Selective uptake of microplastics by a marine bivalve (*Mytilus edulis*)

Lisbeth Van Cauwenberghe

Lisbeth.VanCauwenberghe@UGent.be
Plastics in the environment

Microplastics

Plastics on our Plate?
Ingestion and Translocation

Polystyrene particles

10µm $\varnothing$

30µm $\varnothing$

90µm $\varnothing$

TOTAL CONCENTRATION
110 part.ml$^{-1}$

Ghent University – Environmental Toxicology Group

HYPOTHESIS

Stomach

Heart

Anus

Intestine

Gills

Mouth

Ingestion

Translocation

Effects?
What about mussels?

- All particle sizes are ingested

- Faeces
  Some 10µm particles seem to be missing…

- Acid-destructed tissue and haemolymph
  
  Translocation of the smallest particles to the circulatory system

  But less than 0.3% translocate

- No significant effect observed in Cellular Energy Allocation
And what about humans?

We know:
1 particle/g mussel tissue (actual value!!)
300 g ‘mussel meat’ per portion

→ **Per portion we ingest 300 plastic particles**
This corresponds to approx. 1.5 µg plastic

We also know:
concentration of PCBs in marine plastics 169 ng.g⁻¹

→ **Per portion we ingest ~0.00025 ng PCB’s**
Tolerable daily food intake PCBs = 20 ng.kg⁻¹ body weight .d⁻¹

No exceedance of the Tolerable Daily Intake
1. No significant adverse short-terms effects of exposure

2. Microplastics do end up on our plate!
   - **Raisins**
     - 13 whole insects and 45 fruit fly eggs per 300g
   - **Chocolate**
     - 180 or more insect fragments per 300g or
     - 3 rodent hairs per 300g
   (Source: FDA USA)

3. Pollutant load associated with microplastics