Nya biofilmsapplikationer

Rening av mikroföroreningar

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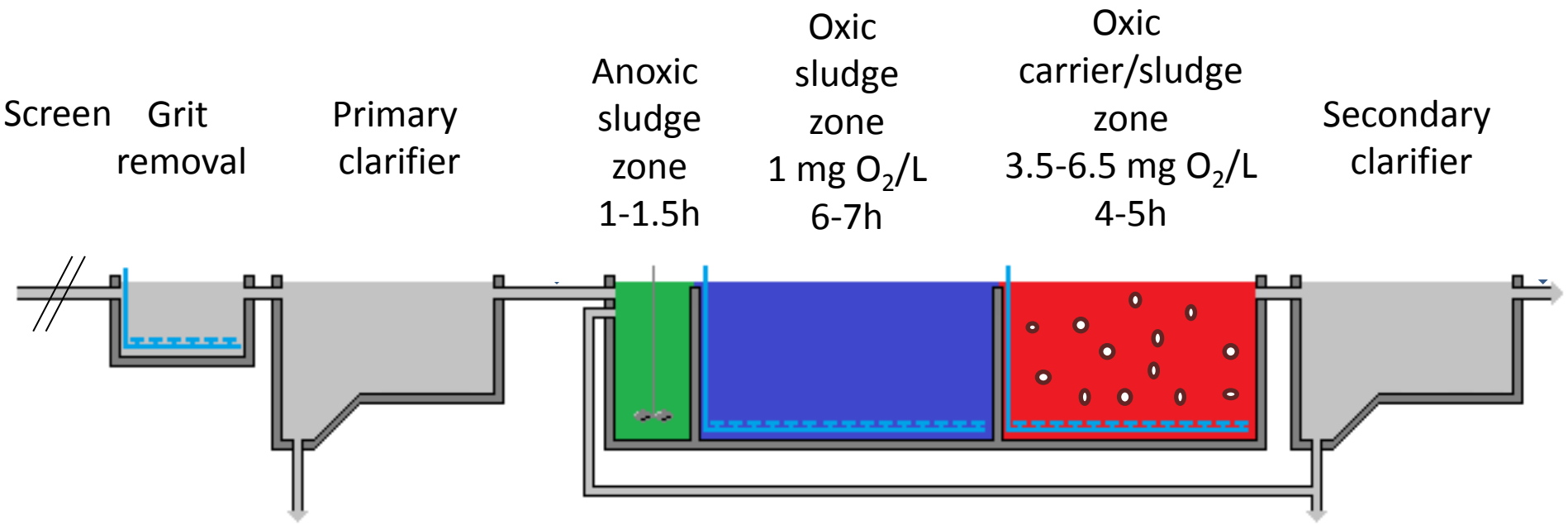
LTH

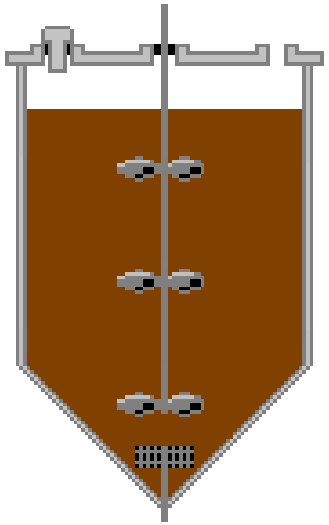
Bad Ragaz WWTP



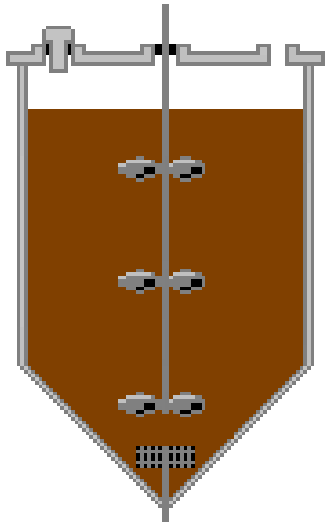
Sludge age: 3-4 days
Filling ratio: 35% last compartment
Carriers: Bio-film Chip M

