

Antropic influence on lakes water quality – case study of Bucharest city

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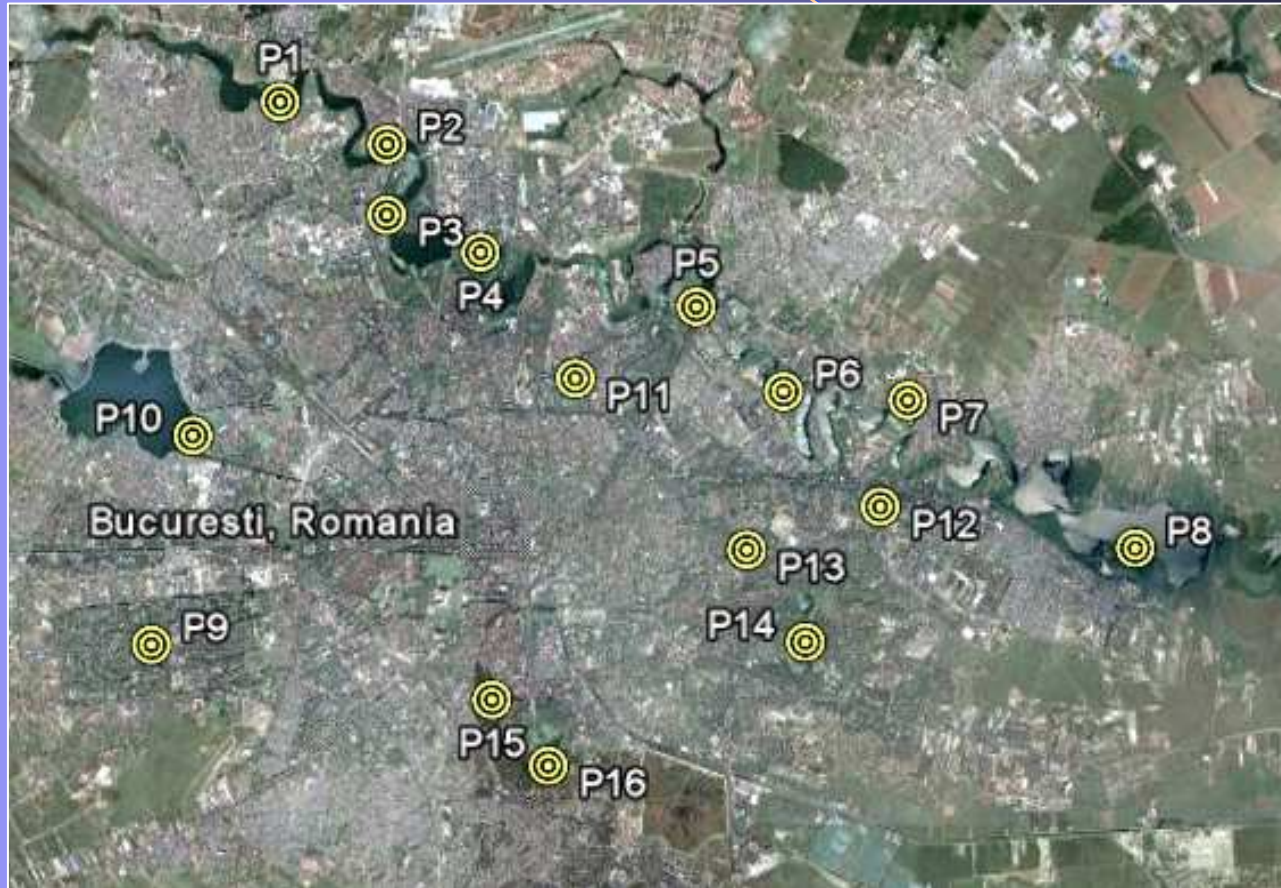
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Aim

- Describe the quality of Bucharest lakes, based, for the first time, on the comparison of standard and fluorescence measurements.

