Microplastic in Indian freshwater systems

Is an anthropogenic influence measurable?

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Why look for microplastics in India?

- Numerous megacities (> 10 mio. inhabitants) and informal settlements
- Insufficient waste and sewage system
- Extreme climatic conditions (monsoon)

Lack of studies concerning microplastics (MP) with many research questions such as:

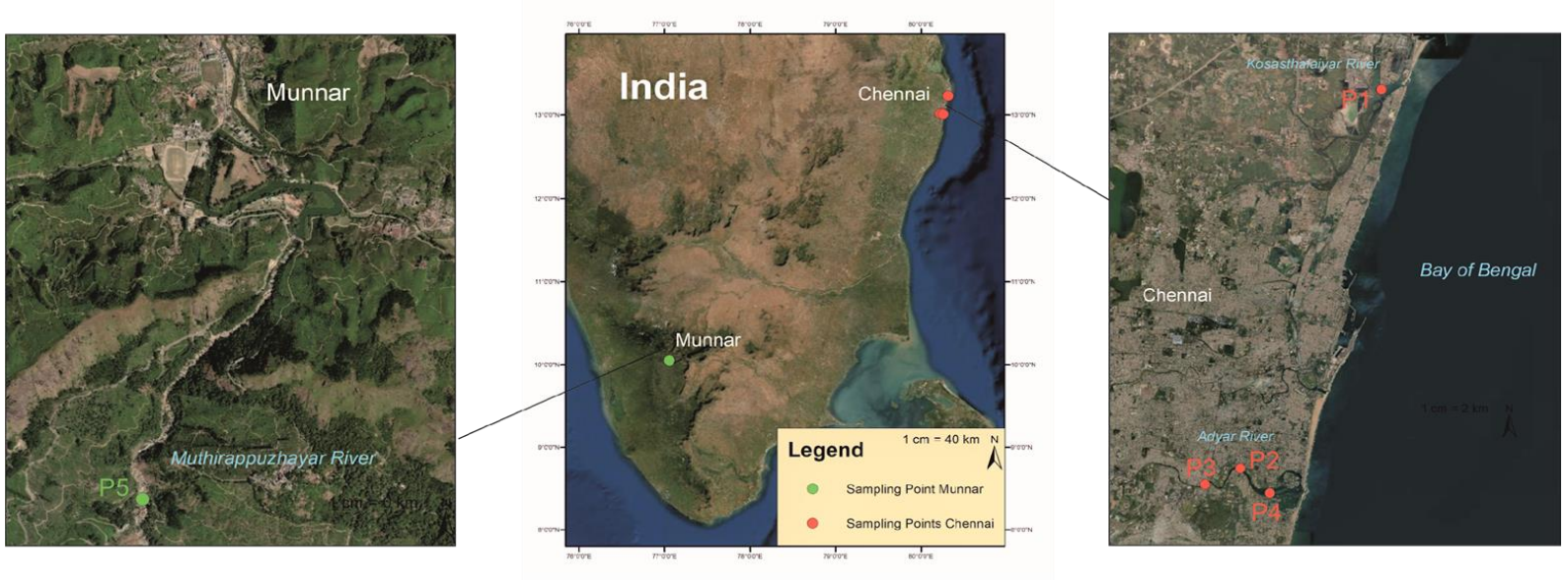
Anthropogenic influence

Climatic influence

Source: The ocean cleanup

Where to sample?

- Comparing urban and rural areas to identify anthropogenic influence
- Fluvial systems in Chennai (n = 3) and Munnar (n = 1)



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How to sample?

- Lowering the mantra trawl from bridges, 3-5 times per location
- Using a mechanical flow meter and sampling for 15 minutes
- Backwashing of the net cup for sample generation (n = 17)

