KICK-OFF MEETING, 22.5.2025.

Exposure, biological effects and fate of microplastics in aquatic organisms under different anthropogenic impacts

PlastOrgAnoTox

Field work – sediment sampling and analyses

Kristina Pikelj

Faculty of Sciences

Why it is important to analyse **sediment**?

- most plastics/microplastics (P/MP) are expected to sink
- cause of sinking:
- biofouling and other environmental processes…
- polymer density

- **sediment→ final sink**
- sediment-associated plastics affect benthic invertebrates

- easy sampling: metal spatula

P/MP in beach sediment on the Lastovo Island (left) and Dugi otok Island (right)

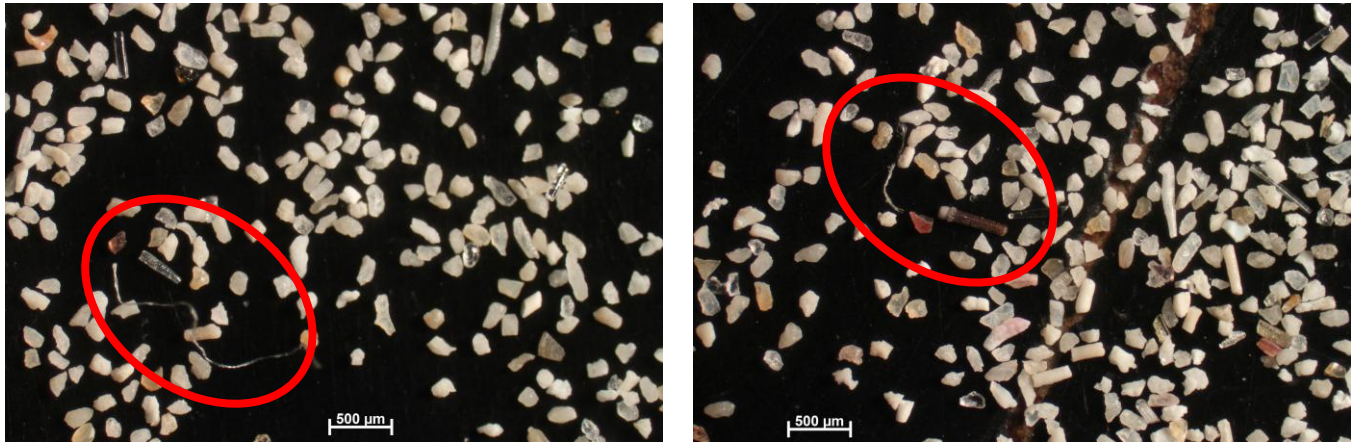
Planned sediment analyses

- sediment characteristics:

- grain size
- mineral composition
- carbonate content

origin of sediment

- metal and metalloid concentrations
- presence, abundance and type of P/MP



MP in very fne sand in the finest sandy fraction (Lojišće beach, Dugi otok Island)

Grain size analysis

- fundamental sediment parameter
- understanding sediment behavior and properties
- evidence of environmental processes

- is there a relationship between grain size and P/MP content?

Grain size analyses (from the top left): wet sieving, sedigraph, laser granulometer

Mineral composition and carbonate content

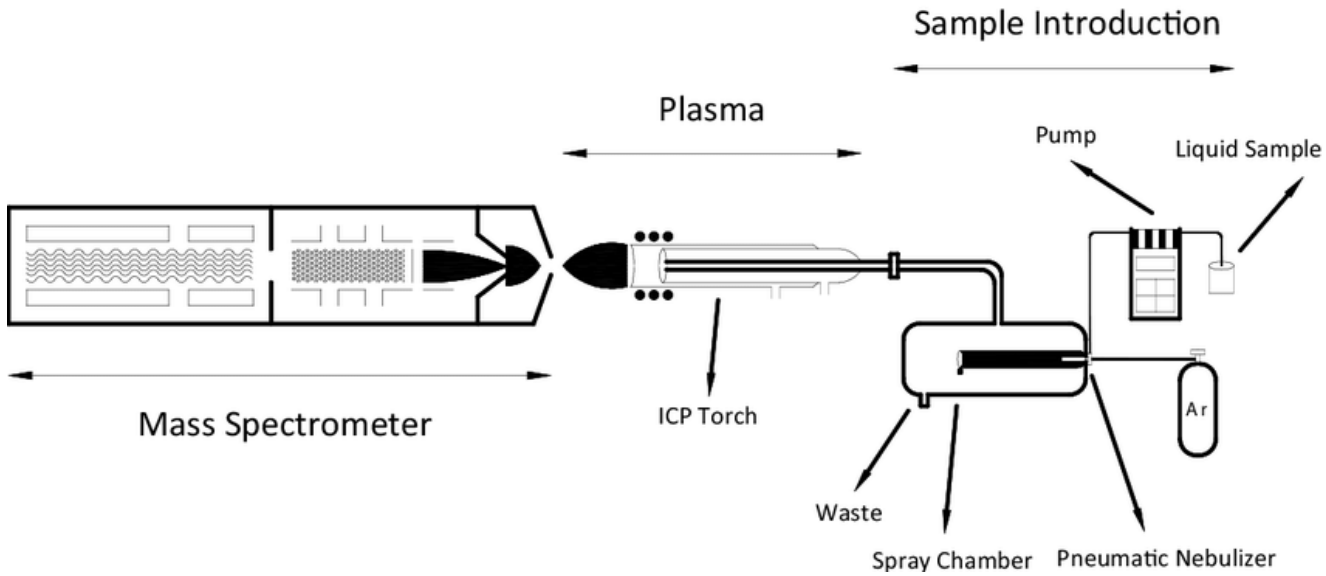
- complementary analyses
- clues of sediment origin
- understanding sediment behavior and properties