Three parallel batch reactors

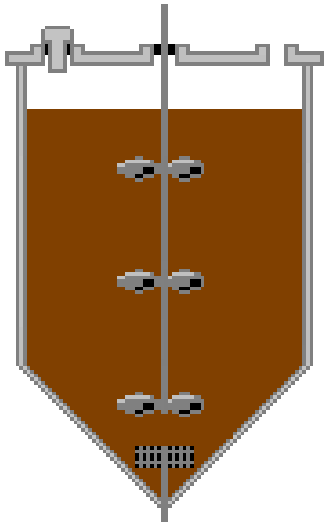
Anoxic sludge
and
effluent wastewater
NO_3-N: 10-50 mg/L



Oxic sludge
and
effluent wastewater
O_2: 3.5 mg/L

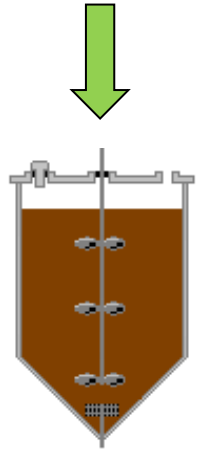


Oxic carriers
and
effluent wastewater
O_2: 3.5 mg/L

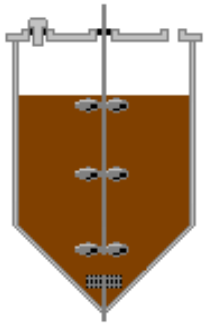


Experimental Set up

Activated sludge or Biofilm carriers
Alkalinity 4 mmol HCO_3^-/L
Ammonium 15 mg NH_4^+-N/L
Micropollutants 1 µg/L