Sampling



Map with sampling locations

Physico chemical measurements

Sampling campaign May – June 2010

- Dissolved oxygen
- Ammonia content
- Chemical oxygen demand
- Nitrates
- Fluorescence spectroscopy

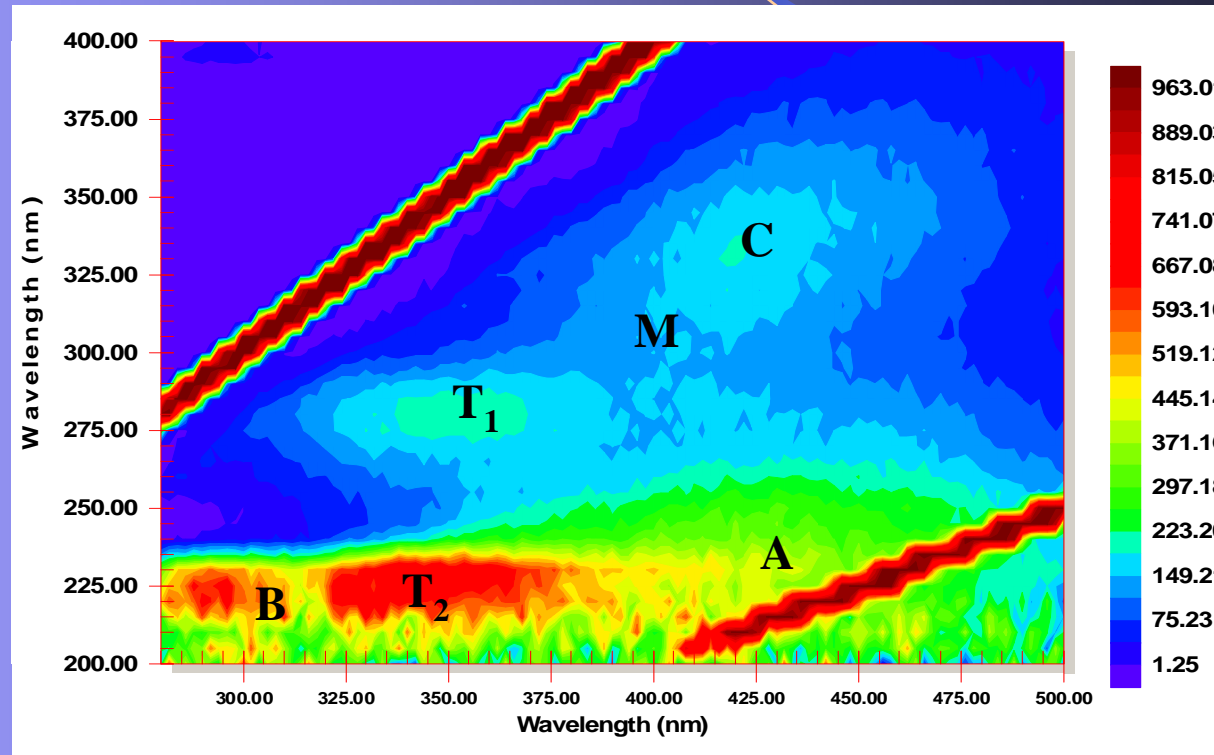
Water fluorescence

Protein-like
fluorescence



