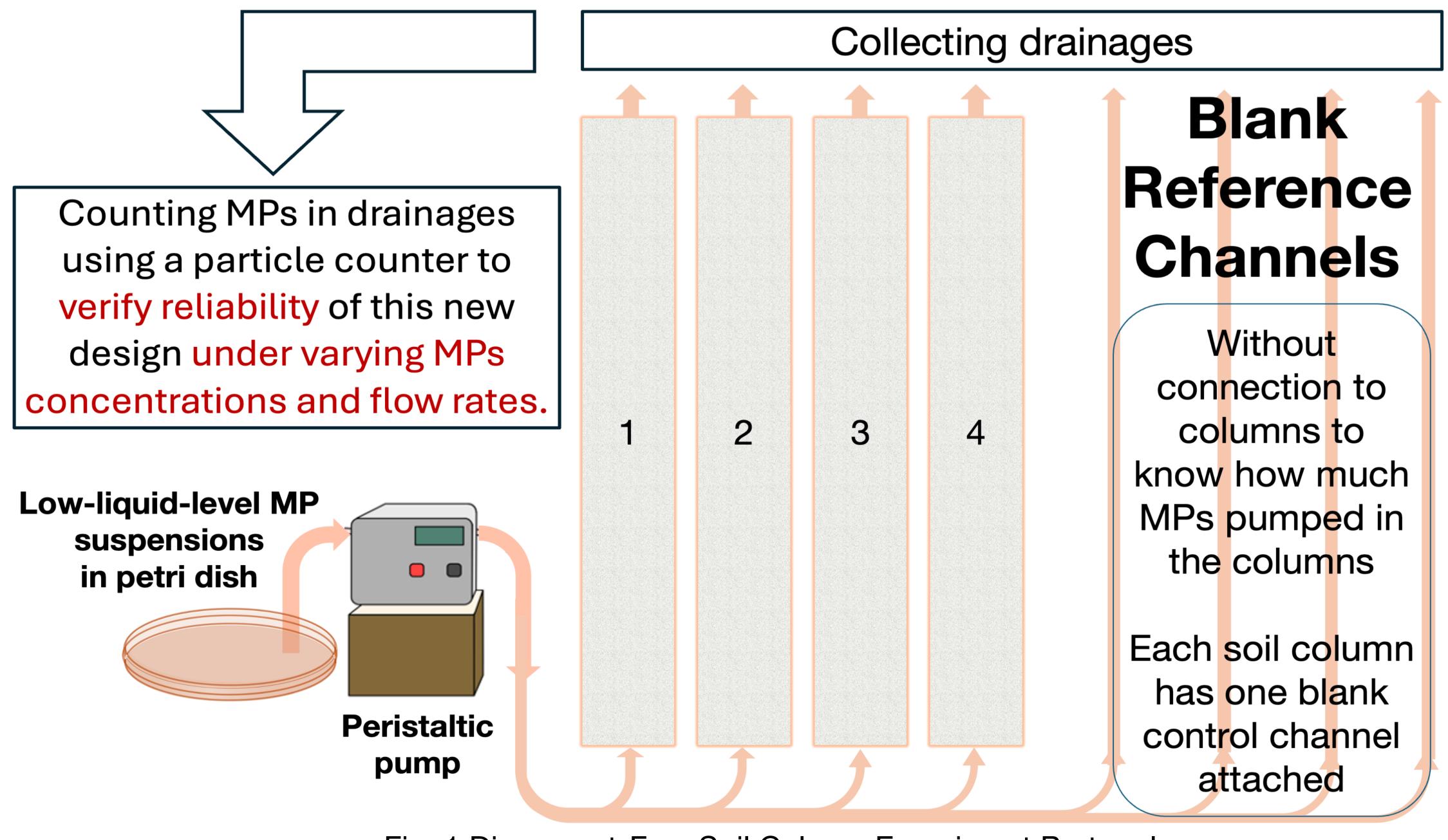
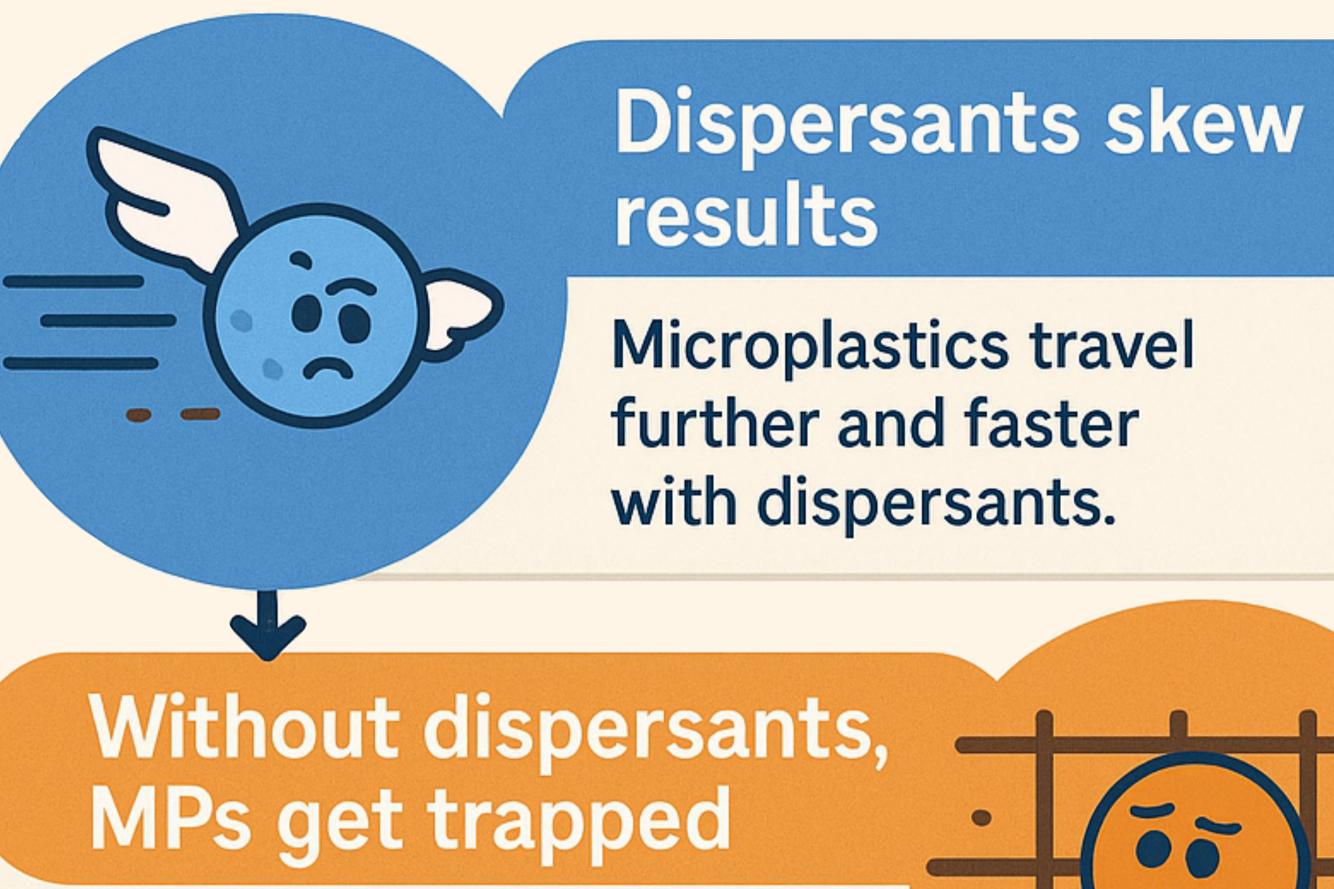


