A NEW APPROACH FOR MONITORING ESTROGENIC POLLUTION AND REPRODUCTIVE CYCLES OF MARINE FISHES

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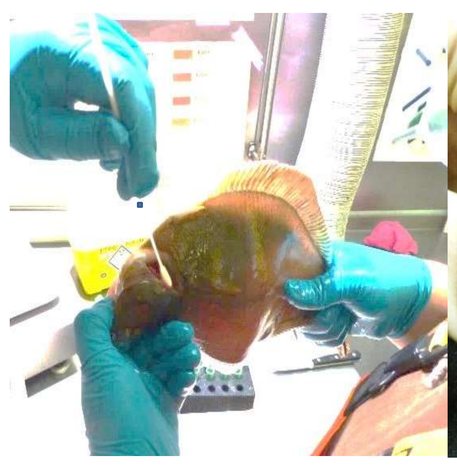
Introduction

Induction of the estrogen dependent yolk protein vitellogenin (VTG) in male and juvenile fishes is a biomarker for environmental endocrine disruptors. The non-destructive VTG detection in the skin mucus is a promising approach for environmental monitoring [1]. A pilot campaign in the frame of the marine fish monitoring of the Thünen Institute of Fisheries Ecology in December 2015 was conducted to assess the suitability of the methods in this specific research environment

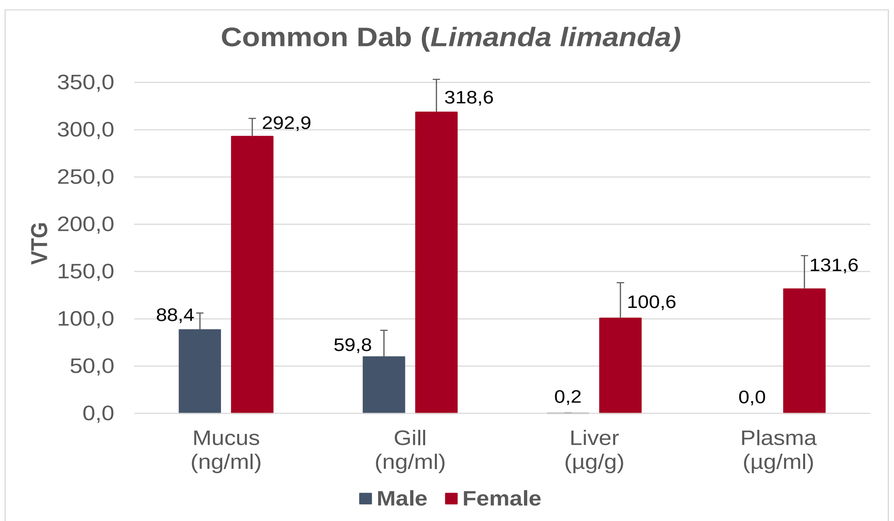
Materials & Methods

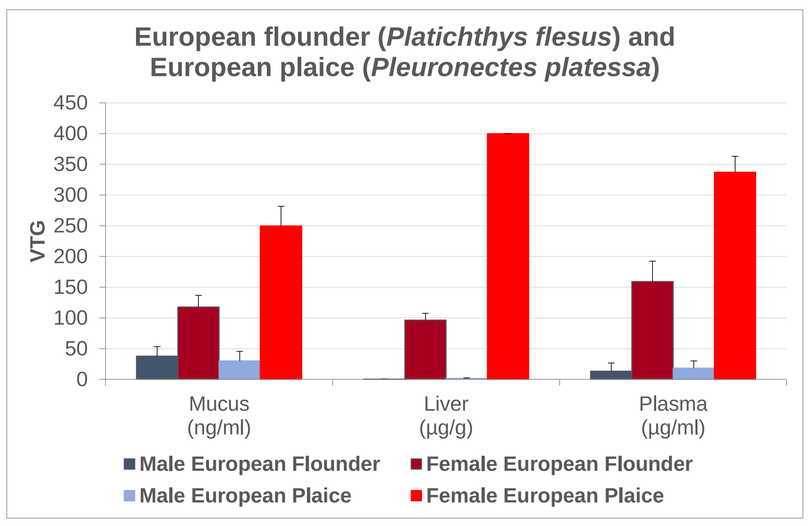
- 5 teleost species , Benthic: - dab (Limanda limanda , flounder (Platichthys flesus) , plaice (Pleuronectes platessa); Benthos feeding: cod (Gadus morhua) Pelagic: herring (*Clupea harengus*)
- Blood, skin mucus and liver samples of at least 20 specimens /gender investigated, as well as gill samples (n=10 / gender) of common dab
- VTG measurement with a multi-species VTG sandwich ELISA