Tryptophan (T):
 λ_{ex} : 230-290 nm
 λ_{em} : 320-350 nm

Tyrosine (B):
 λ_{ex} = 230-280 nm
 λ_{em} = 300-320 nm



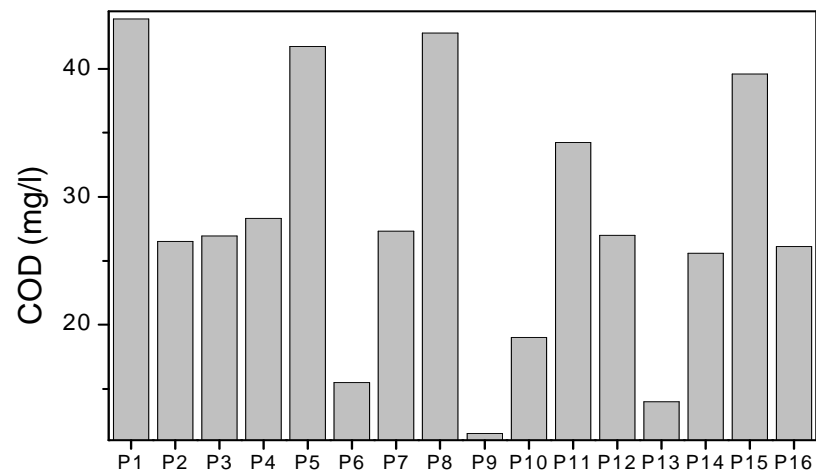
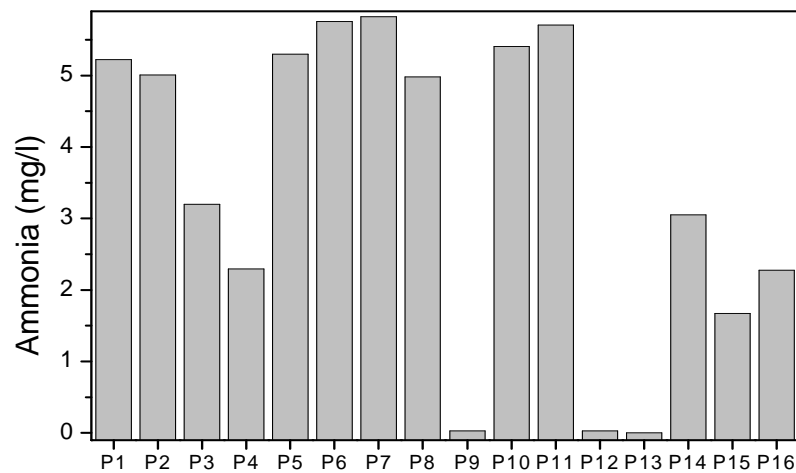
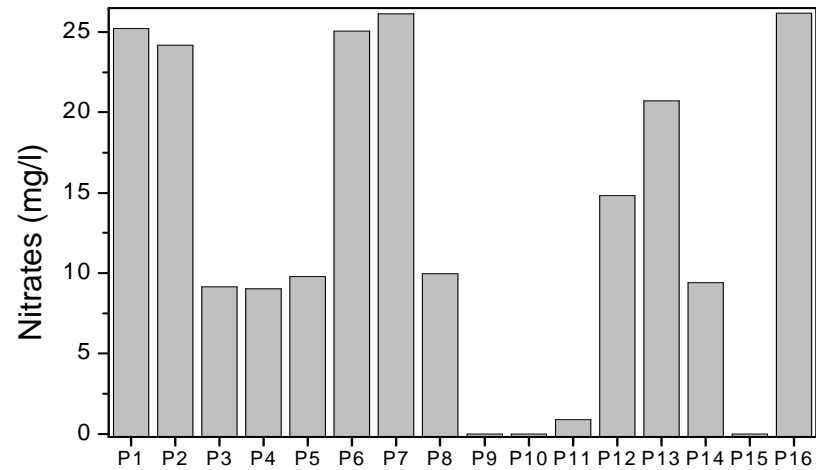
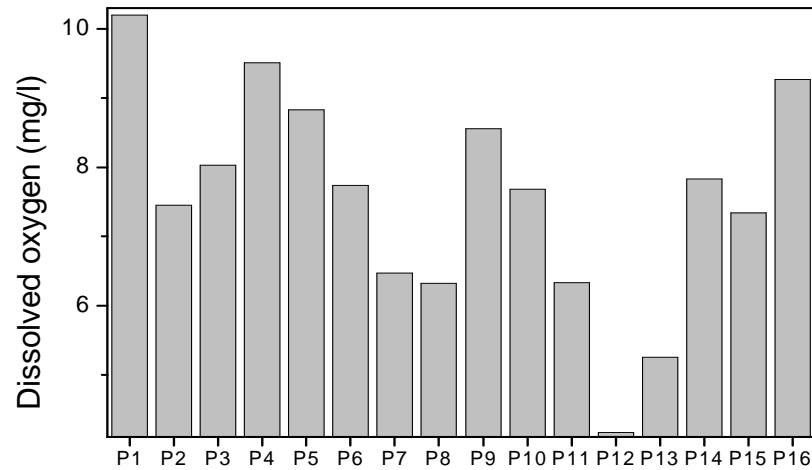
Humic-like
fluorescence