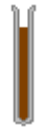


Batch reactor: 10L
Temperature: 16 ± 1 °C
pH: 7.2 ± 0.2

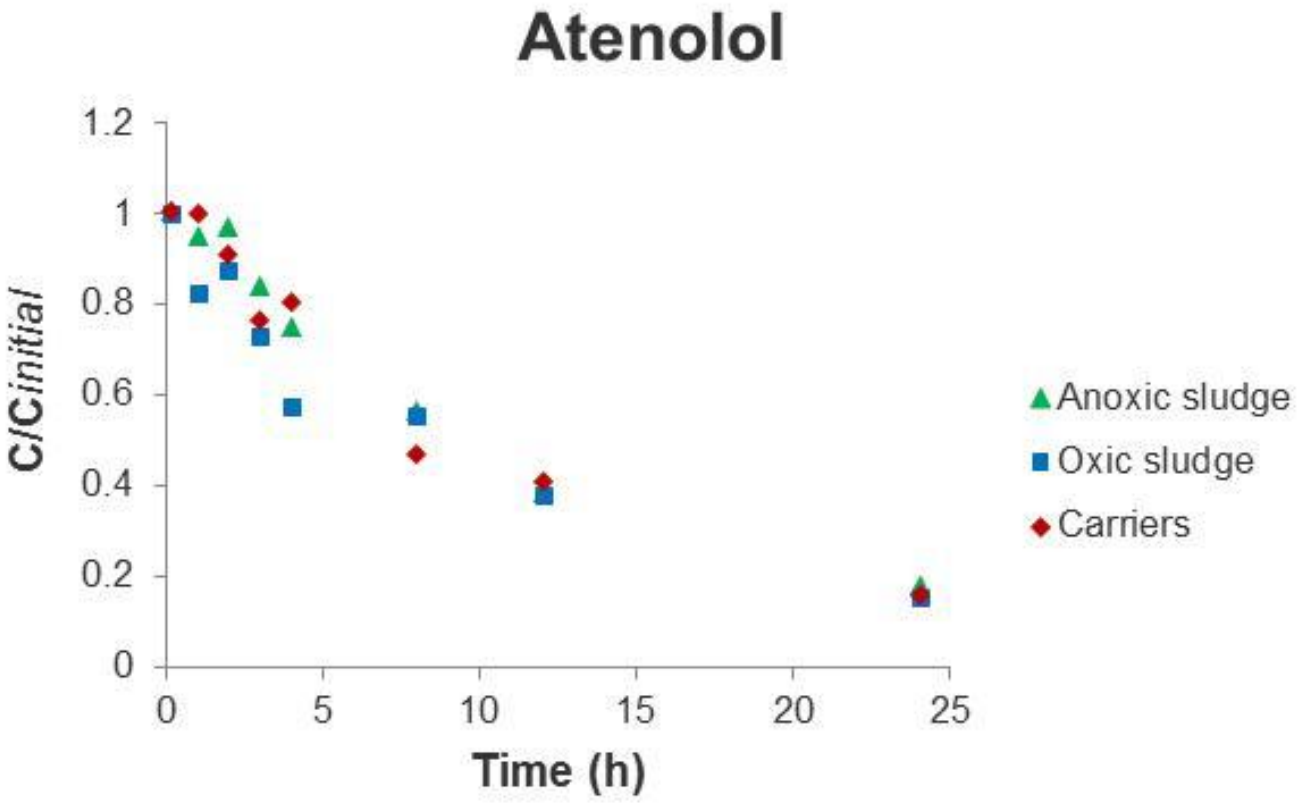


