

# PAHs in freshwater mussels in Finland

- Concentrations of polyaromatic hydrocarbons (PAHs) are needed for the chemical classification of waterbodies
  - EQS are set for benzo[a]pyrene (5 µg/kg w.w.) and fluoranthene (30 µg/kg w.w.) in crustaceans and molluscs (Dir 2013/39/EU)
- Duck mussel (*Anodonta anatina*) was chosen as an example species
  - Mussels were collected from 11 freshwater sites and 1 coastal site with anthropogenic impact and from a reference site (Map 1)
  - Painter's mussels (*Unio pictorum*) or Swan mussels (*Anodonta cygnea*) were chosen if duck mussels were not found
- Altogether 15 different PAH compounds were found out of the 21 analyzed

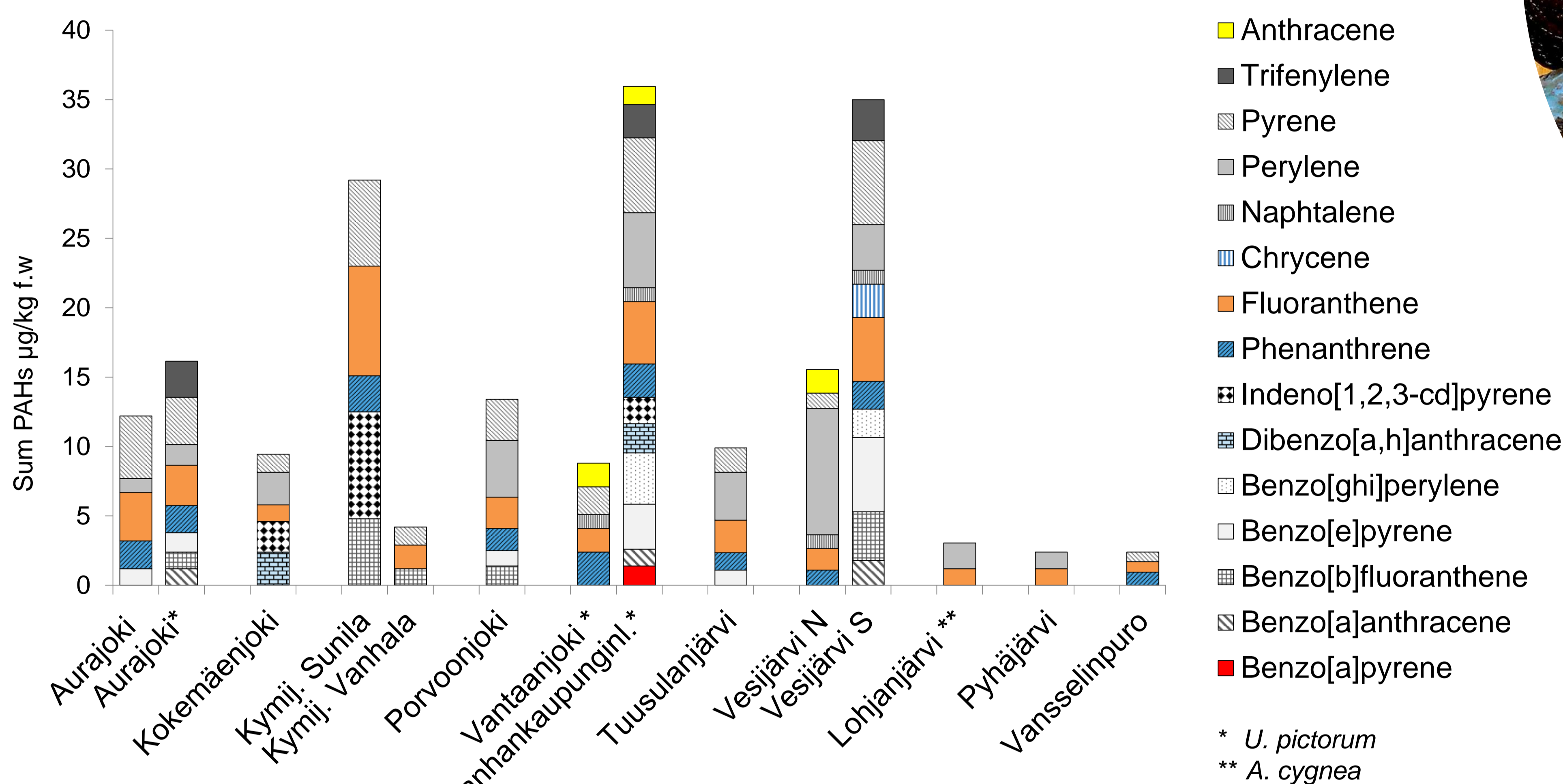


Figure 1. Sum of PAH concentrations in mussel soft tissues.

