Using features of mercury and methylmercury to discriminate contamination profiles between sea bass, *Dicentrarchus labrax*, populations

Cransveld Alice[1], David Amouroux[2], Emmanuil Koutrakis[3], Caiyan Feng[2], Joseph Schnitzler[1], Krishna Das[1]

[1] Oceanology, Sciences Faculty, University of Liège (B6c), B-4000 Sart Tilman, Belgium. [2] Fisheries research institute, Hellenic Agricultural Organisation, G-640 07 Nea Peramos, Kavala, Greece. [3] LCABIE-IPREM, UMR 5254 CNRS, Université de Pau et des Pays de l'Adour, F-64053 Pau Cedex 09, France.
E-mail: Alice.cransveld@ulg.ac.be

Context

Mercury (Hg) loads in marine predators remain high in Europe despite reduction of emissions within the EU. As Hg presents a long residence time in the atmosphere (~1 year), it could be transported far from point sources. A better knowledge of Hg cycling is therefore necessary to understand where the Hg, contaminating marine organisms, comes from.

Our aim is to investigate Hg concentrations, speciation and stable isotopic signature in sea bass originating from several areas around Europe in order to show how this information can help discriminate the sources of Hg pollution.

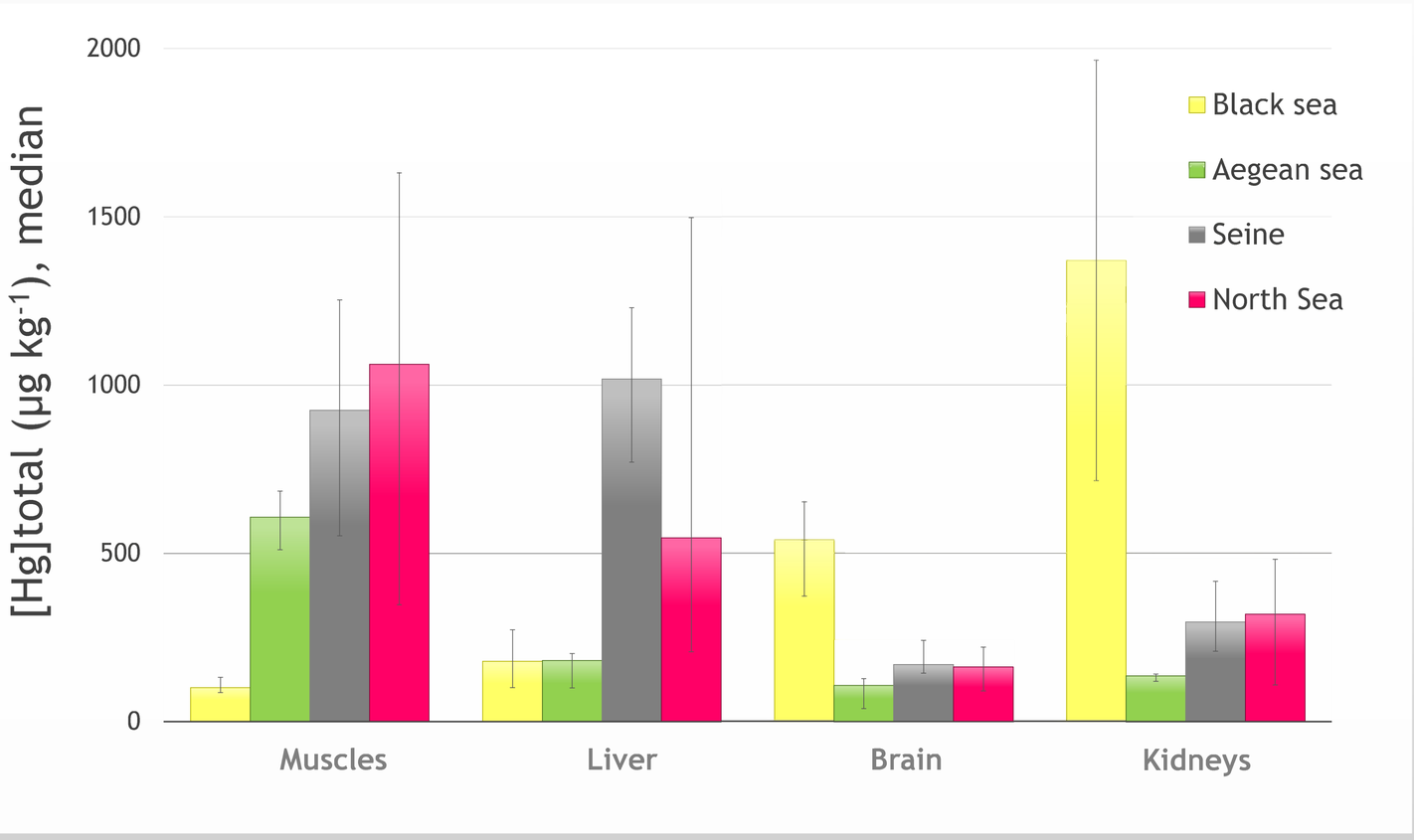
Method

We sampled juvenile sea bass, *Dicentrarchus labrax*, from the mouth of the Seine, the North Sea, the Aegean Sea and the Black Sea. Livers, muscles, brains and kidneys were collected. Total Hg was measured using a DMA 80. A preliminary set of individuals was also selected for the determination of MeHg concentrations.

Results and discussion