Sampling of batch reactor

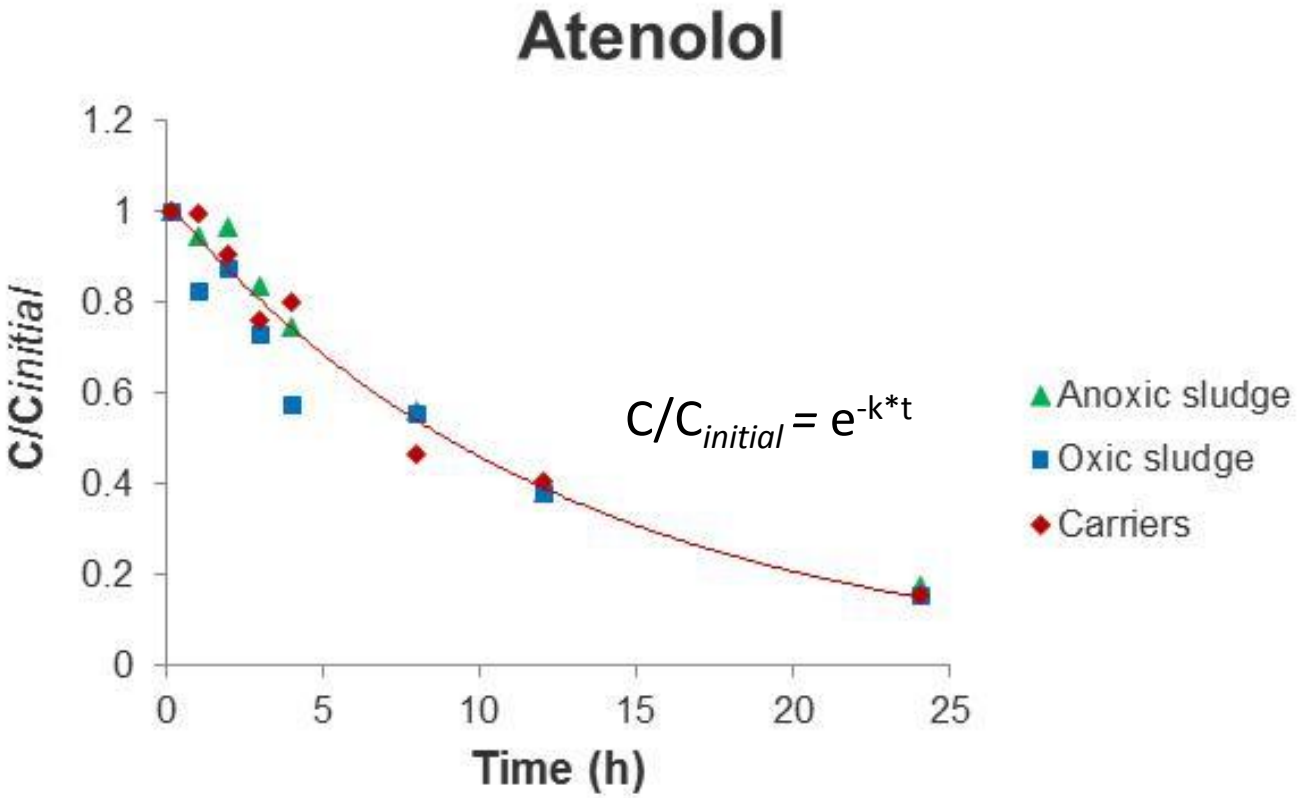
8 samples over 24 h



Micropollutant removal

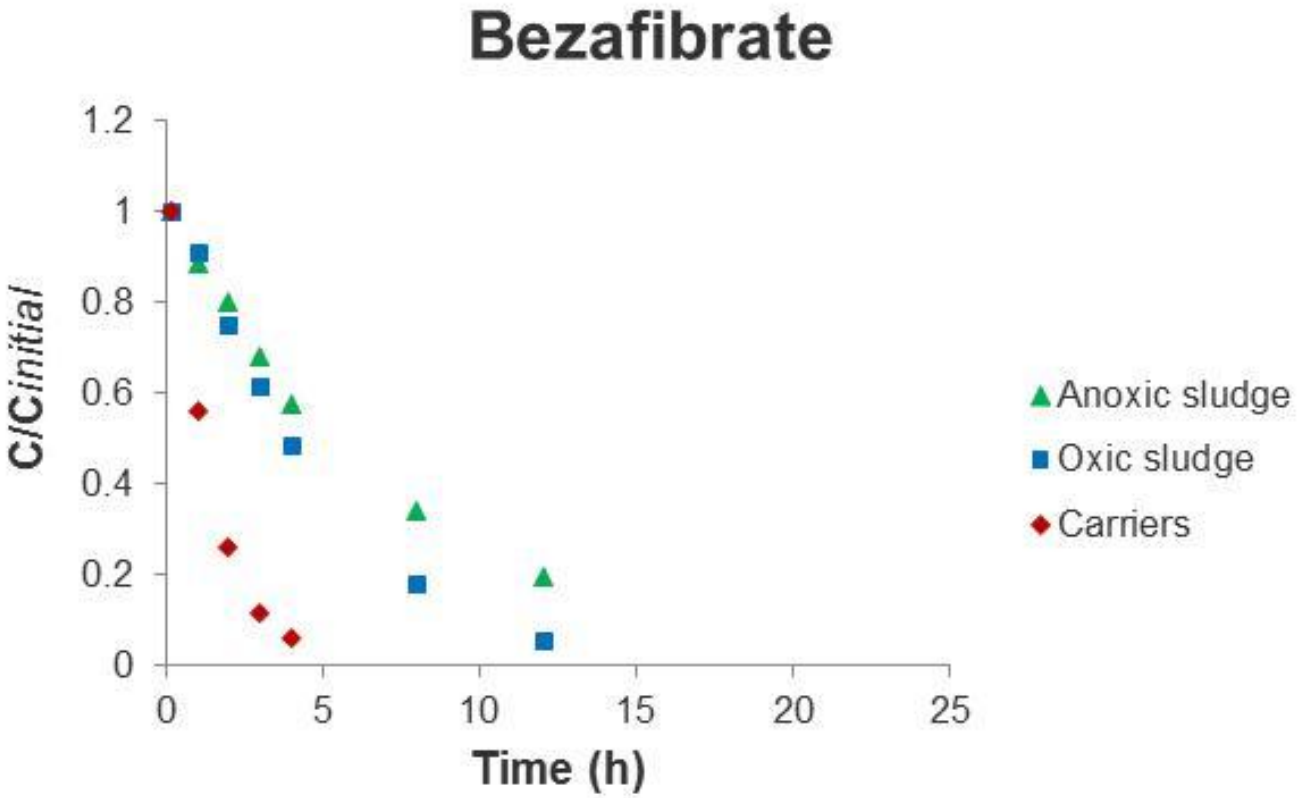