Humic acids (A):
 λ_{ex} = 230-260 nm
 λ_{em} = 380-480 nm

Fulvic acids (C):
 λ_{ex} = 330-360 nm
 λ_{em} = 380-480 nm

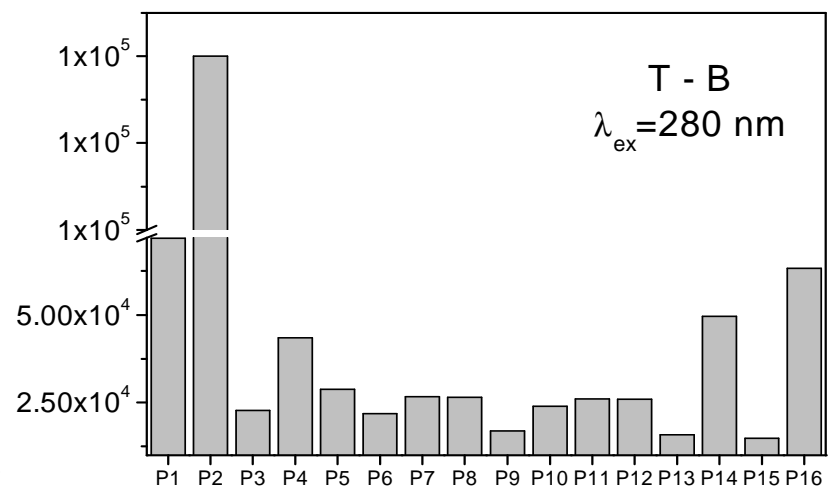
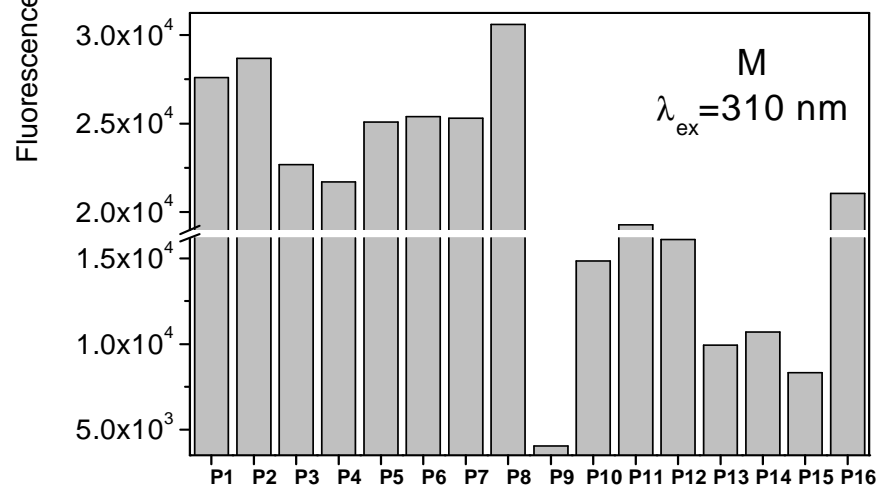
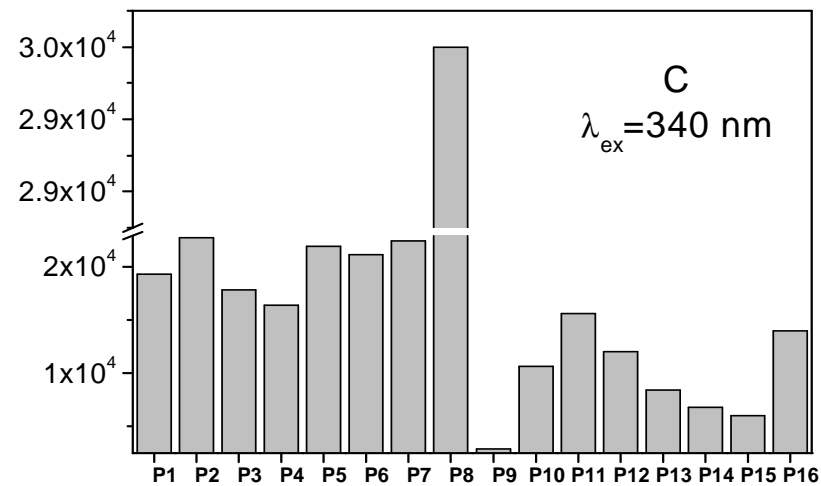
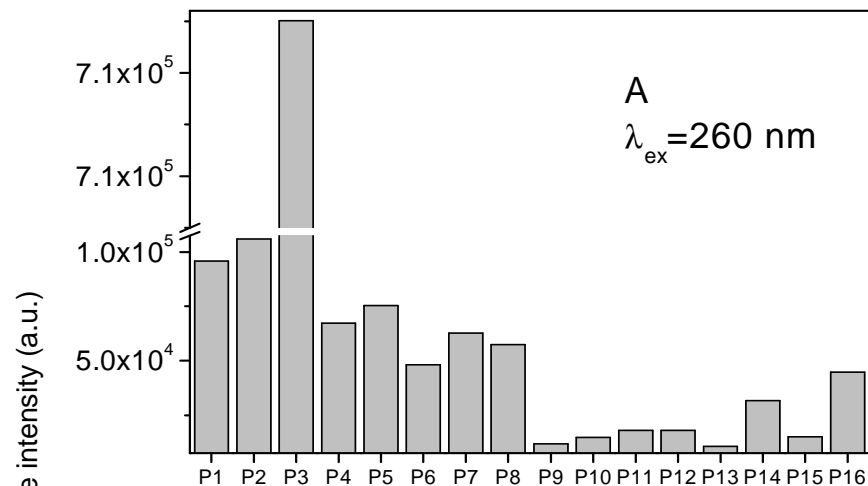
Recent production (M)
 λ_{ex} = 310-320 nm
 λ_{em} = 380-420 nm