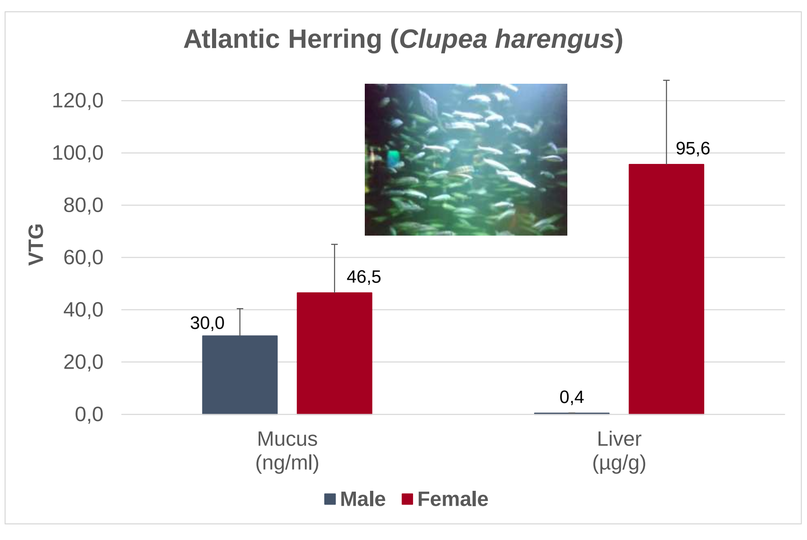


Results & Discussions

The multi-species ELISA is sensitive to variations in VTG content of skin swab samples, blood and homogenates of the 5 investigated species. VTG values in the skin mucus were at least 50% higher in females than in males (herring) , and up to one order of magnitude (plaice). Swab sampling of gills of dab show significant difference in VTG content. Gill mucosa samples may present a good alternative to avoid cross-contamination between individuals due to net fishing.

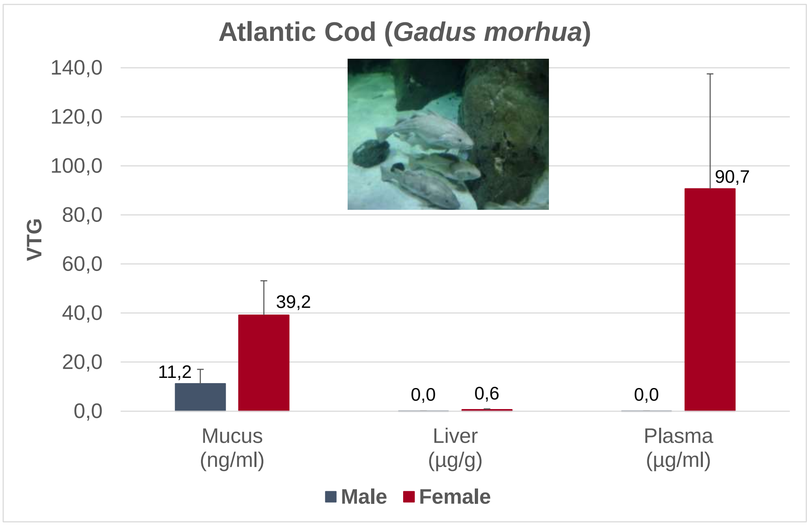






Conclusions

- Skin-/gill swab samples are valid biological matrices that allow non-invasive / non-destructive sampling for VTG detection.
- Information regarding the stage of the reproductive cycle (through VTG levels in the skin mucus of females) may constitute a valuable research tool in marine aquaculture, conservation and restocking strategies.



References

[1]Allner, B., Hennies, M., Lerche, C. F., Schmidt T., Schneider, K., Willner, M., Stahlschmidt-Allner, P., 2016. Kinetic determination of vitellogenin induction in the epidermis of cyprinid and perciform fishes: Evaluation of sensitive enzyme-linked immunosorbent assays (ELISAs). Environmental Toxicology and Chemistry, *in press*.