Micropollutant removal



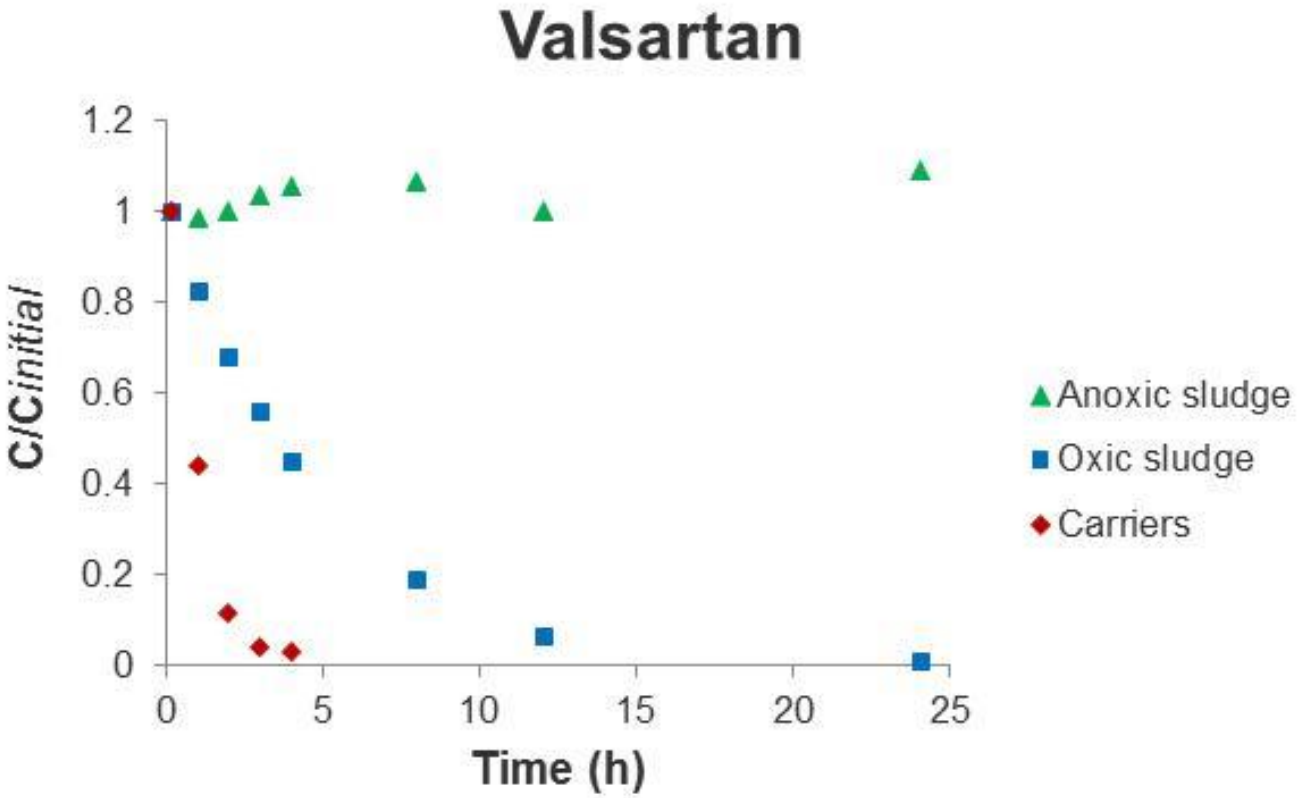
	Removal rate constant (L/g biomass*d)
Anoxic sludge	0.8
Oxic sludge	0.8
Carriers	0.6

