



Green Europe
Let's Do It Together!

Microplastics as contaminants in the water environment



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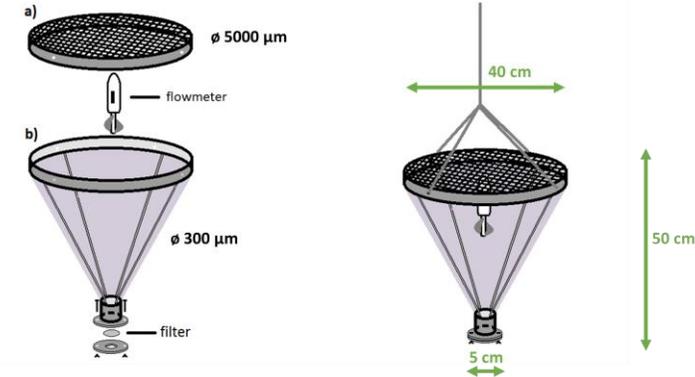


Microplastics

most commonly defined as man-made plastic items smaller than 5 mm.



Symbol	Basin	Sampling point
1	Vistula River	Kwidzyń
2		Tczew
3		Kiezmark
4		Sobieszewo
5	Nogat River	Malbork
6		Kępki
7	Szkarpawa River	Rybina
B	Effluents of Municipal Wastewater Treatment Plants	Gdańsk Wschód
C		Gdynia PEWIK
D		Swarzewo



- B. Gdańsk Wschód - 860 000 PE
 - C. Gdynia PEWIK - 440 000 PE
 - D. Swarzewo – 75 000 - 130 000 PE
- PE- Population Equivalent

The duration: June-December 2017

The ranges of water filtered volume:

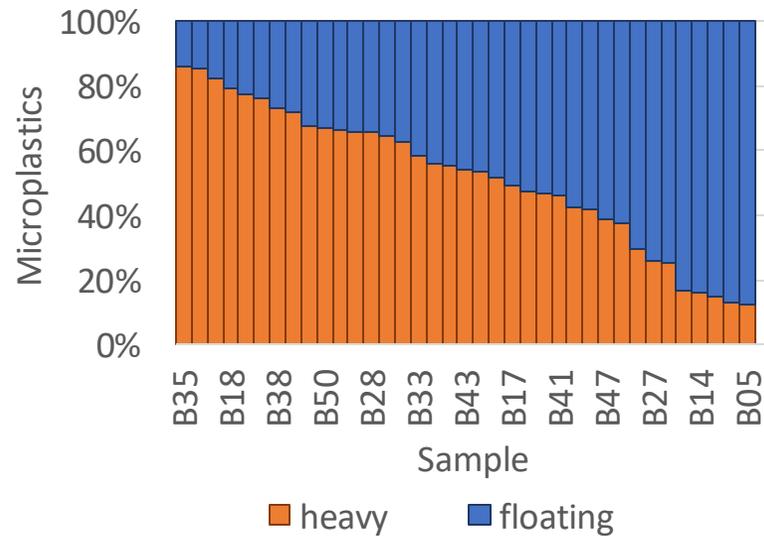
- Rivers 30 – 7 740 L
- Sewage treatment plants 860 – 11 380 L

Just after sampling



Properties of microplastics:

- The main microplastics in surface water and effluents from WWTPs were fibers
- The ratio of microplastics floating on surface of water to those suspended in water was around 1



Solution: 300g NaCl / 1L H₂O

$d = 1.15 \text{ g cm}^{-3}$

Poliethylene $d = 0.91\text{-}0.97 \text{ g cm}^{-3}$

(Sources: textile clothes)