Results and discussions



Standard chemical parameters of the lake water samples

Results and discussions



Principal fluorophores

Results and discussions

$$HIX = \sum F_{435 \rightarrow 480} / \sum F_{300 \rightarrow 345}$$

$\lambda_{ex} = 254 \text{ nm}$

- HIX: 0.59 to 2.48 → bacterial organic matter, of autochthonous origin and less DOM humification degree

- BIX: 0.76 and 1.31 → predominantly autochthonous origin of DOM and organic matter freshly released into water

$$BIX = F_{380} / F_{430}$$

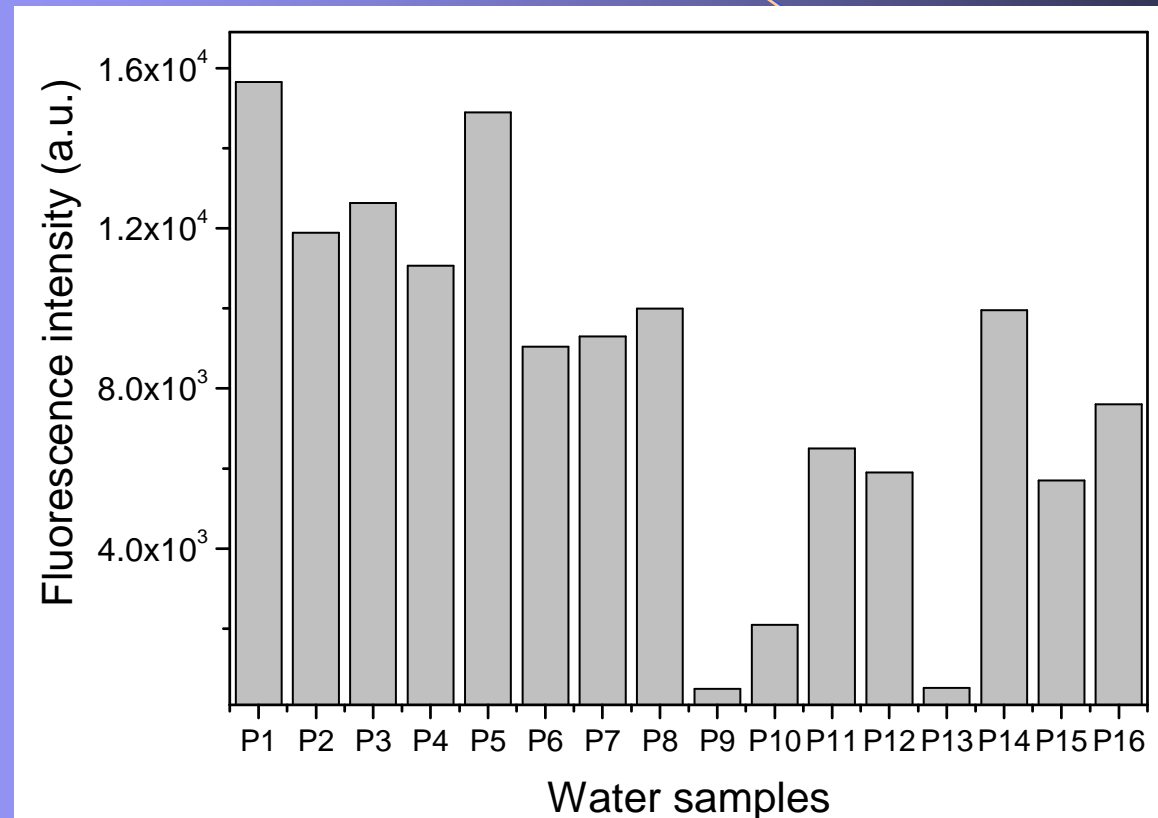
$\lambda_{ex} = 310 \text{ nm}$

$$FI = F_{450} / F_{500}$$

$\lambda_{ex} = 370 \text{ nm}$

- FI ~ 1.24-1.39 → mixture of allochthonous and autochthonous organic matter

Results and discussions



Chlorophyll – a levels in the urban lentic systems

Conclusions

- ❖ Important microbial content found in all lakes, coming from water degradation sources
- ❖ Fluorescence indices showed the presence of bacterial organic matter, of predominantly autochthonous origin, with very low DOM humification degree.
- ❖ Ecological status influenced by individual residential areas in lakes proximity
- ❖ Good correlation with standard parameters

***Thank you
for your attention!***

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