Micropollutant removal



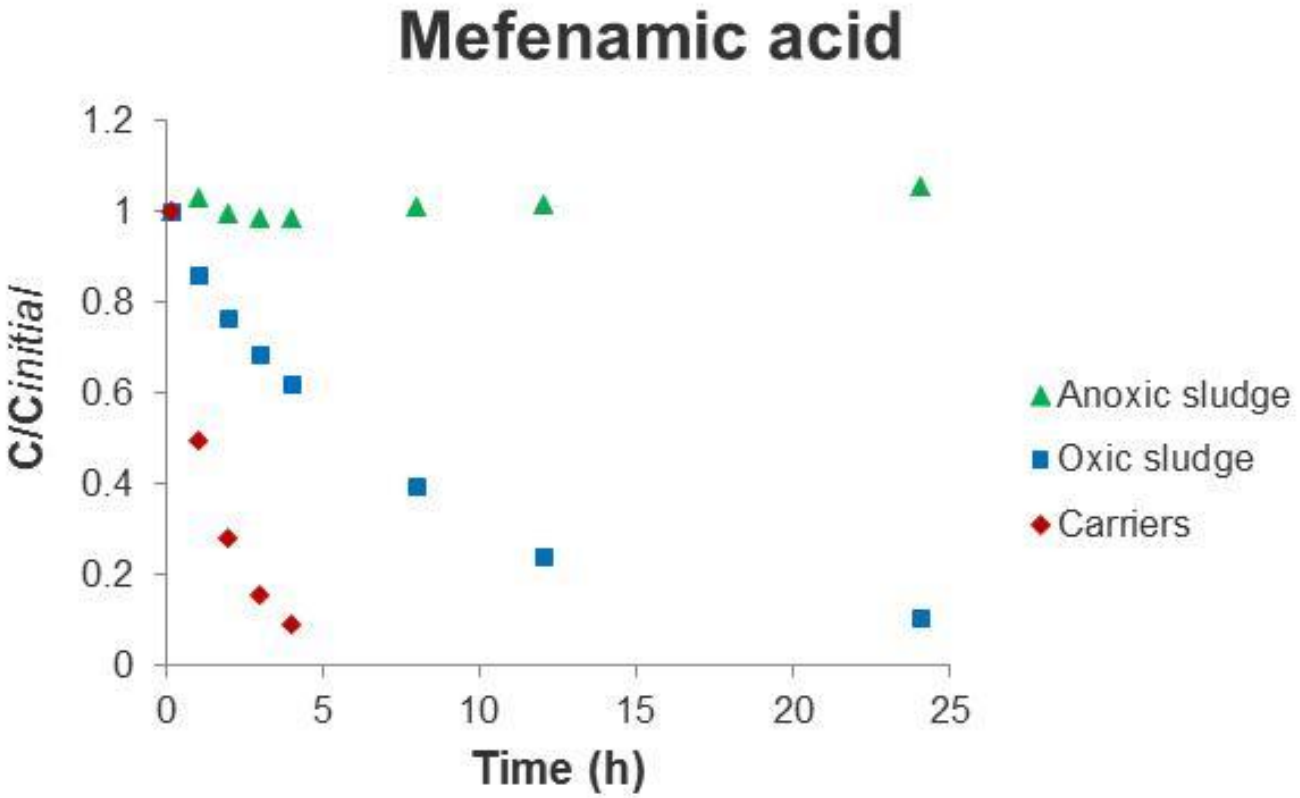
	Removal rate constant (L/g biomass*d)
Anoxic sludge	1.5
Oxic sludge	2.6
Carriers	5.6