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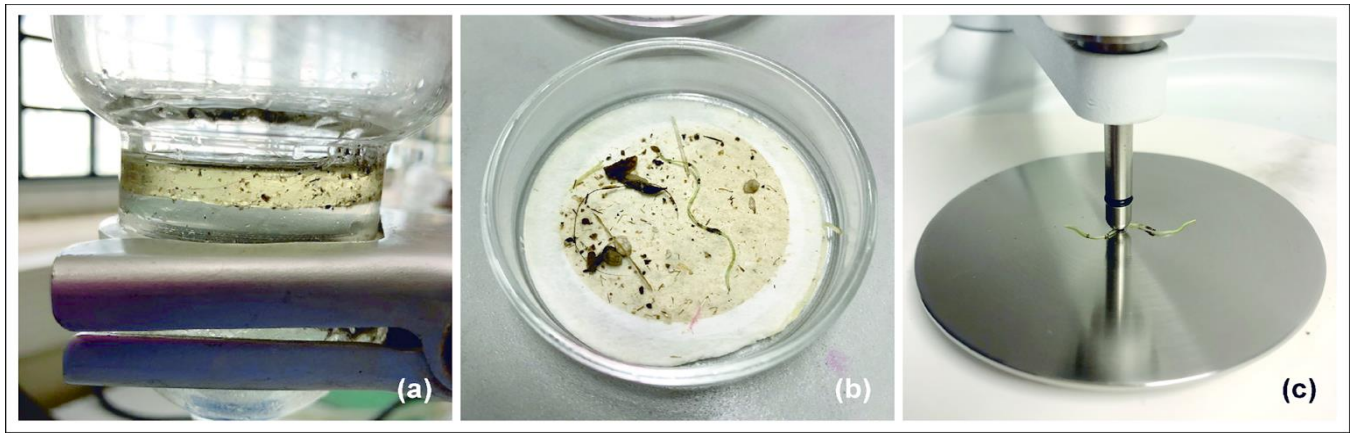
How to prepare samples for microplastic analysis?

- Oil-extraction with canola oil (see Lechthaler et al. 2020)
- Vacuumfiltration of each water sample (Whatman® GF/F filters, pore size 0.7 µm, d = 47 mm) and rinsing with ethanol (96%) to avoid interferences with FT-IR analysis



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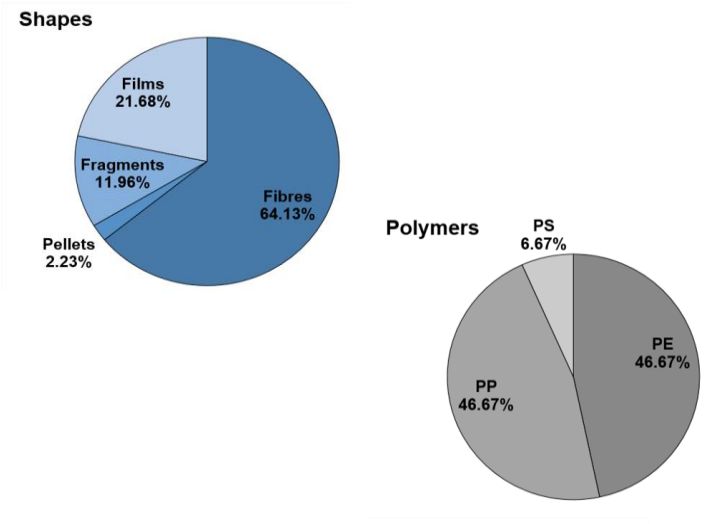
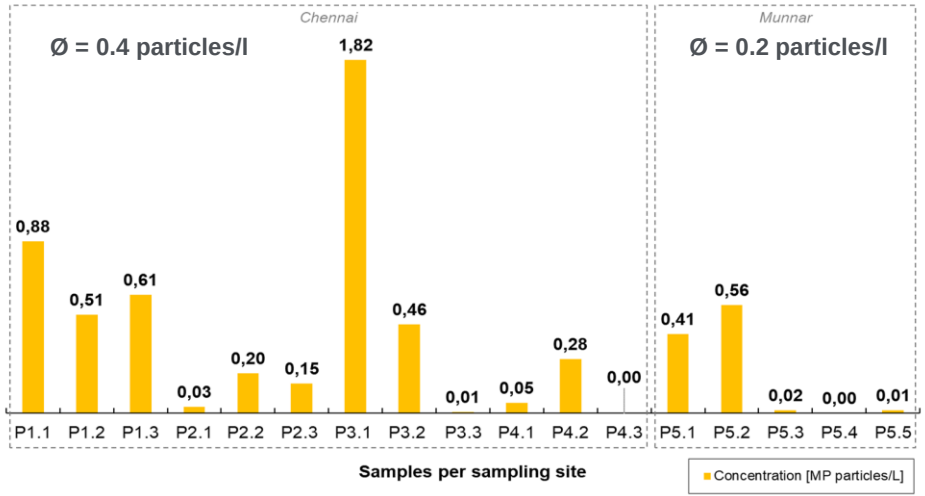
What did we find?

- Microscopic analysis and partially FT-IR-analysis (including blanks)
- Data correction: $MP_{corr} = ((MP_{vis} * p_{error}) - MP_{blank})/V$





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What can we learn from the results? And what should be the focus in the future?

- First baseline study on microplastics in Indian freshwater systems
- Every sampling poses challenges due to on-site conditions
- Anthropogenic influence slightly recognizable but difficult due to missing standardizations and measurement uncertainties (temporal and spatial variation)
- More sampling is needed focusing on other external factors (monsoon, land-use)

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Baseline Study on Microplastics in Indian Rivers under Different Anthropogenic Influences

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