EQS were not exceeded. 3 PAHs were detected from the reference site (Vansselinpuro) while 2 to 13 different PAHs were detected from other sites (Fig 1).

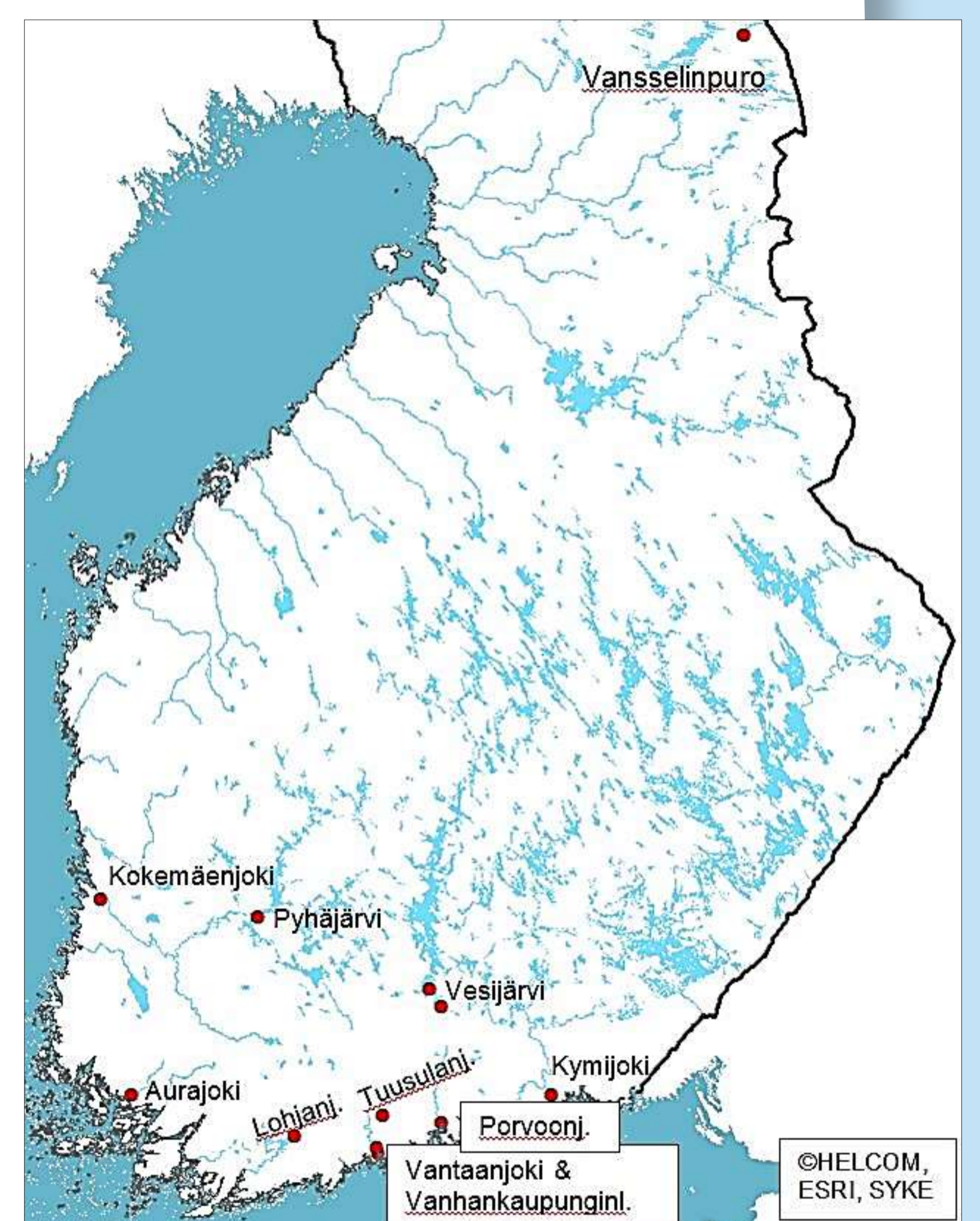
**Benzo[a]pyrene** (BaP) was found only in 1 sample, while plenty of those other high molecular weight (HMW) PAHs it should indicate were. Previous studies in Baltic Sea coast indicate lower BaP levels than other HMW PAHs in mussels (Turja et al. 2015, 2014, 2013). These results suggest that BaP might not be the best indicator to evaluate HMW PAH concentrations in mussels.

**Fluoranthene** was detected in every site (max 7,9 µg/kg w.w. in Kymijoki Sunila).

Most PAHs and highest concentrations were found in *U. pictorum* from Vanhankaupunginlahti in Helsinki urban area, near the outlet of river Vantaanjoki.