Micropollutant removal



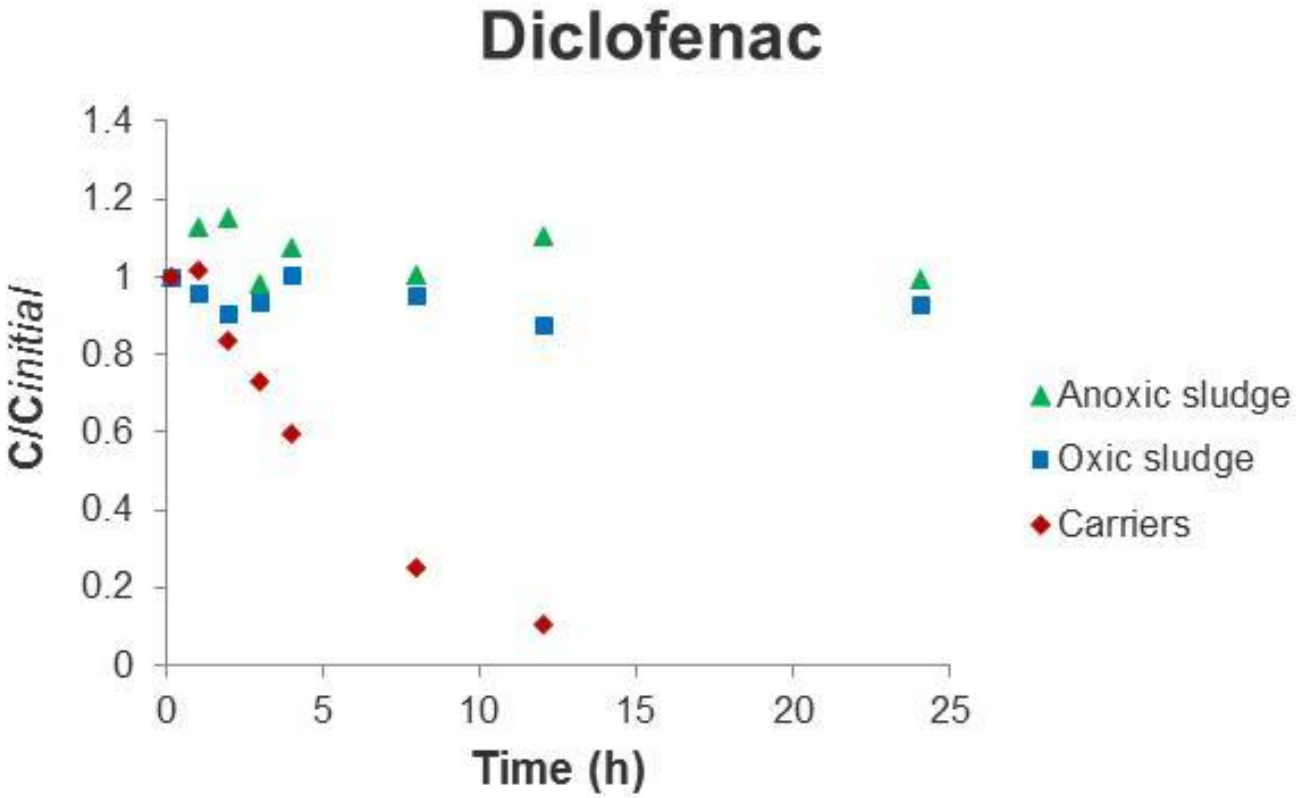
	Removal rate constant (L/g biomass*d)
Anoxic sludge	0
Oxic sludge	2.0
Carriers	7.4