Polipropylene $d = 0.94 \text{ g cm}^{-3}$

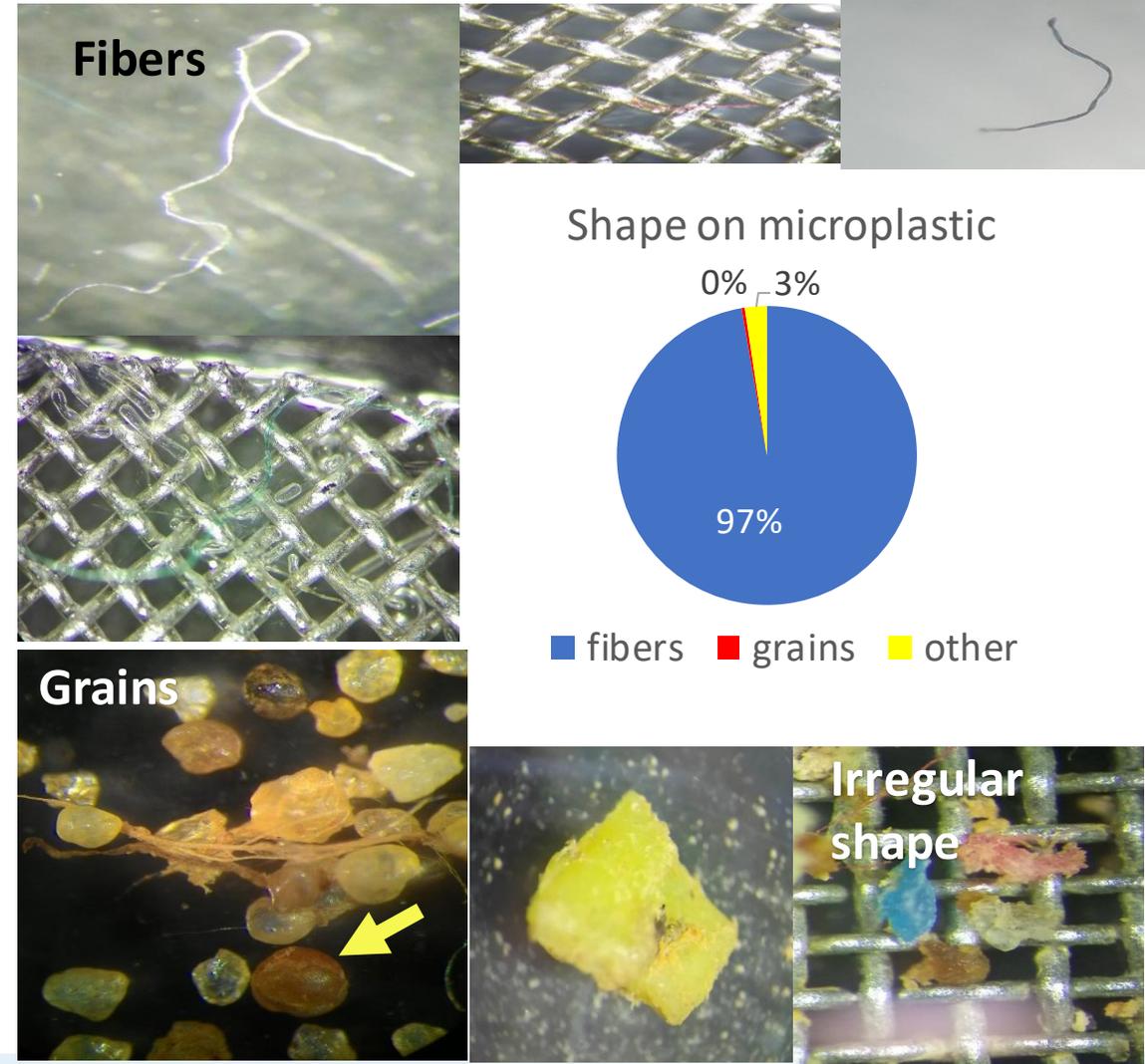
(Sources: building material, protective products)

Polystyrene $d = 1.05 \text{ g cm}^{-3}$

(Sources: building material)

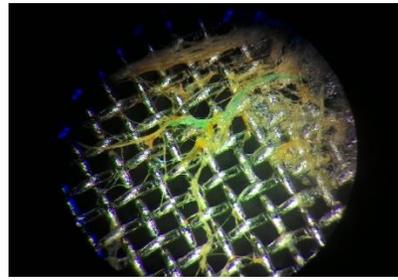
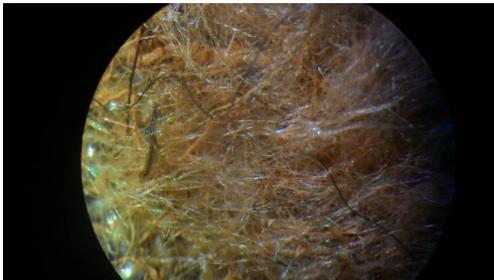
Polivinyle $d = 1.4 \text{ g cm}^{-3}$

(Sources: isolation cables and pipes, building material)



Conclusions and Challenges

- Studied sewage treatment plants removed microplastics in 60%, and still about 400 particles/m³ are discharged to water
- Microplastics collected at the river shore were in the higher particle count than that in mainstream of river waters
- The main microplastics in river water are fibers. They come from households and industry washing.
- Maritime transport and fishing are the source of fibers into water from ropes and nets.
- Education of society
- making lifestyle changes (reduce, reuse, recycle)
- determination the safe level of microplastics in water and food
- Development and standardized methods for microplastics sampling and analysis in food and water
- introduction the obligation monitoring of microplastics in food and water
- Development the processes to remove the microplastics from sewage
- pressure on the governments for change the policy
- looking for new materials that will replace the currently used plastics



A solid knowledge base is critical for policy makers

We do not know if and how microplastics may affect human health



Thank you for your attention