Fig. 1 Dispersant-Free Soil Column Experiment Protocol

Planning to do microplastic transport studies?

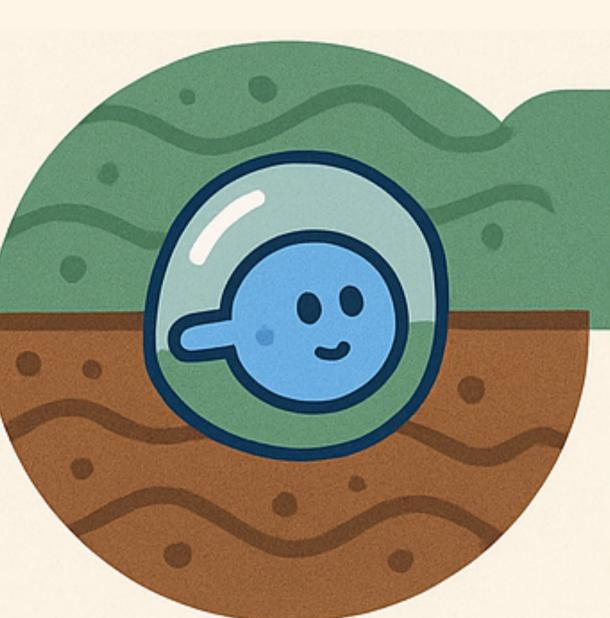
Be cautious with dispersants.

They can alter key processes.



Dispersant-free setups

show more retention in soil.



Not published yet

Sharing not

Effect worsens in complex soils

Silty soils amplify the dispersant effect delayed breathhrough, more retention

We need better lab protocols

Dispersant-free experiments = closer to real soil behavior









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Counting MPs by fluorescence microscopy (counting chamber) Quartz sand Natural silty soil Drainage collections Drainage collections . 200mg/L RhB-PS, dispersant free Reference Channels 2. 200mg/L RhB-PS, with 0.25% v/v Tween 20 Without connection to columns to know how much MPs pumped in the columns Dispersant free 0.25% Tween 20 Each soil column has one blank control channel Low-liquid-level MP Peristaltic suspensions in petri dish

Fig. 2 Experiment set-up for investigating the effect of dispersants on transport of MPs in soil

Silty Soil - No Dispersant

Silty Soil - Dispersant

Breakthrough Curve (C/Co vs PV)