Micropollutant removal



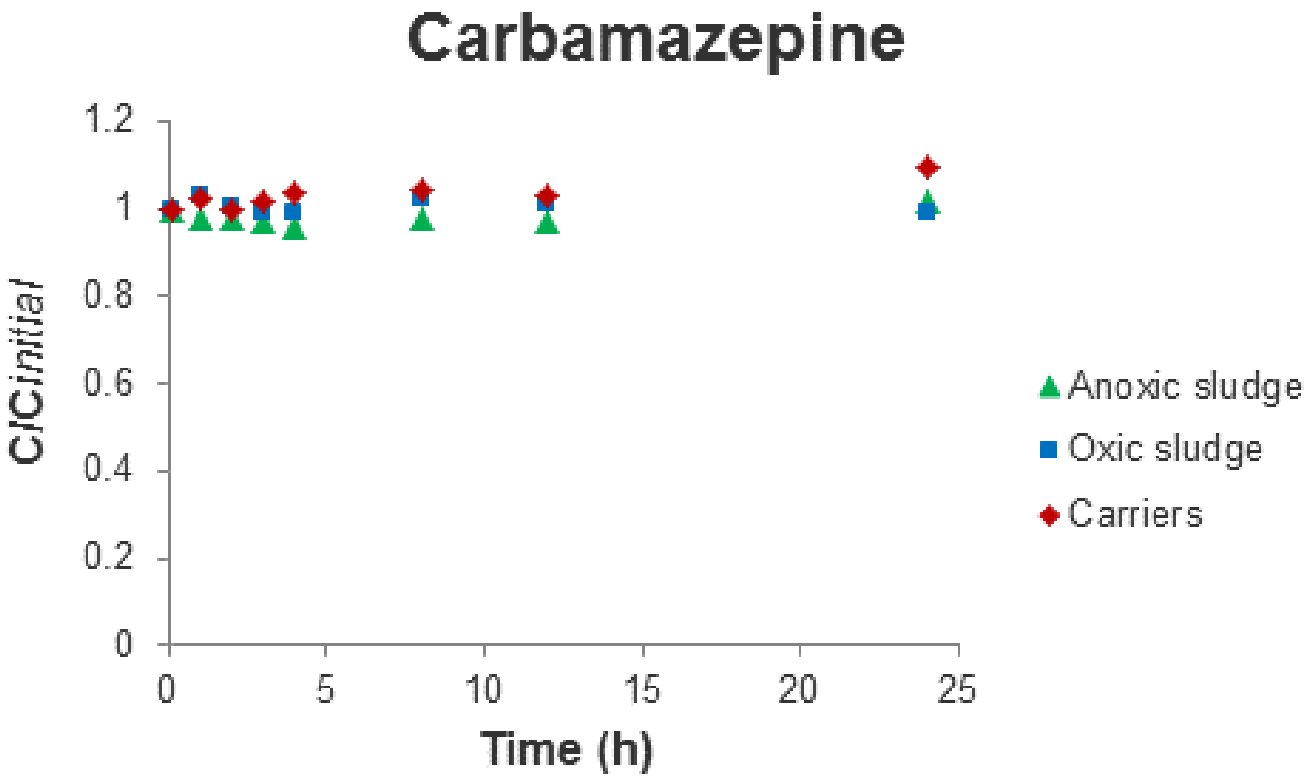
	Removal rate constant (L/g biomass*d)
Anoxic sludge	0
Oxic sludge	1.0
Carriers	4.6

Micropollutant removal



	Removal rate constant (L/g biomass*d)
Anoxic sludge	0
Oxic sludge	0
Carriers	1.5

Micropollutant removal



	Removal rate constant (L/g biomass*d)
Anoxic sludge	0
Oxic sludge	0
Carriers	0

Conclusions

- Biological micropollutant removal rates depended on:
  - the compound properties
  - the redox conditions
  - the microbial composition of biomass

- Carrier-attached biofilms seem to have a higher degradation capacity for some micropollutants, but not all.


Thank you for listening!