- *e.g.* difference between biogenous gravel and terigenous grain
- same grain size – different mineralogy

X-ray difractometer (left)
and Scheibler calcimeter (right)

Metal and metalloid concentrations

- sediment geochemistry
- sediment health
- anthropogenic impacts

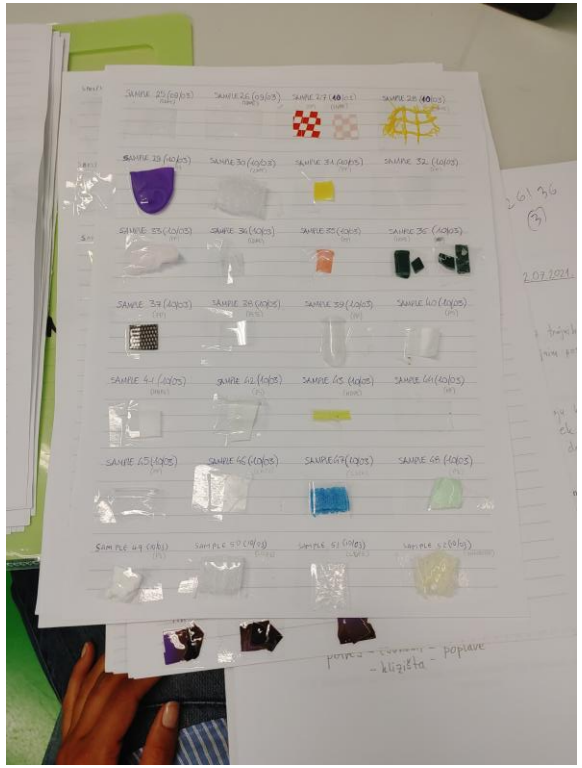


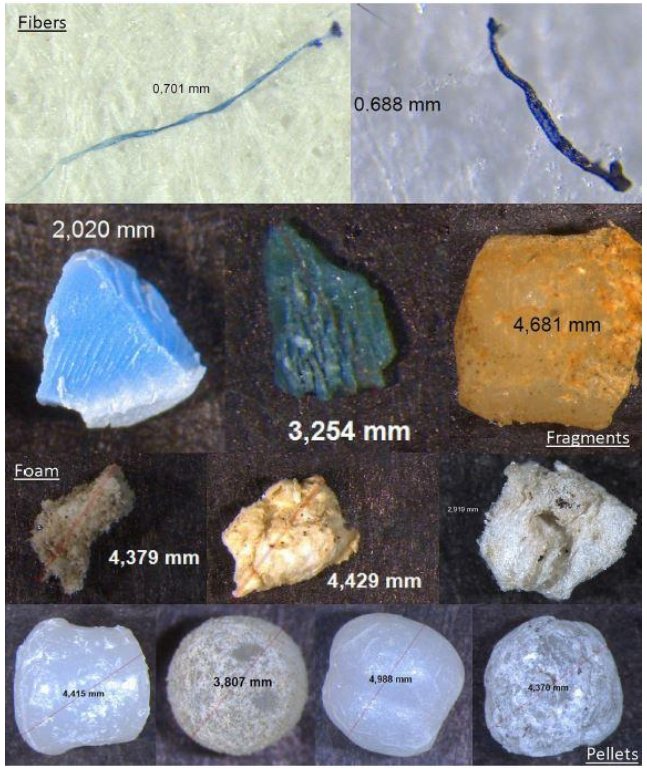
Schematic of ICP-MS

Sediment P/MP load

- extraction:
- NaCl solution(s)
- KOH for organic matter
- HCl for carbonate sediment

- abundance
- type
- shape
- color





Some examples of beached P and MP

Kristina Pikelj

Faculty of Sciences

KICK-OFF MEETING, 22.5.2025.

PlastOrgAnoTox

Thank you!