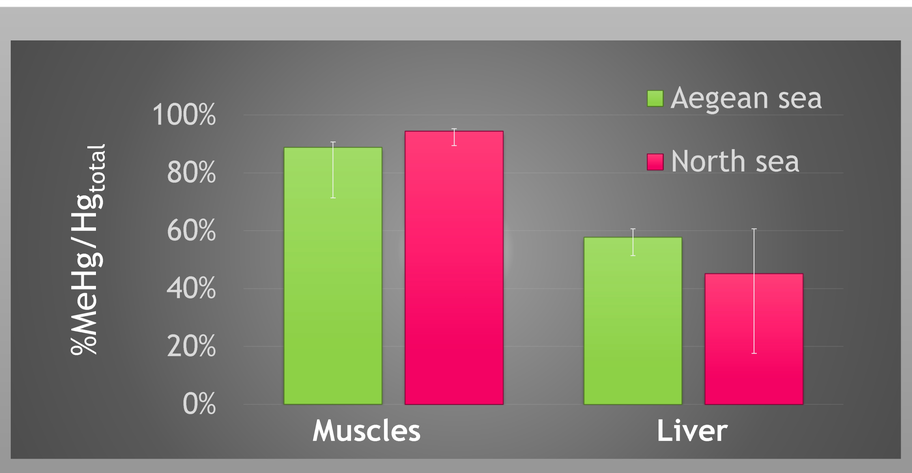
I. Concentration

- Total Hg concentrations varied greatly both between locations and between organs.
- Values found in muscles often **over ranged consumption limits** (1 µg kg^{-1}) in Seine and North Sea, when specimens analyzed are still juveniles.
- Values from the Aegean and North Seas indicate higher contamination of muscles compared to all other tissues, while Seine values are highest for liver. This might indicate that the Seine location is more heavily contaminated.
- **Values from the Black Sea displayed surprising variations** between organs, with highest values found in kidneys and brain. This is opposite to what is found in other locations in this study and previous studies.



Possible explanations are:

- **Diet**: directly linked to the location and/or the age of the specimens
- **Speciation** of the mercury source: different organs are targets for different Hg species



II. Speciation

- Preliminary results confirm a very high proportion of MeHg, the most toxic form of Hg, in muscles.
- Results also seem to confirm a **differential organotropism of mercury species** in our model, *D. labrax*.

Conclusion

- **Brain and kidneys should not be discarded** in future analyses as they could bring additional information, different from muscles and liver.
- Further **speciation analyses, as well as isotopic analyses** on C, N and Hg **will provide us with essential knowledge** for understanding Hg organotropism and, more widely, the sources of Hg contamination.

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