To our knowledge there are hardly any published studies available of PAH concentrations in freshwater mussels in Europe. This study shows that *A. anatina* might be considered as a suitable indicator species of PAH pollution in freshwaters due to its large area of distribution (Map 2) and ability to accumulate PAHs.

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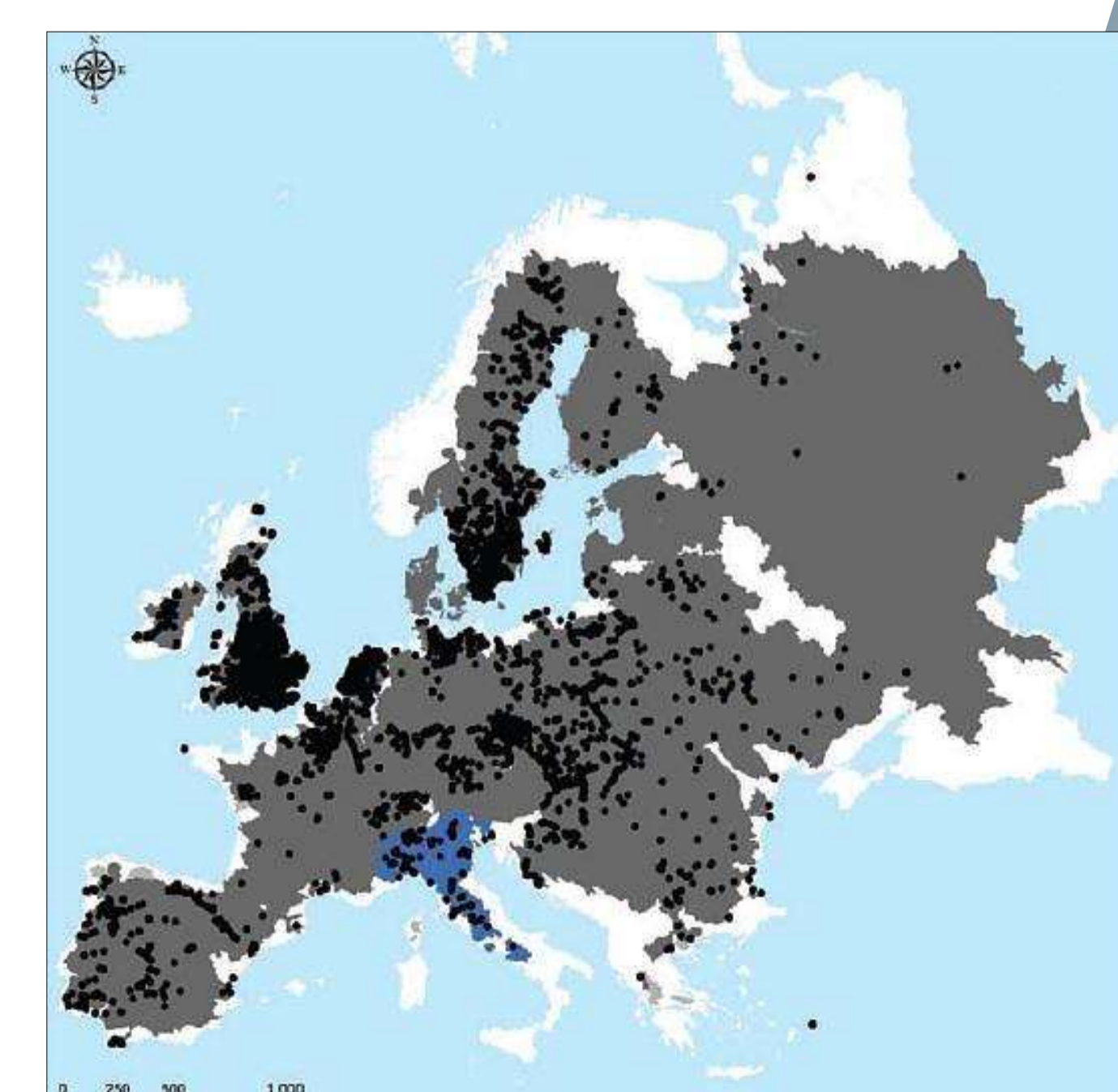
Map 1. Mussel sampling locations.



Searching for mussels in Pyhäjärvi, Pirkkala.



Sampling site Kymijoki Sunila in Kotka.



Map 2. Distribution of *A. anatina* (Lopes-Lima et al. 2017).

UUPRI: The new priority substances assessment within EU Water Framework (WFD) and Marine strategy framework directives (MSFD)

## References

- Lopes-Lima et al. 2017. Conservation status of freshwater mussels in Europe: state of the art and future challenges. *Biol. Rev.* 92:572-607.  
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